CASE 5941: OCC-PERMIT OPERATORS TO SHOW CAUSE WHY INJECTION OF FLUIDS FOR SALT WATER DISPOSAL OR SECONDARY RECOVERY SHOULD NOT BE RESTRICTED OR SUSPENDED

Case Number

5941

Application

Transcripts.

Small Exhibits

ETC.

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date JUNE 13, 1977 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
Les Clements	N.M.O.C.C.	Hobbs, N.M.
Bob McCrary	Gas Co N. Mex.	Dallas
Jim Bowsley	Gas Co of N. Mex	Dallas
Graham Evans	GCNM	HBQ
Byron CATON	GC NM	FARMINGTON
JERRY BOWEN	AMOCO	LEVELLAND, TX
Jack Williams	Transwestern	Houston
John J. Juston	Mobil	Houston
A.J. HANKINSON Jr	Mobil	Houston
N.E. BOURLAND	Mobil	Midland
C.L. Pyle	Mobil	Hobbs
W. T. Mueller	Phillips Pete	Odessa
Daryl L Smith	Northern Natural Gas Co.	Midland
Phil Wade	Northern " " "	Midland
Dean Fuller	Northern " "	Midland
Joe Fury	Northern Nat Gas Co	Omaha
E.R. Manning	El Paso Natural Gas	El Paso
Jerry Bonnette	Anadarko Production Co	Houston
R L Casey Jr	" "	"
J D CHRISTNER	" "	"

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COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date JUNE 13, 1977 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
Herb Henderson	Anadarko Prod. Co	Eunice
DAN KERNAGHAN	"	Houston
J.B. MAYNARD	EPNG	El Paso
Rand Schmitt	"	"
Jack Thompson	"	"
Bob MacFarland	"	"
J.D. Willingham	Cardinal Surveys	Hobbs
L.A. Hamann	Texaco Inc	Midland
H.F. "Hap" Weaver	MOBIL OIL	HOUSTON
Don Buterbaugh	Northwest Pipeline	Salt Lake City
A.L. Porter	U.S.G.S.	HOBBS
G.M. EMERICK	CHEVRON U.S.A.	DENVER
J.G. Shrader	Gulf Oil	Midland
William F. Carr	Shell	Santa Fe
John E. Erickson	E.P.N.G.	Santa Fe
W.G. Abbott	AGUA	1-10665
Chester E. Bledsoe	Getty	Tulsa
William T. Thornton	Getty	Hobbs
HAL A. OWENS	GETTY	HOBBS
R.W. PHILLIPS	Shell	Houston

MORE NAMES ON BACK

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COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date JUNE 13, 1977 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
O. T. Stuckey	Getty Oil Co.	Midland
L. B. Goodheart	Rice Engineering	Hobbs
C. R. Korzekwa	Gulf Oil	Hobbs
J. L. Ludwig	Amoco	Midland
V. T. Lyon	Conoco	Hobbs
Hugh Ingram	Conoco	Hobbs
Wayne Wise	Amerada Hess	Hobbs
Ed M. Johnson	Reserve Oil, Inc	Midland
Sherman E. Galloway	N. Mex. State Engineer	Roswell
Tom Kellahin	Kellahin & Fox	Santa Fe
Bill Grossett	OCC	Artesia
A. L. Kendrick	OCC	Artesia
J. O. Gannon	Texaco Inc	Hobbs
R. S. Anthony	Texaco, Inc	Hobbs
Morris Todd	Texaco Inc	Midland, Tex
Stephen Schlarb	"whole world" railroad	Hobbs
Borden Kelly		SF

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
13 June 1977

COMMISSION HEARING

IN THE MATTER OF:

The hearing called by the Oil Conservation Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County, New Mexico. CASE 5941

BEFORE: Commissioner Joe Ramey
Commissioner Emery Arnold
Commissioner Phil Lucero

TRANSCRIPT OF HEARING

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For Mobil Oil Company:	James E. Sperling, Esq. MODRALL, SPERLING, ROEHL, HARRIS & SISK Box 2168 Albuquerque, New Mexico 87103
For Phillips Petroleum, Anadarko, and Continental:	Tom Kellahin, Esq. KELLAHIN & FOX 500 Don Gaspar St. Santa Fe, New Mexico 87501
For Rice Engineering:	L. B. Goodheart Rice Engineering Hobbs, New Mexico
For Shell Oil Company:	Owen M. Lopez, Esq. MONTGOMERY, ANDREWS & HANNAHS 325 Paseo de Peralta Santa Fe, New Mexico 87501

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CHAIRMAN RAMEY: Case 5941. The hearing will come to order.

MS. TESCHENDORF: Case 5941. In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County, New Mexico.

CHAIRMAN RAMEY: I'll ask for appearances at this time.

MS. TESCHENDORF: Lynn Teschendorf, appearing on behalf of the Commission. I have one witness.

MR. KELLY: Booker Kelly, White, Koch, Kelly & McCarthy, Santa Fe, on behalf of Texaco. We reserve the right to call two witnesses.

MR. ABBOTT: Bill Abbott with Agua. I'll have a statement.

MR. EATON: Paul Eaton, of the Hinkle firm in Roswell, representing Atlantic Richfield. We will have one witness.

MR. BLODGET: Chester Blodget, Getty Oil Company. I'm entering an appearance with Bill Carr as my local counsel and myself. And we'll have three witnesses.

MR. SHRADER: Jeff Shrader with Gulf Oil in Midland,

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Texas. Jack Campbell is preparing a letter of appearance for us. We'll have one witness, who just wishes to make a statement.

MR. SPERLING: Jim Sperling, with the Modrall firm in Albuquerque, appearing on behalf of Mobil Oil Corporation. We'll have one witness.

MR. KELLAHIN: Tom Kellahin of Kellahin and Fox, Santa Fe, appearing on behalf of Phillips Petroleum Company, Anadarko Production Corporation, and Continental Oil Company. I may have three witnesses.

MR. GOODHEART: Lloyd Goodheart, Rice Engineering, Hobbs, and I'll have a statement.

MR. LOPEZ: Owen Lopez, with the Montgomery firm for Shell Oil Company.

CHAIRMAN RAMEY: Do you have any witnesses, Mr. Lopez?

MR. LOPEZ: We have one witness who will present a statement, a prepared statement.

CHAIRMAN RAMEY: I think we'll recess until 1:00 o'clock.

(Thereupon the noon recess was taken.)

CHAIRMAN RAMEY: The hearing will come to order. I would ask that those who have statements that aren't subject to any cross examination, if you could submit those as written statements, it might make things go a little smoother

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and faster.

All right, Ms. Teschendorf, would you proceed?

MS. TESCHENDORF: Call Jerry Sexton.

(At this time the witnesses were duly sworn.)

JERRY SEXTON

calles as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MS. TESCHENDORF:

Q State your name and residence, please?

A Jerry Sexton, Hobbs, New Mexico.

Q By whom are you employed and in what capacity?

A Oil Conservation Commission of New Mexico as District Supervisor, over District One.

Q Have you previously testified before the Commissio and are your credentials a matter of record?

A Yes.

MS. TESCHENDORF: Is the witness considered qualified?

CHAIRMAN RAMEY: Yes, we consider him a qualified witness.

Q (Ms. Teschendorf continuing.) Are you familiar with Case Number 5941?

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A. Yes.

Q. And what is the purpose of this case?

A. To permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County.

Q. An orientation map has been prepared for the benefit of the Commissioners. Would you please point out the three areas in question?

A. We have three problem areas. This is -- the north area is what we call the Vacuum Area, that we've been working on. The central area is called the Monument, or Oil Center Area, and the south area is called the Eunice Area, and these are -- all three are similar and have the same properties.

Q. Would you please refer to Exhibit One and identify that?

A. It just shows the geological sections from the San Andres back up to the ground level, and it shows what formations are involved, and what we'll be talking about.

Q. Okay. Using Exhibit One, could you describe, generally, what problems exist in the three areas?

A. Well, water from either waterflood or disposal wells have not been confined to the disposal or flood intervals, and the water has migrated up to the salt sections,

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which apparently has the first horizontal fracture, and at this point it extends over large areas of ground, and pressure measures in all three areas are fairly uniform; mostly 800 and 900 pound pressure at the surface, and right now it covers approximately 150 sections, the best we can tell, have been pressured up in the salt section in these three areas. The salt lies between, oh, from 1200 to 2500 feet down at Eunice; and 15 to 2700 feet in the Vacuum Area, approximately. And the flow in the salt section is not at any consistent depth. It can be right at the base; it can be in the Morrow; it can be at the top; but logs have been run to show that it is a fairly narrow interval, but it varies throughout this section where the flows are coming from.

And I think it might be good to explain how the problem could be this extensive without it being detected before it got this size.

There are several reasons, but the first reason was that in our area it's common practice to set your surface string at just below the fresh water sand, around 300 to 400 feet; then you'll drill your production string to the San Andres or Queen formation, and set a longer string.

We found that the bradenheads had caved in, apparently, and sealed off the pressure from the salt section so it's really not noticed, except those that have longer casing strings.

And, also, most operation practices were to set your surface head below ground level and many times it won't be checked until problems occur, and for this reason we've had to go back in and dig out bradenheads in the cellars and, consequently, what you see up here is about the size of the area where it was when we found the problem.

Usually, what brought on these problems are either collpased casing, or a valve blow-off, or in the Eunice area, we have had a fresh water well went bad, and this brought the condition to the light of the Commission.

Q. Would you please refer to Exhibit Two and explain that?

A. Okay. This is a map of the Eunice area, and we've got the red is ones that had waterflow, or still do have waterflow out of the salt section. And these are -- these hexagons, they're where the pressures were monitored for our study committee. And the green squares, these are ones that have been gone into and repaired at the Commission request, cemented off.

Q. Okay. And this is the area that was called the south area on the docket, correct?

A. Yes.

Q. What is the history of the problems in the Eunice area?

A. Well, it came to light in January, 1974, there

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was a fresh water well in Section 2, right here (indicating), and it went good water to salt water with a flouride content of approximately 87,000. At this time the fresh water well was an abandoned oil well, and we thought maybe it was coming from down below, and the well was re-entered and due to mechanical failure they couldn't get down to the bottom, but they did get down low enough, below the water sand, to find out that the water was not coming up from the bottom part of the wellbore. And so, at this point, they took casing surveys of the surrounding wells. It was found out that the Armer Well, at that time, which is now Petro-Search, has bought out Armer, it was found that this well, located within a couple hundred yards of the fresh water well, had water coming up around the intermediate casing, and up to the fresh water sand and out, causing the contamination. This well was perforated at the lower part of the salt and squeezed. They did get a squeeze job, by temperature survey, up the hole to prevent any movement. This was confirmed by logs, but the waterflow was so severe there, that they never really got the perforation squeezed off, and for awhile they used straddle packers to be able to produce the well, and then eventually the water did get down to where they could pull the straddle packers and just pump what water was coming in with a conventional pump.

And then from this -- it was right here (indi-

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cating), and offsetting Skelly's well, why, we went in --

Q. What section is that, please?

A. This is Section 2; this outlines Skelly, which borders where the problems arise.

Q. Okay.

A. And at that time the Commission had Skelly, or now Getty, run pressures and temperature surveys on all their injection wells, and we found some problems but nothing that would really indicate anything of this -- of air getting out of the zones.

Then, in June, '74, Skelly had an LPG well which started to flow back water, and after they bled the LPG off of it, it had 800 pounds surface pressure and had a flow rate of between 350 and 1400 barrels a day out of the salt section. And this well was located right here (indicating), in Section 27.

Of course, this is in the center of Anadarko's flood, and so at that time we had Anadarko run temperature surveys, or profiles. This also, although minor problems were found, nothing of the size that would indicate that it was coming all the way up and pressuring up the salt section to any extent.

But due to both of these added problems covering such a big area, in December of '74 an industry committee was formed by the Commission to study this area, consisting

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of 36 sections, and make recommendations back to the Commission on the problems and how they could be solved.

From this study Order R-5003 was issued, and essentially what it said was that in the deep wells in this area and this is a multi-pay area, where you have deep wells through the flood zone, they went back in and studied all the deep wells, and the order issued them to bring cement back up through the flood zone, and then any well with a surface flow, it ordered to perforate at the top of the salt and bring cement back to the surface to prevent contamination of the fresh water sands.

And at this time Anadarko and Skelly, Getty now, were to reduce their water injection to a voidage figure, which Anadarko was based on 100 percent and Skelly then, was based also at a 100 percent, and then in July of '75 Skelly, or Getty, had theirs increased to 150 percent voidage figure.

And I might point out the one thing that R-5003 did bring up, that once you have a waterflow in such a large extent, it's hard to really solve it by cementing techniques. Several wells -- this Petro-Search well finally had a collapsed casing, and another well got in such a condition that they were unable to squeeze it off, and $100,000 squeeze jobs weren't that uncommon in this area.

I think this also left the industry with some questions on how to approach the problem as far as economics,

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whether it would be worthwhile to perforate a zone.

Q. What about Agua?

A. All right, and Agua was injecting in their salt water disposal well H-35, and in September of 1975 we ordered them to cease injection into this well, and at the time it was injecting above the parting pressure of the zone.

Q. I've furnished the Commission with a copy of Order R-5003, and that order originally came from Case 5403 and the hearing for that was held on January 22nd, 1975. The case was re-opened on November 19th, 1975, and an order hasn't been issued, but I would ask that the Commission incorporate the records in those two cases in this hearing.

CHAIRMAN RAMEY: They will be incorporated.

Q. (Ms. Teschendorf continuing.) Would you now refer to Exhibit Three and explain that?

A. This is Exhibit Three. The red indicates where there's waterflow from the bradenheads, and the squares are where there are monitor wells that were used by the committee.

Q. The Vacuum Area, right?

A. Right. And these arrows right here (indicating) are where we had original problems that brought the Vacuum Area problem to light.

Q. What is the history of the problems in the Vacuum Area?

A. Well, in July of '75 Shell had a waterflow from

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the intermediate casing on the State B Number 1, Unit M in Section 31, 17 South, 35 East. Since this well offset the Texaco - San Andres flood, why, we had Texaco run temperatures or profiles on their injection wells on this flood, and this was done by December. And at this time we really didn't have any reason but what to think that -- I might add, also, in December of '75 Shell had two more wells offsetting this break out with water, with flow rates up to 100 barrels an hour from the bradenhead.

At this time, in January of '76, the Commission Order R-5003 was an adequate way to go about approaching the problem, so at this time we sent Texaco a letter, which essentially was the same outline as 5003, where you cemented up through the zone, or confirmed it, and then you perforated any of them with waterflow and brought your cement back to the surface. This was discontinued because of other problems that came up, that will be explained.

Q. Would you now refer to Exhibit Four and explain that?

A. This is the Oil Center Area; it's called Eunice - Monument, but we have been referring to it in committees as the Oil Center - Monument Area, and the symbols are the same. The red shows where we have water pressure on the casing annulus, and the hexagons are the monitor wells, and the green is where we've got the backflow of water out of the

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salt section.

Q. What is the history of the problems in this area?

A. This came up in February of '75. W. K. Bryan, an operator out of Hobbs, reported that he had four wells collapsed due to pressure in the salt section, or right below, and they didn't just occur there. But he repaired two of them and had to plug two, but it was brought to our light at this time.

And in the Texaco Skaggs Unit their Number 6 Well had water break up around the outside of their surface casing, and it was determined there was a hole in the intermediate casing at 60 to 100 foot, which was corrected by perforation and squeezing of cement.

And Amoco had a well in their Delulee (sic) lease that had a valve blow off and flowed 5,700 barrels of water before it could be replaced.

And Getty had a hole come in their riser of their intermediate casing on their State I Number 2.

And these are outlined on the map, but it showed the extent, that we weren't just looking at one area, that we had three areas that all had the same problems, and it was much more serious than we'd considered.

Q. There was a problem with the Skaggs Unit Number 7, too, wasn't there?

A. It had a hole in the casing and was flowing out of

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Yates sand, I think, at around 1800 pounds.

Q. What events have occurred in these areas since 1975?

A. Well, in April of '76 the Commission had an industry meeting up here in Santa Fe, and these, almost the same problems were explained a that time, and the extent of the problem area was pretty well outlined at this time. And it was proposed that the industry set up committees to find out what was causing the problem and what was being done in southeast New Mexico in waterflooding in general, to allow these problems to get this large and this extensive before they were being defined, and to solve this problem.

Q. Were any procedures put together by this committee?

A. Yes. We had some meetings in Hobbs and then we had one committee working on how to approach and find a solution to this problem that everyone would be agreed on that it would be the best approach that the industry could come up with.

And at that time the committee presented the following steps on how to find a solution to this problem:

One, was a bradenhead, bradenheads should be pressured and perforated in order to provide sufficient monitoring locations while the waterfloods were being cycled. The deadline for this survey work to be completed -- to be completed about June 1st. Each annulus that is found capable

of flowing water should be closed for up to twenty-four hours, recording dates and volumes. It should then be shut in and pressure -- pressure build-up recorded. This procedure, test, would indicate that if the pressure is connected to the main problem area, and its value as a monitor point.

Then the New Mexico OCC must set up its schedule to successfully shut in and cycle on each waterflood, or portion of a waterflood, all injectors that are injecting water at pressures equal to or above the pressure of the monitoring point. The shut in wellhead projecting falling pressures should be compared to the monitor point pressure with the time of shut in.

And they give, for example, if the water shut in injection pressure drops below all monitors in the area, that the injector could then, probably, be eliminated as a source of water contamination. If a response pressure fall-off is found in monitor wells during the shut in of a flood, further pinpointing of the problem area could be made by selectively beginning injection in a smaller area and observing the reaction of the monitor wells.

Five, after all floods in the area have been cycled and the problem area identified, the completion of all wells in the area must be reviewed for possible leakage out of the zone, flood zone. This includes not only injectors that cause pressure response, but all producing wells, deep and shallow,

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flood wells, and injection wells, et cetera.

At this point the selected well should be surveyed with the appropriate logs and surveys that are required to identify the problem.

Remedial work on all potential problem wells should be decided at this point.

And, Eight, pressure zones should be bled down, especially in the area where remedial work is being performed.

Nine, water pressure can be effectively bled down, and would eliminate the necessity of squeezing off the monitor points, to protect the fresh water and protect the casing from collapsing. Further, the monitor points can be left open. They can be watched for re-occurrence of the pressure, and normal water injection should be resumed.

Q. Were these procedures implemented by the committee, by the industry?

A. Yes, to as much as possible; although, each committee did approach it in a somewhat different way; the committees did use this outline form as an attempt to find the problem.

Q. Would you now refer to Exhibits Five through Seven, identify them, and summarize their contents?

A. These are the reports made by the individual committees as of January 20th, 1977, and this tells pretty much in detail -- consists of some two hundred pages -- of

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what had been done and what had been tried, and what the committees had accomplished in this year of working on the problem.

Also included in this is a Secondary Recovery, from New Mexico OCC, 1958. We found one well in the Eunice area that had a flow while drilling it in 1959, but also at this time this report points out that there was a million barrels of oil -- or water injected into this area at pressures up to 2200 pounds, so while it does indicate that there may have been natural waterflows in the salt area, it also indicates that we had water injection at high pressures at this time that the flow occurred.

Q. Would you identify each of those by number, please?

A. Yes. Exhibit Number Five-A is a report furnished to the Commission by the Eunice Area. Five-B is the page out of the statistical report put out by New Mexico OCC of 1958 waterflood.

The Vacuum Committee report, as of January 20th, is Exhibit Number Six.

The Exhibit Number Seven is the report from the Oil Center - Monument Area, as to what had been done up to this date.

Q. Would you please summarize the work done by each of the committees?

A. Yes. We'll start out with the Eunice Area. The

Eunice Area, due to 5003, were already further down the line. They had had some previous bradenheads surveys and much of their work on well schematics and flows had already been determined.

So, they started out almost immediately cycling injection wells. They started out around this Petro-Search well that had had such a -- broke through into the fresh water zone, and they would cycle it down to where the injection pressure -- shut the injection well in and when the pressure got below 700 pounds, they felt like it would be safe to then start up if they didn't have any sign of the pressure drop on the monitor point.

And this was continued until there got to be numerous wells that weren't falling below this 700 pounds which had been required, set up by the committee as the pressure to reach that assured safety that the well wasn't furnishing pressure into the salt.

At that time they started flowing back the wells. They could get the pressure down below this point and it would stay to the end of twenty-four hours that it was shut in, then they considered it safe.

And this continued, stepping up, getting more as the injection wells -- as they met, could meet this standard, until September of 1976. And at this time, this Petro-Search well had broken back into the wellbore, and it had rods in it,

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and normal, standard fittings, and they felt like it was just too dangerous, this well had to be plugged. And so they built a 50,000 barrel plastic-lined pit and opened the well up to get enough of the salt water off to where they could safely re-enter the well and plug it. And after sixty hours it flowed 40,000 barrels of water out of this well into the pit. At the end of ten days it flowed back 63,000 barrels. At that time flow was down to about 2 barrels a minute and they could rig up on it and go in and plug the well.

And also during this interval, there were 18 wells that were either Getty's or Anadarko's, were relogged in an attempt to find additional information on how the water was escaping from the flood zone.

And, as this Exhibit Number Five-A states in the conclusions, testing and investigations of this to date have failed to identify the water source.

Q What was done in the Oil Center Area?

A The Oil Center Area was in the most ideal area to implement the plans that -- that had been proposed by the industry. They had their floods drawn at the lower end of their economic range, and so they, instead of shutting down the wells, they would shut down entire floods. In between the 6th and 14th of '76, and October 28th, 1976, all injection to this area went to produce water and the pressure on these injection zones were reduced to -- other than in a few isolated

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cases where the pressure reservoir was pressured up -- all their wells, injection well pressures, went below 500 pounds, which to me is what the industry outlines. They've been on produced water since this time, and as of yet we've had no conclusive response in the monitoring wells.

Q. What was done in the Vacuum Area?

A. The Vacuum Area approached the problem as being a mechanical problem, and it was close to the wellbore in the injection wells. And Mobil and Texaco ran an additional 28 either temperature or tracer logs. Texaco also ran 17 bond logs and attempted to try to find a wellbore condition that would allow this pressuring up to be observed. They also took some pressure fall-off tests and step rate tests without indicating what the problem was.

Q. Following these studies, how did the three committees decide to approach the problem?

A. Well, by January of this year I think it was pretty well decided that the way we had chosen to go about it hadn't really furnished us with any of the problems. So, at a meeting, then, with all three committees, with Mr. Ramey of the Commission, indicated at this time they would like to blow the salt section down and leave the floods essentially how they were, and after the salt section was blown down, then they could find the problem. And all three of the areas were in different status.

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The Eunice Area, it was on a voidage figure; it was a little bit more than produced water.

Oil Center and Monument Area was on produced water and had been for some seven months.

And the Vacuum Area, which was the smallest area in the extent, although they skip -- the waterflow skips on it; they felt like this was the smallest area and was just really getting started, and if they could blow the salt section down and leave the injection the way it was, which hadn't been altered, then they might have a chance of finding the problem, in working the reverse of what had been proposed by the entire industry committee.

Q. What additional data has been obtained?

A. Well, in March of this year, or April, we got new pressures in from the Vacuum Area, and this showed that the problem in this area had been increasing. On the east edge, a Chevron well that had 420 pounds pressure taken last year, now had 825.

Q. Would you give the section number, please?

A. Section 34, 17, 35 -- wait a minute, 4, 68, 30. This happened several places.

And then over on the west side, Arco had encountered two waterflows on their wells that they were working on to expand a waterflood in this area.

Then in the Eunice Area, Skelly, or Getty, had a

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well, B-54, start flowing water and they perforated it at this time and were getting 1000 barrels a day out of it, and with a lot of pressure, which also indicated that the problem may be growing in that area. This is a hard area to evaluate, the Eunice Area, because R-5003 essentially, covered up all the bradenhead survey material, so you kind of had to work from the outside edge. And the pressures haven't increased any and I don't feel like we've done that much good in the area.

And also in the Vacuum Area, Texaco, on their R-5 well, had a hole come in the casing and it's been flowing 1000 barrels a day since the first of April, and since the first of June they've recovered 51,000 barrels of water out of the salt section.

In the Oil Center - Monument Area, Gulf, on their Cutler (sic) well that they'd gone in and perforated and squeezed several years ago, had a casing leak repaired and it was right in the middle of the salt section. The first part of '77 it started flowing salt water, and I estimated the flow about 20,000 barrels out of this well, and the pressure hasn't decreased; it's still flowing, depending on whether it's fresh water or not, it's still flowing out 300-400 barrels a day.

Q. Given these problems, what recommendations do you have to make to the Commission at this time?

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A. Number One, is to reduce water injection in the problem areas to produced water, if the injection pressure is above the parting pressure of the formation. If the injection pressure is below the parting pressure, step rate tests should be sumitted to the Oil Commission within sixty days to determine the parting pressure of each well and the pressure limited to below this pressure.

There are several reasons for this recommendation. Number One, is the recommendation will allow the reservoir pressure to decrease, which will definitely reduce the water going out of the zone.

Also, for the Oil Center Area, where the injection pressures have been decreased for over seven months, we did not show a reversal of flow, and this may indicate to me, that maybe it's entirely pressure oriented problem and that lowering the pressure may take care of it. And also, if we just halt injection in these areas, it's going to have to require disposal lines and everything else, all the associated equipment to be installed, and there's a time lag, I would estimate, at least six months before this could be done, and by allowing it to go to produced water we will accomplish the same thing as halting injection.

Number Two, recommend that the pressure be bled off of the salt section in existing problem areas within a one-year period. The District Office will review the status

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of depressurization of the salt section in ninety days, and at six months a review by the Oil Commission should be made to determine if the plans to implement this are satisfactory or if additional steps are required by the Commission to assure depressurization of the salt zone is accomplished.

And the reason for this recommendation are that depletion of the water from the salt section will assure a protection of the fresh water.

And the reason it put a year down is that to bleed the water from the salt section requires special design in surface equipment and downhole equipment, and to date they've made some headway but this hasn't been perfected, and I think they'll need every bit of this time, while working diligently to do this. Also, it now appears like they may have to add twenty-five to fifty percent either produced water or fresh water to this water from the salt section to be able to accomplish this.

And to dispose of water in another reservoir will be difficult in the Eunice Area. Reservoirs that will take large amounts of water are hard to find in this area and some time will be required to do this.

Number Three is have the companies operating within the problem areas submit quarterly bradenhead tests to allow monitoring of the area to see whether it's decreasing in size of the problem, or whether the problem is expanding.

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Number Four, before any increase in injection rates from produced water, well schematics and plugged wells in the area would be reviewed and any repairs made. Where the floods are operating below parting pressure, a review of these wells should be made in thirty days and any remedial work done within another sixty days. And I think the Commission should review this, the whole scope of the problem, in six months to make sure that satisfactory headway is being made.

Q. In your opinion, will the failure to adopt measures rectifying the situation endanger fresh water of the State of New Mexico?

A. We're going to lose some, and at the present time, I think Skelly, on its B-54, their well salted off while they were backflowing it, and flow occurred outside the surface casing, which has to have had some contamination.

The thing that has probably saved us more than anything else from already being in trouble with the fresh water, is that this salt water is so hard to handle that we've got cases of wellbores plugging off in several days have occurred, and in some cases they've had lines plug off in a matter of hours, so while this also makes it harder to deplete the salt section, it also probably saved us in the water contamination of the fresh water. Eventually, it's going to hit the right wellbore, like this Citgo - State, and

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large volumes are going to be put into the fresh water then if it's not corrected.

Q. Do you have anything further to add to your testimony?

A. I don't believe I do.

Q. Were Exhibits One through Four prepared by you or under your supervision?

A. Yes.

Q. And Exhibits Five through Seven are the committee reports.

MS. TESCHENDORF: And I'll offer Exhibits One through Seven as evidence.

CHAIRMAN RAMEY: They will be admitted.

CROSS EXAMINATION

BY MR. ARNOLD:

Q. Mr. Sexton, let me get this straight. Going to your Exhibit One, I assume water is being injected into the Queen, perhaps the Grayburg and the San Andres, in these areas?

A. Yes.

Q. And you feel that it is somehow escaping out of these zones, going upward some way?

A. Yes. I think many of the wells, especially in the Oil Center Area and the others, were drilled by cable tools

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and now, in this last few years, the water has been noticed in the salt section, and I feel like almost everyone who has worked on the committees agrees that it's come from some sort of injection, whether disposal wells or producing wells.

Q. Okay, but you feel that it is migrating through some -- by some means, and you feel vertical fractures up to the -- into the salt bed?

A. I feel that's the next best possible place to look. I'm not sure -- I don't think anyone's sure, but that's the next logical step to approach.

Q. They haven't been able to determine to date anything else?

A. No.

Q. Any other method. And in the Eunice Area they've done extensive cementing work and there are still indications that new and different problems are occurring?

A. Yes, and definitely there is not a decrease. After the Petro-Search well was flowed back to 63,000 barrels, why, there was some pressure decrease on some of the monitor wells after several months, and then they're just starting to rise back up, which indicates that the area isn't stable.

Q. Okay. On your three exhibits, then, the red dots are wells which have indicated waterflow?

A. Yes.

Q. Could you give us an idea of the magnitude of some

of these flows?

A. Yes. This is the well that flowed the 63,000 barrels out (indicating); and this is the well that's flowing -- probably has the capability of 1000 barrels a day, or close to it (indicating). In the Vacuum Area, this well is flowing right at 1000 barrels a day (indicating).

MS. TESCHENDORF: Jerry could you identify where you're at on those maps, please?

A. Yes, this is the R-5 well in the -- excuse me, over here is the R-5, in Section 6, 17 South, 35 East. These wells had a flow of 100 barrels an hour, and I think we had one well in the Oil Center Area that flowed something like 200-300 barrels an hour for a short period of time, up here in the Skaggs.

Q. Would you identify those first two wells you referred to and what exhibit it's from?

A. Excuse me, this is the Petro-Search - Armer Well, Citgo - State Number 1, Section 2, 23 South, 37 East; and Skelly's B-54 is in Section 9, 23 South, 22 East; and this is either Skelly or Getty LPG Well that originally had a flow of 300 to 1400 barrels a day out of the salt section.

MR. RAMEY: What's the location of that?

A. In Section 27, 22 South, 37 East.

Q. (Mr. Arnold continuing.) Is that well still flowing?

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A. It's flowing just barely and this salting off of the wellbores makes a problem, you know, whether the well has actually been depleted or whether it's actually just a salting off problem. I think now it's flowing something like a tenth of a barrel per minute.

Q. What was the pressure on that well?

A. After we got the LPG bled back off of it, it was 800 pounds. Our original field notes showed that the pressure was 1700 pounds, and much of this was the pressure of the LPG.

Q. What's the depth of the casing in that well?

A. Approximately the top of the salt; it would be around 1100 or 1200 feet, and I might add, these wells, injection wells in two colors with arrows on them, these are the wells which water was injected to in 1958, when Texaco had the flow some distance away in wells in Section 16.

Q. Mr. Sexton, you need to identify these sections, those two sections, if you can.

A. In 1958 injection was occurring in Section 27, 22 South, 37 East; and Section 34, 22 South, 37 East; and Section 33, 22 South, 37 East.

Q. And your waterflows --

A. Were in Section 16, 23 South, 37 East.

Q. Some two and a half miles away?

A. Right, which isn't that unusual. As you see over

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here, we've got pressures --

Q. Over here is where?

A. In the Vacuum Area, we have pressures some three to four miles away from the closest injection point; wells with pressure. This is also true in the Oil Center Area.

Q. These descriptions are off of exhibit what? Which one of the exhibits are you referring to giving all this description? The reason, I'm telling you, I'd hate to be the judge reviewing this, if it goes to court, unless you identify what exhibit.

A. Exhibit Number Two.

Q. Okay. You mentioned something about where you first saw some contamination or something like that, when you started to testify, you referred to some well there?

A. Yes, it was also in Section 2 of 23 South, 37 East.

Q. Thank you.

A. Now, I think you'll find much of this information that I've given to you in detail by the unit, section, township, and range, in the exhibits. The companies did a good job of preparing exhibits and the information that I've presented is, I think, in detail in these exhibits.

Q. Okay, Mr. Sexton, to date, now, you've had one water well contaminated.

A. Yes.

Q. And you've had at least two problems of highly con-

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centrated salt water, I assume, outside the surface pipe of wells?

A. Yes.

Q. And you feel if the water is flowing to the surface, outside the surface pipe, that some of the water would be going into fresh water?

A. Yes, I do. I feel like there would. I believe that.

Q. Do you feel that this is a real potential threat to fresh water here?

A. Yes, it is. And I feel like that there can be headway to be made on it, but it is a serious problem, and I think we've approached it like industry has recommended and I think now these are additional recommendations, although they'll take a year to implement, will take care of any major water contamination.

Q. And you've also stated that there have been some wells that had to be plugged?

A. Yes.

Q. As a result of these waterfloods?

A. I think one of them they were able to go in with a casing patch; they were never able to seal off the waterflow, but the Petro-Search well had to be plugged, and I think this was the only one that actually was, but several of them have been repaired, and have not actually been able to repair the

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casing for operating.

Q. Then didn't you testify there were two wells in the Oil Center Area that were plugged?

A. Yes, there were two wells plugged because of collapsed casing and they couldn't re-enter and get back to the pay.

Q. Now, do you feel that this is a waste that's been created by --

A. Well, it -- I'm sure everyone has to -- I think probably there has been some waste; I mean, it's been fairly well confined with these additional steps, but we haven't found any -- any solution to date of what's causing it, and there is water, I feel, out of zone.

Q. But if wells have been plugged and have replacement wells been drilled?

A. On part of them, yes.

Q. On the Petro-Search well, has --

A. No. No.

Q. So there's a possibility that reserves were left in the ground?

A. Yes.

Q. And there's a possibility of more wells collapsing if the pressure isn't relieved off the salt bed?

A. Yes, I definitely think we'll see an increase in this.

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CHAIRMAN RAMEY: Any other questions of this witness? Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Sexton, in your testimony you indicated that all of this testing had failed to identify the source of the water in the salt. Did you mean to say that the testing had not identified any particular well or any group of wells as the source, rather than it hadn't identified all injection wells as the source?

A. Well, to try to solve the problem we had -- what we were looking for is a certain area or certain condition, and this condition wasn't found, but it still, as far as I was concerned, we generally felt that it was due to water injection of some sort, whether disposal wells or injection wells.

Q. Is that your opinion?

A. Yes.

Q. In your testimony you indicated that many of the possible avenues of water getting into the salt section had been eliminated, and you didn't come right out and say that you thought -- you were certain it was due to vertical pressure. Have all the other possibilities been eliminated?

A. No, they haven't, and I'm not saying that vertical

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fracturing is the case. I'm saying, in my opinion, it's the next best place to look; that we've looked under all the convential tools that's available to the oil industry and we haven't been able to find the problem, and these areas all have one thing in common and that's their high injection pressures. And to me, the next, only from a scientific or -- the way engineers would think, would be to pressure, and I'd be willing to stick by it, that we have some indication that it may be directly pressure oriented, but we also don't have the evidence to say conclusively, but I believe this would be the next approach to the problem. In fact, I know of no other approach other than this.

Q. I believe that you answered my question affirmatively with a no. Let me restate this. It would appear to me that my interpretation of your testimony is that everything that you have looked for, you've tried to find old P & A wells that could be causing the water to flow out into the salt; you've tried to find wells that had improper cementing; and you've found two of these and these have been corrected; these have not resolved the problem; and you have tended to eliminate all of the possibilities except water migration through vertical fractures, is that correct?

A. That's true, except for the cases -- until you re-enter every plugged well or find out absolutely, you can't say a hundred percent that this is the problem. I don't think --

we may not ever be able to find out a hundred percent what causes these kinds of problems, but I do think that the next step would be fracturing; fracturing has got to be considered; as far as I am concerned, it's the best possible solution right now that it is causing the problem.

Q. In your four points, you discussed reducing the injection to produced water in the areas where the pressure is above the parting pressure. How are you going to determine those areas where parting pressure has already been exceeded?

A. I feel like there are several accepted ways to approach this. One is step rate tests, which the industry use. Another method is immediate pressure after fracturing a well, which may be available on some wells from previous treatments; this data may be available on this particular well. I don't think you can be an entire field and say that we've got four dead wells here that show fracturing pressure at 1400; I don't think this would be satisfactory. It's almost going to have to be on a per-well basis.

In the Vacuum Area, Texaco did run step rate tests and they found the fracture pressure varied from up to 500 pounds to 900, and maybe some of them, I feel like they'll find are up around 1400 or so. It's not something you can accept one figure and take the entire field.

Q. Well, if parting pressure had already been exceeded would you have to run a reverse step rate test, lower the in-

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jection pressure a 100 pounds and see what happens; lower it another 100 pounds and see what happens, until the injection dropped off?

A. This is something I'm not that sure how to get that; this may be a possible way, and it may be that as soon as it falls below this, you can take two points and feel fairly safe, where one would take a way smaller amount over 50 pound increments, because it will be, the pressure will be declining in a fairly slow rate, and you may be able to take a 50 pound pressure drop and say at the point of pressure it's taking 100 barrels a day or 200 barrels a day, and at 50 pounds lower it's taking 50 barrels a day or 100 barrels a day, and I'd feel fairly safe that you probably passed over this parting pressure.

Q. In those areas where parting pressure has been exceeded, or in any area, well, in the areas where parting pressure has been exceeded if the wells can be used as injection wells at pressures below the parting pressure and still get in more water than just produced water, it would be your recommendation that additional waters be allowed in those projects?

A. Yes, as long as they have plans to depressurize the salt section.

Q. Now, is there some figure that you think would be a safe figure below the parting pressure, 50 pounds, 100 pounds?

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A. Whatever it can be mechanically shown that you can control the pressure at, at some point below this. I think right now it would be hard to find equipment that could regulate it less than 50, but this might be possible, also.

Q. What was your fourth recommendation? I did not get that written down properly.

A. Well, it's like primarily, if you're going to inject at above produced water rates, then I think the well schematics and plugged wells in the area should be examined to make sure there's cement across the flood zone and the wells are properly plugged. I think this is accepted by the industry that this should be done before any flooding is continued, because, obviously, if you have not covered up your flood zone by cement, you've got a potential problem, whether it is a problem or not.

Q. This would be on existing projects within your problem areas?

A. Yes.

MR. STAMETS: That's all the questions I have.

CROSS EXAMINATION

BY MR. RAMEY:

Q. What about other projects? Should this be done on other projects, also, whether you have a problem at this time?

A. I think a review should be made of all areas. I

really would like to see us come up with some answers, but this might not be possible. We know we've got problems over approximately 150 sections; we might as well go ahead and try to find out if we've got problems in other areas before they get out of hand, and I think bradenhead tests on this, which is one of the recommendations the original industry committee did make, would tell us whether any problem was starting in different areas.

RECROSS EXAMINATION

BY MR. ARNOLD:

Q. Do you know of any other projects where an operator is reviewing potential, let's say, plugged wells that might be a hazard to injection?

A. I know some that have reviewed any wells for pressure on the bradenhead just to see if this problem does exist on any of the other wells; how extensive this is, I'm not sure, but it is now required that any flow be reported to the Commission and we have checked out a couple of more flows and found them to be just, as far as I can see, isolated points, but this has been a help in determining just where the problem areas are and if there are additional problem areas.

Q. Well, let me ask, do you know of any operators of waterfloods that are not checking to see if any potential --

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A. Yes, I don't feel like right now, of course, I don't feel like all floods in Lea County or southeast New Mexico have been checked out to see that the offsetting wells have been cemented through the zone.

MR. ARNOLD: I might comment, it sounds like you've been reading the EPA's underground injection control program.

A. Well.

MR. RAMEY: Any other questions of the witness? Mr. Kelly.

CROSS EXAMINATION

BY MR. KELLY:

Q. Mr. Sexton, you served on these committees that you've testified about?

A. Yes.

Q. And the exhibits that you identified were the official reports of those committees, is that correct?

A. Yes, but I might add that I did not participate in the writing of these reports, although at the time it looked like we were headed to where we are now, that we hadn't found the problems and I really didn't -- I've been on almost all the committee meetings and had been in on everything that had happened up to date, yes.

Q. Now, one of the purposes of those study committees was to determine the source of the pressurization of the salt

zone, is that correct?

A. Yes.

Q. And, as I understand it, those exhibits do not contain any definitive statements of causation.

A. I'm not sure; you'd have to read the actual statements. I think most of them did state that they hadn't found the cause of it, and I'm not sure whether they -- in the minutes of the meetings I think you'll find some discussion on whether it was an injection problem or whether it wasn't, if that's what you're indicating.

Q. But the study committees themselves did not come to the specific conclusion that you've testified to here, that the source of the problems were either injection wells or the waterflood programs, did they?

A. Yes, I thought they did.

Q. You thought they did?

A. Yes.

Q. Well, okay.

MR. KELLY: Mr. Chairman, I would suggest that the best evidence of those reports would be the reports, rather than the conclusion of the witness.

MR. RAMEY: I might say, Mr. Kelly, that in a meeting I attended, why, I believe several operators concluded that they didn't feel this was a natural occurrence.

MR. KELLY: Well, I think we have to keep our in-

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formation on the record.

Q. (Mr. Kelly continuing.) Certainly, the -- you would admit that the evidence adduced by those study committees was basically inconclusive as to where the source of the problem was.

A. Yes, I think you could definitely say this.

Q. In fact, some of the information that was developed did not appear to be consistent with a causation being attributed to the waterflow of the injection wells.

A. No, I don't -- I disagree with this.

Q. Now, you mentioned, say, in the Vacuum Area that a Texaco well was -- recorded 51,000 barrels of water out of the salt section. Do you recall that?

A. Yes.

Q. There wasn't any evidence of any hydrocarbons in that water, was there?

A. This is true, and this is the reason that the Vacuum Area spent -- oh, I would hate to venture how much money was spent in the Vacuum Area, with the belief that it was a wellbore problem, and at one time, they even, through log interpretation, everyone, including myself, thought we'd found the problem, due to the perforation -- perforating those wells up high[illegible], then injecting into the lower zone. This was proved inconclusive, that it wasn't coming from these wells. But I think you'll find that the radius investigation

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of these surveys are within, oh, probably not over a couple feet at the maximum, and most of them closer to the wellbore. But your observation that there is no oil, that we can tell, in the salt section, is somewhat, in my view, that it is close to the wellbore problem and partially supports vertical fracturing being the problem.

Q. In your opinion, have the studies eliminated horizontal fracturing as the cause?

A. Well, horizontal fracturing, as the word indicates, will tend to keep everything in zone, and if your water starts out in a zone and you get horizontal fracturing, you would then have it confined to whatever zone you were injecting. But I think most of the fracture tests, and also the fracturing companies, would agree that at the depths we're talking about vertical fractures do occur and not horizontal fractures.

Q. Mr. Sexton, you testified as to these profile surveys that Texaco did in the Vacuum Field. Could you tell us what those surveys showed?

A. Yes. They showed, generally, that the water was going into the formation that was being flooded. The surveys as a whole were in very good condition.

Q. Now, how about the cement bond logs on Texaco's wells in that field?

A. They did show bonding.

MR. KELLY: That's all I have.

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RECROSS EXAMINATION

BY MR. RAMEY:

Q. Were all of Texaco's wells in the Vacuum Field cemented in the way that they were supposed to have been cemented for protection?

A. No, and we also have a problem with running bond logs on slim, open places, which they have numerous of. If you have two strings of pipe, from what I understand, that bond logs are -- when pipe lays together -- are very inconclusive, and so when you have slim, open places, which is two strings of pipe down one wellbore, they can be wrapped around each other, and undoubtedly are, that your bond log doesn't show this. The cement wasn't up as high as the original commission's order, but right now it also doesn't show that this is or is not a problem.

Q. And when you run a tracer survey, how far out from the wellbore can the radioactive material be picked up?

A. It's -- this varies with opinions -- but I imagine six inches, or less, probably, on a tracer survey. A temperature survey tends to reach out further. How far out into the formation it actually shows what's happening is due to a difference of opinion.

Q. So if you have a fracture system a foot away from the wellbore, there would be no way to detect it by a radioactive tracer survey?

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A. No, I don't believe a tracer would.

Q. Could possibly pick it up with a temperature survey?

A. Right.

CHAIRMAN RAMEY: Any other questions? Mr. Lucero?

CROSS EXAMINATION

BY MR. LUCERO:

Q. Do you feel, in your opinion, that these recommendations you're making for future action might help further define the specific cause of the problem?

A. Yes, I think we've been on this over a year constantly, and I think these are good places to start out with. Now, later on as we get information on the total problems, it may be we would vary some recommendations, but right now I feel like these recommendations will do the most the quickest to prevent any contamination and also prevent additional damage in these areas.

CHAIRMAN RAMEY: Any other questions? Mr. Nutter.

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Sexton, you've mentioned in your recommendation curtailment of injection rates on water injection projects. Do you have any recommendation with regard to salt water dis-

posal wells?

A. Well, I think the same recommendations, if they can show they're below fracture pressure, then continuation up to that point should be allowed unless we find some reason to change this.

Q. So your recommendation for reduced injection rates to below parting pressure would apply to disposal wells as well as waterflood injection?

A. All flood injection in the area.

CHAIRMAN RAMEY: Does anybody else --

RECROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Sexton, in your testimony concerning the Vacuum Area, I believe you indicated that during the course of your investigation the area with water in the salt expanded, is that correct?

A. Yes, we've had indications that -- what we did was, or what we recommended, they just survey the wells with problems that were found a year ago, and on these cases there was enough indication that pressures had increased to indicate the problem was worse, but really, we hadn't changed injection rates in the area that much and I guess it really wasn't to be unexpected.

And on the west side Arco did work on several wells

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and found additional waterflows in areas where we didn't think at the time it was that far, so I felt like it, whether it was due to new information or the information that we had that the pressures were increasing, I felt like it was time to make a change in the way we were going.

Q. Well, could there be any other source for this increased pressure in the salt in Vacuum, increased amount of water in the Vacuum Pool, other than the water injection wells in the area?

A. I think this was discussed in most of the committees and I don't know of any other -- any other zones in any of the three areas that had the pressures to put a column of salt water with 800 to 900 pounds at the surface, except through injection wells.

MR. STAMETS: That's all.

CHAIRMAN RAMEY: Mr. Kellahin.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Sexton, that Order Number R-5003 was entered when?

A. This was entered in -- well, let me get --

MS. TESCHENDORF: April, 1975. I believe April 29th.

Q. (Mr. Kellahin continuing.) That order required

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the industry to make certain remedial repairs on certain wells?

A. Yes.

Q. Did this include that?

A. Yes.

Q. And those repairs were made?

A. I believe there was one well that wasn't, and I might add that this was overlapping when these other problem areas came up, and one of the recommendations of the next industry committee was that we suspend working on wells and give everyone an opportunity to reduce injection pressures and cycle these floods and try to find out where the problem was, thinking that even if it was, say, a plugged well, if you shut down injection it would show up through shutting of the injection wells down, and for this reason we had -- we didn't go ahead and push it, but I believe they were all done except one well.

Q. Since the effective date of that order has any fresh water well in any of these three areas been contaminated?

A. No, there haven't, but if I --

Q. Since -- yes, sir?

A. If I may add to it, in my opinion this -- like I say, we've had several areas where the water had to be contaminated in some way.

Q. All right. You've indicated that there were, I

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thought, two areas where you had salt water flow at the surface outside of the casing string. There were two instances, were there?

A. Yes.

Q. Did those occur before or after the effective date of R-5003?

A. After; one occurred this month.

Q. Would you identify which well that was and where?

A. It was on the Skelly B-54 that that occurred, oh, last week or the week before, and at which time they went in and perforated.

Q. That's in section what?

A. Section 9, 23 South, 37 East.

Q. Now, apart from that well there was another well that broke out at the surface outside of the casing?

A. In the Oil Center Area, yes.

Q. And which is that well?

A. Texaco Skaggs -- I'll have to get it on my notes here. Texaco Skaggs Well Number 6, Unit N, Section 12, 20, 37.

Q. What was the date of that breakout?

A. It was in March of '75.

Q. Other than those two breakouts in all the 150 sections there have been no others, to your knowledge?

A. That's right.

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Q. In response to Mr. Nutter's question you said that it was your recommendation that the order also apply to salt water disposal wells in the area?

A. Yes.

Q. How many disposal wells are in these areas?

A. Well, I think Eunice has one that is under operation, that's Agua's well, which was recently completed, and it is operating under this condition; they ran step rate tests and pressure was limited on the well.

The other areas have disposal wells but they're on a vacuum or low pressure.

Q. What is the frac pressure in that Agua well?

A. I believe it came out 1475 or -- excuse me, I wouldn't say that. It was in between 14 and 15, as I remember.

Q. Is that well disposing of produced water that is produced from areas other than what you've labeled the problem areas?

A. Yes.

Q. Is it your recommendation that Agua be precluded from doing that?

A. No. As long as they conform to the recommendations that I make, I wouldn't see where this would be necessary.

Q. There wouldn't be any prohibition, then, on the source of the produced water to be disposed of in the Agua so long as they didn't exceed the frac pressure?

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A. That's correct.

Q. Are there any areas where capacity allowables or bonus allowables have been allowed in any of these units?

A. Now, that someone else will have to answer because I'm not that aware and I haven't been working with allowables.

Q. Well, if there are areas where bonus allowables and capacity allowables have been granted either for a pressure maintenance project or waterflood, whatever, do you intend to make a recommendation that would restrict those allowables to what we would think of as the normal, standard allowable for a 40-acre unit?

A. No, I would, as long as they conform to these recommendations, which to me your reservoir would determine, probably somewhat on how much allowable you're going to be able to produce anywhere; out here in a tight reservoir obviously, you wouldn't expect to get as much oil out as if you were in a forced reservoir, and I think these recommendations would allow only for your reservoir characteristics.

Q. In your statement of recommendations in response to Ms. Teschendorf's question you said that if the initial recommendation about reducing water injection to produced water, if that is ineffective, you talked in terms of additional steps the Commission might require. Have you given any thought as to what those steps would be or are you prepared to make recommendations about what additional steps

may be required?

A. No, I really don't think this is the time for it.

Q. Okay. Mr. Sexton, what steps would it take to bleed down the salt section?

A. Well, this is one of those things I really hope that -- I don't believe it should be -- I can't believe you'd like to have any more interference from the government than is necessary, and I would hope that you would take these steps, too many steps are obvious for me to point them out; I don't think it's necessary right now.

Q. Is it your intention to propose an administrative solution so that separate waterflood areas could be allowed exceptions to the proposed order?

A. By exceptions, what are you --

Q. To dispose of water in volumes in excess of produced water?

A. I would say only on a temporary basis. I think right now the -- I'm sure you're talking about water from the salt section, and I don't feel like we could bleed the whole entire salt section back into the reservoir we'll see the response in the time we need. What I would hope is that we could work in the area with disposal wells to give them time to -- a substitute disposal well could be found.

MR. KELLAHIN: Thank you. I have no further questions.

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CHAIRMAN RAMEY: Any other questions? The witness may be excused.

MS. TESCHENDORF: I have nothing further.

MR. BLODGET: We may have a couple of questions to put in, if you'll excuse us a minute.

CHAIRMAN RAMEY: Okay.

CROSS EXAMINATION

BY MR. SPERLING:

Q While we're waiting, I might ask Mr. Sexton a question with respect to the question that was concerning an exception, or possible exception, that was suggested by Mr. Kellahin.

Would you feel that an exception would be warranted in those instances where produced water is of such low magnitude that it would be impractical to confine a flood project to that, that is to continue?

A I think this would probably be considered. The main thing is to reduce the pressure in a certain time period to below fracturing pressure.

Q Let me be specific with you, Mr. Sexton. I'm thinking of the North Vacuum - Abo Project, which has, I am informed, produces a water volume of 71 barrels per day, which obviously is inadequate to continue the project. Now, would you think under those circumstances that the injection

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of other than produced water might be the proper subject of exception?

A. I would think this would need to be considered. I might add that the committee really didn't consider the Abo formation as a cause of the -- but I don't think it should be completely ruled out. It's my understanding that if you're below parting pressure, if this is the case, then this is what we ask of you, and if you're not below parting pressure, why, I think it should be -- should fall under the same guidelines.

Q. Well, then the key to your recommendation is the parting pressure.

A. Right, now --

Q. As long as injection is below that by some measure, then you would be satisfied insofar as the criteria that you've suggested?

A. Yes, this was my recommendation.

RECROSS EXAMINATION

BY MR. RAMEY:

Q. So if a waterflood is injecting and below parting pressure, then you would not suggest any restriction on that particular flood?

A. Not at this time. If we can get the salt bled off in a -- everything ties up with getting the salt pressure bled

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off, then I think -- I didn't recommend anything being done to floods operating below the fracture pressure. And we feel that the salt will be bled off and at this time we'll have a lot better idea of being able to find out, really, not only if pressure causes it, or what causes it, in what area it is being caused.

CHAIRMAN RAMEY: Did you have a question, Mr. Blodget?

MR. BLODGET: No, he's asked it, I think.

CHAIRMAN RAMEY: Any other questions? The witness may be excused.

Mr. Kelly, you're next on the list.

MR. KELLY: That's the mistake I make for standing up first.

JOHN GANNON

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. KELLY:

Q. Would you state your full name and by whom employed and in what capacity?

A. My name is John Gannon. I'm District Superintendent for Texaco in Hobbs.

Q. Have you previously qualified as an expert witness before this Commission?

A. No, I haven't.

Q. Would you give the Commission a summary of your educational and professional background?

A. I have a BS degree in Chemical Engineering from the University of Colorado in 1948, and I've been employed by Texaco for twenty-nine years; the first thirteen years as a Petroleum Engineer, and since that time in various supervisory capacities in drilling and production.

Q. Do part of your responsibilities cover the Vacuum and Monument waterflood areas that have been discussed today?

A. Yes, sir.

Q. And did you serve on any of the committees that have been discussed this morning -- this afternoon?

A. Yes, sir, personally I served on the Monument - Oil Center committee, and Texaco had membership on the Vacuum committee, and I attended a number of the Vacuum committee meetings.

MR. KELLY: Are the witness' qualifications acceptable?

CHAIRMAN RAMEY: Yes.

Q. (Mr. Kelly continuing.) Now, can you tell us whether the committees that you have experience with that have been identified and marked as Exhibits, I think, Five,

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Six, and Seven, came to any conclusion as to the source of the water that is found pressuring up these salt zones?

A. No, sir, we have not been able to come to any conclusions as to the source.

Q. Now, specifically, you heard the testimony of Mr. Sexton, who determined, in his opinion, the source of this high pressurization was either injection wells or waterflood projects in the area. Do you have any evidence that would contradict that opinion?

A. We have no evidence that would verify it. Mr. Sexton has suggested that the pressure in the salt zone is coming from the waterfloods, but all the work done by the committees has failed to identify a single offending well in any areas that I've been involved with to show that the waterfloods are the direct cause of the pressuring in the salt zone.

Q. Well, let me refer you to what has been marked Exhibit Number -- Texaco's Exhibit Number One. Could you identify what that is?

A. Yes, this is a map of the Monument - Oil Center study area, and on this map, indicated by the red dots, are locations of a number of Eumont gas wells. This is not the complete list of Eumont gas wells. This is a large field and extends both south and north of the Monument - Oil Center area; however, it does show the Eumont gas wells located within the Monument - Oil Center study area. In addition, in

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black on a number of the wells in the southern part of the study area, we have indicated the shut-in pressures. These are 72-hour shut-in pressures that were taken in 1976. This is required annually.

I might particularly refer to Texaco's Eunice - Monument Unit, which is one of the floods in consideration in this study area, and also one of the floods that is currently shut in. Within that Eunice - Monument area, waterflood area, there are six Eumont gas wells. Four of these are operated by Texaco and I might just point out that the shut-in pressures on these wells are as follows: These can be identified from this map. State of New Mexico H-26, in 1975 the 72-hour shut-in pressure was 383 pounds and in 1976, 335 pounds.

State of New Mexico C Number 9, in 1975, 363; 1976, 320.

C-25, 1975, 314; 1976, 271.

And C-27, in 1975, 293; 1976, 255.

Now, I think there's some significant things about that. One is that the bottom hole pressures are declining in a normal manner as these wells are being depleted. The second thing is that these shut-in pressures are well below the shut-in pressures of monitor wells, and we do have one monitor well within the Eunice - Monument waterflood project, which has a shut-in pressure of approximately 650 pounds.

Immediately to the east we have other monitor

wells on Getty's State I lease and Amoco's Delulee (sic) leases, and these also show shut-in pressures from the salt zone much higher than the shut-in pressures in the Monument in the Eumont gas wells.

When our flood was in operation the injection pressure was much, much higher than these shut-in pressures shown on the Eumont gas wells.

Now, it's been suggested that the salt zone is being pressured through a fracture system from the flood up to the salt. It appears to us that if this is occurring, that the Eumont gas wells should have watered out. It would be impossible for the water to fracture through the Eumont gas zone all the way up to the salt without flooding out the Eumont gas zone, and this hasn't occurred.

And for those of you who might not be familiar with it, the depth of the Eumont gas zone is 3400 to 3550 feet, which is between the Grayburg zone being flooded and the salt zone, which is pressured.

Q. Now, on Exhibit One is there another waterflood project that you have the same basic situation?

A. Yes, there are also Eumont gas wells located within Texaco's Skaggs - Grayburg, and as far as other operators are concerned, down to the south there are Eumont gas wells located within the areas of Conoco's waterflood.

Q. And do you have a similar situation of lower pres-

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sures in these intermediate zones?

A. Yes. The pressures that we have plotted on this exhibit, the maximum pressure shown is 513 pounds. Most of the pressures are in the range 200 to 300 pounds.

Q. In your opinion, this would be inconsistent with the theory of vertical fracturing?

A. Yes, it would.

Q. Now, in the Texaco wells that have produced water from the salt zones, has there been any evidence of hydrocarbons?

A. No, there has not. Currently we're backflowing in the Vacuum Field. We're backflowing our State of New Mexico R-NTC Number 5. We have flowed approximately 55,000 barrels of saturated salt water from this well. As recently as Friday we rechecked the injection well for any evidence of hydrocarbons, and found none. Mr. Sexton mentioned that this well was flowing 1000 barrels a day and this was correct at the outset, but the well has now declined to approximately 300 barrels per day.

Q. Now, you have an exhibit that shows evidence of natural high pressurization in salt zones in the area?

A. Yes, I do.

Q. Is that Exhibit Number Two?

A. Yes.

Q. Would you explain that to the Commission?

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A. This also was referred to by Mr. Sexton, and this is our State of New Mexico BZ Tract 8 Number 5. This is a well that was drilled in 1959 and during the drilling of this well, while going through the salt section, a serious waterflow was encountered. To give you an idea of the magnitude of this, after surface pipe had been set at 1095 feet, the well was drilled on to 1690 feet, when the well started flowing. The well initially was flowing salt water at the rate of 1100 barrels per hour from the zone from 1688 feet to 1690 feet. When the well was shut in, it exhibited a shut-in pressure of 600 pounds. We attempted to squeeze the well off and then drill out, and after drilling out, we again broke into salt water and flowed at the rate of 300 barrels per hour. We continued drilling, handling the salt water as best we could, and by the time we had reached the depth of 1814 feet, the rate, water rate, had increased to 1500 barrels per hour.

Eventually, the well was drilled to a depth of 2460 feet, string of pipe run, and successfully cemented.

I think Mr. Sexton pointed out at this time there was a Skelly pilot waterflood approximately two and a half miles to the north, and on a volume basis, strictly speaking, it would be possible for this water to have come through the salt to Texaco's location; however, it seems very unlikely to us that a pilot flood, which showed excellent response in the zone that was being flooded, and had good injection-withdrawal

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ratio characteristics, could have migrated a distance of two and a half miles and flowed in the volumes that flowed from this well. We think that's unlikely.

Q. Now, did the studies that you participated in reveal any other evidence that would appear to be inconsistent with the theory of vertical fracturing?

A. In the Vacuum Field I have no direct evidence that there is no vertical fracture; however, again, Mr. Sexton mentioned some fall-off tests that were run by Texaco and these fall-off tests that we conducted were in every way normal for a zone that was being properly flooded.

Q. In your opinion, is the -- is the waterflood or salt water injection wells the cause of this salt pressurization?

A. All of the indications, tests, surveys, and so forth, that have been run by Texaco, and Texaco has been a participant on two of these committees and has expended a considerable amount of money in an attempt to find offending wells, and in no case have we been able to find either an offending well or an offending flood. I might mention the work that was done on our Vacuum - Grayburg - San Andres unit. This is a two section waterflood and it is the closest waterflood to the area of highest pressure in the salt zone in the Vacuum Field. This is also the most recent flood in the Vacuum area until Arco started their flood; the second

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most recent flood. In this particular project all of the injection wells were drilled; in no case was an old well converted to injection; all of our wells were drilled in 1973. These were wells that we mentioned that we had run injectivity profiles and all of these profiles indicated the water to be going in zone. These are also wells on which we ran cement bond logs, which indicated competent cement jobs on each of these injection wells. This is also the project in which we perforated some temperature anomolies from temperature surveys and attempted to establish an indication from the injection zone back up the hole to the perforated interval. In neither case on our wells Number 19 and 49 were we able to communicate back with these holes.

Now, it has been mentioned that the cement bond logs and the injectivity profile, too, have a short distance from the bore hole of investigation. But we might also point out that the theory has been suggested that we're fracturing up through the zone and that this might be occurring away from the wellbore, so we might also mention that the high at the point of highest pressure in a waterflood is at the wellbore of the injection well; that from that wellbore of that injection well to the producing well, the pressure is continually decreasing, and consequently, if fracture would occur, the most likely place for it to occur would be in the wellbore of the injection well. Furthermore, it appears to

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us that the bond between cement and open hole, or between cement and pipe, is a much weaker bond than the natural fracture pressured formation, and that if this would occur, we would have detected it in the wellbores of these injection wells.

Q. So in your opinion, in the Vacuum Texaco's injection program is keeping the water isolated to the injection zone?

A. Yes, that's our opinion.

Q. And how about the Monument?

A. We haven't done as extensive surveys in the Monument - Oil Center Area, but the survey work we have done indicates that the water is going in zone. We have made attempts to determine if water were channeling from an injection well to the twin deep producer, and the survey that we ran on one well indicated that there was no fluid movement in the deep producer at all. By the way, these were both wells that did have break-in (sic) pressure in the salt zone.

Q. What would Texaco's conclusions and recommendations be to the Commission?

A. Texaco concludes that from the study work that has been done, investigations which were made, that there is no evidence that the waterfloods are the cause of this problem, and Texaco recommends that in the Monument - Oil Center area, that we resume normal injection and that injection be continued in our waterfloods in the Vacuum Field without any

restriction.

Q. Now, assuming that the Commission follows the recommendation of Mr. Sexton and limits injection to below fracture pressure, do you have an opinion as to the effect this will have on the waterflood project as far as causing waste?

A. We do have an opinion. We're not prepared to present an exhibit, but we have in other fields run profile surveys at low pressures and then again at higher pressures, and our profiles indicate that at higher pressures we often get better water distribution than at the lower pressures, which indicates that some of the lower permeability zones accept water at higher pressure and they will not accept any water at lower pressure. If we are limited to a lower pressure this means that portions of the reservoir will simply not be swept and that this oil will be left in the reservoir.

Q. Now, were Exhibits One and Two prepared by you or under your supervision?

A. Yes, they were.

MR. KELLY: At this time I would move the introduction of Texaco's Exhibits One and Two.

CHAIRMAN RAMEY: They will be accepted. Any questions of the witness?

MR. SEXTON: I have one.

CHAIRMAN RAMEY: Mr. Sexton.

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CROSS EXAMINATION

BY MR. SEXTON:

Q. Did you have waterflows when you drilled your State -- or did you encounter any waterflows when you drilled your injection wells in '73?

A. No, sir.

Q. Are there any zones around that could cause this pressure in the salt section or to cause it -- is there any reason it should be migrating at this last few years?

A. We're not prepared to offer a solution as to how the salt zone is being pressured, other than to say that we have no evidence that it's coming from the waterflood.

Q. In your wells where, as you pointed out, in the Eunice - Monument area you have shallow gas wells that haven't been affected by waterflow. Also, in your flood area you do have, am I right, that you do have one flow that's in a zone that produces gas in the other areas, that's producing water in the --is it Number 7?

A. Our Well Number 7 has a casing leak at a depth -- I forget the exact depth of that; it does have a waterflow but I have not tried to correlate this with the Eumont gas zone.

Q. But there aren't too many gas wells in the area of your Skaggs flood, is that correct?

A. Not too many, no; there are some.

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Q. So these -- these could or could not be on a general basis like your statement further over in the part of the gas field that they could have water in the flood areas themselves?

A. We have two producing wells in the Skaggs area or the Skaggs waterflood but neither one of them had water. I believe that's correct.

MR. SEXTON: That's all I have.

CHAIRMAN RAMEY: Mr. Stamets?

CROSS EXAMINATION

BY MR. STAMETS:

Q. You presented Exhibit Number Two and said this was two, two and a half miles south of the closest waterflood, is that correct?

A. Yes, actually, this well was drilled before any large scale waterflooding had been started in this part of the country. There was one pilot waterflood.

Q. Do you know what the operator -- who the operator of that pilot was at the time? Mr. Sexton's exhibit here, the secondary recovery report of 1958 shows three Langlie - Mattix projects, Gulf Coast, Western Oil Company, and Humble, and Skelly. Were any of those projects the ones that --

A. It was Skelly.

Q. Skelly project.

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A. Yes.

Q. And that had started the first of 1958. How about that Gulf Coast - Western project, do you know whether --

A. I'm not familiar with it.

MR. STAMETS: That's all the questions I have.

CHAIRMAN RAMEY: Mr. Arnold?

CROSS EXAMINATION

BY MR. ARNOLD:

Q. You say you don't have any solution as to how the water might have gotten into the salt section. Could you even provide a theory as to it?

A. I could provide a theory but I'd rather not, because a theory is not defensible.

Q. Actually, it would sound like maybe Mr. Sexton arrived at his conclusions through the process of elimination. The water is there and it wasn't there, so it is reasonable to think that operations in the area might be causing it.

A. This is a difficult problem. It's not nearly as simple as we thought it would be when we first started studying it. And this was a conclusion, I think, that was made by a number of people, that waterfloods were the cause of it, but all of the evidence that we can see indicates no, that they are not the cause of it.

CHAIRMAN RAMEY: Mr. Lucero.

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CROSS EXAMINATION

BY MR. LUCERO:

Q. Can we then conclude it's your recommendation that normal injection pressures continue, then?

A. Yes.

Q. But the water is still there?

A. The water is still there.

Q. So the problem hasn't been solved?

A. No, sir. However, I might say that in no way is Texaco saying that the problem should be ignored. I think the purpose of this hearing today is simply to discuss what should be done with the waterflood, but I might add that Texaco has probably done as much or more than any operator in the entire area as far as actually relieving pressure. Right now we are bleeding down one well; we have plans to bleed down another. We have specially equipped a disposal well to handle the backflow of water from the salt zone. So in no way is Texaco backing off from any responsibility for our portion of whatever solution comes from bleeding down the salt zone.

Q. My questions didn't intend to indicate that we felt that way.

A. Oh, I'm sorry.

Q. But you are, then, taking action to bleed down some of these wells as was suggested by Mr. Sexton?

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A. Yes. At the present time we are bleeding down our Tract 1 Number 5 and we have plans to bleed down our State M Number 6, which is also in the Vacuum Field and we are equipped to do this.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Gannon, on your -- how many wells are on your BZ-NTCA lease?

A. Fifteen wells.

Q. Number 5, I assume, was the fifth well drilled?

A. Yes.

Q. Since that time you've drilled ten wells?

A. Right.

Q. Did you encounter any waterflows in any of the other wells?

A. There were waterflows reported on two other wells but nowhere near the magnitude of this. Of course, this drilling occurred several years ago and no great significance was attached to waterflows other than that we recorded, and from a review of the drilling reports, there were two other wells that did indicate they had a waterflow, but they didn't mention anything about volume or -- and, apparently, from the way the wells were drilled there was no great difficulty encountered.

Q. This well, I assume, is one of the red wells on Exhibit Two, in the south tier of sections, right, on OCC Exhibit Two?

A. This is the well, right here, (indicating) yes.

Q. Do you know of any other reported waterflows to the north?

A. No, I don't.

Q. Okay. Say, on your Eunice - Monument Unit, do you have any idea as to the volume of water that's been injected into that unit compared to the barrels of oil recovered?

A. No, I don't. These numbers are certainly available and we'll be happy to provide them; I don't remember any at this time. The Eunice - Monument Unit is a pilot flood. At one time we were injecting into two -- five spots and we have since reduced that to one, but the daily volume was in the vicinity of three thousand barrels of water a day we were injecting into the project.

Q. And how long were you injecting?

A. For about four years.

Q. Have you had favorable response to your pilot project?

A. We thought we had some indication of response until we ceased injecting make-up water.

Q. You injected at the rate of three thousand barrels a day into the pilot area and thought you had response for a

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period of four years?

A. Yes.

Q. Injected for a period of four years and all of that time you thought you had response?

A. Right.

Q. What about your Skaggs flood, was that a long operated flood?

A. Yes, this has been in operation for at least ten years.

Q. Do you have any idea of the ratio of water injected to the oil recovered in that area?

A. It will be in the range of 7 barrels injected per barrel recovered.

Q. Is that normal for waterfloods?

A. It's not desireable. We pay for every barrel of water that we inject, you know, it's not -- but in some of the limestone-dolomite reservoirs that we have oftentimes this is the type of injection-withdrawal situation we get into.

Q. Could this be similar to a situation a friend of mine was telling me about in Texas, where he said for years we wondered where all that water was going and now we're finding out?

A. We like to think that we do a reasonably good job of monitoring our floods and getting the water going where we

want it to go, because certainly, it's to our economic advantage not to put water out into barren zones. We certainly attempt to get it into the oil productive zones where it will do us the most good.

Q. Okay, in your Eunice - Monument Unit how many -- how many tracer surveys have you run in the four years that you've been operating it?

A. I can't give you an exact number but we have run a number of them.

Q. The same with the Skaggs Unit?

A. Yes.

Q. Same in the Vacuum area?

A. Right, we've run many in the Vacuum Area.

Q. I mean prior to the problem arising had you run any tracer surveys or temperature surveys?

A. Yes, we had.

Q. That was normal? Periodically you normally would run to determine where your water is going?

A. That's right, yes. We use profile surveys as a tool to check the efficiency of injection, right.

CHAIRMAN RAMEY: Any other questions of the witness? You may be excused.

Let's take a fifteen minute recess.

(Thereupon a recess was taken.)

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CHAIRMAN RAMEY: Mr. Abbott, you're next on the list. Do you want to wait?

MR. ABBOTT: I'm not putting on any testimony but I'd like to give a statement.

CHAIRMAN RAMEY: Why don't we wait till the end for you?

MR. ABBOTT: Right.

CHAIRMAN RAMEY: Mr. Eaton.

JERRY TWEED

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. EATON:

Q. Please state your name and by whom you are employed.

A. Jerry Tweed, and I'm employed as a District Engineer for Atlantic Richfield in Midland, Texas.

Q. Mr. Tweed, have you previously testified before this Commission on a number of occasions?

A. Yes, I have.

Q. Does Atlantic Richfield operate any of the waterflood projects which have been discussed today?

A. We operate one waterflood project in the Vacuum

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Area, State Vacuum Unit Number 1, and are working on numerous other projects in the three areas involved.

Q. Would you please state the position of your company with respect to the subject before the Commission today?

A. First of all, we think that the continuation of water injection in secondary recovery projects is necessary in order to recover the maximum economical reserves. The discontinuation of injection would cause waste by reducing the ultimate recovery of the waterflood projects.

What I would suggest, or what I am suggesting, is that injection be restricted on the basis of pressure; that we be allowed to inject within 100 pounds of the parting pressure of the formation, and not be restricted on a volume basis or be restricted to produced water only.

We'd rather be restricted on a pressure basis.

Q. Is your suggestion one that has been followed at any time in the past?

A. Yes. I would like to refer to Exhibit One, which is Commission Order R-5295. This order was given in Atlantic Richfield's case requesting a waterflood project in the State Vacuum Unit. In this case the Commission ordered that Arco's injection pressure be restricted to 860 psi surface pressure, with the Secretary-Director could administratively authorize a higher pressure when informed by the operator that the higher pressure would not be fracture producing.

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And what we plan to do here is to inject into the State Vacuum 1 well. When our pressure reaches 700 psi, or approximately that pressure, we would then go in and take step rate tests on the injection well to determine the parting pressure and make application to the Secretary-Director that we be given a pressure that would be 100 psi below the parting pressure, as determined by these step rate tests. And we think this would adequately protect, as far as the injection well itself, from losing water outside the horizon.

Q. Does Atlantic Richfield have any policy or try to follow any policy with respect to parting pressure?

A. Generally, we attempt to stay below the parting pressure of the formation in our injection projects. I would like to state that I believe there are cases where you can exceed parting pressure without damage, and there are probably cases where it is dangerous to exceed the parting pressure in your injection, for one reason or another.

Q. Mr. Tweed, I believe there has been some discussion today with respect to the status of plugged and abandoned wells.

A. Yes, sir. One thing I would like to add in addition on the parting pressure, after we make application that we be allowed to inject within 100 psi of the parting pressure, periodically we would then take step rate tests on the wells, approximately once every year for the first three

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years, and about once every three years thereafter, to see if the parting pressure is staying the same or increasing. If the parting pressure were increasing, then we would again make application that our allowed injection pressure be increased to within 100 psi of the parting pressure.

Q. Do you consider 100 pounds a reasonable differential?

A. I consider it reasonable and something that would get us enough latitude to where we wouldn't, well, on a normal basis exceed that parting pressure.

Q. All right. Now, I started to ask you about the status of plugged and abandoned wells to which there was some testimony earlier. What is the position of your company with respect to such wells?

A. Well, we think inside the unit boundary on existing waterfloods or proposed waterfloods, that you ought to submit a wellbore diagram on all plugged and abandoned wells that penetrated the proposed or existing secondary recovery zone. If these wells are not plugged in a manner which would allow for the performance of the secondary recovery project, we think the operator should have the option to either properly plug the wells so that he can conduct his secondary operation or else not be allowed to inject offsetting or diagonally offsetting plugged and abandoned wells.

Q. Has your company had any experience with any parti-

cular plugged and abandoned well?

A. Exhibit Two is a plat map of the State Vacuum Unit, which we made application. The Commission required that we re-enter and plug the Hale State Number 1, which is in the far northwestern corner of unit, prior to injecting either offsetting or diagonally offsetting that forty acres.

Exhibit Number Three is a wellbore diagram of how that well was plugged. There was a cement plug set in the middle of the San Andres in the open hole section and there was a section of the San Andres that was open with no plugs set up until the base of the salt, and it was our opinion, as it was the Commission's, that if we injected an offset well it would fracture the San Andres and then it would migrate in this well from the pressured San Andres on up to the base of the salt; therefore, we were required to re-enter it and plug it, which we did.

I think these, obviously, a well like this, if it isn't adequately plugged, could be a source of lost water in a waterflood project.

Q. How do you handle the situation where your plugged well lies outside the unit boundary?

A. Well, the only thing I could say to that, I think it would have to be handled on an individual basis, and on individual circumstances. There might be times when the operator, or the unit operator would be required to plug it;

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there might be times then when the operator or owner of that lease would be required to plug that well satisfactorily.

Q. Mr. Sexton offered four recommendations. What is your opinion concerning those recommendations?

A. I had no disagreement with the last three recommendations and would endorse them. The only difference that I had with the first one is that I would not, where a flood is injecting above frac pressure, I would not restrict the injection to just produced water; I would recommend that we put a limit on the injection pressure, not on the amount of water injected.

Q. So that the injection pressure would be below the frac pressure, or parting pressure?

A. Yes, sir.

Q. Were Exhibits Two and Three prepared by you or under your supervision?

A. Yes, they were.

Q. And Exhibit One is a copy of the Commission order, is that correct?

A. Yes, sir.

Q. Do you have anything else to add?

A. That is all.

MR. EATON: We have no further questions.

CHAIRMAN RAMEY: Will you tender your exhibits, Mr. Eaton?

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MR. EATON: Oh, I'm sorry. We offer Atlantic Richfield's Exhibits One, Two, and Three into evidence.

CHAIRMAN RAMEY: They will be accepted. Any questions of the witness? Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Tweed, you have recommended 100 pounds pressure limitation below the parting pressure, and Mr. Sexton indicated he thought perhaps 50 pounds might be a sufficient differential. Do you disagree with 50 pounds or not?

A. No, I don't. It can get to be a matter of where you're talking about the pressure differential, also. I think -- I was thinking, probably, we'd operate our 100 pounds at the wellhead, but 50 pounds I think also would be adequate. There isn't essentially any difference in 50 and 100 pounds.

MR. STAMETS: That's all.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Tweed, in addition to plugged and abandoned wells, or inadequately plugged and abandoned wells, would you think that a review should be made of deeper wells to see if they have adequate cement to cover the injection zone?

A. Yes, sir, I certainly do. The reason that I didn't

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testify to this is the fact that we don't operate the flood in this area that has that problem, so I thought I would leave it to the other operators to cover that point.

CHAIRMAN RAMEY: Thank you, Mr. Tweed. Any other questions of the witness? He may be excused.

Mr. Blodget, you're next on the list.

WILLIAM T. THOMAS

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. BLODGET:

Q. Will you please state your name, your occupation, and by whom you are employed?

A. I'm Bill Thomas, I'm employed by Getty Oil Company in Hobbs, New Mexico, area.

Q. Have you previously testified before the New Mexico Oil Commission and your qualifications been accepted?

A. Yes, I have.

MR. BLODGET: Any other questions?

CHAIRMAN RAMEY: He is qualified, Mr. Blodget.

MR. BLODGET: Thank you.

Q. (Mr. Blodget continuing.) Now, there's been some reference to a statement of the Eunice Area Waterflood Com-

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mittee. Would you care to read a statement concerning that?

A. Yes. I have a statement to present from the Eunice Area Waterflood Committee.

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee at that time was to collect, analyze data, and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source, or sources, feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of fifteen wells were initially shut in for observation. The wells consisted of 7 injection wells, 6 producing wells, 1 shut-in producing well, and 1 disposal well. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure in the shut-in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the Citgo State well.

The Petro-Search Citgo State Number 1, located in Unit E, Section 2, Township 23 South, Range 37 East -- I believe Mr. Sexton pointed the location of this well out -- had been found to have water entering the wellbore hole behind the four and one-half inch O. D. production casing from 2470 to 2500 and moving up the hole, and had 1185 pounds

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wellhead pressure.

The Committee recommended to the Commission that injection be resumed into the injectors and plans be made to blow down the pressured up salt section in the Citgo State Number 1. Thoughts at the time were to discontinue cycling and attempt to determine if we were dealing with a localized or widespread pressure situation.

The NMOCC felt that cycling and monitoring should be continued. An alternate recommendation was made to the NMOCC at this time. Injection wells with approximately 700 pound wellhead pressure or less be reactivated and cycling expanded to take in more injectors. The Commission agreed to the alternate proposal and this procedure was implemented. During the monitoring and cycling the pressure on the Citgo-State well had remained practically constant at 1150 pounds.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976, meeting that, one, injectors which are high pressure and low volume, and two, those which have shown little or no pressure variation during shut in, be backflowed and tested in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and build up procedure were: Backflow the well for a minimum of forty-eight hours and at such time as the flow rate is 100 barrels

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per day or less, shut the well in for pressure build up, and if pressure does not build up past 800 pounds in forty-eight hours, return the well to injection. From this time forward wells were checked for pressure drop, backflowed, rates and pressures monitored, and build ups ran following backflow.

Upon recommendation from the Committee, and approval from the NMOCC, wells were returned to injection as warranted by results.

At the Committee meeting on August 26, 1976, approval was given by the NMOCC to suspend the present testing procedure and make plans to backflow the Citgo-State well. Fourteen Skelly and Anadarko wells were to be shut in one week prior to backflow.

On September 19, 1976, backflowing of the Citgo-State well was begun. At the time of opening the well had 1010 pounds on the surface. After sixty hours the well had backflowed approximately 40,000 barrels of 9.9 pound brine. Initial flowing pressure was 210 pounds at a rate of 9 barrels per minute. After sixty hours flow pressure had decreased to 70 pounds and the rate was 2 to 3 barrels per minute. During the ten-day flowing period the well flowed back an estimated 63,000 barrels. The fourteen wells were closely monitored during backflow with pressure recorders. No pressure interference was noted on any of the wells. As soon as pressure and flow rate would permit, Petro-Search re-entered,

plugged and abandoned the well.

The test wells were later returned to injection and monitoring discontinued, with the exception of four wells which had previously shown bradenhead pressures. These wells still have pressure recorders attached and have consistently fell off in pressure since backflowing the Citgo-State and return to injection of surrounding wells. These wells are Skelly Penrose "A" Number 44, from 725 to 15; Skelly Penrose "B" Number 54 -- give you more of that in a minute -- and Skelly Penrose "B" Number 52 from 120 to 60, and also had the Skelly Penrose "A" 38, which lost pressure.

Subsequent work of the Committee has consisted of re-evaluation of all available temperature and tracer logs in the area and analyzing our logs as they became available.

Wells which had abnormal temperature gradients have been, and are being, re-logged to confirm data as interpreted from previous logs. Several noise logs have been, and are now being run. Skelly perforated the Skelly Penrose "A" Number 64 at 1460 feet opposite a waterflow which was encountered during drilling of the well, approximately two years ago. Prior to perforating the well was producing 9 barrels of oil and 40 barrels of water per day. Current producing rate is approximately 8 barrels of oil and 43 barrels of water per day. These perforations were acidized and broken down but attempts -- but we did not establish any

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waterflow, and also, based on the waterflow which was encountered in the lower salt section, of the same well, additional perforating was done, acidizing and breakdown failed to establish flow from the lower salt section.

On January 14, 1977, a noise log was ran on the Skelly J. V. Baker Number 11 in an attempt to determine if cycling was occurring between Anadarko's injection well Number 13-C7 and J. V. Baker Number 11, which is a Drinkard producer. It appeared that possibly water which was being injected into the Penrose section might be channeling across to the Baker well and moving up and back to the injection well. No upward or downward movement adjacent to the injection zone was indicated by the log. Logs ran during 1975 on the Anadarko well had shown possible migration across the salt section. Recent logging by two different companies have failed to confirm this.

On March 27, 1977, a surface flow from the oil string annulus was noted on the Skelly Penrose "B" Number 54. A noise log was run and water movement confirmed at 1180, which was the top of the salt, two holes were perforated in the casing at 1180, and to date the well has flowed back approximately 45,000 barrels of salt water. Frequent washing with fresh water is required to prevent salting up. Recently the flow back has been decreasing and steps are being taken to insure that the well is kept free and clear of any restrictio

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which might hinder the flow. I might add, in the last couple of days the Skelly Penrose "B" well has ceased to flow, wo we either have depleted the well of its flow or possibly salted it back up in the formation, but we can pump water in the tubing and establish circulation.

Subsequent logging of wells on the Anadarko Langlie Mattix Penrose Sand Unit and Skelly Penrose "A" and Penrose "B" waterfloods have failed to indicate major storage of water which would warrant perforation of casing to establish flow.

And that completes the Committee statement.

Q. All right. Let me call your attention to an exhibit that's been marked Exhibit A, Getty Oil Company. Would you identify that, please?

A. Yes. This plat is a portion of a current land map prepared by Midland Map Company, showing data on well locations and lease ownership. The 36-section area covered by this hearing is outlined in red. Getty operated leases are shown in green and partnership leases in yellow. As indicated by the plat, it can be seen that Getty operations in the area consists of waterfloods in the Getty Penrose "A" and Penrose "B" Units, and disposal operations by Getty's, formerly Skelly, manufacturing department in section 27, Township 22 South, Range 37 East. The other Getty operated leases on the plat have no injection or disposal facilities

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of their own. These are served by the Agua operated Blinebry-Drinkard Salt Water Disposal System, with the exception of the Ellen Sims "A" lease which is served for disposal purposes by the Getty Penrose "A" unit.

Q. With the exception of the Ellen Sims "A" --

A. With the exception of the Ellen Sims "A" lease, which is served for disposal purposes by the Getty Penrose "A" unit.

Q. All right.

A. Exhibit B is a current performance curve on the Getty Penrose "A" operated waterflood.

Exhibit C is a current performance curve on the Getty Penrose "B" operated waterflood.

Q. Were these exhibits prepared by you or under your supervision?

A. Yes, they were.

MR. BLODGET: We offer these exhibits in evidence.

CHAIRMAN RAMEY: They will be admitted.

Q. (Mr. Blodget continuing.) Would you give us a brief summary of the operations concerning the Getty Penrose "A" Unit and the Getty Penrose "B" Unit?

A. The Getty, formerly Skelly, Penrose "A" Unit became effective May 1, 1967. A pilot flood was in operation on Skelly's H. O. Sims lease prior to unitization, and this is within the unit area. Cumulative injection into these two

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wells was 2,639,018 barrels prior to effective date of the unit. Cumulative injection since unitization into the unit area was 24,743,905 barrels as of April 1, 1977. The daily average water injection rate during April, '77, was 5,222 barrels per day at 1683 psi. Total cumulative injection into the unit area to date is 27,382,923 barrels as of April 1, 1977.

The Penrose "A" Unit contained sixty wells on the effective date in 1967; of these sixty wells, eleven were drilled and completed after 1942. The remaining wells were drilled and completed between 1936 and 1942.

It is a recognized fact that wells in this area have potential for considerable casing problems in all intervals, particularly within the upper 900 feet, where the exterior is subjected to corrosion from the Santa Rosa and upper water sands. In the interim period from the effective date of the unit until now, we have located and performed remedial operations on leaks within the upper 1200 foot interval in a considerable number of wells. It was recognized early that this was a problem, and as the record shows, we have monitored and checked regularly to detect and remedy these problems as they become evident. Additionally, we have located and repaired leaks or water flows behind pipe in the intervals from 1500 to 2500 feet on wells within the unit area. From start of injection to date, injection into this

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unit has been monitored by temperature logs and/or selected injection profiles at irregular intervals. During late 1971 and 1972 a program was initiated to install stub liners in several of the open hole wells to improve control of injected water. Eighteen liners were installed in injection wells in this unit during 1972 and 1973. Injection profiles run immediately following these liners installations indicated that all injection was being confined to the unitized interval. We feel the record of casing leak repairs, repairs to waterflows behind casing, and liner installations within this unit area should be considered as solid evidence that we have diligently attempted to confine water to the unitized interval in this waterflood project.

The first evidence of waterflow in the Penrose "A" area occurred during May of 1973, when waterflow was detected outside the casing of Well Number 29. The well was subsequently repaired.

Waterflow was encountered in July, 1973, during drilling operations on the Ellen Sims "A" Number 1 well, which is located immediately northeast of the unit area. This waterflow was encountered at approximately 2500 feet.

During September, 1973, Unit Well Number 9 developed a leak at 2569. When the Ellen Sims "A" Number 2, which is north offset to the Number 1 well, was drilled during February of '74, no waterflow was encountered.

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In March, 1974, a waterflow outside the casing developed in Unit Well Number 47, and this was followed during the next month, April, 1974, by waterflows in Well Number 63, which was being drilled as an infill well, at approximately 1200 and 2500 feet. Well Number 64 was drilled in August, 1974, and encountered a waterflow at 2500 feet. And two more wells were drilled with not a waterflow being encountered. Waterflows occurred outside casing on Wells Number 3 and 28; these were repaired.

We were requested by the Hobbs Office of the New Mexico Oil Conservation Commission to perform necessary surveys in February, 1974, to determine if there was any injection water leaving the unitized interval. A program was designed, undertaken, and completed during March, 1974, covering twenty-eight wells within the unit area.

This survey included all included all injection wells in the unit at that time. Analysis of data from injection profiles, temperature decay, and 24-hour temperature surveys, shut-in temperature surveys, on these wells indicated three wells which were not confining injection to the unitized interval. These wells were subsequently repaired. Several wells indicated varying degrees of channeling within the unitized interval. These wells were repaired. It was our intention then, as it is now, to confine all injection to the unitized interval.

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There are two wells within the unit area which had been plugged and abandoned, as recommended by Getty, and approved by the Hobbs office of the NMOCC. They requested we re-enter and replug these wells to provide sufficient cement across the Penrose Sand interval and across intervals above which could be charged from stray water so any movement within the wells would be eliminated. These wells were re-entered and replugged as requested by the Commission.

The R. D. Sims, and others, Number 2 was drilled and completed during 1948 and the Ellen Sims Number 6, also. Location of these wells is southeast quarter of the northwest quarter of Section 3, and northwest quarter of the southeast quarter of Section 3, respectively, all located in Township 23 South, Range 37 East. Approximately 23,000,000 barrels of water had been injected into the Penrose "A" unit area at this point in time.

Cumulative oil production from the unit area since unitization was 3,067,404 barrels as of April 1, 1977. Average daily oil production during April of 1977 was approximately 650 barrels per day, as compared to the average daily production of 1,588 barrels of oil per day during October, 1974. This was prior to the Commission order which restricted injection rates. Several wells were drilled and seven wells had been recently stimulated, which had contributed to increasing and maintaining a maximum production rate. Estimated

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remaining recoverable secondary reserves at that time were approximately 1.7 million barrels, under conditions and pattern configuration in existence at that time.

As may be noted on Exhibit B, the waterflood is rate sensitive and, as the curve shows, daily oil production has steadily declined from approximately 1600 barrels -- approximately 1600 barrels per day to a current rate of approximately 650 barrels. This amounts to a forty-one percent decline in daily production over the past two and one-half years.

We feel, based on past history, that any further restrictions on injection rates, for any appreciable length of time, would do irreparable damage to the reservoir as well as extending the life of the project beyond economic limits, resulting in loss of revenue to the state and federal government, as well as parties to the unit.

Q. Now, do you have a summary of Getty operations on the Penrose "B" Unit?

A. Yes, sir, I do. The Getty Penrose "B" Unit, containing sixty-three wells became effective July 1, 1965. The unit now contains twenty-eight injection wells and thirty-one active producing wells.

Cumulative injection into the Getty Penrose "B" Unit to April 1, 1977, was 24,717,893 barrels of water. The daily average injection rate during April, 1977, was 4419

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barrels at an average wellhead injection pressure of 1782 pounds.

From start of injection to date, injection into this unit has been monitored by temperature logs and/or selected injection profiles at irregular intervals. There have been no indications from this data that injection water was going outside the unitized interval. During March of 1972 a casing leak was located in well Number 32 in the interval 226 to 446 and was squeezed off during the course of other operations on the well. Well Number 53 developed a waterflow between the casing string and surface casing; this problem was repaired. Cumulative oil production from the unit area since unitization was 1,277,039 barrels of oil as of March 1, 1977. Current oil producing rate is approximately 170 barrels of oil per day.

Recently a waterflow was noted on the Skelly Penrose "B" 54 well, between the surface and production casing. The waterflow was found to be entering the casing at approximately 1180. Two holes were perforated in the casing at that point and to date approximately 45,000 barrels have been backflowed from the well.

Plans are underway to conduct temperature, profile, and possibly noise logs, on all injection wells surrounding the Penrose "B" 54 injection well.

On the Penrose "B" plans are to continue monitoring

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of bradenhead pressures and periodic surveys of injection wells, as required and dictated by performance to insure that confinement of injected fluid is maintained. A study is now underway to evaluate the feasibility of doing additional work in the northern portion of the unit to increase ultimate reserves.

Q All right. Does Getty operate some deeper wells in this particular area?

A Yes. In addition to the secondary flood units, Getty operates wells on primary production status in the area, as indicated on Exhibit A. These include the Hobbs "M" lease in Section 20; the J. V. Baker in Section 22 and 27; and the Baker "A" leases in Section 26; and the Baker "C" lease in Section 26; and the Ellen Sims "A" lease in Section 3.

Wells on the Baker "A", the Baker "C", and J. V. Baker leases were completed deeper in zones below the Penrose Sand unit. Four of these wells experienced cacing leaks durin the period 1973 and 1974.

We were directed by the Hobbs office of the NMOCC on October 24, 1974, to re-enter seven wells which were in this deeper category and run cement bond logs, perforate, and bring cement back either into the next casing shoe or provide sufficient cement to tie back into the base of the salt. We concurred with the idea that it was the responsibility of the

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operator of the deeper wells in the area to take remedial action which would insure the placement of cement across the producing interval for shallower zones within the area of these floods. Procedures were developed, and these were approved by the Hobbs office of the Oil Commission. All of the well work, as recommended by Skelly at the time, and approved by the Commission has since been completed. This remedial work should insure that these wells will not continue to be a possible pipeline to transmit stray water within the area, as well as protecting the wells from collapsed casing due to external corrosion on the casing and pressure on the outside of the casing. The possibility exists that one or more of these deeper wells could have been providing a pathway to transmit stray water and have had a significant role concerning the pressured up salt section. If this was the case, it is possible that the source or sources have been masked through recementing and replugging of wells in the area.

Q. Now, does Getty have a salt water disposal well in the Eunice Area?

A. Yes, we do. The Eunice Salt Water Disposal Well Number 1 operated by the manufacturing department of Getty Oil Company is located 2580 feet from the south line, 1200 feet from the west line of Section 27, Township 22 South, Range 37 East, Lea County, New Mexico. This well is completed open hole 4010 to 4550 in the San Andres zone with ten and

three-quarter inch casing set at 300 feet and cemented to the surface and seven inch casing set at 4010 feet and cemented back to the surface. Based on surveys on the well, water is being contained in the San Andres zone and no problems are known to exist at this time. Continued disposal of this water into the well is considered vital by Getty's Manufacturing Department to continue operation of this plant for hydrocarbon extraction from casinghead gas in the area.

Q Now, Getty also has an LPG Storage Well in this area, does it not?

A Yes. The Eunice Gasoline Plant Number 1 Storage Well Number 3 is located 1650 feet from the west line and 2310 feet from the north line of Section 27, Township 22 South, Range 37 East. This well was drilled to a TD of 2075 feet with eight and five-eighths inch casing set at 1848 feet and five and one-half inch tubing set at 2045. Completion is open hole, 1848 to 2075. A cavern is washed out in the salt interval for LPG storage. This well was completed in June, 1953, and no problems were experienced until June, 1974, at which time the well had product in storage. On June 29, 1974, the well developed a casing pressure of approximately 1700 pounds. After delivery or removal of 220,000 gallons of propane from the well, with no water input the casing pressure dropped to 1050 pounds. Pressure was normally 700 pounds on this well when delivering to the pipeline. Surveys were

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ran on the well which indicated the well had no casing leak but that foreign water was entering the well within the cavern. The tracer survey indicated that water was entering below the bottom of the casing in the cavern. A decision was made to tap the well and leave the water flowing through an open casing valve to surface pits to avoid pressuring the cavern. This storage well has remained inactive since that time. This LPG storage well is no longer considered safe or satisfactory for its designed purpose.

A test conducted June 3, 1977, on this well, by the manufacturing department showed the well to be flowing approximately one-half gallon per hour of water. After being shut in for six hours, the pressure at the surface was 78 pounds. It appears that the problem in this area is approaching stabilization.

Q. Now, after all that information, do you have any conclusions and summary?

A. Recently a survey was conducted in an effort to determine fracturing or parting pressures on the Penrose "A" and Penrose "B" units. Current fracturing jobs were checked to evaluate the instantaneous shut in pressures. As may be noted on the attached tabulation, next sheet, 1600 pounds is an approximate average. And also Wells Number 63 and 64, which are newly drilled wells, were fractured on completion, as the tabulation shows. The instantaneous shut-in pressure

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on the two new wells are very similar to the older ones.

Using 3500 feet as midpoint of perforations and .4775 psi per foot for 9.2 pounds per gallon fracturing fluid, calculations indicate a bottom hole fracture pressure of 3271 psi per foot. Using the same data, the frac gradient calculates to be .935 psi per foot.

Water analyses have shown the density of the Penrose "A" and "B" produced water to be 8.6 pounds per gallon and make up water 8.45 pounds per gallon. Assuming a hundred percent produced water, neglecting friction, the surface pressure could be 1710 pounds without exceeding bottom hole frac pressure, and assuming a hundred percent make up water the surface pressure could be 1727 pounds without exceeding bottom hole frac pressure. Basedon April, 1977, C-120 reports average surface injection pressures were 1683 on the Penrose "A" and 1782 on the Penrose "B" .

We have no evidence to indicate that we are presently injection water at sufficient pressure to cause formation fracturing, or to be fracturing in the upper zone. These injection pressures might be lowered somewhat through an extensive program of backflowing of injection wells, acidizing, and so forth. Accumulation of iron sulfide, scale, and other materials in the vicinity of the borehole are definitely a contributing factor to the pressure requirements to inject water.

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In summary, we do not feel that we are presently injecting above parting pressure and feel that physical evidence supports this conclusion. One, no apparent channeling between wells; no wells accepting water at excessively low pressure or vacuum; three, no oil or hydrocarbons have been present in backflow water from the salt section; difficulty in proving or disproving that communication exists between the salt section and the pay zone out in the reservoir. We concur with the Eunice Area Committee recommendations as set forth at the NMOCC meeting in Hobbs during January, 1977. Getty Oil Company requests that no further requirements be placed on our operations in the area, or restrictions. We will continue to work toward relieveing the pressured up salt section and will put forth every effort possible to achieve this end. We are fully aware of the gravity of the situation and all Federal, State, and interested parties and others can be assured of our hundred percent cooperation in solving and eliminating the problem.

MR. BLODGET: Pass the witness.

CHAIRMAN RAMEY: Have you offered your exhibits?

MR. BLODGET: I think I did, but if I haven't, I'll offer them again.

CHAIRMAN RAMEY: Yes, they will be accepted. Any questions of the witness?

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Thomas, do you feel that these waterfloods are normal operating waterfloods?

A. Yes, I do, particularly on our Penrose "A" and Penrose "B" has never been near -- it's required more injection.

CHAIRMAN RAMEY: Any other questions?

CROSS EXAMINATION

BY MR. SEXTON:

Q. You said your flood decline dropped forty percent from the time water curtailment occurred. How much of this do you feel was normal decline?

A. It's difficult to say because the flood at that time was on the decline. Now, this, as I stated, was partly because some wells were being drilled and some stimulation work we had done; as the performance curve will show, back in October, 1974, it would be on a decline.

CHAIRMAN RAMEY: Any other questions?

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Thomas, you indicated that your current injection pressures were something just in excess of 1700 pounds

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in the Penrose projects. Looking here at the 1976 District One Secondary Recovery Projects Report, and there the pressure is indicated at -- the average pressure, 1800 and 1900 for the "A" and "B" projects. Have you lowered the injection pressure --

A. Yes, we have, we have lowered it. We have lowered injection pressures.

Q. So, in the past you have been injecting at pressures higher than --

A. Yes.

Q. -- parting pressure?

A. Somewhat, yes.

MR. STAMETS: Okay, thank you.

CHAIRMAN RAMEY: Any other questions?

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Would you locate that Skelly Penrose "B" Number 54 well for me? What is the section and township and range?

A. Township 23 South, Range 37 East, in Section 9.

Q. And where was that Anadarko injection well Number 13 C-7 that you made reference to? I think it was in Section 27, was it not?

A. Right here.

Q. What is that section?

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A. 27.

Q. Of what township and range?

A. Range 37 East, Township 23 South.

Q. Thank you.

CHAIRMAN RAMEY: Any other questions?

MR. CLEMENTS: May I ask one?

CHAIRMAN RAMEY: Yes.

CROSS EXAMINATION

BY MR. CLEMENTS:

Q. Mr. Thomas, do you know whether or not any effort has been made to find out where that LPG well Number 3 is being bridged off by salt or not?

A. Not at this time, Les, they don't -- they don't think it is. They are testing on that well right now.

But I do know for a period of time the flow rate had been coming way down along with the pressure.

Does that answer your question?

Q. Okay. Thank you.

CHAIRMAN RAMEY: The witness may be excused.

MR. BLODGET: In order, Mr. Chairman, in order to save time, we have another written summary of the Getty Oil Company East Eumont Unit, and I can put the man on that wrote it and qualify him, or I can just hand you the statement now to save time; either way.

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CHAIRMAN RAMEY: I think the statement would be fine.

MR. BLODGET: I think we have to qualify him as an expert witness, maybe.

CHAIRMAN RAMEY: Why don't you put your witness on and have him qualified and then give us the copies.

HAL A. OWENS

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. BLODGET:

Q. Would you state your name and by whom you are employed and in what capacity?

A. Hal Owens. I'm employed with Getty Oil Company as a Staff Engineer in Hobbs, New Mexico.

Q. All right. Have you previously testified before this Commission and your qualifications been accepted?

A. No, I haven't.

Q. All right. Would you give us a short summary of your educational background and experience background?

A. I have a B. S. in Petroleum Engineering from Louisiana State University, and have worked for Getty Oil Company two and a half years in Hobbs, New Mexico.

Q. Are you familiar with the East Eumont Unit and its operations?

A. Yes, I am.

Q. Were you assigned to that project?

A. Yes, sir.

Q. Okay. Have you written a statement concerning the operation of that particular unit?

A. Yes, sir, I have.

Q. And we probably ought to have you hand copies of that unit statement to the members of the Commission. We'd like to mark that whatever it will be, Exhibit, Getty Oil Exhibit Number -- it would be D.

Now, was this statement prepared by you?

A. Yes, sir, it was.

MR. BLODGET: We'd just like to introduce the statement for the record, please.

CHAIRMAN RAMEY: That would be fine.

A. The Eumont structure --

Q. We've just introduced it by record. You don't have to read it.

Do you have anything further, Mr. Owen?

A. No, sir.

CHAIRMAN RAMEY: Do you have anything further, Mr. Blodget?

MR. BLODGET: I think that's it. Thank you.

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CHAIRMAN RAMEY: Mr. Shrader?

MR. SHRADER: I just have a statement.

CHAIRMAN RAMEY: Mr. Sperling?

A. J. HANKINSON

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. SPERLING:

Q. Would you please state your name?

A. Jim Hankinson.

Q. Where do you live, Mr. Hankinson?

A. 1442 Scenic Ridge, Houston, Texas.

Q. What is the name of your employer? And in what capacity are you employed?

A. Mobil Oil Corporation, Reservoir Engineer.

Q. In that capacity are you familiar with the waterflood projects operated by Mobil in New Mexico?

A. Yes, sir.

Q. Would you identify those, please, by name and by area?

A. The two involved in the subject of this hearing are located principally in the north area of Vacuum Field, and they're called our North Vacuum Abo Unit, outlined in red,

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and the Bridges-State Grayburg-San Andres Co-op flood, outlined in blue. They're in T17South, R34East, of the North Area of the section.

Q. All right, now you're referring to what's been marked as Mobil's Exhibit Number 1?

A. Yes, sir.

Q. Now, would you give us the benefit of a short history of these two projects in whatever order you choose?

A. Yes, sir, I certainly will. We've identified firstly, the location of these projects, and I will provide a brief review of the history that we believe will show that they've been operating prudently and injection water has been confined to the flood zones.

I would like to discuss these individually. First we'll start with the Grayburg-San Andres. The pilot waterflood -- the field was discovered in 1929. The pilot waterflood, which began in December of '58, was probably one of the first Grayburg-San Andres floods in the State Of New Mexico. It's been expanded several times. It started in the pilot area in the north central portion and developed southward and northward, and it's been in operation eighteen years.

The project is now in what we call the advanced stage of secondary recovery after recovering 13.5 million barrels of oil and 7 million barrels of water.

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Our Exhibit Number Two is a performance history of the project, and you might note on the exhibit that we submitted other historical data is shown in tabular form on the bottom of the first page there.

We would like to sort of outline what our guidelines, what we think are necessary for a successful flood project.

Number One, that the producing horizons in producing wells and injection wells be completed in correlative zones.

Item Two, that we confine injection to the approved flood zone; and Item Three, that we do frequent -- make frequent analyses of flood performance to insure the confinement is maintained.

We started running a few tracer surveys on the Grayburg-San Andres Co-op project back in 1966. The technique has been described previously. And we've done a few -- I think up until 1976, about ten surveys. Then as a part of the Co-op and industry and NMOCC project, we ran, I think was it eleven radioactive surveys, twelve temperature surveys, in eleven injection wells. None of these surveys indicated that water was leaving the intended flood zone. In addition, as other witnesses testified, we selected two wells that have some temperature anomalies that were unexplainable, deliberately perforated these zones, swabbed them to see if they would give

up fluid; they did not. Ran a tubing and packer and injected below to see if we could establish communication; that we did not. Came out of the hole with injection equipment and acidized the zone, reset the packer as before; still no communication. So we finally gave up and cemented those perforations and put the wells back as they were.

Also as part of this Co-op industry investigation we shut in eleven injectors in this area of the project, right here, Sections 25, 26, and 27, T17South, R34East. And on certain selected wells on the offset properties to the south, and I think there was one to the east and one to the west, we installed pressure recorders on the annular spaces to record the effect, if any, on the annular pressures. The wells were shut in on September 1st, 1976, and injection resumed, I think, May 17th. During this time there was no noticeable change on the so-called monitor wells.

We've also used step rate testing, discussed earlier, as a means of controlling injection at conditions below frac pressure. There again, step rate testing has been discussed.

During '76 we ran what we call pumping tests to determine the frac pressure in this area in question. This is an old, mature flood in the late stages of secondary recovery, and the indicated surface frac pressure was from 2400 to 2700 pounds and we had been injecting below these pressures in our wells.

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So, more or less in summary on the San Andres here, we can see no evidence of injected water leaving the intended Grayburg-San Andres flood zone.

Gentlemen, I would like to introduce Exhibit Three which identifies the various geological intervals in the multipay Vacuum Field. You've got a copy on your desk there and this one, I think if we could tape it up on the board and talk about it, we might shed a little more light.

Gentlemen, this marker, I'm sure from the audience cannot be seen too well, but this identifies the zones, the geologic horizons from the Abo down here about 8400 feet on up the hole to the Blinebry, Glorieta, base of San Andres, top of San Andres, Grayburg, Queen, Yates, base of salt, top of salt, Rustler Anhydrite -- we didn't unfold it far enough, did we.

Q What is the thickness of the salt zone in this area? Approximately?

A 1700, Jim, to the -- about 1000 feet; 1700 to 2700.

Q Okay. Well, obviously, this is a multi-pay zone?

A Yes, it is a multi-pay field.

Q What is the situation with respect to the cement program that Mobil has observed in connection with the development of this project?

A There have been some 190 wells drilled in this area that have penetrated the flood zone, and on two occasions

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we've made a complete review of every wellbore and all wells in the area that we are conducting flood operations have cement opposite the approved flood zone.

Q. That's within the Grayburg-San Andres flood?

A. Yes, sir.

Q. Does that include the Abo, also?

A. Yes, sir, all wellbores.

Q. Okay.

A. One point that we would like to make on this Exhibit Three, from the San Andres standpoint, we believe that any water injected into the Grayburg-San Andres interval, which the flood zone in our interval is poor quality pay, this is the flood zone here down to the, more or less, you might say, the waterlog contact, would preferentially, rather than going up the hole, would go to this zone; this is a low pressure disposal zone. It takes water by gravity in this area. We think it would be more likely that it would go there than come up the wellbore to higher intervals.

This pretty well concludes the comments on San Andres, we'll proceed to the Abo.

Q. Yes, would you proceed and discuss the Abo situation?

A. The Abo was discovered with completion of Mobil's Bridges-State Number 112 on June 15th of '66. Development of the field proceeded rather slowly in the early years of

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'66 to '69, because of the rapid decline indications on some wells and the indicated low recovery indicated from this solution gas drive reservoir. It wasn't until we considered the benefits of fluid injection in this reservoir that our development pace accelerated in the years 1970 and 1972. The NMOCC approved unitization on October 27, '72, and we began injection on August 1st of '73. The project is currently in the response stage and our production exceeds our primary by some 2700 barrels per day.

Q. Would you refer to what's been marked as Exhibit 4 and explain its purpose?

A. Yes, sir. Exhibit Four is the production history of our North Vacuum Abo Unit.

Q. Would you explain the procedures that have been employed in connection with the operation of this flood?

A. Yes, sir, I certainly will. Firstly, injection profiles have been run on 35 of the 36 injectors in the field. The only reason for not running the additional well was it was such a low capacity injector that we didn't feel that it would warrant the cost. This type of work was initiated early in the life, as soon as we did see wells with pressures indicating some degree of fill-up.

We have also -- by the way, none of these surveys indicated that water was leaving the Abo zone or this zone here, approximately 8400 feet. We have also run some sixty-

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two step rate tests to confirm that our injection pressures have been below fracture pressures.

We've also performed a reservoir simulator study. For those not familiar with this, it consists simply of describing the reservoir on a low cell basis, many cells wide and maybe 20 or 30 cells wide and 40 to 50 or however, and describing each of these cells in terms of porosity, thickness, permeability, and other reservoir characteristics, and then using a high speed computer to solve the reservoir flow equations and describe flow. The results of these simulator studies indicate good agreement with actual performance when we start comparing, you know, well by well; there are a few anomalies, but basically, from the modeling standpoint, it was good agreement. This would not be so if injection water was escaping from the reservoir; you would not get the agreement between your actual performance and your model performance.

As stated previously, we've injected in the Abo below frac pressure. We want to go into this performance history right here. If you gentlemen can see there, we started our injection approximately mid-year, or August there, of '73. We've injected about 11,000,000 barrels of water, or at about seventy-one percent fill-up, have seen our oil production go from about 1110 barrels a day up to 3700 barrels a day and our water production, which is the lower dashed curve, actually decrease down to about -- this shows fifty-some barrels;

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current production is about seventy barrels. We're producing seventy-one barrels of water a day out of this project, and one of the best indicators of fracturing is the production of water in nearby wells, call it channeling, call it fracturing, we have not seen any water production. This has been an excellent response and has performed in a very satisfactory manner. But there again I mentioned fill-up; at the present time it's estimated to be seventy-one percent. The initial response was about fifty percent, which is quite normal for a flood project.

And finally, I'd like to refer to this Exhibit Three again. As you will note on this, if you can see it, here's the upper hundred feet of the Abo, what we consider to be the production interval; lower intervals here contain a little water. The Blinebry is productive in this area; that's located right in here. The Glorieta is productive, quite extensively all across this area. The San Andres is productive; this is a low pressure zone. The point I'm trying to make is that even if water was escaping by fracturing or by any other means, we would believe that we would see this in these shallower pay zones, the Blinebry, the Glorieta, or even San Andres. And, Gentlemen, we haven't seen it. We haven't seen it either by water analyses or by extraneous amounts of water above what you'd normally expect, so that it's our conclusion that water is not leaving the Abo, it is

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being confined here and we do not see any water production in these shallow reservoirs, and furthermore, this zone right here is a gravity disposal zone, and we would --if it did get past these two, it would be most likely that it would be retained in this low pressure disposal zone. This is logical, and from operating results that we've seen.

This pretty well indicates that to our extent, that we have operated this project very prudently; we do not exceed the frac pressure; and that water is being confined to these reservoirs.

Q. Do you have any recommendations?

A. Yes, sir. We recommend continuation of present operations in the Grayburg-San Andres and Abo reservoirs and that injection in these projects neither be restricted nor curtailed beyond the limitations of frac pressure. We were at seventy-one barrels a day when this happened, and if we're curtailed to produced water, it really puts a cramp in our operation. We'd like to point out that such a reduction we believe, would reduce production immediately by about 2800 barrels a day. It would also decrease the New Mexico royalty income by some 350 barrels a day, and would furthermore jeopardize the recovery of eight to twelve million barrels of fluid injection reserves on these projects.

Q. Do you have anything else?

A. No, sir.

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MR. SPERLING: I'd like to offer Mobil's Exhibits One through Four at this time.

CHAIRMAN RAMEY: They will be accepted.

MR. SPERLING: Mr. Hankinson, I made the grievous error in failing to establish your qualifications. I think, so far as I'm concerned, you've demonstrated them in the course of your testimony, but for the record, have you on any previous occasion testified before the Commission so that your qualifications are a matter of record?

A. Yes, sir.

Q. And your qualifications have been accepted?

A. Yes, sir.

Q. All right.

MR. SPERLING: I submit the witness is qualified.

CHAIRMAN RAMEY: I have to agree with you, Mr. Sperling. Any questions of Mr. Hankinson?

CROSS EXAMINATION

BY MR. SEXTON:

Q. Did you run a reservoir simulator on your San Andres flood?

A. No, sir, we have not.

Q. And also, would you explain about your fracture pressure in the Grayburg, how you determined it?

A. Determined it, what we did there, there are a

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couple of techniques. Step rate tests are one way. Our pump station is only capable of going to 2500, putting out approximately 2450 or 2400 at the wellheads. We were trying to determine frac pressure and we were trying to determine quickly for the committee. So we deliberately called out a pump truck that had the capability of injecting in the range of a barrel a minute or a barrel and a half a minute, which we knew was beyond the capability of the clay -- we are in the edge, or the upper zone, we're edge oil company in the San Andres here, and these were pump-in tests and these range -- wellhead pressures were an indication of 2400 to 2700 pounds. This is an old, mature flood project. This is the way these were determined.

Q. They haven't been confirmed by step rate tests, then?

A. Let me just a second -- let me verify this with one of my cohorts.

Gentlemen, Jerry, I've been provided information that we ran two tests, what is considered a normal step rate test, here recently, and both these data indicate this range of pressure. Well 7 indicates a frac pressure of 2480, or somewhere in there, and this other one did not get up to a rate which you would expect in the curve. In other words, our injection is normally at the range of 137 is the average on the San Andres. This particular rate of 600 barrels a day

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and the pressure was still increasing in a linear direction, indicating that the frac pressure had not increased but this is much beyond the injection rate of this well, what it is normally injected in.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Is it possible that the 2400 pound pressure is already above the parting pressure of the formation and what you're seeing here in your test of 2700 pounds is secondary fracture?

A. I think no. I think your first pressure break will be your highest pressure break. Subsequent breaks will be, perhaps, lower. This is only an opinion.

Q. Do you have any evidence to show any, say, frac pressures when these wells were completed or were these wells fraced when completed?

A. Well, they were probably not when they were completed. I think the bigger part of them were drilled probably in the '40s. I'd just have to investigate that. I really can't answer you at this time. Some of them were fractured later during the -- after the reservoir in that area was semi-depleted, but I can't answer that.

Q. If there were any tests taken at that time, any instantaneous shut-in pressures that were recorded, that

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would be evidence to verify your step rate tests?

A. No, sir, it would not be evidence to verify my step rate tests, because your frac pressure to a large extent is a function of fill-up in the reservoir, pressure in effect then, and the pressure then could have been a good deal different, much lower, for example, than the pressure now, which would have indicated a lower frac pressure; therefore, the two data are not necessarily compatible.

RECROSS EXAMINATION

BY MR. SEXTON:

Q. Did you take friction pressure out of your calculations?

A. Did we take what?

Q. Friction pressure out of your calculations?

A. I don't know. Friction pressure is negligible, in the range of 250 to 300 barrels a day judging rates. Jerry, we did not, but it would be very, very low.

CHAIRMAN RAMEY: Any other questions of the witness? He may be excused.

And we'll recess the hearing until 9:00 o'clock tomorrow morning.

(Thereupon the hearing was in recess until 9:00 o'clock a. m. on 14 June 1977.)

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Phone (505) 982-9212

REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, prepared to the best of my knowledge, skill, and ability.

Sally Walton Boyd

Sally Walton Boyd, C. S. R.

PROGRESS REPORT

EUNICE AREA WATERFLOW COMMITTEE

DISCUSSION OF ACTIVITIES

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee was to collect, analyze data and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of thirteen wells were initially shut-in for observation. The wells consisted of 5 injection wells, 6 producing wells, 1 shut-in producing well and 1 disposal well. Due to a slight pressure drop on the Citgo-State No. 1, the closest and most significant monitor point, two additional wells were shut-in. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure on the shut-in injection wells had decreased substantially below readings on monitor points and with virtually no change in recorded pressure on the Citgo well. The Committee recommended to the NMOCC that injection be resumed into the injectors, and plans be made to "blow-down" the pressured up salt section in the Citgo-State No. 1. Thoughts at this time were to discontinue cycling, and attempt to determine if we were dealing with a localized or widespread pressure problem. The NMOCC felt that cycling and monitoring should be continued because it appeared that one of the other study groups was making some headway through this procedure. An alternate recommendation was made to the NMOCC at

this time. Injection wells with approximately 700# wellhead pressure or less be reactivated and cycling expanded to take in more injectors. The NMOCC agreed to this proposal and this procedure was implemented. During all the monitoring and cycling, the pressure on the Citgo-State well had remained practically constant at 1150#.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976 meeting that (1) injectors which are high pressure and low volume, and (2) those which have shown little or no pressure variation during shut-in be backflowed and tested, in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and buildup procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 barrels per day or less, shut the well in for pressure build-up. If pressure does not build up past 800# in 48 hours, return the well to injection". From this time forward, wells were checked for pressure drop, backflowed, (rates and pressures monitored) and buildups ran following backflow. Upon recommendation from the Committee and approval from the NMOCC, wells were returned to injection as warranted by results.

At the Committee meeting on August 26, 1976, approval was given by the NMOCC to suspend the present testing procedure and go ahead with plans to backflow the Citgo-State. Fourteen Skelly and Anadarko wells were to be shut-in one week prior to backflow. On September 19, 1976, backflowing of the Citgo-State well was begun. At time of opening, the well had 1010# on surface. After

60 hours well had flowed back approximately 40,000 barrels of 9.9# brine. Initial flowing pressure was 210# at a rate of 9 BPM. After 60 hours flow pressure had decreased to 70# and rate was approximately 2 - 3 BPM. During the ten day flowing period, the well flowed back an estimated 63,000 barrels. The fourteen wells were closely monitored during backflow with pressure recorders. No pressure interference was noted on any of the wells. As soon as pressure and flow rate would permit, Petro-Search re-entered, plugged and abandoned the well.

The test wells were later returned to injection and monitoring discontinued, with the exception of 4 wells which had previously shown bradenhead pressures. These wells still have pressure recorders attached and have consistently fell off in pressure since backflowing of the Citgo-State and return to injection of surrounding wells. These wells are: Skelly Penrose "A" Water Injection Well No. 38 from 275# to 45#; Skelly Penrose "A" No. 44 from 725# to 95#; Skelly Penrose "B" No. 54 from 90# to vacuum and Skelly Penrose "B" No. 52 from 120# to 65#. Subsequent work of the Committee has consisted of re-evaluating all available temperature and tracer logs in the area and analyzing new logs as they become available.

Wells which had abnormal temperature gradients have been, and are being re-logged to confirm data as interpreted from previous logs. Several noise logs have been and are now being run.

Skelly recently perforated the Skelly Penrose "A" No. 64 at 1460' opposite a water flow which was encountered during drilling of the well approximately 2 years ago. Prior to perforating, the well was producing 9 BO and 40 BW per day. Current producing rate is 8 BO and 43 BW per day.

On January 14, 1977, a noise log was ran on the Skelly J. V. Baker No. 11 in an attempt to determine if cycling was occuring between Anadarkos' injection Well No. 13-C7 and the J. V. Baker No 11, which is a Drinkard producer. It appeared that possibly water which was being injected into the Penrose section might be channelling across to the Baker Well and moving up and back to the injection well. No upward or downward movement adjacent to the injection zone was indicated by the log, however, an increase in noise intensity was noted from 920' to 1430', which could be indicative of water migration. Logs ran during 1975 on the Anadarko well had shown possible migration across the salt section. Recent logging by two different companies have failed to confirm this. At present the well is operating at reduced pressure and rates, but still has approximately a 20 BWPD flow out the bradenhead.

CONCLUSION

(1) All wells drilled in the area have surface pipe set at regulatory agency approved depth and there is no evidence of surface water being contaminated at this time.

(2) Some formation shallower than the waterflood objective formation contains pressured salty water in certain areas within the area of investigation.

(3) Testing and investigations, to date, have failed to identify the water source

(4) Previous surveys which indicated anomalies or temperature variations have proven difficult to confirm from recent surveys.

RECOMMENDATIONS

(1) Attempt to blow-down "salt section" through selected wells.

(2) Record pressure and volume before, during and after "blow-down" operation. Continue to monitor for a sufficient length of time to determine if "salt section" is being re-pressured.

(3) Continue periodic injection well surveys to determine distribution of injected water. Conduct necessary remedial operations to confine water to unitized interval.

(4) Continue committee efforts to determine & eliminate source of pressured water.

(5) In order to prevent masking data from "blow-down" no further restrictions be imposed on injection operations, until "blow-down" operations are complete and results are evaluated.

RECENTLY RUN SURVEYS - EUNICE AREA

Skelly Oil Company

J. V. Baker #11
Skelly Penrose "A" #26
Skelly Penrose "A" #28
Skelly Penrose "A" #34

Anaderko Production Company

Langlie Mattix Penrose Sand Unit #34-4
Langlie Mattix Penrose Sand Unit #27-1
Langlie Mattix Penrose Sand Unit #13-B-2
Langlie Mattix Penrose Sand Unit #40-1
Langlie Mattix Penrose Sand Unit #13-C7
Langlie Mattix Penrose Sand Unit #1-2
Langlie Mattix Penrose Sand Unit #8-1
Langlie Mattix Penrose Sand Unit #7-1
Langlie Mattix Penrose Sand Unit #7-3
Langlie Mattix Penrose Sand Unit #13-A1
Langlie Mattix Penrose Sand Unit #13C-5
Langlie Mattix Penrose Sand Unit #15-2
Langlie Mattix Penrose Sand Unit #17-1
Langlie Mattix Penrose Sand Unit #21-2

SKELLY PENROSE "A" UNIT
Langlie-Mattix Pool
Lea County, New Mexico

Monthly Oil Production (BBLS.)

Gas-Oil Ratio

Monthly Water Injection (BBLS.)

Monthly Water Production (BBLS.)

Oil Production

Gas-Oil Ratio

Water Injection

Water Production

% Water

Unit Effective Date

100,000
10,000
1,000
100

1,000,000
100,000
10,000
1,000

100
80
60
40
20

1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978

BEFORE THE OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 6144 Exhibit No. 8
Submitted by Skelly Oil Co.
Hearing Date 12-13-78

SKELLY PENROSE "B" UNIT
Langlie-Mattix Pool
Lea County, New Mexico

Oil Production (BBLS/Month)

Gas-Oil Ratio

Monthly Water Injection (BBLS)

Monthly Water Production (BBLS)

Water Injection

Oil Production

GOR

% Water

Water Production

1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Exhibit No. C
Case No. 8484
Submitted by
Hearing Date

Getty oil Exhibit D

TESTIMONY
Case No. 5941

GETTY OIL COMPANY
East Eumont Unit

The Eumont structure, located in Southeast New Mexico, is primarily a gas reservoir in the Penrose Queen. Oil is produced from a rim held in place by the gas from the huge gas cap and a pinchout structure. The oil rim was discovered in 1953 and was developed on 40 acre spacing after that time.

By 1961, it was apparent that the oil rim was depleting inefficiently and additional secondary oil may be available. Unit regotiations were begun and after producing 2,956,031 barrels of primary oil (ultimate primary was estimated to be approximately 3,200,000 BO), the East Eumont Unit, consisting of 5,560 acres, was formed and made effective July 1, 1965.

The flood was developed by installing a 5-spot pilot test in the South end (most prolific portion) of the unit. While the pilot was responding, the south sector was converted to flood. In 1969 the central sector was converted to flood. The north sector is yet to be developed pending the study of water-flow problems in Southeast New Mexico.

San Andres water is used for make up water in the south sector and fresh water is used for make up water in the central sector. Both sectors have water supply wells which supplies the make up water. Two plants utilize plunger pumps powered by gas engines. The injection systems are completely protected from corrosion by coatings and linings. The gathering system consists of 5 satellites where in the gas is separated and sold and wells are tested. These satellites then pump their fluid to 2 central facilities where the oil is sold and the water is redistributed to the injection wells.

In 1970 a review of the unit was made and recommendations to survey a majority of the injectors. By the end of 1971 this had been done and all wells surveyed showed to be going into the desired intervals.

In 1973, two producers, EEU #65 and EEU # 74, were selected to be refraced in and attempt to increase their productivity. Both wells were fraced using 20,000 gallons of 9.2#/gal gelled brine water containing 20,000# 20/40 mesh sand. From this data a frac gradient on each well can be calculated.

(1) EEU # 65
BHFP = ISIP + P_h
ISIP = 2200 psi
Midpoint of perfs = 3814
P_h = 9.2 x .052 x 3814 = 1824 psi

BHFP = 2200 + 1824 = 4024 psi
Fracture gradient = 4024 ÷ 3814 = 1.06 psi/ft

(2) EEU # 74
ISIP = 2300 psi
Midpoint of perfs = 3819
P_h = 9.2 x .052 x 3819 = 1827

BHFP = 2300 + 1827 = 4127 psi
Fracture gradient = 4127 ÷ 3819 = 1.08 psi/ft.

The values of 1.06 and 1.08 psi/ft compare closely and are believed to hold true for both the south and central sectors of the East Eumont Unit.

Since unitization and thru 5-1-77 the central sector had produced 508,487 BO and 1,213,920 BW. The central sector has injected 6,928,395 BW of which 5,716,180BW was make up water. The south sector has produced 1,668,252 BO and 5,401,377 BW The south sector has injected 17,421,377 BW of which 11,997,513 was San Andres make up water. Over the life of the flood the injectors were limited to 2200 psi of surface injection pressure and not more than 350 BW/D. Over the history of the flood, the injectors slowly pressured up to the limit of 2200 psi, starting on the eastside and moving west. By early 1976 all injectors but 5 were injecting

at maximum pressure. All wells on the east flank were injecting little or no water at all, while holding 2200 psi. Based on the fore mentioned EEU #'s 65 & 74 a pressure injection gradient can be calculated. From water analysis made on the injection water the specific Gravity was found to be 1.0075 or 8.39 lb/gal. Using the average midpoint of perfs for #65 and #74 of 3815 and a surface injection pressure of 2200#

$$\text{BHIP} = P_i + P_h$$
$$= 2200 + (3815 \times .052 \times 8.39)$$
$$= 3864 \text{ psi}$$

$\therefore \frac{3864}{3815} = 1.01$ psi/ft

This is 160 to 263 psi lower than the fracture pressures calculated earlier. Based on the above and the fact that a large no. of wells are taking little or no water with 2200# of surface pressure, the wells do not appear to be fracing out of zone.

Water injection was stopped in the south sector in August 1976 and October 1976 in the central sector. Three wells in the south sector are now being used to reinject the produced water, all at below 500 psi injection pressure. Before re-injection was limited to produced water only, the flood had an annual decline rate 12%/yr. Since August when the flood was shutdown and only produced water re-injected, the annual decline rate has been 40%/yr+. Before the unit was restricted to injection of produced water only the unit use 1.57 bbls. of make up water for each bbl. of produced water along with maintaining the 2200 psi injection pressure, thus maximizing effiency and maintain a fairly low decline rate.

From the information stated above, it can be said the unit appears to be operating below the fracture pressure of the reservoir, the zone of interest is being flooded, and make up water is required to maintain maximum efficiency.

Unless the unit is allowed to operate as before, it appears a larger portion of the secondary reserves could be lost, resulting in loss revenue for the operator, working interest owner, the state and federal government.

ATTACHMENTS

1. Figure 1 - Location of East Eumont Unit in relation to Permian Basin.
2. Figure 2 - East Eumont Unit - well plat
3. Figure 3 - East Eumont Unit - Primary and Secondary Production History

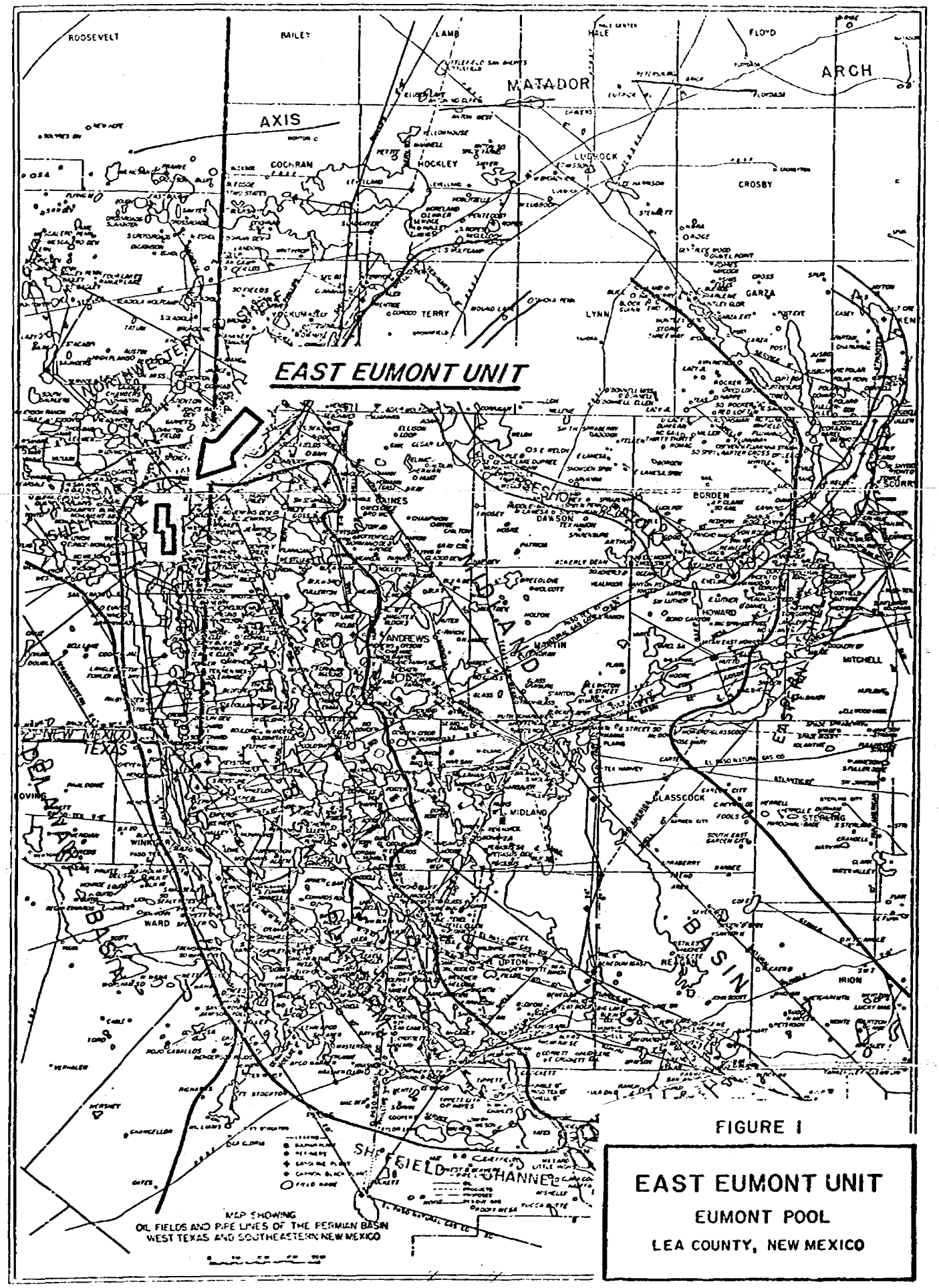


FIGURE 1

EAST EUMONT UNIT

EUMONT POOL

LEA COUNTY, NEW MEXICO

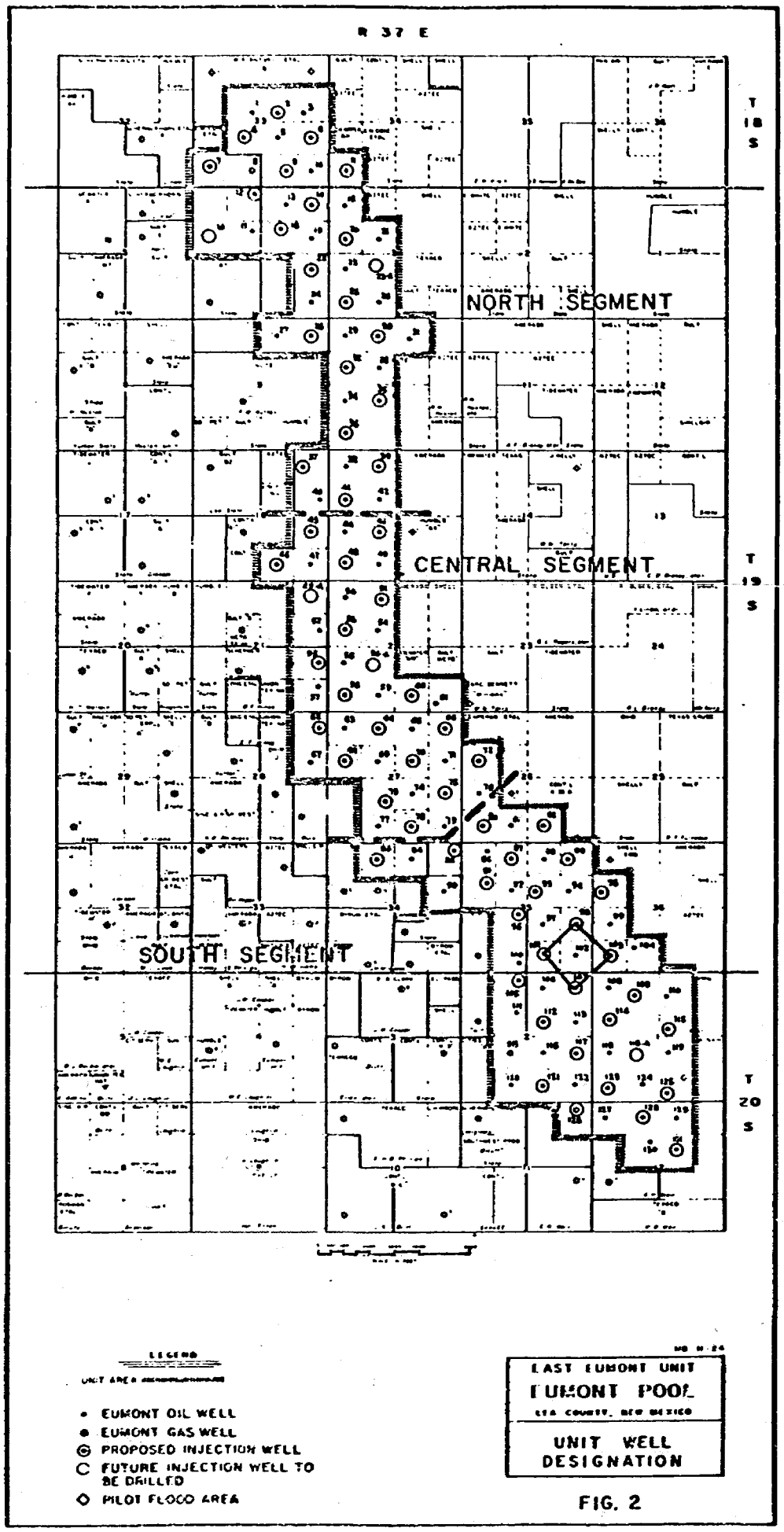

R 37 E
T 19 S
T 20 S
NORTH SEGMENT
CENTRAL SEGMENT
SOUTH SEGMENT
LEGEND
UNIT AREA
EUMONT OIL WELL
EUMONT GAS WELL
PROPOSED INJECTION WELL
FUTURE INJECTION WELL TO BE DRILLED
PILOT FLOOD AREA
EAST EUMONT UNIT
EUMONT POOL
LEA COUNTY, NEW MEXICO
UNIT WELL DESIGNATION

FIG. 2

GETTY OIL COMPANY
EAST EUMONT UNIT
EUMONT (Y-7R:-Q)
LEA COUNTY, NEW MEXICO

103,551

WATER PROD.

OIL PROD.

WATER INJ.

GOR

GOR (CF/B)
WATER INJ. (BBLS. X 100)

OIL PROD. (BOPM)
WATER PROD. (BWPM)

100,000
50,000
10,000
5,000
1,000
500
100

UNIT EFFECTIVE 7-1-65

FIRST WATER INJ. 4-21-66 (4 WELLS)

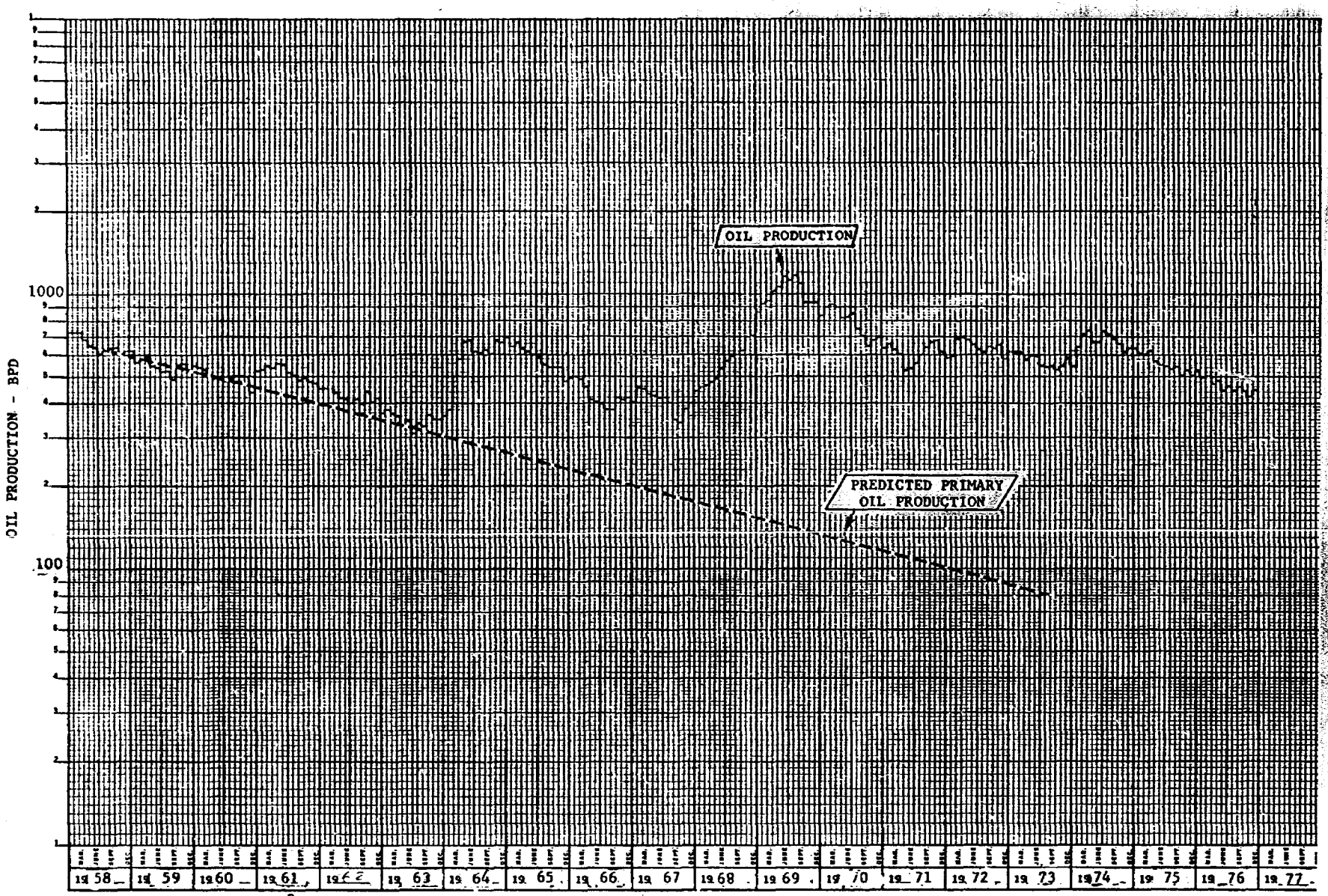
ADDED 20 INJ. WELLS (8-4-67)

PILOT KICKED

RESPONSE 8-1-68

STARTED INJECTING WATER
ON THE CENTER SEGMENT
11-3-69

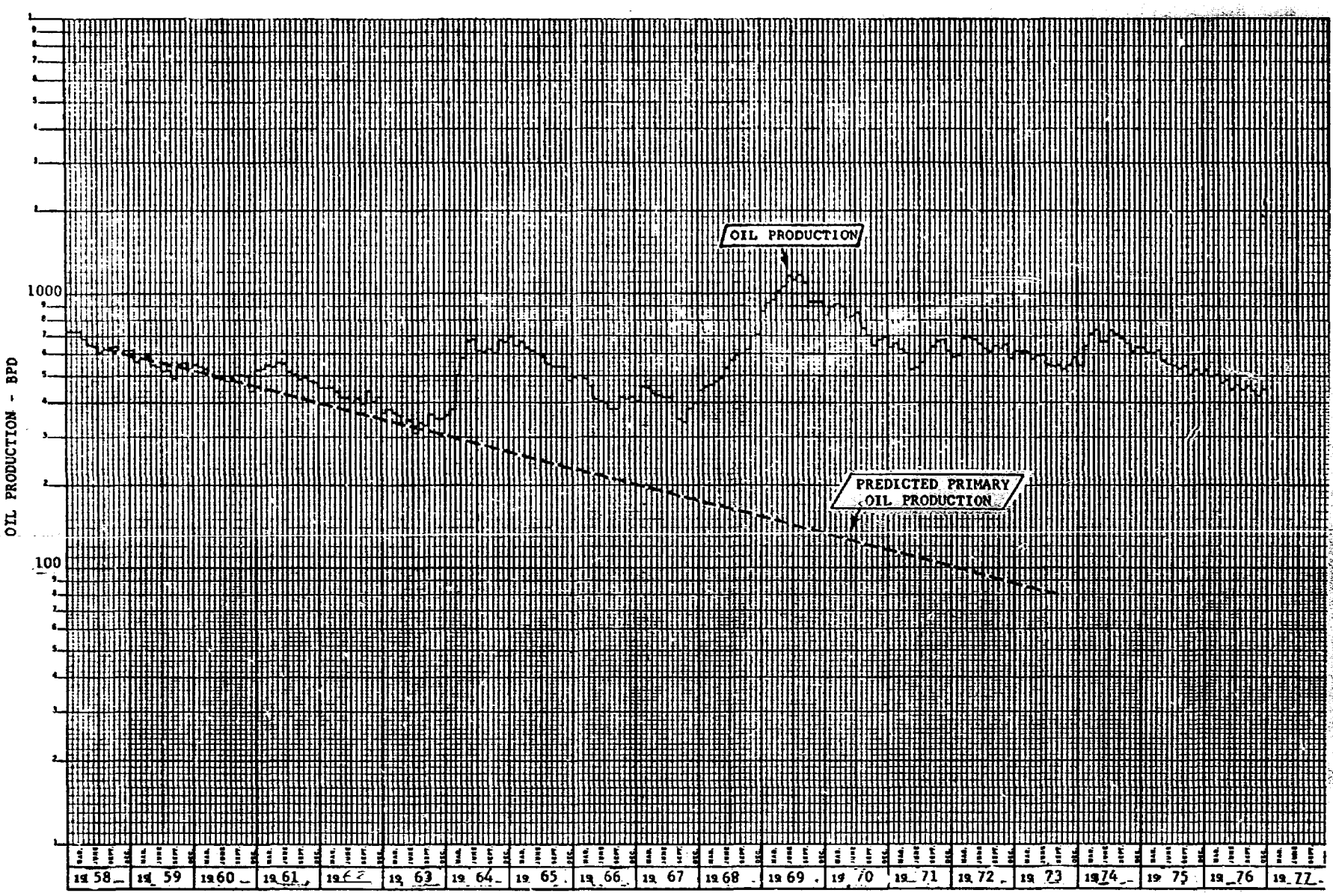
19 59 | 19 60 | 19 61 | 19 62 | 19 63 | 19 64 | 19 65 | 19 66 | 19 67 | 19 68 | 19 69 | 19 70 | 19 71 | 19 72 | 19 73 | 19 74 | 19 75 | 19 76 | 19 77 | 19 78



Mobil Exn
Cs 5-941

Mobil Oil Corporation
Houston E&P Division
PERFORMANCE PREDICTION
VACUUM SA CO-OP FLOOD
BRIDGES STATE G,J, & II
LEA COUNTY, NEW MEXICO

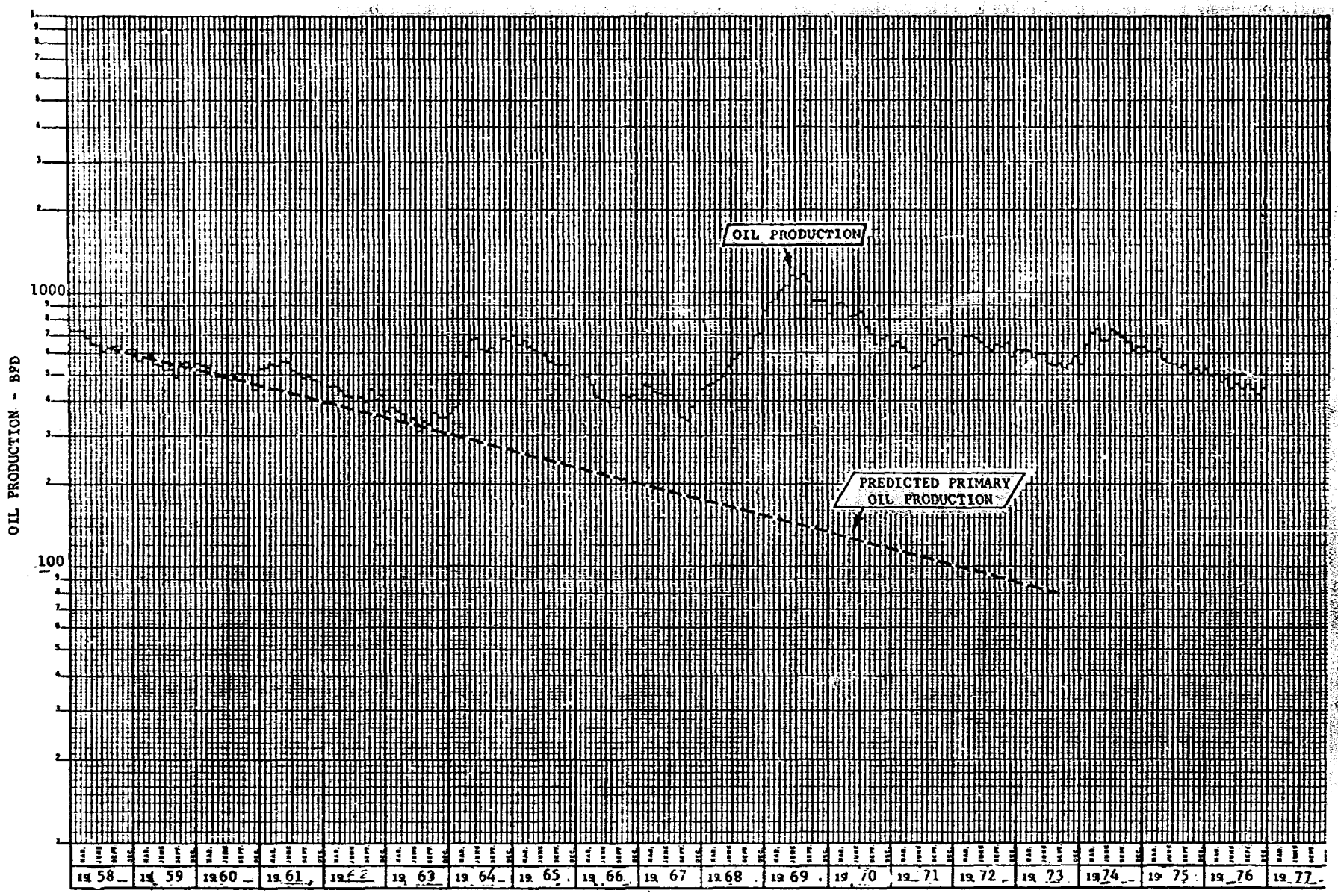
VACUUM S. A. BRIDGES ST. LSES.



TIME-YEARS

Mobil Oil Corporation
Houston E&P Division
PERFORMANCE PREDICTION
VACUUM SA CO-OP FLOOD
BRIDGES STATE G,J, & II
LEA COUNTY, NEW MEXICO

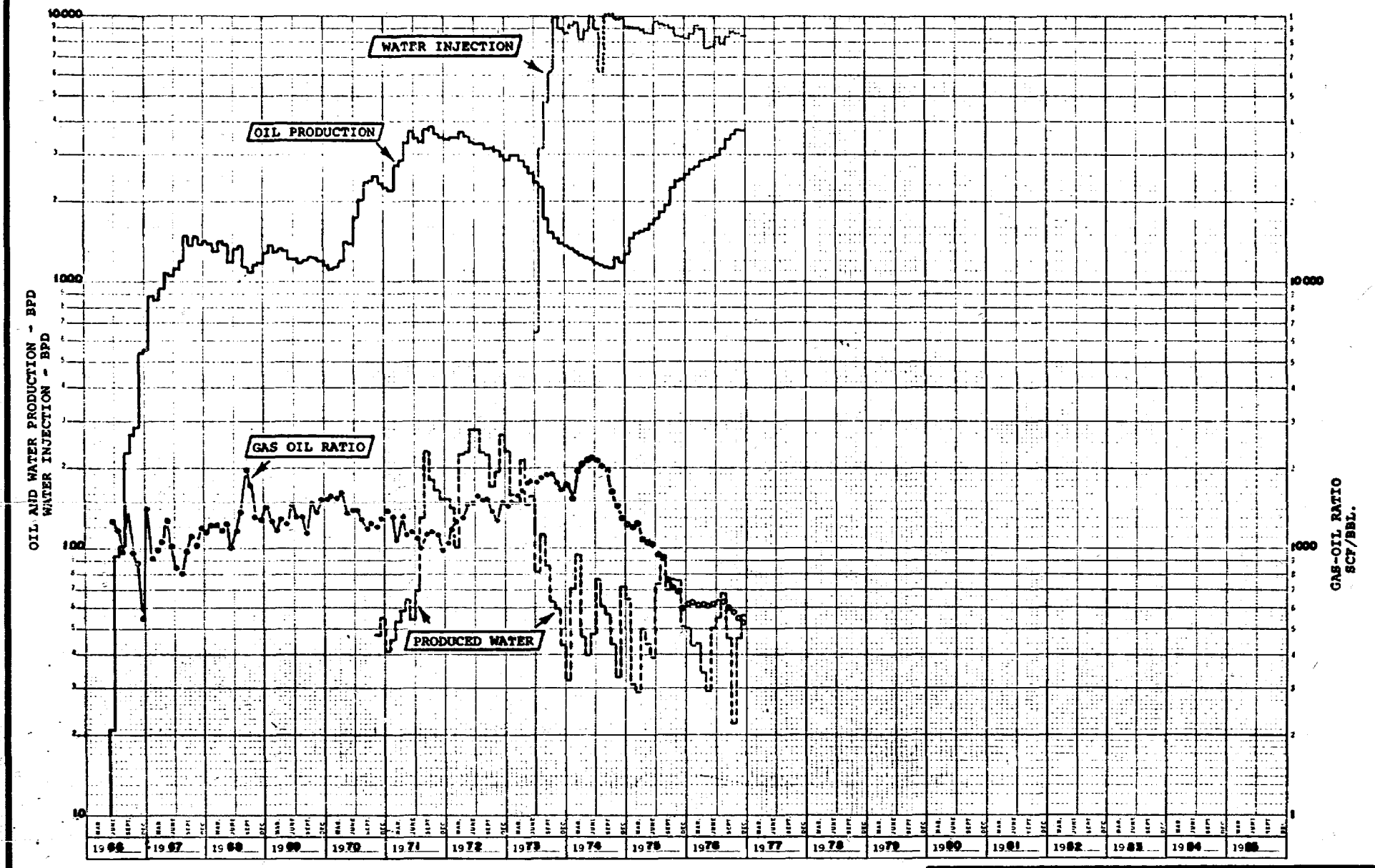
VACUUM S. A. BRIDGES ST. LSES.



TIME-YEARS

Mobil Oil Corporation
Houston E&P Division
PERFORMANCE PREDICTION
VACUUM SA CO-OP FLOOD
BRIDGES STATE G,J, & II
LEA COUNTY, NEW MEXICO

VACUUM S. A. BRIDGES ST. LSES.



Mobil E&P
CR 5941

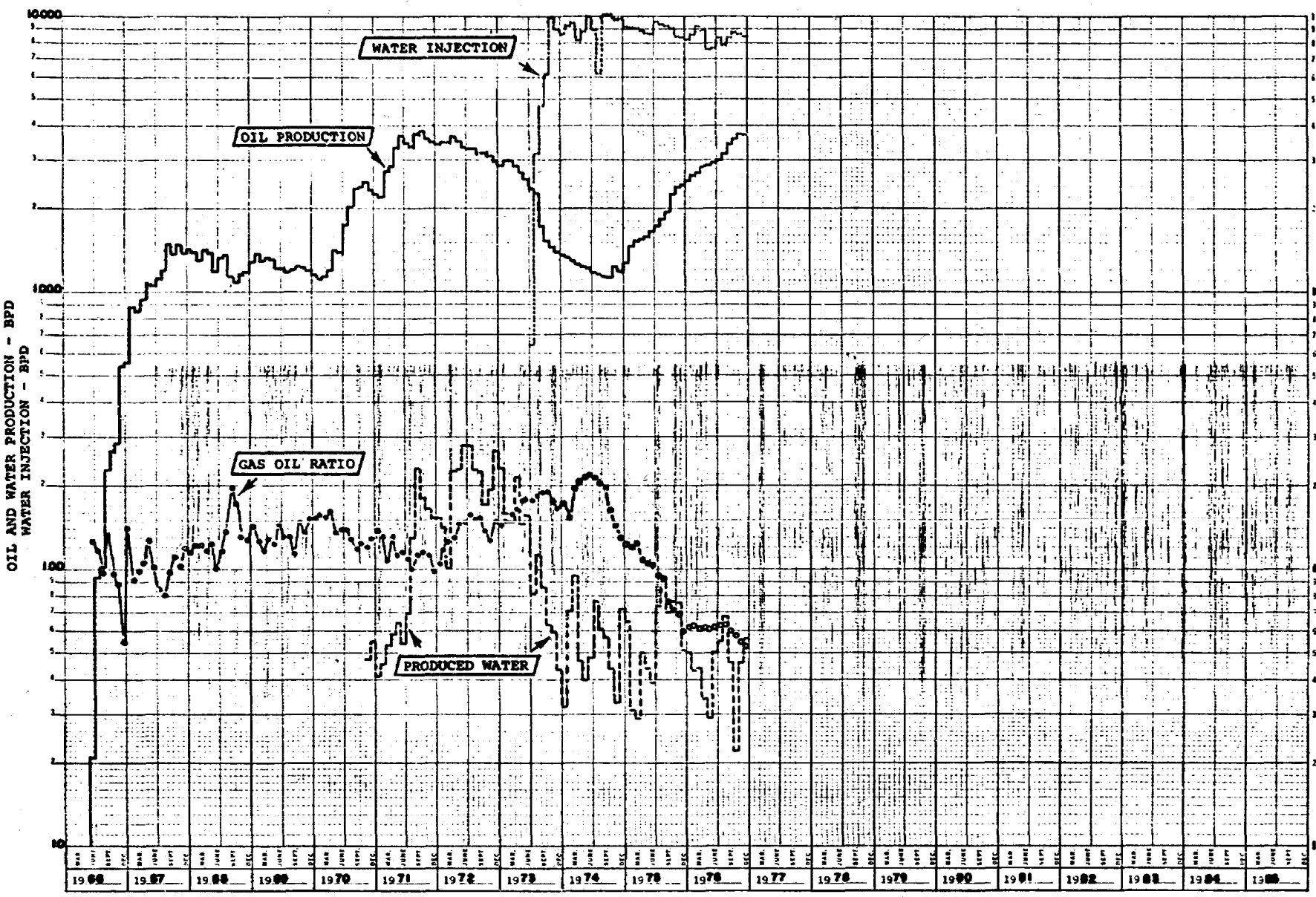
Mobil Oil Corporation
Houston E & P Division

PRODUCTION HISTORY
NORTH VACUUM ABO UNIT
LEA COUNTY, NEW MEXICO

Scale

Date 2-16-77
Drawn ECH
Checked
Approved
Revised

VACUUM N. ABO UN.



TIME - YEARS

Mobil Oil Corporation
Houston E & P Division

PRODUCTION HISTORY
NORTH VACUUM ABO UNIT
LEA COUNTY, NEW MEXICO

Scale

Date 2-16-77
Drawn ECM
Checked
Approved
Revised

VACUUM N. ABO UN.

EXHIBIT 1

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5762
Order No. R-5295

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR A WATERFLOOD PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 15, 1976, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 12th day of October, 1976, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Atlantic Richfield Company, seeks authority to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through 11 injection wells located in Unit M of Section 29, Units A and I of Section 31 and Units C, E, G, I, K, M, N, and O of Section 32, all in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico.

(3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper wells.

(4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the Cole Darden Oil Company Hale State Well No. 1 in Unit A, Section 31, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico, was not plugged and abandoned in a manner such as to assure that water injected through said State Vacuum Unit injection wells will not migrate from the Grayburg-San Andres formation to other formations or the surface.

Exhibit 1 - pg. 2

(6) That injection pressure around said Colo Darden Oil Company Hale State Well No. 1 should be limited to prevent such migration.

(7) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(8) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Atlantic Richfield Company, is hereby authorized to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through the following-described wells in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico:

State Vacuum Unit Well No.	Unit	Section	Township	Range
1	M	29	17S	34E
2	A	31	17S	34E
4	C	32	17S	34E
7	E	32	17S	34E
9	G	32	17S	34E
11	I	31	17S	34E
13	K	32	17S	34E
15	J	32	17S	34E
17	H	32	17S	34E
19	O	32	17S	34E
21	N	32	17S	34E

(2) That injection into each of said wells should be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation, or in the case of an open-hole completion, to the casing shoe; that the casing-tubing annulus of each injection well shall be tested for leaks, be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device, and that the injection wells or system shall be equipped in such a manner as to limit wellhead pressure to no more than 860 psi.

(3) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of 860 psi upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

Exhibit 1 - pg. 3

(4) That there shall be no injection under pressure into the Cole Barden Oil Company Hale State Well No. 1 in Unit A of Section 31, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, or into any well on said 40-acre tract or any 40-acre tract directly or diagonally offsetting said well, until said well has been reentered and replugged in accordance with a Commission approved plugging program or said well has been equipped in such a manner as to monitor for leaks below the salt section.

(5) That the operator shall immediately notify the supervisor of the Commission's Hobbs district office of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(6) That the subject waterflood project is hereby designated the ARCO State Vacuum Unit Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(7) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(8) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

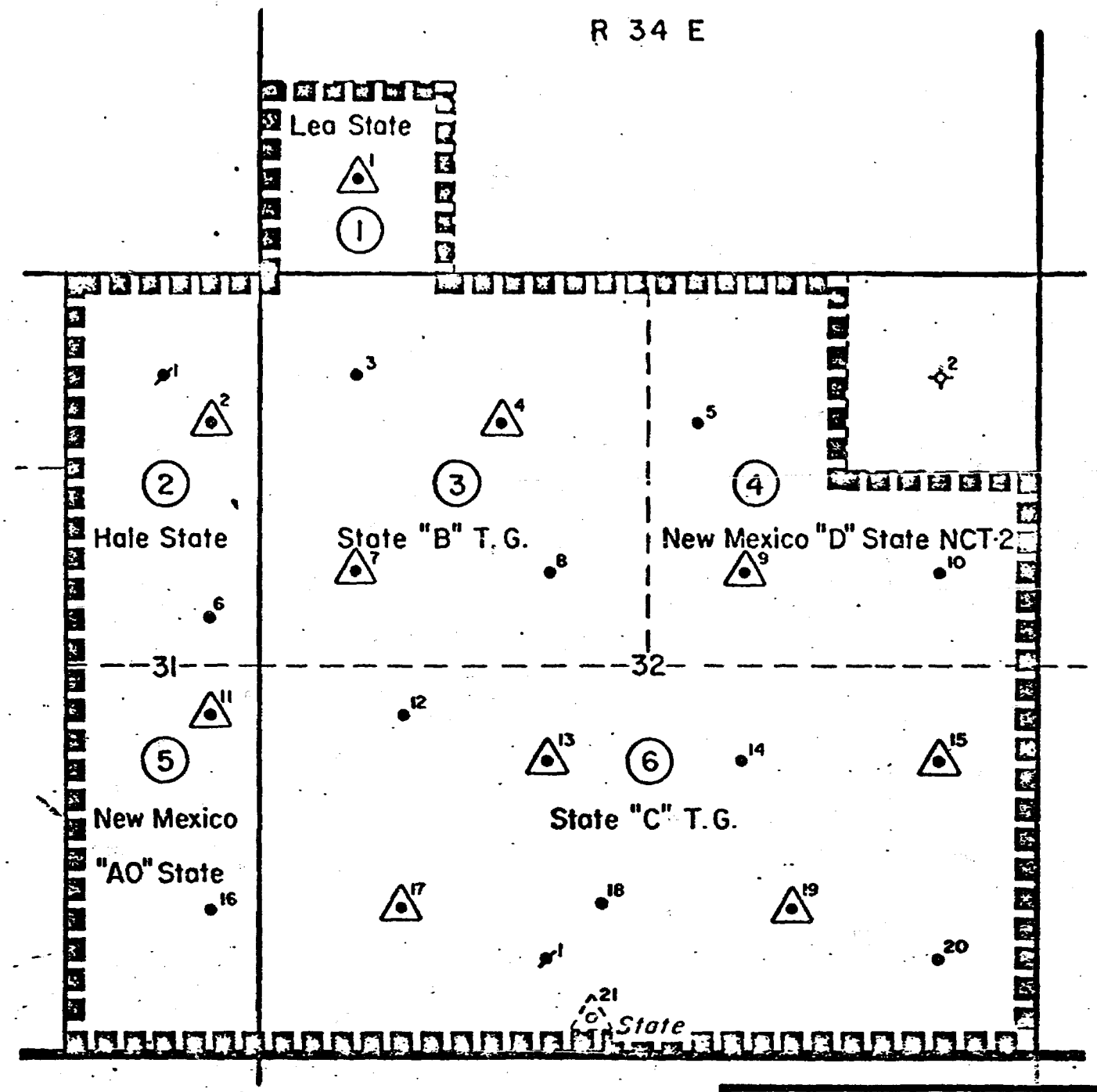
EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

EXHIBIT 2



UNIT BOUNDARY

(1) TRACT NUMBER

INJECTOR

PRODUCER

INJECTOR – TO BE DRILLED

AtlanticRichfieldCompany
North American Producing Division
Permian District Midland, Texas

STATE VACUUM UNIT

LEA COUNTY, NEW MEXICO

Scale: 1"=1000'

By	Drawn By J.L. Date 4-22-71
Date	Reviewed By G.L.F Date 5-5-71
Dept	Dwg No.

EXHIBIT 3

COLE-DARDEN OIL COMPANY
HALE STATE NO. 1
Schematic Drawing of Plugged and Abandoned Well
660' FNL & 660' FEL Section 31, T-17S, R-34E
Lea County, New Mexico

All measurements are from KB 8' above GL

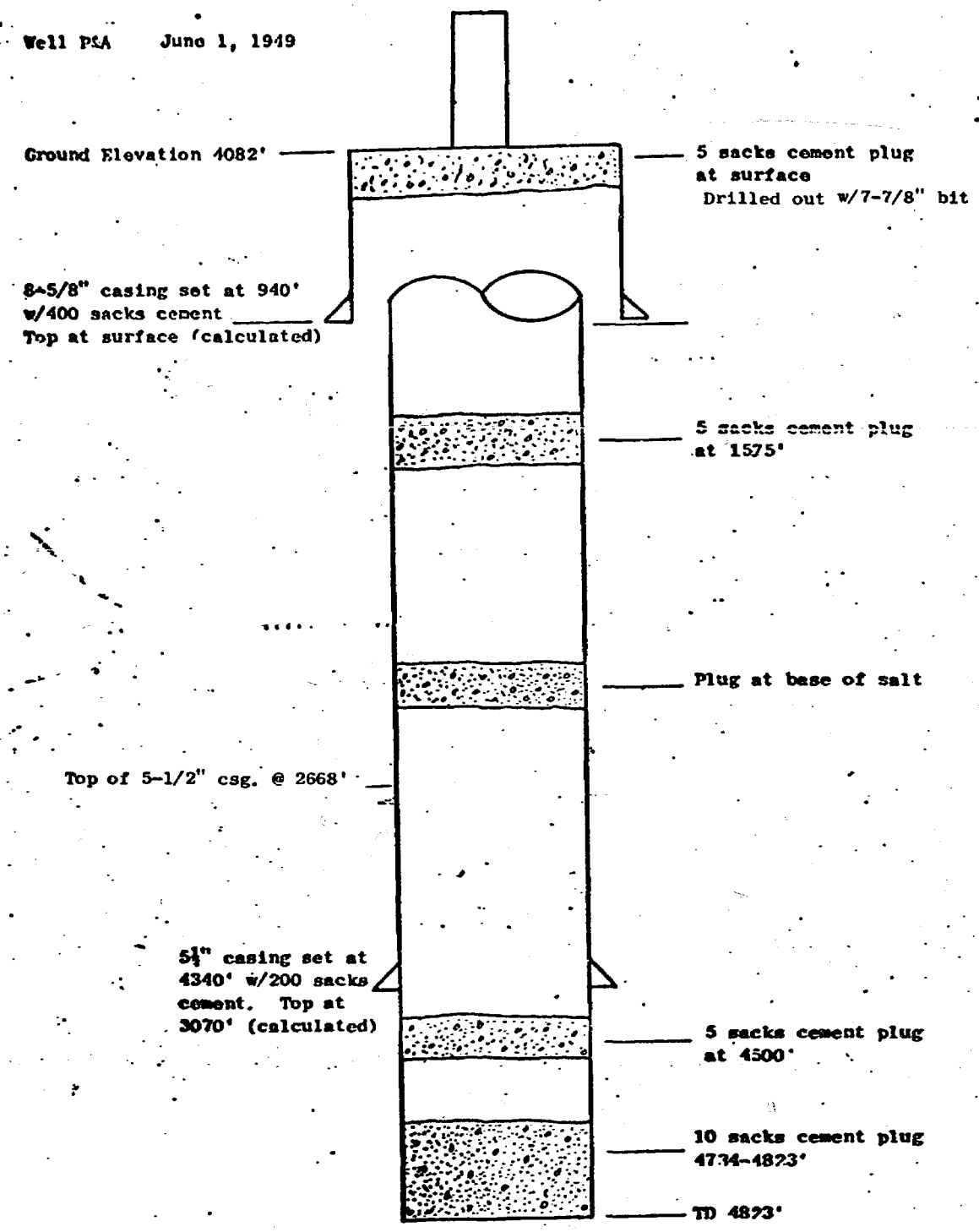


EXHIBIT 1

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5762
Order No. R-5295

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR A WATERFLOOD PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 15, 1976, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 12th day of October, 1976, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Atlantic Richfield Company, seeks authority to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through 11 injection wells located in Unit M of Section 29, Units A and I of Section 31 and Units C, E, G, I, K, M, N, and O of Section 32, all in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico.

(3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.

(4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the Cole Darden Oil Company Hale State Well No. 1 in Unit A, Section 31, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico, was not plugged and abandoned in a manner such as to assure that water injected through said State Vacuum Unit injection wells will not migrate from the Grayburg-San Andres formation to other formations or the surface.

Exhibit 1 - pg. 2

(6) That injection pressure around said Cole Darden Oil Company Hale State Well No. 1 should be limited to prevent such migration.

(7) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(8) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Atlantic Richfield Company, is hereby authorized to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through the following-described wells in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico:

State Vacuum Unit Well No.	Unit	Section	Township	Range
1	H	29	17S	34E
2	A	31	17S	34E
4	C	32	17S	34E
7	E	32	17S	34E
9	G	32	17S	34E
11	I	31	17S	34E
13	K	32	17S	34E
15	J	32	17S	34E
17	H	32	17S	34E
19	O	32	17S	34E
21	N	32	17S	34E

(2) That injection into each of said wells should be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation, or in the case of an open-hole completion, to the casing shoe; that the casing-tubing annulus of each injection well shall be tested for leaks, be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device, and that the injection wells or system shall be equipped in such a manner as to limit wellhead pressure to no more than 860 psi.

(3) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of 860 psi upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

Exhibit 1 - pg. 3

(4) That there shall be no injection under pressure into the Cole Darden Oil Company Hale State Well No. 1 in Unit A of Section 31, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, or into any well on said 40-acre tract or any 40-acre tract directly or diagonally offsetting said well, until said well has been reentered and replugged in accordance with a Commission approved plugging program or said well has been equipped in such a manner as to monitor for leaks below the salt section.

(5) That the operator shall immediately notify the supervisor of the Commission's Hobbs district office of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(6) That the subject waterflood project is hereby designated the ARCO State Vacuum Unit Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(7) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(8) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

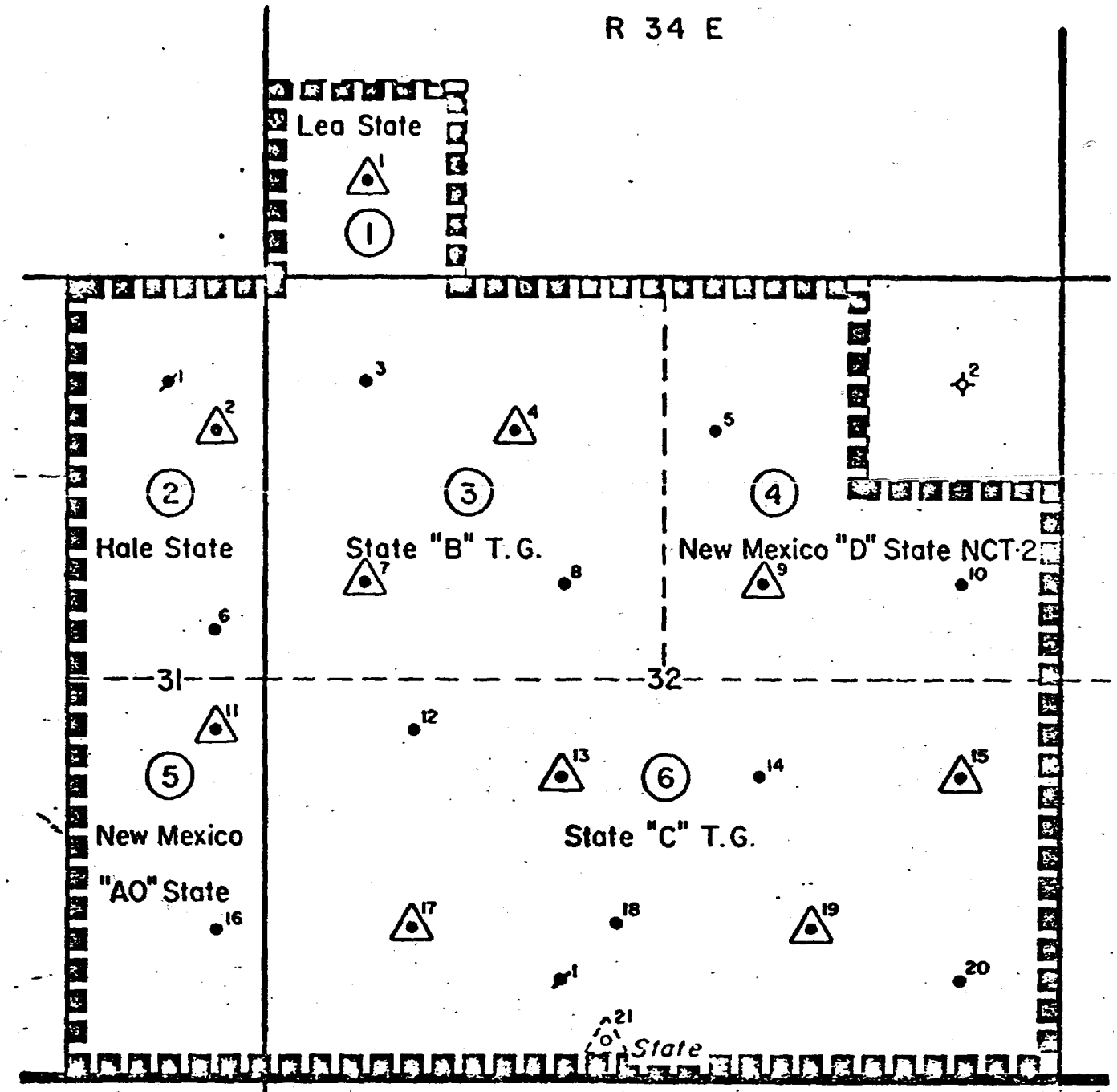
EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

EXHIBIT 2



UNIT BOUNDARY

(1) TRACT NUMBER

INJECTOR

PRODUCER

INJECTOR – TO BE DRILLED

AtlanticRichfieldCompany
North American Producing Division
Permian District Midland, Texas

STATE VACUUM UNIT

LEA COUNTY, NEW MEXICO

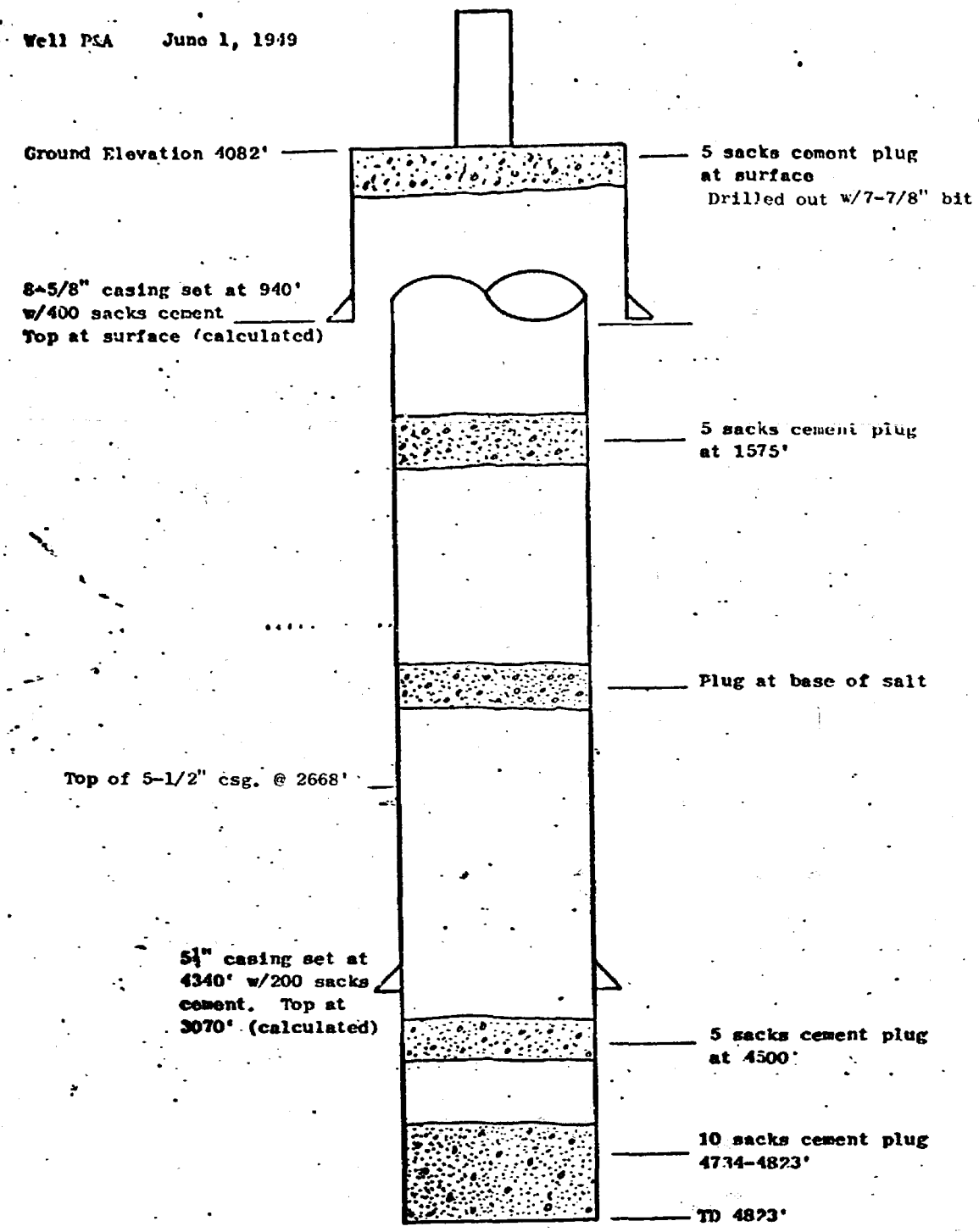
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By	Drawn By J.L.	Date 6-27-7
Date	Revised By G.L.F.	Date 7-5-7
Dept	Dwg No	

EXHIBIT 3

COLE-DARDEN OIL COMPANY
HALE STATE NO. 1
Schematic Drawing of Plugged and Abandoned Well
660' FNL & 660' FEL Section 31, T-17S, R-34E
Lea County, New Mexico

All measurements are from KB 8' above GL



OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

February 11, 1980

Mr. W. Thomas Kellahin
Box 1769
Santa Fe, New Mexico

Dear Tom:

Pursuant to your letter of January 30, 1980, concerning the authorization to increase injection for Anadarko in the Langlie Mattix Penrose Sand Unit, this is to advise that an Administrative Order authorizing this would probably be premature at this time.

As a result of the mentioned meeting, Anadarko was authorized to increase injection. However, recent bradenhead surveys have indicated new and compounded trouble spots in the area and it appears that injection may again be restricted.

We are presently studying the results of our latest tests and will probably be contacting you in the very near future.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

COPY

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Attorneys at Law
500 Don Gaspar Avenue
Post Office Box 1769
Santa Fe, New Mexico 87501

Jason Kellahin
W. Thomas Kellahin

Karen Aubrey

Telephone 982-4285
Area Code 505

January 30, 1980

Mr. Joe Ramey
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

re: Anadarko Production Company,
Langlie Mattix Penrose Sand Unit

Dear Joe:

As you know, our firm represents Anadarko Production Company. You will recall that on June 21, 1979, Mr. Dan Kernaghan, and others from Anadarko, and I met with you and Dan Nutter to request that Anadarko be allowed to increase the volumes of injection into the Queen formation of the Langlie Mattix Penrose Sand Unit operated by Anadarko.

5377
5403 My recollection is that Division Orders R-4936 and R-5003 are the applicable orders controlling the Anadarko water-flooding operations.

During that meeting you authorized Anadarko to increase their injectionpressure to an amount not to exceed 2,000 psi at the surface for all injection wells except for injection well No. 40-1, which was limited to an injection pressure not to exceed 1,800 psi at the surface.

I had understood that you would confirm that authorization by an Administrative Order. I have recently reviewed my files and find that I have not received a copy of that order.

I would appreciate you sending me a copy so that I can keep my file current. Thank you for your assistance.

Very truly yours,

W. Thomas Kellahin

cc: Mr. Iley Bonnette
Mr. Dan Kernaghan
WTK:mf

VACUUM WATERFLOW COMMITTEE

STATUS REPORT

JANUARY 20, 1977

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 6
CASE 5941

VACUUM WATERFLOW COMMITTEE REPORT

The Vacuum Waterflow Committee was appointed by the NMOCC and began its existence April 20, 1976, with Mobil designated as chairman. The purpose of the committee was to identify the extent of waterflow problems in the Vacuum Field and to suggest solutions.

The committee met on the afternoon of the 20th and prepared the following objectives:

1. Operators in the Vacuum Field shall report all annulus pressures.
2. Wells that will flow will be tested to determine flow rate and type of fluid.
3. The NMOCC and another committee member will be notified 48 hours prior to the survey.
4. Operators will furnish wellbore sketches on all wells in the field.
5. Problem wells identified above will not be repaired unless at NMOCC request.
6. The Vacuum Waterflow Committee will meet periodically to prepare final recommendations.

The following summarizes the accomplishments of the committee to date:

1. Wellbore sketches have been made of virtually every well in the Vacuum Field which consists of approximately 1150 wellbores.

2. Bradenhead pressures were obtained on each of the 1150 wells. It was found that 74 wells exhibited some form of waterflows and 14 wells exhibited only gas pressure. (See attached Exhibit A.) In addition to these findings, Shell had experienced waterflows in three wellbores and repaired these prior to the formation of the committee. (See Exhibit B.) Based on this data the committee conducted a more detailed study of wellbores in the vicinity of a concentrated area of waterflows in the south central segment of the field.

3. Texaco, at the request of the committee, ran sound logs on several wells in the problem area that had low cement tops or other irregularities. The results are as tabulated below:

LEASE & WELL NO. (TEXACO)	APPARENT FLUID ENTRY AS DETERMINED BY SONAN
N.M. "R" St. (NCT-1) #10	5500' *
N.M. "O" St. (NCT-1) #3	1900'
N.M. "O" St. (NCT-1) #17	3250'
N.M. "L" St. #9	3000'
N.M. "M" St. #6	2175'-2350'
N.M. "AC" St. #8	None **
N.M. "AB" St. #5	None **

* BP set @ 5500'

** These wells have never exhibited surface waterflows or press.

4. Forty-eight hour fall-off tests were conducted at the request of the committee by Mobil and Texaco on 22 Grayburg-San Andres injection wells. All wells exhibited normal fall-off characteristics.

5. The committee recommended that Texaco be allowed to repair their State "R" #10 which had a rather severe waterflow. This action was prompted by the productive capacity of the well. The work has not been performed to date.

6. Mobil and Texaco ran temperature and tracer logs on 28 wells in the Vacuum Area in an effort to identify the source of the waterflows and to develop a method of future investigations to help prevent further waterflow problems. Texaco also ran cement bond logs on 17 wells to validate cement tops and adequate protection. The bond logs indicated that the San Andres was adequately protected in every case. The tracer surveys did not reveal movement of extraneous water behind the casing. The temperature logs were evaluated in detail due to the many temperature anomolies apparent on them. The two logging companies provided personnel to aid in interpretation of each log as described in Attachment C.

7. As a result of the temperature log interpretation, the committee recommended that Texaco and Mobil conduct perforating and testing work on six wells. Based on temperature log interpretation, these wells exhibited obvious flow or storage of extraneous water. The first four of these wells were worked over and showed virtually no storage or movement of water behind pipe. Based on these data the workovers on the remaining two wells were not performed. The workover data indicated that the committee's interpretation of the temperature logs was incorrect and invalid. The workover procedures on the four wells are included in Attachment D.

8. Mobil cycled 11 injectors while 5 known waterflow wells on offset leases were monitored. These wells have been shut in for 3 months with no reaction on monitor wells. A number of these wells have gone to zero wellhead pressure. (See Attachment E for pressure data.)

9. Mobil and Texaco were asked to perform tests on 13 injection wells for the purpose of determining fracture pressure data. Due to the relatively low injection rates and high pressures (50-400 b/d @ 1900-2500 psi), the traditional step-rate method of determining frac pressures was found to be unacceptable on Mobil's eight injectors. An alternate method was attempted but was also found to be invalid. Texaco, however, was able to determine frac pressure of their wells with some success. Frac pressures were found to be 550-950 psi at the surface (friction loss deducted from wellhead pressure in the Vacuum Grayburg-San Andres Unit).

Exhibits attached:

1. Bradenhead pressure survey.
2. Remedial work procedures to shut off waterflow.
3. Tabulation of temp log analyses.
4. Remedial work procedures for determining validity of temp log interpretation.
5. Pressure data on cycling and monitoring.

R. J. Anthony, Texaco
C. L. Pyle, Mobil
W. J. Mueller, Phillips
F. Schuman, Phillips

RECOMMENDATIONS

1. Attempt to determine a feasible procedure for "blowdown" of the salt section. Localized depressurizing will first be attempted through Texaco's State "M" #6. This well is to be back-flowed from the salt section through tubing. Surrounding wells will be monitored continuously.

2. Re-survey each well in the Vacuum Area that had indicated pressure and/or flow on previous surveys.

EXHIBIT "A"
INITIAL CASING PRESSURE SURVEY RESULTS
WELLS WITH FLUID FLOW
JUNE 1976

Township-Range Section	Unit	Well	S.I. Pressure Prior to Flow Test Weak Flow	Strong Flow
T-16-S None				
T-17-S; 34-E				
10	L	Shell #4-VH	20#	
	P	Shell Angle St. W-202		300#
11	F	Mobil B.S. W-217		80#
	H	" " W-216		220#
13	B	" " 152		50#
14	B	" " 146	240#	
21	H	Gulf Ritts #2		235#
	J	PPCo #25	15#	
	N	PPCo #26	20#	
22	D	Exxon #1-CQ		230#
23	J	Mobil B.S. #156		950#
	K	Amerada "VA" W-3		500# repaired
	L	" " 2	84#	
	M	" " W-6	795#	
24	O	Arco State E #1	100#	
	P	Arco State C #2	130#	
25	H	Texaco "T" #2	640#	
	H	" "T" #3	535#	
	J	" "Q" #8	425#	
27	B	Mobil B.S. #143		730# repaired
	F	Texaco "D" #4		1010#
	L	" " #6		1000#
	N	" " #7		1130#
31	F	Sohio Phillips Lea State "B" #1	275#	
32	C	Arco State B #4	25#	
33	H	Texaco O #17	350#	
34	N	Texaco "V" #35		110#
	P	" " #37		repaired
35	B	Cont. H-35 #3	380#	
	C	" " #6	295#	
	G	" " #5	500#	
	H	" " #12	200#	
36	E	Texaco "O" #20	480#	
	J	" #6	repaired	
	L	Mobil State "I" #1		repaired
	M	Texaco "O" #22	220#	
	N	" " #13	610#	
	N	" " #17	960#	
	P	" " #24	960#	
	P	" " #7	860#	
T-17-S; 35-E				
19	D	Mobil B.S. #206	25#	
	J	Josaline "C" 1-K		120#
	L	Exxon State "J" #4		55#

Township-Range Section	Unit	Well	S.I. Pressure Prior to Flow Test Weak Flow	Strong Flow
T-17-S; 35-E				
19	N	Arco "J" #1	160#	
22	P	Mobil "P" #2	0#	
25	E	Great Western #1	375#	
26	J	Shell "W" #1	50#	
27	D	Chevron State-S #8		350#
	G	CS State "V" #1	55#	
	P	Shell "J" #6	90#	
28	H	Shell "N" #5	20#	
29	M	Shell State-F #1	390#	
	N	" " " #2	140#	
	N	" " " #4		130#
	O	Shell State M #2		120#
30	E	Texaco N #7	700#	
	P	Shell B #4		140#
31	B	Shell "St-A" #7		350#
	E	Phillips Santa Fe #88	45#	
	G	Shell St-A #6		300#
	H	" " " #3		300#
	M	" " D #2	90#	
	M	" " D #1		repaired
	N	" " E #1		"
	N	" " E #2		"
32	A	Exxon St-K #7		545#
	D	Chevron St-B #2		555#
	E	" " B #6	460#	
	J	Exxon St-K #22		405#
	P	" " #6		550#
33	R	Phillips Santa Fe #32	125#	
	D	Skelly St-P #1	340#	
	M	Getty St-H #1	660#	
	P	Phillips Vac Abo 11-6	160#	
34	C	Mobil "M" #1	320#	
	D	" " #13	130#	
	E	" " #3	0#	
	J	Chevron St #12		225#
	L	" St #11		460#
18-S; 34-E				
1	A	Texaco St-L #7	175#	
	C	" " M #6		550#
	G	" VGSAU #42	860#	
	H	" St-L #9		875#
	I	" VGSAU #16	150#	
11	A	" VGSAU #1	175#	
18-S; 35-E				
4	C	Phillips Vac Abo #13-3	240#	

Township-Range Section	Unit	Well	Weak Flow	Strong Flow
18-S; 35-E				
5	C	Phillips Santa Fe #98	320#	
	D	" " " #99	660#	
	E	" " " #112	285#	
6	B	Texaco St-R #2		repaired
	B	" " " #10		950#
	K	Marathon St. Warn #17	15#	
	N	" " " #8	300#	
	P	Texaco St-AB #8	550#	
7	J	Getty St-N #5	385#	
	N	Exxon St-BP #2	45#	

Total number of Gas Flows = 14

EXHIBIT "B"

SHELL STATE "E" NO. 1

Disconnected wellhead. Ran 5½" casing spear. Picked up 60,000 lbs. No indication of casing part. Broke circulation down 8-5/8" casing at 500 psi. Ran packer and bridge plug. Found casing leak between 920' and 1094'. Ran 5½" casing cutter and cut off casing at 1254'. Pulled casing. Found 3 small holes. Ran 5½" lead seal bowl and 1244' 5½" casing. Casing bowl set at 1254'. Pressured up on 5½" casing to 1000 psi. Held ok. Established injection rate down 8-5/8" surface casing at 2 BPM at 800 psi. Mixed and pumped 350 sx Class "C" cement containing 10 lbs. salt per sx, 2% $CaCl_2$ and ¼ lb. Flocele per sx. Slurry weight 14.8 lbs. per gal. Pressure rose to 1400 psi and held. Could not pump into surface casing at 1500 psi. Ran Sonan log to 4631'. No indication of fluid flow behind the pipe.

SHELL STATE "E" NO. 2

On December 8, 1975, discovered water flowing out of surface casing at 50 bbls. per hour at 400 psi. Rigged up Howco. Established injection rate down 13-3/8" surface casing at 4 BPM at 400 psi. Mixed and pumped 500 sx Class "C" cement containing 12% salt and 2% $CaCl_2$. Displaced cement 50' below surface. S.I.P. - 350 psi.

SHELL STATE "D" NO. 1

Established injection rate at 7.5 BPM at 1400 psi down 8-5/8" casing. Pressured up on 5½" casing to 1000 psi. Mixed and pumped 1000 sx cement with 18% salt and 2% $CaCl_2$. Flushed cement with 40 bbls. fresh water treated with sodium chromate. After 20 hrs., 8-5/8" casing pressure = 0.

EXHIBIT "C"

Tabulation of Temperature Log Analyses

Bridges State #17 - Mobil
Injection - 275 b/d @ 1900 psi
Cmt. top - 2664' (calc)

Interval	Gradient	Remarks
4000'-3600'	0.57°/100'	
3600'-3250'	0.38	
3050'-2800'	0.36	
2650'-2500'	0.00	
2500'-2380'	1.10	
2380'-2050'	0.45	
1800'-1690'	0.00	

Conclusion: Indication of activity 2380'-3100'

Bridges State #29 - Mobil
Injection - 450 b/d @ 2000 psi
Cmt. top - 2675' (calc)

Interval	Gradient	Remarks
4200'-3520'	0.00°/100'	Possible shoe leak
3500'-3200'	0.60	
3200'-2950'	0.86	
2850'-1500'	1.10	

Conclusion: No activity in salt. Possible shoe leak.

Bridges State #32 - Mobil
Injection - 370 b/d @ 2200 psi
Cmt. top - 2625' (calc)

Interval	Gradient	Remarks
4300'-3600'	0.60°/100'	
3600'-3100'	0.52	
2700'-2100'	0.54	2660'-2580' Flat, may be cmt. top.
1900'-1800'	0.55	
1770'-1620'	0.20	

Conclusion: Indication of activity 1680'-2020'

Bridges State #42 - Mobil
Injection - 150 b/d @ 2600 psi
Cmt. top - 2714' (calc)

Interval	Gradient	Remarks
4150'-3400'	0.27°/100'	
3250'-2750'	0.32	
2750'-2050'	0.43	
2050'-1500'	0.40	

Conclusions: 30 min & 24 hr curves run parallel throughout which is usually indicative of no problems. The low gradients may have been a logging problem.

Bridges State #47 - Mobil
Injection - 300 b/d @ 2500 psi
Cmt. top - 2784' (calc)

Interval	Gradient	Remarks
4020'-3660'	0.60°/100'	
3660'-3060'	0.53	
3060'-2300'	0.53	Flattening 2620'-3040'
2300'-1820'	0.50	
2020'-1720'	0.00	with several flat areas

Conclusions: Major storage 4560'-4620'. Possible movement 1720'-2020' & 2640'-3040'.

Bridges State #48 - Mobil
Injection - 375 b/d @ 2000 psi. Csg shoe @ 4185'
Cmt. top - 2649' (calc)

Interval	Gradient	Remarks	
3950'-3600'	0.51°/100'	3900'-4000'	.3°/100
3600'-3150'	0.33		
3150'-2850'	0.57		
2850'-2350'	0.36		
2350'-2150'	0.95		
2150'-1750'	0.44		
1750'-1500'	0.00		

Conclusions: Possible shoe leak. Fluid activity 1550'-1850'.

Bridges State #52 - Mobil
Injection - 180 b/d @ 2350 psi
Cmt. top - 2638' (calc)

Interval	Gradient	Remarks
4150'-3850'	0.86°/100'	
3850'-3450'	0.00	
3100'-2600'	0.55	
2100'-1600'	0.56	

Conclusions: Fluid storage 3814'-40' & 3856'-74'; fluid movement 3450'-3875'.

Bridges State #167 - Mobil
Injection - 75 b/d @ 2500 psi
Cmt. top - Circulated to surface

Interval	Gradient	Remarks
4600'-3200'	0.59°/100'	
3200'-2800'	0.53	
2800'-2000'	0.40	
2000'-1600'	0.45	

Conclusions: No apparent activity.

State G-3 - Mobil
Injection - 300 b/d @ 2350 psi
Cmt. top - 2700' (calc)

Interval	Gradient	Remarks
4100'-3100'	0.66°/100'	
2800'-1850'	0.58	
1850'-1750'	0.00	
1750'-1600'	1.16	

Conclusions: Possible activity 1750'-1850'

State J-1 - Mobil
Injection - 250 b/d @ 1975 psi
Cmt. top - 2930' (calc)

Interval	Gradient	Remarks
4050'-3300'	0.8°/100'	
3300'-3000'	0.67	
2900'-2400'	0.68	
2400'-1600'	0.45	

Conclusions: No apparent activity

State J-4 - Mobil
Injection - 350 b/d @ 2475 psi
Cmt. top - 2675' (calc)

Interval	Gradient	Remarks
4100'-3850'	0.72°/100'	
3850'-3200'	0.25	
3050'-2620'	0.00	
2620'-2520'	(-0.20)	
2520'-1500'	0.00	

Conclusions: Crossflow 1886'-2274', 2400'-2530' & 2672'-2888'

West Vacuum Unit #11 - Texaco
Injection - 200 b/d @ 2375 psi
Cmt. top - 2900'

Interval	Gradient	Remarks
4100'-2900'	0.70°/100'	
2900'-2000'	0.77	
1930'-1750'	0.97	
1750'-1600'	0.00	
1550'-800'	0.93	

Conclusions: Storage interval 1600'-1750'

West Vacuum Unit #18 - Texaco
Injection - 650 b/d @ 2600 psi
Cmt. top - 2940'

Interval	Gradient	Remarks
4000'-3850'	0.00°/100'	
3850'-3220'	0.53	
3220'-2720'	0.48	
2720'-2610'	0.00	Possible pen shift problem.
2400'-1560'	0.50	
1750'-1640'	0.00	
1560'-860'	0.74	

Conclusions: (1) Shoe leak @ 3850'± - tracer agrees
(2) Storage area 1640'-1750'

West Vacuum Unit #20 - Texaco
Injection - 400 b/d @ 2400 psi
Cmt. top - 3200'

Interval	Gradient	Remarks
4200'-4000'	0.00°/100'	
4000'-3800'	0.50	
3800'-2700'	0.59	
2700'-1450'	0.50	
1450'-1150'	0.83	
1150'-400'	0.66	

Conclusions: Possible storage area 1500'-1800'. Possible shoe leak - tracer agrees.

West Vacuum Unit #32 - Texaco
Injection - 475 b/d @ 2450 psi
Cmt. top - 2270'

Interval	Gradient	Remarks
4300'-3150'	0.65°/100'	
3150'-2150'	0.50	
2150'-1900'	0.50	
1900'-1580'	0.00	
1580'-250'	1.00	

Conclusions: Fluid storage 1580'-1900'.

West Vacuum Unit #36 - Texaco
Injection - 1000 b/d @ 900 psi
Cmt. top - 2860'

Interval	Gradient	Remarks
4150'-3750'	0.50°/100'	
3750'-2850'	0.38	
2850'-2750'	0.00	
2750'-1200'	0.44	
1200'-1000'	0.50	
1000'-750'	0.00	Probably water temp. vs. form. temp anomoly.

Conclusions: Difficult to call 2750'-3300' storage because flat area is hot rather than cool. Area coincides with top of cement.

West Vacuum Unit #48 - Texaco
Injection - 450 b/d @ 2000 psi
Cmt. top - 2890'

Interval	Gradient	Remarks
4000'-3300'	0.50°/100'	
3300'-2950'	0.43	
2900'-2150'	0.44	Flat 2840'-2740'
2000'-1700'	0.00	
1700'-1200'	0.64	

Conclusions: Storage 1700'-2200'.

Vacuum Grayburg San Andres #5 - Texaco
Injection - 3000 b/d @ 1000 psi
Cmt. top - 2680'

Interval	Gradient	Remarks
4300'-3750'	0.50°/100'	
3750'-3300'	0.58	
3300'-2650'	0.46	
2650'-2450'	0.75	
2450'-2300'	0.59	
2300'-2000'	0.38	
2000'-1750'	0.40	1820'-1890' flat
1750'-1200'	0.75	
1200'-800'	1.00	
800'-400'	0.69	

Conclusions: (1) No clearcut storage area in injection interval.
(2) Possible offender well.
(3) All fluid apparently leaving wellbore through one perforation.

Vacuum Grayburg San Andres #15 - Texaco
Injection - 2200 b/d @ 1250 psi
Cmt. top - 2400'

Interval	Gradient	Remarks
4150'-3050'	0.55°/100'	
3050'-2550'	0.36	
2550'-2200'	0.45	
2200'-1850'	0.77	
1850'-1730'	0.00	
1730'-1450'	0.40	
1450'-1300'	0.00	
1300'-1050'	1.00	
1050'-450'	0.73	

Conclusions: Fluid behind pipe from 3050' to top of storage area (1300').

Vacuum Grayburg San Andres #17 - Texaco
Injection - 3121 b/d @ 1500 psi
Cmt. top - 2710'

Interval	Gradient	Remarks
4250'-3900'	0.29°/100'	
3860'-3750'	0.00	
3750'-3100'	0.49	
3100'-1350'	0.00	
1350'-1150'	0.71	
1150'-450'	1.05	

Conclusions: Fairly clearcut example of channel from 4410'-1610'. Storage area 1520'-1610'.

Vacuum Grayburg San Andres #19 - Texaco
Injection - 4000 b/d @ 1000 psi
Cmt. top - 3510'

Interval	Gradient	Remarks
4200'-4000'	0.00°/100'	
4000'-3600'	0.38	
3600'-3400'	0.75	
3400'-3250'	2.00	
3250'-2600'	0.46	
3070'-3000'	--	Hot spot
2800'-2600'	--	Hot spot
2600'-2200'	0.19	
2200'-1980'	0.00	1/2° shift @ 1950' & 2150'
1940'-1620'	0.00	
1620'-1530'	0.00	w/hot spot
1530'-1100'	0.47	
1100'-100'	0.80	

Conclusion: Definite channel up from perfs to 1600'±.
Storage 1600'-2200'.

Vacuum Grayburg San Andres #29 - Texaco
Injection - 757 b/d @ 1100 psi; 24 hr S.I. press. - 750 psi
Cmt. top - 2770'

Interval	Gradient	Remarks
4400'-4050'	0.00°/100'	
4050'-3750'	0.42	
3750'-3300'	0.53	
3000'-2250'	0.60	Flats - 2960'-3080', 2630'-2780', 2250'-2400'
2250'-1950'	--	Hot spot
1750'-1430'	0.60	
1430'-1200'	0.22	
1220'-600'	0.32	
600'-surf.	0.00	

Conclusions: (1) Storage area 1200'-2770' (cmt top).
(2) Possible channel <u>down</u> 2770'-4530'.

Vacuum Grayburg San Andres #33 - Texaco
Injection - 2193 b/d @ 1250 psi
Cmt. top - 2370'

Interval	Gradient	Remarks
4200'-3000'	0.53°/100'	
3000'-2200'	0.45	
2200'-1100'	0.59	
1100'-700'	1.13	

Conclusions: No activity.

Vacuum Grayburg San Andres #31 - Texaco
Injection - 3125 b/d @ 1500 psi
Cmt. top - 2620'

Interval	Gradient	Remarks
4100'-2950'	0.41°/100'	
2950'-2600'	0.00	with shifts
2600'-1800'	0.00	with shifts
1800'-1450'	0.64	
1450'-1050'	0.00	Warmer - probably formation
1050'-500'	0.67	

Conclusions: 1800'-2950' storage area.

Vacuum Grayburg San Andres #35 - Texaco
Injection - 1374 b/d @ 1000 psi
Cmt. top - 2450'

Interval	Gradient	Remarks
4100'-3700'	0.40°/100'	
3700'-3100'	0.58	
3100'-2350'	0.49	
2450'-2100'	0.86	
2100'-1850'	0.40	
1850'-550'	0.70	Some areas of 0°/100' slope

Conclusions: Storage area 1480'-1800'.

Vacuum Grayburg San Andres #45 - Texaco
Injection 1660 b/d @ 900 psi
Cmt. top - 2470'

Interval	Gradient	Remarks
4300'-4000'	0.73°/100'	
4000'-3700'	0.73	
3700'-2350'	0.50	
2350'-2050'	0.70	
2050'-1800'	0.56	
1800'-1300'	0.84	

Conclusions: No channel, no storage out of zone.

Vacuum Grayburg San Andres #47 - Texaco
Injection - 2864 b/d @ 900 psi
Cmt. top - 2650'

Interval	Gradient	Remarks
4200'-3690'	0.44°/100'	
3690'-2900'	0.49	
2900'-2500'	0.38	
2500'-2350'	1.00	
2350'-2280'	--	steep shift
2280'-1830'	0.44	
1800'-1600'	0.00	
1600'-1300'	0.66	
1300'-1200'	0.00	
1100'-680'	0.70	

Conclusions: Storage area 1600'-1800'. No channel.

Vacuum Grayburg San Andres #49 - Texaco
Injection - 4670 b/d @ 900 psi
Cmt. top - 2450'

Interval	Gradient	Remarks
4150'-3900'	0.00°/100'	
3900'-3550'	0.57	
3550'-3000'	0.64	
3000'-2450'	0.00	
2450'-2100'	0.57	
2100'-1800'	--	shifts and flats
1750'-1500'	0.00	
1500'-surf.	--	parabolic curve

Conclusions: Storage 1500'-1750'. Possible minor channel 4373'-3900'.

EXHIBIT "D"

TEXACO INC.
VACUUM GRAYBURG SAN ANDRES UNIT #49

Ran E-2 drill cement retainer to 4175'. Perforated 4½" casing at 4065'. Swabbed well down, no fluid entry. Spotted 200 gals. 15% acid across perfs and broke down perfs. Pumped 10 bbls. water into perfs at 2000 psi. Swabbed well down. No fluid entry. Shut well in 14 hrs. No pressure buildup. Checked fluid level. No fluid entry. Went in with injection tubing and stabbed into cement retainer at 4175'. Placed well on injection. On December 15, 1976, well taking 3300 BWPD at 1160 psi. No pressure buildup on tubing-casing annulus to date.

TEXACO INC.
VACUUM GRAYBURG SAN ANDRES UNIT #19

Ran step-rate test. Found frac pressure at 650 psi surface pressure (without friction). Set cement retainer at 4200'. Perforated 4½" casing at 3415' (above cmt. top). No pressure or fluid entry encountered. Established circulation down 4½" and up the back side. Shut well in overnight. No pressure buildup or fluid entry. Ran injection tubing and stabbed into cement retainer. Placed well on injection with pressure recorder on bradenhead. Injected over weekend. Brought injection pressure up to 950 psi. No pressure change on bradenhead. Pulled injection tubing and pumped 2500 sx cement. Cement top 1900' by temperature survey. Drilled out retainers and returned well to injection.

MOBIL
BRIDGES STATE NO. 29

Pulled injection tubing and ran 2-3/8" workstring. Set bridge plug at 3875' and set packer at 3725'. Perforated 7" casing at 3798'. Swabbed tubing dry. No fluid entry. Shut well in overnight. Checked fluid level. No fluid entry. Pulled packer and bridge plug. Ran tubing and injection packer. Started injection at 460 BWPD at 0 tubing pressure. Injected 8 days. Tubing pressure 2200 psi. Casing pressure zero. Pulled injection packer and ran bridge plug and packer. Acidized perfs at 3798' with 1000 gals. 15% HCl acid. Pulled packer and bridge plug and ran injection packer. Started injection at 800 BWPD at 100 psi. No pressure on casing. Injected 5 days. Rate 230 BWPD. Pressure 2300 psi. Casing pressure zero. Pulled injection packer. Squeezed perfs at 3798' with 50 sx Class "C" cement. Cleaned out to T.D. and returned well to injection.

Mobil
Bridges State No. 52

EXHIBIT "D"

MOBIL
BRIDGES STATE NO. 52

12/10/76 - Total depth 4900'. Open hole 4248 to 4900'. MIRU. Pull out of hole with tbg & 7" pkr. GIH w/RBP & FB pkr. Set RBP @ 3871' and FB pkr @ 3809. Test RBP to 2000 lbs. - OK. POH w/pkr - perf 7" csg 3830 to 3833 w/4 jspf. Ran pkr & set @ 3860. Swabbed - no feed in. 14 hr SI tbg press 30 psi. Ran swab, found no feed in. Pulled RBP. GIH w/FB pkr to 3918'. Begin injection @ 200 BWPD. Csg press - 0; tbg press - 0; injected 11 days. Csg press - 0; tbg press - 24.20. POH w/tbg & pkr. Set RBP @ 3918'. Attempt to pump in perfs 3830 to 3833 w/3000 psi. No success. Acidized w/1000 gals 15% + 5 gals FR @ 3000 psi at 2.5 BPM. ISIP 2500 psi. 14 hrs SI tbg press 2300 psi. Release pressure, swab - no feed in. Set FB pkr @ 3779'. Squeeze perfs 3830 to 3833. Drill cmt 3742 to 3840. Test squeeze - OK. POH w/RBP. GIH w/injection equipment.

EXHIBIT "E"

Injection Well S.I. Pressures on 12-20-76
Wells Have Been S.I. Since 9-1-76

BRIDGES STATE WELL NO.	TBG (PSI)	CSG (PSI)
5	760	-0-
17	25	-0-
29	Vacuum	-0-
30	550	-0-
32	30	-0-
35	700	-0-
42	Vacuum	-0-
48	325	-0-
52	*	-0-
105	1025	-0-
132	975	-0-

* Bridges State #52 currently under workover to determine credibility of temp. log interpretation.

Monitor Wells Casing Pressure 12-23-76

		CSG (PSI)
N.M. "D" St. (NCT-1)	#4	1225
	#6	775
	#7	175
Exxon St. "J" No. 4		220
Gulf "Ritts" St. No. 2		253

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
OCC EXHIBIT NO. 7
CASE 5941

January 7, 1977

OIL CENTER - MONUMENT COMMITTEE REPORT

This Sub-Committee was appointed by the New Mexico Oil Conservation Commission (NMOCC) Appointed Committee on April 20, 1976. The purpose of this Sub-Committee was to study and locate the source of waterflow problems in the Oil Center-Monument Area and to suggest solutions.

The Committee met on the afternoon of the 20th and prepared the following objectives:

1. That the Study Area would consist of the following area:

   T-19-S, R-37-E, Sec. 15, 16, 21, 22, 26, 27, 28, 33, 34, 35, & 36

   T-20-S, R-37-E, Sec. 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 35, and 36

   T-20-S, R-36-E, Sec. 13, 14, and 25

   T-20-S, R-38-E, Sec. 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, and 31

   T-21-S, R-36-E, Sec. 1 and 12

   T-21-S, R-37-E, Sec. 5, 6, 7, and 8

   (SEE ATTACHED PLAT)

2. That all Operators would submit to the Committee downhole well schematics on all wells (i.e., injection, producing, NIO, and P & A) in the above discribed area.

3. That bradenhead surveys would be run on all wells with surface or intermediate casing set through the red bed section.

4. That from the bradenhead survey, monitor wells would be picked.

5. That the waterfloods in the Oil Center-Monument Area would be cycled (i.e., each flood would be shut-in for a given period of time) so that pressures on monitor wells could be observed and the source of the problem located.

The following summarizes the accomplishments of the Committee to date:

1. Wellbore schematics have been made and received on 99% of the wells in the Oil Center-Monument Study Area. This consists of approximately 1000 wellbores.

2. It was generally thought that wells with short surface and/or short intermediate casing (i.e., 250 to 500') would probably not show bradenhead pressures even if they had them, due to the red bed sluffing in around the pipe. Therefore, bradenhead surveys were run only on those wells which had surface or intermediate casing of 1000' in length (thru the red bed section).

The Committee received approximately 415 bradenhead surveys. Of the 415, 206 were found with pressure on the bradenheads. Sixty-three wells showed pressure in the range 300 psi to 599 psi; fifty wells were in the pressure range 600 psi to 899 psi; and 9 wells had pressure in excess of 900 psi. One hundred seventeen wells in the survey had waterflows on the bradenhead. See attachments of surveys.

3. From the bradenhead survey the following wells were chosen as monitor points:

1.	Getty	East Eumont Unit #58	M-22-19-37
2.	Byrom	Williams #2	O-34-19-37
3.	Shell	Cooper "A" #1	B-4-20-37
4.	Rice	SWD M-9	M-9-20-37
5.	Texaco	C.H. Weir B #5	G-11-20-37
6.	Getty	East Eumont #130	F-12-20-37
7.	Texaco	C.H. Weir A #11	G-12-20-37
8.	Texaco	Skaggs Grayburg Unit #2	J-12-20-37
9.	Texaco	M.B. Weir "B" #7	M-12-20-37
10.	Texaco	Skaggs GB Unit #11	D-13-20-37
11.	Texaco	L.R. Kershaw #10	F-13-20-37
12.	Conoco	Britt B #8	J-15-20-37
13.	Conoco	Britt B #7	N-15-20-37
14.	Marathon	Hanson State #2	G-16-20-37
15.	Getty S	State "I" #2	K-16-20-37
16.	Skelly	State "F" #1	P-17-20-37
17.	Texaco	Eunice Monument Unit #21	L-19-20-37
18.	Amoco	Gillully "B" Fed. #6Y	A-21-20-37
19.	Amoco	Gillully "B" Fed. #9	D-22-20-37
20.	Texaco	Skaggs Grayburg Unit #7	L-12-20-37
21.	Byrom	Williams No. 3	N-34-19-37

Each of the above wells was equipped with a 7 day pressure recorder on or by June 9, 1976.

4. The Texaco Skaggs Grayburg Unit was shut-in on June 14, 1976. By July 7, 1976 all but 5 of Texaco's injectors had fallen to zero or to pressures below the shut-in pressures of the monitor wells. It was decided to back-flow 3 of Texaco's injection wells to speed up the evaluation. It was also decided at this time that all pressure on injection wells when shut-in should be maintained below 500 psi. Backflowing and injection well pressure declines continued through July and August on the Texaco Skaggs Flood. No unusual declines had been noted on any of the monitor wells, except for the Skaggs Grayburg Unit Well No. 7. This well is monitoring a casing leak in the 7-Rivers Formation.

Water injection into the Conoco SEMU was shut-in on August 11, 1976. Shut-in tubing pressures began to fall after one week. In order to speed up the process, wells with pressures in excess of 500 psi were backflowed. Thru August 23, 1976 no unusual pressure declines had been noted on the monitor wells. The South Segment of the Getty East Eumont Unit was shut-in on the above date. Backflowing was started on September 1, 1976 from selected wells. At this time several wells were still being backflowed on the Skaggs and SEM Units.

Injection on the Eumont Hardy Unit and the Eumont Monument Unit was stopped On September 29, 1976. The Central Segment of the Getty EEU was shut-in on October 28, 1976. Thru this period of time, still no major response had been noted on the monitor wells. By November 17, 1976 all injection wells were

below 500 psi, except for a scattered few still being backflowed and wells that scaled up and periodically have to be shut-in to clean out their injection lines.

5. In November, 1976 Texaco ran cement bond and sonar logs on their M. B. Weir "B" Well No. 7 while injecting in the adjacent Skaggs Grayburg #5 injection well. There was no indication of fluid movement around the wellbore with the well shut-in. Anamolies were found in the salt section between 2200' and 2300'.

6. On November 17, 1976 the Committee recommended flowing the bradenheads on the Getty State "I" Well No. 2 and Amoco Gillully "B" #6Y monitor wells. Each well backflowed a small amount of saturated salt water before the pressure bled down. After bleeding down the State "I" #2 was shut-in and the pressure built up to 750#. However, upon opening it again the pressure dropped rapidly, apparently indicating salt bridging. On January 12, 1977, Amoco was unable to pump fresh water into bradenhead on Gillully "B" 6Y with 400-500 psi in an attempt to dissolve the salt bridge.

7. In the January 6, 1977 Meeting, the Committee recommended flowing the bradenheads on the Getty EEU #131 and the Texaco S-GR Unit #11. The EEU #131 backflowed approximately 425 barrels of saturated salt water and bled down. Texaco is in the process of preparing to backflow the Skaggs Grayburg #11.

This committee has had no success in determining the source of the waterflow in the area from the data collected. In conclusion, this committee recommends that the salt section be bled down.

MONUMENT -- OIL CENTER

WATER FLOW

ATTACHMENTS

1. Monitor Well Pressures

2. Injection Well Pressures and Backflowing

3. Bradenhead Flow Test Surveys

4. Plat of Study Area with Monitor Wells

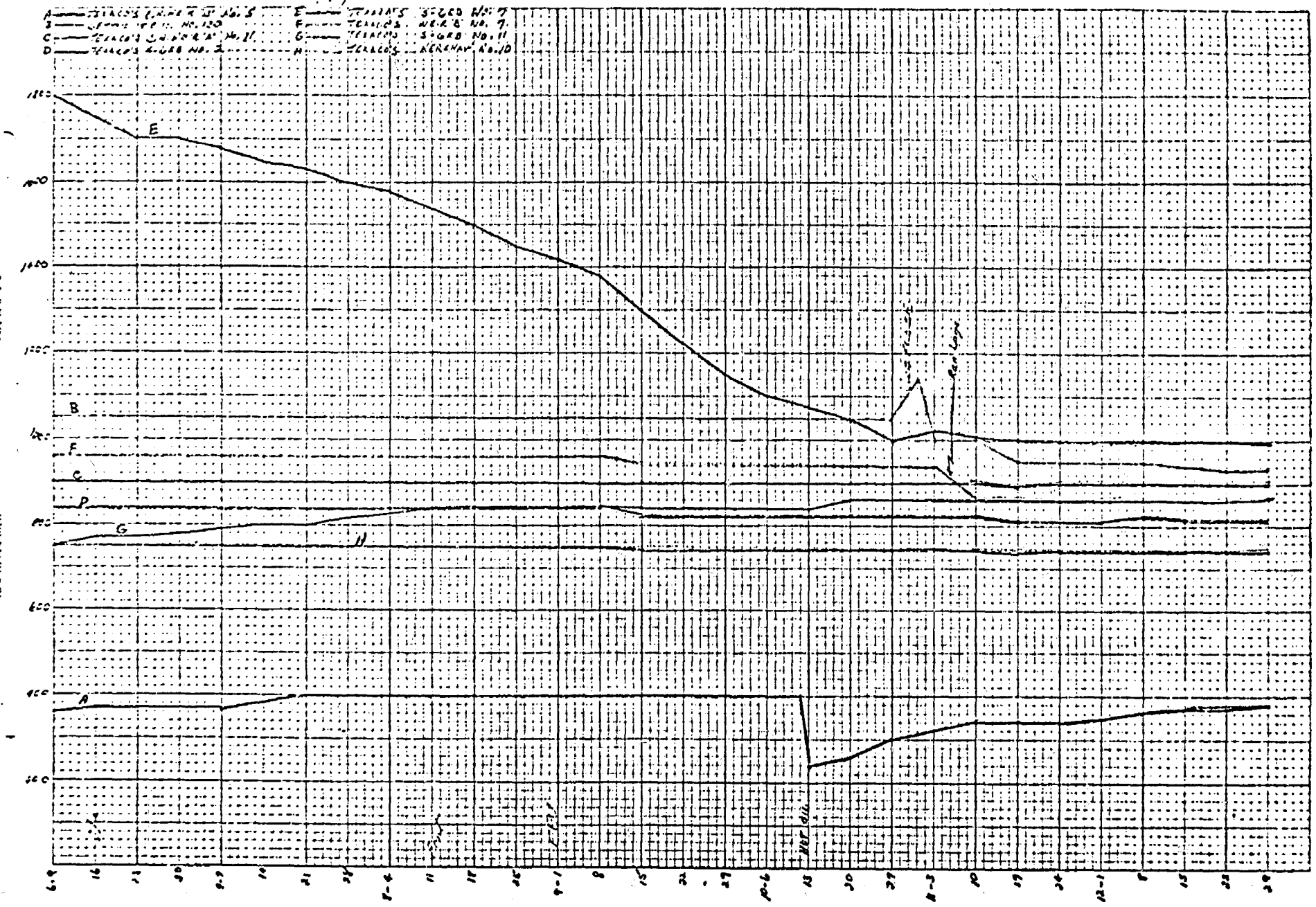
HAO/bh

1-13-77

MONUMENT - OIL CENTER WATER MAIN
AREA I



MONUMENT - OIL LEVEL & WATER FLOW
AREA III



MONUMENT - OIL ISATER WATER FLOW
AREA III

A —— KICK S. SWD NO. M-9
B —— COLLINS & ATT "C" NO. 8
C —— SKELLY "B" NO. 7
D —— LOCKE STATE "B" NO. 2
E —— ANADEL GILLULY "B" NO. 4
F —— MARATHON'S HANLEY STATE NO. 2
G —— TEXACO'S ERWIN NO. 21
H —— SKELLY STATE "B" NO. 1
I —— AMOCO'S GILLULY "B" NO. 9

1500
1400
1300
1200
1100
1000
900

1-T 4 30 36 2-11 14 31 35 8-4 11 18 23 9-1 8 15 24 29 D-6 13 20 27 11-3 10 17 24 33-1 6 15 22 29

Salty Bracke
Fresh
Salty Bracke
Fresh
Salty Bracke
Fresh

INJECTION WELLS

NONUMENT-OIL CENTER WATER FLOW

COMPANY: GETTY OIL COMPANY
UNIT: EAST FALCON

ELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
42	1150	90	0 BBL	
45	1150	300	190 "	
46	1925	1525	42 "	
48	1300	460	12 "	
51	1500	275	52 "	
53	2100	100	2,044 "	
55	1425	VACUUM	114 "	
58	1625	100	1,034 "	
60	1850	110	2,961 "	
62	1425	525	0 "	
64	1960	185	1,444 "	
66	1925	200	518 "	
68	1170	225	1,138 "	
70	1580	150	239 "	
72	1300	150	23 "	
73	1850	125	1,143 "	
75	1950	215	4,941 "	
78	1350	140	172 "	
827	1550	160	499 "	
856	1725	220	302 "	
80	1800	250	325 "	
82	925	0	0 "	
83	VACUUM	225	503 "	
85	1625	0	927 "	
87	1800	0	0 "	
89	1900	90	420 "	
91	1900	250	3292 "	
93	1900	225	10,904 "	
95	2000	225	12,398 "	
96	1850	250	2,932 "	
98	1700	25	63 "	
101	1300	500	3,899 "	
103	3000	200	417 "	
105	1450	500	935 "	
107	1950	0	2,922 "	
109	2100	375	2,999 "	
112	1950	500	2,231 "	
115	2000	500	2,553 "	
117	1500	500	1,072 "	
121	VACUUM	350	0 "	
123	1950	500	1,918 "	
125	1900	525	3,055 "	
126	VACUUM	350	0 "	
128	1400	500	2,100 "	
131	1900	500	1,572 "	
132	VACUUM	0	0 "	
134	1900	50	2,265 "	
114	1800	400	1,425 "	
TOTAL	—	—	81,715 "	

MONUMENT-OIL CENTER WATER FLOW

COMPANY: CONOCO

UNIT: SKAGGS UNIT NORTH PROJECT

14 Formation WELL NO.	Original SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976(psig)	VOLUME OF WATER BACK FLOWED	REMARKS
11	1800	50		Unable to produce
13	1725	0		Original volumes on
20	1725	0		low of the wells.
23	1825	100		
25	1675	0		
26	1500	25		
29	1650	0		
31	1625	0		
32	1400	0		
40	1775	0		
49	1725	0		
35	1700	100		
36	2000	100		
44	2100	75		
45	1400	100		
76	1000	0		
78	2100	100		
79	2000	100		

MONUMENT-OIL CENTER WATER FLOW

COMPANY: Conoco

UNIT: Eumont Penrose Upper Yates

[illegible] OF WHICH WELL NO.	Initial SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
2	[illegible]	0		Unable to determine
[illegible]	1400	0		estimated volume on
40	[illegible]	0		on line at this time.
[illegible]	1500	0		
21	1500	0		
32	[illegible]	0		
13	[illegible]	0		
17	1500	0		
20	[illegible]	0		
5	1700	0		
9	1400	0		
[illegible]	1500	0		
42	1475	0		
47	1450	0		
27	1400	0		
31	1500	0		
35	1425	0		
15	1475	0		
19	1450	0		
23	1425	0		
7	1450	0		
11	1425	0		
25	1425	0		

MONUMENT-OIL CENTER WATER FLOW

COMPANY: TEXACO CORP.
UNIT: EUMONT UNIT

WELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
13	1450	100	—	Produced water 15 [illegible]
15	450	0	—	[illegible] to work [illegible]
22	1100	0	—	[illegible]
24	700	0	—	[illegible]
30	1900	0	—	[illegible]
32	0	0	—	[illegible]
				Injection pressure. Volume
				Average [illegible] BWPD.

MONUMENT-OIL CENTER WATER FLOW

COMPANY: [illegible]

UNIT: [illegible]

ELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
1	[illegible]	[illegible]	--	
3	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	—	
7	[illegible]	[illegible]	—	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	—	
14	[illegible]	[illegible]	[illegible]	[illegible]
21	[illegible]	[illegible]	—	
22	[illegible]	[illegible]	—	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	3	F	16-20-37							Refer back to previous C-103

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	2	P	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	1	C	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	35	0	0	NONE	GAS

I Hereby certify that the information submitted is the truth and comple'e to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj.

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Ltt "A"	1	N	6-20S-37E	6-10-7	13"	1550	0	0	0	
					9-5/8"	0	0	0	0	
					7"	0	0	0	0	
Ltt "A"	2 ✓	N	6-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	655#	0	655#	0	Bled down in 5 seconds. Gas Press. built up to 400# in one min. after shuting in.
					7"	0	0	0	0	
Ltt "A"	3	K	6-20S-37E	6-11-76	13-3/8"	10#	0	0	0	
					8-5/8"	220#	150#	150#	0	Flowing Gas
					5-1/2"	10#	0	0	0	
Ltt "A"	6		6-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					9-5/8"	40#	0	5#	0	Bled down in 1-½ minutes
					5-1/2"	35#	0	15#	0	Bled down in 1 minute
Ltt "B"	1	N	6-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	--	--	--	--	Selling Gas
					7"	0	0	0	0	
Ltt "B"	2	N	6-20S-37E	6-11-76	13-3/8"	0	0	0	0	
					8-5/8"	655#	0	655#	0	Bled down in 5 seconds. Gas Press. built up to 400# in one min. after shuting in.
					5-1/2"	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	13	J	7-20S-37E	6-11-76	13-3/8"	0	0	0	0	
					8-5/8"	30#	0	0	0	
					5-1/2"	0	0	0	0	
Britt	1	F	7-20S-37E	6-10-76	10"	0	0	0	0	
					8-5/8"	60#	0	0	0	Bled down in 6 minutes.
					6-7/8"	0	0	0	0	
Britt	2	C	7-20S-37E	6-14-76	13-3/8"	0	0	0	0	
					9-5/8"	520#	0	450#	0	Bled down in 20 seconds.
					7"	0	0	0	0	
Britt	3	C	7-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	470#	0	20#	0	Bled down in 3 minutes.
					7"	--	--	--	--	Selling Gas
Britt	4	B	7-20S-37E	6-10-76	13-3/8"	0	0	-0	0	
					9-5/8"	50#	0	40#	1-1/2 gals	Est. Flowing 1 Bbl H_2O/24hr
					7"	35#	0	0	0	
Britt	5	K	7-20S-37E	6-10-76	13"	40#	0	0	0	
					9-5/8"	560#	520#	560#	0	Gas well-opened valve on 9-5/8" press. on 7" dropped the same amt. possible hole in casing.
					7"	570#	520#	560#	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	11	G	7-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					8-5/8"	0	0	0	0	
					5-1/2"	0	0	0	0	
Britt	12	G	7-20S-37E	6-10-76	13-3/8"	60#	0	0	0	
					8-5/8"	700#	10#	30#	0	Flowing Gas
					5-1/2"	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Libby H. Post

COMPANY Union Texas Petroleum Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Campbell & Hedrick

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alexander	1	L	7-21-37	6/3/x	4½-7"	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Olen H. Hedrick

COMPANY Campbell & Hedrick

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Sabie Petr Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Azus A	1	P	Sec 7 T 21S R 37E	6-1-76	174' of 9⅝ - Surface	24 Hrs	0	0	0	Braden Head Test
Azus A	2	M	Sec 8 T 21S R 37E	6-1-76	1236' of 8⅝ Surface	24 Hrs	890 PSI	10 PSI	Very Small Amount	Braden Head Test Small amount of drlg mud & water flowed out of Braden Head
Azus B	1	F	Sec 8 T 21S R 37E	6-1-76	211' of 8⅝ - Surface	24 Hrs	0	0	0	Braden Head Test

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: L. B. Rawlitzer

COMPANY Sabie Petr Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILLIAMS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	3	F	16-20-3?							Refer back to previous 9-193

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILLIAMS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	2	F	16-20-3?	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILLIAMS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	1	C	16-20-3?	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	35	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dfj

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Cleary Petroleum Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "E"	1	L	21-19-37	5/12/76		25#	5#	40#	None	
New Mexico State "E"	2	E	21-19-37	5/12/76		35#	8#	130#	None	
New Mexico State "E"	3	D	21-19-37	5/12/76		20#	0#	25#	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Richard Ferguson

COMPANY Cleary Petroleum Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY APCO Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Carter	1	G	12, 21S, 37E	5-27-76	Surface	125 psi	0 psi	0 psi	TSTM	Air
Christmas	1	D	11, 20S, 37E	5-26-76	Surface	10 psi	0 psi	0 psi	TSTM	Air
Currie	1	N	5, 21S, 37E	5-28-76	Intermed	20 psi	0 psi	10 psi	TSTM	Gas (?)
Huston	1	K	21, 19S, 37E	5-24-76	Surface	120 psi	100 psi	120 psi	1 Bbl	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY APCO Oil Corporation

P.O Box 1027

Odessa, Texas 79760

Phone: 915-381-2794

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Cities Service

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Rechinne	1	N	4	6-17	SURFACE	0	0	0	0	

HAVE LES OF NATHAN
INSPECT - WELL OK

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Cities Service

COMPANY Cities Service

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Great Western Drilling Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bordages	1	D	S-33 T-19S R-37E	6/4/76	tubing Prod.	7½ PSI	0	0	0	No Oil, Water, or Gas 15 Min. no change 1 hour no change
					Prod. Inter-mediate	0	0	0	0	
					Inter-mediate Surface	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Curtis McInney

COMPANY Curtiss Mahaney ~~Great Western Drilling Co.~~

DATA SHEET FOR FLOW TEST IN OIL CENTER--NORTHEAST AREA

COMPANY Shell Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State E	1		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	2		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	3		[illegible]	[illegible]		-115	-0-	-30-	-0-	gas
	4		[illegible]	[illegible]	...	-50-	-0-	-50-	-min-	water & gas
Cooper A	1		[illegible]	[illegible]		1100	-1100-	-1100-	Small	water
Cooper B	1		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	2		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	4		[illegible]	[illegible]		-50-	-0-	-50-	-min-	water
State Sec 8	1		[illegible]	[illegible]		-30-	-0-	-30-	-min-	gas & water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible]

COMPANY Shell Oil Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--NORTHEAST AREA

COMPANY Exxon Co. U.S.A.

1 LEASE	2 WELL NO.	3 UNIT LETTER	4 SECTION TOWNSHIP RANGE	5 DATE OF TEST	6 CASING STRING TESTED	7 SHUT IN PRESSURE BEFORE TEST	8 PRESSURE IMMEDIATELY AFTER TEST	9 PRESSURE 1-HR. AFTER TEST	10 EST. VOLUME OF FLUID DURING TEST	11 REMARKS (Oil-Water-Gas-etc.)
Exmont Gas Com. No. 1	1	—	S-4 T-20-S R-37-E	5-25-76	8⅝"	#130	#100	#130	0	OPEN VALVE FOR 15 min. GAS PRESSURE FROM #130 to #100
										0 - ON SURFACE

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: John Pearce

COMPANY Exxon Co. U.S.A.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Critchfield "32"	1	I	32-19-37	5-19-76	8 5/8	0	0	0	0	None

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gilluly "A"	1	M	9-20-37	5-19-76	13 3/8	0	0	0	0	NONE
					9 5/8	105	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY WKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	9	O	7-20-37	5-12-76	13	0	0	0	NONE	NONE
					9 5/8	60	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY WKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	7	J	7-20-37	5-12-76	13	0	0	0	NONE	NONE
					9 5/8	110	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kerrigan A. E. Kerrigan, dj

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	10	D	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	140	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	7	L	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	6	M	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	25	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	5	I	12-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	0	0	0	0	None

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Haygood, Dist.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER—NONIDENT AREA

COMPANY ASHMUN & HILLIARD

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. W. COOPER	1	F	3-20-37	6-30-76	Surface	0	0	0	0	
					Interm.	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY ASHMUN & HILLIARD

Unocal

DATA SHEET FOR FLOW TEST IN OIL CENTER—NONIDENT AREA

COMPANY Mallard Exploration, Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Laughlin	1	H	9-20S-37E	5-25-76	20#	-0-	-0-	-0-	TSTM	Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Mallard Exploration, Inc.
200 Wilco Bldg.
Midland, Texas 79701

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	6	N	7-20-37	5-12-76	13	0	0	0	NONE	NONE
					9 5/8	35	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	5	J	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	190	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	4	O	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	30	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	3	N	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	40	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kerrigan A. E. Kerrigan, dg

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MEX OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E. Laughlin	2	M	1-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	120	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MEX OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E. Laughlin	1	J	1-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	15	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	4	A	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					7 5/8	40	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper	8	P	2-20-37	5-24-76	13 3/8	0	0	0	NONE	
					7 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	5	P	1-20-37	5-17-76	12½	0	0	0	0	None
					9 5/8	40	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Aubrey E. Kenyon W. E. Kenyon, dj

COMPANY John H. Hendrix Protection

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	1	H	7-20-37	5-17-7[illegible]	15[illegible]	0	0	0	0	None
					7 5/8	45	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	4	M	17-20-37	5-14-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	3	L	17-20-37	5-14-76	10 3/4	0	0	0	None	None
					7 5/8	15	0	0	None	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	2	N	17-20-37	5-14-76	10 3/4	0	0	0	None	None
					7 5/8	0	0	0	None	None

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER SHUT	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	1	K	17-20-37	5-14-56						
					10 3/4	0	0	0	0	None
					7 5/8	85	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	6	I	7-20-37	5-17-56						
					12½	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	4	D	8-20-37	5-17-56						
					12½	0	0	0	0	None
					9 5/8	110	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	3	L	8-20-37	5-17-56						
					12½	0	0	0	0	None
					9 5/8	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY [illegible]

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Norths Parker	2	A	[illegible]	5-17-[illegible]						
					12[illegible]	0	0	0	0	None
					9 5/8	60	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	12	D	7-20-37	5-19-76						
					13 3/8	0	0	0	0	None
					9 5/8	45	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	11	H	12-20-36	5-19-76						
					13 3/8	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "X"	1	L	16-20-37	5-21-76						
					8 5/8	210	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon J. E. Kenyon, Jr.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#7	N	15-20-37	5-28-76	S	0	0	0	0	
					I	800	800	800	1/2 Bbl	would not bleed off
					P	540	0	120	0	
Britt B	#8	J	15-20-37	5-28-76	S	800	800	800		would not bleed down
					P	460	0	360	0	
Britt B	#12	E	15-20-37	5-28-76	S	540	0	10	1/2	water
					P	40	40	40	10	
Britt B	#13	D	15-20-37	5-28-76	S	850	0	25	1/2	water
					P	50	0	10	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Conti... Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#3	L	15-20-37	5-28-76	S	0	0	0	0	
					I	900	0	100	0	
					P	40	40	40	0	
Britt B	#4	M	15-20-37	5-28-76	S	0	0	0	0	
					I	200	0	10	1/4	Bbl. water
					P	540	0	120	0	
Britt B	#5	K	15-20-37	5-28-76	S	0	0	0	0	
					I	0	0	0	0	
					P	525	0	100	0	
Britt B	#6	F	15-20-37	5-28-76	S	0	0	0	0	
					I	540	0	15	1/2	water
					P	325	0	125	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Smitt B-18	#1	O	18-20-37	5-27-76	S	0	0	0		Has TSTM
					I	50	0	0		
					P	210	210	210		O
Smitt B-18	#2	F	18-20-37	5-27-76	S	0	0	0		Water TSTM
					I	350	0	200		2 sec. blow down
					P	20	20	20		
Smitt B-18	#3	J	18-20-37	5-27-76	S	0	0	0	1	water
					I	440	0	200		4 sec. blow down
					P	20	20	20		
										O

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Smitt B-18	#4	I	18-20-37	5-27-76	S	0	0	0		
					I	340	0	0		
					P	20	20	20	½	water
										4 sec. blow down O
Smitt B-18	#5	E	18-20-37	5-27-76	S	0	0	0		
					I	450	10	50		
					P	440	440	440	½	water
Smitt B-18	#6	P	18-20-37	5-27-76	S	0	0	0		Has TSTM
					I	360				2 sec. blowdown
					P	630	630	630		
Smitt B-18	#7	O	18-20-37	5-27-76	S	0	0	0		Has
					I	120	0	0		4 sec. blowdown O

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B-8	#1	C	8-20-37	5-27-76	S	0	0	0		Has TSTM
					I	5	0	0		1 sec. blead down.
					P					unable to open valve
Britt B-8	#2	C	8-20-37	5-27-76	S	0	0	0		
					I	10	0	0		Has TSTM
					P	40	40	40		2 sec. blead down
Britt B-8	#3	C	8-20-37	5-27-76	S	0	0	0		Has TSTM.
					I	10	0	0		
					P	50	50	50		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Exxon Co. U.S.A.

1 LEASE	2 WELL NO.	3 UNIT LETTER	4 SECTION TOWNSHIP RANGE	5 DATE OF TEST	6 CASING STRING TESTED	7 SHUT IN PRESSURE BEFORE TEST	8 PRESSURE IMMEDIATELY AFTER TEST	9 PRESSURE 1-HR. AFTER TEST	10 EST. VOLUME OF FLUID DURING TEST	11 REMARKS (Oil-Water-Gas-etc.)
Sunset Gas Com Wn 4	1	—	S-25 T-20-S R-36-E	5-25-76	7 5/8"	#610	#25	#300	0	OPEN 2" VALVE BLEW FOR 20 SECOND THEN ONLY SLIGHT TRACE OF GAS
										0- ON SURFACE

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: M M Reese

COMPANY Exxon Co. U.S.A.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "H"17	2	D	17-20-3[illegible]	5-21-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Patsy	1	B	8-20-37	5-20-76	13 3/8	0	0	0	0	
					9 5/8	190	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	2	O	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					9 5/8	85	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	3	P	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					9 5/8	15	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Keown A. E. Keown, Agt.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "Y"	2	J	17-20-37	5-21-76	12 1/2	0	0	0	0	
					8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "T"	7	L	29-19-37	5-21-76	12 1/2	0	0	0	0	
					8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "T"	8	K	29-19-37	5-21-76	8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "H"17	1	E	17-20-37	5-20-76	12 3/4	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alaska Cooper	1	A	17-20-37	5-24-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alaska Cooper	2	E	17-20-37	5-24-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "X"	1	L	16-20-37	5-21-76	12 1/2	0	0	0	0	NONE
					8 5/8	60	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "Y"	1	I	17-20-37	5-21-76	12 1/2	0	0	0	0	
					8 5/8	40	0	0	0	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, Jr.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt Phillips	#1	E	16-20-37	5-27-½	S	550	0	20	1 bbl.	
					P	150	0	100	0	
Britt Skaggs	#1	P	19-20-37	5-28-½	S	0	0	0	0	
					P	625	0	100	0	
Britt B	#1	O	15-20-37	5-28-½	S	0	0	0	0	
					I	540	0	20	3 bbl.	water
					P	0	0	0	0	
Britt B	#2	E	15-20-37	5-28-½	S	0	0	0	0	
					I	540	0	15	1	water
					P	625	0	125	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eumont Hardy Unit	#9	D	35-20-37	5-31	S	0	0	0	0	
					P	0	0	0	0	
Eumont Hardy Unit	#16	I	20-20-37	5-31	S	0	0	0	0	
					I	100	0	5	½	wtr.
					P	40	40	40	40	
Eumont Hardy Unit	#23	P	36-20-37	5-31	S	0	0	0	0	
					I	70	0	5	0	
					P	0	0	0	0	
Eumont Hardy Unit	#31	A	1-21-36	5-31	S	0	0	0	0	
					P	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOUSTON AREA

COMPANY Continental Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#14	L	15-20-37	5-28-76	S	850	0	125	0	
					P	650	0	200	0	
Britt B	#15	M	10-20-37	5-27-76	S	0	0	0	0	
					I	600	0	20	1/4	water
					P	150	150	150	0	
Britt B	#18	N	10-20-37	5-27-76	S	625	0	10	1/2	water
					*P	40	40	40	0	
Britt B	#19			5-28-76	S	620	0	10	1/2	bbl. water
					*P	40	40	40	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOUSTON AREA

COMPANY Continental Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#20	L	10-20-37	5-27-76	S	550	0	0	1	
					*P	40	40	40	0	
Britt B	#21	J	10-20-37	5-27-76	S	650	0	10	0	
					*P	40	40	40	0	
Britt B	#22	P	10-20-37	5-27-76	S	650	0	12	0	
					*P	40	40	40	0	
Britt B	#24			5-28-76	S	550	0	70	1/4	water
					P	625	0	175	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Current Hardy Unit	#41	L	6-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	40	0	0		
Current Hardy Unit	#43	M	6-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	40	0	0	0	
Current Hardy Unit	#44	O	6-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	0	0	0		
Current Hardy Unit	#37	J	6-21-37	5-31	S	0	0	0	0	
					I	280	0	20	1/4	wtr.
					* P	40	40	40	0	

I Hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Current Hardy Unit	#32	H	1-21-36	5-28	S	0	0	0	0	
					I	0	0	0	0	
					P	0	0	0		
Current Hardy Unit	#39	D	5-21-37	5-31	S	0	0	0	0	
					I	375	0	10	1/8	wtr.
					P	0	0	0	0	
Current Hardy Unit	#38	E	5-21-37	5-31	S	0	0	0	0	
					I	200	0	15	1/2	wtr.
					P	40	40	40	0	
Current Hardy Unit	#40	K	6-21-37	5-31	S	0	0	0	0	
					I	100	0	5	1/8	wtr.
					P	0	0	0	0	

I Hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
[illegible]	[illegible]	[illegible]	[illegible]	5-31	S	0	0	0	0	
					P	0	0	0	0	
BLANK A	#6	G	8-21-37	5-30	S	700	0	0	0	
					P	45	45	45	0	
BLANK B-1	#14	I	8-21-37	5-31	S	230	230	230	1 Bbl.	SALT WTR.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Read B	#11	N	24-20-36	5-27-76	S	0	0	0		
					I	150		0		Water TSTM
					P	50	50	50		
Read B	#12	K	24-20-36	5-27-76	S	0	0			
					I	120	0	0		Gas TSTM
					P	75	75	75		
Read B	#13	M	24-20-36	5-27-76	S	0	0	0	0	
					I	0	0	0	0	
					P	50				
Read B	#14	L	24-20-36	5-27-76	S	0	0	0		
					I	0	0	0		TSTM
					P	50	50	50		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
mu Tubb	#55	G	13-20-37	5-27-76	S	100	0	10	0	
					P	50	0	60	0	
mu Tubb	#54			5-28-76	S	650	0	10	0	
					*P	40	40	40	0	
mu Tubb	#85	H	15-20-37	5-28-76	S	0	0	10	1/4	water
					*P	40	40	40	40	
mu Tubb	#86	D	14-20-37	5-28-76	S	625	0	10	1/2	water
					*P	40	40	40	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
SEmu Tubb	#57	N	14-20-37	5-28-76	S	700	0	10	566	oil, water, mud
					P	340	0	125	0	
SEmu Tubb	#88	F	14-20-37	5-28-76	S	900	0	25	6 bbl	water, mud
SEmu Paamian	#14	I	24-20-37	5-28-76	S	0	0	0	0	
					I	400	0	75	1/2	water
					P	0	0	0	0	
Phillips Hooper	#1	O	27-20-37	5-31-76	S	open-0	0	0	0	
					P	50	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State F-1	#1	O	1-21-37	5-28-76	S	0	0	0	0	
					I	600	0	10	0	
					P	300	0	150	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Rice Engineering & Operating, Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Monument-Salt Water Disposal System	1-5	K	35,T19S, R37E	5-27-76	9-5/8"	95	0	0	None	Bled air off in 132 minutes
	1-20	H	20,T20S, R37E	5-27-76	9-5/8"	20	0	1	None	Bled air off in 6 minutes
	1-9	M	9,T20S, R37E	5-27-76	9-5/8"	460	30	410	4 bbls.	Salt water to surface in 10 seconds-flowing by heads at end of 15 minutes flow test
	1-5	M	5,T20S, R37E	5-27-76	13-3/8"	0	-	-	-	
					9-5/8"	810	740	740	None	Gas flow restricted. possible choke nipple inside of 9-5/8" casing valve
					*9-5/8"	740	8	12	None	*Bled gas off 9-5/8" casing over 18 hour period

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature] D. D. Ducheneaux, Division Manager

COMPANY Rice Engineering & Operating, Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Aztec Oil & Gas Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State Unit E	1	M	35-20-37	5/27	7 5/8	125	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Aztec Oil & Gas Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

POOL	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Jalmat Grayburg	1	K	Sec. 12, 20S, 37E	5-12-76	7-5/8 X 9-5/8	-0-	-0-	-0-	-	
X	2	J	Sec. 12, 20S, 37E	"	5-1/2 X 8-5/8	820 ✓	60 ✓	825 ✓	192	Water
	3	I	Sec. 12, 20S, 37E	"	5-1/2 X 8-5/8	600 ✓	-0-	240 ✓	96 ✓	Water
	4	J	Sec. 12, 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-	
	5	H	Sec. 12, 20S, 37E	"	5-1/2 X 8-5/8	900 ✓	-0-	750 ✓	672 ✓	Water
	6	H	Sec. 12, 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-	
	7	O	Sec. 12, 20S, 37E	"	5-1/2 X 8-5/8	410 ✓	-0-	160 ✓	96 ✓	Water
	8	P	Sec. 12, 20S, 37E	"	5-1/2 X 8-5/8	100 ✓	-0-	60 ✓	Trace ✓	Water
	9	M	Sec. 7, 20S, 37E	"	7-5/8 X 9-5/8	-0-	-0-	-0-	-0-	
	10	M	Sec. 7, 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	11	D	Sec. 13, 20S, 37E	"	7X9-5/8	710 ✓	710 ✓	710 ✓	7690 ✓	Water
	12	C	Sec. 13, 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

COMPANY TEXACO Inc.

*Calculated 24 hour rate based on 1 hour or less flow test - Barrels of water per day.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

POOL	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Jalmat Grayburg	13	O	Sec. 13, 20S, 37E	5-12-76	5-1/2 X 9-5/8	310 ✓	-0-	110 ✓	24 ✓	Water
	14	A	Sec. 13, 20S, 37E	"	5-1/2 X 8-5/8	200 ✓	-0-	60 ✓	24 ✓	Water
	15	D	Sec. 18, 20S, 38E	"	5-1/2 X 8-5/8	200 ✓	-0-	100 ✓	48 ✓	Water
	16	C	Sec. 18, 20S, 38E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	17	E	Sec. 18, 20S, 38E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	18	E	Sec. 13, 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	19	F	Sec. 13, 20S, 37E	"	5-1/2 X 8-5/8	700 ✓	-0-	700 ✓	Not Est.	Gas - Bled to 0 in 15 Mins.
	20	H	Sec. 13, 20S, 37E	"	5-1/2 X 8-5/8	200 ✓	-0-	90 ✓	Not Est.	Gas " " " " " "
	21	E	Sec. 18, 20S, 38E	"	5-1/2 X 8-5/8	300 ✓	10 ✓	65 ✓	48 ✓	Water
	22	K	Sec. 13, 20S, 37E	"	5-1/2 X 8-5/8	20 ✓	-0-	20 ✓	Not Est.	Gas - Bled to 0 in 5 Mins.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY B.W.E Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State A-20	1	L	20-20-37	5-9-76	7 5/8	350	12	280	7 gallons	Casing Strings 20" - 250' 7 5/8 - 1140' 5 1/2 - 3650' Water
										Surface Pipe - 0" pressure Nothing
	2	JV	20-20-37	5-10-76	7 5/8	0	0	0	Nothing	Casing Strings 7 5/8 - 1140' 4 1/2 - 3548'
	3	O	20-20-37	5-10-76	10 3/4	0	0	0	Nothing	Casing Strings 10 3/4 - 138' 5 1/2 - 3584'

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: D. Williams

COMPANY B.W.E Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY THE SUPERIOR OIL COMPANY

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE-A	5		S-13 T-20-S R-36-E	5-26-76	9-5/8	775	-0-	-0-	No Fluid	Dry Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. B. Taylor

COMPANY THE SUPERIOR OIL COMPANY

WITNESSED BY:

Mr. John Runyan
New Mexico Oil Conservation Commission

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Cities Service Oil Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State F	1	O	Sec. 30 T20S R37E	5-26-76	Intermediate ✓	Int. 140# Surf 0#	Int. 0# Surf 0#	Int. 42# Surf 0#	No Fluid	Bled off gas - no fluid recovered
State F	2	I	Sec. 30 T20S R37E	5-26-76	Intermediate ✓	Int. 200# Surf 0#	Int. 0# Surf 0#	Int. 78 Surf 0#	No Fluid	Bled off gas - no fluid recovered
Laughlin B	5	O	Sec. 5 T20S R37E	5-26-76	Intermediate	Int. 0# Surf 0#	Int. 0# Surf 0#	Int. 0# Surf 0#	No Fluid	No gas - no fluid recovered

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Robert H. Schwaner Jr.

COMPANY Cities Service Oil Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Sun Oil

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M E Loughlon	1	I	5-21-37	5-25-76	[illegible] 9-5/8	0 20# ✓	0	0	0	
M E Loughlin	2	L	4-21-37	5-25-76	[illegible] 9-5/8	0 0	0	0	0	
A B Reeves	1	G	29-20-37	5-25-76	9-5/8	190 ✓	75 ✓	195 ✓	0	ALL GAS (Little Oil)
A Cooper	1	D	4-20-37	5-25-76	13-3/8 9-5/8 7	0 21 55	0 0 0	0 0 0	0 0 0	
A Cooper	3	D	D 7-20-37	5-25-76	13-3/8 9-5/8 7	0 0 112	0 0 0	0 0 0	0 0 0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W. D. Wyatt

COMPANY Sun Oil Company

WITNESSED BY LES CLEMONS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. M. Cooper	1	D	Sec. 5 20S, 37E	5-12-76	7 X 9-5/8	-0-	-0-	-0-	-0-	
	2	A	Sec. 5 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	3	G	Sec. 5 20S, 37E	"	7 X 9-5/8	40 ✓	-0-	-0-	Not Est.	Gas
	4	H	Sec. 5 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	5	G	Sec. 5 20S, 37E	"	5-1/2 X 0-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is true and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice Monument Unit	1	D	Sec. 19 20S, 37E	5-17-76	7X9-5/8	110 ✓	-0-	-0-	Not Est.	Gas
	2	C	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	500 ✓	10 ✓	10 ✓	Not Est.	Gas
	3	B	Sec. 19 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	4	A	Sec. 19 20S, 37E	"	7X9-5/8	75 ✓	-0-	20 ✓	Not Est.	Gas
	5	D	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	-0-	
	6	C	Sec. 20 20S, 37E	"	7X9-5/8	100 ✓	-0-	95 ✓	Not Est.	Gas
	7	D	Sec. 20 20S, 37E	"	7X9-5/8	20 ✓	-0-	-0-	Not Est.	Gas
	8	A	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	9	D	Sec. 21 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	10	C	Sec. 21 20S, 37E	"	7X9-5/8	650 ✓	500 ✓	860 ✓	672	Water - 5 Minutes pressured to 860 psi.
	11	E	Sec. 19 20S, 37E	"	7X9-5/8	230 ✓	-0-	120 ✓	11	Water

I hereby certify that the information submitted is true and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

*Calculated 24 hour rate based on 1 hour or less flow test - Barrels of water per day.

DATA SHEET FOR FLOW TEST IN OIL CENTER--POMPEY AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
C. H. Weir 'A'	4	L	Sec. 12 20S, 37E	5-12-70	5-1/2 X 8-5/8	50 ✓	-0-	50 ✓	288 ✓	Oil
	7	L	Sec. 12 20S, 37E	"	7-5/8 X 10-3/4	700 ✓	-0-	25 ✓	Not Est	Gas
	8	F	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	880 ✓	200 ✓	880 ✓	1440 ✓	Water
	9	K	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	880 ✓	-0-	480 ✓	672 ✓	Water
	10	J	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	720 ✓	50 ✓	740 ✓	384 ✓	Water
	11	G	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	920 ✓	570 ✓	830 ✓	3552 ✓	Water
C. H. Weir 'B'	1	H	Sec. 11 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	Not Est.	Gas
	2	A	Sec. 11 20S, 37E	"	5-1/2 X 9-5/8	400 ✓	-0-	110 ✓	25 ✓	Water
	4	I	Sec. 11 20S, 37E	"	7-5/8 X 10-3/4	-0-	-0-	-0-	-0-	
	5	G	Sec. 11 20S, 37E	"	5-1/2 X 8-5/8	460 ✓	-0-	200 ✓	192 ✓	Water
	6	P	Sec. 11 20S, 37E	"	2-7/8 X 8-5/8	450 ✓	-0-	185 ✓	96 ✓	Water
	7	J	Sec. 11 20S, 37E	"	2-7/8 X 9-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--POMPEY AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M. C. Weir 'B'	7	H	Sec. 12 20S, 37E	5-12-70	2-7/8 X 9-5/8	1040 ✓	-0-	1000 ✓	1584 ✓	Water
	8	H	Sec. 12 20S, 37E	"	2-7/8 X 7-5/8	600 ✓	-0-	-0-	192 ✓	Water
	9	O	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	100 ✓	-0-	50 ✓	-0-	
	10	P	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	140 ✓	140 ✓	140 ✓	Not Est.	Gas - Blew down in 1 sec.
L. R. Kershaw	7	C	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	850 ✓	-0-	310 ✓	Trace ✓	Water & Gas
	8	D	Sec. 13 20S, 37E	"	2-7/8 X 9-5/8	710 ✓	710 ✓	710 ✓	7690	Water - Same well as Skaggs Grayburg Unit #11
	9	D	Sec. 13 20S, 37E	"	2-7/8 X 9-5/8	250 ✓	-0-	70 ✓	Not Est.	Gas - Blew down in 2 Mins.
	10	F	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	800 ✓	10 ✓	600 ✓	240 ✓	Water
	11	E	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	800 ✓	10 ✓	225 ✓	400 ✓	Water
E.H.B. Phillips 'B'	1	F	Sec. 10 20S, 37E	"	2-7/8 X 9-5/8	20 ✓	-0-	20 ✓	Not Est.	Gas
	2	G	Sec. 10 20S, 37E	"	2-7/8 X 9-5/8	275 ✓	-0-	100 ✓	48 ✓	Water
E.H.B. Phillips 'C'	1	A	Sec. 10 20S, 37E	"	2-7/8 X 8-5/8	20 ✓	-0-	20 ✓	Not Est.	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice Monument Unit	12	F	Sec. 19 20S, 37E	5-17-76	5-1/2 X 7-5/8	-0-	-0-	-0-	-0-	
	13	G	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	250 ✓	-0-	-0-	Not Est.	Gas
	14	H	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	100 ✓	-0-	-0-	Not Est.	Gas
	15	E	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	100 ✓	-0-	-0-	Not Est.	Gas
	16	F	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-0-	
	17	G	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	420 ✓	-0-	130 ✓	34 —	Water
	18	H	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	-0-	
	19	E	Sec. 21 20S, 37E	"	7X9-5/8	450 ✓	-0-	120 ✓	96 ✓	Water
	20	I	Sec. 24 20S, 36E	"	7X9-5/8	125 ✓	-0-	-0-	2 ✓	Water
	21	L	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	525 ✓	-0-	380 ✓	69 ✓	Water
	22	K	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	510 ✓	-0-	510 ✓	-0-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice Monument Unit	23	J	Sec. 19 20S, 37E	5-17-76	5-1/2 X 8-5/8	-0-	-0-	-0-	-	
	24	I	Sec. 19 20S, 37E	"	4-1/2 X 9-5/8	420 ✓	-0-	20 ✓	-	
	25	L	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	100 ✓	-0-	-0-	Not Est.	Gas
	26	K	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-	
	27	P	Sec. 24 20S, 36E	"	7 X 9-5/8	-0-	-0-	-0-	-	
	28	M	Sec. 19 20S, 37E	"	7 X 9-5/8	550 ✓	25 ✓	260 ✓	96 ✓	Water
	29	N	Sec. 19 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	Not Est.	Gas
	30	O	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-	
	31	P	Sec. 19 20S, 37E	"	7 X 9-5/8	110 ✓	-0-	200 ✓	200 ✓	Water
	32	~~O~~ P	Sec. ~~19~~ 20 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-	
	33	N	Sec. 20 20S, 37E	"	4-1/2 X 7-5/8	-0-	-0-	-0-	-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

Company TEXACO Inc.

Pool	Well No.	Unit Letter	Section Township & Range	Date of Test	Casing String Tested	Shut In Pressure Beginning Test	Pressure Immediately After Test	Pressure 3-Hrs.After Test	*Est.Volume of Fluid During Test	Remarks (Oil-Water-Gas-etc.)
Ice Monument	34	D	Sec. 30 20S, 37E	5-12-76	7 X 9-5/8	-0-	-0-	-0-	-0-	
	37	A	Sec. 30 20S, 37E	"	7 X 9-5/8	500 ✓	-0-	330 ✓	Not Est.	Gas
	38	D	Sec. 29 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	39	C	Sec. 29 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	40	B	Sec. 29 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
Ty Riddell	1	H	Sec. 12 21S, 36E	"	5-1/2 X 8-5/8	600 ✓	-0-	210 ✓	Not Est.	Gas
New Mexico 'H' State NCT-2	26	B	Sec. 20 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
New Mexico 'H' State NCT-4	27	G	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	220 ✓	50 ✓	220	Not Est.	Gas
New Mexico 'H' State NCT-3	25	D	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	75 ✓	-0-	40 ✓	Not Est.	Gas
New Mexico 'C' State NCT-2	9	C	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	140 ✓	-0-	20 ✓	Not Est.	Gas

I hereby certify that the information submitted is true and complete to the best of my knowledge.

Name: _____

Company TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Laughlin	1	P	1-20S-38E	5-24-76	Surf Inter	0	0	0	None	Gas Blow
	2	C	1-20S-38E	5-24-76	Surf Inter	0	0	0	None	Gas Blow
	3	B	1-20S-38E	5-24-76	Surf Inter	0	0	0	None	Gas Blow
	4	A	1-20S-38E	5-24-76	Surf Inter	560	560	125	15 BBL	Water (Spray)
Phillips	1	N	33-19S-38E	5-24-76	Surf Inter	0	0	0	1.0 BBL	Water - Died in 10 min.
	2	K	33-19S-38E	5-24-76	Surf Inter	105	0	0	6.25 BBL	Water
Brown McKee Unit	101	B	18-20S-38E	5-24-76	Surf Inter	0	0	0	None	Air
	102	L	8-20S-38E	5-24-76	Surf Inter	0	0	0	None	
	201	I	7-20S-38E	5-24-76	Surf Inter	0	0	0	None	
	202	J	7-20S-38E	5-24-76	Surf Inter	0	0	0	None	Slight Gas - Died in 2 min. Blow
	203	K	7-20S-38E	5-24-76	Surf Inter	0	0	0	None	✓ ✓ - 4 min. blow
	110	G	18-20S-38E	5-25-76	Surf Inter	0	0	0	None	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Stigall

COMPANY Amerada Hess Corp.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Brown McKee Unit	111	I	18-20S-38E	5-24-76	Surf Inter	0 (2)	0	0	None	Gas - Died in 3 min
	112	F	18-20S-38E	5-25-76	Surf Inter	0	0	0	None	Gas
	113	P	18-20S-38E	5-24-76	Surf Inter	0 45	0 35	0 35	None	Gas
	114	A	18-20S-38E	5-24-76	Surf Inter	0 25	0 0	0 0	None	Gas - Died in 15 min
	117	H	18-20S-38E	5-25-76	Surf Inter	0 15	0 0	0 0	None	Air - Died in 2 min
	119	J	18-20S-38E	5-24-76	Surf Inter	0 3	0 3	0 0	None	Gas
	121	D	17-20S-38E	5-24-76	Surf Inter	0 20	0 0	0 0	None	Gas - Died in 5 sec.
	132	D	20-20S-38E	5-24-76	Surf Inter	0 15	0 0	0 0	None	Gas - Died in 10 min
	141	M	17-20S-38E	5-24-76	Surf Inter	0 2	0 0	0 0	None	
	142	L	17-20S-38E	5-24-76	Surf Inter	0 2	0 0	0 0	None	
	401	N	7-20S-38E	5-25-76	Surf Inter	0 15	0 1	0 0	None	Gas
	402	C	18-20S-38E	5-24-76	Surf Inter	0 1275	0 1125	0 1125	None	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Stigall

COMPANY Amerada Hess Corp.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Amerada Hess	501	O	13-20S-37E	5-24-76	Surf Inter	5	0	0	None	Air - Died in 1 min
	101	P	13-20S-37E	5-24-76	Surf Inter	320	215	320	None	Air
	701	D	13-20S-37E	5-24-76	Surf Inter	155	0	0	Gas & Oil	Blow of Spray - Died in Lowis
	702	M	13-20S-37E	5-24-76	Surf Inter	30	0	25	None	
	901	A	18-20S-38E	5-25-76	Surf Inter	550	225	225	None	Air Gas
State Q	1	J	16-20S-37E	5-24-76	Surf Inter	10	0	0	None	Gas - Died in 10 min
	2	I	16-20S-37E	5-24-76	Surf Inter	25	0	0	None	Slight Gas Blow
	3	O	16-20S-37E	5-24-76	Surf Inter	75	0	0	None	✓ ✓ ✓
	4	I	16-20S-37E	5-24-76	Surf	0	0	0	None	
	5	O	16-20S-37E	5-24-76	Surf	675	25	675	None	20" mud. Test ruined 9 well bled off to 0#
	6	P	16-20S-37E	5-24-76	Surf	1225	700	925	None	Gas
						350	0	0	None	Gas Blow
State W	1	H	30-20S-37E	5-26-76	Surf Inter	0	0	0	None	
						250	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Petzel

COMPANY Amerada Hess Corp.

1

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State W	2	G	30-20S-37E	5-26-76	Surf Inter	0	0	0	0.25 Bbl.	Slight Spray
	3	F	30-20S-37E	5-26-76	Surf Inter	575	0	185		
	4	E	30-20S-37E	5-25-76	Surf Inter	310	0	100	0.25 Bbl.	Slight Spray - Died in 13 min
State M	2	J	13-20S-36E	5-25-76	Surf Inter	TSTM	8	60	None	Gas
State Z	1	A	13-20S-37E	5-26-76	Surf Inter	220	10	150	None	Gas
	2	A	13-20S-36E	5-25-76	Surf Inter	485	0	115 *	1.5 Bbl.	* Water flowed for short time, Gas for other 2 wells
T. Anderson	1	K	8-20S-37E	5-25-76	Surf Inter	110	9	18	None	Gas
	2	FN	8-20S-37E	5-4-76	Surf Inter	85	60	85	None	Air Air - Died in 6 min
	3	K	8-20S-37E	5-25-76	Surf Inter	15	0	0	None	Gas - Died in 30 sec.
	4	K	8-20S-37E	5-25-76	Surf Inter	330	0	0	None	Gas - Died in 10 min
Adkins	1	M	5-20S-37E	5-25-76	Surf Inter	5	0	0	None	Air - Died in 8 min
	3	M	5-20S-37E	5-25-76	Surf Inter	10	0	0	None	
						0	0	0	None	
						0	0	0	None	Gas well completed thru intermediate string
						600	—	—	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Petzel

COMPANY Amerada Hess Corp.

1

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "H"	1	F	25-20-36	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	
↓	2	D	25-20-36	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	300#	5#	100#	SLUG	GAS & SALT WATER

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "G"	1	J	20-20-37	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "F"	1	P	17-20-37	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	850#	850#	850#	55 BBLS	WATER (SALTY)
↓	2	O	17-20-37	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: John Hinkley

COMPANY SKELLY OIL CO.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WINSETT-II	1	O	9-20-37	5-22-74	13 x 8 5/8	0	0	0	0	
					9 5/8 x 7	0	0	0	0	SLIGHT (show) GAS
	7	I	9-20-37	5-22-74	13 x 7	0	0	0	0	
	8	P	9-20-37	5-22-74	13 x 7	0	0	0	0	
	9	L	9-20-37	5-22-74	13 x 7	0	0	0	0	
	10	O	9-20-37	5-22-74	13 x 7	0	0	0	0	
	11	I	9-20-37	5-22-74	9 5/8 x 5 1/2	1220#	0	120#	1/2 BBL	GAS (show)
✓	12	O	9-20-37	5-22-74	9 5/8 x 5 1/2	500#	0 #	115#	3 1/2 BBL	GAS (show)

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Otis Shirley

COMPANY SKELLY OIL CO.

N.M.O.C.C.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. WINSETT-II	1	L	9-20-37	5-22-74	13 x 8 5/8	0	0	0	0	
					9 5/8 x 7	0	0	0	0	
	2	M	9-20-37	5-22-74	13 x 8 5/8	IF WELDED	TO 0#	1 7	SLIGHT (show)	
					9 5/8 x 7	420#	0	150#	1 1/2 BBLS	GAS (show)
	3	N	9-20-37	5-22-74	13 x 8 5/8	0	0	0	0	
					9 5/8 x 7	135#	5	20#	0	GAS
	4	K	9-20-37	5-22-74	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	20#	2#	25#	0	GAS
✓	5	J	9-20-37	5-22-74	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	540#	0	200#	1/2 BBL	GAS (show)

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Otis Shirley

COMPANY SKELLY OIL CO.

Phillips Petroleum Company
Room 806, Phillips Building
COMPANY Odessa, Texas 79761

DATA SHEET FOR FLOW TEST IN OIL CENTER--POMPANO AREA

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Noble	1	K	18,20,37	4-20-76	Surface	0	0	0	None	
				"	9-5/8	0	0	0	None	Gas Only
Noble	4	L	18,20,37	4-20-76	Surface	0	0	0	None	
				"	9-5/8	100#	100#	110#	None	Gas Only
Noble	3	M	18,20,37	4-20-76	Surface	0	0	0	None	
				"	9-5/8	10#	0#	10#	None	Gas Only
Noble	2	N	18,20,37	4-20-76	Surface	No valve				No valve on surface csg.
				"	9-5/8	0	120#	580#	None	Gas Only
Mexico	1	A	18,20,37	4-20-76	Surface	0	0	0	None	
				"	9-5/8	260#	0	0	None	Gas Only
Mexico	2	G	18,20,37	4-20-76	Surface	0	0	0	None	
				"	9-5/8	190#	0	0	None	Gas Only
Mexico	3	H	18,20,37	4-20-76	Surface	0	0	0	None	
				"	9-5/8	100#	0	50#	None	Gas Only
Gaspee	1	P	19,20,37	4-20-76	Surface	0	0	0		
				"	9-5/8	100#	5#	15#	2 B, Wtr	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: L. L. Frantz

COMPANY Phillips Petroleum

DATE: May 25, 1976

13-3/8 Valves on all wells botton valve
9-5/8 " " " " Middle "
7. " " " " Top "

NOTE: Per conversation between Messrs. Jerry Sexton/C. L. Sumerwell, these tests were not witnessed by NMOCC representative.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Ida "B" State	1	D	26-19-37	5-18-70	9-5/8"	(0)	0#	0#	0	Gas
F.M.Kutter "B"	1	H	21-19-37	5-18-70	10-3/4"	0	0	0		
"	2	E	23-19-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	550#	0	50#	1 bbl	Gas and water
"	3	D	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	4	F	"	"	8-5/8"	0	0	0		
E.Shipp "A"	1	F	21-19-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
T. Anderson	1	O	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	2	C	17-20-37	"	10-3/4"	(75#)	12#	75#	0	Gas
"	"	"	"	"	7-5/8"	(25)	0	0	0	#
"	3	P	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	4	B	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	6	A	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	7	H	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	8	G	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
R.R.Bell "G"	1	P	13-20-36	5-19-70	10-3/4"	0	0	0		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
R.R. Bell "G"	1	P	13-20-36	5-19-70	7-5/8"	(105#)	0	0	0	Gas (dual)
"	2	O	13-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	375#	0	225#	1 bbl ✓	Water & gas
Graham St. "B"	1	L	13-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
B.Whitmire	1	G	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	(20#)	0	20#	0	Gas
"	2	B	8-20-37	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	3	F	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	5	F	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	6	B	"	"	13-3/8"	(50#)	20#	50#	0	Gas
"	"	"	"	"	9-5/8"	0	0	0		
"	8	F	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	9	H	"	5-18-70	9-5/8"	0	0	0		
A. B. Reeves	1	L	29-20-37	5-20-70	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	2	E	"	"	16"conductor	0	0	0		
"	"	"	"	"	9-5/8"	375#	0	175#	2 bbls water ✓	
Sunshine	1	H	30-20-37	5-19-70	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR.AFTER TEST	EST.VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Sunshine	2	H	33-20-37	5-19-70	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	10#	0	0	0	Gas
"	3	K	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	100#	0	100#	0	Gas
H.T.Orcutt "C"	1	E	2-20-37	"	9-5/8"	0	0	0		
L.W.White "A"	1	P	25-20-36	5-20-70	10-3/4"	175#	50#	175#	2 bbls	Gas & water
"	"	"	"	"	7-5/8"	100#	70#	100#	1 bbl	Gas & oil
L.W.White "A"	2	I	25-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	700#	200#	300#	0	Gas (dual csg compl)
"	3	H	25-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	5	A	"	"	10-3/4"	50#	0	30#	½ bbl	Water
"	"	"	"	"	7-5/8"	500#	0	50#	0	Gas
Bell-Ramsay "D"	1	H	29-20-37	"	16"conductor	0#	0	0		
"	"	"	"	"	9-5/8"	400#	0	75#	1 bbl	Gas & water
"	2	H	33-20-37	"	16"conductor	0	0	0		
"	"	"	"	"	5-5/8"	0	0	0		
"	3	L	28-20-37	"	9-5/8"	0	0	0		
Bell-Ramsay "D"	1	G	35-20-37	5-19-70	9-5/8"	0	0	0		
H.T.Orcutt "D"	1	B	13-20-36	5-25-70	10-3/4"	20#	0	0		Gas
"	"	"	"	"	7-5/8"	900#	100#	300#	Spray	Water - gas
"	2	G	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
H.T.Orcutt "B"	1	E	11-20-37	"	8-5/8"	430#	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Lyons

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR.AFTER TEST	EST.VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
H.T.Mattern "C"	9	P	7-21-37	5-19-70	8-5/8"	10#	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Lyons

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EJ Becker	5	P	S-20S-37E	5-23-76	Sur.	37	0	22	2 bbl	Gas - Bled off 15 min.
EJ Becker	5	P	S-20S-37E	5-23-76	Tot.	60	0	5	None	Gas - Bled off 1 min.
EJ Becker	7	A	S-20S-37E	5-23-76	Sur.	0	0	0	None	
EJ Becker	7	A	S-20S-37E	5-23-76	Tot.	60	0	7	None	Gas - Bled off 2 min.
EJ Becker	14	H	S-20S-37E	5-23-76	Sur.	17	0	0	None	Gas - Bled off 40 sec.
EJ Becker	14	H	S-20S-37E	5-23-76	Tot.	22	0	0	None	Gas - Bled off 1 min.
EJ Becker	15	H	S-20S-37E	5-23-76	Sur.	0	0	0	None	
EJ Becker	15	H	S-20S-37E	5-23-76	Tot.	27	0	4	None	Gas - Bled off 5 sec.
EJ Becker	10	E	S-20S-37E	5-23-76	Sur.	4	0	0	None	Gas - Bled off 1 sec
EJ Becker	10	E	S-20S-37E	5-23-76	Tot.	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: George Bonham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EJ Becker	13X	E	S-20S-37E	5-23-76	Sur.	120	0	2	None	Gas - Bled off 7 sec
EJ Becker	13X	E	S-20S-37E	5-23-76	Tot.	47	0	16	None	Gas - Bled off 3 min
Becker Gas Unit	1	E	S-20S-37E	5-23-76	Sur.	0	0	0	None	
Becker Gas Unit	1	E	S-20S-37E	5-23-76	Tot.	0	0	0	None	
EJ Becker	16	L	S-20S-37E	5-23-76	Sur.	80	0	28	None	Gas - Bled off 5 sec.
EJ Becker	16	L	S-20S-37E	5-23-76	Tot.	130	90	120	None	Gas -
EJ Becker	11	L	S-20S-37E	5-23-76	Sur.	2	0	0	None	Gas - Bled off 15 sec.
EJ Becker	11	L	S-20S-37E	5-23-76	Tot.	80	0	5	None	Gas - Bled off 2 min.
EJ Becker	19	I	S-20S-37E	5-23-76	Sur.	0	0	0	None	
EJ Becker	19	I	S-20S-37E	5-23-76	Tot.	35	0	10	None	Gas - Bled off 5 sec.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: George Bonham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
RJ Parker	20	P	[illegible]	[illegible]	Sur.	[illegible]	0	220	None	Gas - Est. 600 MCF
RJ Parker	20	P	[illegible]	[illegible]	Tub.	[illegible]	0	135	None	Gas - Est. 450 MCF
ST Parker	12	A	[illegible]	[illegible]	Sur.	[illegible]	0	0	None	
ST Parker	12	A	[illegible]	[illegible]	Tub.	[illegible]	0	2	None	Gas - Est. 600 MCF

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State P	1	F	25-20S-36E	5-23-76	Sur.	0	0	0	None	
State P	1	F	25-20S-36E	5-23-76	Tub.	0	0	0	None	
State P	2	C	25-20S-36E	5-23-76	Sur.	0	0	0	None	
State P	2	C	25-20S-36E	5-23-76	Tub.	(2)	0	0	None	Gas - Est. 250 MCF

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOMEMENT AREA

COMPANY Amoco Production Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gillully "A" Fed.	2	A	24 20 36	5-18	Int.	20	10	10	0	Gas
"	3	G	25 20 36	5-17	Int.	360	0	60	1 Bbl	Water flow with gas
"	5	B	" "	5-18	Int.	500	0	30	10 Bbl	Water
"	6	K	"	5-17	Int.	30	0	0	0	Gas
"	8	J	24 20 36	5-18	Int.	190	0	120	10 Gal	Water - Standing full of water
"	9	C	" "	"	Int.	20	0	0	0	Gas - Bled off 5 min.
"	10	H	" "	"	Int.	55#	0	0	0	Gas - Surf. 55#, bled int. - surf. 0 in 3-1/2 min.
"	11	G	" "	"	Int.	20	0	20	0	Gas - Bled off 1 min.
"	12	D	" "	5-17	Int.	320	0	0	0	Standing full of water - bled off 2 min.
"	13	F	" "	5-18	Int.	40	0	20	2 Gal	Water
"	14	E	" "	"	Int.	0	0	0	0	
Gillully Fed. Gas Com	4	B	24 20 36	5-18	Int.	0	0	0	0	Light blow - less than 1#
"	7	D	" "	"	Int.	25	0	10	0	Gas
Gillully "B" Fed.	1	L	25 20 36	5-17	Int.	0	0	0	0	
"	2	B	21 20 37	5-18	Int.	0	0	0	0	
"	4	D	22 20 37	5-17	Int.	0	0	0	0	
"	5	C	" "	"	Int.	640	300	640	9 Bbl	Water flow
"	6Y	A	21 20 37	"	Int.	720	130 (30 min test)	540	100 Bbl	Water flow - 200 bbl. per hour

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOMEMENT AREA

COMPANY Amoco Production Company (Page 2)

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gillully "B" Fed.	7	K	22 20 37	5-17	Int.	0	0	0	0	
"	8	C	" "	"	Int.	580	100	220	2 Bbl	Water flow
"	9	D	" "	"	Int.	775	20	630	38 Bbl	Water flow - Gas 775# to 500#
"	10	B	" "	"	Int.	460	0	10	0	Gas
"	11	F	" "	"	Int.	635	30	150	1 Bbl	Water flow

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: B. W. Grayson

COMPANY Amoco Production Company

Note: Witnessed by Mr. Nathan Clegg, Field Representative - NMOCC

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J.H. Williams	1	A	[illegible]	[illegible]	Int.	[illegible]	[illegible]	[illegible]	None	
J.H. Williams	2	C	[illegible]	[illegible]	Int.	[illegible]	0	0	None	Low Fluid Level

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
U.S. Sudyo B	1	M	[illegible]	5-23-76	Int.	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY GETTY OIL COMPANY

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-Blow)
[illegible] EUMONT UNIT	50	M	22-19-37	5-12-76	SURFACE	600 PSI	0 PSI	240 PSI	1.25 Bbl.	Water-Oil String Pressure was 500 PSI, fell to 0 PSI during Flow Period. Built to to 240 PSI 1 hr. after Flow Test.
[illegible] EUMONT UNIT	59	N	22-19-37	5-12-76	SURFACE	400 PSI	0 PSI	40 PSI	.75 Bbl.	Flow Oil & a Little Gas.
[illegible] EUMONT UNIT	67	H	20-19-37	5-13-76	SURFACE	50 PSI	0 PSI	0 PSI	TSTM	Blew down to 0# in 1 Sec.
[illegible] EUMONT UNIT	82	O	26-19-37	5-12-76	SURFACE	0 PSI	0 PSI	0 PSI	TSTM	Flowed Water for 5 Sec.
[illegible] EUMONT UNIT	92	F	35-19-37	5-12-76	SURFACE	200 PSI	0 PSI	0 PSI	1 Bbl.	Flow Oil & a Little Ga
[illegible] EUMONT UNIT	130	P	12-20-37	5-12-76	SURFACE	940 PSI	940 PSI	940 PSI	10 Bbls.	Water.
[illegible] EUMONT UNIT	131	G	12-20-37	5-12-76	SURFACE	820 PSI	690 PSI	290 PSI	5 Bbls.	Water.
[illegible] EUMONT UNIT	915	K	2-20-37	5-12-76	SURFACE	435 PSI	0 PSI	220 PSI	-	Gas blew for 30 Sec., then Slight Blow.
[illegible] E. LAUGHLIN	2	K	4-20-37	5-13-76	SURFACE	400 PSI	50 PSI	50 PSI	-	Gas
[illegible] ANDERSON	2	I	8-20-37	5-13-76	INTERMED.	345 PSI	0 PSI	20 PSI	-	Gas Blew Off in 2 Min.
[illegible] STATE "E"	2	K	16-20-37	5-13-76	INTERMED.	980 PSI	150 PSI	900 PSI	7 Bbls.	Water.
[illegible] STATE "K"	1	K	13-20-36	5-13-76	INTERMED.	200 PSI	0 PSI	20 PSI	3 Bbls.	Water.
[illegible] STATE "A"	1	H	12-20-37	5-13-76	INTERMED.	200 PSI	0 PSI	100 PSI	TSTM	WATER. Blew off in 5 min.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: C. L. Wade, AREA SUPERINTENDENT

COMPANY GETTY OIL COMPANY

P.O. Box 249

Hobbs, New Mexico 88240

RBS/bh
5-18-76

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY El Paso Natural Gas Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-Blow)
Shell State	11	C	13-20-36	5-24-76	Surf. 8 5/8	160#	0	0	0	Blew to 0 psi in approx. 5 seconds.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: C. D. Bynum

COMPANY El Paso Natural Gas Company

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY W. K. Byrom

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. H. Williams	2	O	34-19-37	5-19-76	85/8	700	0	70	1/8"stream	Salt Water
Williams	3	N	34-19-37	5-19-76	85/8	400	0	0	1/8"stream	Salt Water
J. W. Cooper C (Eumont)	3	B	3-20-37	5-19-76	85/8	100	0	0	1/8"stream	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W. K. Byrom

COMPANY W. K. Byrom

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY W. K. Byrom

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. H. Williams	2	O	34-19-37	5-19-76	85/8	700	0	70	1/8"stream	Salt Water
Williams	3	N	34-19-37	5-19-76	85/8	400	0	0	1/8"stream	Salt Water
J. W. Cooper C (Eumont)	3	B	3-20-37	5-19-76	85/8	100	0	0	1/8"stream	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W. K. Byrom

COMPANY W. K. Byrom

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Marathon Oil Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Martha Barter	2	C	5-20S-37E	5-25-76	9-5/8"	110	45	140	11 Gallons	1 Gallon oil; 10 Gallons water
	4	K	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	5	D	5-20S-37E	5-25-76	9-5/8"	400	0	175	3 Gallons	3 Gallons oil
	6	L	5-20S-37E	5-25-76	9-5/8"	360	50	90	4 Barrels	4 Barrels oil
	7	I	5-20S-37E	5-25-76	9-5/8"	600	100	195	2.5 Barrels	2.5 Barrels oil
	8	E	5-20S-37E	5-25-76	9-5/8"	5	0	0	No Fluid	
	9	E	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	10	L	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	11	D	5-20S-37E	5-25-76	8-5/8"	5	0	40	No Fluid	
	12	L	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
J.R. Laughlin	1	E	9-20S-37E	5-25-76	9-5/8"	50	0	20	.5 Barrel	.5 Barrel oil
	2	F	9-20S-37E	5-25-76	9-5/8"	525	25	210	1 Barrel	.5 Barrel oil; .5 Barrel water
	3	G	9-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
Hansen State	1	B	16-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	2	G	16-20S-37E	5-25-76	9-5/8"	800	795	860	21 Barrels	21 Barrels water(salt)
	5	H	16-20S-37E	5-25-76	8-5/8"	0	0	0	No Fluid	
	6	G	16-20S-37E	5-25-76	10-3/4"	560	45	120	2 Barrels	2 Barrels oil & drilling mud

* Slight Puff

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

NAME: Doyle Skinner

COMPANY Marathon Oil Company

Secondary Recovery for 1958

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. SB
CASE 5941

COUNTY	PROJECT & OPERATOR	PRODUCING FORMATION	AVERAGE DEPTH	NUMBER ACRES	AVG. PAY THICKNESS	AVG. PSI	NO. INJ. WELLS	NO. PROD. WELLS	CUMULATIVE GA - WATER INJECTION	CUMULATIVE GAS-WATER PRODUCTION	CUMULATIVE OIL PROD. FOR PROJ.	CUMULATIVE OIL RECOV. PER ACRE	DATE PROJECT STARTED
Lea	LANGLIE MATTIX (continued) Gulf Coast Western Oil Company	Y-SR-Q	3300	360	72	2200	3	6	796,051w	9,945w	10,658	29.60	2/58
	Humble Oil & Refining Co.	Y-SR-Q	3300	240	72	919	1	5	243,744w	✓ ?	6,968	29.03	6/57
	Skelly Oil Company	Y-SR-Q	3300	240	30-70	1175	2	4	793,220w	10,148w	24,699	102.91	1/58
Edd-	LOCO HILLS Natomt Oil Company	GB-SA	2815	320	40	203	6	7	106,173w		2,489	7.77	11/58
	Operating Committee Press.Maint.Progrm	GB-SA		NA		NA		176	NA	NA	15,194,403		1/41
Lea	MALJAMAR Mewanee Oil Company	GB-SA	4200	480	55	1614	4	14	435,717w 1,461,018g	7,559w 465,543g	151,927	316.5	7/58w
	Maljamar Coop. Repress.	GB-SA	3800	7840	30	NA	35	197	*	20,312,737g	31,292,048	3,991.3	1/53
	Mewanee & Maljamar Coop. new l project			8320			39	211	*85%	20,778,280g	31,443,975	3,779.32	
	*85% gas produced returned to formation.15% gas used for lease use and flared-per Engineering Report.												
Lea	PENROSE SKELLY Socony Mobil Oil Co.	GB-Queen	3680	120	15	925	1	2	762,055w	21,797w	26,037	30.9	/50
Eddy	RED LAKE Hersey & Company Red Lake Premier Ut.	Grayburg	1900	1320	14	875	13	31	1,363,709w	63,374w	77,806	58.94	6/55
Eddy	RUSSELL Neil H. Wills	Yates-ss	775	6[illegible]	12	596	25	29	2,859,096w	623,242w	40[illegible],5 8	675.89	4/53
Eddy	NORTH SHUGART Maxwell Oil Company	Queen-ss	3500	240	22	1600	1	6	293,806w	16,038w	137,750	573.95	4/52
Eddy	SQUARE LAKE Ambassador Oil Corp.	GB-SA	3500	520	22	700	6	7	114,041w		6,982	13.42	2/58

C O N T E N T S

(1) Progress Report

(2) Report Given at Last Meeting in Santa Fe

(3) CITGO - State C-103

(4) Minutes of Meetings and Supporting Data

OCC Ex 5A
Ca 5941

PROGRESS REPORT

EUNICE AREA WATERFLOW COMMITTEE

DISCUSSION OF ACTIVITIES

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee was to collect, analyze data and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of thirteen wells were initially shut-in for observation. The wells consisted of 5 injection wells, 6 producing wells, 1 shut-in producing well and 1 disposal well. Due to a slight pressure drop on the Citgo-State No. 1, the closest and most significant monitor point, two additional wells were shut-in. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure on the shut-in injection wells had decreased substantially below readings on monitor points and with virtually no change in recorded pressure on the Citgo well. The Committee recommended to the NMOCC that injection be resumed into the injectors, and plans be made to "blow-down" the pressured up salt section in the Citgo-State No. 1. Thoughts at this time were to discontinue cycling, and attempt to determine if we were dealing with a localized or widespread pressure problem. The NMOCC felt that cycling and monitoring should be continued because it appeared that one of the other study groups was making some headway through this procedure. An alternate recommendation was made to the NMOCC at

this time. Injection wells with approximately 700# wellhead pressure or less be reactivated and cycling expanded to take in more injectors. The NMOCC agreed to this proposal and this procedure was implemented. During all the monitoring and cycling, the pressure on the Citgo-State well had remained practically constant at 1150#.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976 meeting that (1) injectors which are high pressure and low volume, and (2) those which have shown little or no pressure variation during shut-in be backflowed and tested, in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and buildup procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 barrels per day or less, shut the well in for pressure build-up. If pressure does not build up past 800# in 48 hours, return the well to injection". From this time forward, wells were checked for pressure drop, back-flowed, (rates and pressures monitored) and buildups ran following backflow. Upon recommendation from the Committee and approval from the NMOCC, wells were returned to injection as warranted by results.

At the Committee meeting on August 26, 1976, approval was given by the NMOCC to suspend the present testing procedure and go ahead with plans to backflow the Citgo-State. Fourteen Skelly and Anadarko wells were to be shut-in one week prior to backflow. On September 19, 1976, backflowing of the Citgo-State well was begun. At time of opening, the well had 1010# on surface. After

60 hours well had flowed back approximately 40,000 barrels of 9.9# brine. Initial flowing pressure was 210# at a rate of 9 BPM. After 60 hours flow pressure had decreased to 70# and rate was approximately 2 - 3 BPM. During the ten day flowing period, the well flowed back an estimated 63,000 barrels. The fourteen wells were closely monitored during backflow with pressure recorders. No pressure interference was noted on any of the wells. As soon as pressure and flow rate would permit, Petro-Search re-entered, plugged and abandoned the well.

The test wells were later returned to injection and monitoring discontinued, with the exception of 4 wells which had previously shown bradenhead pressures. These wells still have pressure recorders attached and have consistently fell off in pressure since backflowing of the Citgo-State and return to injection of surrounding wells. These wells are: Skelly Penrose "A" Water Injection Well No. 38 from 275# to 45#; Skelly Penrose "A" No. 44 from 725# to 95#; Skelly Penrose "B" No. 54 from 90# to vacuum and Skelly Penrose "B" No. 52 from 120# to 65#. Subsequent work of the Committee has consisted of re-evaluating all available temperature and tracer logs in the area and analyzing new logs as they become available.

Wells which had abnormal temperature gradients have been, and are being re-logged to confirm data as interpreted from previous logs. Several noise logs have been and are now being run.

Skelly recently perforated the Skelly Penrose "A" No. 64 at 1460' opposite a water flow which was encountered during drilling of the well approximately 2 years ago. Prior to perforating, the well was producing 9 BO and 40 BW per day. Current producing rate is 8 BO and 43 BW per day.

On January 14, 1977, a noise log was ran on the Skelly J. V. Baker No. 11 in an attempt to determine if cycling was occuring between Anadarkos' injection Well No. 13-C7 and the J. V. Baker No 11, which is a Drinkard producer. It appeared that possibly water which was being injected into the Penrose section might be channelling across to the Baker Well and moving up and back to the injection well. No upward or downward movement adjacent to the injection zone was indicated by the log, however, an increase in noise intensity was noted from 920' to 1430', which could be indicative of water migration. Logs ran during 1975 on the Anadarko well had shown possible migration across the salt section. Recent logging by two different companies have failed to confirm this. At present the well is operating at reduced pressure and rates, but still has approximately a 20 BWPD flow out the bradenhead.

CONCLUSION

(1) All wells drilled in the area have surface pipe set at regulatory agency approved depth and there is no evidence of surface water being contaminated at this time.

(2) Some formation shallower than the waterflood objective formation contains pressured salty water in certain areas within the area of investigation.

(3) Testing and investigations, to date, have failed to identify the water source

(4) Previous surveys which indicated anomalies or temperature variations have proven difficult to confirm from recent surveys.

RECOMMENDATIONS

(1) Attempt to blow-down "salt section" through selected wells.

(2) Record pressure and volume before, during and after "blow-down" operation. Continue to monitor for a sufficient length of time to determine if "salt section" is being re-pressured.

(3) Continue periodic injection well surveys to determine distribution of injected water. Conduct necessary remedial operations to confine water to unitized interval.

(4) Continue committee efforts to determine & eliminate source of pressured water.

(5) In order to prevent masking data from "blow-down" no further restrictions be imposed on injection operations, until "blow-down" operations are complete and results are evaluated.

RECENTLY RUN SURVEYS - EUNICE AREA

Skelly Oil Company

J. V. Baker #11
Skelly Penrose "A" #26
Skelly Penrose "A" #28
Skelly Penrose "A" #34

Anadarko Production Company

Langlie Mattix Penrose Sand Unit #34-4
Langlie Mattix Penrose Sand Unit #27-1
Langlie Mattix Penrose Sand Unit #13-B-2
Langlie Mattix Penrose Sand Unit #40-1
Langlie Mattix Penrose Sand Unit #13-C7
Langlie Mattix Penrose Sand Unit #1-2
Langlie Mattix Penrose Sand Unit #8-1
Langlie Mattix Penrose Sand Unit #7-1
Langlie Mattix Penrose Sand Unit #7-3
Langlie Mattix Penrose Sand Unit #13-A1
Langlie Mattix Penrose Sand Unit #13C-5
Langlie Mattix Penrose Sand Unit #15-2
Langlie Mattix Penrose Sand Unit #17-1
Langlie Mattix Penrose Sand Unit #21-2

REPORT OF N.M.O.C.C. APPOINTED SUB-COMMITTEE ASSIGNED TO STUDY WATER FLOWS IN AND AROUND THE EUNICE AREA

In March, 1976, the N.M.O.C.C. called a meeting for April 8, 1976 of operators from the Southeast Lea County area " to discuss water flows which have developed in and around several waterfloods and disposal systems in Lea County." At this meeting it was pointed out that the waterflow problems were much more widespread than earlier thought; and that measures in the original problem area had contained, but not eliminated the problem, an industry committee was designated to investigate these problems.

On April 13, 1976, the industry committee met in Hobbs, New Mexico. Sub-committees were formed to study: (1) Injection pressures to be allowed in waterfloods and disposal wells, and to determine if injection volume/fluid withdrawal ratios can be used as a tool to determine problems in waterfloods. (2) Measures to deal with problems of pressured up salt section and shallow zones. (3) To determine what information is required to monitor waterfloods, and (4) To determine what data is necessary before a new waterflood can be approved. These sub-committees reported back to the industry committee on April 20, 1976, and were then dissolved. Three committees were then appointed to develop recommendations on an area basis to implement the ideas advanced by the prior sub-committees. One of the three appointed committees was designated to study the Eunice Area. This committee is chaired by Skelly and is made up of representatives from Gulf, Anadarko, Arco, Reserve, and AGUA, Inc.

The Eunice area committee became operational on May 10, 1976 and has met at weekly intervals there-after to collect, analyze data, and present recommendations to the N.M.O.C.C. District Supervisor on measures considered pertinent to developing data on the waterflow problem in this area and to locating source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use, these wells were:

Skelly Penrose "A" Unit		
# 26-J	3-23-37	Water injection well
# 23-F	3-23-37	Water injection well
# 13-B	3-23-37	Water injection well
# 40-P	3-23-37	Water injection well
Anadarko Langlie Mattix Penrose Sand Unit		
# 3-P	34-22-37	Water injection well
Morenco		
# 36-1K	36-22-37	Producing well
Petro-Search		
Citgo-St. # 1-E	2-23-37	Producing well S.I.
Fluor # 1-M	35-22-37	Producing well
Gulf St. # 2-F	2-23-37	Producing well
Summit Energy, Inc.		
Gulf St. # 1-F	36-22-37	Producing well
Gulf Sims # 1-P	25-22-37	Producing well
Texas Pacific Oil Co.		
Ella Drk. # 2-E	25-22-37	Producing well

AGUA, Inc.
Hinebry-Drk. # 35-H 35-22-37 SWD well

The four Skelly and one Anadarko wells were to be shut in during the monitoring period, with pressure recorders attached to the injection well-head.. The producing and disposal well were also to have pressure recorders attached. All concerned operators were notified by telephone or letter, seven day recorders were installed. Due to a slight pressure drop on the Petro-Search Citgo-State no. 1, Skelly water injection wells no. 28-L and 38-N were subsequently shut in and pressure recorders attached.

Pressure recorders were used to monitor performance on the initially shut in wells until June 17, 1976. Pressure at that time on the shut in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the salt section. Daily production from the Skelly Penrose "A" Unit decreased from 846 to 824 BOPD during this period. The committee recommended that the six shut in Skelly and one Anadarko wells be returned to injection and an attempt be made to "blow down" the pressured salt section through the Citgo-State no. 1. This procedure would relieve pressure on the wellhead and provide information as to whether or not the pressure might be localized or widespread. The N.M.O.C.C. was not in agreement with this proposal and felt that the shut in wells remain shut-in.

During the week of June 17th to June 24th, five additional Skelly water injection wells (nos. 42-B, 44-D, 36-P, 21-H and 12-N) and Anadarko 4-H and 1-J were shut in and pressure recorders attached. Reason for the additional installations was to extend the test area out to take in another row of wells.

A meeting between chairmen of the three study groups and members of the N.M.O.C.C. from the Hobbs and Santa Fe office was held at 10:00 a.m. June 24th at the Hobbs office of the N.M.O.C.C. At this time the three study groups presented a review of progress being made in their respective areas. None of the groups had any definite answers to the problem at this time. General consensus was to continue cycling and testing as recommended and agreed to by the N.M.O.C.C. At this meeting the chairman of the Eunice Study Group requested that arrangements be made to backflow the Citgo-State well: Due to the fact that testing and cycling of wells to date had not provided the answer concerning communication between the shut in injection wells and the Citgo-State well.

At the July 1st meeting of the Eunice Study Group a request was made by the committee to the N.M.O.C.C. to permit a 24-48 hr. backflow of the monitor well in an effort to determine if a pressure-trapped condition might exist in the well. An alternate recommendation was made to the N.M.O.C.C., at this time: If they would not permit backflowing of the Citgo-State; then the injection wells with approximately 700# or less should be re-activated and recycling expanded to another row of injectors.

At the next committee meeting on July 8th, the N.M.O.C.C. reported that they felt the monitor well should not be backflowed or disturbed, at least for the time being, until more injectors in the area had been shut in and monitored. Jerry Sexton of the N.M.O.C.C. agreed to the following proposals by the committee: Return Skelly Penrose "A" Unit water injection wells no. 13, 26, 23, 38 and 28 to injection. Shut in and attach pressure recorders to Skelly Penrose "A" injection wells no. 2, 10, 17, 30, 32, 34, 46, 48, 50, 52, 61,

and Anadarko Langlie Mattix Penrose Sand Unit wells no. 21-7 and 36-1. This would extend the test area out to take in another complete row of injectors. Due to the larger pressure drop indicated by the Skelly injection well no. 28, a decision was made to leave the well shut in with pressure recorder attached. At this point in time it was felt by the committee that results from the testing had been inconclusive and no definite communication between the shut in injection wells and producing wells, temporarily abandoned wells or disposal well had been established.

At the committee meeting on July 15, 1976, further discussion took place concerning the feasibility of backflowing the high pressure low volume injectors which have shown little, if any, pressure variation during the shut in periods.

During the week of July 21st to July 28th, approximately 10 barrells of water was backflowed from the Citgo State well with no apparent pressure change.

A recommendation was made by the committee at the July 21st meeting that injection wells which are high pressure and low volume, and those which had shown little or no pressure variation during shut in be backflowed and tested, in a further attempt to determine if any communication exists between the concerned injection wells and the Citgo-State well.

Several wells were scheduled for backflow the following week: Skelly Penrose "A" no. 40, 42, 21, and 44. Anadarko Langlie Mattix Penrose Sand Unit no. 3-P and 4-H. Based on pressure response from shut-in, and results from backflowing and testing, the following wells were returned to injection status; Skelly Penrose "A" Unit nos. 12, 34, 36, 40, 42, 46. Anadarko wells nos. 37-3P, 36-4H. Wells to be shut in for observation with pressure recorders attached: Skelly Penrose "A" nos. 4, 8, 53, 55, 57. Skelly Penrose "B" nos. 17, 29, 40, 42. Anadarko Langlie Mattix Penrose Sand Unit 18-2, 19-2, 21-3, 21-2. Wells recommended to be backflowed and tested: Skelly Penrose "A" Unit nos. 21, 44, 50, 61, (the 9 5/8" and 7" to be checked individually on no 44.) Skelly Penrose "B" Unit no. 52. (casing and tubing tested individually.) Anadarko Langlie Mattix Penrose Sand Unit no. 36-1B.

From this time forward wells were checked for pressure drop, backflowed (rates and pressures monitored) and buildups ran following backflow. Data was gathered, charts were read and analyzed, other pertinent information was evaluated. Upon approval from the committee and the N.M.O.C.C., wells were returned to injection status as warranted by results from testing. Guidelines for the backflowing and buildup procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 bbls per day or less, shut the well in for pressure build up. If pressure does not build up past 800# in 48 hours then return the well to injection. Instructions will be given by the committee on wells that do not meet this guideline."

At the committee meeting on August 26, 1976 a decision was made, with approval of the N.M.O.C.C., to suspend the present testing procedure and shut in wells around the Citgo-State for pressure monitoring during backflow and drawdown of the well. Wells to be shut in 1 week prior to backflowing of the Citgo-State were: Skelly Penrose "A" no. 13, 23, 26, 40, 12, 21, 28, 38, 42 and 52. Skelly Penrose "B" no. 52. Anadarko tract 37-3P, 37-1J, 36-4H. All other wells were returned to injection. Date of re-shut down and installation of pressure recorders was August 31 (to allow 1 week for stabilization). Anticipated date of flow back of the Citgo-State was September 7, 1976.

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NEW MEXICO OIL CONSERVATION COMMISSION

Form C-103
Supersedes Old C-102 and C-103
Effective 1-1-65

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.: E-2387

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [X] GAS WELL [ ] OTHER- Temporarily Abandoned

7. Unit Agreement Name: -

2. Name of Operator: Petro-Search, Inc.

8. Farm or Lease Name: CITGO State

3. Address of Operator: 825 Petroleum Club Building, Denver, Colorado 80202

9. Well No.: 1

4. Location of Well: UNIT LETTER E, 2138 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE, SECTION 2 TOWNSHIP 23S RANGE 37E NMPM.

10. Field and Pool, or Wildcat: Langlie-Mattix SR

15. Elevation *(Show whether DF, RT, GR, etc.)*: 3301' GR 3311' RKB

12. County: Lea

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]		COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [X]
PULL OR ALTER CASING [ ]	CHANGE PLANS [ ]	CASING TEST AND CEMENT JOB [ ]	
OTHER [ ]		OTHER [ ]	

17. Describe Proposed or Completed Operations *(Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)* SEE RULE 1103.

The CITGO State #1 well was completed by Armer Oil Company, predecessor to Petro-Search, Inc., on 1-22-74 from Penrose sand perforations from 3568'-82' with a 24-hour pumping potential of 29 BO and 150 BW with estimated GOR 2000:1.

Because of a water flow in the salt section behind the 4-1/2" OD production casing in the subject well, no allowable was assigned by the NMOCC to the well until corrective action was taken to remedy this situation.

On the basis of a temperature survey ran on 2-8-74, a water flow was found to be entering the well bore behind the 4-1/2" OD production casing from 2470'-2500' and moving up the hole.

The 4-1/2" OD production casing was perforated at 2460' immediately above the water entry zone on 2-11-74, and after several unsuccessful attempts to squeeze the water flow zone with cement, braden head cement squeeze, cal-seal, sand, fix-mix, barite, etc. during February and early March, 1974, Western Company's Flow Control-1 was utilized on 3-7-74 to stop the movement of water up the hole behind the 4-1/2" OD production casing and to confine the water flow to the interval from 2470'-2500'.

Subsequent to the above workover, the NMOCC granted an allowable to the well on 3-15-74, and the well was placed on production on 3-27-74.

(Over)

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED C. W. Stumhoffer TITLE Agent DATE 10-4-76

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

The well was produced from the Penrose sand perforations from 3568'-82' until 11-26-75 when water suddenly broke inside of the 4-1/2" OD production casing. The well was shut-in after this water break-in, and well head pressure was recorded at 1185 psig.

An effort was made to pull the 3/4" rods and 2-3/8" OD tubing from the well during 12-75, but due to a water flow rate of an estimated 7-8 BPM at pressures of 1000 psig, this work was abandoned due to inadequate disposal equipment and facilities in the area.

Subsequent to the above work, the well has been shut-in and utilized as a monitor well to evaluate other work being done in the area to locate the source of this water flow.

By August, 1976, it was noted that (1) the source of this water flow had not been definitely located as indicated by the 1050 psig shut-in pressure on the CITGO State #1 well and (2) the CITGO State #1 well was beginning to leak around the well head. At this time, it was decided that the CITGO State #1 well should be plugged and abandoned.

With the approval of the NMOCC, a plastic-lined pit with a storage capacity of approximately 50,000 barrels was constructed adjacent to the CITGO State #1 well. This pit was for the purpose of flowing the well in an effort to reduce well head pressure and water flow rates to a point where the rods and tubing could be pulled before proceeding with plugging operations.

The well was opened to the pit at 7:00 pm MST 9-18-76. Initial flow rate was an estimated 9 BPM that declined to an estimated 1 BPM on 9-27-76 when a well service rig was moved onto well to attempt pulling the rods and tubing. During the ten-day flowing period, the well produced an estimated 63,000 barrels of 9.9# brine water.

On 9-28-76, the rods were startedout of the hole, but the 1-3/4" tubing pump hung in the 2-3/8" OD tubing at an approximate depth of 2500'. Rods unscrewed at the top of the pump while attempting to pull the pump through a tight place in the tubing, and all rods were recovered. Subsequent attempts to pull the 2-3/8" OD tubing were not successful, indicating that the 4-1/2" OD production casing had collapsed opposite the water flow zone from 2470'-2500'.

With telephone approval from Mr. Jerry Sexton, District Director of the NMOCC in Hobbs, New Mexico, the 2-3/8" OD tubing was cut off at 2468' - 18' above tight place inside of 2-3/8" OD tubing at 2486' - and pulled, and the well was plugged with 1,000 sacks of Class C cement with 2% CaCl pumped down 4-1/2" OD production casing with job completed at 5:25 pm MST 9-28-76. Top of cement inside of 4-1/2" OD production casing was found at 280' by wireline measurement at 9:00 am MST 9-29-76.

Marker has been placed on well, location has been cleared, and 50,000-barrel pit will be back-filled when water has been disposed.

SKELLY OIL COMPANY

May 11, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 A.M. May 10, 1976. Purpose of this meeting was to evaluate data which has been submitted by operators in the vicinity, and to determine and select monitor points for study.

After analyzing data on all wells which appeared to have possible value as monitor points, 13 wells were selected for the initial phase, these wells are as follows:

Skelly Penrose "A" Unit			
	# 26-J	3-23-37	Water Injection Well
	# 23-F	3-23-37	" " "
	# 13-B	3-23-37	" " "
	# 40-P	3-23-37	" " "
Anadarko Langlie Mattix Penrose Sand Unit			
	# 3-P	34-22-37	Water Injection Well
Moranco			
	# 36-1K	36-22-37	Producing Well
Petro-Search			
Citgo St.	# 1-E	2-23-37	Producing Well
Flour	# 1-M	35-22-37	" "
Gulf St.	# 2-F	2-23-37	" "
Summit Energy, Inc.			
St.	# 1-F	36-22-37	Producing Well
Gulf Sims	# 1-P	25-22-37	" "
Texas Pacific Oil Co.			
Ella Drk.	# 2-E	25-22-37	Producing Well (T.A.)
Agua, Inc.			
Blinebry-Drk.	# 35-H	35-22-37	Salt Water Disp. Well

The four Skelly and one Anadarko wells will be shut in during the monitoring period, with pressure recorders attached to the injection well head. The producing and disposal wells will have recorders attached. Bradenhead pressures will be monitored on the producers and injection pressure monitored on the Petro-Search # 1-M and surface pressure monitored on the shut-in Agua Disposal well. Plans are to install pressure recorders and begin monitoring of the 13 wells at 9:00 A.M. on May 19, 1976. The N.M.O.C.C. will notify all concerned operators by telephone or letter. Seven day recorders will be installed on the wells and they will be checked daily by a N.M.O.C.C. representative from the Hobbs office of the N.M.O.C.C.

Another meeting of the "Eunice Area Sub-Committee" will be called when sufficient data becomes available for evaluation.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

9:30 A.M. May 10, 1976 - Skelly's Hobbs Office

Name	Co.	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Elmer Teel	Texas Pacific	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
J. D. Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Erd Johnson	Reserve O & G	Midland, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
L. C. Hudry	Arco	Hobbs, New Mexico

Meeting adjourned at 3:00 P.M. May 10, 1976

May 27, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 A.M. May 27, 1976. Purpose of the meeting was to analyze pressure data which was furnished by operators of the thirteen wells which have been selected by the committee for use as monitor points. The wells which were shut in and pressure data recorded and analyzed are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
120 hr. shut in, pressure at beginning 1850#, ending pressure 1200#
23-F 3-23-37 Water Injection Well
168 hr. shut in, pressure at beginning 1400#, ending pressure 750#
13-B 3-23-37 Water Injection Well
168 hr. shut in, pressure at beginning 1650#, ending pressure 1065#
40-P
120 hr. shut in, pressure at beginning 1750#, ending pressure 1670#
38-N 3-23-37 Water Injection Well
48 hr. shut in, pressure at beginning 1600#, ending pressure 1200#
28-L 3-23-37 Water Injection Well
48 hr. shut in, pressure at beginning 1550#, ending pressure 950#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in, pressure at beginning 1500#, ending pressure 1300#

Moranco

36-IK 36-22-37 Producing Well
168 hr. shut in, pressure at beginning 0#, ending pressure 0#

Petro-Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in, pressure at beginning 1150#, ending pressure ~~1125~~#
1-M Fluor 35-22-37 Producing Well
168 hr. shut in, pressure at beginning 600#, ending pressure 575#
2-F Gulf St. 2-23-37 S.W.D. Well
168 hr. shut in, pressure at beginning 150#, ending pressure 75#

Summit Energy, Inc.

1-F St. 36-22-27 Producing Well
168 hr. shut in, pressure at beginning 750#, ending pressure 725#
1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in, pressure at beginning 800#, ending pressure 800#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in, pressure at beginning 625#, ending pressure 625#

Agua, Inc.
35-H Blinebry-Drk. 35-22-37 S.W.D. Well
168 hr. shut in, pressure at beginning 200#, ending pressure 250#

A slight decrease in pressure was noted on the Petro-Search Citgo State # 1; this occurred between 6:00 PM Friday May 21, and 9:00AM Saturday May 22. A pressure drop of 75# occurred on the Petro-Search Gulf State # 2. Skelly Penrose "A" injection wells # 38-N and 28-L had been shut in for 48 hrs, from Wednesday morning to Friday morning. On Friday morning the recorders were removed and installed on Skelly Penrose "A" injection wells 26-J and 40-P. Due to the pressure drop occurring when it did, a decision was made by the committee to recommend installation of pressure recorders on the Skelly Penrose "A" injection wells 38-N and 28-L, this was concurred with by Les Clements of the N.M.O.C.C. Pressure recorders are now being attached. All previously listed monitor wells still have pressure recorders hooked up, plus the 2 additional Skelly wells. The charts will be removed at 9:00 AM on June 2, 1976 and will be submitted to the committee through the N.M.O.C.C.

Another meeting of the "Eunice Area Sub-Committee" has been called for Thursday June 3, 1976 at Skelly's Hobbs office. At that time charts will be studied and further recommendations made.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

Name	Company	Location
Bill Thomas (Chairman)	Skelly	Hobbs, New Mexico
W. G. Abbott	Agua, Inc.	Hobbs, New Mexico
Erd M. Johnson	Reserve O&G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

Meeting adjourned at 11:00 AM

June 3, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 AM June 3, 1976. Purpose of the meeting was to analyze pressure data which was furnished by operators of the fifteen wells on which pressure recorders are attached and are being monitored. The wells on which pressures were recorded and analyzed are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
1200# - 950#
Total shut in time since beginning of test 288 hrs.
initial pressure 1850#, ending pressure 950#

23-F 3-23-37 Water Injection Well
168 hr. shut in
750# - 640#
Total shut in time since beginning of test 336 hrs.
initial pressure 1400#, ending pressure 640#

13-B 3-23-37 Water Injection Well
168 hr. shut in
1065# - 910#
Total shut in time since beginning of test 336 hrs.
initial pressure 1650#, ending pressure 910#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1640# - 1600#
Total shut in time since beginning of test 288 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
120 hr. shut in
1720# - 1050#
Total shut in time since beginning of test 168 hrs.
initial pressure 1600#, ending pressure 1050#

28-L 3-23-37 Water Injection Well
120 hr. shut in
1625# - 650#
Total shut in time since beginning of test 168 hrs.
initial pressure 1550#, ending pressure 650#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1280# - 1200#
Total shut in time since beginning of test 336 hrs.
initial pressure 1500#, ending pressure 1200#

Moranco
36-IK 36-22-37 Producing Well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 336 hrs.
initial pressure 0#, ending pressure 0#

Petro-Search
1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1090#
Total shut in time since beginning of test 336 hrs.
initial pressure 1150#, ending pressure 1090#
1-M Fluor 35-22-37 Producing Well
168 hr. shut in
610# - 590#
Total shut in time since beginning of test 336 hrs.
initial pressure 600#, ending pressure 590#
2-F Gulf St. 2-23-37 Producing Well
168 hr. shut in
75# - 75#
Total shut in time since beginning of test 336 hrs.
initial pressure 150#, ending pressure 75#

Summit Energy, Inc.
1-F Gulf-St. 36-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 336 hrs.
initial pressure 750#, ending pressure 740#
1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
800# - 830#
Total shut in time since beginning of test 336 hrs.
initial pressure 800#, ending pressure 830#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 635#
Total shut in time since beginning of test 336 hrs.
initial pressure 625#, ending pressure 635#

Agua, Inc.
35-H 35-22-37 S.W.D. Well
168 hr. shut in
250# - 230#
Total shut in time since beginning of test 336 hrs.
initial pressure 200#, ending pressure 230#

Pressure recorders are still attached on all of the above mentioned wells, with exception of the Moranco well. The Committee feels this well can eliminated as a monitor point because no pressure response of any sort has been observed. Pressure response on all concerned wells was generally less than anticipated. Pressure charts will be removed at 9:00 AM on June 9, 1976 and will be submitted to the Committee thru the N.M.O.C.C.

Plans are to open up the Petro-Search Citgo State well at 1:00 PM on June 10th and flow at maximum rate for 2-3 hours, then choke the well back to 100 barrells per hour. Negotiations are now underway to see if an arrangement can be worked out between Skelly, Petro-Search and the N.M.O.C.C. whereby Skelly could dispose of the backflow water into their Skelly Penrose "A" Unit waterflood. Rate and pressure will be monitored on the Citgo State well, as well as the other wells, which already have recorders attached, to determine if and where any pressure communication does exist.

Another meeting of the "Eunice Area Sub-Committee" has been called for 9:30 AM on June 10, 1976, at which time another weeks run of pressure charts will be analyzed and evaluated.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

9:30 AM June 3, 1976 - Skelly's Hobbs office

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
Erd. M. Johnson	Reserve O & G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Elmer Teel	Texas Pacific Oil	Eunice, New Mexico
J. D. Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. V. Ryan Jr.	Agua	Hobbs, New Mexico
L. C. Rudry	Arco	Hobbs, New Mexico

Meeting adjourned at 11:00 AM June 3, 1976

June 10, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met at Skelly"s office in Hobbs, New Mexico at 9:30 AM June 10, 1976. Pressure charts were read and data evaluated.

Pressure data from the wells are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
950# - 775#
Total shut in time since beginning of test 456 hrs.
initial pressure 1850#, ending pressure 775#

23-F 3-23-37 Water Injection Well
168 hr. shut in
640# - 575#
Total shut in time since beginning of test 504 hrs.
initial pressure 1400#, ending pressure 575#

13-B 3-23-37 Water Injection Well
168 hr. shut in
850# - 675#
Total shut in time since beginning of test 504 hrs.
initial pressure 1650#, ending pressure 675#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 456 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
168 hr. shut in
1050# - 900#
Total shut in time since beginning of test 336 hrs.
initial pressure 1600#, ending pressure 900#

28-L 3-23-37 Water Injection Well
168 hr. shut in
650# - 350#
Total shut in time since beginning of test 336 hrs.
initial pressure 1550#, ending pressure 350#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1200# - 1050#
Total shut in time since beginning of test 504 hrs.
initial pressure 1500#, ending pressure 1050#

Petro- Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 504 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing Well
168 hr. shut in
590# - 560#
Total shut in time since beginning of test 504 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
75# - 25#
Total shut in time since beginning of test 504 hrs.
initial pressure 150#, ending pressure 25#

Summit Energy, Inc.

1-F Gulf-St. 36-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 504 hrs.
initial pressure 750#, ending pressure 740#

1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
750# - 740#
Total shut in time since beginning of test 504 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 635#
Total shut in time since beginning of test 504 hrs.
initial pressure 625#, ending pressure 635#

Agua, Inc.

35-H 35-22-37 S.W.D. Well
168 hr. shut in
230# - 275#
Total shut in time since beginning of test 504 hrs.
initial pressure 200#, ending pressure 275#

Pressure recorders are still attached on all of the above wells. A letter has been mailed to Petro-Search from the N.M.O.C.C., requesting that they contact Skelly to work out an arrangement whereby Skelly may dispose of backflow water from their Citgo-State No. 1. Weter breakthrough occurred on the Skelly Penrose "B" Unit well No. 52-F on Wednesday of this week, flow is from the 8 5/8 and 5 1/2 annulus. A dual pen recorder is now being hooked up on the well, to monitor tubing and bradenhead pressure, the chart will be removed next Wednesday and submitted, through the N.M.O.C.C., to the committee for evaluation.

Another meeting of the "Eunice Area Sub-Committee" has been set for 9:30 AM on June 17, 1976, at which time another weeks run of pressure charts will be analyzed and evaluated.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Jimmie Christner	Anaderko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
Clarence R. Chandler	Reserve O & G	Midland, Texas
J. V. Ryan Jr.	Agua	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

Meeting adjourned at 10:30 AM June 10, 1976

June 17, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met at Skelly's office in Hobbs, New Mexico at 9:30 AM June 17, 1976. Pressure charts were read and data evaluated. Pressure from charts are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
775# - 650#
Total shut in time since beginning of test 624 hrs.
initial pressure 1850#, ending pressure 650#

23-F 3-23-37 Water Injection Well
168 hr. shut in
575# - 510#
Total shut in time since beginning of test 672 hrs.
initial pressure 1400#, ending pressure 510#

13-B 3-23-37 Water Injection Well
168 hr. shut in
675# - 560#
Total shut in time since beginning of test 672 hrs.
initial pressure 1650#, ending pressure 560#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 624 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
168 hr. shut in
900# - 775#
Total shut in time since beginning of test 504 hrs.
initial pressure 1600#, ending pressure 775#

28-L 3-23-37 Water Injection Well
168 hr. shut in
350# - 175#
Total shut in time since beginning of test 504 hrs.
initial pressure 1550#, ending pressure 175#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1050# - 1050#
Total shut in time since beginning of test 672 hrs.
initial pressure 1500#, ending pressure 1050#

Petro-Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 672 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing Well
168 hr. shut in
560# - 560#
Total shut in time since beginning of test 672 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
25# - 25#
Total shut in time since beginning of test 672 hrs.
initial pressure 150#, ending pressure 25#

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing Well
168 hr. shut in
740# - ? recorder malfunction
Total shut in time since beginning of test 672 hrs.
initial pressure 750#, ending pressure ?

1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 672 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 640#
Total shut in time since beginning of test 672 hrs.
initial pressure 625#, ending pressure 640#

Agua, Inc.

35-H 35-22-37 S.W.D. Well
168 hr. shut in
275# - 275#
Total shut in time since beginning of test 672 hrs.
initial pressure 230#, ending pressure 275#

Pressure recorders are to be removed Friday morning from the Skelly Penrose "A" Unit wells no. 26-J, 23-F, 13-A, 40-P and 38-N, guages will be installed for monitoring pressure. Due to the larger pressure drop shown by the Skelly Penrose "A" well no. 28-L, the pressure recorder will be left in place.

To date results from testing have been inconclusive as to establishing any definite communication between the shut in injection wells and producing wells.

Plans are to extend the testing out and shut in the next row of water injection wells. Additional wells to be shut in are; Skelly Penrose "A"

Unit wells no. 42, 44, 36, 21 and 12, Anadarko Langlie Mattix Penrose Sand Unit injection wells no. 4-H and 1-J.

Another meeting of the "Eunice Area Sub-Committee" has been set for 8:00 AM on June 24, 1976, at which time pressure charts will be analyzed and evaluated. A meeting of the three Area Committee Chairmen and Mr. Joe Ramey, Secretary-Director of the N.M.O.C.C is scheduled for 10:00 AM Thursday June 24, 1976 at the Hobbs office of the N.M.O.C.C.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
J. V. Ryan, Jr.	Agua	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
L. C. Hudry	Arco	Hobbs, New Mexico
Erd M. Johnson	Reserve O & G	Midland, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

Meeting adjourned at 11:30 AM June 17, 1976

June 24, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committe" met at Arco's office in Hobbs, New Mexico at 8:00 AM June 24, 1976. Pressure charts were read and data evaluated. Five Skelly Penrose "A" Unit waterflood injection wells and two Anadarko injection wells were shut in during the past week. The Skelly wells are: 42-B, 44-D, 36-P, 21-H, and 12-N. The Anadarko wells are 4-H and 1-J. Pressure and changes from charts and gauges are as follows.

Skelly Penrose "A" Unit

26-J 3-23-37 Water injection well
168 hr. shut in
650# - 525#
Total shut in time since beginning of test 792 hrs
initial pressure 1850#, ending pressure 525#

23-F 3-23-37 Water injection well
168 hr. shut in
510# - 450#
Total shut in time since beginning of test 840 hrs.
initial pressure 1400#, ending pressure 450#

13-B 3-23-37 Water injection well
168 hr. shut in
560# - 500#
Total shut in time since beginning of test 840 hrs.
initial pressure 1650#, ending pressure 560#

40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 792 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water injection well
168 hr. shut in
775# - 750#
Total shut in time since beginning of test 672 hrs.
initial pressure 1600#, ending pressure 750#

28-L 3-23-37 Water injection well
168hr. shut in
175# - 35#
Total shut in time since beginning of test 672 hrs
initial pressure 1550#, ending pressure 35#

42-B 10-23-37 Water injection well
114 hr. shut in
1850# - 1675#
Total shut in time since beginning of test 114 hrs.
initial pressure 1850#, ending pressure 1675#

44-D 10-23-37 Water injection well
116 hr. shut in
1775# - 1600#
Total shut in time since beginning of test 116 hrs.
initial pressure 1775#, ending pressure 1600#

36-P 4 23-37 Water injection well
117 hr. shut in
1800# - 1400#
Total shut in time since beginning of test 117 hrs.
initial pressure 1800#, ending pressure 1400#

21-H 4-23-37 Water injection well
115 hr shut in
1850# - 1700#
Total shut in time since beginning of test 115 hrs.
initial pressure 1850#, ending pressure 1700#

12-N 34-22-37 water injection well
113 hr shut in
1600# - 1020#
Total shut in time since beginning of test 113 hrs.
initial pressure 1600#, ending pressure 1020#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 water injection well
168 hr shut in
1050# - 1050#
Total shut in time since beginning of test 840 hrs.
initial pressure 1500#, ending pressure 1050#

4-H 34-22-37 Water injection well
121 hr. shut in
1625# - 1275#
Total shut in time since beginning of test 121 hrs.
initial pressure 1625#, ending pressure 1275#

1-J 34-22-37 Water injection well
121 hr. shut in
1280# - 1120#
Total shut in time since beginning of test 121 hrs.
initial pressure 1280#, ending pressure 1120#

Petro Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 840 hrs
initial pressure 1150#, ending pressure 1140#

1-M Flour 35-22-37 Producing well
168 hr. shut in
560# -560#
Total shut in time since beginning of test 840 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
25# - 0#
Total shut in time since beginning of test 840 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing well
168 hr. shut in
Chart not availeble
Total shut in time since beginning of test 840 hrs.
initial pressure 750#, ending pressure?

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
740# - Chart not available
Total shut in time since beginning of test 840 hrs.
initial pressure 800#, ending pressure?

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
640# - 625#
Total shut in time since beginning of test 840 hrs
initial pressure 625#, ending pressure 625#

Agua Inc.
35-H 35-22-37 S.W.D. well
168 hr. shut in
275# - 275#
Total shut in time since beginning of test 840 hrs.
initial pressure 230#, ending pressure 275#

Skelly Penrose "B" Unit # 52 Injection well
has been shut in for approximately
360 hrs. has 350# on casing
and 1150# on tubing

Pressure recorders removed from Skelly Penrose "A" Water Injection Wells nos. 26, 23, 13, 40 and 38 and pressure gauges installed. The recorders were installed on Skelly Penrose "A" injection wells nos. 42, 44, 36, 21 and 12. Pressure recorders were also put on Anadarko injection wells nos. 4-H and 1-J. Reason for the additional installations was to extend the test area out to take in another row of wells. A meeting between chairmen of the study groups and members of the N.M.O.C.C. from the Hobbs and Santa Fe office was held at 10:00 A.M. June 24 at the Hobbs office. The three Study Groups presented a review of progress being made in their respective areas. None of the Study Groups have come up with any definite answers and plans are to continue cycling and testing as recommended and agreed to by the N.M.O.C.C. The Eunice Group requested that the N.M.O.C.C. request that Petro-Search make arrangements to backflow their Citgo - State No. 1 well. Testing to date has been inconclusive as to establishing communication between any of the shut in injection wells and the Citgo - State well. Another meeting of the Eunice Area sub-committee is scheduled for 10:00 AM July 1, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs
Val Ryan	Agua	Hobbs
Herb Henderson	Anadarko	Eunice
Jimmie Christner	Anadarko	Houston
Clarence Chandler	Reserve O&G	Midland
L.C. Hudry	Arco	Hobbs
Jim Gibson	Gulf	Hobbs

July 1, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 10:00 a.m. July 1, 1976. Pressure charts were read and data evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

#26-J 3-23-37 Water injection well
168 hr. shut-in
525# - 450#
Total shut-in time since beginning of test 960 hrs.
initial pressure 1850#, ending pressure 450#

#23-F 3-23-37 Water injection well
168 hr. shut-in
450# - 400#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1400#, ending pressure 400#

#13-B 3-23-37 Water injection well
168 hr. shut-in
500# - 430#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1650#, ending pressure 430#

#40-P 3-23-37 Water injection well
168 hr. shut-in
1600# - 1600#
Total shut-in time since beginning of test 960 hrs.
initial pressure 1750#, ending pressure 1600#

#38-N 3-23-37 Water injection well
168 hr. shut-in
750# - 650#
Total shut-in time since beginning of test 840 hrs.
initial pressure 1600#, ending pressure 650#

#28-L 3-23-37 Water injection well
168 hr. shut-in
35# - 20" vacuum
Total shut-in time since beginning of test 840 hrs.
initial pressure 1550#, ending pressure 20" vacuum

#42-B 10-23-37 Water injection well
168 hr. shut-in
1675# - 1675#
Total shut-in time since beginning of test 282 hrs.
initial pressure 1850#, ending pressure 1675#

#44-D 10-23-37 Water injection well
168 hr. shut-in
1600# - 1575#
Total shut-in time since beginning of test 284 hrs.
initial pressure 1775#, ending pressure 1575#

#36-P 4-23-37 Water injection well
168 hr. shut-in
1400# - 1175#
Total shut-in time since beginning of test 285 hrs.
initial pressure 1800#, ending pressure 1175#

#21-H 4-23-37 Water injection well
168 hr. shut-in
1700# - 1725#
Total shut-in time since beginning of test 283 hrs.
initial pressure 1850#, ending pressure 1725#

#12-N 34-22-37 Water injection well
168 hr. shut-in
1020# - 950#
Total shut-in time since beginning of test 281 hrs.
initial pressure 1600#, ending pressure 950#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water injection well
168 hr. shut-in
1050# - 1050#
Total shut-in time since beginning of test 1008 hrs.
iniital pressure 1500#, ending pressure 1050#

4-H 34-22-37 Water injection well
168 hr. shut-in
1275# - 1200#
Total shut-in time since beginning of test 289 hrs.
initial pressure 1625#, ending pressure 1200#

1-J 34-22-37 Water injection well
168 hr. shut-in
1120# - 1020#
Total shut-in time since beginning of test 289 hrs.
initial pressure 1280#, ending pressure 1020#

Petro Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut-in
1140# - 1140#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Flour 35-22-37 Producing well
168 hr. shut-in
560# - 560#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing well
168 hr. shut-in
0# - 100#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 150#, ending pressure 100#.

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing well
168 hr. shut-in
750# - 750# (Pressure variations indicated during day)
Total shut-in time since beginning of test 1008 hrs.
initial pressure 750#, ending pressure 750#
(N.M.O.C.C. to check for reasons for pressure variations. Looks like possible pump action for SWD).

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut-in
760# - 760#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 800#, ending pressure 760#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut-in
655# - 630#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 625#, ending pressure 630#

Agua, Inc.
#35-H 35-22-37 SWD well
168 hr. shut-in
310# - 310#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 230#, ending pressure 310#

Skelly Penrose "B" Unit #52 Injection well
168 hrs. shut-in
has been shut-in for approximately
528 hrs. has 300# on casing
and 1100# on tubing

The Eunice group restated recommendation that injection wells where pressure had declined to 600-700# range or less be returned to active status since no variation in pressure was noted at the monitoring point. Request was restated that the N.M.O.C.C. request Petro-Search to make arrangements to backflow their Citgo-State No. 1 well for 24-48 hours to determine if a pressure-trapped condition exists in this well. Recommendation was made that if the N.M.O.C.C. will not permit flowing the Citgo-State No. 1 well; then the injection wells with 700# pressure or less should be re-activated and recycling expanded to another row of injectors. Mr. Sexton agreed to take this matter under advisement for discussion with Mr. Ramey and report back to the chairman by Wednesday, July 7, 1976. Another meeting of the Eunice Area Sub-committee is scheduled for 9:00 a.m. July 8, 1976, at Arco's Hobbs office.

O. V. Stuckey

O. V. Stuckey

OVS/ss

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
O. V. Stuckey (Chairman)	Skelly	Midland
Val Ryan	Agua	Hobbs
Herb Henderson	Anadarko	Eunice
Jimmie Christner	Anadarko	Houston
Clarence Chandler	Reserve O&G	Midland
L. C. Hudry	Arco	Hobbs
Clem Korzekna	Gulf	Hobbs
Jerry Sexton	N.M.O.C.C.	Hobbs

July 8, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 8, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

#26-J 3-23-37 Water injection well
168 hr. shut in
450# - 375#
Total shut in time since beginning of test 1128 hrs.
initial pressure 1850#, ending pressure 375#

#23-F 3-23-37 Water injection well
168 hr. shut in
400# - 350#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1400#, ending pressure 350#

#13-B 3-23-37 Water injection well
168 hr. shut in
430# - 325#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1650#, ending pressure 325#

#40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 1128 hrs.
initial pressure 1750#, ending pressure 1600#

#38-N 3-23-37 Water injection well
168 hr. shut in
650# - 575#
Total shut in time since beginning of test 1008 hrs.
initial pressure 1600#, ending pressure 575#

#28-L 3-23-37 Water injection well
168 hr. shut in
20" vacuum--22" vacuum
Total shut in time since beginning of test 1008 hrs.
initial pressure 1550#, ending pressure 22" vacuum

#42-B 10-23-37 Water injection well
168 hr. shut in
1675# - 1650#
Total shut in time since beginning of test 450 hrs.
initial pressure 1850#, ending pressure 1650#

#44-D 10-23-37 Water injection well
168 hr. shut in
1575# - 1550#
Total shut in time since beginning of test 452 hrs.
initial pressure 1775#, ending pressure 1550#

#36-P 4-23-37 Water injection well
168 hr. shut in
1175# - 1050#
Total shut in time since beginning of test 453 hrs.
initial pressure 1800#, ending pressure 1050#

#21-H 4-23-37 Water injection well
168 hr. shut in 1725# - 1750#
Total shut in time since beginning of test 451 hrs.
initial pressure 1850#, ending pressure 1750#

#12-N 34-22-37 Water injection well
168 hr. shut in
950# - 925#
Total shut in time since beginning of test 449 hrs.
initial pressure 1600#, ending pressure 925#

Anadarko Langlie Mattix Penrose Sand Unit
#3-P 34-22-37 Water injection well
168 hr. shut in
1050# - 1050#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1500#, ending pressure 1050#
#4-H 34-22-37 Water injection well
168 hr. shut in
1200# - 1100#
Total shut in time since beginning of test 457 hrs.
initial pressure 1625#, ending pressure 1100#
#1-J 34-22-37 Water injection well
168 hr. shut in
1020# - 900#
Total shut in time since beginning of test 457 hrs.
initial pressure 1280#, ending pressure 900#

Petro-Search
#1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1150#, ending pressure 1140#
#1-M Fluor 35-22-37 Producing well
168 hr. shut in
560# -560#
Total shut in time since beginning of test 1176 hrs.
initial pressure 600#, ending pressure 560#
#2-F Gulf State 2-23-37 Producing well
168 hr. shut in
100# - 0#
Total shut in time since beginning of test 1176 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.
#1-F Gulf State 36-22-37 Producing well
168 hr. shut in
750# - 750# (chart still showing pressure variations)
Total shut in time since beginning of test 1176 hrs.
initial pressure 750#, ending pressure 750#
(N.M.O.C.C. to check for reasons for pressure variation)
#1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
760# - 740#
Total shut in time since beginning of test 1176 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.
#2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1176 hrs.
initial pressure 625#, ending pressure 630#

Agua, Inc.
#35-H 35-22-37 SWD well
168 hr. shut in
310# - 310#
Total shut in time since beginning of test 1176 hrs.
initial pressure 230#, ending pressure 310#

Skelly Penrose "B" Unit
#52-F 9-23-37 Water injection well
168 hr. shut in
300# - 250# (casing)
1100# - 1040# (tubing)
Total shut in time since beginning of test 696 hrs.
casing -- ending pressure 250#
tubing -- ending pressure 1040#

Jerry Sexton met with the committee to discuss the N.M.O.C.C. position concerning a prior request of the committee that all injection wells in the test area that have declined to 600# - 700# range or less be returned to active injection status, as no apparent communication exists between such wells and the monitor well. A request had also been made by the sub-committee concerning a 24-48 hr. backflow of the Petro-Search Citgo-State no. 1 well, in an effort to determine if a pressure-trapped condition might exist in the well: The N.M.O.C.C. feels that this well should not be disturbed, at least for the time being, until more injectors in the area have been shut in and monitored.

Mr. Sexton agreed to the following proposals by the committee: Return Skelly Penrose "A" Unit injection wells no. 13, 26, 23, 38 and 28 to injection, well no. 28 will be surveyed as soon as injection has stabilized. Skelly Penrose "A" injection wells no. 2, 10, 17, 30, 32, 34, 46, 48, 50, 52, 61 and Anadarko Langlie Mattix Penrose Sand Unit wells no. 21-7 and 36-1 will be shut in and pressure recorders attached. This extends the test area out to take in another complete row of injectors. Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 15, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
O. V. Stuckey	Skelly	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
Erd M Johnson	Reserve O & G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W. G. Abbott	AGUA, Inc.	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

July 15, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 15, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water injection well
144 hr. shut in
375# - 360#
Total shut in time since beginning of test 1272 hrs.
initial pressure 1850#, ending pressure 360#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 890 BWPD at 1675# tubing pressure

23-F 3-23-37 Water injection well
144 hr. shut in
350# - 325#
Total shut in time since beginning of test 1320 hrs.
initial pressure 1400#, ending pressure 325#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 540 BWPD at 1400# tubing pressure

13-B 3-23-37 Water injection well
144 hr. shut in
325# - 275#
Total shut in time since beginning of test 1320 hrs.
initial pressure 1650#, ending pressure 275#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 625 BWPD at 1580# tubing pressure

40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 1296 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water injection well
144 hr. shut in
575# - 500#
Total shut in time since beginning of test 1152 hrs.
initial pressure 1600#, ending pressure 500#
well was returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 660 BWPD at 1550#

28-L 3-23-37 Water injection well
144 hr. shut in
22" vacuum - 22" vacuum
Total shut in time since beginning of test 1152 hrs.
initial pressure 1550#, ending pressure 22" vacuum
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 450 BWPD at 1500# tubing pressure

42-B 10-23-37 Water injection well
168 hr. shut in
1650# - 1640#
Total shut in time since beginning of test 618 hrs.
initial pressure 1850#, ending pressure 1640#

44-D 10-23-37 Water injection well
168 hr. shut in
1550# - 1550#
Total shut in time since beginning of test 620 hrs.
initial pressure 1775#, ending pressure 1550#
on July 10, 1976 at 2:00 p.m., water broke through the 9 5/8" X 7" casing annulus--immediate shut in pressure was 750#, estimated flow was 75 BWPD. On July 12, 1976 @ 10:00 a.m. a dual pen recorder was hooked up to this well--tubing pressure was 1550#, casing pressure was 660# July 14, 1976 (when chart was changed) had 1550# on tubing and 630# on casing.

36-P 4-23-37 Water injection well
168 hr. shut in
1050# - 925#
Total shut in time since beginning of test 621 hrs.
initial pressure 1800#, ending pressure 925#

21-H 4-23-37 Water injection well
168 hr. shut in
1750# - 1640#
Total shut in time since beginning of test 619 hrs.
initial pressure 1850#, ending pressure 1640#

12-N 34-22-37 Water injection well
168 hr. shut in
925# - 850#
Total shut in time since beginning of test 617 hrs.
initial pressure 1600#, ending pressure 850#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
250# - 240# (casing)
1040# - 1000# (tubing)
Total shut in time since beginning of test 864 hrs.
casing -- ending pressure 240#
tubing -- ending pressure 1000#

The following wells were shut in for observation on July 12 and 13: Skelly Pen. "A" U.

2-L 34-22-37 Water injection well
43 hr. shut in
1920# - 1830#
Total shut in time since beginning of test 43 hrs.
initial pressure 1920#, ending pressure 1830#

10-P 33-22-37 Water injection well
42 hr. shut in
1775# - 1540#
Total shut in time since beginning of test 42 hrs.
initial pressure 1775#, ending pressure 1540#

17-B 4-23-37 Water injection well
44 hr. shut in
1850# - 1750#
Total shut in time since beginning of test 42 hrs.
initial pressure 1850#, ending pressure 1750#

30-J 4-23-37 Water injection well
41 hr. shut in
1800# - 1700#
Total shut in time since beginning of test 41 hrs.
initial pressure 1800#, ending pressure 1700#

#32-L 4-23-37 Water injection well
40 hr. shut in
1790# - 1700#
Total shut in time since beginning of test 40 hrs.
initial pressure 1790#, ending pressure 1700#

#34-N 4-23-37 Water injection well
46 hr. shut in
1350# - 950#
Total shut in time since beginning of test 46 hrs.
initial pressure 1350#, ending pressure 950#

#46-B 9-23-37 Water injection well
47 hr. shut in
1350# - 1175#
Total shut in time since beginning of test 47 hrs.
initial pressure 1350#, ending pressure 1175#

48-H 9-23-37 Water injection well
45 hr. shut in
1725# - 1700#
Total shut in time since beginning of test 45 hrs.
initial pressure 1725#, ending pressure 1700#

#50-F 10-23-37 Water injection well
48 hr. shut in
1900# - 1625#
Total shut in time since beginning of test 48 hrs.
initial pressure 1900#, ending pressure 1625#

#52-H 10-23-37 Water injection well
27 hr. shut in
1900# - 1625#
Total shut in time since beginning of test 27 hrs.
initial pressure 1900#, ending pressure 1625#

#61-F 4-23-37 Water injection well
42 hr. shut in
1790# - 1675#
Total shut in time since beginging of test 42 hrs.
initial pressure 1790#, ending pressure 1675#

Anadarko Langlie Mattix Penrose Sand Unit

#3-P 34-22-37 Water injection well
168 hr. shut in
1050# - 910
Total shut in time since beginning of test 1344 hrs.
initial pressure 1500#, ending pressure 910#

#4-H 34-22-37 Water injection well
168 hr. shut in
1100# - 1020#
Total shut in time since beginning of test 625 hrs.
initial pressure 1625#, ending pressure 1020#

#1-J 34-22-37 Water injection well
168 hr. shut in
900# - 800#
Total shut in time since beginning of test 625 hrs.
initial pressure 1625#, ending pressure 800#

The following wells were shut in for observation on July 12, 1976: Anadarko (L.M.P.S.U.)

Tr 21-7F 34-22-27 Water injection well
40 hr. shut in
1700# - 1600#
Total shut in time since beginning of test 40 hrs.
initial pressure 1700#, ending pressure 1600#

Tr 36-1 B 34-22-37 Water injection well
40 hr. shut in
1500# - 1440#
Total shut in time since beginning of test 40 hrs.
initial pressure 1500#, ending pressure 1440#

Petro-Search
1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1344 hrs.
initial pressure 1150#, ending pressure 1140#
1-M Fluor 35-22-37 Producing well
168 hr. shut in
560# - 560#
Total shut in time since beginning of test 1344 hrs.
initial pressure 600#, ending pressure 560#
2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
0# - 75#
Total shut in time since beginning of test 1344 hrs.
initial pressure 150#, ending pressure 75#

Summit Energy, Inc.
1-F Gulf State 36-22-37 Producing well
168 hr. shut in
750# - 720# (chart still showing press. variation)
Total shut in time since beginning of test 1344 hrs.
initial pressure 750#, ending pressure 720#
1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
740# - 730#
Total shut in time since beginning of test 1344 hrs.
initial pressure 800#, ending pressure 730#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1344 hrs.
initial pressure 625#, ending pressure 630#

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
310# - 340#
Total shut in time since beginning of test 1344 hrs.
initial pressure 230#, ending pressure 340#

Further discussion took place concerning the feasibility of backflowing the high pressure, low volume injectors which have shown little, if any, pressure variation during the shut in periods. Also, the committee reaffirms its position concerning backflowing and testing of the Petro-

Search Citgo State No. 1.

The committee recommends that high pressure low volume injectors which have shown little or no variations in pressure be backflowed and tested, in a further attempt to determine if communication does or does not exist between these wells and the monitor well. We also reaffirm our prior recommendation that the Citgo State No. 1 be backflowed, even if for a short period of time, to be sure that we are not dealing with a pressure trapped condition in this well.

Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 22, 1976 at Arco's Hobbs office. The chairman of the committee is to meet with the N.M.O.C.C. before the next regular committee meeting to strongly urge and request that we be permitted to proceed as per recommendations.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Bill Thomas (chairman)	Skelly	Hobbs, N.M.
Odis Henley	Skelly	Hobbs, N.M.
J.W. Gibson	Gulf	Hobbs, N.M.
Jimmie Christner	Anadarko	Houston, Tex
Herb Henderson	Anadarko	Eunice, N.M.
Val Ryan	AGUA	Hobbs, N.M.
Erd Johnson	Reserve	Midland, Tex.
Lad Hudry	Arco	Hobbs, N.M.

July 21, 1976

MINUTES OF SUB-COMMITTE APPOINTED BY N.M.O.C.C TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 21, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Water injection well
168 hr. Shut in
1600# - 1575#
Total shut in time since beginning of test 1464 hrs.
initial pressure 1750#, ending pressure 1575#

42-B 10-23-37 Water injection well
168 hr. Shut in
1640# - 1640#
Total shut in time since beginning of test 786 hrs.
initial pressure 1850#, ending pressure 1640#

44-D 10-23-37 Water injection well
168 hr. Shut in
1550# - 1525# (tubing)
630# - 630# (casing)
Total shut in time since beginning of test 788 hrs.

36-P 4-23-37 Water injection well
168 hr. shut in
925# - 825#
Total shut in time since beginning of test 789 hrs.
initial pressure 1800#, ending pressure 825#

21-H 4-23-37 Water injection well
168 hr. shut in
1640# - 1550#
Total shut in time since beginning of test 787# hrs.
initial pressure 1850#, ending pressure 1550#

12-N 34-22-37 Water injection well
168 hr. shut in
850# - 750#
Total shut in time since beginning of test 785 hrs.
initial pressure 1600#, ending pressure 750#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
240# - 200# (casing)
1000# - 775# (tubing)
Total shut in time since beginning of test 1032 hrs.
casing -- ending pressure 200#
tubing -- ending pressure 775#

The following wells were shut in for observation on July 12 & 13, 1976

Skelly Penrose "A" Unit

2-I 34-22-37 Water injection well
168 hr shut in
1830# - 1680#

4-H 34-22-37 Water injection well
168 hr. shut in
1020# - 970#
Total shut in time since beginning of test 793 hrs.
initial pressure 1625#, ending pressure 970#

1-J 34-22-37 Water injection well
168 hr. shut in
800# - 610#
Total shut in time since beginning of test 793 hrs.
initial pressure 1625#, ending pressure

The following wells were shut in for observation on July 12, 1976

Anadarko (L.M.P.S.U.)

Tr. 21-7F 34-22-37 Water injection well
168 hr. shut in
1600# - 1300#
Total shut in time since beginning of test 208 hrs.
initial pressure 1700#, ending pressure 1300#

Tr. 36-1B 34-22-37 Water injection well
168 hr. shut in
1440# - 1300#
Total shut in time since beginning of test 208 hrs.
initial pressure 1500#, ending pressure 1300#

Petro - Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1140 hrs.
initial pressure 1150#, ending pressure

1-M Fluor 35-22-37 Producing well
168 hr shut in
560# - 500# (no change in chart)
Total shut in time since beginning of test 1512 hrs.
initial pressure 600#, ending pressure 500#

2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
75# - 0#
Total shut in time since beginning of test 1512 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy Inc.

1-F Gulf State 31-22-37 Producing well
168 hr. shut in
720# - 720# (chart showing pres. variation)
Total shut in time since beginning of test 1512 hrs.
initial pressure 750#, ending pressure 720#

1-P Gulf Sims 25-22-37 Producing well
168 hr shut in
730# - 720#
Total shut in time since beginning of test 1512 hrs.
initial pressure 800#, ending pressure 720#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1512 hrs.
initial pressure 625#, ending pressure 630#

ARCO, INC

Total shut in time since beginning of test 211 hrs.
initial pressure 1920#, ending pressure 1680#

10-P 33-22-37 Water injection well
168 hr. shut in
1540# - 1375#
Total shut in time since beginning of test 210 hrs.
initial pressure 1775#, ending pressure 1375#

17-B 4-23-37 Water injection well
168 hr. shut in
1750# - 1525#
Total shut in time since beginning of test 210 hrs..
initial pressure 1850#, ending pressure 1525#

30-J 4-23-37 Water injection well
168 hr shut in
1700# - 1575#
Total shut in time since beginning of test 209 hrs.
initial pressure 1800#, ending pressure 1575#

32-L 4-23-37 Water injection well
168 hr. shut in
1700# - 1600#
Total shut in time since beginning of test 208 hrs.
initial pressure 1790#, ending pressure 1600#

34-N 4-23-37 Water injection well
168 hr. shut in
950# - 750#
Total shut in time since beginning of test 214 hrs.
initial pressure 1350#, ending pressure 750#

46-B 9-23-37 Water injection well
168 hr shut in
1175# - 975#
Total shut in time since beginning of test 215 hrs.
initial pressure 1350#, ending pressure 975#

48-H 9-23-37 Water injection well
168 hr. shut in
1700# - 1650#
Total shut in time since beginning of test 213 hrs.
initial pressure 1725#, ending pressure 1650#

50-F 10-23-37 Water injection well
168 hr. shut in
1625# - 1565#
Total shut in time since beginning of test 216 hrs.
initial pressure 1900#, ending pressure 1565#

52-H 10-23-37 Water injection well
168 hr. shut in
1625# - 1400#
Total shut in time since beginning of test 195 hrs.
initial pressure 1900#, ending pressure 1400#

61-F 4-23-37 Water injection well
168 hr shut in
1675# - 1575#
Total shut in time since beginning of test 210 hrs.
initial pressure 1790#, ending pressure 1575#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water injection well
168 hr. shut in
910# - 890#
Total shut in time since beginning of test 1512 hrs,
initial pressure 1500#, ending pressure 890#

35-H 35-22-37 SWD well
168 hr. shut in
340# - 340#
Total shut in time since beginning of test 1512 hrs.
Initial pressure 230#, ending pressure 340#

Plans are to backflow and test the following injection wells:

Skelly Penrose "A" Unit no. 40-P
" " " " " 42-B
" " " " " 21-H
" " " " " 44-D

Anadarko Langlie Mattix Penrose Sand Unit 3-P
" " " " " " 4-H

These wells will be backflowed to approximately 500 lbs. or until stabilization is reached. Following backflow, pressure recorders will be attached and pressures monitored.

The committee and the N.M.O.C.C. feel that this procedure will provide adequate data to determine if pressure communication exists between the wells and the monitor well. The committee and the N.M.O.C.C. feel that this testing procedure will accelerate the study, as well as being able to return wells to injection status thereby providing adequate facilities to accommodate the shutting in of additional injection wells for testing and study. During the past week approximately 10 bbls. of water was backflowed from the Citgo-State no. 1 with no apparent pressure change. Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 29, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Cecil Henley	Skelly	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
J.C. Gibson	Gulf	Hobbs, New Mexico

July 29, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 29, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Water injection well
Well was backflowed 40 hrs. Backflowed 325 bbls. of water. Results of backflow and observation of Citgo St. well indicate no apparent communication. Committee and N.M.O.C.C. agree that this well can be returned to injection status.

42-B 10-23-37 Water injection well
Well was backflowed approximately 40 hrs. Backflowed 350 bbls. of water. Results from backflow and observation of Citgo St. well indicate no apparent communication. Committee and N.M.O.C.C. agree that this well can be returned to injection status.

44-D 10-23-37 Water injection well
168 hr. shut in
1525# - 1525# (tubing)
630# - 630# (casing)
Total shut in time since beginning of test 956 hrs.
This well will be backflowed and tested this week and if communication with the monitor well is not indicated it will be returned to injection.

36-P 4-23-37 Water injection well
168 hr. shut in
825# - 750#
Total shut in time since beginning of test 950 hrs.
initial pressure 1800#, ending pressure 825#
The committee recommends, and the N.M.O.C.C. approves, that based on data obtained through the shut in period, this well can be returned to injection status.

21-B 4-23-37 Water injection well
168 hr. shut in
1550# - 1525#
Total shut in time since beginning of test 955 hrs.
initial pressure 1850#, ending pressure 1525#
The committee recommends and N.M.O.C.C. approves that this well be backflowed and tested this week. If no communication exists between it and the monitor well a recommendation will be made that the well be returned to injection status.

12-N 34-22-37 Water injection well
168 hr. shut in
750# - 700#
Total shut in time since beginning of test 953 hrs.
initial pressure 1600#, ending pressure 700#
This well will be returned to injection status.

2-L 34-22-37 Water injection well
168 hr. shut in
1680# - 1620#
Total shut in time since beginning of test 379 hrs.
initial pressure 1920#, ending pressure 1620#

10-P 33-22-37 Water injection well
168 hr. shut in
1375# - 1225#
Total shut in time since beginning of test 378 hrs.
initial pressure 1775#, ending pressure 1225#

17-B 4-23-37 Water injection well
168 hr. shut in
1525# - 1450#
Total shut in time since beginning of test 378 hrs.
initial pressure 1850#, ending pressure 1450#

30-J 4-23-37 Water injection well
168 hr. shut in
1575# - 1525#
Total shut in time since beginning of test 377 hrs.
initial pressure 1800#, ending pressure 1525#

32-L 4-23-37 Water injection well
168 hr. shut in
1600# - 1550#
Total shut in time since beginning of test 376 hrs.
initial pressure 1790#, ending pressure 1550#

34-N 4-23-37 Water injection well
168 hr. shut in
750# - 700#
Total shut in time since beginning of test 382 hrs.
initial pressure 1350#, ending pressure 700#
This well will be returned to injection status.

46-B 9-23-37 Water injection well
168 hr. shut in
975# - 875#
Total shut in time since beginning of test 383 hrs.
initial pressure 1350#, ending pressure 875#
This well will be returned to injection status.

48-H 9-23-37 Water injection well
168 hr. shut in
1650# - 1600#
Total shut in time since beginning of test 381 hrs.
initial pressure 1725#, ending pressure 1600#

50-F 10-23-37 Water injection well
168 hr. shut in
1565# - 1565#
Total shut in time since beginning of test 384 hrs.
initial pressure 1900#, ending pressure 1565#
This well is to be backflowed and tested.

52-H 10-23-37 Water injection well
168 hr. shut in
1400# - 1275#
Total shut in time since beginning of test 363 hrs.
initial pressure 1900#, ending pressure 1275#

61-F 4-23-37 Water injection well
168 hr. shut in
1575# - 1525#
Total shut in time since beginning of test 378 hrs.
This well is to be backflowed and tested.

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in

200# - 200# (casing)
775# - 800# (tubing)
Both casing and tubing will be backflowed and tested, separately.

Anadarko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
32 hr. shut in (prior to backflow)
890# - 890#
Total shut in time since beginning of test 1544 hrs.
initial pressure 1500#, ending pressure 890#
This well was backflowed and tested during the past week and is to be returned to injection status.

36-4E 34-22-37 Water injection well
31 hr. shut in (prior to backflow)
970# - 970#
Total shut in time since beginning of test 824 hrs.
initial pressure 1625#, ending pressure 970#
Returned to injection status following backflow.

37-1J 34-22-37 Water injection well
168 hr. shut in
610# - 510#
Total shut in time since beginning of test 871 hrs.
initial pressure 1625#, ending pressure 510#
The committee recommended and N.M.O.C.C. agreed to return this well to injection status.

21-7F 34-22-37 Water injection well
54 hr. shut in
1300# - 1250#
Total shut in time since beginning of test 262 hrs.
initial pressure 1700#, ending pressure 1250#
This well was backflowed--continue to backflow and will shut in and test.

36-1B 34-22-37 Water injection well
168 hr. shut in
1300# - 1160#
Total shut in time since beginning of test 376 hrs.
initial pressure 1500#, ending pressure 1160#
This well is to be backflowed.

Petro-Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1680 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 1680 hrs.
initial pressure 600#, ending pressure 500#

2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 1680 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.
1-F Gulf St. 31-22-37 Producing well
168 hr. shut in
720# - 720# (chart still showing pressure variation)
Total shut in time since beginning of test 1680 hrs.
initial pressure 750#, ending pressure 720#
1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# - 720#
Total shut in time since beginning of test 1680 hrs.
initial pressure 800#, ending pressure 720#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1680 hrs.
initial pressure 625#, ending pressure 630#

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
340# - 340#
Total shut in time since beginning of test 1680 hrs.
initial pressure 230#, ending pressure 340#

The following wells are to be returned to injection status:
Skelly Penrose "A" Unit no. 12,34,36,40,42,46

Anadarko Langlie Mattix Penrose Sand Unit no. 37-3P, 36-4H

Wells to be shut in for observation with pressure recorders attached:
Skelly Penrose "A" Unit no. 4,8,53,55,57
Skelly Penrose "B" Unit no. 17,29,40,42

Anadarko Langlie Mattix Penrose Sand Unit no. 18-2, 19-2, 21-3, 21-2

Wells to be backflowed and tested
Skelly Penrose "A" Unit no. 21,44,50,61,44, the 9 5/8 and 7" will be checked individually on the no. 44 well.
Skelly Penorse "B" # 52 (casing and tubing tested individually)

Anadarko Langlie Mattix Penrose Sand Unit no. 36-1B

Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 5, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Odis Henley	Skelly	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
W. G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. D. Christner	Anadarko	Houston, New Mexico

August 5, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a. m. August 5, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Returned to injection 7/30/76

42-B 10-23-37 Returned to injection 7/30/76

44-D 10-23-37 Water injection well
120 hr. shut in
1525#--1500# (tubing)
630#--630# (9 5/8" X 7")
Total shut in time since beginning of test 1076 hrs.
Backflowed two days, recovered 340 barrels of water
No pressure communication with casing indicated.
Committee and N.M.O.C.C. agreed to return to injection and put pressure recorder on casing.

36-P 4-23-37 Return to injection 7/30/76

21-H 4-23-37
30 hrs. shut in
1525#--1525#
Total shut in time since beginning of test 985 hrs.
initial pressure 1850#, ending pressure 1525#
The well was backflowed 71 hrs. recovered 980 barrels of water
Returned to injection 8/2/76

12-N 34-22-37 Returned to injection 8/2/76

2-L 34-22-37
168 hr. shut in
1620#--1520#
Total shut in time since beginning of test 547 hrs.
initial pressure 1920#, ending pressure 1520#
Committee and N.M.O.C.C agreed to backflow and return to injection if there is no pressure interferance with the Citgo-State well.

10-P 33-22-37 Water injection well
168 hr. shut in
1225#--1240#
Total shut in time since beginning of test 546 hrs.
initial pressure 1775#, ending pressure 1240#
will check gauge and leave shut in another week

17-B 4-23-37 Water injection well
168 hr. shut in
1450#--1300#
Total shut in time since beginning of test 546 hrs.
initial pressure 1850#, ending pressure 1300#
will leave shut in another week

30-J 4-23-37 Water injection well
168 hr. shut in
1525#--1475#
Total shut in time since beginning of test 545 hrs.
initial pressure 1800#, ending pressure 1475#
Committee and N.M.O.C.C. agree to backflow two days and return to injection if there is no pressure interferance with Citgo-State well.

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
146 hr. shut in
800#--800#
Total shut in time since beginning of test 1200 hrs.
initial pressure 775#, ending pressure 800#
Backflowed 22 hrs. recovered 9 barrels of water.
No pressure communication between tubing and casing.
Casing pressure 200#. Bled casing pressure down, had small waterflow on the second day. Committee and N.M.O.C.C agreed to return the well to injection and install a pressure recorder on the casing for further testing.

17-D 4-23-37 Water injection well
112 hr. shut in
1950#--1775#

29-H 5-23-37 Water injection well
116 hr. shut in
2200#--1950#
Committee agreed pressures abnormally high. Will check recorder and continue test till next meeting.

40-P 5-23-37 Water injection well
112 hr. shut in
1600#--1175#

42-D 9-23-37 Water injection well
113 hr. shut in
975#--875#
Committee and N.M.O.C.C. agreed to return to injection.

Anadarko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
Returned to injection 7/29/76

36-4H 34-22-37 Water injection well
Returned to injection 7/29/76

37-1J 34-22-37 Water injection well
Returned to injection 7/29/76

21-7F 34-22-37 Water injection well
Backflowed 71 hrs. recovered 534 barrels of water. Closed well in tubing pressure 8:00 a.m. 7/30/76 was 640# and at 8:00 a.m. 8/4/76 was 800#. Committee and N.M.O.C.C. agreed to return to injection.

36-1B 34-22-37 Water injection well
Backflowed 76 hrs. recovered 420 barrels of water
Returned to injection 8/2/76

18-2L 26-22-37 Water injection well
144 hr. shut in
1890#--1890#
Backflowing well at this time.

19-2P 27-22-37 Water injection well
72 hr. shut in
1400#--1250#

21-3D 34-22-37 Water injection well
72 hr. shut in
1850#--1850#
Backflowing well now.

21-2N 27-22-37 Water injection well
120 hr. shut in
1760#--1520#

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1140#--1100#
Total shut in time since beginning of test ~~1146~~ 1848 hrs.
initial pressure 1150#, ending pressure 1100#
Committee and N.M.O.C.C. decided that a more sensitive recorder was necessary to monitor this well. N.M.O.C.C. to handle with company.

1-M Flour 35-22-37 Producing well
168 hr. shut in
500#--500#
Total shut in time since beginning of test 1848 hrs.
initial pressure 500#, ending pressure 500#
N.M.O.C.C. to handle more sensitive recorder change with the company.

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0#--0#
Total shut in time since beginning of test 1848 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.

1-M 2-23-37 SWD well
To install pressure recorder. N.M.O.C.C. to handle with company

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
720#--720#
Total shut in time since beginning of test 1848 hrs.
initial pressure 750#, ending pressure 720#
Pressure variations are becoming more pronounced and uniform.
Committee and N.M.O.C.C. to check for activities in area that is causing pressure flucuations.

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# -720#
Total shut in time since beginning of test 1848 hrs.
initial pressure 800#, ending pressure 720#
Will continue to monitor till next meeting

Texas Pacific Oil Company

2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630#--630#
Total shut in time since beginning of test 1848 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.

35-H 35-22-37 SWD well
168 hr. shut in
340# -340# (Bradenhead)
Total shut in time since beginning of test 1848 hrs.
initial pressure 230#, ending pressure 340#
Tubing is backflowing

The following wells are to be returned to injection status: (if backflow tests are satisfactory)

Skelly Penrose "A" 44-D, 36-P, 21-H, 12-N, 2-L, 30-J, 32-L, 48-H, 50-F, 52-H, 61-F

Skelly Penrose "B" 52-F and 42-D

Anadarko Langlie Mattix Penrose Sand Unit no. 21-7F, 36-1B

The following well is to be returned to producing status:

Petro-Search no. 2F Gulf State

The following well is to be monitored with a pressure recorder:

Petro-Search 1-M Gulf State

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 12, 1976 in Arco's Hobbs office.

ATTENDANCE AT AUGUST 5, 1976 MEETING

Bert Brown (chairman)	Skelly	Hobbs, New Mexico
Odis Henley	Skelly	Hobbs, New Mexico
Ies Clements	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Val Ryan	AGUA	Midland, Texas
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. D. Christner	Anadarko	Houston, Texas

August 12, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a.m. August 12, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

- # 40-P 3-23-37 Returned to injection 7/30/76
- # 42-B 10-23-37 Returned to injection 7/30/76
- # 44-D 10-23-37 Water injection well
  Well returned to injection 8/5/76
- # 36-P 4-23-37 Returned to injection 7/30/76
- # 21-H 4-23-37 Returned to injection 8/2/76
- # 21-N 34-22-37 Returned to injection 8/2/76
- # 2-L 34-22-37
  Backflowed well 48 hrs. (2920 bbls)
  Will hook up recorder and monitor pressure
- # 10-P 33-22-37 Water injection well
  168 hr. shut in
  1240# - 1180#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1775#, ending pressure 1180#
  Continue shut in another week
- # 17-B 4-23-37 Water injection well
  168 hr. shut in
  1300# - 1235#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1850#, ending pressure 1235#
  Continue shut in another week
- # 30-J 4-23-37 Water injection well
  Backflowed well 48 hrs. (865 bbls.)
  Will hook up recorder and monitor pressure
- # 32-L 4-23-37 Water injection well
  168 hr. shut in
  1500# - 1495#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1600#, ending pressure 1495#
  Committee and N.M.O.C.C. agree to backflow well two days, shut in for 48 hrs. pressure build up and return to injection if there is no pressure interference with the Citgo-State well.
- # 34-N 4-23-37 Water injection well
  Returned to injection 7/30/76
- # 46-B 9-23-37 Water injection well
  Returned to injection 7/30/76
- # 48-H 9-23-37 Water injection well
  Backflowed well 48hrs. (1290 bbls.)
  Put back on injection 8/9/76
- # 50-F 10-23-37 Water injection well
  Well returned to injection 8/2/76

52-H 10-23-37 Water injection well
Backflowed well 48 hrs. (980 bbls.)
Returned to injection 8/9/76
Continue to monitor pressure

61-F 4-23-37 Water injection well
168 hr. shut in
1525# - 1540#
Total shut in time since beginning of test 714 hrs.
initial pressure 1575#, ending pressure 1540#
Committee and N.M.O.C.C. agree to backflow two days, shut in for 48 hr. pressure build up and return to injection if there is no pressure interference with the Citgo-State well.

4-J 33-22-37 Water injection well
168 hr. shut in
1850# - 1850#
Total shut in time since beginning of test 284 hrs.
initial pressure 1950#, ending pressure 1850#

8-N 33-22-37 Water injection well
168 hr. shut in
1650# - 1490#
Total shut in time since beginning of test 284 hrs.
initial pressure 1950#, ending pressure 1490#

53-J 10-23-37 Water injection well
168 hr. shut in
1850# - 1765#
Total shut in time since beginning of test 285 hrs.
initial pressure 1900#, ending pressure 1765#

55-L 10-23-37 Water injection well
168 hr. shut in
1550# - 1390#
Total shut in time since beginning of test 284 hrs.
initial pressure 1900#, ending pressure 1390#

57-J 9-23-37 Water injection well
168 hr. shut in
1100# - 850#
Total shut in time since beginning of test 285 hrs.
initial pressure 1850#, ending pressure 850#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
Total shut in time since beginning of test 1368 hrs.
Returned to injection 8/6/76
Gauge on annulus has 200# on casing.

17-D 4-23-37 Water injection well
168 hr. shut in
1775# - 1750#
Total shut in time since beginning of test 280 hrs.
initial pressure 1950#, ending pressure 1750#

29-H 5-23-37 Water injection well
168 hr. shut in
1950# - 1700#
Total shut in time since beginning of test 284 hrs.
initial pressure 2200#, ending pressure 1700#

40-P 5-23-37 Water injection well
168 hr. shut in
1175# - 1125#
Total shut in time since beginning of test 280 hrs.
initial pressure 1600#, ending pressure 1125#

42-D 9-23-37 Water injection well
168 hr. shut in
875# - 875#
Total shut in time since beginning of test 281 hrs.
initial pressure 975#, ending pressure 875#
Returned to injection 8/5/76
Committee and N.M.O.C.C. agreed to return to injection

Anaderko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
Returned to injection 7/29/76

36-4H 34-22-37 Water injection well
Returned to injection 7/29/76

37-1J 34-22-37 Water injection well
Returned to injection 7/29/76

21-7F 34-22-37 Water injection well
Returned to injection 8/6/76

36-1B 34-22-37 Water injection well
Returned to injection 8/2/76

18-2L 26-22-37 Water injection well
Well to be returned to injection

19-2P 27-22-37 Water injeciton
168 hr. shut in
1250# - 1070#
Total shut in time since beginning of test 240 hrs.
initial pressure 1400#, ending pressure 1070#

21-3D 34-22-37 Water injection well
Well now being backflowed

21-2N 27-22-37 Water injection well
Well now shut in, recording build up

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1100# - 1100#
Total shut in time since beginning of test 2016 hrs.
initial pressure 1150#, ending pressure 1100#
A more sensitive recorder has been installed on this well.

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 2016 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 2016 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.

1-M 2-23-37 SWD well
Pressure recorder has been installed

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
720# - 660#
Total shut in time since beginning of test 2016 hrs.
initial pressure 750#, ending pressure 660#

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# - 700#
Total shut in time since beginning of test 2016 hrs.
initial pressure 800#, ending pressure 700#
Will continue to monitor till next meeting

Texas Pacific Oil Company
2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2016 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.
35-H 35-22-37 SWD
168 hr. shut in
340# - 375# (Bradenhead)
Total shut in time since beginning of test 2016 hrs.
initial pressure 230#, ending pressure 340#
Tubing is backflowing

The following wells have been returned to injection status.
Skelly Penrose "A" 44-D, 36-P, 21-H, 12-N, 48-H, 50-F, 52-H
Skelly Penrose "B" 52-F and 42-D
Anadarko Langlie Mattix Penrose Sand Unit no. 21-7F, 36-1B

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 19, 1976 an Arco's Hobbs office.

ATTENDANCE AT AUGUST 12, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Val Ryan	AGUA	Hobbs, New Mexico
Clarence Chandler	Reserve	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Glyn Stone	Gulf	Hobbs, New Mexico

August 19, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a.m. August 19, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Shelly Penrose "A" Unit

2-L 34-22-37
Backflowed well 48 hrs. (2920 bbls)
Returned to injection 8-11-76
Will shut in and record pressure

10-P 33-22-37 Water injection well
144 hr. shut in
1180# - 1140#
Total shut in time since beginning of test 858 hrs.
initial pressure 1775#, ending pressure 1140#
Will backflow

17-B 4-23-37 Water injection well
144 hr. shut in
1235# - 1180#
Total shut in time since beginning of test 858 hrs.
initial pressure 1850#, ending pressure 1180#
Will backflow

30-J 4-23-37 Water injection well
Backflowed well 48 hrs. (865 bbls.)
Shut in 144 hrs. Pressure 1485#
Will continue to monitor pressure gauge

32-L 4-23-37 Water injection well
168 hr. shut in
1500# - 1495#
Total shut in time since beginning of test 714 hrs.
initial pressure 1600#, ending pressure 1495#
Backflowed 910 bbls. in 48 hrs.
Now shut in

52-H 10-23-37 Water injection well
Backflowed well 48 hrs. (980 bbls.)
Returned to injection 8-9-76
Continue to monitor pressure

61-F 4-23-37 Water injection well
168 hr. shut in
1525# - 1540#
Total shut in time since beginning of test 882 hrs.
initial pressure 1575#, ending pressure 1540#
Backflowed 1060 bbls in 48 hrs.
Now shut in

4-J 33-22-37 Water injection well
144 hr. shut in
1850# - 1840#
Total shut in time since beginning of test 428 hrs.
initial pressure 1950#, ending pressure 1840#
Will backflow

8-N 33-22-37 Water injection well
144 hr. shut in
1490# - 1380#
Total shut in time since beginning of test 428 hrs.
initial pressure 1950#, ending pressure 1380#
Will backflow

53-J 10-23-37 Water injection well
144 hr. shut in
1765# - 1680#
Total shut in time since beginning of test 429 hrs.
initial pressure 1900#, ending pressure 1680#
Will backflow

55-L 10-23-37 Water injection well
144 hr. shut in
1390# - 1250#
Total shut in time since beginning of test 428 hrs.
initial pressure 1900#, ending pressure 1250#
Continue shut in time

57-J 9-23-37 Water injection well
144 hr. shut in
850# - 710#
Total shut in time since beginning of test 429 hrs.
initial pressure 1850#, ending pressure 710#
Will return to injection

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
1368 hr. shut in
initial pressure 775#, ending pressure 800#
Backflowed 9 bbls in 22 hrs. Continue to monitor
Returned to injection 8-6-76
Gauge on oil string annulus has 200# in 312 hrs.

17-D 4-23-37 Water injection well
144 hr. shut in
1750# - 1720#
Total shut in time since beginning of test 424 hrs.
initial pressure 1950#, ending pressure 1720#
Will backflow

29-H 5-23-37 Water injection well
144 hr. shut in
1700# - 1475#
Total shut in time since beginning of test 428 hrs.
initial pressure 2200#, ending pressure 1475#
Will backflow

40-P 5-23-37 Water injection well
144 hr. shut in
1125# - 1050#
Total shut in time since beginning of test 424 hrs.
initial pressure 1600#, ending pressure 1050#
Continue to monitor

Anadarko Langlie Mattix Penrose Sand Unit

19-2P 27-22-37 Water injection well
Total shut in time since beginning of test 240 hrs.
initial pressure 1400#, ending pressure 1070#
Backflowed 48 hrs. 381 bbls
Return to injection

21-3D 34-22-37 Water injection well
After backflow shut in pressure increased to 1250#
Will backflow again

21-2N 27-22-37 Water injection well
Well now shut in, recording build up
Will backflow

Petro-Search

1-E Citgo-State 2-23-37 Producing well
144 hr. shut in
1100# - 1100#
Total shut in time since beginning of test 2160 hrs.
initial pressure 1150#, ending pressure 1100#
A more sensitive recorder has been installed on this well
Committee recommends that this well be flowed down at the maximum rate with volumes and pressures being monitored, after logs have been run on the Petro-Search # 1-M SWD

1-M Fluor 35-22-37 Producing well
144 hr. shut in
500# - 500#
Total shut in time since beginning of test 2160 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
144 hr. shut in
0# - 0#
Total shut in time since beginning of test 2016 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.
Continue to monitor bradenhead pressure

1-M 2-23-37 SWD well
Pressure recorder has been installed
Committee recommends that this well be surveyed. Mr. Korzekwa will investigate and recommend a logging program at next meeting.

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
144 hr. shut in
660# - 660#
Total shut in time since beginning of test 2160 hrs.
initial pressure 750#, ending pressure 660#
Continue to monitor

1-P Gulf Sims 25-22-37 Producing well
144 hr. shut in
700# - 700#
Total shut in time since beginning of test 2160 hrs.
initial pressure 800#, ending pressure 700#
Will continue to monitor till next meeting

Texas Pacific Oil Company

2-E Ella Drinkard 25-22-37 Producing well (TA)
144 hr. shut in
630# - 630#
Total shut in time since beginning of test 2160 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.
35-H 35-22-37 SWD well
144 hr. shut in
375# - 400# (Bradenhead)
Total shut in time since beginning of test 2160 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

The following wells have been returned to injection status.
Skelly Penrose "A" 57-J

Anadarko Langlie Mattix Penrose Sand Unit no. 19-2P

To expidite the testing proceedures the following guideline was adopted by the committee: Backflow wells a minimum of 48 hrs., and at such time as the flow rate is 100 bbls. per day or less, shut the well in for pressure build up. If pressure does not build up past 800# in 48 hrs. then return well to injection. Instructions will be given by the committee on wells that do not meet this guideline.

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 26, 1976 at the N.M.O.C.C. conferance room in Hobbs, New Mexico.

ATTENDANCE AT AUGUST 19, 1976 MEETING

Bert Brown (chairman)	Skelly	Hobbs, New Mexico
Bill Krafft	Skelly	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
C.R. Kerzelma	Gulf	Hobbs, New Mexico
Clarence Chandler	Reserve O&G	Midland, Texas

B.O.B.

August 26, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met in N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. August 26, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

2-L 34-22-37
Backflowed well 48 hrs. (2920 bbls)
Returned to injection 8-11-76
Shut in and record pressure 144 hrs. 1600#

10-P 33-22-37 Water injection well
~~168~~ hr. shut in
1140# - 1075#
Total shut in time since beginning of test 1026 hrs.
initial pressure 1775#, ending pressure 1075#

17-B 4-23-37 Water injection well
144 hr. shut in
1235# - 1180#
Total shut in time since beginning of test 858 hrs.
initial pressure 1850#, ending pressure 1180#
Backflowed 84 hrs. 840 bbls Rate below 100 B/D SI for build up

30-J 4-23-37 Water injection well
Backflowed well 48 hrs. (865 bbls)
Shut in 144 hrs. Pressure 1525#

32-L 4-23-37 Water injection well
168 hr. shut in
1495# - 1350#
Total shut in time since beginning of test 882 hrs.
initial pressure 1600#, ending pressure 1350#
Backflowed 910 bbls. in 48 hrs.

52-H 10-23-37 Water injection well
Backflowed well 48 hrs. (980 bbls)
Returned to injection 8-9-76
Pressure after 240 hrs. injection 1925#

61-F 4-23-37 Water injection well
Backflowed 1060 bbls in 48 hrs.
124 hr. shut in
After backflow pressure 1500#

4-J 33-22-37 Water injection well
144 hr. shut in
1850# - 1840#
Total shut in time since beginning of test 596 hrs.
initial pressure 1950#, ending pressure 1840#
Will backflow

8-N 33-22-37 Water injection well
168 hr. shut in
1380# - 1260#
Total shut in time since beginning of test 596 hrs.
initial pressure 1950#, ending pressure 1260#

53-J 10-23-37 Water injection well
144 hrs. shut in
1765# - 1680#
Total shut in time since beginning of test 429 hrs.
initial pressure 1900#, ending pressure 1680#
Backflowed 84 hrs. 1260 bbls.

4/5

55-L 10-23-37 Water injection well
168 hr. shut in
1250# - 1080#
Total shut in time since beginning of test 596 hrs.
initial pressure 1900#, ending pressure 1080#

57-J 9-23-37 Water injection well
144 hr. shut in
850# - 710#
Total shut in time since beginning of test 429 hrs.
initial pressure 1850#, ending pressure 710#
Returned to injection 8-19-76

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
~~1368~~ hr. shut in
initial pressure 775#, ending pressure 800#
Backflowed 9 bbls in 22 hrs. Continue to monitor
Returned to injection 8-6-76
Gauge on oil string annulus has 110# in 486 hrs..
Injection line split, well had backflowed

17-D 4-23-37 Water injection well
144 hr. shut in
1750# - 1720#
Total shut in time since beginning of test 424 hrs.
initial pressure 1950#, ending pressure 1720#
~~backflowed 81 hrs. 840 bbls, gauge on annulus 100 psig, oil from backed up~~

29-H 5-23-37 Water injection well
168 hr. shut in
1475# - 1425#
Total shut in time since beginning of test 596 hrs.
initial pressure 2200#, ending pressure 1425#

40-P 5-23-37 Water injection well
168 hr. shut in
1050# - 1000#
Total shut in time since beginning of test 592 hrs.
initial pressure 1600#, ending pressure 1000#

Anadarko Langlie Mattix Penrose Sand Unit

21-3D 34-22-37 Water injection well
After backflow shut in pressure increased to 1250#

21-2N 27-22-37 Water injection well
Well now shut in, recording build up

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1100# - 1100#
2328
Total shut in time since beginning of test ~~1644~~ hrs.
initial pressure 1150#, ending pressure 1100#.
A more sensitive recorder has been installed on this well
Will be backflowed with proposed starting date of 9-7-76

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 2328 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test ~~2316~~ 2328 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.
Continue to monitor bradenhead pressure 3#

1-M 2-23-37 SWD well
Pressure recorder has been installed
Surveying to be suspended pending backflow of Citgo-State #1-E

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
660# - 660#
Total shut in time since beginning of test 2328 hrs.
initial pressure 750#, ending pressure 660#
Continue to monitor

1-P Gulf Sims 25-22-37 Producing well
168 hrs. shut in
700# - 690#
Total shut in time since beginning of test 2328 hrs.
initial pressure 800#, ending pressure 690#
Will continue to monitor till next meeting

Texas Pacific Oil Company

2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2328 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.

35-H 35-22-37 SWD well
168 hr. shut in
400# - 400# (Bradenhead)
Total shut in time since beginning of test 2328 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

~~Petro-Search stated that they would backflow the Citgo-State well.~~
The Committee and N.M.O.C.C decided to suspend the present testing proceedure and shut in wells around the Citgo-State for pressure monitoring during the backflow and pressure draw down of the well. Wells ~~to be~~ shut in are: Skelly Penrose "A" no. 13,23,26,40,12,21,28,38, 42,52.
Skelly Penrose "B" no. 52.
Anadarko tract 37-3P, tract 37 1-J and tract 36 4-H
All other wells ~~will be~~ returned to injection. Expected dete of shut in 8-31-76

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. September 2, 1976 at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT AUGUST 26, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
C.R. Korzekwa	Gulf	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico
Erd Johnson	Reserve	Midland, Texas
C.W. Stumhoffer	Petro-Search, Inc.	Ft. Worth, Texas

September 2, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. September 2,1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Eunice Penrose "A" Unit

[illegible] 34-22-37
Shut in and record pressure 264 hrs. 1500#
Returned to injection 8-31-76

10-P 33-22-37 Water injection well
initial pressure 1775#, ending pressure 1020#
Returned to injection 8-31-76

17-B 4-23-37 Water injection well
initial pressure 1850#, ending pressure 1180#
Backflowed 64 hrs. 140 bbls. Shut in 48 hrs. Pressure 600#
Returned to injection 8-31-76

30-J 4-23-37 Water injection well
Shut in 120 hrs. Pressure 1575#
Returned to injection 8-31-76

32-L 4-23-37 Water injection well
initial pressure 1350#, ending pressure 1390#, after backflow
Returned to injection 8-31-76

52-H 10-23-37 Water injection well
Pressure after 408 hrs. injection 1925#

[illegible] 4-23-37 Water injection well
244 hr. shut in
After backflow pressure 1535#

4-J 33-22-37 Water injection well
120 hr. shut in
1840# - 1840#
Total shut in time since beginning of test 716 hrs.
initial pressure 1950#, ending pressure 1840#
Returned to injection 8-31-76

8-N 33-22-37 Water injection well
120 hr. shut in
1260# - 1320#
Total shut in time since beginning of test 716 hrs.
initial pressure 1950#, ending pressure 1320#
Returned to injection 8-31-76

53-J 10-23-37 Water injection well
Backflowed 63 hrs. 150 bbls.
Shut in 48 hrs. after backflow. Pressure 700#
Returned to injection 8-31-76

55-L 10-23-37 Water injection well
120 hr. shut in
1080# - 1050#
Total shut in time since beginning of test 716 hrs.
initial pressure 1900#, ending pressure 1050#
Returned to injection 8-31-76

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
Gauge on oil string annulus has 60# in 654 hrs.
Shut in 8-31-76

17-D 4-23-37 Water injection well
120 hr. shut in
1720# - 1700#
Total shut in time since beginning of test 544 hrs.
initial pressure 1950#, ending pressure 1700#
Returned to injection 8-31-76

29-H 5-23-37 Water injection well
120 hr. shut in
1425# - 1385#
Total shut in time since beginning of test 716 hrs.
initial pressure 2200#, ending pressure 1385#
Returned to injection 8-31-76

40-P 5-23-37 Water injection well
120 hr. shut in
1000# - 1000#
Total shut in time since beginning of test 712 hrs.
initial pressure 1600#, ending pressure 1000#
Returned to injection 8-31-76

Anadarko Langlie Mattix Penrose Sand Unit

21-3D 34-22-37 Water injection well
After second backflow (3030 bbls), 207 hrs., pressure was 1100# in 72 hrs.
Returned to injection 8-26-76

21-2N 27-22-37 Water injection well
Returned to injection 8-26-76

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1100# - 1020#
Total shut in time since beginning of test 2496 hrs.
initial pressure 1150#, ending pressure 1020#

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 2496 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 2496 hrs.
initial pressure 0#, ending pressure 0#
Continue to monitor bradenhead pressure (chart not available)

1-M 2-23-37 SWD well
Minimum shut down pressure 550#, maximum inj. pressure 1250#

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
660# - 660#
Total shut in time since beginning of test 2496 hrs.
initial pressure 750#, ending pressure 660#
Continue to monitor

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
700# - 690#
Total shut in time since beginning of test 2496 hrs.
initial pressure 800#, ending pressure 690#
Will continue to monitor till next meeting

Texas Pacific Oil Company
2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2496 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
400# - 400# (Bradenhead)
Total shut in time since beginning of test 2496 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

The Committee and N.M.O.C.C. decided to suspend the present testing proceedure and shut in wells around the Citgo-State for pressure monitoring during the backflow and pressure draw down of the well. Wells shut in are: Skelly Penrose "A" no. 13, 23, 26, 40, 12, 21, 28, 38, 42, 52
Skelly Penrose "B" no. 52
Anadarko tract 37-3P, tract 37-1J and tract 36-4H
All other wells were returned to injection on or before 8-31-76

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. September 9, 1976 at the Arco's conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 2, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
C.R. Korzekwa	Gulf	Hobbs, New Mexico
Erd Johnson	Reserve	Midland, Texas
W.G. Abbott	AGUA	Hobbs, New Mexico

September 9, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. September 9, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit
- # 52-H 10-23-37 Water injection well
  - Shut in 8-31-76
  - initial pressure 1875#, after 168 hrs. 1325#

Skelly Penrose "B" Unit
- # 52-F 9-23-37 Water injection well
  - initial tbg. pressure 1875#, csg. pressure 20#
  - after 168 hrs. tbg. pressure 1350#, csg. pressure 110#

Petro-Search
- # 1-E Citgo-State 2-23-37 Producing well
  - 168 hr. shut in
  - 1020# - 1010#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 1150#, ending pressure 1010#
- # 1-M Fluor 35-22-37 Producing well
  - 168 hr. shut in
  - 500# - 490#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 500#, ending pressure 490#
- # 2-F Gulf State 2-23-37 Producing well
  - 168 hr. shut in
  - 0# - 3#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 0#, ending pressure 3#
- # 1-M 2-23-37 SWD well
  - Minimum shut down pressure 550#, maximum inj. pressure 1250#

Summit Energy, Inc.
- # 1-F Gulf State 36-22-37 Producing well
  - 168 hr. shut in
  - 660# - 660#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 750#, ending pressure 660#

The following wells have been shut in preparatory to monitoring during backflowing of the Petro-Search Citgo-State no. 1.

Skelly Penrose "A" Unit

Well no.	Shut in	Initial pressure	Fin. Pressure
13	168	960#	585#
23	168	1340#	550#
26	168	1500#	850#
40	168	1625#	1590#
12	168	1460#	725#
21	168	1725#	1675#

28	168	1500#	340#
38	168	1100#	700#
42	168	1775#	1590#
52	168	1775#	1320#
elly Penrose "B" Unit			
52	168	tbg. 1875#	1350#
		csg. 20#	110#
adarko Langlie Mattix Penrose Sand Unit			
37-3P	168	1550#	1275#
37-1J	96	1750#	950#
36-4H	168	1525#	1100#

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
690# - 680#
Total shut in time since beginning of test 2664 hrs.
initial pressure 800#, ending pressure 680#

exes Pacific Oil Company
2-E Ella Drinkerd 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2664 hrs.
initial pressure 625#, ending pressure 630#

GUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
400# - 400# (Bradenhead)
Total shut in time since beginning of test 2664 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

he next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 .m. September 16, 1976 at Arco's conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 9, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Clarence Chandler	Reserve	Midland, Texas
L.C. Hudry	Arco	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

September 16, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. September 16, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	144	312	1460	725-740
13	144	312	960	585-460
21	144	312	1725	1675-1660
23	144	312	1340	550-440
26	144	312	1500	850-700
28	144	312	1500	340-110
38	144	312	1100	700-655
40	144	312	1625	1590-1590
42	144	312	1775	1590-1590
44 annulus	144	2060	760	760-730
52	144	312	1775	1325-1200
Skelly Penrose "B" Unit				
52 casing	144	20	110	110-115
tubing	144	312	1875	1350-1350
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	336	1550	1275-1120
37-1J	168	264	1750	950-560
36-4H	168	336	1525	1100-1000
Petro-Search Citgo-State				
1-E	168	2832	1150	1010-1010
Fluor 1-M	168	2832	500	490-490
Gulf-State				
2-F	168	2832	4	0-4
Gulf State 1-M (intermittant injection Max. 1250 Min. 500)				
Summit Energy, Inc.				
Gulf-State 1-F	168	2832	750	660-660
Gulf-Sims 1-P	168	2832	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	2832	625	630-630
AGWA, Inc.				
SWD 35-H csg	168	2832	230	400-400
tbg (backflowing)				0-0

The Citgo-State well is being prepared for backflowing. A Pit is being dug and lined to contain the water that is expected to flow from the well. The well will reportedly be ready to flow by Sept. 19, 1976. The shut-in injection wells will have approximately two weeks shut-in stabilization time by the time the Citgo-State is opened to the pit. Close observation of the pressure recorders will be conducted after the flow begins.

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. September 23, 1976 at Arco"s conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 16, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Erd Johnson	Reserve	Midland, Texas
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
C.R. Korzekwa	Gulf	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico

September 23, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. September 23, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	168	480	1460	740-760
13	168	480	960	460-350
21	168	480	1725	1660-1660
23	168	480	1340	440-350
26	168	480	1500	700-550
28	168	480	1500	110-0
38	168	480	1100	655-525
40	168	480	1625	1590-1510
42	168	480	1775	1590-1535
44 annulus	168	2228	760	730-90*
52	168	480	1775	1200-1110
Skelly Penrose "B" Unit				
52 casing	168	188	110	115-120
tubing	168	480	1875	1350-1185
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	504	1550	1120-1050
37-1J	168	432	1750	560-500
36-4H	168	504	1525	1000-950
Petro-Search Citgo-State				
1-E	108	2940	1150	1010-1010
backflowing	60	60	210	210-70
Fluor 1-M	168	2940	500	490-490
Gulf-State				
2-F	168	2940	4	0-4
Gulf State 1-M (intermittant injection max. 1250 min.450)				
Summit Energy, Inc.				
Gulf-State 1-F	168	2940	750	660-660
Gulf-Sims 1-P	168	2940	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	2940	625	630 630
AGUA, Inc.				
SWD 35-H csg tbg (backflowing)	168	2940	230	400-450

*Pressure bled off to repair tubing leak

The Citgo-State well is backflowing. It has been flowing for 60 hours and has produced an estimated 35 to 40 thousand barrels of 9.9# salt water. The flowing pressure and the flow rate are decreasing. Initial flowing pressure was 210# but after 60 hours was 70#. Close monitoring of shut-in injection and monitor wells has been conducted but no pressure interferance has been noted as yet.

The committee began a study of temperature survey on injection wells in the area. The log study is aimed at determining whether or not the survey can be used to indicate water intrusion into the beds above the reservior.

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. September 30, 1976 at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 23, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Rudry	Arco	Hobbs, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Clarence Chandler	Reserve O & G	Midland, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
J.D. Willingham	Cardinal Surveys	Hobbs, New Mexico
C.A. Adams, Jr.	Cardinal Surveys	Midland, Texas

EUNICE WATERFLOW MEETING

The Eunice area waterflow study group met on Thursday, September 23 and Monday, September 27. Skelly's Penrose "A" waterflood temperature logs from injection wells were analyzed and gradients were calculated. Representatives from Cardinal Surveys and Western Company assisted in interpretation. The data derived from this has been tabulated. Additional consideration by the committee is necessary to determine further use and disposition of the data.

September 30, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. September 30, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	168	648	1460	740-760
13	168	648	960	350-300
21	168	648	1725	1660-1660
23	168	648	1340	350-300
26	168	648	1500	550-500
28	168	648	1500	0-0
38	168	648	1100	525-420
40	168	648	1625	1510-1510
42	168	648	1775	1535-1535
44 annulus	168	2396	760	90-200
52	168	648	1775	1110-1050
Skelly Penrose "B" Unit				
52 casing	168	356	110	120-120
tubing	168	648	1875	1185-1185
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	672	1550	1050-1040
37-1J	168	600	1750	500-450
36-4H	168	672	1525	950-910
Petro-Search				
Citgo-State				
backflowing	168	228	210	70-10
Fluor 1-M	168	3108	500	490-490
Gulf-State				
2-F	168	3108	4	4-14
Gulf State 1-M (intermittant injection max. 1375 min. 680)				
Summit Energy, Inc.				
Gulf-State 1-F	168	3108	750	660-660
Gulf-Sims 1-P	168	3108	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	3108	625	630-630
AGUA, Inc.				
SWD 35-H csg	168	3108	230	400-450
tbg (backflowing)				

The Citgo-State well is P & A. It backflowed for 228 hours and produced an estimated 65 to 75 thousand barrels of salt water. Initial flowing pressure was 210#. After 228 hours it was 10#. Close monitoring of shut-in injection and monitor wells has been conducted but no pressure interferance was detected.

During the week temperature surveys were run on Skelly Penrose "A" well no. 13 and no. 40, after extended shut-in periods. These and others were examined and studied by the committee. The committee was assisted by service company personnel. More detailed logging proceedures are to be conducted on selected wells at the recommendation of the committee. The purpose is to determine the optimum logging program that gives the maximum information, with all factors being considered.

The next meeting of the Eunice Area Sub-Committee will be called when a more detailed temperature log is available for study, at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 30, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Val Ryan	AGUA	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

October 26, 1976

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

RE: NEW MEXICO "BZ" STATE NCT-8 LEASE

ATTENTION: MR. JOE D. RAMEY
SECRETARY-DIRECTOR

Gentlemen:

The following information has been compiled concerning the salt water flows on Texaco's New Mexico "BZ" State NCT-8 Lease as discussed during your telephone conversation with Don Craig on October 25, 1976. Attached is a typed copy of the original drilling report on Well No. 5 covering the time interval where the salt water flow was encountered, a Sonic log covering the interval where the water flow occurred, and a plat showing all the wells on the "BZ" NCT-8 lease.

Also, a salt water flow was mentioned on the drilling report when Well No. 7 was drilled. Salt water was encountered at 1684' with a flowing pressure of 200 psi. No other information was included in the drilling report.

Yours very truly,

J. V. GANNON

J. V. Gannon
District Superintendent

DRC:las
Attachments

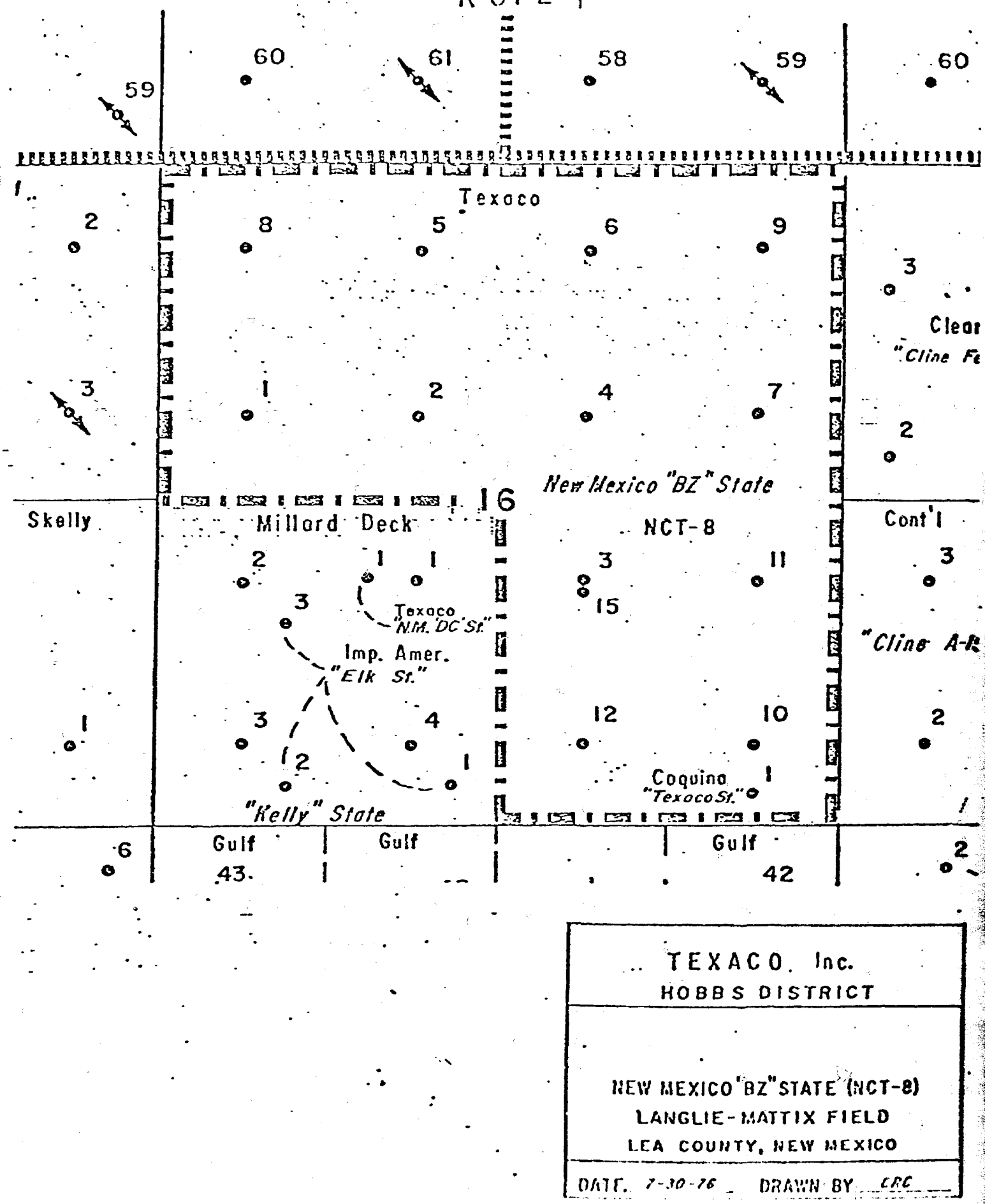
NMOCC - Hobbs, N.M.

HAS, JR.

File
Chron

STATE OF NEW MEXICO "BZ" NCT-8 No. 5

3/1-2/59	6-3/8" hole from 1095'. Press. up on 8-5/8" csg @ 10:15 to 10:45 A.M. 2-28-59. 1000# for 30 min. Drill plug and cement and approx. one foot of formation. Press. up on formation. 1000# in 30 min. @ 11:15 to 11:45 A.M. 1000# O.K. T.D. 1690'. Well started to flow back salt water. Well started flowing 1100 bbls. salt water per hour from 1688' to 1690'. Shut well in. 600# press. Bradenhead squeeze open hole from 1095' to 1690' by Howco w/2500 sx Reg cmt w/ 2% calcium chloride down 8-5/8" csg.
3/3/59	Drilled cement plug from 1146' to 1160'. No show of water. Drilled plug to 1690'. Water broke. Returns of 300 bbls. salt water per hr. Drilled ahead in formation. Drilled formation from 1690' to 1814'. Water and air increasing. Pulled 360' of drill pipe. Water increased to 1500 bbls. per hour. Pulled drill pipe. Bradenhead squeezed formation w/2500 sx of Reg Neat cement plus 2% calcium chloride from 1095' to 1814' by Howco. Pumping. Press. on cement 650 lbs. Comp. at 8:45 P.M. 3-2-59.
3/4/59	No report.
3/5/59	Trying to squeeze off salt water w/ cement.
3/6/59	No report.
3/7/59	No report.
3/10/59	Drlg salt and anhy 1986'. Increased to 7-7/8" hole from 1095'.
3/11/59	Drlg.
3/12/59	T.D. 7-7/8" hole @ 2460'. Anhy.
3/13/59	7-7/8" hole to 2460'. Comp @ 5:15 A.M. 3-12-59. Snubbing pipe out of hole. Snub 7" in hole. Ran 64 jts hydril and collared pipe.(2445' of 26#). Set @ 2460'. Cement by Howco w/ 200 sx Neat cement. Top cmt by T.S. @ 1760'. Second stage down bradenhead w/ 200 sx Reg cmt. Job complete 3:00 P.M. 3-12-59. WOC 9 hrs.
3/14/59	Tested 7" csg w/ 1200 psi for 30 min. from 5:00 A.M. to 5:30 A.M. on 3-14-59. Tested O.K. Now WOC.



TEXACO Inc.
HOBBS DISTRICT

NEW MEXICO "BZ" STATE (NCT-8)
LANGLIE-MATTIX FIELD
LEA COUNTY, NEW MEXICO

DATE. 7-30-76 DRAWN BY CRC

Bill Thomas

October 28, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at the N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. October 28, 1976. The temperature gradient data was discussed and it was decided to file the work copies for possible future reference.

Mr. Jerry Sexton handed out a letter and drilling record on Texaco's State of New Mexico "EZ" NCT-8 well no. 5 located in section 6, T23S R37E. The drilling record showed that an extensive water flow was encountered in the salt section during drilling operations in 1959. This was prior to any extensive waterflooding in the area. The letter also states that well no. 7 on the same lease encountered the water flow.

The committee had expected to consider the recently run Anadarko temperature surveys, however the logging company representative was not present with the logs. The committee was informed that these logs would be ready for study Friday the 28th.

Therefore, the next meeting is scheduled for 8:00 a.m. Friday October 29, 1976 at the N.M.O.C.C. office in Hobbs, New Mexico.

ATTENDANCE AT ~~AUGUST 12~~ Oct 28, 1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
W. G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

October 29, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. October 29, 1976. Mr. Billy P. Morris presented an analysis of temperature and tracer surveys that were run on two of Anadarko's wells. The wells on which the surveys were run were considered to be potential problem wells. The surveys indicated no problems in these wells that would contribute to the problem of water getting into the salt section. One log showed a slight anomalie in the salt section could possibly be water storage from a transient source.

It was decided that a study group meeting would be held November 8, 1976 at the N.M.O.C.C. office in Hobbs, New Mexico for the purpose of reviewing Skelly's old temperature survey's to determine potential problem wells for additional survey studies on Skelly's Penrose "A" and Penrose "B" units.

ATTENDANCE AT OCTOBER 29, 1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Joe Ramey	N.M.O.C.C.	Santa Fe, New Mexico
Billy Morris	McCollough Surveys	Odessa, Texas

November 8th and 9th, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The study group met at the N.M.O.C.C. office in Hobbs, New Mexico, from 8:00 a.m. to 5:30 p.m. on November 8th and from 8:00 a.m. to 4:30 p.m. on November 9, 1976.

Temperature and tracer surveys on Skelly's Penrose "A" and Penrose "B" Units and Anadarko's Langlie Mattix Unit wells were studied and analyzed under the guidance of Mr. Billy P. Morris of the McCollough Company.

Various data from logs were tabulated. Particular attention being given to temperature anomalies in the salt section, and or channeling up the well bores. Plans are to map the data and determine if certain areas of water intrusion can be defined.

Another meeting of the committee has not been scheduled at this time.

ATTENDANCE 11-8-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas
Rick Alderman	McCollough	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico

ATTENDANCE 11-9-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

November 8th and 9th, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The study group met at the N.M.O.C.C. office in Hobbs, New Mexico, from 8:00 a.m. to 5:30 p.m. on November 8th and from 8:00 a.m. to 4:30 p.m. on November 9, 1976. Temperature and tracer surveys on Skelly's Penrose "A" and Penrose "B" Units and Anadarko's Langlie Mattix Unit wells were studied and analyzed under the guidance of Mr. Billy P. Morris of the McCollough Company.

Various data from logs were tabulated. Particular attention being given to temperature anomalies in the salt section, and or channeling up the well bores. Plans are to map the data and determine if certain areas of water intrusion can be defined.

Another meeting of the committee has not been scheduled at this time.

ATTENDANCE 11-8-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas
Rick Alderman	McCollough	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico

ATTENDANCE 11-9-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

November 18, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The group met at the N.M.O.C.C. office in Hobbs, New Mexico on November 18, 1976 from 8:00 a.m. to 10:00 a.m. Further discussion of recent log analysis in the area took place.

Several ideas were presented by members present as to what steps should be taken to expedite the study.

The committee and N.M.O.C.C. feel that we are at the point to begin consideration of attempting to "blow down" the pressured up salt section. This decision being based on the recent two day study session during which time all temperature and tracer injection well logs were analyzed and evaluated, as well as data which has been gathered during the past several months through monitoring.

The group felt that suspect wells should be re-logged due to work having been done on wells in the area, possible changes in the salt section due to blowing down of the Citgo-State well and questions as to the different logging procedures and interpretive techniques used.

Plans are to proceed with logging of the suspect wells for re-evaluation. Before the next meeting on December 2, 1976 each member is to study his companies injection and/or disposal facilities in the area to determine, how much, if any, of the backflow water he can accomodate once blowing down of the salt section is began. Due to restrictions now in effect on injection and disposal facilities in the area, this is the major problem at the present time.

Another meeting has been scheduled for 8:00 a.m. (MST) at the Hobbs, New Mexico office of the N.M.O.C.C.

ATTENDANCE AT NOVEMBER 18,1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Clem Korzekwa	Gulf	Hobbs, New Mexico
Bill Abbott	ACUA	Hobbs, New Mexico
Era Johnson	Reserve	Midland, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in N.M.O.C.C. office in Hobbs, New Mexico at 8:00 AM January 5, 1977.

Recently run surveys on injection wells were discussed as was other data and activities conducted by operators in the area. Skelly had recently run surveys on Skelly Penrose "A" Wells No. 26, 28, and 34. Skelly also had perforated the Skelly Penrose "A" Well No. 64 at 1460' opposite a water flood encountered while drilling the well. After acidizing perforations, the well initially produced around 40 BWPD but has declined and settled at around 6 BWPD. The Temperature and Tracer Logs on Skelly wells indicated no channeling or water intrusions or water flows of any irregular nature. Penrose "A" Well No. 26 had shown some fluid storage in the base of the salt section and a short channel up to 3200' on a previous survey. It had not been repaired between surveys.

Anadarko had run logs on 13 wells recently. Two temporary abandoned wells (#34-4 and #27-1) were surveyed with a noise tool in addition to survey tools, in an effort to locate storage of water in the salt section that would be prospects for perforating and draining the salt section. No indication of water in the salt were evident. Additional wells surveyed by Anadarko were #13-B2, #40-1, #13-C7, #1-2, #8-1, #7-1, #7-3, #13-A1, #13C-5, #15-2, #17-1 & #21-2. Only the #13-C7 indicated a problem of any kind. It showed to be communicating from the salt section up to the surface. The #13-C7 is a twin to Skellys' J. V. Baker No. 11. The Committee recommended and Skelly has approved, logging the

Baker well to determine if it is contributing to the upward migration of water in the #13-C7.

Mr. Jerry Sexton informed the Committee that Mr. Joe Ramey would be in Hobbs for a combined meeting of the three appointed Sub-Committees on January 20, 1977. Mr. Ramey has requested that the Sub-Committees present recommendations for future action aimed at a solution to the water migration problems in the area.

Skelly is still monitering pressures on the Penrose "A" Well No. 38, #44, Penrose "B" #52 & #54, bradenheads. All have shown declining pressure since the "blow-down" of the Citgo-State well.

The next meeting will be held 8:00 AM Friday January 7, 1977 at Skelly Oil Co.- Hobbs, New Mexico.

ATTENDANCE

Bill Thomas	Skelly Oil Co.	Hobbs, New Mexico
Bert Brown	Skelly Oil Co.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L. C. Hudry	ARCO	Hobbs, New Mexico
Erd Johnson	Reserve Oil	Midland, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
Jerry Sexton	NMOCC	Hobbs, New Mexico
C. R. Korzekwa	Gulf Oil	Hobbs, New Mexico
Billy P. Morris	McCullough	Midland, Texas

MINUTES OF SUB-COMMITTEE APPOINTED TO STUDY EUNICE AREA

The Sub-Committee met at 8:00 AM January 7, 1977, in Skelly's Hobbs Office.

Discussion, conclusions and recommendations were formulated and approved for presentation to the Joint Sub-Committee meeting. These are presented by seperate instrument.

The next meeting will be a Joint Sub-Committee meeting to be held Thursday, Jan. 13, 1977 at 9:00 AM in Shell Oil Company Office - Hobbs, New Mexico.

ATTENDANCE

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Erd Johnson	Reserve Oil, Inc.	Midland, Texas
C. R. Korzekwa	Gulf Oil Co.	Hobbs, New Mexico
W. G. Abbott	Agua, Inc.	Hobbs, New Mexico

SOUTHEASTERN NEW MEXICO

PLATFORM - SHELF				DELAWARE BASIN			
SYSTEM	SERIES	GROUP	FORMATION	FORMATION	GROUP	SERIES	SYSTEM
QUATERNARY			"Boisom, Caliche & Alluvium"				QUATERNARY
TERTIARY			OGALLALA	OGALLALA			TERTIARY
CRETACEOUS	(Wedge on Shelf)						
TRIASSIC	DOCKUM	DOCKUM	CHINLE	CHINLE	DOCKUM	DOCKUM	TRIASSIC
			Santa Rosa (Red Beds)	Santa Rosa (Red Beds)			
			Dewey Lake	Dewey Lake			
			Rustler	Rustler	SALADO		
	OCHOAN	SALADO	"Salt"	Cowden Anhy. / "Salt & Anhydrite"	CASTILE	OCHOAN	
PERMIAN	GUADALUPIAN	ARTESIA GROUP / CHALK BLUFF / WHITEHORSE	TANSILL	Lamar Ls.	DELAWARE MOUNTAIN	GUADALUPIAN	PERMIAN
			YATES	BELL CANYON			
			SEVEN RIVERS				
			QUEEN	CHERRY CANYON			
			GRAYBURG				
		N.D.	SAN ANDRES	BUSHY CANYON			

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 1
CASE 5941

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
14 June 1977

COMMISSION HEARING

IN THE MATTER OF:

The hearing called by the Oil Conservation Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County, New Mexico.

CASE 5941

BEFORE: Commissioner Joe Ramey
Commissioner Emery Arnold
Commissioner Phil Lucero

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: Lynn Teschendorf, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For Texaco: William B. Kelly, Esq.
WHITE, KOCH, KELLY & McCARTHY
Attorneys at Law
P. O. Box 787
Santa Fe, New Mexico

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General Court Reporting Service
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Phone (505) 982-9212

APPEARANCES CONTINUED

FOR GETTY OIL COMPANY:
William F. Carr, Esq.
CATRON, CATRON & SAWTELL
Attorneys at Law
P.O. Box 788
Santa Fe, New Mexico

FOR PHILLIPS PETROLEUM, ANADARKO, AND CONTINENTAL:
W. Thomas Kellahin
KELLAHIN & FOX
Attorneys at Law
500 Don Gaspar Street
Santa Fe, New Mexico

FOR SHELL OIL COMPANY:
Owen M. Lopez, Esq.
MONTGOMERY, ANDREWS & HANNAHS
Attorneys at Law
325 Paseo de Peralta
Santa Fe, New Mexico

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Phone (505) 982-9212

MR. RAMEY: The hearing will come to order.

I think we are down to Mr. Kellahin.

MR. KELLAHIN: Thank you. I would like to present my witness from Anadarko first, Mr. Dan Kernaghan.

DANIEL G. KERNAGHAN

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Kernaghan, would you state your name, by whom you are employed and in what capacity?

A. Dan Kernaghan, I'm employed by Anadarko Production Company as Division Evaluation Engineer in Houston.

Q. In what areas do you hold a degree, Mr. Kernaghan?

A. Petroleum engineer.

Q. Have you previously testified before this Commission and had your qualifcations as an expert witness accepted and made a matter of record?

A. Yes, I have.

MR. KELLAHIN: If the Commission please, are the witness' qualifications acceptable?

MR. RAMEY: Yes, we are acquainted with him.

Q. (Mr. Kelllahin continuing.) Mr. Kernaghan, would

you state for the Commission where Anadarko operates its waterflood project?

A. Anadarko's Langlie-Mattix Penrose Sand Unit is in Township 22 South, 37 East. This area is shown by the hach lines immediately to the north of Skelly's Penrose "A" and "B".

Q. On which exhibit is that?

A. I believe that is Commission Exhibit Two.

Q. It is indicated by which line on that exhibit?

A. It's the northernmost unit indicated by the hach lines. It's in Sections 21, 22, 27, 28, parts of 33, 34, 23, 26, 14, 29 and 32 of 22 South, 37 East.

Q. Anadarko's flood is in this central area?

A. No, it's in the south area.

Q. The south area?

A. In the Eunice area.

Q. What has been the history of Anadarko's participation in the Commission ordered Industry Committees to examine and evaluate waterflood and injection systems in these areas?

A. Well, Anadarko was participating in these committees from the start. One of our representatives was the Chairman of the North Subcommittee that the committee appointed in December of '74 and was broken in two. We had a representative that chaired one of the subcommittes that was formed after the January 22nd, '75 hearing and we've had continuous partici-

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pation in the Eunice Area Subcommittee since March, 1976 or May 1976 when it was formed.

Q. As part of Anadarko's participation in this study committee, what if any tests has Anadarko run on the waterflood project?

A. Starting with the summer of 1974 as requested by the Committee, we ran tracer and temperature surveys on all of the injection wells in the unit. This work continued until the spring of 1975. Since that time we have run additional tracer and temperature surveys either as indicated or as requested by the subcommittee. We have run sound logs on two wells, we ran one step rate test on Well 40-1. This was back in 1974.

Q. Do those tests appear in the minutes of the Committee that were introduced here yesterday by Mr. Sexton?

A. Yes, for the most part they were. We may have run a few others on the basis of information from the earlier tests that didn't appear in the minutes but for the most part they do.

Q. What if any remedial work has Anadarko done on its waterflood project in response to a request or an order by the Commission?

A. We plugged the old Elder Willingham TO May No. 1 Well in location B of Section 34, I believe.

Q. Would you point to that on the Commission Exhibit

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825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Two?

A. That's this well right here. That's location B of Section 34, 22 South, 37 East.

Q. What did you do with that well?

A. We reentered it and plugged it to their specifications.

Q. When was that done, do you recall, the approximate date?

A. I believe it was done before our Order R-5003 which would have put it in '74.

Q. Has there been any additional remedial work done by Anadarko?

A. We squeezed a couple instances of holes in the casing that turned up on the tracer surveys and one casing shoe that was shown to be leaking on that survey.

Q. Commission Exhibit Two indicates some Anadarko wells that have been called problem wells. Will you explain to us what those wells are, what the problem is and what Anadarko has done and if you will begin your testimony with that well No. 8-2?

A. 8-2?

Q. 8-2.

A. It's in location C of Section 21. That well, Well 8-3, which is in location D in the same section and Well 10-2 which is in location K of Section 21, all are shown to have bradenhead pressure and water flow.

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Q. That is the problem?

A. Yes.

Q. That is what we mean when we call it a problem?

A. Yes. I have tested the wells on several occasions and at the most we get volumes of water from a quart to maybe a gallon out of these wells and they just flow down in a period of anywhere from thirty seconds to a minute and a half. It's my opinion that the flows are caused by gas from the Yates formation that slowly bleeds in there and as you release the pressure it takes a little water with it and it depletes and that's it.

Q. What's the volume of fluid?

A. Anywhere from a quart to a gallon or a cup in some cases. 10-2 I never was able to get anything out of it. We didn't have any pressure on it and it didn't have any flow the times I've been there.

Q. When have you done that?

A. Over the last year and a half. I was out there a couple of weeks ago.

Q. The next well was something named 27-1?

A. 27-1 is indicated on this map as a problem well. We perforated a section that had a water flow in a Gulf well that was drilled last year.

Q. Where is the Gulf well?

A. I don't believe it's on this map.

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Q. Where is 27-1?

A. It's in location C of Section 28. We perforated a section in that well above the salt and were not able to establish any flow out of it. We have acidized it and we are still not able to establish any flow out of it and we went back and put it on production.

A few weeks later we had spontaneous flow break out at the bradenhead, the annulus between the surface casing and the long string on Well 27-2 which is on the same location, same unit anyway. This well flowed twenty-four hundred barrels over a period of a week. It declined in rate and it had about a hundred and fifty pounds of pressure on it to begin with and it ceased flowing. We pumped in fifty barrels of fresh water slowly over a period of several hours and it failed to establish anymore flow.

It's not marked on this map.

Q. Would you mark that on the map, please? Do you know where 27-2 is?

A. I can put a little check mark by it.

Q. Would you label that 27-2, is it so numbered?

A. I don't believe they show our tract numbers on here. The other well circled in red.

Q. Well, let me ask you about this 27-2 now. In your opinion why did it stop flowing?

A. I think that the lense that was pressured up just

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depleted.

Q. Mr. Sexton indicated in his testimony yesterday that he experienced what he thought was salting off of that particular --

A. We pumped in fresh water and the fresh water went into a formation somewhere. Now, if there was a formation permeable enough to accept water it should have pressured up also I would think. It should have had salt water in it.

Q. In your opinion did this well salt off?

A. No, I don't think so.

Q. It's your opinion that the pressure was depleted?

A. I think so, yes.

Q. Are there any other wells there?

A. They have Skelley's LPG storage well marked in its location F of Section 27 and it was discussed yesterday. The flow was down to something like a quarter of a barrel a day on it now. It had substantial flow originally.

Q. In your opinion, Mr. Kernaghan, are there any wells in Andarko's Langlie-Mattix flood causing the salt section in this area to pressure up?

A. I don't think there are, no.

Q. Describe for me what this salt section is?

A. Well --

Q. Where it's found?

A. It's found from about twelve hundred feet to twenty-

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four hundred feet in this area and it's sodium and potassium chloride and imbedded with anhydrites and sand stringers.

Q. Some twelve hundred feet thick?

A. Yes, sir.

Q. In your opinion, Mr. Kernaghan, is there any evidence or indication that Anadarko's flood has contaminated any fresh water in the area?

A. No, I don't believe there is.

Q. In your opinion, Mr. Kernaghan, is the injected salt water being used in this flood remaining in the Penrose formation?

A. I think it is at this time, yes.

Q. Why?

A. Well --

Q. Why do you think that?

A. Well, any possible communication through deeper wells was handled by Commission Order R-5003 and our tracer surveys and temperature surveys don't show any evidence of leakage past the casing shoe or up the hole. They show no indication of that movement of the radioactive tracers.

Q. There was some discussion yesterday whether these areas were experiencing vertical fracturing and the discussions concerned vertical fractures some distance away from the well-bore. In your opinion, Mr. Kernaghan, is there any vertical fracturing occurring in Anadarko's flood beyond the two-foot

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radius of the wellbore?

A. Well, no, I don't believe that there is.

Q. Why not?

A. Well, it was brought out yesterday and I completely agreed that the zone or the area or the point of greatest pressure is near the wellbore. The pressure falls off as the log of the distance when you get away from the wellbore. The point of greatest stress is near the wellbore. If the fluid moved out and encountered some zone of weakness or fracture zone away from the wellbore it's -- I don't believe it could migrate any great distance in this type of fracture system. In the first place this system probably doesn't occur throughout that whole section, from the salt section down. It certainly couldn't occur in the salt section.

If the fluid migrated upward in a zone like this it should bleed off in the first permeable zone that it encountered in the upward movement. It would then either move back to the, if it was above the cement sheath around the pipe it would move back to the annular space and then migrate along that or it would at least move into this permeable zone sufficiently that it could be -- any permeable zone it encountered would be a plane perpendicular to the wellbore and it would move in this plane until -- you know, some of the tracer surveys would have picked it up and we've got something like fifty of them out there and with something like fifty wells with more tracer

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surveys than that and none of them encountered the situation. We pulled these tools at least several hundred feet above the Penrose and that was only in the first one and then the later ones we pulled them all the way to the surface.

Q. You said you agreed with the testimony yesterday. I assume that by that you meant you agreed with Mr. Gannon's testimony on behalf of Texaco?

A. Yes, sir.

Q. You heard Mr. Sexton's testimony yesterday, did you not, Mr. Kernaghan?

A. Yes, sir.

Q. What is Anadarko's position with regard to Mr. Sexton's recommendations? Are you for or against it?

A. We are opposed to the recommendations.

Q. Why?

A. Well, we don't believe there is any evidence, we don't believe there is sufficient evidence to support the present restrictions that we are operating under and we don't really believe there is any to support any further restrictions.

Q. If Mr. Sexton's recommendations are adopted by the Commission as an order will Anadarko experience any waste with regard to its waterflood project?

A. Yes, we will. We will suffer a substantial loss in reserves.

Q. All right, explain that for them?

A. Well, we estimate the reserves as of July 1st --

Q. July 1st of '77?

A. July 1st of '77. If we were allowed to operate without restrictions or allowed to inject a hundred and fifty percent of withdrawal, that we have reserves of about one point eight million barrels.

Q. Those are reserves that you could recover?

A. That's right.

Q. One point eight million?

A. Down to the economic limit. Under the present order of restricting us to a hundred percent of withdrawal we estimate the remaining reserves to be about a million barrels as of the same date. If we were limited to injection water only, or produced water only, we estimate that the reserves would be in the neighborhood of five hundred thousand barrels, all as of the same date, July 1st, 1977. It would be a net loss of one point three million barrels.

Q What would be the loss of reserves if ycu are limited to injection of no more than a fracture pressure?

A. It would be somewhere in between the five hundred thousand million barrels. We don't know exactly what effect it will have yet but we have a few wells over the frac pressure we have several wells injected over the fracture pressure and it will reduce their rate.

Q Now, this loss in producible reserves that you have

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mentioned, have you taken into consideration the natural decline in the waterflood?

A. Yes, it was declining in December of 1974. Its peak rate was something like two thousand barrels a day or a little above and immediately prior to the order issued in December of '74 it had declined to sixteen hundred barrels a day. The last day for which we have a count, which I believe was late Saturday, it produced nine hundred and seventy-four barrels. Had the order of December '74 restricting us to a hundred percent of withdrawal, a hundred percent of voidage, not been put into effect we would have declined to about twelve hundred barrels a day anyway.

Q. Now, tell me about your daily production again just prior to the restriction in December of '74. What was the waterflood making?

A. It was making sixteen hundred barrels a day.

Q. As of today's date under the order that imposes a hundred percent of voidage?

A. We made nine hundred and seventy-four barrels last Saturday. Last month it averaged a thousand or a little less.

Q. You have indicated to us what the potential loss is in terms of barrels of oil, can you place a dollar amount on that loss?

A. At one point three million barrels, it's going to be nine or ten million dollars. Well, we'll get stripper price

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later on down the line but the loss will be in the range of nine to ten million dollars.

Q. What, if any recommendations does Anadarko have with regards to this?

A. We recommend that based on the failure or based on the indications that there is no movement outside of the flood zone that can be seen at this time or no point where this movement occurs can be found, that we be allowed to go back to a hundred and fifty, either unrestricted injection or a hundred and fifty percent of withdrawals.

Q. Do you have any further recommendations?

A. No.

Q. Do you believe that there is a continuing need to further monitor these area?

A. Yes, sir.

Q. What effect, if any, has the remedial work that has been done in the recent past have on your particular flood?

A. Well, I'm of the opinion that the remedial work that has been done has probably cured the problem. There is no reason to believe that it did not cure the migration of fluids that did occur if that was the source of them.

MR. KELLAHIN: No further questions.

CROSS EXAMINATION

BY MR. RAMEY:

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Q. Mr. Kernaghan, I think you indicated by when you said that you are now not allowing any water to get into the salt section that you did feel at one time that perhaps water was getting out of the flood interval into the salt section?

A. Well, I don't think the salt section was naturally pressured up. I don't think there is any question but that the water came from somewhere. I really had no problem with the philosophy that it was probably migrating up through the deeper wells that were unseamed.

Q. I think you said something about that you couldn't see any fractures in the salt that the salt section was fractured?

A. Yeah, it would be kind of hard for me to picture fractures in the salt section. It doesn't seem to me to be a medium that would tend to fracture.

Q. How would you account for these very large water flows?

A. Well, the salt section does have, you know, it's interbedded with some other materials, it has anhydrite and occasional sand and shale stringers. I think you can get flow along the bedding planes there. You can get some storage capacity in these interbedded materials that are with it.

I was speaking of vertical fractures. This salt does not seem to be a medium that would tend to, you know, it's a rather plastic type of thing and by its nature it would

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seem to me it would prevent a natural fracture from occurring and it would heal, you know, in the event of fracturing it would heal very quickly.

Q. Under normal waterflood practice is it good practice to fracture the formation?

A. In this area I don't consider it a bad practice. I don't think these zones or these formations would ever have been flooded if we couldn't have put fluids in over the fracture pressure or over the fracture gradient.

In the past we have operated as many as fifteen or twenty floods in New Mexico and it's a common practice to inject fluid over the fracture gradient.

Q. What happens to the fluid when your formation fractures?

A. Well, fracture calculations are such that you propogate a fracture in a zone of weakness, a zone of greatest porosity for instance, and that fracture propogates until immediate sufficient bleed off of the injected fluid to reduce the pressure at the end of the fracture to below the pressure required to keep it open and at the injection rates we're talking about here it doesn't take very much formation face to lose sufficient fluid through bleed off to reduce that pressure.

I made some fracture calculations based on the conditions under which we were operating and it was a matter of a few tens of feet that you could propogate a fracture in the

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Penrose sand and admittedly in an impermeable medium there is no bleed off but by the same token there is no, you tend to -- you know there is no porosity in there by which you can initiate the fracture with the same ease that you would in a sandstone that will take fluid.

Q. What is the advantage in fracturing?

A. Just to be able to put in enough fluid in the ground to make the flood economic, to make the rates economic. We are talking about formations here that are pretty tight.

Q. What about efficiency, what happens to your efficiency sweep pattern?

A. Well, I don't think these fractures extend, I think the extent of them away from the wellbore is a matter of fifty feet at the outside, let's say, a few tens of feet. It just shouldn't have any effect whatsoever on the sweep efficiency. We have had a very efficient flood here, not a very efficient but we've had a reasonabley efficient flood here. It has been economic, it's going to recover essentially the same as the primary did.

The history of our operations through New Mexico has been that we have recovered probably more oil than you could theoretically predict prior to the initiation of the flood.

Q. R-5003 designated a group of wells in the area that needed to be repaired, is that right?

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A. Yes, deep wells and plugged and abandoned wells.

Q. Have all of the wells in the area been repaired?

A. To the best of my knowledge all of the deep wells have been recemented. I believe that was borne out in testimony in an earlier case. I think it was in the re-hearing of November of '75. Mr. Clements testified that the Wolfson Boyd No. 1, I believe that well is in location L, Section 23, 22 South, 37 East.

Q. While you are up there, Mr. Kernaghan, where are your injection wells in relation to that?

A. We've got a well within the same location, in the same forty acre location. This map doesn't show our tract numbers. I believe that's our well, 40-1, but I wouldn't be positive without looking at another map.

Q. You are injecting then?

A. It is essentially a -- it's not exactly a twin well but it's within four hundred feet of the well, three hundred.

Q. But you don't feel there is any water escaping out of your flood interval?

A. Well, the Wolfson Well wasn't plugged -- it was plugged to the best of the operators capability according to the information they supplied you all and Mr. Clements put in his testimony.

Q. Do you feel that it is plugged satisfactorily to contain the water within the Penrose?

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A. Well, I hate to comment on that. We didn't have access, like I say, to the original, to the full drilling reports on that well.

Q. But evidently the Commission didn't --

A. The Commission -- Mr. Clements didn't think it was plugged satisfactorily and so stated.

Q. Are you aware that the Commission now will not allow injection offsetting any wells that aren't satisfactorily plugged and abandoned in new authorized water floods?

A. No, I was not aware of that.

Q. Are you aware that the Federal UIC program which should be coming out sometime this year says that injection shall be under the fracture pressure?

A. Yes, sir.

Q. Don't you think that this Commission is going to have to conform to that program?

A. Well, that's getting out of my area of expertise.

MR. RAMEY: Any other questions of the witness? Mr. Nutter?

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Kernaghan, you have achieved fill up of the formation in this flood, have you not?

A. Yes, sir, that's right.

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Q. All right, now, supposing you produce X barrels of oil and water and X MCF of gas and then you inject at a hundred and fifty percent or some other figure above one hundred percent of withdrawals, where does the excess water go?

A. Well, the formation is not a closed formation. It extends out in all directions. There is a flood to the west of us that is injecting less than withdrawals, there is a formation to the east that was not sufficiently permeable to yield primary recoveries that were economic, at least would not support drilling but it did extend on to the east. To the south we are bordered by a flood that is probably replacing withdrawals and a little bit more but I feel that the extent the fluid can migrate and the extent of the formation that --

Q. In other words, some of the fluid would migrate off your unit?

A. That's right.

Q. And the oil with it, is that correct?

A. Well, we've got a pretty effective pattern there. We are pretty well depending that we are protecting ourselves from oil migration off the unit.

Q. Did Anadarko operate any of the waterfloods in the Caprock Queen?

A. We operated one and it was sold before I came to work for the company.

Q. Are you acquainted with the Ambassador waterflood

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that was up in the north end of the Caprock?

A. No, I'm not, like I said, it was sold before I came with Anadarko.

Q. You weren't aware that they injected at high rates and, in fact, created a new oil pool on the west side of the reservoir there, did they not?

A. I never made a study of that flood.

Q. In other words, awhile ago, Mr. Kernaghan, in response to a question from Mr. Ramey, you said that the fractures if you injected in excess of reservoir frac pressure that the fractures extend out from the wellbore in a matter of a few tens of feet?

A. That's right.

Q. But you don't think that the fractures would extend beyond that according to your calculations?

A. I don't think at the rates we were putting water in, I don't think so.

Q. So what you are in effect doing is simply enlarging the wellbore in the immediate vicinity of the well?

A. That's right.

Q. And the rest of the formation remains a unit formation?

A. That's right.

Q. Now, when you mentioned that the rate of production in December of 1974 from this Anadarko unit was sixteen hundred barrels a day and the rate of production last Saturday was

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nine hundred and seventy-four barrels per day, you didn't intend to imply that the decline from sixteen hundred to nine seventy-four was due to reduction in injection?

A. No, I said that if we had continued under unrestricted injection we would have declined naturally to around twelve hundred barrels a day anyway.

Q. So the most you would be claiming for the decreased injection would be something like two hundred and twenty-six barrels per day?

A. That's right.

Q. Not seventeen hundred?

A. No, that's right.

Q. Does Anadarko operate any disposal wells in this area?

A. We have one disposal well on the Walden lease. It's used only for injecting water that cannot be put into our waterflood injection well up there and it is used on an intermittent basis only and for the last year the use should have been very intermittent.

Q. Where is the Walden lease?

A. It borders the Langlie-Mattix field, it's in Section 15. It consists of the south two hundred and forty acres of the west half of Section 15, 22 South, 37 East.

Q. Which is the disposal well there?

A. It's the Walden 4.

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Q. In Unit L?

A. That's a Drinkard well that is in Unit E, I believe.

Q. In Unit E, okay.

A. The trouble is there are two or three operators there each numbering on their own system.

Q. So you are not using it for disposal regularly?

A. I cannot say that it has not had water put in it but it is used intermittently only to dispose of some volumes that we can't take either into our Langlie-Mattix system or into our normal injection well in that area.

Q. That's on a lease, it's not on the unit?

A. No, it's not in the unit, that's right.

Q. What formation is that completed in?

A. In the Grayburg. That is the producing formation at least in the Grayburg.

Q. And when you do dispose into that well what disposal pressure do you use at the surface?

A. That depends on how much we are putting in it, I'm sure. Water has been injected into the well at over frac pressure in some instances.

Q. What was the pressure you were injecting into your waterflood project in December of '74 and prior to that?

A. Up to twenty-one hundred pounds.

Q. What is the current pressure?

A. The median is around sixteen hundred pounds. We've

got about half our wells that are above that. The highest pressure that we report to the State and show on our own records for that matter is around nineteen hundred pounds.

Q. That is the maximum?

A. Yes.

Q. Is that below the fracture pressure in the reservoir?

A. No, I imagine it's above. That's just an estimate because we haven't made a -- I'm not familiar with a fracture pressure calculation on the well, any wells that we are injecting in at nineteen hundred pounds. I am sure that it will be above the average fracture gradient for the unit, whether it is in those particular instances or not, I cannot say, but it would be reasonable to assume that it is probably somewhat above it.

Q. Well, Mr. Kernaghan, if the UIC controlled program goes into effect, which I imagine it will, and if the State of New Mexico has to use it as guidelines for the operation of injection projects, which we assume that it will, all of these floods and disposal projects will be required to be operated at less than fracture pressure, is that correct?

A. Well, I would imagine that this flood would. The order that I read did give the State the authority to request exemptions in areas where there are no fresh water sands which covers a large part of the State, particularly out in Eddy County but in this particular area the order as written looked

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to me as if it would probably restrict us in these.

Q. So in effect what it will amount to would be that all waterfloods throughout the country will more or less have to operate on a slow soak method of flooding rather than a speedy flood is that it?

A. Well, we are probably going to be out of the waterflood business in New Mexico.

Q. It's going to be all over the country, though, isn't it?

A. Well, New Mexico is really a large part of Anadarko's waterflood operation.

Q. And then Mr. Sexton's recommendation that all floods be operated at produced waters until the frac pressure has been established and then injection rates at less than frac pressure will not be so unique at all, will they?

A. Well, the part about being less than frac pressure, no.

Q. It will be more or less a universal thing across the country?

A. Yes, but the UIC regulations have been talked about for three years.

Q. Well, the last I heard they promised them by July.

A. We would like to operate as long after that as we can we're not going to be here forever.

Q. The guy with the EPA is the one that said that and he

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said those were the regs.

A. We think that we can flood faster than the government can get regulations into effect.

Q. If you don't use the slow soak. Thank you, Mr. Kernaghan.

MR. RAMEY: Are there any other questions of the witness?

CROSS EXAMINATION

BY MR. SEXTON:

Q. Mr. Kernaghan, were you able to get to the bottom of all of the wells that you made pressure surveys in?

A. No, we were not, we got below the casing shoe on all of them.

Q. Were you able to get below where the majority of the water was going?

A. It was going out below the bottom, below the point where the tool was run in some cases.

Q. Do you think it could be going further out of the zone beyond that?

A. Going out of the bottom and then coming around and getting up to the salt?

Q. I'm just saying, did you establish that it was going into the zone?

A. Did we establish that it was going -- well, as I said

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if we did not get to the bottom of the well there was a Penrose zone below the point at which our tool was run and if water was still going downward -- I'm not too inclined to think it's going to migrate down to the San Andres, I would anticipate that it goes into the Penrose at some point and into the Upper Grayburg at the outside.

Q. This was a common occurrence on most of the logs that were run, that water was going below where you had established it?

A. On most of the logs run? It wasn't my impression that it was most of the logs run. It was an occurrence that was not uncommon. It happened in a number of cases.

Q. This is one of the things that I think the Committee did, a trend that all of the water was going past where it was injected according to the surveys?

A. I would like to say, if we did not get to the bottom of the hole we did not get to the bottom of the Penrose section. If the water is going below the point which we surveyed there is a limit to where it can be going. The formations below it are the Grayburg and the San Andres. The San Andres is over a part of our flood anyway, probably it's just a high pressure in the Penrose. I don't see any way that the water could migrate back up to the salt.

Q. This could be one reason why you need higher rates. If you are not sure where it is being contained at you might

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need higher rates?

A. Possibly so. There are unproductive zones in the Penrose too probably. As you go down in the Penrose there are some barren zones that aren't pertaining to the water flood. Leakage into them would be a source of leakage outside of the producing reservoir.

MR. SEXTON: That's all I have.

MR. RAMEY: Are there any other questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. KELLAHIN: Mr. Ramey, I call Mr. Vic Lyon on behalf of Continental Oil Company and he has not been previously sworn.

(THEREUPON, the witness was duly sworn.)

VICTOR T. LYON

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Please state your name, by whom you are employed and in what capacity?

A. I'm Victor T. Lyon, L-y-o-n, I'm employed by Continental Oil Company as Conservation Coordinator in the

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Hobbs Division Office located in Hobbs, New Mexico.

Q. In what area do you hold a degree, Mr. Lyon?

A. I have a degree in general engineering from the University of Oklahoma and I have been practicing petroleum engineering for the past thirty years.

Q. Does Continental Oil Company operate a waterflood project or projects within any of the areas in question?

A. Yes, we do.

Q. What are the names of those floods and where are they located?

A. I would like to use the Commission's Exhibit Four, if I may, in pointing these out.

Continental Oil Company operates a waterflood in the Skaggs-Grayburg Pool within the area of the Southeast Monument Unit which is shown on Exhibit Four in Sections 13, 24, 25, of Township 20 South, Range 37 East and in Sections 18, 19 and 30 of Township 20 South, Range 38 East. We also operate a flood, it is designated here as Continental SM Unit which is an area between the Skaggs Unit, actually that is the Skaggs waterflood project in the Southeast New Mexico Unit and the Eumont-Hardy Unit. That area is in Section 25, Township 20 South, Range 37 East and those injection wells, that waterflood project per se, has been shut down for several years.

We also operate the Eumont-Hardy Unit which is also shown outlined on Exhibit Four in Sections 25 and 36 of

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Township 20 South, 37 East, Section 31 of 20 South, 38 East, Section 1 of 21 South 36 East and Sections 5 and 6 in Township 21 South, Range 37 East.

We also have a working interest in the East Eumont Unit which is in the central area under discussion at this hearing.

Q. Are those floods your responsibility, Mr. Lyon?

A. Not directly, no, sir.

Q. Do you have knowledge of their operations and you appear here to testify on those particular floods?

A. Yes, I have a general knowledge of those.

Q. Have you previously testified before the Commission and had your qualifications as an expert witness accepted and made a matter of record?

A. Yes, I have.

MR. KELLAHIN: We tender the witness as an expert.

MR. RAMEY: He is considered an expert.

Q. (Mr. Kellahin continuing.) Mr. Lyon, would you refer to what you have marked as Exhibit Number One and identify it and explain the information that it contains?

A. Exhibit Number One is a performance curve on our Skaggs Pool waterflood. This is the one I first referred to as lying within the boundaries of the Southeast Monument Unit. This waterflood has been under operation for at least fifteen years in the Skaggs-Grayburg Pool.

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The exhibit shows the oil producing rates by the heavy solid line. The water -- well, I beg your pardon, I guess that flood started in 1966 or '65. It shows the water producing rate by the heavy dashed lines, the water injection rate by the thinner solid line. Toward the lower portion of the exhibit it shows the percent water cut and the fluid in and fluid out ratio.

As you can see the project has been operating for at least ten years and we injected water on more or less a continual basis until the Monument Oil Center Committee was formed and then in cooperation with that committee and its investigations, this well was shut in.

Now, I might point out and it may have been already pointed out that this area was the only one of the three that the waterflood injection programs were just stopped. Now, I think that most of the other floods have been injecting their water at very much reduced injection pressures.

We, in our two waterflood projects have ceased injection altogether and have disposed of our produced water through our connection with Rice Engineering Disposal System. So we have not been injecting in either of these projects since we shut them in in cooperation with the committee's efforts.

You might note that the oil production curve, that the decline rate has not materially changed since we stopped injection because of that reason and because of the fact that

this flood has passed its maturity and is in the decline stage. At this particular time we see no probability that we will resume injection. This could change as conditions develop but at the present time we see no reason to place this waterflood back on injection.

Q. Please refer to Exhibit Number Two and identify it?

A. Exhibit Number Two is a similar performance curve on our Eumont-Hardy Unit which is the southernmost of the two units that I have pointed out that Continental operates. This curve shows essentially the same information that was shown on Exhibit Number One.

Water injection began in this project in 1968 and it has also passed the maturity stage and is in the advanced stage. We have a fairly high water cut so that our operating expenses are probably at about the maximum but if you will note the oil production curve, when we shut this fluid in in October of 1976, the oil producing rates began a steep decline which I calculated at approximately fifty-three point five percent per year as opposed to approximately eleven percent decline rate which had been shown for the year previous to that. If you would extrapolate those curves as I have done, it appears that if this project is not placed back on injection that the difference represented by the area between the two extrapolated curves would represent oil which could be recovered that will not be recovered and I calculate this to be a minimum of three

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hundred thousand barrels.

Q. You were here yesterday when Mr. Sexton testified as to what his recommendations to the Commission are, do you have any recommendations on behalf of Continental Oil on those recommendations?

A. Well, I must agree with Mr. Gannon in his testimony that we have seen no direct evidence that these waterfloods have contributed to the problem that we have in this area and I might also point out that the Committee set up a two-pronged program to try to find some connection between the injection wells and the injection projects and the wells having pressure casings, water flows, et cetera. The first of these was to take injection projects off injection in order to attempt to create a pulse which might be detected at our monitor wells.

We have had all of the five injection projects off injection for at least seven months, some of them almost a year and there has been no direct evidence of any connection between any individual project or individual wells and I believe that it is time we started the second prong of this program which is to place the project back on injection and continue monitoring the pressures in our monitor wells and see if the second half of this thing will give us the information which we did not get in the first half.

I think that it is rather unfortunate that we might be limited to produced water in placing these injection projects

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back on injection. I feel that this will result in probably a loss of recoverable oil and I really see no reason from what we have observed in our committee's deliberations and the data gathered why there should be such a restriction.

Q. Do you have a recommendation as to whether any restrictions at all ought to be placed on these waterflood projects?

A. We would like to be permitted to place the Eumont-Hardy Unit back on injection essentially as it was operated prior to the shut in. Of course, the first indication that we have where anything is being pressured up we would slack off. I don't expect to see any such evidence.

MR. KELLAHIN: I have no further questions. We move the introduction of Exhibits One and Two.

MR. RAMEY: They will be admitted.

(THEREUPON, Conoco Exhibits One and Two were admitted into evidence.)

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Lyon, let's talk about your Eumont-Hardy here a minute. When you were under full operations there what were your injection pressures?

A. I don't have that data with me. I think it was in the neighborhood of two thousand pounds, perhaps slightly

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above this.

Q. What is the pressure on the injection wells now that they have been shut in for some eight or nine months?

A. We have prepared curves on each of the injection wells in the Eumont-Hardy Unit and they are all shown to be at zero.

Q. Okay, if you started injection at this point wouldn't it be a relatively simple matter to establish what the fracture pressure is on this flood?

A. Yes.

Q. And then resume injection at something under the fracture pressure?

A. Yes, I think that could be done. I'm not certain of this but I don't believe we have performed separate tests on these wells but I would like to state that I agree essentially with Mr. Kernaghan that I see no danger in injecting above the fracture pressure so long as you are not greatly in excess of the fracture pressure. In fact, I feel that in a large percentage of the waterflood projects in New Mexico that if you don't inject above the fracture pressure you are likely to have an uneconomic waterflood.

Q. Would you rather have the EPA administer the waterfloods or the New Mexico Oil Conservation Commission in accordance with the EPA instructions?

A. Well if you have to do everything that the EPA tells

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you to do the only difference would be that we would come to Santa Fe rather than to Washington and I'd prefer it from that basis. I think that it is most unfortunate that the people who are making these environmental rules seem to feel that it's undesirable to have anyone in their employee or on committees and so forth that knows anything about what's going on.

Q. Well, we all tend to agree with that, Mr. Lyon, but I think we need to face reality that we are going to have a UIC program and we have the choice of administering it at the state level or letting them administer it and part of this very definitely says that injection will be under the fracture pressure.

A. Well, I recognize that and I try to be realistic about these things but at the same time I don't think because the EPA has made motions about placing these kind of restrictions that I should under any way, shape or form set up here and testify in agreement with them. I think they're wrong but I don't think I can carry much weight with them.

Q. So I think, as I understand Mr. Sexton's recommendations, now that you have bled the pressure off of your injection wells you would be allowed to inject outside water up to the fracture pressure. Is that the way you interpret his recommendations?

A. Yes, I think that's right.

Q. So in essence you wouldn't be limited to produced water?

A. Right, and, you know, we would just have to put the project back on injection and take whatever steps the Commission feels to be advisable and if we feel that we are unduly restricted, to come up and see if there isn't something we can work out.

Q. I think it might be very interesting to see what happens in a situation like that.

A. Right.

Q. Mr. Lyon, do you feel these water flows and such coming out of the salt section in this central area are natural?

A. No, I'm inclined to think they are not natural.

Q. They have come from some outside source?

A. I think so. There may have been some natural phenomena in there but I think that it has been aided by outside sources, yes.

Q. That has been my observation that there have been water flows in several places in Lea County but there has always been injection of some kind in conjunction with these waters.

What is the significance of the fluid in-fluid out curve?

A. Well, it depends on the individual project. If you have a completely enclosed reservoir it should give you some indication of the efficiency of your waterflood.

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Q. What would you consider the curve on the Eumont-Hardy, would you consider that an efficient waterflood?

A. Well, I would like to point out that in both of these projects, the projects are located in a low structural area and to the west of both of those projects the structure is rising and there is a gas-oil contact in there. We have realized in the Skaggs Unit that we were injecting water into areas where gas was productive. The same is true of the Eumont-Hardy. As a matter of fact, in our initial injection pattern we placed all of the wells on the western side on injection in order to form a water barrier to prevent the migration of oil up structure so we know that we have been injecting water into the gas cap area and we have done this intentionally to prevent the migration of oil.

In such a situation the fluid in-fluid out ratio has got to have a great deal of interpretation to have any value at all and, therefore, we feel that we really couldn't say that it had any measurable value in this case.

Q. Well, you could surely make some rough calculation on how much water was needed to create your water bank at the gas-oil contact and then do your calculations from there, couldn't you?

A. Well, that's true but the Eumont gas pool, as you know, is having declining bottom-hole pressures. We are building up the pressures in our waterflood area and we really don't

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have any way of knowing how far that water bank is going to move into the Eumont gas pool.

Q. How would you, in just looking at your fluid in-fluid out, would you say that you had a reasonably efficient flood?

A. Well, it hasn't been as efficient as we had hoped it would be.

MR. RAMEY: Thank you. Any other questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. RAMEY: I think we ought to have a fifteen minute recess.

(THEREUPON, the hearing was in recess.)

MR. RAMEY: The hearing will come to order.

Do you have another witness, Mr. Kellahin?

MR. KELLAHIN: No, sir.

MR. RAMEY: Mr. Lopez, did you have a witness?

MR. LOPEZ: Mr. R. W. Phillips from Shell Oil Company in Houston is here but he would like to just give a statement for the Company.

MR. RAMEY: All right, Mr. Abbott, do you have a statement that you wanted to offer at this time?

MR. ABBOTT: Yes, I would.

MR. RAMEY: Mr. Abbott.

MR. ABBOTT: My name is W. G. Abbott, Manager of

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Agua, Incorporated.

I want to speak a little bit for salt water disposal since it's being discussed in this area. Southeast New Mexico has two hundred and thirty-two salt water disposal wells and the accumulative disposal in these wells through 1976 was two and a quarter billion barrels. The monthly water disposed is about nine point six million barrels and a good part of this water is put in the San Andres formation.

In this area that is being discussed today, the south area, this south unit area, Aqua operates the Blinebry-Drinkard salt water disposal system. We have four hundred and sixty-three wells connected to this system and the water disposed in the year 1976 is about three point seven million barrels. The water is increasing. There was a twenty-one percent increase in water disposed in 1976 over 1975 and there has been a twelve percent increase in the connected wells to the system so things aren't exactly static in this disposal system.

We have three salt water disposal wells which are served by a hundred miles of gathering system. These three wells, our H-35 well, our C-2 well and our A-22 well.

Now, when this water problem came up in this area and water was observed on the surface strings, migrating evidentally through or close to the salt section, the Conservation Commission ordered us to shut in this H-35 Well. That

meant that we had to quickly put in a temporary line to dispose of the water that was going into the H-35 and it was re-routed to our C-2 Well which takes the water by gravity.

The H-35, by the way, the highest pressure in it was fairly steady. It was, when we were injecting over five thousand barrels a day, was seventeen hundred pounds. This was in a zone, the San Andres zone, from four to five thousand feet. Now, this is five hundred feet below the Queen sand where the water flooding was going on and it's considerably below the base of the salt around twenty-five hundred feet.

Also in order to increase the capacity of our C-2 Well it was necessary to open up the perforation in the Upper San Andres which by the order of the Commission we had to later blank off and we are disposing in the Lower San Andres in the C-2 Well.

Then our A-22 Well has been restricted to fourteen hundred psi surface pressure. We had run a separate injection test in the well and found that the fracture pressure was about fourteen sixty. Because of the increase in water and because the H-35 well is still shut in and because of the restriction on the A-22 surface pressure, we are in the process now of circulating an AFE to drill a new well, salt water disposal well, which we will call the N-18 Well and it will be located in the southeast quarter of the southwest quarter of Section 18, Township 22 South, Range 37 East. This will be on

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the west side of this subject area discussed today.

I want to get back to this H-35 Well. The well was authorized for disposal in October of 1968. In 1975, in August, this well was ordered to be shut in by the Commission and it was shut in September of 1975. In July, July 14th, 1976, in Case 5713, we had a hearing to get permission to resume disposal in the H-35 and no order has been issued by the Commission, that's about eleven months ago. We would again ask the Commission to review that Case 5713 and issue an order so that we can resume disposal into this well.

That concludes my statement.

MR. RAMEY: Thank you, Mr. Abbott.

Mr. Schrader, do you have any testimony?

MR. SCHRADER: Mr. Korzekwa has a statement he would like to read into the record but he has not been sworn.

MR. RAMEY: I don't think it's necessary to swear him for a statement.

MR. KORZEKWA: My name is C. R. Korzekwa, I'm Project Petroleum Engineer for the Gulf Oil Corporation in the Hobbs area.

(Reading) Gulf Oil operates one hundred oil and gas wells within the area covered by this hearing. Combined production from these wells averages six hundred and twenty-one BOPD, eight hundred and ninety-seven BWPD and twenty-one million eight hundred and eighty MCF per day. None of the wells operated by

Gulf in this area is under waterflood at the present time.

While Gulf does not operate any waterfloods within this area, it does own a working interest in seven active waterflood units in this area that are operated by other parties. Gulf's working interest in these floods ranges from more than eleven percent to less than one percent.

Gulf does not operate any water disposal wells within the area covered by this hearing. Water produced from wells operated by Gulf in this area is disposed of through the Blinebry-Drinkard System and the Eunice Monument System.

As shown, Gulf has a significant economic interest in the production from this area. Any proposed remedies should bear in mind the economic realities of the situation. Gulf is ready and willing to cooperate within economic reason with the Oil Conservation Commission in reaching a solution to any existing salt water problems. We believe that by working together the industry and the OCC can reach a reasonable and equitable solution to control this and any other potential problems in this area. (End of reading.)

MR. RAMEY: Thank you, Mr. Korzekwa.

Mr. Goodheart?

MR. GOODHEART: I would like to make a brief statement for the record only.

I'm L. B. Goodheart, Producing Manager for Rice Engineering, Hobbs, New Mexico.

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In these three areas outlined on the docket we operate seven salt water disposal wells. We would like to state that all of these wells inject water by gravity into the Lower San Andres zone and since there is no evidence that this injection has contributed to the problem of pressuring of salt sections in any way or the high-grade pressures in the area, we would recommend that there be no restrictions placed on these wells, any further restrictions, and certainly that none of the operations be considered for suspension of any kind.

That completes my statement.

MR. RAMEY: Thank you, Mr. Goodheart.

Mr. Lopez.

MR. LOPEZ: If you would like we can read the statement into the record.

MR. RAMEY: If it is short that will be all right.

MR. LOPEZ: This was prepared by Mr. R. W. Phillips.

(Reading.) Shell Oil Company is an operator and interest holder of various leases within the areas designated by Case 5941 for public hearing on June 13, 1977. Although Shell does not operate any supplemental recovery projects or salt water disposal wells within the designated areas, future projects are planned in the State of New Mexico. Therefore, Shell Oil Company believes it to be prudent to state their position relative to the three areas of current interest and

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to the operation of supplemental recovery projects in general and to have these statements entered into the record of said hearing.

Number One, Shell Oil Company acknowledges that a problem exists in the three areas designated by Case 5941 and that a potential problem exists elsewhere within Southeast New Mexico and in other areas wherein supplemental recovery and salt water disposal projects are in operation. Shell believes temporary restrictions may be in order for certain wells within these three problem areas with the objective of relieving the pressure existing in the salt section and determining the source of said pressure. To this end, Shell shall encourage the current efforts toward bleeding the pressure off the salt section at wellbores having known pressure and fluid flow potential.

In addition, Shell believes it prudent to (A) Investigate more thoroughly possible water escape routes through wellbores other than injection wells and require corrective measures.

(B) Maintain surveillance of and possibly expand the number of monitor points throughout the life of the project.

Two, Shell Oil Company believes the following statements and guidelines will minimize problems in the future:

(A) Shell Oil Company believe that no limitations

should be imposed upon injection pressures for salt water disposal wells or for supplemental recovery project injectors. To date there has been no evidence in the three areas subject to Case 5941 that there is escape of injected fluids to other formations at the injector wellbores. This is evident from numerous investigations during the past year using modern surveillance tools and from testing through perforations. Furthermore, there is strong evidence from field operations that fractures of lengthy vertical extent in these problem areas cannot be created by pressures and injection rates used in supplemental recovery projects. Any restriction of injection pressure will result in injection volume limitations and ultimately reduce the overall recovery of hydrocarbons, especially from the tighter reservoirs that probably will be proposed in the future. In addition, abandonment of currently planned projects may occur.

(B) Shell Oil Company believes certain guideline requirements should be established at inception of any fluid injection project to assure that the zone of injection is properly isolated in all boreholes within and immediately adjacent to the unit area.

(C) Shell Oil Company believes a surveillance program using sophisticated modern equipment should be required to assure that the injected fluid is being restricted to the project interval. A surveillance program should include, one,

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tracer and temperature surveys of injectors, two, periodic annulur surface pressure surveys of all wells within and immediately adjacent to project area and, three, downhole surveillance of selected producers where zonal isolation may be questionable. If such program indicates injected fluid is not being restricted to project interval then corrective measures should be required immediately. (End of reading.)

Thank you.

MR. RAMEY: Thank you, Mr. Lopez.

Does anyone have anything further to offer in this case? If not, the Commission will take the case under advisement and the hearing is adjourned.

(THEREUPON, the hearing was adjourned.)

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REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish, C.S.R.

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
14 June 1977

COMMISSION HEARING

IN THE MATTER OF:

The hearing called by the Oil Conservation Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County, New Mexico.

CASE 5941

BEFORE: Commissioner Joe Ramey
Commissioner Emery Arnold
Commissioner Phil Lucero

TRANSCRIPT OF HEARING

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MR. RAMEY: The hearing will come to order.

I think we are down to Mr. Kellahin.

MR. KELLAHIN: Thank you. I would like to present my witness from Anadarko first, Mr. Dan Kernaghan.

DANIEL G. KERNAGHAN

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Kernaghan, would you state your name, by whom you are employed and in what capacity?

A Dan Kernaghan, I'm employed by Anadarko Production Company as Division Evaluation Engineer in Houston.

Q In what areas do you hold a degree, Mr. Kernaghan?

A Petroleum engineer.

Q Have you previously testified before this Commission and had your qualifcations as an expert witness accepted and made a matter of record?

A Yes, I have.

MR. KELLAHIN: If the Commission please, are the witness' qualifications acceptable?

MR. RAMEY: Yes, we are acquainted with him.

Q (Mr. Kellahin continuing.) Mr. Kernaghan, would

you state for the Commission where Anadarko operates its waterflood project?

A. Anadarko's Langlie-Mattix Penrose Sand Unit is in Township 22 South, 37 East. This area is shown by the hach lines immediately to the north of Skelly's Penrose "A" and "B".

Q. On which exhibit is that?

A. I believe that is Commission Exhibit Two.

Q. It is indicated by which line on that exhibit?

A. It's the northernmost unit indicated by the hach lines. It's in Sections 21, 22, 27, 28, parts of 33, 34, 23, 26, 14, 29 and 32 of 22 South, 37 East.

Q. Anadarko's flood is in this central area?

A. No, it's in the south area.

Q. The south area?

A. In the Eunice area.

Q. What has been the history of Anadarko's participation in the Commission ordered Industry Committees to examine and evaluate waterflood and injection systems in these areas?

A. Well, Anadarko was participating in these committees from the start. One of our representatives was the Chairman of the North Subcommittee that the committee appointed in December of '74 and was broken in two. We had a representative that chaired one of the subcommittes that was formed after the January 22nd, '75 hearing and we've had continuous partici-

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pation in the Eunice Area Subcommittee since March, 1976 or May 1976 when it was formed.

Q As part of Anadarko's participation in this study committee, what if any tests has Anadarko run on the waterflood project?

A Starting with the summer of 1974 as requested by the Committee, we ran tracer and temperature surveys on all of the injection wells in the unit. This work continued until the spring of 1975. Since that time we have run additional tracer and temperature surveys either as indicated or as requested by the subcommittee. We have run sound logs on two wells, we ran one step rate test on Well 40-1. This was back in 1974.

Q Do those tests appear in the minutes of the Committee that were introduced here yesterday by Mr. Sexton?

A Yes, for the most part they were. We may have run a few others on the basis of information from the earlier tests that didn't appear in the minutes but for the most part they do.

Q What if any remodial work has Anadarko done on its waterflood project in response to a request or an order by the Commission?

A We plugged the old Elder Willingham TO May No. 1 Well in location B of Section 34, I believe.

Q Would you point to that on the Commission Exhibit

Two?

A That's this well right here. That's location B of Section 34, 22 South, 37 East.

Q What did you do with that well?

A We reentered it and plugged it to their specifications.

Q When was that done, do you recall, the approximate date?

A I believe it was done before our Order R-5003 which would have put it in '74.

Q Has there been any additional remedial work done by Anadarko?

A We squeezed a couple instances of holes in the casing that turned up on the tracer surveys and one casing shoe that was shown to be leaking on that survey.

Q Commission Exhibit Two indicates some Anadarko wells that have been called problem wells. Will you explain to us what those wells are, what the problem is and what Anadarko has done and if you will begin your testimony with that well No. 8-2?

A 8-2?

Q 8-2.

A It's in location C of Section 21. That well, Well 8-3, which is in location D in the same section and Well 10-2 which is in location K of Section 21, all are shown to have bradenhead pressure and water flow.

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Q That is the problem?

A Yes.

Q That is what we mean when we call it a problem?

A Yes. I have tested the wells on several occasions and at the most we get volumes of water from a quart to maybe a gallon out of these wells and they just flow down in a period of anywhere from thirty seconds to a minute and a half. It's my opinion that the flows are caused by gas from the Yates formation that slowly bleeds in there and as you release the pressure it takes a little water with it and it depletes and that's it.

Q What's the volume of fluid?

A Anywhere from a quart to a gallon or a cup in some cases. 10-2 I never was able to get anything out of it. We didn't have any pressure on it and it didn't have any flow the times I've been there.

Q When have you done that?

A Over the last year and a half. I was out there a couple of weeks ago.

Q The next well was something named 27-1?

A 27-1 is indicated on this map as a problem well. We perforated a section that had a water flow in a Gulf well that was drilled last year.

Q Where is the Gulf well?

A I don't believe it's on this map.

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Q Where is 27-1?

A It's in location C of Section 28. We perforated a section in that well above the salt and were not able to establish any flow out of it. We have acidized it and we are still not able to establish any flow out of it and we went back and put it on production.

A few weeks later we had spontaneous flow break out at the bradenhead, the annulus between the surface casing and the long string on Well 27-2 which is on the same location, same unit anyway. This well flowed twenty-four hundred barrels over a period of a week. It declined in rate and it had about a hundred and fifty pounds of pressure on it to begin with and it ceased flowing. We pumped in fifty barrels of fresh water slowly over a period of several hours and it failed to establish anymore flow.

It's not marked on this map.

Q Would you mark that on the map, please? Do you know where 27-2 is?

A I can put a little check mark by it.

Q Would you label that 27-2, is it so numbered?

A I don't believe they show our tract numbers on here. The other well circled in red.

Q Well, let me ask you about this 27-2 now. In your opinion why did it stop flowing?

A I think that the lense that was pressured up just

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depleted.

Q. Mr. Sexton indicated in his testimony yesterday that he experienced what he thought was salting off of that particular --

A. We pumped in fresh water and the fresh water went into a formation somewhere. Now, if there was a formation permeable enough to accept water it should have pressured up also I would think. It should have had salt water in it.

Q. In your opinion did this well salt off?

A. No, I don't think so.

Q. It's your opinion that the pressure was depleted?

A. I think so, yes.

Q. Are there any other wells there?

A. They have Skelley's LPG storage well marked in its location F of Section 27 and it was discussed yesterday. The flow was down to something like a quarter of a barrel a day on it now. It had substantial flow originally.

Q. In your opinion, Mr. Kernaghan, are there any wells in Andarko's Langlie-Mattix flood causing the salt section in this area to pressure up?

A. I don't think there are, no.

Q. Describe for me what this salt section is?

A. Well --

Q. Where it's found?

A. It's found from about twelve hundred feet to twenty-

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four hundred feet in this area and it's sodium and potassium chloride and imbedded with anhydrites and sand stringers.

Q Some twelve hundred feet thick?

A Yes, sir.

Q In your opinion, Mr. Kernaghan, is there any evidence or indication that Anadarko's flood has contaminated any fresh water in the area?

A No, I don't believe there is.

Q In your opinion, Mr. Kernaghan, is the injected salt water being used in this flood remaining in the Penrose formation?

A I think it is at this time, yes.

Q Why?

A Well --

Q Why do you think that?

A Well, any possible communication through deeper wells was handled by Commission Order R-5003 and our tracer surveys and temperature surveys don't show any evidence of leakage past the casing shoe or up the hole. They show no indication of that movement of the radioactive tracers.

Q There was some discussion yesterday whether these areas were experiencing vertical fracturing and the discussions concerned vertical fractures some distance away from the wellbore. In your opinion, Mr. Kernaghan, is there any vertical fracturing occurring in Anadarko's flood beyond the two-foot

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radius of the wellbore?

A. Well, no, I don't believe that there is.

Q. Why not?

A. Well, it was brought out yesterday and I completely agreed that the zone or the area or the point of greatest pressure is near the wellbore. The pressure falls off as the log of the distance when you get away from the wellbore. The point of greatest stress is near the wellbore. If the fluid moved out and encountered some zone of weakness or fracture zone away from the wellbore it's -- I don't believe it could migrate any great distance in this type of fracture system. In the first place this system probably doesn't occur throughout that whole section, from the salt section down. It certainly couldn't occur in the salt section.

If the fluid migrated upward in a zone like this it should bleed off in the first permeable zone that it encountered in the upward movement. It would then either move back to the, if it was above the cement sheath around the pipe it would move back to the annular space and then migrate along that or it would at least move into this permeable zone sufficiently that it could be -- any permeable zone it encountered would be a plane perpendicular to the wellbore and it would move in this plane until -- you know, some of the tracer surveys would have picked it up and we've got something like fifty of them out there and with something like fifty wells with more tracer

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surveys than that and none of them encountered the situation. We pulled these tools at least several hundred feet above the Penrose and that was only in the first one and then the later ones we pulled them all the way to the surface.

Q You said you agreed with the testimony yesterday. I assume that by that you meant you agreed with Mr. Gannon's testimony on behalf of Texaco?

A Yes, sir.

Q You heard Mr. Sexton's testimony yesterday, did you not, Mr. Kernaghan?

A Yes, sir.

Q What is Anadarko's position with regard to Mr. Sexton's recommendations? Are you for or against it?

A We are opposed to the recommendations.

Q Why?

A Well, we don't believe there is any evidence, we don't believe there is sufficient evidence to support the present restrictions that we are operating under and we don't really believe there is any to support any further restrictions.

Q If Mr. Sexton's recommendations are adopted by the Commission as an order will Anadarko experience any waste with regard to its waterflood project?

A Yes, we will. We will suffer a substantial loss in reserves.

Q All right, explain that for them?

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A Well, we estimate the reserves as of July 1st --

Q July 1st of '77?

A July 1st of '77. If we were allowed to operate without restrictions or allowed to inject a hundred and fifty percent of withdrawal, that we have reserves of about one point eight million barrels.

Q Those are reserves that you could recover?

A That's right.

Q One point eight million?

A Down to the economic limit. Under the present order of restricting us to a hundred percent of withdrawal we estimate the remaining reserves to be about a million barrels as of the same date. If we were limited to injection water only, or produced water only, we estimate that the reserves would be in the neighborhood of five hundred thousand barrels, all as of the same date, July 1st, 1977. It would be a net loss of one point three million barrels.

Q What would be the loss of reserves if you are limited to injection of no more than a fracture pressure?

A It would be somewhere in between the five hundred thousand million barrels. We don't know exactly what effect it will have yet but we have a few wells over the frac pressure we have several wells injected over the fracture pressure and it will reduce their rate.

Q Now, this loss in producible reserves that you have

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mentioned, have you taken into consideration the natural decline in the waterflood?

A Yes, it was declining in December of 1974. Its peak rate was something like two thousand barrels a day or a little above and immediately prior to the order issued in December of '74 it had declined to sixteen hundred barrels a day. The last day for which we have a count, which I believe was late Saturday, it produced nine hundred and seventy-four barrels. Had the order of December '74 restricting us to a hundred percent of withdrawal, a hundred percent of voidage, not been put into effect we would have declined to about twelve hundred barrels a day anyway.

Q Now, tell me about your daily production again just prior to the restriction in December of '74. What was the waterflood making?

A It was making sixteen hundred barrels a day.

Q As of today's date under the order that imposes a hundred percent of voidage?

A We made nine hundred and seventy-four barrels last Saturday. Last month it averaged a thousand or a little less.

Q You have indicated to us what the potential loss is in terms of barrels of oil, can you place a dollar amount on that loss?

A At one point three million barrels, it's going to be nine or ten million dollars. Well, we'll get stripper price

later on down the line but the loss will be in the range of nine to ten million dollars.

Q What, if any recommendations does Anadarko have with regards to this?

A We recommend that based on the failure or based on the indications that there is no movement outside of the flood zone that can be seen at this time or no point where this movement occurs can be found, that we be allowed to go back to a hundred and fifty, either unrestricted injection or a hundred and fifty percent of withdrawals.

Q Do you have any further recommendations?

A No.

Q Do you believe that there is a continuing need to further monitor these area?

A Yes, sir.

Q What effect, if any, has the remedial work that has been done in the recent past have on your particular flood?

A Well, I'm of the opinion that the remedial work that has been done has probably cured the problem. There is no reason to believe that it did not cure the migration of fluids that did occur if that was the source of them.

MR. KELLAHIN: No further questions.

CROSS EXAMINATION

BY MR. RAMEY:

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Q Mr. Kernaghan, I think you indicated by when you said that you are now not allowing any water to get into the salt section that you did feel at one time that perhaps water was getting out of the flood interval into the salt section?

A Well, I don't think the salt section was naturally pressured up. I don't think there is any question but that the water came from somewhere. I really had no problem with the philosophy that it was probably migrating up through the deeper wells that were unseamed.

Q I think you said something about that you couldn't see any fractures in the salt that the salt section was fractured?

A Yeah, it would be kind of hard for me to picture fractures in the salt section. It doesn't seem to me to be a medium that would tend to fracture.

Q How would you account for these very large water flows?

A Well, the salt section does have, you know, it's interbedded with some other materials, it has anhydrite and occasional sand and shale stringers. I think you can get flow along the bedding planes there. You can get some storage capacity in these interbedded materials that are with it.

I was speaking of vertical fractures. This salt does not seem to be a medium that would tend to, you know, it's a rather plastic type of thing and by its nature it would

seem to me it would prevent a natural fracture from occurring and it would heal, you know, in the event of fracturing it would heal very quickly.

Q. Under normal waterflood practice is it good practice to fracture the formation?

A. In this area I don't consider it a bad practice. I don't think these zones or these formations would ever have been flooded if we couldn't have put fluids in over the fracture pressure or over the fracture gradient.

In the past we have operated as many as fifteen or twenty floods in New Mexico and it's a common practice to inject fluid over the fracture gradient.

Q. What happens to the fluid when your formation fractures?

A. Well, fracture calculations are such that you propogate a fracture in a zone of weakness, a zone of greatest porosity for instance, and that fracture propogates until immediate sufficient bleed off of the injected fluid to reduce the pressure at the end of the fracture to below the pressure required to keep it open and at the injection rates we're talking about here it doesn't take very much formation face to lose sufficient fluid through bleed off to reduce that pressure

I made some fracture calculations based on the conditions under which we were operating and it was a matter of a few tens of feet that you could propogate a fracture in the

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Penrose sand and admittedly in an impermeable medium there is no bleed off but by the same token there is no, you tend to -- you know there is no porosity in there by which you can initiate the fracture with the same ease that you would in a sandstone that will take fluid.

Q What is the advantage in fracturing?

A Just to be able to put in enough fluid in the ground to make the flood economic, to make the rates economic. We are talking about formations here that are pretty tight.

Q What about efficiency, what happens to your efficiency sweep pattern?

A Well, I don't think these fractures extend, I think the extent of them away from the wellbore is a matter of fifty feet at the outside, let's say, a few tens of feet. It just shouldn't have any effect whatsoever on the sweep efficiency. We have had a very efficient flood here, not a very efficient but we've had a reasonabley efficient flood here. It has been economic, it's going to recover essentially the same as the primary did.

The history of our operations through New Mexico has been that we have recovered probably more oil than you could theoretically predict prior to the initiation of the flood.

Q R-5003 designated a group of wells in the area that needed to be repaired, is that right?

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A Yes, deep wells and plugged and abandoned wells.

Q Have all of the wells in the area been repaired?

A To the best of my knowledge all of the deep wells have been recemented. I believe that was borne out in testimony in an earlier case. I think it was in the re-hearing of November of '75. Mr. Clements testified that the Wolfson Boyd No. 1, I believe that well is in location L, Section 23, 22 South, 37 East.

Q While you are up there, Mr. Kernaghan, where are your injection wells in relation to that?

A We've got a well within the same location, in the same forty acre location. This map doesn't show our tract numbers. I believe that's our well, 40-1, but I wouldn't be positive without looking at another map.

Q You are injecting then?

A It is essentially a -- it's not exactly a twin well but it's within four hundred feet of the well, three hundred.

Q But you don't feel there is any water escaping out of your flood interval?

A Well, the Wolfson Well wasn't plugged -- it was plugged to the best of the operators capability according to the information they supplied you all and Mr. Clements put in his testimony.

Q Do you feel that it is plugged satisfactorily to contain the water within the Penrose?

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A. Well, I hate to comment on that. We didn't have access, like I say, to the original, to the full drilling reports on that well.

Q. But evidently the Commission didn't --

The Commission -- Mr. Clements didn't think it was plugged satisfactorily and so stated.

Q. Are you aware that the Commission now will not allow injection offsetting any wells that aren't satisfactorily plugged and abandoned in new authorized water floods?

A. No, I was not aware of that.

Q. Are you aware that the Federal UIC program which should be coming out sometime this year says that injection shall be under the fracture pressure?

A. Yes, sir.

Q. Don't you think that this Commission is going to have to conform to that program?

A. Well, that's getting out of my area of expertise.

MR. RAMEY: Any other questions of the witness? Mr. Nutter?

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Kernaghan, you have achieved fill up of the formation in this flood, have you not?

A. Yes, sir, that's right.

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Q All right, now, supposing you produce X barrels of oil and water and X MCF of gas and then you inject at a hundred and fifty percent or some other figure above one hundred percent of withdrawals, where does the excess water go?

A Well, the formation is not a closed formation. It extends out in all directions. There is a flood to the west of us that is injecting less than withdrawals, there is a formation to the east that was not sufficiently permeable to yield primary recoveries that were economic, at least would not support drilling but it did extend on to the east. To the south we are bordered by a flood that is probably replacing withdrawals and a little bit more but I feel that the extent the fluid can migrate and the extent of the formation that --

Q In other words, some of the fluid would migrate off your unit?

A That's right.

Q And the oil with it, is that correct?

A Well, we've got a pretty effective pattern there. We are pretty well depending that we are protecting ourselves from oil migration off the unit.

Q Did Anadarko operate any of the waterfloods in the Caprock Queen?

A We operated one and it was sold before I came to work for the company.

Q Are you acquainted with the Ambassador waterflood

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that was up in the north end of the Caprock?

A. No, I'm not, like I said, it was sold before I came with Anadarko.

Q. You weren't aware that they injected at high rates and, in fact, created a new oil pool on the west side of the reservoir there, did they not?

A. I never made a study of that flood.

Q. In other words, awhile ago, Mr. Kernaghan, in response to a question from Mr. Ramey, you said that the fractures if you injected in excess of reservoir frac pressure that the fractures extend out from the wellbore in a matter of a few tens of feet?

A. That's right.

Q. But you don't think that the fractures would extend beyond that according to your calculations?

A. I don't think at the rates we were putting water in, I don't think so.

Q. So what you are in effect doing is simply enlarging the wellbore in the immediate vicinity of the well?

A. That's right.

Q. And the rest of the formation remains a unit formation?

A. That's right.

Q. Now, when you mentioned that the rate of production in December of 1974 from this Anadarko unit was sixteen hundred barrels a day and the rate of production last Saturday was

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nine hundred and seventy-four barrels per day, you didn't intend to imply that the decline from sixteen hundred to nine seventy-four was due to reduction in injection?

A No, I said that if we had continued under unrestricted injection we would have declined naturally to around twelve hundred barrels a day anyway.

Q So the most you would be claiming for the decreased injection would be something like two hundred and twenty-six barrels per day?

A That's right.

Q Not seventeen hundred?

A No, that's right.

Q Does Anadarko operate any disposal wells in this area?

A We have one disposal well on the Walden lease. It's used only for injecting water that cannot be put into our waterflood injection well up there and it is used on an intermittent basis only and for the last year the use should have been very intermittent.

Q Where is the Walden lease?

A It borders the Langlie-Mattix field, it's in Section 15. It consists of the south two hundred and forty acres of the west half of Section 15, 22 South, 37 East.

Q Which is the disposal well there?

A It's the Walden 4.

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Q In Unit L?

A That's a Drinkard well that is in Unit E, I believe.

Q In Unit E, okay.

A The trouble is there are two or three operators there each numbering on their own system.

Q So you are not using it for disposal regularly?

A I cannot say that it has not had water put in it but it is used intermittently only to dispose of some volumes that we can't take either into our Langlie-Mattix system or into our normal injection well in that area.

Q That's on a lease, it's not on the unit?

A No, it's not in the unit, that's right.

Q What formation is that completed in?

A In the Grayburg. That is the producing formation at least in the Grayburg.

Q And when you do dispose into that well what disposal pressure do you use at the surface?

A That depends on how much we are putting in it, I'm sure. Water has been injected into the well at over frac pressure in some instances.

Q What was the pressure you were injecting into your waterflood project in December of '74 and prior to that?

A Up to twenty-one hundred pounds.

Q What is the current pressure?

A The median is around sixteen hundred pounds. We've

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got about half our wells that are above that. The highest pressure that we report to the State and show on our own records for that matter is around nineteen hundred pounds.

Q That is the maximum?

A Yes.

Q Is that below the fracture pressure in the reservoir?

A No, I imagine it's above. That's just an estimate because we haven't made a -- I'm not familiar with a fracture pressure calculation on the well, any wells that we are injecting in at nineteen hundred pounds. I am sure that it will be above the average fracture gradient for the unit, whether it is in those particular instances or not, I cannot say, but it would be reasonable to assume that it is probably somewhat above it.

Q Well, Mr. Kernaghan, if the UIC controlled program goes into effect, which I imagine it will, and if the State of New Mexico has to use it as guidelines for the operation of injection projects, which we assume that it will, all of these floods and disposal projects will be required to be operated at less than fracture pressure, is that correct?

A Well, I would imagine that this flood would. The order that I read did give the State the authority to request exemptions in areas where there are no fresh water sands which covers a large part of the State, particularly out in Eddy County but in this particular area the order as written looked

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to me as if it would probably restrict us in these.

Q. So in effect what it will amount to would be that all waterfloods throughout the country will more or less have to operate on a slow soak method of flooding rather than a speed flood is that it?

A. Well, we are probably going to be out of the waterflood business in New Mexico.

Q. It's going to be all over the country, though, isn't it?

A. Well, New Mexico is really a large part of Anadarko's waterflood operation.

Q. And then Mr. Sexton's recommendation that all floods be operated at produced waters until the frac pressure has been established and then injection rates at less than frac pressure will not be so unique at all, will they?

A. Well, the part about being less than frac pressure, no.

Q. It will be more or less a universal thing across the country?

A. Yes, but the UIC regulations have been talked about for three years.

Q. Well, the last I heard they promised them by July.

A. We would like to operate as long after that as we can, we're not going to be here forever.

Q. The guy with the EPA is the one that said that and he

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said those were the rags.

A. We think that we can flood faster than the government can get regulations into effect.

Q. If you don't use the slow soak. Thank you, Mr. Kernaghan.

MR. RAMEY: Are there any other questions of the witness?

CROSS EXAMINATION

BY MR. SEXTON:

Q. Mr. Kernaghan, were you able to get to the bottom of all of the wells that you made pressure surveys in?

A. No, we were not, we got below the casing shoe on all of them.

Q. Were you able to get below where the majority of the water was going?

A. It was going out below the bottom, below the point where the tool was run in some cases.

Q. Do you think it could be going further out of the zone beyond that?

A. Going out of the bottom and then coming around and getting up to the salt?

Q. I'm just saying, did you establish that it was going into the zone?

A. Did we establish that it was going -- well, as I said

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if we did not get to the bottom of the well there was a Penrose zone below the point at which our tool was run and if water was still going downward -- I'm not too inclined to think it's going to migrate down to the San Andres, I would anticipate that it goes into the Penrose at some point and into the Upper Grayburg at the outside.

Q. This was a common occurrence on most of the logs that were run, that water was going below where you had established it?

A. On most of the logs run? It wasn't my impression that it was most of the logs run. It was an occurrence that was not uncommon. It happened in a number of cases.

Q. This is one of the things that I think the Committee did, a trend that all of the water was going past where it was injected according to the surveys?

A. I would like to say, if we did not get to the bottom of the hole we did not get to the bottom of the Penrose section. If the water is going below the point which we surveyed there is a limit to where it can be going. The formations below it are the Grayburg and the San Andres. The San Andres is over a part of our flood anyway, probably it's just a high pressure in the Penrose. I don't see any way that the water could migrate back up to the salt.

Q. This could be one reason why you need higher rates. If you are not sure where it is being contained at you might

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need higher rates?

A Possibly so. There are unproductive zones in the Penrose too probably. As you go down in the Penrose there are some barren zones that aren't pertaining to the water flood. Leakage into them would be a source of leakage outside of the producing reservoir.

MR. SEXTON: That's all I have.

MR. RAMEY: Are there any other questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. KELLAHIN: Mr. Ramey, I call Mr. Vic Lyon on behalf of Continental Oil Company and he has not been previously sworn.

(THEREUPON, the witness was duly sworn.)

VICTOR T. LYON

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Please state your name, by whom you are employed and in what capacity?

A I'm Victor T. Lyon, L-y-o-n, I'm employed by Continental Oil Company as Conservation Coordinator in the

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Hobbs Division Office located in Hobbs, New Mexico.

Q In what area do you hold a degree, Mr. Lyon?

A I have a degree in general engineering from the University of Oklahoma and I have been practicing petroleum engineering for the past thirty years.

Q Does Continental Oil Company operate a waterflood project or projects within any of the areas in question?

A Yes, we do.

Q What are the names of those floods and where are they located?

A I would like to use the Commission's Exhibit Four, if I may, in pointing these out.

Continental Oil Company operates a waterflood in the Skaggs-Grayburg Pool within the area of the Southeast Monument Unit which is shown on Exhibit Four in Sections 13, 24, 25, of Township 20 South, Range 37 East and in Sections 18, 19 and 30 of Township 20 South, Range 38 East. We also operate a flood, it is designated here as Continental SM Unit which is an area between the Skaggs Unit, actually that is the Skaggs waterflood project in the Southeast New Mexico Unit and the Eumont-Hardy Unit. That area is in Section 25, Township 20 South, Range 37 East and those injection wells, that waterflood project per se, has been shut down for several years.

We also operate the Eumont-Hardy Unit which is also shown outlined on Exhibit Four in Sections 25 and 36 of

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Township 20 South, 37 East, Section 31 of 20 South, 38 East, Section 1 of 21 South 36 East and Sections 5 and 6 in Township 21 South, Range 37 East.

We also have a working interest in the East Dumont Unit which is in the central area under discussion at this hearing.

Q Are those floods your responsibility, Mr. Lyon?

A Not directly, no, sir.

Q Do you have knowledge of their operations and you appear here to testify on those particular floods?

A Yes, I have a general knowledge of those.

Q Have you previously testified before the Commission and had your qualifications as an expert witness accepted and made a matter of record?

A Yes, I have.

MR. KELLAHIN: We tender the witness as an expert.

MR. RAMEY: He is considered an expert.

Q (Mr. Kellahin continuing.) Mr. Lyon, would you refer to what you have marked as Exhibit Number One and identify it and explain the information that it contains?

A Exhibit Number One is a performance curve on our Skaggs Pool waterflood. This is the one I first referred to as lying within the boundaries of the Southeast Monument Unit. This waterflood has been under operation for at least fifteen years in the Skaggs-Grayburg Pool.

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The exhibit shows the oil producing rates by the heavy solid line. The water -- well, I beg your pardon, I guess that flood started in 1966 or '65. It shows the water producing rate by the heavy dashed lines, the water injection rate by the thinner solid line. Toward the lower portion of the exhibit it shows the percent water cut and the fluid in and fluid out ratio.

As you can see the project has been operating for at least ten years and we injected water on more or less a continual basis until the Monument Oil Center Committee was formed and then in cooperation with that committee and its investigations, this well was shut in.

Now, I might point out and it may have been already pointed out that this area was the only one of the three that the waterflood injection programs were just stopped. Now, I think that most of the other floods have been injecting their water at very much reduced injection pressures.

We, in our two waterflood projects have ceased injection altogether and have disposed of our produced water through our connection with Rice Engineering Disposal System. So we have not been injecting in either of these projects since we shut them in in cooperation with the committee's efforts.

You might note that the oil production curve, that the decline rate has not materially changed since we stopped injection because of that reason and because of the fact that

this flood has passed its maturity and is in the decline stage. At this particular time we see no probability that we will resume injection. This could change as conditions develop but at the present time we see no reason to place this waterflood back on injection.

Q Please refer to Exhibit Number Two and identify it?

A Exhibit Number Two is a similar performance curve on our Eumont-Hardy Unit which is the southernmost of the two units that I have pointed out that Continental operates. This curve shows essentially the same information that was shown on Exhibit Number One.

Water injection began in this project in 1968 and it has also passed the maturity stage and is in the advanced stage. We have a fairly high water cut so that our operating expenses are probably at about the maximum but if you will note the oil production curve, when we shut this fluid in in October of 1976, the oil producing rates began a steep decline which I calculated at approximately fifty-three point five percent per year as opposed to approximately eleven percent decline rate which had been shown for the year previous to that. If you would extrapolate those curves as I have done, it appears that if this project is not placed back on injection that the difference represented by the area between the two extrapolated curves would represent oil which could be recovered that will not be recovered and I calculate this to be a minimum of three

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hundred thousand barrels.

Q You were here yesterday when Mr. Sexton testified as to what his recommendations to the Commission are, do you have any recommendations on behalf of Continental Oil on those recommendations?

A Well, I must agree with Mr. Gannon in his testimony that we have seen no direct evidence that these waterfloods have contributed to the problem that we have in this area and I might also point out that the Committee set up a two-pronged program to try to find some connection between the injection wells and the injection projects and the wells having pressure casings, water flows, et cetera. The first of these was to take injection projects off injection in order to attempt to create a pulse which might be detected at our monitor wells.

We have had all of the five injection projects off injection for at least seven months, some of them almost a year and there has been no direct evidence of any connection between any individual project or individual wells and I believe that it is time we started the second prong of this program which is to place the project back on injection and continue monitoring the pressures in our monitor wells and see if the second half of this thing will give us the information which we did not get in the first half.

I think that it is rather unfortunate that we might be limited to produced water in placing these injection project

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back on injection. I feel that this will result in probably a loss of recoverable oil and I really see no reason from what we have observed in our committee's deliberations and the data gathered why there should be such a restriction.

Q Do you have a recommendation as to whether any restrictions at all ought to be placed on these waterflood projects?

A We would like to be permitted to place the Eumont-Hardy Unit back on injection essentially as it was operated prior to the shut in. Of course, the first indication that we have where anything is being pressured up we would slack off. I don't expect to see any such evidence.

MR. KELLAHIN: I have no further questions. We move the introduction of Exhibits One and Two.

MR. RAMEY: They will be admitted.

(THEREUPON, Conoco Exhibits One and Two were admitted into evidence.)

CROSS EXAMINATION

BY MR. RAMEY:

Q Mr. Lyon, let's talk about your Eumont-Hardy here a minute. When you were under full operations there what were your injection pressures?

A I don't have that data with me. I think it was in the neighborhood of two thousand pounds, perhaps slightly

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above this.

Q What is the pressure on the injection wells now that they have been shut in for some eight or nine months?

A We have prepared curves on each of the injection wells in the Eumont-Hardy Unit and they are all shown to be at zero.

Q Okay, if you started injection at this point wouldn't it be a relatively simple matter to establish what the fracture pressure is on this flood?

A Yes.

Q And then resume injection at something under the fracture pressure?

A Yes, I think that could be done. I'm not certain of this but I don't believe we have performed separate tests on these wells but I would like to state that I agree essentially with Mr. Kernaghan that I see no danger in injecting above the fracture pressure so long as you are not greatly in excess of the fracture pressure. In fact, I feel that in a large percentage of the waterflood projects in New Mexico that if you don't inject above the fracture pressure you are likely to have an uneconomic waterflood.

Q Would you rather have the EPA administer the waterfloods or the New Mexico Oil Conservation Commission in accordance with the EPA instructions?

A Well if you have to do everything that the EPA tells

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you to do the only difference would be that we would come to Santa Fe rather than to Washington and I'd prefer it from that basis. I think that it is most unfortunate that the people who are making these environmental rules seem to feel that it's undesirable to have anyone in their employee or on committees and so forth that knows anything about what's going on.

Q Well, we all tend to agree with that, Mr. Lyon, but I think we need to face reality that we are going to have a UIC program and we have the choice of administering it at the state level or letting them administer it and part of this very definitely says that injection will be under the fracture pressure.

A Well, I recognize that and I try to be realistic about these things but at the same time I don't think because the EPA has made motions about placing these kind of restrictions that I should under any way, shape or form set up here and testify in agreement with them. I think they're wrong but I don't think I can carry much weight with them.

Q So I think, as I understand Mr. Sexton's recommendations, now that you have bled the pressure off of your injection wells you would be allowed to inject outside water up to the fracture pressure. Is that the way you interpret his recommendations?

A Yes, I think that's right.

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Q. So in essence you wouldn't be limited to produced water?

A. Right, and, you know, we would just have to put the project back on injection and take whatever steps the Commission feels to be advisable and if we feel that we are unduly restricted, to come up and see if there isn't something we can work out.

Q. I think it might be very interesting to see what happens in a situation like that.

A. Right.

Q. Mr. Lyon, do you feel these water flows and such coming out of the salt section in this central area are natural?

A. No, I'm inclined to think they are not natural.

Q. They have come from some outside source?

A. I think so. There may have been some natural phenomena in there but I think that it has been aided by outside sources, yes.

Q. That has been my observation that there have been water flows in several places in Lea County but there has always been injection of some kind in conjunction with these waters.

What is the significance of the fluid in-fluid out curve?

A. Well, it depends on the individual project. If you have a completely enclosed reservoir it should give you some indication of the efficiency of your waterflood.

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Q What would you consider the curve on the Eumont-Hardy, would you consider that an efficient waterflood?

A Well, I would like to point out that in both of these projects, the projects are located in a low structural area and to the west of both of those projects the structure is rising and there is a gas-oil contact in there. We have realized in the Skaggs Unit that we were injecting water into areas where gas was productive. The same is true of the Eumont-Hardy. As a matter of fact, in our initial injection pattern we placed all of the wells on the western side on injection in order to form a water barrier to prevent the migration of oil up structure so we know that we have been injecting water into the gas cap area and we have done this intentionally to prevent the migration of oil.

In such a situation the fluid in-fluid out ratio has got to have a great deal of interpretation to have any value at all and, therefore, we feel that we really couldn't say that it had any measurable value in this case.

Q Well, you could surely make some rough calculation on how much water was needed to create your water bank at the gas-oil contact and then do your calculations from there, couldn't you?

A Well, that's true but the Eumont gas pool, as you know, is having declining bottom-hole pressures. We are building up the pressures in our waterflood area and we really don't

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have any way of knowing how far that water bank is going to move into the Eumont gas pool.

Q How would you, in just looking at your fluid in-fluid out, would you say that you had a reasonably efficient flood?

A Well, it hasn't been as efficient as we had hoped it would be.

MR. RAMEY: Thank you. Any other questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. RAMEY: I think we ought to have a fifteen minute recess.

(THEREUPON, the hearing was in recess.)

MR. RAMEY: The hearing will come to order.

Do you have another witness, Mr. Kellahin?

MR. KELLAHIN: No, sir.

MR. RAMEY: Mr. Lopez, did you have a witness?

MR. LOPEZ: Mr. R. W. Phillips from Shell Oil Company in Houston is here but he would like to just give a statement for the Company.

MR. RAMEY: All right, Mr. Abbott, do you have a statement that you wanted to offer at this time?

MR. ABBOTT: Yes, I would.

MR. RAMEY: Mr. Abbott.

MR. ABBOTT: My name is W. G. Abbott, Manager of

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Agua, Incorporated.

I want to speak a little bit for salt water disposal since it's being discussed in this area. Southeast New Mexico has two hundred and thirty-two salt water disposal wells and the accumulative disposal in these wells through 1976 was two and a quarter billion barrels. The monthly water disposed is about nine point six million barrels and a good part of this water is put in the San Andres formation.

In this area that is being discussed today, the south area, this south unit area, Aqua operates the Blinebry-Drinkard salt water disposal system. We have four hundred and sixty-three wells connected to this system and the water disposed in the year 1976 is about three point seven million barrels. The water is increasing. There was a twenty-one percent increase in water disposed in 1976 over 1975 and there has been a twelve percent increase in the connected wells to the system so things aren't exactly static in this disposal system.

We have three salt water disposal wells which are served by a hundred miles of gathering system. These three wells, our H-35 well, our C-2 well and our A-22 well.

Now, when this water problem came up in this area and water was observed on the surface strings, migrating evidentally through or close to the salt section, the Conservation Commission ordered us to shut in this H-35 Well. That

meant that we had to quickly put in a temporary line to dispose of the water that was going into the H-35 and it was re-routed to our C-2 Well which takes the water by gravity.

The H-35, by the way, the highest pressure in it was fairly steady. It was, when we were injecting over five thousand barrels a day, was seventeen hundred pounds. This was in a zone, the San Andres zone, from four to five thousand feet. Now, this is five hundred feet below the Queen sand where the water flooding was going on and it's considerably below the base of the salt around twenty-five hundred feet.

Also in order to increase the capacity of our C-2 Well it was necessary to open up the perforation in the Upper San Andres which by the order of the Commission we had to later blank off and we are disposing in the Lower San Andres in the C-2 Well.

Then our A-22 Well has been restricted to fourteen hundred psi surface pressure. We had run a separate injection test in the well and found that the fracture pressure was about fourteen sixty. Because of the increase in water and because the H-35 well is still shut in and because of the restriction on the A-22 surface pressure, we are in the process now of circulating an AFE to drill a new well, salt water disposal well, which we will call the N-18 Well and it will be located in the southeast quarter of the southwest quarter of Section 18, Township 22 South, Range 37 East. This will be on

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the west side of this subject area discussed today.

I want to get back to this H-35 Well. The well was authorized for disposal in October of 1968. In 1975, in August, this well was ordered to be shut in by the Commission and it was shut in September of 1975. In July, July 14th, 1976, in Case 5713, we had a hearing to get permission to resume disposal in the H-35 and no order has been issued by the Commission, that's about eleven months ago. We would again ask the Commission to review that Case 5713 and issue an order so that we can resume disposal into this well.

That concludes my statement.

MR. RAMEY: Thank you, Mr. Abbott.

Mr. Schrader, do you have any testimony?

MR. SCHRADER: Mr. Korzekwa has a statement he would like to read into the record but he has not been sworn.

MR. RAMEY: I don't think it's necessary to swear him for a statement.

MR. KORZEKWA: My name is C. R. Korzekwa, I'm Project Petroleum Engineer for the Gulf Oil Corporation in the Hobbs area.

(Reading) Gulf Oil operates one hundred oil and gas wells within the area covered by this hearing. Combined production from these wells averages six hundred and twenty-one BOPD, eight hundred and ninety-seven BWPD and twenty-one million eight hundred and eighty MCF per day. None of the wells operated by

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Gulf in this area is under waterflood at the present time.

While Gulf does not operate any waterfloods within this area, it does own a working interest in seven active waterflood units in this area that are operated by other parties. Gulf's working interest in these floods ranges from more than eleven percent to less than one percent.

Gulf does not operate any water disposal wells within the area covered by this hearing. Water produced from wells operated by Gulf in this area is disposed of through the Blinebry-Drinkard System and the Eunice Monument System.

As shown, Gulf has a significant economic interest in the production from this area. Any proposed remedies should bear in mind the economic realities of the situation. Gulf is ready and willing to cooperate within economic reason with the Oil Conservation Commission in reaching a solution to any existing salt water problems. We believe that by working together the industry and the OCC can reach a reasonable and equitable solution to control this and any other potential problems in this area. (End of reading.)

MR. RAMEY: Thank you, Mr. Korzekwa.

Mr. Goodheart?

MR. GOODHEART: I would like to make a brief statement for the record only.

I'm L. B. Goodheart, Producing Manager for Rice Engineering, Hobbs, New Mexico.

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In these three areas outlined on the docket we operate seven salt water disposal wells. We would like to state that all of these wells inject water by gravity into the Lower San Andres zone and since there is no evidence that this injection has contributed to the problem of pressuring of salt sections in any way or the high-grade pressures in the area, we would recommend that there be no restrictions placed on these wells, any further restrictions, and certainly that none of the operations be considered for suspension of any kind.

That completes my statement.

MR. RAMEY: Thank you, Mr. Goodheart.

Mr. Lopez.

MR. LOPEZ: If you would like we can read the statement into the record.

MR. RAMEY: If it is short that will be all right.

MR. LOPEZ: This was prepared by Mr. R. W. Phillips.

(Reading.) Shell Oil Company is an operator and interest holder of various leases within the areas designated by Case 5941 for public hearing on June 13, 1977. Although Shell does not operate any supplemental recovery projects or salt water disposal wells within the designated areas, future projects are planned in the State of New Mexico. Therefore, Shell Oil Company believes it to be prudent to state their position relative to the three areas of current interest and

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to the operation of supplemental recovery projects in general and to have these statements entered into the record of said hearing.

Number One, Shell Oil Company acknowledges that a problem exists in the three areas designated by Case 5941 and that a potential problem exists elsewhere within Southeast New Mexico and in other areas wherein supplemental recovery and salt water disposal projects are in operation. Shell believes temporary restrictions may be in order for certain wells within these three problem areas with the objective of relieving the pressure existing in the salt section and determining the source of said pressure. To this end, Shell shall encourage the current efforts toward bleeding the pressure off the salt section at wellbores having known pressure and fluid flow potential.

In addition, Shell believes it prudent to (A) Investigate more thoroughly possible water escape routes through wellbores other than injection wells and require corrective measures.

(B) Maintain surveillance of and possibly expand the number of monitor points throughout the life of the project.

Two, Shell Oil Company believes the following statements and guidelines will minimize problems in the future:

(A) Shell Oil Company believe that no limitations

should be imposed upon injection pressures for salt water disposal wells or for supplemental recovery project injectors. To date there has been no evidence in the three areas subject to Case 5941 that there is escape of injected fluids to other formations at the injector wellbores. This is evident from numerous investigations during the past year using modern surveillance tools and from testing through perforations. Furthermore, there is strong evidence from field operations that fractures of lengthy vertical extent in these problem areas cannot be created by pressures and injection rates used in supplemental recovery projects. Any restriction of injection pressure will result in injection volume limitations and ultimately reduce the overall recovery of hydrocarbons, especially from the tighter reservoirs that probably will be proposed in the future. In addition, abandonment of currently planned projects may occur.

(B) Shell Oil Company believes certain guideline requirements should be established at inception of any fluid injection project to assure that the zone of injection is properly isolated in all boreholes within and immediately adjacent to the unit area.

(C) Shell Oil Company believes a surveillance program using sophisticated modern equipment should be required to assure that the injected fluid is being restricted to the project interval. A surveillance program should include, one,

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tracer and temperature surveys of injectors, two, periodic annulur surface pressure surveys of all wells within and immediately adjacent to project area and, three, downhole surveillance of selected producers where zonal isolation may be questionable. If such program indicates injected fluid is not being restricted to project interval then corrective measures should be required immediately. (End of reading.)

Thank you.

MR. RAMEY: Thank you, Mr. Lopez.

Does anyone have anything further to offer in this case? If not, the Commission will take the case under advisement and the hearing is adjourned.

(THEREUPON, the hearing was adjourned.)

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REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish, C.S.R.

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/jr

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

CASE NO. 5941
Order No. R-

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION TO PERMIT OPERATORS OF INJECTION WELLS AND ALL OTHER INTERESTED PARTIES TO APPEAR AND SHOW CAUSE WHY THE INJECTION OF FLUIDS FOR SALT WATER DISPOSAL OR SECONDARY RECOVERY SHOULD NOT BE RESTRICTED OR SUSPENDED IN CERTAIN AREAS IN LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 13, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this _____ day of November, 1977, the Commission, a quorum being present, having considered the evidence adduced at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That on December 3, 1974, the Commission heard Case No. 5377, which was a hearing called by the Oil Conservation Commission on its own motion to permit all interested parties to appear and show cause why the continued injection of water for secondary recovery or disposal purposes into any formation from the surface of the ground down to and including the Drinkard formation should be permitted in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and Sections 1 through 12, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That subsequent to said hearing, the Commission entered its Order No. R-4936 on December 5, 1974, finding that all water being injected into the Queen and/or San Andres formations underlying the lands described in Finding No. (2) above "... is not being contained in the formation in which it is placed," ... and that "... injected water has appeared in formations above the top of the salt section ..., in the salt section ..., and in formations from the

Continuation of Finding 3

Further, "that there is evidence that some contamination of fresh water supplies in the subject area has occurred."

base of the salt section ... to the top of the Queen formation...."

(4) That said Order No. R-4936 ~~also~~ required, among other things, that water injection volumes in certain waterflood projects within the aforesaid lands be reduced, and that injection into certain water disposal wells be limited; and directing the Secretary-Director of the Commission to appoint a study committee to further investigate the condition of all wells within the aforesaid lands.

(5) That on January 22, 1975, Case No. 5403 was heard by the Commission's Examiner, said case being called by the Oil Conservation Commission on its own motion to further consider the subject matter of Case No. 5377.

(6) That subsequent to said hearing, the Commission entered its Order No. R-5003, which order continued and broadened the curtailment of water injection in the lands described in Finding No. (2) above, and ordered that remedial work be performed on certain wells in the area, that the Supervisor of the Hobbs District Office of the Commission institute a testing procedure and schedule for conducting tests and on wells in the area, and that the case be reopened in November, 1975.

(7) That said case was reopened in November, 1975, at which time testimony was heard by the Commission's Examiner that although significant progress had been made and was continuing to be made in the performance of the required remedial work and in efforts to bleed off the pressure in formations to which water had migrated, and although bradenhead and intermediate casing pressures in some wells had decreased, additional wells with such extrinsic pressures were being encountered, and the overall problem appeared possibly to be spreading.

(8) That subsequent to the above-described hearings and orders relating to the lands described in Finding No. (2) above, other so-called "problem areas" developed, and the Commission

called an industry meeting in Santa Fe in April, 1976, at which time the problem areas were "pretty well outlined" and defined as the North, or "Vacuum" Area, the Central, or "Oil Center-Monument" Area, and the South, or "Eunice" Area; an industry committee was appointed to develop means to rectify the situation and to make recommendations to the Commission.

(9) That said industry committee divided itself into sub-committees to attack the problem in each of the aforesaid areas, to work out testing procedures, to make recommendations for remedial work, and to report regularly to the Commission on progress made.

(10) That while the sub-committees worked diligently, and while most of the affected operators of problem wells cooperated to the fullest degree with the Commission, even to the extent of spending hundreds of thousands of dollars on well repairs and pressure depletion methods, it became apparent in early 1977 that a more effective approach must be taken to ensure that the salt section and formations above the salt are depleted of alien waters and that no further invasion of said beds by injected water occurs.

(11) That the instant case was called by the Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in the following areas in Lea County, New Mexico:

(VACUUM)
NORTH AREA

Township 17 South, Range 33 East: Section 36;

Township 17 South, Range 34 East: Sections 1 thru 4, 9 thru 16, E/2 of 20, 21 thru 29, E/2 of 30, and 31 thru 36;

Township 17 South, Range 35 East: W/2 of Section 6, all of 7, S/2 of 8, and all of 17 thru 36;

Township 18 South, Range 34 East: Sections 1 thru 3, N/2 of 4, NE/4 of 5, and all of 11 and 12;

Township 18 South, Range 35 East: Section 2 thru 8.

(OILCENTER-MONUMENT)
CENTRAL AREA

Township 19 South, Range 37 East: Sections 15, 16, 21, 22, 26 thru 28, and 33 thru 36;

Township 20 South, Range 36 East: Section 13, 24, and 25;

Township 20 South, Range 37 East: Sections 1 thru 5, 7 thru 30, and 35 and 36;

Township 20 South, Range 38 East: Sections 5 thru 8, 17 thru 20, and 29 thru 31;

Township 21 South, Range 36 East; Sections 1 and 12;

Township 21 South, Range 37 East: Sections 5 thru 8.

(EUNICE)
SOUTH AREA

Township 22 South, Range 37 East: Sections 13 thru 36;

Township 23 South, Range 37 East: Sections 1 thru 12.

work

(12) That the conditions referred to in Finding No. (3) above continue to exist in the Eunice Area, and that similar conditions also now exist in the Vacuum Area, and in the Oil Center-Monument Area.

(13) That the presence of water in the salt section is most probably not natural, but is man-caused, resulting from the escape into the salt section of waters injected into formations below the salt section.

(14) That although extensive investigations have been made to determine and identify the avenues of escape for waters injected into formations below the salt, these avenues have not as yet been identified in any of the three subject areas defined in Finding No. (11) above, and hereinafter referred to as the "affected areas," but are most likely either one or both of the following:

A: Improperly cased, cemented, or plugged wells;

B: Vertical fractures in the formations below the salt and in the salt and in the formations above the salt resulting from the injection of fluids at pressures greater than the yield strength of the formation.

(15) That in order to alleviate the conditions referred to in Finding No. (12) above, namely the presence of alien salt water in formations above the salt section in each of the affected areas, and to protect the underground fresh water supplies from contamination by the invasion of brines from formations underlying the fresh water beds, it will be necessary to depressurize the salt section.

(16) That the depressurization of the salt section in each of the three affected areas can only be accomplished by a combination of two functions:

A. The prevention of further migration of any additional water into the salt section; and

B. The removal of alien brines from their present position in the salt section and in beds overlying the salt section.

(17) That the function described in Finding No. (16)A above can best be accomplished by:

A. Continued inspection, logging, testing, and surveillance of all wells in the affected areas to determine if they are, or may become, avenues of escape for waters injected into formations below the salt section.

B. Reducing the rate of water injection into waterfloods in the affected areas to no more than the amount of water produced in such waterfloods unless and until it can be shown that injection of greater volumes can be accomplished at less than the formation fracture pressure.

C. Prohibiting the injection of volumes of water greater than produced water in all waterfloods in the affected areas unless the schematics of all existing wells and plugged and abandoned wells within one half mile of an injection well indicates that said wells will not provide avenues of escape for injected waters, or until satisfactory repairs have been made on any well which does appear to present a possible avenue of escape.

Case No.
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E. Prohibiting the injection of water into any formation at a pressure equal to or greater than the formation fracture pressure.

D. Prohibiting the injection of a volume of water greater than the volume of water and oil produced in any waterflood in the affected area where a bradenhead or intermediate casing waterflow is present within the project area or within one-half mile thereof.

void

(18) That the function described in Finding No. (16) B above can best be accomplished by:

A. The production of brines from those wells in the affected areas that have brine flows on the bradenhead or on the intermediate casing where such flows are indicated to be comming from the salt section or higher.

B. Continuing such production until it appears that such brines have been depleted.

C. Drilling additional wells to the salt section in those areas where it appears that the salt section is charged with alien waters and the production of brines from existing wells does not appear to be depleting said waters.

(19) That the Secretary-Director of the Commission should review the progress being made in accomplishing the objections set forth in Finding No. (16) above at at least six-month intervals by calling industry meetings; that in the event he feels satisfactory progress is not being made within 12 months after the entry of this order, he should cause to be prepared legal notice for a hearing to consider the adoption of more stringent methods of resolving the problem in the affected areas including the complete suspension of water injection within the affected areas.

(20) That in order to lessen the likelihood of similar migration of injected fluids into formations other than the injection zone in other areas of this state, the Secretary-Director of the Commission should immediately cause to be prepared legal notice for a hearing to consider the amendment of Rule 701 et seg of Section I of the Commission Rules and Regulations relating to secondary recovery, pressure maintenance, and salt water disposal

(21) That approval of an order embodying the above findings will prevent waste of oil and gas, will protect correlative rights, and will alleviate the contamination of fresh water supplies.

word

DRAFT
DSN/jf

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

CASE NO. 5941
Order No. R-

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION TO PERMIT OPERATORS OF INJECTION WELLS AND ALL OTHER INTERESTED PARTIES TO APPEAR AND SHOW CAUSE WHY THE INJECTION OF FLUIDS FOR SALT WATER DISPOSAL OR SECONDARY RECOVERY SHOULD NOT BE RESTRICTED OR SUSPENDED IN CERTAIN AREAS IN LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 13, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this _____ day of November, 1977, the Commission, a quorum being present, having considered the evidence adduced at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That on December 3, 1974, the Commission heard Case No. 5377, which was a hearing called by the Oil Conservation Commission on its own motion to permit all interested parties to appear and show cause why the continued injection of water for secondary recovery or disposal purposes into any formation from the surface of the ground down to and including the Drinkard formation should be permitted in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and Sections 1 through 12, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That subsequent to said hearing, the Commission entered its Order No. R-4936 on December 5, 1974, finding that all water being injected into the Queen and/or San Andres formations underlying the lands described in Finding No. (2) above "... is not being contained in the formation in which it is placed," ... and that "... injected ... water has appeared in formations above the top of the salt section ..., in the salt section ..., and in formations from the

Continuation of Finding 3

Further, "that there is evidence that some contamination of fresh water supplies in the subject area has occurred."

Mayhew

base of the salt section ... to the top of the Queen formation..."

(4) That said Order No. R-4936 ~~also~~ required, among other things, that water injection volumes in certain waterflood projects within the aforesaid lands be reduced, and that injection into certain water disposal wells be limited; and directing the Secretary-Director of the Commission to appoint a study committee to further investigate the condition of all wells within the aforesaid lands.

(5) That on January 22, 1975, Case No. 5403 was heard by the Commission's Examiner, said case being called by the Oil Conservation Commission on its own motion to further consider the subject matter of Case No. 5377.

(6) That subsequent to said hearing, the Commission entered its Order No. R-5003, which order continued and broadened the curtailment of water injection in the lands described in Finding No. (2) above, and ordered that remedial work be performed on certain wells in the area, that the Supervisor of the Hobbs District Office of the Commission institute a testing procedure and schedule for conducting tests ~~and~~ on wells in the area, and that the case be reopened in November, 1975.

(7) That said case was reopened in November, 1975, at which time testimony was heard by the Commission's Examiner that although significant progress had been made and was continuing to be made in the performance of the required remedial work and in efforts to bleed off the pressure in formations to which water had migrated, and bradenhead and intermediate casing pressures in some wells had decreased, additional wells with such extrinsic pressures were being encountered, and the overall problem appeared possibly to be spreading.

(8) That subsequent to the above-described hearings and orders relating to the lands described in Finding No. (2) above, other so-called "problem areas" developed, and the Commission

called an industry meeting in Santa Fe in April, 1976, at which time the problem areas were "pretty well outlined" and defined as the North, or "Vacuum" Area, the Central, or "Oil Center-Monument" Area, and the South, or "Eunice" Area; an industry committee was appointed to develop means to rectify the situation and to make recommendations to the Commission.

(9) That said industry committee divided itself into sub-committees to attack the problem in each of the aforesaid areas, to work out testing procedures, to make recommendations for remedial work, and to report regularly to the Commission on progress made.

(10) That while the sub-committees worked diligently, and while most of the affected operators of problem wells cooperated to the fullest degree with the Commission, even to the extent of spending hundreds of thousands of dollars on well repairs and pressure depletion methods, it became apparent in early 1977 that a more effective approach must be taken to ensure that the salt section and formations above the salt are depleted of alien waters and that no further invasion of said beds by injected water occurs.

(11) That the instant case was called by the Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in the following areas in Lea County, New Mexico:

(VACUUM)

NORTH AREA

Township 17 South, Range 33 East: Section 36;

Township 17 South, Range 34 East: Sections 1 thru 4, 9 thru 16, E/2 of 20, 21 thru 29, E/2 of 30, and 31 thru 36;

Township 17 South, Range 35 East: W/2 of Section 6, all of 7, S/2 of 8, and all of 17 thru 36;

Township 18 South, Range 34 East: Sections 1 thru 3, N/2 of 4, NE/4 of 5, and all of 11 and 12;

Township 18 South, Range 35 East: Section 2 thru 8.

(OILCENTER-MONUMENT)

CENTRAL AREA

Township 19 South, Range 37 East: Sections 15, 16, 21, 22, 26 thru 28, and 33 thru 36;

Township 20 South, Range 36 East: Section 13, 24, and 25;

Township 20 South, Range 37 East: Sections 1 thru 5, 7 thru 30, and 35 and 36;

Township 20 South, Range 38 East: Sections 5 thru 8, 17 thru 20, and 29 thru 31;

Township 21 South, Range 36 East: Sections 1 and 12;

Township 21 South, Range 37 East: Sections 5 thru 8.

(EUNICE)

SOUTH AREA

Township 22 South, Range 37 East: Sections 13 thru 36;

Township 23 South, Range 37 East: Sections 1 thru 12.

(12) That the conditions referred to in Finding No. (3) above continue to exist in the Eunice Area, and that similar conditions also now exist in the Vacuum Area, and in the Oil Center-Monument Area.

(13) That the presence of water in the salt section is most probably not natural, but is man-caused, resulting from the escape into the salt section of waters injected into formations below the salt section.

(14) That although extensive investigations have been made to determine and identify the avenues of escape for waters injected into formations below the salt, these avenues have not as yet been identified in any of the three subject areas defined in Finding No. (11) above, and hereinafter referred to as the "affected areas," but are most likely either one or both of the following:

A: Improperly cased, cemented, or plugged wells;

B: Vertical fractures in the formations below the salt and in the salt ~~and in the formations above the salt~~ resulting from the injection of fluids at pressures greater than the yield strength of the formation.

(15) That in order to alleviate the conditions referred to in Finding No. (12) above, namely the presence of alien salt water in formations above the salt section in each of the affected areas, and to protect the underground fresh water supplies from contamination by the invasion of brines from formations underlying the fresh water beds, it will be necessary to depressurize the salt section.

(16) That the depressurization of the salt section in each of the three affected areas can only be accomplished by a combination of two functions:

A. The prevention of further migration of any additional water into the salt section; and

B. The removal of alien brines from their present position in the salt section and in beds overlying the salt section.

(17) That the function described in Finding No. (16)A above can best be accomplished by:

A. Continued inspection, logging, testing, and surveillance of all wells in the affected areas to determine if they are, or may become, avenues of escape for waters injected into formations below the salt section.

B. Reducing the rate of water injection into waterfloods in the affected areas to no more than the amount of water produced in such waterfloods unless and until it can be shown that injection of greater volumes can be accomplished at less than the formation fracture pressure.

C. Prohibiting the injection of volumes of water greater than produced water in all waterfloods in the affected areas unless the schematics of all existing wells and plugged and abandoned wells within one half mile of an injection well indicates that said wells will not provide avenues of escape for injected waters, or until satisfactory repairs have been made on any well which does appear to present a possible avenue of escape.

5003
Voidage

Case No.
Order No. R-

E. Prohibiting the injection of water into any formation at a pressure equal to or greater than the formation fracture pressure.

D. Prohibiting the injection of a volume of water greater than the volume of water and oil produced in any waterflood in the affected area where a bradenhead or intermediate casing waterflow is present within the project area or within one-half mile thereof.

(18) That the function described in Finding No. (16) B above can best be accomplished by:

A. The production of brines from those wells in the affected areas that have brine flows on the bradenhead or on the intermediate casing where such flows are indicated to be comming from the salt section or higher,

B. Continuing such production until it appears that such brines have been depleted,

C. Drilling additional wells to the salt section in those areas where it appears that the salt section is charged with alien waters and the production of brines from existing wells does not appear to be depleting said waters,

comply w/ sec (A) (B)

(19) That the Secretary-Director of the Commission should review the progress being made in accomplishing the objectives set forth in Finding No. (16) above at at least six-month intervals by calling industry meetings; that in the event he feels satisfactory progress is not being made within 12 months after the entry of this order, he should cause to be prepared legal notice for a hearing to consider the adoption of more stringent methods of resolving the problem in the affected areas including the complete suspension of water injection within the affected areas.

(20) That in order to lessen the likelihood of similar migration of injected fluids into formations other than the injection zone in other areas of this state, the Secretary-Director of the Commission should immediately cause to be prepared legal notice for a hearing to consider the amendment of Rule 701 et seq of Section I of the Commission Rules and Regulations relating to secondary recovery, pressure maintenance, and salt water disposal

(21) That approval of an order embodying the above findings will prevent waste of oil and gas, will protect correlative rights, and will alleviate the contamination of fresh water supplies.

ROUGH

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION TO PERMIT OPERATORS OF INJECTION WELLS AND ALL OTHER INTERESTED PARTIES TO APPEAR AND SHOW CAUSE WHY THE INJECTION OF FLUIDS FOR SALT WATER DISPOSAL OR SECONDARY RECOVERY SHOULD NOT BE RESTRICTED OR SUSPENDED IN CERTAIN AREAS IN LEA COUNTY, NEW MEXICO.

CASE NO. 5941

Order No. R-7221

R-7221

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:00 am on June 13, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this _____ day of February, 19____, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That Case No. 5941 should be dismissed.

IT IS THEREFORE ORDERED:

(1) That Case No. ~~6208~~ 5941 is hereby dismissed.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jim Bacca ~~ALEX J. ARMIJO~~, Member

Ed Kelley
ED KELLEY, Member

Joe D. Ramey
JOE D. RAMEY, Member & Secretary

SEAL

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION TO PERMIT OPERATORS OF INJECTION WELLS AND ALL OTHER INTERESTED PARTIES TO APPEAR AND SHOW CAUSE WHY THE INJECTION OF FLUIDS FOR SALT WATER DISPOSAL OR SECONDARY RECOVERY SHOULD NOT BE RESTRICTED OR SUSPENDED IN CERTAIN AREAS IN LEA COUNTY, NEW MEXICO.

CASE NO. 5941
Order No. R-7221

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 13, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 25th day of February, 1983, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That Case No. 5941 should be dismissed.

IT IS THEREFORE ORDERED:

That Case No. 5941 is hereby dismissed.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JIM BACA, Member

ED KELLEY, Member

JOE D. RAMEY, Member &
Secretary

S E A L

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 5A
CASE 5941

PROGRESS REPORT

EUNICE AREA WATERFLOW COMMITTEE

DISCUSSION OF ACTIVITIES

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee was to collect, analyze data and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of thirteen wells were initially shut-in for observation. The wells consisted of 5 injection wells, 6 producing wells, 1 shut-in producing well and 1 disposal well. Due to a slight pressure drop on the Citgo-State No. 1, the closest and most significant monitor point, two additional wells were shut-in. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure on the shut-in injection wells had decreased substantially below readings on monitor points and with virtually no change in recorded pressure on the Citgo well. The Committee recommended to the NMOCC that injection be resumed into the injectors, and plans be made to "blow-down" the pressured up salt section in the Citgo-State No. 1. Thoughts at this time were to discontinue cycling, and attempt to determine if we were dealing with a localized or widespread pressure problem. The NMOCC felt that cycling and monitoring should be continued because it appeared that one of the other study groups was making some headway through this procedure. An alternate recommendation was made to the NMOCC at

this time. Injection wells with approximately 700# wellhead pressure or less be reactivated and cycling expanded to take in more injectors. The NMOCC agreed to this proposal and this procedure was implemented. During all the monitoring and cycling, the pressure on the Citgo-State well had remained practically constant at 1150#.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976 meeting that (1) injectors which are high pressure and low volume, and (2) those which have shown little or no pressure variation during shut-in be backflowed and tested, in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and buildup procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 barrels per day or less, shut the well in for pressure build-up. If pressure does not build up past 800# in 48 hours, return the well to injection". From this time forward, wells were checked for pressure drop, backflowed, (rates and pressures monitored) and buildups ran following backflow. Upon recommendation from the Committee and approval from the NMOCC, wells were returned to injection as warranted by results.

At the Committee meeting on August 26, 1976, approval was given by the NMOCC to suspend the present testing procedure and go ahead with plans to backflow the Citgo-State. Fourteen Skelly and Anadarko wells were to be shut-in one week prior to backflow. On September 19, 1976, backflowing of the Citgo-State well was begun. At time of opening, the well had 1010# on surface. After

60 hours well had flowed back approximately 40,000 barrels of 9.9# brine. Initial flowing pressure was 210# at a rate of 9 BPM. After 60 hours flow pressure had decreased to 70# and rate was approximately 2 - 3 BPM. During the ten day flowing period, the well flowed back an estimated 63,000 barrels. The fourteen wells were closely monitored during backflow with pressure recorders. No pressure interference was noted on any of the wells. As soon as pressure and flow rate would permit, Petro-Search re-entered, plugged and abandoned the well.

The test wells were later returned to injection and monitoring discontinued, with the exception of 4 wells which had previously shown bradenhead pressures. These wells still have pressure recorders attached and have consistently fell off in pressure since backflowing of the Citgo-State and return to injection of surrounding wells. These wells are: Skelly Penrose "A" Water Injection Well No. 38 from 275# to 45#; Skelly Penrose "A" No. 44 from 725# to 95#; Skelly Penrose "B" No. 54 from 90# to vacuum and Skelly Penrose "B" No. 52 from 120# to 65#. Subsequent work of the Committee has consisted of re-evaluating all available temperature and tracer logs in the area and analyzing new logs as they become available.

Wells which had abnormal temperature gradients have been, and are being re-logged to confirm data as interpreted from previous logs. Several noise logs have been and are now being run.

Skelly recently perforated the Skelly Penrose "A" No. 64 at 1460' opposite a water flow which was encountered during drilling of the well approximately 2 years ago. Prior to perforating, the well was producing 9 BO and 40 BW per day. Current producing rate is 8 BO and 43 BW per day.

On January 14, 1977, a noise log was ran on the Skelly J. V. Baker No. 11 in an attempt to determine if cycling was occuring between Anadarkos' injection Well No. 13-C7 and the J. V. Baker No 11, which is a Drinkard producer. It appeared that possibly water which was being injected into the Penrose section might be channelling across to the Baker Well and moving up and back to the injection well. No upward or downward movement adjacent to the injection zone was indicated by the log, however, an increase in noise intensity was noted from 920' to 1430', which could be indicative of water migration. Logs ran during 1975 on the Anadarko well had shown possible migration across the salt section. Recent logging by two different companies have failed to confirm this. At present the well is operating at reduced pressure and rates, but still has approximately a 20 BWPD flow out the bradenhead.

CONCLUSION

(1) All wells drilled in the area have surface pipe set at regulatory agency approved depth and there is no evidence of surface water being contaminated at this time.

(2) Some formation shallower than the waterflood objective formation contains pressured salty water in certain areas within the area of investigation.

(3) Testing and investigations, to date, have failed to identify the water source

(4) Previous surveys which indicated anomalies or temperature variations have proven difficult to confirm from recent surveys.

RECOMMENDATIONS

(1) Attempt to blow-down "salt section" through selected wells.

(2) Record pressure and volume before, during and after "blow-down" operation. Continue to monitor for a sufficient length of time to determine if "salt section" is being re-pressured.

(3) Continue periodic injection well surveys to determine distribution of injected water. Conduct necessary remedial operations to confine water to unitized interval.

(4) Continue committee efforts to determine & eliminate source of pressured water.

(5) In order to prevent masking data from "blow-down" no further restrictions be imposed on injection operations, until "blow-down" operations are complete and results are evaluated.

RECENTLY RUN SURVEYS - EUNICE AREA

Skelly Oil Company

J. V. Baker #11
Skelly Penrose "A" #26
Skelly Penrose "A" #28
Skelly Penrose "A" #34

Anadarko Production Company

Langlie Mattix Penrose Sand Unit #34-4
Langlie Mattix Penrose Sand Unit #27-1
Langlie Mattix Penrose Sand Unit #13-B-2
Langlie Mattix Penrose Sand Unit #40-1
Langlie Mattix Penrose Sand Unit #13-C7
Langlie Mattix Penrose Sand Unit #1-2
Langlie Mattix Penrose Sand Unit #8-1
Langlie Mattix Penrose Sand Unit #7-1
Langlie Mattix Penrose Sand Unit #7-3
Langlie Mattix Penrose Sand Unit #13-A1
Langlie Mattix Penrose Sand Unit #13C-5
Langlie Mattix Penrose Sand Unit #15-2
Langlie Mattix Penrose Sand Unit #17-1
Langlie Mattix Penrose Sand Unit #21-2

REPORT OF N.M.O.C.C. APPOINTED SUB-COMMITTEE ASSIGNED TO STUDY WATER FLOWS IN AND AROUND THE EUNICE AREA

In March, 1976, the N.M.O.C.C. called a meeting for April 8, 1976 of operators from the Southeast Lea County area " to discuss water flows which have developed in and around several waterfloods and disposal systems in Lea County." At this meeting it was pointed out that the waterflow problems were much more widespread than earlier thought; and that measures in the original problem area had contained, but not eliminated the problem, an industry committee was designated to investigate these problems.

On April 13, 1976, the industry committee met in Hobbs, New Mexico. Sub-committees were formed to study: (1) Injection pressures to be allowed in waterfloods and disposal wells, and to determine if injection volume/fluid withdrawal ratios can be used as a tool to determine problems in waterfloods. (2) Measures to deal with problems of pressured up salt section and shallow zones. (3) To determine what information is required to monitor waterfloods, and (4) To determine what data is necessary before a new waterflood can be approved. These sub-committees reported back to the industry committee on April 20, 1976, and were then dissolved. Three committees were then appointed to develop recommendations on an area basis to implement the ideas advanced by the prior sub-committees. One of the three appointed committees was designated to study the Eunice Area. This committee is chaired by Skelly and is made up of representatives from Gulf, Anadarko, Arco, Reserve, and AGUA, Inc.

The Eunice area committee became operational on May 10, 1976 and has met at weekly intervals there-after to collect, analyze data, and present recommendations to the N.M.O.C.C. District Supervisor on measures considered pertinent to developing data on the waterflow problem in this area and to locating source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use, these wells were:

Skelly Penrose "A" Unit		
# 26-J	3-23-37	Water injection well
# 23-F	3-23-37	Water injection well
# 13-B	3-23-37	Water injection well
# 40-P	3-23-37	Water injection well
Anadarko Langlie Mattix Penrose Sand Unit		
# 3-P	34-22-37	Water injection well
Morenco		
# 36-1K	36-22-37	Producing well
Petro-Search		
Citgo-St. # 1-E	2-23-37	Producing well S.I.
Fluor # 1-M	35-22-37	Producing well
Gulf St. # 2-F	2-23-37	Producing well
Summit Energy, Inc.		
Gulf St. # 1-F	36-22-37	Producing well
Gulf Sims # 1-P	25-22-37	Producing well
Texas Pacific Oil Co.		
Ella Drk. # 2-E	25-22-37	Producing well

AGUA, Inc.
Blinebry-Drk. # 35-H 35-22-37 SWD well

The four Skelly and one Anadarko wells were to be shut in during the monitoring period, with pressure recorders attached to the injection well-bead.. The producing and disposal well were also to have pressure recorders attached. All concerned operators were notified by telephone or letter, seven day recorders were installed. Due to a slight pressure drop on the Petro-Search Citgo-State no. 1, Skelly water injection wells no. 28-L and 38-N were subsequently shut in and pressure recorders attached.

Pressure recorders were used to monitor performance on the initially shut in wells until June 17, 1976. Pressure at that time on the shut in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the salt section. Daily production from the Skelly Penrose "A" Unit decreased from 846 to 824 BOPD during this period. The committee recommended that the six shut in Skelly and one Anadarko wells be returned to injection and an attempt be made to "blow down" the pressured salt section through the Citgo-State no. 1. This procedure would relieve pressure on the wellhead and provide information as to whether or not the pressure might be localized or widespread. The N.M.O.C.C. was not in agreement with this proposal and felt that the shut in wells remain shut-in.

During the week of June 17th to June 24th, five additional Skelly water injection wells (nos. 42-B, 44-D, 36-P, 21-H and 12-N) and Anadarko 4-H and 1-J were shut in and pressure recorders attached. Reason for the additional installations was to extend the test area out to take in another row of wells.

A meeting between chairmen of the three study groups and members of the N.M.O.C.C. from the Hobbs and Santa Fe office was held at 10:00 a.m. June 24th at the Hobbs office of the N.M.O.C.C. At this time the three study groups presented a review of progress being made in their respective areas. None of the groups had any definite answers to the problem at this time. General consensus was to continue cycling and testing as recommended and agreed to by the N.M.O.C.C. At this meeting the chairman of the Eunice Study Group requested that arrangements be made to backflow the Citgo-State well: Due to the fact that testing and cycling of wells to date had not provided the answer concerning communication between the shut in injection wells and the Citgo-State well.

At the July 1st meeting of the Eunice Study Group a request was made by the committee to the N.M.O.C.C. to permit a 24-48 hr. backflow of the monitor well in an effort to determine if a pressure-trapped condition might exist in the well. An alternate recommendation was made to the N.M.O.C.C., at this time: If they would not permit backflowing of the Citgo-State; then the injection wells with approximately 700# or less should be re-activated and recycling expanded to another row of injectors.

At the next committee meeting on July 8th, the N.M.O.C.C. reported that they felt the monitor well should not be backflowed or disturbed, at least for the time being, until more injectors in the area had been shut in and monitored. Jerry Sexton of the N.M.O.C.C. agreed to the following proposals by the committee: Return Skelly Penrose "A" Unit water injection wells no. 13, 26, 23, 38 and 28 to injection. Shut in and attach pressure recorders to Skelly Penrose "A" injection wells no. 2, 10, 17, 30, 32, 34, 46, 48, 50, 52, 61,

and Anadarko Langlie Mattix Penrose Sand Unit wells no. 21-7 and 36-1. This would extend the test area out to take in another complete row of injectors. Due to the larger pressure drop indicated by the Skelly injection well no. 28, a decision was made to leave the well shut in with pressure recorder attached. At this point in time it was felt by the committee that results from the testing had been inconclusive and no definite communication between the shut in injection wells and producing wells, temporarily abandoned wells or disposal well had been established.

At the committee meeting on July 15, 1976, further discussion took place concerning the feasibility of backflowing the high pressure low volume injectors which have shown little, if any, pressure variation during the shut in periods.

During the week of July 21st to July 28th, approximately 10 barrells of water was backflowed from the Citgo State well with no apparent pressure change.

A recommendation was made by the committee at the July 21st meeting that injection wells which are high pressure and low volume, and those which had shown little or no pressure variation during shut in be backflowed and tested, in a further attempt to determine if any communication exists between the concerned injection wells and the Citgo-State well.

Several wells were scheduled for backflow the following week: Skelly Penrose "A" no. 40, 42, 21, and 44. Anadarko Langlie Mattix Penrose Sand Unit no. 3-P and 4-H. Based on pressure response from shut-in, and results from backflowing and testing, the following wells were returned to injection status; Skelly Penrose "A" Unit nos. 12, 34, 36, 40, 42, 46. Anadarko wells nos. 37-3P, 36-4H. Wells to be shut in for observation with pressure recorders attached: Skelly Penrose "A" nos. 4, 8, 53, 55, 57. Skelly Penrose "B" nos. 17, 29, 40, 42. Anadarko Langlie Mattix Penrose Sand Unit 18-2, 19-2, 21-3, 21-2. Wells recommended to be backflowed and tested: Skelly Penrose "A" Unit nos. 21, 44, 50, 61, (the 9 5/8" and 7" to be checked individually on no 44.) Skelly Penrose "B" Unit no. 52. (casing and tubing tested individually.) Anadarko Langlie Mattix Penrose Sand Unit no. 36-1B.

From this time forward wells were checked for pressure drop, backflowed (rates and pressures monitored) and buildups ran following backflow. Data was gathered, charts were read and analyzed, other pertinent information was evaluated. Upon approval from the committee and the N.M.O.C.C., wells were returned to injection status as warranted by results from testing. Guidelines for the backflowing and buildup procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 bbls per day or less, shut the well in for pressure build up. If pressure does not build up past 800# in 48 hours then return the well to injection. Instructions will be given by the committee on wells that do not meet this guideline."

At the committee meeting on August 26, 1976 a decision was made, with approval of the N.M.O.C.C., to suspend the present testing procedure and shut in wells around the Citgo-State for pressure monitoring during backflow and drawdown of the well. Wells to be shut in 1 week prior to backflowing of the Citgo-State were: Skelly Penrose "A" no. 13, 23, 26, 40, 12, 21, 28, 38, 42 and 52. Skelly Penrose "B" no. 52. Anadarko tract 37-3P, 37-1J, 36-4H. All other wells were returned to injection. Date of re-shut down and installation of pressure recorders was August 31 (to allow 1 week for stabilization). Anticipated date of flow back of the Citgo-State was September 7, 1976.

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NEW MEXICO OIL CONSERVATION COMMISSION

Form C-103
Supersedes Old C-102 and C-103
Effective 1-1-65

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.: E-2387

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [X] GAS WELL [ ] OTHER: Temporarily Abandoned

7. Unit Agreement Name: -

2. Name of Operator: Petro-Search, Inc.

8. Farm or Lease Name: CITGO State

3. Address of Operator: 825 Petroleum Club Building, Denver, Colorado 80202

9. Well No.: 1

4. Location of Well: UNIT LETTER E, 2138 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE, SECTION 2, TOWNSHIP 23S, RANGE 37E, NMPM.

10. Field and Pool, or Wildcat: Langlie-Mattix SR

15. Elevation (Show whether DF, RT, GR, etc.): 3301' GR 3311' RKB

12. County: Lea

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	[ ]	PLUG AND ABANDON	[ ]	REMEDIAL WORK	[ ]	ALTERING CASING	[ ]
TEMPORARILY ABANDON	[ ]			COMMENCE DRILLING OPNS.	[ ]	PLUG AND ABANDONMENT	[X]
PULL OR ALTER CASING	[ ]	CHANGE PLANS	[ ]	CASING TEST AND CEMENT JOB	[ ]		
OTHER	[ ]			OTHER			[ ]

17. Describe Proposed or Completed Operations *(Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)* SEE RULE 1103.

The CITGO State #1 well was completed by Armer Oil Company, predecessor to Petro-Search, Inc., on 1-22-74 from Penrose sand perforations from 3568'-82' with a 24-hour pumping potential of 29 BO and 150 BW with estimated GOR 2000:1.

Because of a water flow in the salt section behind the 4-1/2" OD production casing in the subject well, no allowable was assigned by the NMOCC to the well until corrective action was taken to remedy this situation.

On the basis of a temperature survey ran on 2-8-74, a water flow was found to be entering the well bore behind the 4-1/2" OD production casing from 2470'-2500' and moving up the hole.

The 4-1/2" OD production casing was perforated at 2460' immediately above the water entry zone on 2-11-74, and after several unsuccessful attempt to squeeze the water flow zone with cement, braden head cement squeeze, cal-seal, sand, fix-mix, barite, etc. during February and early March, 1974, Western Company's Flow Control-1 was utilized on 3-7-74 to stop the movement of water up the hole behind the 4-1/2" OD production casing and to confine the water flow to the interval from 2470'-2500'.

Subsequent to the above workover, the NMOCC granted an allowable to the well on 3-15-74, and the well was placed on production on 3-27-74.

(Over)

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED C. W. Stumhoffer (C. W. Stumhoffer) TITLE Agent DATE 10-4-76

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

The well was produced from the Penrose sand perforations from 3568'-82' until 11-26-75 when water suddenly broke inside of the 4-1/2" OD production casing. The well was shut-in after this water break-in, and well head pressure was recorded at 1185 psig.

An effort was made to pull the 3/4" rods and 2-3/8" OD tubing from the well during 12-75, but due to a water flow rate of an estimated 7-8 BPM at pressures of 1000 psig, this work was abandoned due to inadequate disposal equipment and facilities in the area.

Subsequent to the above work, the well has been shut-in and utilized as a monitor well to evaluate other work being done in the area to locate the source of this water flow.

By August, 1976, it was noted that (1) the source of this water flow had not been definitely located as indicated by the 1050 psig shut-in pressure on the CITGO State #1 well and (2) the CITGO State #1 well was beginning to leak around the well head. At this time, it was decided that the CITGO State #1 well should be plugged and abandoned.

With the approval of the NMOCC, a plastic-lined pit with a storage capacity of approximately 50,000 barrels was constructed adjacent to the CITGO State #1 well. This pit was for the purpose of flowing the well in an effort to reduce well head pressure and water flow rates to a point where the rods and tubing could be pulled before proceeding with plugging operations.

The well was opened to the pit at 7:00 pm MST 9-18-76. Initial flow rate was an estimated 9 BPM that declined to an estimated 1 BPM on 9-27-76 when a well service rig was moved onto well to attempt pulling the rods and tubing. During the ten-day flowing period, the well produced an estimated 63,000 barrels of 9.9# brine water.

On 9-28-76, the rods were startedout of the hole, but the 1-3/4" tubing pump hung in the 2-3/8" OD tubing at an approximate depth of 2500'. Rods unscrewed at the top of the pump while attempting to pull the pump through a tight place in the tubing, and all rods were recovered. Subsequent attempts to pull the 2-3/8" OD tubing were not successful, indicating that the 4-1/2" OD production casing had collapse opposite the water flow zone from 2470'-2500'.

With telephone approval from Mr. Jerry Sexton, District Director of the NMOCC in Hobbs, New Mexico, the 2-3/8" OD tubing was cut off at 2468' - 18' above tight place inside of 2-3/8" OD tubing at 2486' - and pulled, and the well was plugged with 1,000 sacks of Class C cement with 2% CaCl pumped down 4-1/2" OD production casing with job completed at 5:25 pm MST 9-28-76. Top of cement inside of 4-1/2" OD production casing was found at 280' by wireline measurement at 9:00 am MST 9-29-76.

Marker has been placed on well, location has been cleared, and 50,000-barrel pit will be back-filled when water has been disposed.

SKELLY OIL COMPANY

May 11, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 A.M. May 10, 1976. Purpose of this meeting was to evaluate data which has been submitted by operators in the vicinity, and to determine and select monitor points for study.

After analyzing data on all wells which appeared to have possible value as monitor points, 13 wells were selected for the initial phase, these wells are as follows:

Skelly Penrose "A" Unit			
	# 26-J	3-23-37	Water Injection Well
	# 23-F	3-23-37	" " "
	# 13-B	3-23-37	" " "
	# 40-P	3-23-37	" " "
Anadarko Langlie Mattix Penrose Sand Unit			
	# 3-P	34-22-37	Water Injection Well
Moranco			
	# 36-IK	36-22-37	Producing Well
Petro-Search			
	Citgo St. # 1-E	2-23-37	Producing Well
	Flour # 1-M	35-22-37	" "
	Gulf St. # 2-F	2-23-37	" "
Summit Energy, Inc.			
	St. # 1-F	36-22-37	Producing Well
	Gulf Sims # 1-P	25-22-37	" "
Texas Pacific Oil Co.			
	Ella Drk. # 2-E	25-22-37	Producing Well (T.A.)
Agua, Inc.			
	Blinebry-Drk. # 35-H	35-22-37	Salt Water Disp. Well

The four Skelly and one Anadarko wells will be shut in during the monitoring period, with pressure recorders attached to the injection well head. The producing and disposal wells will have recorders attached. Bradenhead pressures will be monitored on the producers and injection pressure monitored on the Petro-Search # 1-M and surface pressure monitored on the shut-in Agua Disposal well. Plans are to install pressure recorders and begin monitoring of the 13 wells at 9:00 A.M. on May 19, 1976. The N.M.O.C.C. will notify all concerned operators by telephone or letter. Seven day recorders will be installed on the wells and they will be checked daily by a N.M.O.C.C. representative from the Hobbs office of the N.M.O.C.C.

Another meeting of the "Eunice Area Sub-Committee" will be called when sufficient data becomes available for evaluation.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

9:30 A.M. May 10, 1976 - Skelly's Hobbs Office

Name	Co.	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Elmer Teel	Texas Pacific	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
J. D. Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Erd Johnson	Reserve O & G	Midland, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
L. C. Hudry	Arco	Hobbs, New Mexico

Meeting adjourned at 3:00 P.M. May 10, 1976

May 27, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 A.M. May 27, 1976. Purpose of the meeting was to analyze pressure data which was furnished by operators of the thirteen wells which have been selected by the committee for use as monitor points. The wells which were shut in and pressure data recorded and analyzed are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
120 hr. shut in, pressure at beginning 1850#, ending pressure 1200#
23-F 3-23-37 Water Injection Well
168 hr. shut in, pressure at beginning 1400#, ending pressure 750#
13-B 3-23-37 Water Injection Well
168 hr. shut in, pressure at beginning 1650#, ending pressure 1065#
40-P
120 hr. shut in, pressure at beginning 1750#, ending pressure 1670#
38-N 3-23-37 Water Injection Well
48 hr. shut in, pressure at beginning 1600#, ending pressure 1200#
28-L 3-23-37 Water Injection Well
48 hr. shut in, pressure at beginning 1550#, ending pressure 950#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in, pressure at beginning 1500#, ending pressure 1300#

Moranco

36-IK 36-22-37 Producing Well
168 hr. shut in, pressure at beginning 0#, ending pressure 0#

Petro-Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in, pressure at beginning 1150#, ending pressure ~~1125~~#
1-M Fluor 35-22-37 Producing Well
168 hr. shut in, pressure at beginning 600#, ending pressure 575#
2-F Gulf St. 2-23-37 S.W.D. Well
168 hr. shut in, pressure at beginning 150#, ending pressure 75#

Summit Energy, Inc.

1-F St. 36-22-27 Producing Well
168 hr. shut in, pressure at beginning 750#, ending pressure 725#
1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in, pressure at beginning 800#, ending pressure 800#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in, pressure at beginning 625#, ending pressure 625#

Agua, Inc.
35-H Blinebry-Drk. 35-22-37 S.W.D. Well
168 hr. shut in, pressure at beginning 200#, ending pressure 250#

A slight decrease in pressure was noted on the Petro-Search Citgo State # 1; this occurred between 6:00 PM Friday May 21, and 9:00AM Saturday May 22. A pressure drop of 75# occurred on the Petro-Search Gulf State # 2. Skelly Penrose "A" injection wells # 38-N and 28-L had been shut in for 48 hrs, from Wednesday morning to Friday morning. On Friday morning the recorders were removed and installed on Skelly Penrose "A" injection wells 26-J and 40-P. Due to the pressure drop occurring when it did, a decision was made by the committee to recommend installation of pressure recorders on the Skelly Penrose "A" injection wells 38-N and 28-L, this was concurred with by Les Clements of the N.M.O.C.C. Pressure recorders are now being attached. All previously listed monitor wells still have pressure recorders hooked up, plus the 2 additional Skelly wells. The charts will be removed at 9:00 AM on June 2, 1976 and will be submitted to the committee through the N.M.O.C.C.

Another meeting of the "Eunice Area Sub-Committee" has been called for Thursday June 3, 1976 at Skelly's Hobbs office. At that time charts will be studied and further recommendations made.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

Name	Company	Location
Bill Thomas (Chairman)	Skelly	Hobbs, New Mexico
W. G. Abbott	Agua, Inc.	Hobbs, New Mexico
Erd M. Johnson	Reserve O&G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

Meeting adjourned at 11:00 AM

June 3, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 AM June 3, 1976. Purpose of the meeting was to analyze pressure data which was furnished by operators of the fifteen wells on which pressure recorders are attached and are being monitored. The wells on which pressures were recorded and analyzed are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
1200# - 950#
Total shut in time since beginning of test 288 hrs.
initial pressure 1850#, ending pressure 950#

23-F 3-23-37 Water Injection Well
168 hr. shut in
750# - 640#
Total shut in time since beginning of test 336 hrs.
initial pressure 1400#, ending pressure 640#

13-B 3-23-37 Water Injection Well
168 hr. shut in
1065# - 910#
Total shut in time since beginning of test 336 hrs.
initial pressure 1650#, ending pressure 910#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1640# - 1600#
Total shut in time since beginning of test 288 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
120 hr. shut in
1720# - 1050#
Total shut in time since beginning of test 168 hrs.
initial pressure 1600#, ending pressure 1050#

28-L 3-23-37 Water Injection Well
120 hr. shut in
1625# - 650#
Total shut in time since beginning of test 168 hrs.
initial pressure 1550#, ending pressure 650#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1280# - 1200#
Total shut in time since beginning of test 336 hrs.
initial pressure 1500#, ending pressure 1200#

Moranco
36-IK 36-22-37 Producing Well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 336 hrs.
initial pressure 0#, ending pressure 0#

Petro-Search
1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1090#
Total shut in time since beginning of test 336 hrs.
initial pressure 1150#, ending pressure 1090#
1-M Fluor 35-22-37 Producing Well
168 hr. shut in
610# - 590#
Total shut in time since beginning of test 336 hrs.
initial pressure 600#, ending pressure 590#
2-F Gulf St. 2-23-37 Producing Well
168 hr. shut in
75# - 75#
Total shut in time since beginning of test 336 hrs.
initial pressure 150#, ending pressure 75#

Summit Energy, Inc.
1-F Gulf-St. 36-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 336 hrs.
initial pressure 750#, ending pressure 740#
1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
800# - 830#
Total shut in time since beginning of test 336 hrs.
initial pressure 800#, ending pressure 830#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 635#
Total shut in time since beginning of test 336 hrs.
initial pressure 625#, ending pressure 635#

Agua, Inc.
35-H 35-22-37 S.W.D. Well
168 hr. shut in
250# - 230#
Total shut in time since beginning of test 336 hrs.
initial pressure 200#, ending pressure 230#

Pressure recorders are still attached on all of the above mentioned wells, with exception of the Moranco well. The Committee feels this well can eliminated as a monitor point because no pressure response of any sort has been observed. Pressure response on all concerned wells was generally less than anticipated. Pressure charts will be removed at 9:00 AM on June 9, 1976 and will be submitted to the Committee thru the N.M.O.C.C.

Plans are to open up the Petro-Search Citgo State well at 1:00 PM on June 10th and flow at maximum rate for 2-3 hours, then choke the well back to 100 barrells per hour. Negotiations are now underway to see if an arrangement can be worked out between Skelly, Petro-Search and the N.M.O.C.C. whereby Skelly could dispose of the backflow water into their Skelly Penrose "A" Unit waterflood. Rate and pressure will be monitored on the Citgo State well, as well as the other wells, which already have recorders attached, to determine if and where any pressure communication does exist.

Another meeting of the "Eunice Area Sub-Committee" has been called for 9:30 AM on June 10, 1976, at which time another weeks run of pressure charts will be analyzed and evaluated.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

9:30 AM June 3, 1976 - Skelly's Hobbs office

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
Erd. M. Johnson	Reserve O & G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Elmer Teel	Texas Pacific Oil	Eunice, New Mexico
J. D. Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. V. Ryan Jr.	Agua	Hobbs, New Mexico
L. C. Hudry	Arco	Hobbs, New Mexico

Meeting adjourned at 11:00 AM June 3, 1976

June 10, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met at Skelly"s office in Hobbs, New Mexico at 9:30 AM June 10, 1976. Pressure charts were read and data evaluated.

Pressure data from the wells are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
950# - 775#
Total shut in time since beginning of test 456 hrs.
initial pressure 1850#, ending pressure 775#

23-F 3-23-37 Water Injection Well
168 hr. shut in
640# - 575#
Total shut in time since beginning of test 504 hrs.
initial pressure 1400#, ending pressure 575#

13-B 3-23-37 Water Injection Well
168 hr. shut in
850# - 675#
Total shut in time since beginning of test 504 hrs.
initial pressure 1650#, ending pressure 675#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 456 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
168 hr. shut in
1050# - 900#
Total shut in time since beginning of test 336 hrs.
initial pressure 1600#, ending pressure 900#

28-L 3-23-37 Water Injection Well
168 hr. shut in
650# - 350#
Total shut in time since beginning of test 336 hrs.
initial pressure 1550#, ending pressure 350#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1200# - 1050#
Total shut in time since beginning of test 504 hrs.
initial pressure 1500#, ending pressure 1050#

Petro- Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 504 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing Well
168 hr. shut in
590# - 560#
Total shut in time since beginning of test 504 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
75# - 25#
Total shut in time since beginning of test 504 hrs.
initial pressure 150#, ending pressure 25#

Summit Energy, Inc.

1-F Gulf-St. 36-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 504 hrs.
initial pressure 750#, ending pressure 740#

1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
750# - 740#
Total shut in time since beginning of test 504 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 635#
Total shut in time since beginning of test 504 hrs.
initial pressure 625#, ending pressure 635#

Agua, Inc.

35-H 35-22-37 S.W.D. Well
168 hr. shut in
230# - 275#
Total shut in time since beginning of test 504 hrs.
initial pressure 200#, ending pressure 275#

Pressure recorders are still attached on all of the above wells. A letter has been mailed to Petro-Search from the N.M.O.C.C., requesting that they contact Skelly to work out an arrangement whereby Skelly may dispose of backflow water from their Citgo-State No. 1. Water breakthrough occurred on the Skelly Penrose "B" Unit well No. 52-F on Wednesday of this week, flow is from the 8 5/8 and 5 1/2 annulus. A dual pen recorder is now being hooked up on the well, to monitor tubing and bradenhead pressure, the chart will be removed next Wednesday and submitted, through the N.M.O.C.C., to the committee for evaluation.

Another meeting of the "Eunice Area Sub-Committee" has been set for 9:30 AM on June 17, 1976, at which time another weeks run of pressure charts will be analyzed and evaluated.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
Clarence R. Chandler	Reserve O & G	Midland, Texas
J. V. Ryan Jr.	Agua	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

Meeting adjourned at 10:30 AM June 10, 1976

June 17, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met at Skelly's office in Hobbs, New Mexico at 9:30 AM June 17, 1976. Pressure charts were read and data evaluated. Pressure from charts are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
775# - 650#
Total shut in time since beginning of test 624 hrs.
initial pressure 1850#, ending pressure 650#

23-F 3-23-37 Water Injection Well
168 hr. shut in
575# - 510#
Total shut in time since beginning of test 672 hrs.
initial pressure 1400#, ending pressure 510#

13-B 3-23-37 Water Injection Well
168 hr. shut in
675# - 560#
Total shut in time since beginning of test 672 hrs.
initial pressure 1650#, ending pressure 560#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 624 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
168 hr. shut in
900# - 775#
Total shut in time since beginning of test 504 hrs.
initial pressure 1600#, ending pressure 775#

28-L 3-23-37 Water Injection Well
168 hr. shut in
350# - 175#
Total shut in time since beginning of test 504 hrs.
initial pressure 1550#, ending pressure 175#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1050# - 1050#
Total shut in time since beginning of test 672 hrs.
initial pressure 1500#, ending pressure 1050#

Petro-Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 672 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing Well
168 hr. shut in
560# - 560#
Total shut in time since beginning of test 672 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
25# - 25#
Total shut in time since beginning of test 672 hrs.
initial pressure 150#, ending pressure 25#

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing Well
168 hr. shut in
740# - ? recorder malfunction
Total shut in time since beginning of test 672 hrs.
initial pressure 750#, ending pressure ?

1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 672 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 640#
Total shut in time since beginning of test 672 hrs.
initial pressure 625#, ending pressure 640#

Agua, Inc.

35-H 35-22-37 S.W.D. Well
168 hr. shut in
275# - 275#
Total shut in time since beginning of test 672 hrs.
initial pressure 230#, ending pressure 275#

Pressure recorders are to be removed Friday morning from the Skelly Penrose "A" Unit wells no. 26-J, 23-F, 13-A, 40-P and 38-N, guages will be installed for monitoring pressure. Due to the larger pressure drop shown by the Skelly Penrose "A" well no. 28-L, the pressure recorder will be left in place.

To date results from testing have been inconclusive as to establishing any definite communication between the shut in injection wells and producing wells.

Plans are to extend the testing out and shut in the next row of water injection wells. Additional wells to be shut in are; Skelly Penrose "A"

Unit wells no. 42, 44, 36, 21 and 12, Anadarko Langlie Mattix Penrose Sand Unit injection wells no. 4-H and 1-J.

Another meeting of the "Eunice Area Sub-Committee" has been set for 8:00 AM on June 24, 1976, at which time pressure charts will be analyzed and evaluated. A meeting of the three Area Committee Chairmen and Mr. Joe Ramey, Secretary-Director of the N.M.O.C.C is scheduled for 10:00 AM Thursday June 24, 1976 at the Hobbs office of the N.M.O.C.C.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
J. V. Ryan, Jr.	Agua	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
L. C. Hudry	Arco	Hobbs, New Mexico
Erd M. Johnson	Reserve O & G	Midland, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

Meeting adjourned at 11:30 AM June 17, 1976

June 24, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committe" met at Arco's office in Hobbs, New Mexico at 8:00 AM June 24, 1976. Pressure charts were read and data evaluated. Five Skelly Penrose "A" Unit waterflood injection wells and two Anadarko injection wells were shut in during the past week. The Skelly wells are: 42-B, 44-D, 36-P, 21-H, and 12-N. The Anadarko wells are 4-H and 1-J. Pressure and changes from charts and gauges are as follows.

Skelly Penrose "A" Unit

26-J 3-23-37 Water injection well
168 hr. shut in
650# - 525#
Total shut in time since beginning of test 792 hrs
initial pressure 1850#, ending pressure 525#

23-F 3-23-37 Water injection well
168 hr. shut in
510# - 450#
Total shut in time since beginning of test 840 hrs.
initial pressure 1400#, ending pressure 450#

13-B 3-23-37 Water injection well
168 hr. shut in
560# - 500#
Total shut in time since beginning of test 840 hrs.
initial pressure 1650#, ending pressure 560#

40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 792 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water injection well
168 hr. shut in
775# - 750#
Total shut in time since beginning of test 672 hrs.
initial pressure 1600#, ending pressure 750#

28-L 3-23-37 Water injection well
168hr. shut in
175# - 35#
Total shut in time since beginning of test 672 hrs
initial pressure 1550#, ending pressure 35#

42-B 10-23-37 Water injection well
114 hr. shut in
1850# - 1675#
Total shut in time since beginning of test 114 hrs.
initial pressure 1850#, ending pressure 1675#

44-D 10-23-37 Water injection well
116 hr. shut in
1775# - 1600#
Total shut in time since beginning of test 116 hrs.
initial pressure 1775#, ending pressure 1600#

36-P 4-23-37 Water injection well
117 hr. shut in
1800# - 1400#
Total shut in time since beginning of test 117 hrs.
initial pressure 1800#, ending pressure 1400#

21-H 4-23-37 Water injection well
115 hr shut in
1850# - 1700#
Total shut in time since beginning of test 115 hrs.
initial pressure 1850#, ending pressure 1700#

12-N 34-22-37 water injection well
113 hr shut in
1600# - 1020#
Total shut in time since beginning of test 113 hrs.
initial pressure 1600#, ending pressure 1020#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 water injection well
168 hr shut in
1050# - 1050#
Total shut in time since beginning of test 840 hrs.
initial pressure 1500#, ending pressure 1050#

4-H 34-22-37 Water injection well
121 hr. shut in
1625# - 1275#
Total shut in time since beginning of test 121 hrs.
initial pressure 1625#, ending pressure 1275#

1-J 34-22-37 Water injection well
121 hr. shut in
1280# - 1120#
Total shut in time since beginning of test 121 hrs.
initial pressure 1280#, ending pressure 1120#

Petro Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 840 hrs
initial pressure 1150#, ending pressure 1140#

1-M Flour 35-22-37 Producing well
168 hr. shut in
560# -560#
Total shut in time since beginning of test 840 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
25# - 0#
Total shut in time since beginning of test 840 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing well
168 hr. shut in
Chart not aveileble
Total shut in time since beginning of test 840 hrs.
initiel pressure 750#, ending pressure?

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
740# - Chart not available
Total shut in time since beginning of test 840 hrs.
initial pressure 800#, ending pressure?

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
640# - 625#
Total shut in time since beginning of test 840 hrs
initial pressure 625#, ending pressure 625#

Agua Inc.
35-H 35-22-37 S.W.D. well
168 hr. shut in
275# - 275#
Total shut in time since beginning of test 840 hrs.
initial pressure 230#, ending pressure 275#

Skelly Penrose "B" Unit # 52 Injection well
has been shut in for approximately
360 hrs. has 350# on casing
and 1150# on tubing

Pressure recorders removed from Skelly Penrose "A" Water Injection Wells nos. 26, 23, 13, 40 and 38 and pressure gauges installed. The recorders were installed on Skelly Penrose "A" injection wells nos. 42, 44, 36, 21 and 12. Pressure recorders were also put on Anadarko injection wells nos. 4-H and 1-J. Reason for the additional installations was to extend the test area out to take in another row of wells. A meeting between chairmen of the study groups and members of the N.M.O.C.C. from the Hobbs and Santa Fe office was held at 10:00 A.M. June 24 at the Hobbs office. The three Study Groups presented a review of progress being made in their respective areas. None of the Study Groups have come up with any definite answers and plans are to continue cycling and testing as recommended and agreed to by the N.M.O.C.C. The Eunice Group requested that the N.M.O.C.C. request that Petro-Search make arrangements to backflow their Citgo - State No. 1 well. Testing to date has been inconclusive as to establishing communication between any of the shut in injection wells and the Citgo - State well. Another meeting of the Eunice Area sub-committee is scheduled for 10:00 AM July 1, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs
Val Ryan	Agua	Hobbs
Herb Henderson	Anadarko	Eunice
Jimmie Christner	Anadarko	Houston
Clarence Chandler	Reserve O&G	Midland
L.C. Hudry	Arco	Hobbs
Jim Gibson	Gulf	Hobbs

July 1, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 10:00 a.m. July 1, 1976. Pressure charts were read and data evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

#26-J 3-23-37 Water injection well
168 hr. shut-in
525# - 450#
Total shut-in time since beginning of test 960 hrs.
initial pressure 1850#, ending pressure 450#

#23-F 3-23-37 Water injection well
168 hr. shut-in
450# - 400#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1400#, ending pressure 400#

#13-B 3-23-37 Water injection well
168 hr. shut-in
500# - 430#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1650#, ending pressure 430#

#40-P 3-23-37 Water injection well
168 hr. shut-in
1600# - 1600#
Total shut-in time since beginning of test 960 hrs.
initial pressure 1750#, ending pressure 1600#

#38-N 3-23-37 Water injection well
168 hr. shut-in
750# - 650#
Total shut-in time since beginning of test 840 hrs.
initial pressure 1600#, ending pressure 650#

#28-L 3-23-37 Water injection well
168 hr. shut-in
35# - 20" vacuum
Total shut-in time since beginning of test 840 hrs.
initial pressure 1550#, ending pressure 20" vacuum

#42-B 10-23-37 Water injection well
168 hr. shut-in
1675# - 1675#
Total shut-in time since beginning of test 282 hrs.
initial pressure 1850#, ending pressure 1675#

#44-D 10-23-37 Water injection well
168 hr. shut-in
1600# - 1575#
Total shut-in time since beginning of test 284 hrs.
initial pressure 1775#, ending pressure 1575#

#36-P 4-23-37 Water injection well
168 hr. shut-in
1400# - 1175#
Total shut-in time since beginning of test 285 hrs.
initial pressure 1800#, ending pressure 1175#

#21-H 4-23-37 Water injection well
168 hr. shut-in
1700# - 1725#
Total shut-in time since beginning of test 283 hrs.
initial pressure 1850#, ending pressure 1725#

#12-N 34-22-37 Water injection well
168 hr. shut-in
1020# - 950#
Total shut-in time since beginning of test 281 hrs.
initial pressure 1600#, ending pressure 950#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water injection well
168 hr. shut-in
1050# - 1050#
Total shut-in time since beginning of test 1008 hrs.
iniital pressure 1500#, ending pressure 1050#

4-H 34-22-37 Water injection well
168 hr. shut-in
1275# - 1200#
Total shut-in time since beginning of test 289 hrs.
initial pressure 1625#, ending pressure 1200#

1-J 34-22-37 Water injection well
168 hr. shut-in
1120# - 1020#
Total shut-in time since beginning of test 289 hrs.
initial pressure 1280#, ending pressure 1020#

Petro Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut-in
1140# - 1140#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Flour 35-22-37 Producing well
168 hr. shut-in
560# - 560#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing well
168 hr. shut-in
0# - 100#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 150#, ending pressure 100#.

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing well
168 hr. shut-in
750# - 750# (Pressure variations indicated during day)
Total shut-in time since beginning of test 1008 hrs.
initial pressure 750#, ending pressure 750#
(N.M.O.C.C. to check for reasons for pressure variations. Looks like possible pump action for SWD).

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut-in
760# - 760#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 800#, ending pressure 760#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut-in
655# - 630#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 625#, ending pressure 630#

Agua, Inc.
#35-H 35-22-37 SWD well
168 hr. shut-in
310# - 310#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 230#, ending pressure 310#

Skelly Penrose "B" Unit #52 Injection well
168 hrs. shut-in
has been shut-in for approximately
528 hrs. has 300# on casing
and 1100# on tubing

The Eunice group restated recommendation that injection wells where pressure had declined to 600-700# range or less be returned to active status since no variation in pressure was noted at the monitoring point. Request was restated that the N.M.O.C.C. request Petro-Search to make arrangements to backflow their Citgo-State No. 1 well for 24-48 hours to determine if a pressure-trapped condition exists in this well. Recommendation was made that if the N.M.O.C.C. will not permit flowing the Citgo-State No. 1 well; then the injection wells with 700# pressure or less should be re-activated and recycling expanded to another row of injectors. Mr. Sexton agreed to take this matter under advisement for discussion with Mr. Ramey and report back to the chairman by Wednesday, July 7, 1976. Another meeting of the Eunice Area Sub-committee is scheduled for 9:00 a.m. July 8, 1976, at Arco's Hobbs office.

O. V. Stuckey

O. V. Stuckey

OVS/ss

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
O. V. Stuckey (Chairman)	Skelly	Midland
Val Ryan	Agua	Hobbs
Herb Henderson	Anadarko	Eunice
Jimmie Christner	Anadarko	Houston
Clarence Chandler	Reserve O&G	Midland
L. C. Hudry	Arco	Hobbs
Clem Korzekna	Gulf	Hobbs
Jerry Sexton	N.M.O.C.C.	Hobbs

July 8, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 8, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

#26-J 3-23-37 Water injection well
168 hr. shut in
450# - 375#
Total shut in time since beginning of test 1128 hrs.
initial pressure 1850#, ending pressure 375#

#23-F 3-23-37 Water injection well
168 hr. shut in
400# - 350#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1400#, ending pressure 350#

#13-B 3-23-37 Water injection well
168 hr. shut in
430# - 325#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1650#, ending pressure 325#

#40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 1128 hrs.
initial pressure 1750#, ending pressure 1600#

#38-N 3-23-37 Water injection well
168 hr. shut in
650# - 575#
Total shut in time since beginning of test 1008 hrs.
initial pressure 1600#, ending pressure 575#

#28-L 3-23-37 Water injection well
168 hr. shut in
20" vacuum--22" vacuum
Total shut in time since beginning of test 1008 hrs.
initial pressure 1550#, ending pressure 22" vacuum

#42-B 10-23-37 Water injection well
168 hr. shut in
1675# - 1650#
Total shut in time since beginning of test 450 hrs.
initial pressure 1850#, ending pressure 1650#

#44-D 10-23-37 Water injection well
168 hr. shut in
1575# - 1550#
Total shut in time since beginning of test 452 hrs.
initial pressure 1775#, ending pressure 1550#

#36-P 4-23-37 Water injection well
168 hr. shut in
1175# - 1050#
Total shut in time since beginning of test 453 hrs.
initial pressure 1800#, ending pressure 1050#

#21-H 4-23-37 Water injection well
168 hr. shut in 1725# - 1750#
Total shut in time since beginning of test 451 hrs.
initial pressure 1850#, ending pressure 1750#

#12-N 34-22-37 Water injection well
168 hr. shut in
950# - 925#
Total shut in time since beginning of test 449 hrs.
initial pressure 1600#, ending pressure 925#

Anadarko Langlie Mattix Penrose Sand Unit
#3-P 34-22-37 Water injection well
168 hr. shut in
1050# - 1050#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1500#, ending pressure 1050#
#4-H 34-22-37 Water injection well
168 hr. shut in
1200# - 1100#
Total shut in time since beginning of test 457 hrs.
initial pressure 1625#, ending pressure 1100#
#1-J 34-22-37 Water injection well
168 hr. shut in
1020# - 900#
Total shut in time since beginning of test 457 hrs.
initial pressure 1280#, ending pressure 900#

Petro-Search
#1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1150#, ending pressure 1140#
#1-M Fluor 35-22-37 Producing well
168 hr. shut in
560# -560#
Total shut in time since beginning of test 1176 hrs.
initial pressure 600#, ending pressure 560#
#2-F Gulf State 2-23-37 Producing well
168 hr. shut in
100# - 0#
Total shut in time since beginning of test 1176 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.
#1-F Gulf State 36-22-37 Producing well
168 hr. shut in
750# - 750# (chart still showing pressure variations)
Total shut in time since beginning of test 1176 hrs.
initial pressure 750#, ending pressure 750#
(N.M.O.C.C. to check for reasons for pressure variation)
#1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
760# - 740#
Total shut in time since beginning of test 1176 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.
#2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1176 hrs.
initial pressure 625#, ending pressure 630#

Agua, Inc.
#35-H 35-22-37 SWD well
168 hr. shut in
310# - 310#
Total shut in time since beginning of test 1176 hrs.
initial pressure 230#, ending pressure 310#

Skelly Penrose "B" Unit
#52-F 9-23-37 Water injection well
168 hr. shut in
300# - 250# (casing)
1100# - 1040# (tubing)
Total shut in time since beginning of test 696 hrs.
casing -- ending pressure 250#
tubing -- ending pressure 1040#

Jerry Sexton met with the committee to discuss the N.M.O.C.C. position concerning a prior request of the committee that all injection wells in the test area that have declined to 600# - 700# range or less be returned to active injection status, as no apparent communication exists between such wells and the monitor well. A request had also been made by the sub-committee concerning a 24-48 hr. backflow of the Petro-Search Citgo-State no. 1 well, in an effort to determine if a pressure-trapped condition might exist in the well: The N.M.O.C.C. feels that this well should not be disturbed, at least for the time being, until more injectors in the area have been shut in and monitored.

Mr. Sexton agreed to the following proposals by the committee: Return Skelly Penrose "A" Unit injection wells no. 13, 26, 23, 38 and 28 to injection, well no. 28 will be surveyed as soon as injection has stabilized. Skelly Penrose "A" injection wells no. 2, 10, 17, 30, 32, 34, 46, 48, 50, 52, 61 and Anadarko Langlie Mattix Penrose Sand Unit wells no. 21-7 and 36-1 will be shut in and pressure recorders attached. This extends the test area out to take in another complete row of injectors. Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 15, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
O. V. Stuckey	Skelly	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
Erd M Johnson	Reserve O & G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W. G. Abbott	AGUA, Inc.	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

July 15, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 15, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water injection well
144 hr. shut in
375# - 360#
Total shut in time since beginning of test 1272 hrs.
initial pressure 1850#, ending pressure 360#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 890 BWPD at 1675# tubing pressure

23-F 3-23-37 Water injection well
144 hr. shut in
350# - 325#
Total shut in time since beginning of test 1320 hrs.
initial pressure 1400#, ending pressure 325#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 540 BWPD at 1400# tubing pressure

13-B 3-23-37 Water injection well
144 hr. shut in
325# - 275#
Total shut in time since beginning of test 1320 hrs.
initial pressure 1650#, ending pressure 275#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 625 BWPD at 1580# tubing pressure

40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 1296 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water injection well
144 hr. shut in
575# - 500#
Total shut in time since beginning of test 1152 hrs.
initial pressure 1600#, ending pressure 500#
well was returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 660 BWPD at 1550#

28-L 3-23-37 Water injection well
144 hr. shut in
22" vacuum - 22" vacuum
Total shut in time since beginning of test 1152 hrs.
initial pressure 1550#, ending pressure 22" vacuum
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 450 BWPD at 1500# tubing pressure

42-B 10-23-37 Water injection well
168 hr. shut in
1650# - 1640#
Total shut in time since beginning of test 618 hrs.
initial pressure 1850#, ending pressure 1640#

44-D 10-23-37 Water injection well
168 hr. shut in
1550# - 1550#
Total shut in time since beginning of test 620 hrs.
initial pressure 1775#, ending pressure 1550#
on July 10, 1976 at 2:00 p.m., water broke through the 9 5/8" X 7" casing annulus--immediate shut in pressure was 750#, estimated flow was 75 BWPD. On July 12, 1976 @ 10:00 a.m. a dual pen recorder was hooked up to this well--tubing pressure was 1550#, casing pressure was 660# July 14, 1976 (when chart was changed) had 1550# on tubing and 630# on casing.

36-P 4-23-37 Water injection well
168 hr. shut in
1050# - 925#
Total shut in time since beginning of test 621 hrs.
initial pressure 1800#, ending pressure 925#

21-H 4-23-37 Water injection well
168 hr. shut in
1750# - 1640#
Total shut in time since beginning of test 619 hrs.
initial pressure 1850#, ending pressure 1640#

12-N 34-22-37 Water injection well
168 hr. shut in
925# - 850#
Total shut in time since beginning of test 617 hrs.
initial pressure 1600#, ending pressure 850#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
250# - 240# (casing)
1040# - 1000# (tubing)
Total shut in time since beginning of test 864 hrs.
casing -- ending pressure 240#
tubing -- ending pressure 1000#

The following wells were shut in for observation on July 12 and 13: Skelly Pen. "A" U.

2-L 34-22-37 Water injection well
43 hr. shut in
1920# - 1830#
Total shut in time since beginning of test 43 hrs.
initial pressure 1920#, ending pressure 1830#

10-P 33-22-37 Water injection well
42 hr. shut in
1775# - 1540#
Total shut in time since beginning of test 42 hrs.
initial pressure 1775#, ending pressure 1540#

17-B 4-23-37 Water injection well
44 hr. shut in
1850# - 1750#
Total shut in time since beginning of test 42 hrs.
initial pressure 1850#, ending pressure 1750#

30-J 4-23-37 Water injection well
41 hr. shut in
1800# - 1700#
Total shut in time since beginning of test 41 hrs.
initial pressure 1800#, ending pressure 1700#

#32-L 4-23-37 Water injection well
40 hr. shut in
1790# - 1700#
Total shut in time since beginning of test 40 hrs.
initial pressure 1790#, ending pressure 1700#

#34-N 4-23-37 Water injection well
46 hr. shut in
1350# - 950#
Total shut in time since beginning of test 46 hrs.
initial pressure 1350#, ending pressure 950#

#46-B 9-23-37 Water injection well
47 hr. shut in
1350# - 1175#
Total shut in time since beginning of test 47 hrs.
initial pressure 1350#, ending pressure 1175#

48-H 9-23-37 Water injection well
45 hr. shut in
1725# - 1700#
Total shut in time since beginning of test 45 hrs.
initial pressure 1725#, ending pressure 1700#

#50-F 10-23-37 Water injection well
48 hr. shut in
1900# - 1625#
Total shut in time since beginning of test 48 hrs.
initial pressure 1900#, ending pressure 1625#

#52-H 10-23-37 Water injection well
27 hr. shut in
1900# - 1625#
Total shut in time since beginning of test 27 hrs.
initial pressure 1900#, ending pressure 1625#

#61-F 4-23-37 Water injection well
42 hr. shut in
1790# - 1675#
Total shut in time since beginging of test 42 hrs.
initial pressure 1790#, ending pressure 1675#

Anadarko Langlie Mattix Penrose Sand Unit

#3-P 34-22-37 Water injection well
168 hr. shut in
1050# - 910
Total shut in time since beginning of test 1344 hrs.
initial pressure 1500#, ending pressure 910#

#4-H 34-22-37 Water injection well
168 hr. shut in
1100# - 1020#
Total shut in time since beginning of test 625 hrs.
initial pressure 1625#, ending pressure 1020#

#1-J 34-22-37 Water injection well
168 hr. shut in
900# - 800#
Total shut in time since beginning of test 625 hrs.
initial pressure 1625#, ending pressure 800#

The following wells were shut in for observation on July 12, 1976: Anadarko (L.M.P.S.U.)

Tr 21-7F 34-22-27 Water injection well
40 hr. shut in
1700# - 1600#
Total shut in time since beginning of test 40 hrs.
initial pressure 1700#, ending pressure 1600#

Tr 36-1 B 34-22-37 Water injection well
40 hr. shut in
1500# - 1440#
Total shut in time since beginning of test 40 hrs.
initial pressure 1500#, ending pressure 1440#

Petro-Search
1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1344 hrs.
initial pressure 1150#, ending pressure 1140#
1-M Fluor 35-22-37 Producing well
168 hr. shut in
560# - 560#
Total shut in time since beginning of test 1344 hrs.
initial pressure 600#, ending pressure 560#
2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
0# - 75#
Total shut in time since beginning of test 1344 hrs.
initial pressure 150#, ending pressure 75#

Summit Energy, Inc.
1-F Gulf State 36-22-37 Producing well
168 hr. shut in
750# - 720# (chart still showing press. variation)
Total shut in time since beginning of test 1344 hrs.
initial pressure 750#, ending pressure 720#
1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
740# - 730#
Total shut in time since beginning of test 1344 hrs.
initial pressure 800#, ending pressure 730#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1344 hrs.
initial pressure 625#, ending pressure 630#

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
310# - 340#
Total shut in time since beginning of test 1344 hrs.
initial pressure 230#, ending pressure 340#

Further discussion took place concerning the feasibility of backflowing the high pressure, low volume injectors which have shown little, if any, pressure variation during the shut in periods. Also, the committee reaffirms its position concerning backflowing and testing of the Petro-

Search Citgo State No. 1.

The committee recommends that high pressure low volume injectors which have shown little or no variations in pressure be backflowed and tested, in a further attempt to determine if communication does or does not exist between these wells and the monitor well. We also reaffirm our prior recommendation that the Citgo State No. 1 be backflowed, even if for a short period of time, to be sure that we are not dealing with a pressure trapped condition in this well.

Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 22, 1976 at Arco's Hobbs office. The chairman of the committee is to meet with the N.M.O.C.C. before the next regular committee meeting to strongly urge and request that we be permitted to proceed as per recommendations.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Bill Thomas (chairman)	Skelly	Hobbs, N.M.
Odis Henley	Skelly	Hobbs, N.M.
J.W. Gibson	Gulf	Hobbs, N.M.
Jimmie Christner	Anadarko	Houston, Tex
Herb Henderson	Anadarko	Eunice, N.M.
Val Ryan	AGUA	Hobbs, N.M.
Erd Johnson	Reserve	Midland, Tex.
Lad Hudry	Arco	Hobbs, N.M.

July 21, 1976

MINUTES OF SUB-COMMITTE APPOINTED BY N.M.O.C.C TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 21, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit
- # 40-P 3-23-37 Water injection well
  - 168 hr. Shut in
  - 1600# - 1575#
  - Total shut in time since beginning of test 1464 hrs.
  - initial pressure 1750#, ending pressure 1575#
- # 42-B 10-23-37 Water injection well
  - 168 hr. Shut in
  - 1640# - 1640#
  - Total shut in time since beginning of test 786 hrs.
  - initial pressure 1850#, ending pressure 1640#
- # 44-D 10-23-37 Water injection well
  - 168 hr. Shut in
  - 1550# - 1525# (tubing)
  - 630# - 630# (casing)
  - Total shut in time since beginning of test 788 hrs.
- # 36-P 4-23-37 Water injection well
  - 168 hr. shut in
  - 925# - 825#
  - Total shut in time since beginning of test 789 hrs.
  - initial pressure 1800#, ending pressure 825#
- # 21-H 4-23-37 Water injection well
  - 168 hr. shut in
  - 1640# - 1550#
  - Total shut in time since beginning of test 787# hrs.
  - initial pressure 1850#, ending pressure 1550#
- # 12-N 34-22-37 Water injection well
  - 168 hr. shut in
  - 850# - 750#
  - Total shut in time since beginning of test 785 hrs.
  - initial pressure 1600#, ending pressure 750#

Skelly Penrose "B" Unit
- # 52-F 9-23-37 Water injection well
  - 168 hr. shut in
  - 240# - 200# (casing)
  - 1000# - 775# (tubing)
  - Total shut in time since beginning of test 1032 hrs.
  - casing -- ending pressure 200#
  - tubing -- ending pressure 775#

The following wells were shut in for observation on July 12 & 13, 1976

Skelly Penrose "A" Unit
- # 2-L 34-22-37 Water injection well
  - 168 hr shut in
  - 1830# - 1680#

#4-H 34-22-37 Water injection well
168 hr. shut in
1020# - 970#
Total shut in time since beginning of test 793 hrs.
initial pressure 1625#, ending pressure 970#

1-J 34-22-37 Water injection well
168 hr. shut in
800# - 610#
Total shut in time since beginning of test 793 hrs.
initial pressure 1625#, ending pressure

The following wells were shut in for observation on July 12, 1976

Anadarko (L.M.P.S.U.)

Tr. 21-7F 34-22-37 Water injection well
168 hr. shut in
1600# - 1300#
Total shut in time since beginning of test 208 hrs.
initial pressure 1700#, ending pressure 1300#

Tr. 36-1B 34-22-37 Water injection well
168 hr. shut in
1440# - 1300#
Total shut in time since beginning of test 208 hrs.
initial pressure 1500#, ending pressure 1300#

Petro - Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1140 hrs.
initial pressure 1150#, ending pressure

1-M Fluor 35-22-37 Producing well
168 hr shut in
560# - 500# (no change in chart)
Total shut in time since beginning of test 1512 hrs.
initial pressure 600#, ending pressure 500#

2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
75# - 0#
Total shut in time since beginning of test 1512 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy Inc.

1-F Gulf State 31-22-37 Producing well
168 hr. shut in
720# - 720# (chart showing pres. variation)
Total shut in time since beginning of test 1512 hrs.
initial pressure 750#, ending pressure 720#

1-P Gulf Sims 25-22-37 Producing well
168 hr shut in
730# - 720#
Total shut in time since beginning of test 1512 hrs.
initial pressure 800#, ending pressure 720#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1512 hrs.
initial pressure 625#, ending pressure 630#

AGW, INC

Total shut in time since beginning of test 211 hrs.
initial pressure 1920#, ending pressure 1680#

10-P 33-22-37 Water injection well
168 hr. shut in
1540# - 1375#
Total shut in time since beginning of test 210 hrs.
initial pressure 1775#; ending pressure 1375#

17-B 4-23-37 Water injection well
168 hr. shut in
1750# - 1525#
Total shut in time since beginning of test 210 hrs..
initial pressure 1850#, ending pressure 1525#

30-J 4-23-37 Water injection well
168 hr shut in
1700# - 1575#
Total shut in time since beginning of test 209 hrs.
initial pressure 1800#, ending pressure 1575#

32-L 4-23-37 Water injection well
168 hr. shut in
1700# - 1600#
Total shut in time since beginning of test 208 hrs.
initial pressure 1790#, ending pressure 1600#

34-N 4-23-37 Water injection well
168 hr. shut in
950# - 750#
Total shut in time since beginning of test 214 hrs.
initial pressure 1350#, ending pressure 750#

46-B 9-23-37 Water injection well
168 hr shut in
1175# - 975#
Total shut in time since beginning of test 215 hrs.
initial pressure 1350#, ending pressure 975#

48-H 9-23-37 Water injection well
168 hr. shut in
1700# - 1650#
Total shut in time since beginning of test 213 hrs.
initial pressure 1725#, ending pressure 1650#

50-F 10-23-37 Water injection well
168 hr. shut in
1625# - 1565#
Total shut in time since beginning of test 216 hrs.
initial pressure 1900#, ending pressure 1565#

52-H 10-23-37 Water injection well
168 hr. shut in
1625# - 1400#
Total shut in time since beginning of test 195 hrs.
initial pressure 1900#, ending pressure 1400#

61-F 4-23-37 Water injection well
168 hr shut in
1675# - 1575#
Total shut in time since beginning of test 210 hrs.
initial pressure 1790#, ending pressure 1575#

210

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water injection well
168 hr. shut in
910# - 890#
Total shut in time since beginning of test 1512 hrs,
initial pressure 1500#, ending pressure 890#

35-H 35-22-37 SWD well
168 hr. shut in
340# - 340#
Total shut in time since beginning of test 1512 hrs.
initial pressure 230#, ending pressure 340#

Plans are to backflow and test the following injection wells:

Skelly Penrose "A" Unit no. 40-P
" " " " " 42-B
" " " " " 21-H
" " " " " 44-D

Anadarko Langlie Mattix Penrose Sand Unit 3-P
" " " " " " 4-H

These wells will be backflowed to approximately 500 lbs. or until stabilization is reached. Following backflow, pressure recorders will be attached and pressures monitored.

The committee and the N.M.O.C.C. feel that this procedure will provide adequate data to determine if pressure communication exists between the wells and the monitor well. The committee and the N.M.O.C.C. feel that this testing procedure will accelerate the study, as well as being able to return wells to injection status thereby providing adequate facilities to accommodate the shutting in of additional injection wells for testing and study. During the past week approximately 10 bbls. of water was backflowed from the Citgo-State no. 1 with no apparent pressure change. Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 29, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Cris Hanley	Skelly	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
J.C. Gibson	Gulf	Hobbs, New Mexico

July 29, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 29, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Water injection well
Well was backflowed 40 hrs. Backflowed 325 bbls. of water. Results of backflow and observation of Citgo St. well indicate no apparent communication. Committee and N.M.O.C.C. agree that this well can be returned to injection status.

42-B 10-23-37 Water injection well
Well was backflowed approximately 40 hrs. Backflowed 350 bbls. of water. Results from backflow and observation of Citgo St. well indicate no apparent communication. Committee and N.M.O.C.C. agree that this well can be returned to injection status.

44-D 10-23-37 Water injection well
168 hr. shut in
1525# - 1525# (tubing)
630# - 630# (casing)
Total shut in time since beginning of test 956 hrs.
This well will be backflowed and tested this week and if communication with the monitor well is not indicated it will be returned to injection.

36-P 4-23-37 Water injection well
168 hr. shut in
825# - 750#
Total shut in time since beginning of test 950 hrs.
initial pressure 1800#, ending pressure 825#
The committee recommends, and the N.M.O.C.C. approves, that based on data obtained through the shut in period, this well can be returned to injection status.

21-H 4-23-37 Water injection well
168 hr. shut in
1550# - 1525#
Total shut in time since beginning of test 955 hrs.
initial pressure 1850#, ending pressure 1525#
The committee recommends and N.M.O.C.C. approves that this well be backflowed and tested this week. If no communication exists between it and the monitor well a recommendation will be made that the well be returned to injection status.

12-N 34-22-37 Water injection well
168 hr. shut in
750# - 700#
Total shut in time since beginning of test 953 hrs.
initial pressure 1600#, ending pressure 700#
This well will be returned to injection status.

2-L 34-22-37 Water injection well
168 hr. shut in
1680# - 1620#
Total shut in time since beginning of test 379 hrs.
initial pressure 1920#, ending pressure 1620#

10-P 33-22-37 Water injection well
168 hr. shut in
1375# - 1225#
Total shut in time since beginning of test 378 hrs.
initial pressure 1775#, ending pressure 1225#

17-B 4-23-37 Water injection well
168 hr. shut in
1525# - 1450#
Total shut in time since beginning of test 378 hrs.
initial pressure 1850#, ending pressure 1450#

30-J 4-23-37 Water injection well
168 hr. shut in
1575# - 1525#
Total shut in time since beginning of test 377 hrs.
initial pressure 1800#, ending pressure 1525#

32-L 4-23-37 Water injection well
168 hr. shut in
1600# - 1550#
Total shut in time since beginning of test 376 hrs.
initial pressure 1790#, ending pressure 1550#

34-N 4-23-37 Water injection well
168 hr. shut in
750# - 700#
Total shut in time since beginning of test 382 hrs.
initial pressure 1350#, ending pressure 700#
This well will be returned to injection status.

46-B 9-23-37 Water injection well
168 hr. shut in
975# - 875#
Total shut in time since beginning of test 383 hrs.
initial pressure 1350#, ending pressure 875#
This well will be returned to injection status.

48-H 9-23-37 Water injection well
168 hr. shut in
1650# - 1600#
Total shut in time since beginning of test 381 hrs.
initial pressure 1725#, ending pressure 1600#

50-F 10-23-37 Water injection well
168 hr. shut in
1565# - 1565#
Total shut in time since beginning of test 384 hrs.
initial pressure 1900#, ending pressure 1565#
This well is to be backflowed and tested.

52-H 10-23-37 Water injection well
168 hr. shut in
1400# - 1275#
Total shut in time since beginning of test 363 hrs.
initial pressure 1900#, ending pressure 1275#

61-F 4-23-37 Water injection well
168 hr. shut in
1575# - 1525#
Total shut in time since beginning of test 378 hrs.
This well is to be backflowed and tested.

Shelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in

200# - 200# (casing)
775# - 800# (tubing)
Both casing and tubing will be backflowed and tested, separately.

Anadarko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
32 hr. shut in (prior to backflow)
890# - 890#
Total shut in time since beginning of test 1544 hrs.
initial pressure 1500#, ending pressure 890#
This well was backflowed and tested during the past week and is to be returned to injection status.

36-4E 34-22-37 Water injection well
31 hr. shut in (prior to backflow)
970# - 970#
Total shut in time since beginning of test 824 hrs.
initial pressure 1625#, ending pressure 970#
Returned to injection status following backflow.

37-1J 34-22-37 Water injection well
168 hr. shut in
610# - 510#
Total shut in time since beginning of test 871 hrs.
initial pressure 1625#, ending pressure 510#
The committee recommended and N.M.O.C.C. agreed to return this well to injection status.

21-7F 34-22-37 Water injection well
54 hr. shut in
1300# - 1250#
Total shut in time since beginning of test 262 hrs.
initial pressure 1700#, ending pressure 1250#
This well was backflowed--continue to backflow and will shut in and test.

36-1B 34-22-37 Water injection well
168 hr. shut in
1300# - 1160#
Total shut in time since beginning of test 376 hrs.
initial pressure 1500#, ending pressure 1160#
This well is to be backflowed.

Petro-Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1680 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 1680 hrs.
initial pressure 600#, ending pressure 500#

2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 1680 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.
1-F Gulf St. 31-22-37 Producing well
168 hr. shut in
720# - 720# (chart still showing pressure variation)
Total shut in time since beginning of test 1680 hrs.
initial pressure 750#, ending pressure 720#
1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# - 720#
Total shut in time since beginning of test 1680 hrs.
initial pressure 800#, ending pressure 720#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1680 hrs.
initial pressure 625#, ending pressure 630#

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
340# - 340#
Total shut in time since beginning of test 1680 hrs.
initial pressure 230#, ending pressure 340#

The following wells are to be returned to injection status:
Skelly Penrose "A" Unit no. 12,34,36,40,42,46

Anadarko Langlie Mattix Penrose Sand Unit no. 37-3P, 36-4H

Wells to be shut in for observation with pressure recorders attached:
Skelly Penrose "A" Unit no. 4,8,53,55,57
Skelly Penrose "B" Unit no. 17,29,40,42

Anadarko Langlie Mattix Penrose Sand Unit no. 18-2, 19-2, 21-3, 21-2

Wells to be backflowed and tested
Skelly Penrose "A" Unit no. 21,44,50,61,44, the 9 5/8 and 7" will be checked individually on the no. 44 well.
Skelly Penorse "B" # 52 (casing and tubing tested individually)

Anadarko Langlie Mattix Penrose Sand Unit no. 36-1B

Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 5, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Odis Henley	Skelly	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
W. G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. D. Christner	Anadarko	Houston, New Mexico

August 5, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a. m. August 5, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Returned to injection 7/30/76

42-B 10-23-37 Returned to injection 7/30/76

44-D 10-23-37 Water injection well
120 hr. shut in
1525#--1500# (tubing)
630#--630# (9 5/8" X 7")
Total shut in time since beginning of test 1076 hrs.
Backflowed two days, recovered 340 barrels of water
No pressure communication with casing indicated.
Committee and N.M.O.C.C. agreed to return to injection and put pressure recorder on casing.

36-P 4-23-37 Return to injection 7/30/76

21-H 4-23-37
30 hrs. shut in
1525#--1525#
Total shut in time since beginning of test 985 hrs.
initial pressure 1850#, ending pressure 1525#
The well was backflowed 71 hrs. recovered 980 barrels of water
Returned to injection 8/2/76

12-N 34-22-37 Returned to injection 8/2/76

2-L 34-22-37
168 hr. shut in
1620#--1520#
Total shut in time since beginning of test 547 hrs.
initial pressure 1920#, ending pressure 1520#
Committee and N.M.O.C.C agreed to backflow and return to injection if there is no pressure interferance with the Citgo-State well.

10-P 33-22-37 Water injection well
168 hr. shut in
1225#--1240#
Total shut in time since beginning of test 546 hrs.
initial pressure 1775#, ending pressure 1240#
will check gauge and leave shut in another week

17-B 4-23-37 Water injection well
168 hr. shut in
1450#--1300#
Total shut in time since beginning of test 546 hrs.
initial pressure 1850#, ending pressure 1300#
will leave shut in another week

30-J 4-23-37 Water injection well
168 hr. shut in
1525#--1475#
Total shut in time since beginning of test 545 hrs.
initial pressure 1800#, ending pressure 1475#
Committee and N.M.O.C.C. agree to backflow two days and return to injection if there is no pressure interferance with Citgo-State well.

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
146 hr. shut in
800#--800#
Total shut in time since beginning of test 1200 hrs.
initial pressure 775#, ending pressure 800#
Backflowed 22 hrs. recovered 9 barrels of water.
No pressure communication between tubing and casing.
Casing pressure 200#. Bled casing pressure down, had small waterflow on the second day. Committee and N.M.O.C.C agreed to return the well to injection and install a pressure recorder on the casing for further testing.

17-D 4-23-37 Water injection well
112 hr. shut in
1950#--1775#

29-H 5-23-37 Water injection well
116 hr. shut in
2200#--1950#
Committee agreed pressures abnormally high. Will check recorder and continue test till next meeting.

40-P 5-23-37 Water injection well
112 hr. shut in
1600#--1175#

42-D 9-23-37 Water injection well
113 hr. shut in
975#--875#
Committee and N.M.O.C.C. agreed to return to injection.

Anadarko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
Returned to injection 7/29/76

36-4H 34-22-37 Water injection well
Returned to injection 7/29/76

37-1J 34-22-37 Water injection well
Returned to injection 7/29/76

21-7F 34-22-37 Water injection well
Backflowed 71 hrs. recovered 534 barrels of water. Closed well in tubing pressure 8:00 a.m. 7/30/76 was 640# and at 8:00 a.m. 8/4/76 was 800#. Committee and N.M.O.C.C. agreed to return to injection.

36-1B 34-22-37 Water injection well
Backflowed 76 hrs. recovered 420 barrels of water
Returned to injection 8/2/76

18-2L 26-22-37 Water injection well
144 hr. shut in
1890#--1890#
Backflowing well at this time.

19-2P 27-22-37 Water injection well
72 hr. shut in
1400#--1250#

21-3D 34-22-37 Water injection well
72 hr. shut in
1850#--1850#
Backflowing well now.

21-2N 27-22-37 Water injection well
120 hr. shut in
1760#--1520#

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1140#--1100#
Total shut in time since beginning of test ~~1496~~ 1848 hrs.
initial pressure 1150#, ending pressure 1100#
Committee and N.M.O.C.C. decided that a more sensitive recorder was necessary to monitor this well. N.M.O.C.C. to handle with company.

1-M Flour 35-22-37 Producing well
168 hr. shut in
500#--500#
Total shut in time since beginning of test 1848 hrs.
initial pressure 500#, ending pressure 500#
N.M.O.C.C. to handle more sensitive recorder change with the company.

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0#-0#
Total shut in time since beginning of test 1848 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.

1-M 2-23-37 SWD well
To install pressure recorder. N.M.O.C.C. to handle with company

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
720#--720#
Total shut in time since beginning of test 1848 hrs.
initial pressure 750#, ending pressure 720#
Pressure variations are becoming more pronounced and uniform.
Committee and N.M.O.C.C. to check for activities in area that is causing pressure flucuations.

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# -720#
Total shut in time since beginning of test 1848 hrs.
initial pressure 800#, ending pressure 720#
Will continue to monitor till next meeting

Texas Pacific Oil Company

2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630#--630#
Total shut in time since beginning of test 1848 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.

35-H 35-22-37 SWD well
168 hr. shut in
340# -340# (Bradenhead)
Total shut in time since beginning of test 1848 hrs.
initial pressure 230#, ending pressure 340#
Tubing is backflowing

The following wells are to be returned to injection status: (if backflow tests are satisfactory)

Skelly Penrose "A" 44-D, 36-P, 21-H, 12-N, 2-L, 30-J, 32-L, 48-H, 50-F, 52-H, 61-F

Skelly Penrose "B" 52-F and 42-D

Anadarko Langlie Mattix Penrose Sand Unit no. 21-7F, 36-1B

The following well is to be returned to producing status:

Petro-Search no. 2F Gulf State

The following well is to be monitored with a pressure recorder:

Petro-Search 1-M Gulf State

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 12, 1976 in Arco's Hobbs office.

ATTENDANCE AT AUGUST 5, 1976 MEETING

Bert Brown (chairman)	Skelly	Hobbs, New Mexico
Odis Henley	Skelly	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Val Ryan	AGUA	Midland, Texas
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. D. Christner	Anadarko	Houston, Texas

August 12, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a.m. August 12, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

- # 40-P 3-23-37 Returned to injection 7/30/76
- # 42-B 10-23-37 Returned to injection 7/30/76
- # 44-D 10-23-37 Water injection well
  Well returned to injection 8/5/76
- # 36-P 4-23-37 Returned to injection 7/30/76
- # 21-H 4-23-37 Returned to injection 8/2/76
- # 21-N 34-22-37 Returned to injection 8/2/76
- # 2-L 34-22-37
  Backflowed well 48 hrs. (2920 bbls)
  Will hook up recorder and monitor pressure
- # 10-P 33-22-37 Water injection well
  168 hr. shut in
  1240# - 1180#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1775#, ending pressure 1180#
  Continue shut in another week
- # 17-B 4-23-37 Water injection well
  168 hr. shut in
  1300# - 1235#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1850#, ending pressure 1235#
  Continue shut in another week
- # 30-J 4-23-37 Water injection well
  Backflowed well 48 hrs. (865 bbls.)
  Will hook up recorder and monitor pressure
- # 32-L 4-23-37 Water injection well
  168 hr. shut in
  1500# - 1495#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1600#, ending pressure 1495#
  Committee and N.M.O.C.C. agree to backflow well two days, shut in for 48 hrs. pressure build up and return to injection if there is no pressure interference with the Citgo-State well.
- # 34-N 4-23-37 Water injection well
  Returned to injection 7/30/76
- # 46-B 9-23-37 Water injection well
  Returned to injection 7/30/76
- # 48-H 9-23-37 Water injection well
  Backflowed well 48hrs. (1290 bbls.)
  Put back on injection 8/9/76
- # 50-F 10-23-37 Water injection well
  Well returned to injection 8/2/76

52-H 10-23-37 Water injection well
Backflowed well 48 hrs. (980 bbls.)
Returned to injection 8/9/76
Continue to monitor pressure

61-F 4-23-37 Water injection well
168 hr. shut in
1525# - 1540#
Total shut in time since beginning of test 714 hrs.
initial pressure 1575#, ending pressure 1540#
Committee and N.M.O.C.C. agree to backflow two days, shut in for 48 hr. pressure build up and return to injection if there is no pressure interference with the Citgo-State well.

4-J 33-22-37 Water injection well
168 hr. shut in
1850# - 1850#
Total shut in time since beginning of test 284 hrs.
initial pressure 1950#, ending pressure 1850#

8-N 33-22-37 Water injection well
168 hr. shut in
1650# - 1490#
Total shut in time since beginning of test 284 hrs.
initial pressure 1950#, ending pressure 1490#

53-J 10-23-37 Water injection well
168 hr. shut in
1850# - 1765#
Total shut in time since beginning of test 285 hrs.
initial pressure 1900#, ending pressure 1765#

55-L 10-23-37 Water injection well
168 hr. shut in
1550# - 1390#
Total shut in time since beginning of test 284 hrs.
initial pressure 1900#, ending pressure 1390#

57-J 9-23-37 Water injection well
168 hr. shut in
1100# - 850#
Total shut in time since beginning of test 285 hrs.
initial pressure 1850#, ending pressure 850#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
Total shut in time since beginning of test 1368 hrs.
Returned to injection 8/6/76
Gauge on annulus has 200# on casing.

17-D 4-23-37 Water injection well
168 hr. shut in
1775# - 1750#
Total shut in time since beginning of test 280 hrs.
initial pressure 1950#, ending pressure 1750#

29-H 5-23-37 Water injection well
168 hr. shut in
1950# - 1700#
Total shut in time since beginning of test 284 hrs.
initiel pressure 2200#, ending pressure 1700#

40-P 5-23-37 Water injection well
168 hr. shut in
1175# - 1125#
Total shut in time since beginning of test 280 hrs.
initial pressure 1600#, ending pressure 1125#

42-D 9-23-37 Water injection well
168 hr. shut in
875# - 875#
Total shut in time since beginning of test 281 hrs.
initial pressure 975#, ending pressure 875#
Returned to injection 8/5/76
Committee and N.M.O.C.C. agreed to return to injection

Anaderko Langlie Mattix Penrose Sand Unit
37-3P 34-22-37 Water injection well
Returned to injection 7/29/76
36-4H 34-22-37 Water injection well
Returned to injection 7/29/76
37-1J 34-22-37 Water injection well
Returned to injection 7/29/76
21-7F 34-22-37 Water injection well
Returned to injection 8/6/76
36-1B 34-22-37 Water injection well
Returned to injection 8/2/76
18-2L 26-22-37 Water injection well
Well to be returned to injection
19-2P 27-22-37 Water injeciton
168 hr. shut in
1250# - 1070#
Total shut in time since beginning of test 240 hrs.
initial pressure 1400#, ending pressure 1070#
21-3D 34-22-37 Water injection well
Well now being backflowed
21-2N 27-22-37 Water injection well
Well now shut in, recording build up

Petro-Search
1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1100# - 1100#
Total shut in time since beginning of test 2016 hrs.
initial pressure 1150#, ending pressure 1100#
A more sensitive recorder has been installed on this well.
1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 2016 hrs.
initial pressure 500#, ending pressure 500#
2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 2016 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.
1-M 2-23-37 SWD well
Pressure recorder has been installed

Summit Energy, Inc.
1-F Gulf State 36-22-37 Producing well
168 hr. shut in
720# - 660#
Total shut in time since beginning of test 2016 hrs.
initial pressure 750#, ending pressure 660#

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# - 700#
Total shut in time since beginning of test 2016 hrs.
initial pressure 800#, ending pressure 700#
Will continue to monitor till next meeting

Texas Pacific Oil Company
2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2016 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.
35-H 35-22-37 SWD
168 hr. shut in
340# - 375# (Bradenhead)
Total shut in time since beginning of test 2016 hrs.
initial pressure 230#, ending pressure 340#
Tubing is backflowing

The following wells have been returned to injection status.
Skelly Penrose "A" 44-D, 36-P, 21-H, 12-N, 48-H, 50-F, 52-H
Skelly Penrose "B" 52-F and 42-D
Anadarko Langlie Mattix Penrose Sand Unit no. 21-7F, 36-1B

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 19, 1976 an Arco's Hobbs office.

ATTENDANCE AT AUGUST 12, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Val Ryan	AGUA	Hobbs, New Mexico
Clarence Chandler	Reserve	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Glyn Stone	Gulf	Hobbs, New Mexico

August 19, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a.m. August 19, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

2-L 34-22-37
Backflowed well 48 hrs. (2920 bbls)
Returned to injection 8-11-76
Will shut in and record pressure

10-P 33-22-37 Water injection well
144 hr. shut in
1180# - 1140#
Total shut in time since beginning of test 858 hrs.
initial pressure 1775#, ending pressure 1140#
Will backflow

17-B 4-23-37 Water injection well
144 hr. shut in
1235# - 1180#
Total shut in time since beginning of test 858 hrs.
initial pressure 1850#, ending pressure 1180#
Will backflow

30-J 4-23-37 Water injection well
Backflowed well 48 hrs. (865 bbls.)
Shut in 144 hrs. Pressure 1485#
Will continue to monitor pressure gauge

32-L 4-23-37 Water injection well
168 hr. shut in
1500# - 1495#
Total shut in time since beginning of test 714 hrs.
initial pressure 1600#, ending pressure 1495#
Backflowed 910 bbls. in 48 hrs.
Now shut in

52-H 10-23-37 Water injection well
Backflowed well 48 hrs. (980 bbls.)
Returned to injection 8-9-76
Continue to monitor pressure

61-F 4-23-37 Water injection well
168 hr. shut in
1525# - 1540#
Total shut in time since beginning of test 882 hrs.
initial pressure 1575#, ending pressure 1540#
Backflowed 1060 bbls in 48 hrs.
Now shut in

4-J 33-22-37 Water injection well
144 hr. shut in
1850# - 1840#
Total shut in time since beginning of test 428 hrs.
initial pressure 1950#, ending pressure 1840#
Will backflow

8-N 33-22-37 Water injection well
144 hr. shut in
1490# - 1380#
Total shut in time since beginning of test 428 hrs.
initial pressure 1950#, ending pressure 1380#
Will backflow

53-J 10-23-37 Water injection well
144 hr. shut in
1765# - 1680#
Total shut in time since beginning of test 429 hrs.
initial pressure 1900#, ending pressure 1680#
Will backflow

55-L 10-23-37 Water injection well
144 hr. shut in
1390# - 1250#
Total shut in time since beginning of test 428 hrs.
initial pressure 1900#, ending pressure 1250#
Continue shut in time

57-J 9-23-37 Water injection well
144 hr. shut in
850# - 710#
Total shut in time since beginning of test 429 hrs.
initial pressure 1850#, ending pressure 710#
Will return to injection

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
1368 hr. shut in
initial pressure 775#, ending pressure 800#
Backflowed 9 bbls in 22 hrs. Continue to monitor
Returned to injection 8-6-76
Gauge on oil string annulus has 200# in 312 hrs.

17-D 4-23-37 Water injection well
144 hr. shut in
1750# - 1720#
Total shut in time since beginning of test 424 hrs.
initial pressure 1950#, ending pressure 1720#
Will backflow

29-H 5-23-37 Water injection well
144 hr. shut in
1700# - 1475#
Total shut in time since beginning of test 428 hrs.
initial pressure 2200#, ending pressure 1475#
Will backflow

40-P 5-23-37 Water injection well
144 hr. shut in
1125# - 1050#
Total shut in time since beginning of test 424 hrs.
initial pressure 1600#, ending pressure 1050#
Continue to monitor

Anadarko Langlie Mattix Penrose Sand Unit

19-2P 27-22-37 Water injection well
Total shut in time since beginning of test 240 hrs.
initial pressure 1400#, ending pressure 1070#
Backflowed 48 hrs. 331 bbls
Return to injection

21-3D 34-22-37 Water injection well
After backflow shut in pressure increased to 1250#
Will backflow again

21-2N 27-22-37 Water injection well
Well now shut in, recording build up
Will backflow

Petro-Search

1-E Citgo-State 2-23-37 Producing well
144 hr. shut in
1100# - 1100#
Total shut in time since beginning of test 2160 hrs.
initial pressure 1150#, ending pressure 1100#
A more sensitive recorder has been installed on this well
Committee recommends that this well be flowed down at the maximum rate with volumes and pressures being monitored, after logs have been run on the Petro-Search # 1-M SWD

1-M Fluor 35-22-37 Producing well
144 hr. shut in
500# - 500#
Total shut in time since beginning of test 2160 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
144 hr. shut in
0# - 0#
Total shut in time since beginning of test 2016 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.
Continue to monitor bradenhead pressure

1-M 2-23-37 SWD well
Pressure recorder has been installed
Committee recommends that this well be surveyed. Mr. Korzekwa will investigate and recommend a logging program at next meeting.

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
144 hr. shut in
660# - 650#
Total shut in time since beginning of test 2160 hrs.
initial pressure 750#, ending pressure 660#
Continue to monitor

1-P Gulf Sims 25-22-37 Producing well
144 hr. shut in
700# - 700#
Total shut in time since beginning of test 2160 hrs.
initial pressure 800#, ending pressure 700#
Will continue to monitor till next meeting

Texas Pacific Oil Company

2-E Ella Drinkard 25-22-37 Producing well (TA)
144 hr. shut in
630# - 630#
Total shut in time since beginning of test 2160 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.
35-H 35-22-37 SWD well
144 hr. shut in
375# - 400# (Bradenhead)
Total shut in time since beginning of test 2160 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

The following wells have been returned to injection status.
Skelly Penrose "A" 57-J

Anadarko Langlie Mattix Penrose Sand Unit no. 19-2P

To expidite the testing proceedures the following guideline was adopted by the committee: Backflow wells a minimum of 48 hrs., and at such time as the flow rate is 100 bbls. per day or less, shut the well in for pressure build up. If pressure does not build up past 800# in 48 hrs. then return well to injection. Instructions will be given by the committee on wells that do not meet this guideline.

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. August 26, 1976 at the N.M.O.C.C. conferance room in Hobbs, New Mexico.

ATTENDANCE AT AUGUST 19, 1976 MEETING

Bert Brown (chairman)	Skelly	Hobbs, New Mexico
Bill Krafft	Skelly	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W.C. Abbott	AGUA, Inc.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
C.R. Kornelsen	Gulf	Hobbs, New Mexico
Clarence Chandler	Reserve O&G	Midland, Texas

B.O.B.

August 26, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met in N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. August 26, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

2-L 34-22-37
Backflowed well 48 hrs. (2920 bbls)
Returned to injection 8-11-76
Shut in and record pressure 144 hrs. 1600#

10-P 33-22-37 Water injection well
~~168~~ hr. shut in
1140# - 1075#
Total shut in time since beginning of test 1026 hrs.
initial pressure 1775#, ending pressure 1075#

17-B 4-23-37 Water injection well
144 hr. shut in
1235# - 1180#
Total shut in time since beginning of test 858 hrs.
initial pressure 1850#, ending pressure 1180#
Backflowed 84 hrs. 840 bbls Rate below 100 B/D SI for build up

30-J 4-23-37 Water injection well
Backflowed well 48 hrs. (865 bbls)
Shut in 144 hrs. Pressure 1525#

32-L 4-23-37 Water injection well
168 hr. shut in
1495# - 1350#
Total shut in time since beginning of test 882 hrs.
initial pressure 1600#, ending pressure 1350#
Backflowed 910 bbls. in 48 hrs.

52-H 10-23-37 Water injection well
Backflowed well 48 hrs. (980 bbls)
Returned to injection 8-9-76
Pressure after 240 hrs. injection 1925#

61-F 4-23-37 Water injection well
Backflowed 1060 bbls in 48 hrs.
124 hr. shut in
After backflow pressure 1500#

4-J 33-22-37 Water injection well
144 hr. shut in
1850# - 1840#
Total shut in time since beginning of test 596 hrs.
initial pressure 1950#, ending pressure 1840#
Will backflow

8-N 33-22-37 Water injection well
168 hr. shut in
1380# - 1260#
Total shut in time since beginning of test 596 hrs.
initial pressure 1950#, ending pressure 1260#

53-J 10-23-37 Water injection well
144 hrs. shut in
1765# - 1680#
Total shut in time since beginning of test 429 hrs.
initial pressure 1900#, ending pressure 1680#
Backflowed 84 hrs. 1260 bbls.

4

55-L 10-23-37 Water injection well
168 hr. shut in
1250# - 1080#
Total shut in time since beginning of test 596 hrs.
initial pressure 1900#, ending pressure 1080#

57-J 9-23-37 Water injection well
144 hr. shut in
850# - 710#
Total shut in time since beginning of test 429 hrs.
initial pressure 1850#, ending pressure 710#
Returned to injection 8-19-76

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
~~1368 hr.~~ shut in
initial pressure 775#, ending pressure 800#
Backflowed 9 bbls in 22 hrs. Continue to monitor
Returned to injection 8-6-76
Gauge on oil string annulus has 110# in 486 hrs..
Injection line split, well had backflowed

17-D 4-23-37 Water injection well
144 hr. shut in
1750# - 1720#
Total shut in time since beginning of test 424 hrs.
initial pressure 1950#, ending pressure 1720#
~~Backflowed 30 bbls, 840 bbls produced, 108 BWPD, 3% BSW~~

29-H 5-23-37 Water injection well
168 hr. shut in
1475# - 1425#
Total shut in time since beginning of test 596 hrs.
initial pressure 2200#, ending pressure 1425#

40-P 5-23-37 Water injection well
168 hr. shut in
1050# - 1000#
Total shut in time since beginning of test 592 hrs.
initial pressure 1600#, ending pressure 1000#

Anadarko Langlie Mattix Penrose Sand Unit

21-3D 34-22-37 Water injection well
After backflow shut in pressure increased to 1250#

21-2N 27-22-37 Water injection well
Well now shut in, recording build up

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1100# - 1100#
2328
Total shut in time since beginning of test ~~1644~~ hrs.
initial pressure 1150#, ending pressure 1100#
A more sensitive recorder has been installed on this well
Will be backflowed with proposed starting date of 9-7-76

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 2328 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test ~~2016~~ 2328 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.
Continue to monitor bradenhead pressure 3#

1-M 2-23-37 SWD well
Pressure recorder has been installed
Surveying to be suspended pending backflow of Citgo-State #1-E

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
660# - 660#
Total shut in time since beginning of test 2328 hrs.
initial pressure 750#, ending pressure 660#
Continue to monitor

1-P Gulf Sims 25-22-37 Producing well
168 hrs. shut in
700# - 690#
Total shut in time since beginning of test 2328 hrs.
initial pressure 800#, ending pressure 690#
Will continue to monitor till next meeting

Texas Pacific Oil Company

2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2328 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.

35-H 35-22-37 SWD well
168 hr. shut in
400# - 400# (Bradenhead)
Total shut in time since beginning of test 2328 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

~~Petro-Search stated that they would backflow the Citgo-State well.~~
The Committee and N.M.O.C.C decided to suspend the present testing proceedure and shut in wells around the Citgo-State for pressure monitoring during the backflow and pressure drew down of the well. Wells ~~to be~~ shut in are: Skelly Penrose "A" no. 13,23,26,40,12,21,28,38, 42,52.
Skelly Penrose "B" no. 52.
Anadarko tract 37-3P, tract 37 1-J and tract 36 4-H
All other wells ~~will be~~ returned to injection. Expected dete of shut in 8-31-76

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. September 2, 1976 at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT AUGUST 26, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
C.R. Korzekwa	Gulf	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico
Erd Johnson	Reserve	Midland, Texas
C.W. Stumhoffer	Petro-Search, Inc.	Ft. Worth, Texas

September 2, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. September 2,1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

2-L 34-22-37
Shut in and record pressure 264 hrs. 1500#
Returned to injection 8-31-76

10-P 33-22-37 Water injection well
initial pressure 1775#, ending pressure 1020#
Returned to injection 8-31-76

17-B 4-23-37 Water injection well
initial pressure 1850#, ending pressure 1180#
Backflowed 64 hrs. 140 bbls. Shut in 48 hrs. Pressure 600#
Returned to injection 8-31-76

30-J 4-23-37 Water injection well
Shut in 120 hrs. Pressure 1575#
Returned to injection 8-31-76

32-L 4-23-37 Water injection well
initial pressure 1350#, ending pressure 1390#, after backflow
Returned to injection 8-31-76

52-H 10-23-37 Water injection well
Pressure after 408 hrs. injection 1925#

61-F 4-23-37 Water injection well
244 hr. shut in
After backflow pressure 1535#

4-J 33-22-37 Water injection well
120 hr. shut in
1840# - 1840#
Total shut in time since beginning of test 716 hrs.
initial pressure 1950#, ending pressure 1840#
Returned to injection 8-31-76

8-N 33-22-37 Water injection well
120 hr. shut in
1260# - 1320#
Total shut in time since beginning of test 716 hrs.
initial pressure 1950#, ending pressure 1320#
Returned to injection 8-31-76

53-J 10-23-37 Water injection well
Backflowed 63 hrs. 150 bbls.
Shut in 48 hrs. after backflow. Pressure 700#
Returned to injection 8-31-76

55-L 10-23-37 Water injection well
120 hr. shut in
1080# - 1050#
Total shut in time since beginning of test 716 hrs.
initial pressure 1900#, ending pressure 1050#
Returned to injection 8-31-76

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
Gauge on oil string annulus has 60# in 654 hrs.
Shut in 8-31-76

17-D 4-23-37 Water injection well
120 hr. shut in
1720# - 1700#
Total shut in time since beginning of test 544 hrs.
initial pressure 1950#, ending pressure 1700#
Returned to injection 8-31-76

29-H 5-23-37 Water injection well
120 hr. shut in
1425# - 1385#
Total shut in time since beginning of test 716 hrs.
initial pressure 2200#, ending pressure 1385#
Returned to injection 8-31-76

40-P 5-23-37 Water injection well
120 hr. shut in
1000# - 1000#
Total shut in time since beginning of test 712 hrs.
initial pressure 1600#, ending pressure 1000#
Returned to injection 8-31-76

Anadarko Langlie Mattix Penrose Sand Unit

21-3D 34-22-37 Water injection well
After second backflow (3030 bbls), 207 hrs., pressure was
1100# in 72 hrs.
Returned to injection 8-26-76

21-2N 27-22-37 Water injection well
Returned to injection 8-26-76

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1100# - 1020#
Total shut in time since beginning of test 2496 hrs.
initial pressure 1150#, ending pressure 1020#

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 2496 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 2496 hrs.
initial pressure 0#, ending pressure 0#
Continue to monitor bradenhead pressure (chart not available)

1-M 2-23-37 SWD well
Minimum shut down pressure 550#, maximum inj. pressure 1250#

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
660# - 660#
Total shut in time since beginning of test 2496 hrs.
initial pressure 750#, ending pressure 660#
Continue to monitor

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
700# - 690#
Total shut in time since beginning of test 2496 hrs.
initial pressure 800#, ending pressure 690#
Will continue to monitor till next meeting

Texas Pacific Oil Company
2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2496 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
400# - 400# (Bradenhead)
Total shut in time since beginning of test 2496 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

The Committee and N.M.O.C.C. decided to suspend the present testing proceedure and shut in wells around the Citgo-State for pressure monitoring during the backflow and pressure draw down of the well. Wells shut in are: Skelly Penrose "A" no. 13, 23, 26, 40, 12, 21, 28, 38, 42, 52
Skelly Penrose "B" no. 52
Anadarko tract 37-3P, tract 37-1J and tract 36-4H
All other wells were returned to injection on or before 8-31-76

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. September 9, 1976 at the Arco's conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 2, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
C.R. Korzekwa	Gulf	Hobbs, New Mexico
Erd Johnson	Reserve	Midland, Texas
W.G. Abbott	AGUA	Hobbs, New Mexico

S[illegible]ber 9, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. September 9, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit
- # 52-H 10-23-37 Water injection well
  - Shut in 8-31-76
  - initial pressure 1875#, after 168 hrs. 1325#

Skelly Penrose "B" Unit
- # 52-F 9-23-37 Water injection well
  - initial tbg. pressure 1875#, csg. pressure 20#
  - after 168 hrs. tbg. pressure 1350#, csg. pressure 110#

Petro-Search
- # 1-E Citgo-State 2-23-37 Producing well
  - 168 hr. shut in
  - 1020# - 1010#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 1150#, ending pressure 1010#
- # 1-M Fluor 35-22-37 Producing well
  - 168 hr. shut in
  - 500# - 490#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 500#, ending pressure 490#
- # 2-F Gulf State 2-23-37 Producing well
  - 168 hr. shut in
  - 0# - 3#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 0#, ending pressure 3#
- # 1-M 2-23-37 SWD well
  - Minimum shut down pressure 550#, maximum inj. pressure 1250#

Summit Energy, Inc.
- # 1-F Gulf State 36-22-37 Producing well
  - 168 hr. shut in
  - 660# - 660#
  - Total shut in time since beginning of test 2664 hrs.
  - initial pressure 750#, ending pressure 660#

The following wells have been shut in preparatory to monitoring during backflowing of the Petro-Search Citgo-State no. 1.

Skelly Penrose "A" Unit

Well no.	Shut in	Initiel pressure	Fin. Pressure
13	168	960#	585#
23	168	1340#	550#
26	168	1500#	850#
40	168	1625#	1590#
12	168	1460#	725#
21	168	1725#	1675#

28	168	1500#	340#
38	168	1100#	700#
42	168	1775#	1590#
52	168	1775#	1320#

Skelly Penrose "B" Unit

52	168	tbg. 1875#	1350#
		csg. 20#	110#

Anadarko Langlie Mattix Penrose Sand Unit

37-3P	168	1550#	1275#
37-1J	96	1750#	950#
36-4H	168	1525#	1100#

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
690# - 680#
Total shut in time since beginning of test 2664 hrs.
initial pressure 800#, ending pressure 680#

Texas Pacific Oil Company
2-E Ella Drinkerd 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2664 hrs.
initial pressure 625#, ending pressure 630#

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
400# - 400# (Bradenhead)
Total shut in time since beginning of test 2664 hrs.
initial pressure 230#, ending pressure 400#
Tubing is backflowing at 0 pressure

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. September 16, 1976 at Arco's conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 9, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Clarence Chandler	Reserve	Midland, Texas
L.C. Rudry	Arco	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

September 16, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. September 16, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	144	312	1460	725-740
13	144	312	960	585-460
21	144	312	1725	1675-1660
23	144	312	1340	550-440
26	144	312	1500	850-700
28	144	312	1500	340-110
38	144	312	1100	700-655
40	144	312	1625	1590-1590
42	144	312	1775	1590-1590
44 annulus	144	2060	760	760-730
52	144	312	1775	1325-1200
Skelly Penrose "B" Unit				
52 casing	144	20	110	110-115
tubing	144	312	1875	1350-1350
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	336	1550	1275-1120
37-1J	168	264	1750	950-560
36-4H	168	336	1525	1100-1000
Petro-Search Citgo-State				
1-E	168	2832	1150	1010-1010
Fluor 1-M	168	2832	500	490-490
Gulf-State				
2-F	168	2832	4	0-4
Gulf State 1-M (intermittant injection Max. 1250 Min. 500)				
Summit Energy, Inc.				
Gulf-State 1-F	168	2832	750	660-660
Gulf-Sims 1-P	168	2832	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	2832	625	630-630
AGUA, Inc.				
SWD 35-H csg	168	2832	230	400-400
tbg (backflowing)				0-0

The Citgo-State well is being prepared for backflowing. A Pit is being dug and lined to contain the water that is expected to flow from the well. The well will reportedly be ready to flow by Sept. 19, 1976. The shut-in injection wells will have approximately two weeks shut-in stabilization time by the time the Citgo-State is opened to the pit. Close observation of the pressure recorders will be conducted after the flow begins.

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. September 23, 1976 at Arco"s conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 16, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Erd Johnson	Reserve	Midland, Texas
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
C.R. Korzekwa	Gulf	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico

September 23, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. September 23, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	168	480	1460	740-760
13	168	480	960	460-350
21	168	480	1725	1660-1660
23	168	480	1340	440-350
26	168	480	1500	700-550
28	168	480	1500	110-0
38	168	480	1100	655-525
40	168	480	1625	1590-1510
42	168	480	1775	1590-1535
44 annulus	168	2228	760	730-90*
52	168	480	1775	1200-1110
Skelly Penrose "B" Unit				
52 casing	168	188	110	115-120
tubing	168	480	1875	1350-1185
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	504	1550	1120-1050
37-1J	168	432	1750	560-500
36-4H	168	504	1525	1000-950
Petro-Search Citgo-State				
1-E	108	2940	1150	1010-1010
backflowing	60	60	210	210-70
Fluor 1-M	168	2940	500	490-490
Gulf-State				
2-F	168	2940	4	0-4
Gulf State 1-M (intermittant injection max. 1250 min.450)				
Summit Energy, Inc.				
Gulf-State 1-F	168	2940	750	660-660
Gulf-Sims 1-P	168	2940	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	2940	625	630 630
ACUA, Inc.				
SWD 35-H csg	168	2940	230	400-450
tbg (backflowing)				

*Pressure bled off to repair tubing leak

The Citgo-State well is backflowing. It has been flowing for 60 hours and has produced an estimated 35 to 40 thousand barrels of 9.9# salt water. The flowing pressure and the flow rate are decreasing. Initial flowing pressure was 210# but after 60 hours was 70#. Close monitoring of shut-in injection and monitor wells has been conducted but no pressure interferance has been noted as yet.

The committee began a study of temperature survey on injection wells in the area. The log study is aimed at determining whether or not the survey can be used to indicate water intrusion into the beds above the reservior.

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. September 30, 1976 at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 23, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Rudry	Arco	Hobbs, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Clarence Chandler	Reserve O & G	Midland, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
J.D. Willingham	Cardinal Surveys	Hobbs, New Mexico
C.A. Adams, Jr.	Cardinal Surveys	Midland, Texas

EUNICE WATERFLOW MEETING

The Eunice area waterflow study group met on Thursday, September 23 and Monday, September 27. Skelly's Penrose "A" waterflood temperature logs from injection wells were analyzed and gradients were calculated. Representatives from Cardinal Surveys and Western Company assisted in interpretation. The data derived from this has been tabulated. Additional consideration by the committee is necessary to determine further use and disposition of the data.

September 30, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. September 30, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	168	648	1460	740-760
13	168	648	960	350-300
21	168	648	1725	1660-1660
23	168	648	1340	350-300
26	168	648	1500	550-500
28	168	648	1500	0-0
38	168	648	1100	525-420
40	168	648	1625	1510-1510
42	168	648	1775	1535-1535
44 annulus	168	2396	760	90-200
52	168	648	1775	1110-1050
Skelly Penrose "B" Unit				
52 casing	168	356	110	120-120
tubing	168	648	1875	1185-1185
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	672	1550	1050-1040
37-1J	168	600	1750	500-450
36-4H	168	672	1525	950-910
Petro-Search				
Citgo-State backflowing	168	228	210	70-10
Fluor 1-M	168	3108	500	490-490
Gulf-State 2-F	168	3108	4	4-14
Gulf State 1-M (intermittant injection max. 1375 min. 680)				
Summit Energy, Inc.				
Gulf-State 1-F	168	3108	750	660-660
Gulf-Sims 1-P	168	3108	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	3108	625	630-630
AGUA, Inc.				
SWD 35-H csg tbg (backflowing)	168	3108	230	400-450

The Citgo-State well is P & A. It backflowed for 228 hours and produced an estimated 65 to 75 thousand barrels of salt water. Initial flowing pressure was 210#. After 228 hours it was 10#. Close monitoring of shut-in injection and monitor wells has been conducted but no pressure interferance was detected.

During the week temperature surveys were run on Skelly Penrose "A" well no. 13 and no. 40, after extended shut-in periods. These and others were examined and studied by the committee. The committee was assisted by service company personnel. More detailed logging proceedures are to be conducted on selected wells at the recommendation of the committee. The purpose is to determine the optimum logging program that gives the maximum information, with all factors being considered.

The next meeting of the Eunice Area Sub-Committee will be called when a more detailed temperature log is available for study, at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 30, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Val Ryan	AGUA	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

October 26, 1976

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

RE: NEW MEXICO "BZ" STATE NCT-8 LEASE

ATTENTION: MR. JOE D. RAMEY
SECRETARY-DIRECTOR

Gentlemen:

The following information has been compiled concerning the salt water flows on Texaco's New Mexico "BZ" State NCT-8 Lease as discussed during your telephone conversation with Don Craig on October 25, 1976. Attached is a typed copy of the original drilling report on Well No. 5 covering the time interval where the salt water flow was encountered, a Sonic log covering the interval where the water flow occurred, and a plat showing all the wells on the "BZ" NCT-8 lease.

Also, a salt water flow was mentioned on the drilling report when Well No. 7 was drilled. Salt water was encountered at 1684' with a flowing pressure of 200 psi. No other information was included in the drilling report.

Yours very truly,

J. V. GANNON

J. V. Gannon
District Superintendent

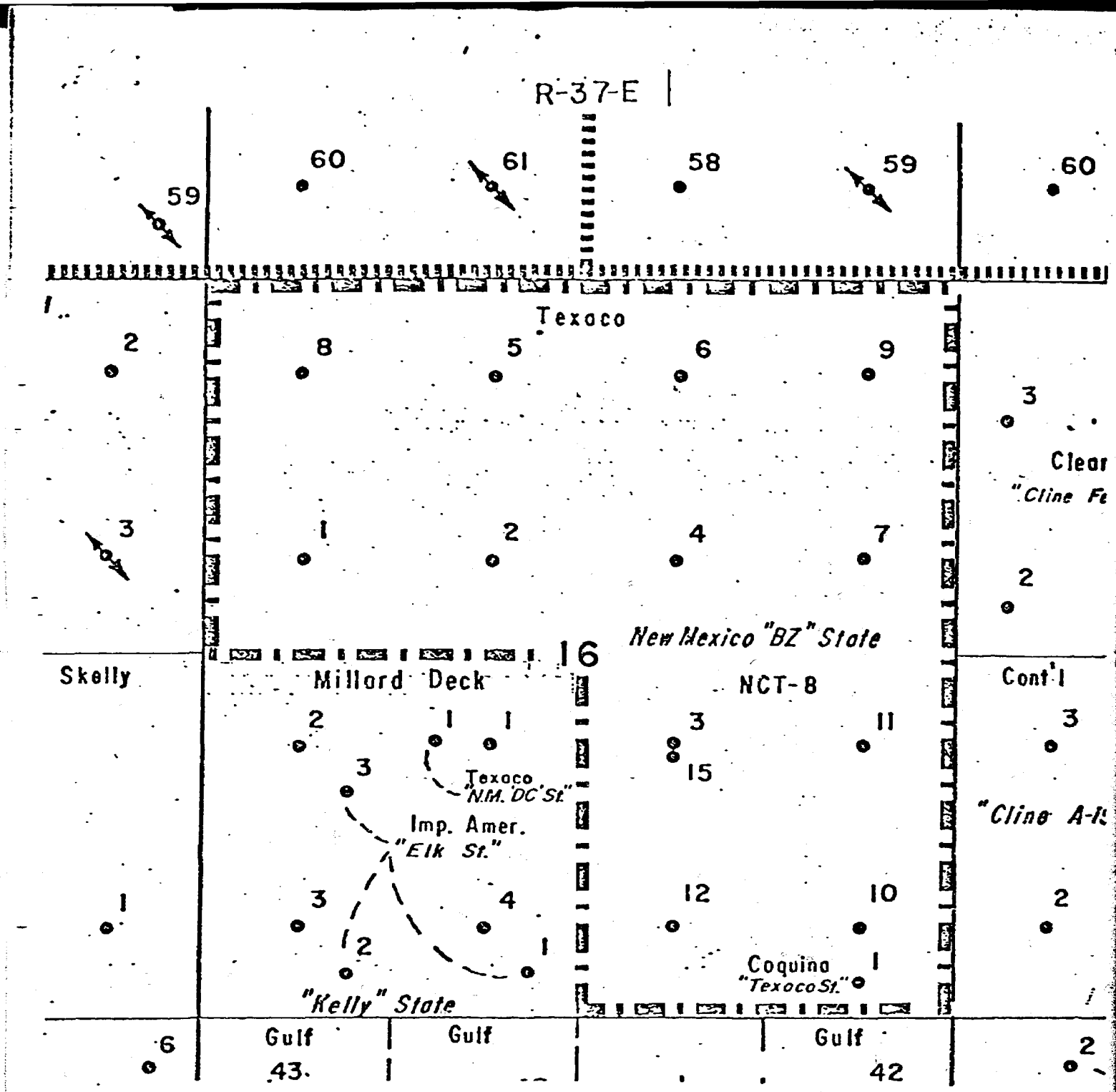
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Attachments

NMOCC - Hobbs, N.M.

HAS, JR.

File
Chrono

3/1-2/59	6-3/8" hole from 1095'. Press. up on 8-5/8" csg @ 10:15 to 10:45 A.M. 2-28-59. 1000# for 30 min. Drill plug and cement and approx. one foot of formation. Press. up on formation. 1000# in 30 min. @ 11:15 to 11:45 A.M. 1000# O.K. T.D. 1690'. Well started to flow back salt water. Well started flowing 1100 bbls. salt water per hour from 1688' to 1690'. Shut well in. 600# press. Bradenhead squeeze open hole from 1095' to 1690' by Howco w/2500 sx Reg cmt w/ 2% calcium chloride down 8-5/8" csg.
3/3/59	Drilled cement plug from 1146' to 1160'. No show of water. Drilled plug to 1690'. Water broke. Returns of 300 bbls. salt water per hr. Drilled ahead in formation. Drilled formation from 1690' to 1814'. Water and air increasing. Pulled 360' of drill pipe. Water increased to 1500 bbls. per hour. Pulled drill pipe. Bradenhead squeezed formation w/2500 sx of Reg Neat cement plus 2% calcium chloride from 1095' to 1814' by Howco. Pumping. Press. on cement 650 lbs. Comp. at 8:45 P.M. 3-2-59.
3/4/59	No report.
3/5/59	Trying to squeeze off salt water w/ cement.
3/6/59	No report.
3/7/59	No report.
3/10/59	Drlg salt and anhy 1986'. Increased to 7-7/8" hole from 1095'.
3/11/59	Drlg.
3/12/59	T.D. 7-7/8" hole @ 2460'. Anhy.
3/13/59	7-7/8" hole to 2460'. Comp @ 5:15 A.M. 3-12-59. Snubbing pipe out of hole. Snub 7" in hole. Ran 64 jts hydril and collared pipe.(2445' of 26#). Set @ 2460'. Cement by Howco w/ 200 sx Neat cement. Top cmt by T.S. @ 1760'. Second stage down bradenhead w/ 200 sx Reg cmt. Job complete 3:00 P.M. 3-12-59. WOC 9 hrs.
3/14/59	Tested 7" csg w/ 1200 psi for 30 min. from 5:00 A.M. to 5:30 A.M. on 3-14-59. Tested O.K. Now WOC.



TEXACO Inc.
HOBBS DISTRICT

NEW MEXICO "BZ" STATE (NCT-8)
LANGLIE-MATTIX FIELD
LEA COUNTY, NEW MEXICO

DATE 7-30-76 DRAWN BY CRC

Bill Thomas

October 28, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at the N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. October 28, 1976. The temperature gradient data was discussed and it was decided to file the work copies for possible future reference.

Mr. Jerry Sexton handed out a letter and drilling record on Texaco's State of New Mexico "BZ" NCT-8 well no. 5 located in section 6, T23S R37E. The drilling record showed that an extensive water flow was encountered in the salt section during drilling operations in 1959. This was prior to any extensive waterflooding in the area. The letter also states that well no. 7 on the same lease encountered the water flow.

The committee had expected to consider the recently run Anadarko temperature surveys, however the logging company representative was not present with the logs. The committee was informed that these logs would be ready for study Friday the 28th.

Therefore, the next meeting is scheduled for 8:00 a.m. Friday October 29, 1976 at the N.M.O.C.C. office in Hobbs, New Mexico.

ATTENDANCE AT ~~AUGUST 12~~ Oct 28, 1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
W. G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

October 29, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. October 29, 1976. Mr. Billy P. Morris presented an analysis of temperature and tracer surveys that were run on two of Anadarko's wells. The wells on which the surveys were run were considered to be potential problem wells. The surveys indicated no problems in these wells that would contribute to the problem of water getting into the salt section. One log showed a slight anomalie in the salt section could possibly be water storage from a transient source.

It was decided that a study group meeting would be held November 8, 1976 at the N.M.O.C.C. office in Hobbs, New Mexico for the purpose of reviewing Skelly's old temperature survey's to determine potential problem wells for additional survey studies on Skelly's Penrose "A" and Penrose "B" units.

ATTENDANCE AT OCTOBER 29, 1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyen	N.M.O.C.C.	Hobbs, New Mexico
Joe Ramey	N.M.O.C.C.	Santa Fe, New Mexico
Billy Morris	McCollough Surveys	Odessa, Texas

November 8th and 9th, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The study group met at the N.M.O.C.C. office in Hobbs, New Mexico, from 8:00 a.m. to 5:30 p.m. on November 8th and from 8:00 a.m. to 4:30 p.m. on November 9, 1976.

Temperature and tracer surveys on Skelly's Penrose "A" and Penrose "B" Units and Anadarko's Langlie Mattix Unit wells were studied and analyzed under the guidance of Mr. Billy P. Morris of the McCollough Company.

Various data from logs were tabulated. Particular attention being given to temperature anomalies in the salt section, and or channeling up the well bores.

Plans are to map the data and determine if certain areas of water intrusion can be defined.

Another meeting of the committee has not been scheduled at this time.

ATTENDANCE 11-8-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas
Rick Alderman	McCollough	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico

ATTENDANCE 11-9-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

November 18, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The group met at the N.M.O.C.C. office in Hobbs, New Mexico on November 18, 1976 from 8:00 a.m. to 10:00 a.m. Further discussion of recent log analysis in the area took place.

Several ideas were presented by members present as to what steps should be taken to expedite the study.

The committee and N.M.O.C.C. feel that we are at the point to begin consideration of attempting to "blow down" the pressured up salt section. This decision being based on the recent two day study session during which time all temperature and tracer injection well logs were analyzed and evaluated, as well as data which has been gathered during the past several months through monitoring.

The group felt that suspect wells should be re-logged due to work having been done on wells in the area, possible changes in the salt section due to blowing down of the Citgo-State well and questions as to the different logging procedures and interpretive techniques used.

Plans are to proceed with logging of the suspect wells for re-evaluation. Before the next meeting on December 2, 1976 each member is to study his companies injection and/or disposal facilities in the area to determine, how much, if any, of the backflow water he can accomodate once blowing down of the salt section is began. Due to restrictions now in effect on injection and disposal facilities in the area, this is the major problem at the present time.

Another meeting has been scheduled for 8:00 a.m. (MST) at the Hobbs, New Mexico office of the N.M.O.C.C.

ATTENDANCE AT NOVEMBER 18, 1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Clem Korzekwa	Gulf	Hobbs, New Mexico
Bill Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve	Midland, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in N.M.O.C.C. office in Hobbs, New Mexico at 8:00 AM January 5, 1977.

Recently run surveys on injection wells were discussed as was other data and activities conducted by operators in the area. Skelly had recently run surveys on Skelly Penrose "A" Wells No. 26, 28, and 34. Skelly also had perforated the Skelly Penrose "A" Well No. 64 at 1460' opposite a water flood encountered while drilling the well. After acidizing perforations, the well initially produced around 40 BWPD but has declined and settled at around 6 BWPD. The Temperature and Tracer Logs on Skelly wells indicated no channeling or water intrusions or water flows of any irregular nature. Penrose "A" Well No. 26 had shown some fluid storage in the base of the salt section and a short channel up to 3200' on a previous survey. It had not been repaired between surveys.

Anadarko had run logs on 13 wells recently. Two temporary abandoned wells (#34-4 and #27-1) were surveyed with a noise tool in addition to survey tools, in an effort to locate storage of water in the salt section that would be prospects for perforating and draining the salt section. No indication of water in the salt were evident. Additional wells surveyed by Anadarko were #13-B2, #40-1, #13-C7, #1-2, #8-1, #7-1, #7-3, #13-A1, #13C-5, #15-2, #17-1 & #21-2. Only the #13-C7 indicated a problem of any kind. It showed to be communicating from the salt section up to the surface. The #13-C7 is a twin to Skellys' J. V. Baker No. 11. The Committee recommended and Skelly has approved, logging the

Baker well to determine if it is contributing to the upward migration of water in the #13-C7.

Mr. Jerry Sexton informed the Committee that Mr. Joe Ramey would be in Hobbs for a combined meeting of the three appointed Sub-Committees on January 20, 1977. Mr. Ramey has requested that the Sub-Committees present recommendations for future action aimed at a solution to the water migration problems in the area.

Skelly is still monitering pressures on the Penrose "A" Well No. 38, #44, Penrose "B" #52 & #54, bradenheads. All have shown declining pressure since the "blow-down" of the Citgo-State well.

The next meeting will be held 8:00 AM Friday January 7, 1977 at Skelly Oil Co.- Hobbs, New Mexico.

ATTENDANCE

Bill Thomas	Skelly Oil Co.	Hobbs, New Mexico
Bert Brown	Skelly Oil Co.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L. C. Hudry	ARCO	Hobbs, New Mexico
Erd Johnson	Reserve Oil	Midland, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
Jerry Sexton	NMOCC	Hobbs, New Mexico
C. R. Korzekwa	Gulf Oil	Hobbs, New Mexico
Billy P. Morris	McCullough	Midland, Texas

MINUTES OF SUB-COMMITTEE APPOINTED TO STUDY EUNICE AREA

The Sub-Committee met at 8:00 AM January 7, 1977, in Skelly's Hobbs Office.

Discussion, conclusions and recommendations were formulated and approved for presentation to the Joint Sub-Committee meeting. These are presented by seperate instrument.

The next meeting will be a Joint Sub-Committee meeting to be held Thursday, Jan. 13, 1977 at 9:00 AM in Shell Oil Company Office - Hobbs, New Mexico.

ATTENDANCE

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Erd Johnson	Reserve Oil, Inc.	Midland, Texas
C. R. Korzekwa	Gulf Oil Co.	Hobbs, New Mexico
W. G. Abbott	Agua, Inc.	Hobbs, New Mexico

VACUUM WATERFLOW COMMITTEE

STATUS REPORT

JANUARY 20, 1977

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 6
CASE 5941

VACUUM WATERFLOW COMMITTEE REPORT

The Vacuum Waterflow Committee was appointed by the NMOCC and began its existence April 29, 1976, with Mobil designated as chairman. The purpose of the committee was to identify the extent of waterflow problems in the Vacuum Field and to suggest solutions.

The committee met on the afternoon of the 20th and prepared the following objectives:

1. Operators in the Vacuum Field shall report all annulus pressures.
2. Wells that will flow will be tested to determine flow rate and type of fluid.
3. The NMOCC and another committee member will be notified 48 hours prior to the survey.
4. Operators will furnish wellbore sketches on all wells in the field.
5. Problem wells identified above will not be repaired unless at NMOCC request.
6. The Vacuum Waterflow Committee will meet periodically to prepare final recommendations.

The following summarizes the accomplishments of the committee to date:

1. Wellbore sketches have been made of virtually every well in the Vacuum Field which consists of approximately 1150 wellbores.

2. Bradenhead pressures were obtained on each of the 1150 wells. It was found that 74 wells exhibited some form of waterflows and 14 wells exhibited only gas pressure. (See attached Exhibit A.) In addition to these findings, Shell had experienced waterflows in three wellbores and repaired these prior to the formation of the committee. (See Exhibit B.) Based on this data the committee conducted a more detailed study of wellbores in the vicinity of a concentrated area of waterflows in the south central segment of the field.

3. Texaco, at the request of the committee, ran sound logs on several wells in the problem area that had low cement tops or other irregularities. The results are as tabulated below:

LEASE & WELL NO. (TEXACO)	APPARENT FLUID ENTRY AS DETERMINED BY SONAR
N.M. "R" St. (NCT-1) #10	5500' *
N.M. "O" St. (NCT-1) #3	1900'
N.M. "O" St. (NCT-1) #17	3250'
N.M. "L" St. #9	3000'
N.M. "M" St. #6	2175'-2350'
N.M. "AC" St. #8	None **
N.M. "AB" St. #5	None **

* BP set @ 5500'
** These wells have never exhibited surface waterflows or press.

4. Forty-eight hour fall-off tests were conducted at the request of the committee by Mobil and Texaco on 22 Grayburg-San Andres injection wells. All wells exhibited normal fall-off characteristics.

5. The committee recommended that Texaco be allowed to repair their State "R" #10 which had a rather severe waterflow. This action was prompted by the productive capacity of the well. The work has not been performed to date.

6. Mobil and Texaco ran temperature and tracer logs on 28 wells in the Vacuum Area in an effort to identify the source of the waterflows and to develop a method of future investigations to help prevent further waterflow problems. Texaco also ran cement bond logs on 17 wells to validate cement tops and adequate protection. The bond logs indicated that the San Andres was adequately protected in every case. The tracer surveys did not reveal movement of extraneous water behind the casing. The temperature logs were evaluated in detail due to the many temperature anomolies apparent on them. The two logging companies provided personnel to aid in interpretation of each log as described in Attachment C.

7. As a result of the temperature log interpretation, the committee recommended that Texaco and Mobil conduct perforating and testing work on six wells. Based on temperature log interpretation, these wells exhibited obvious flow or storage of extraneous water. The first four of these wells were worked over and showed virtually no storage or movement of water behind pipe. Based on these data the workovers on the remaining two wells were not performed. The workover data indicated that the committee's interpretation of the temperature logs was incorrect and invalid. The workover procedures on the four wells are included in Attachment D.

8. Mobil cycled 11 injectors while 5 known waterflow wells on offset leases were monitored. These wells have been shut in for 3 months with no reaction on monitor wells. A number of these wells have gone to zero wellhead pressure. (See Attachment E for pressure data.)

9. Mobil and Texaco were asked to perform tests on 13 injection wells for the purpose of determining fracture pressure data. Due to the relatively low injection rates and high pressures (50-400 b/d @ 1900-2500 psi), the traditional step-rate method of determining frac pressures was found to be unacceptable on Mobil's eight injectors. An alternate method was attempted but was also found to be invalid. Texaco, however, was able to determine frac pressure of their wells with some success. Frac pressures were found to be 550-950 psi at the surface (friction loss deducted from wellhead pressure in the Vacuum Grayburg-San Andres Unit).

Exhibits attached:

1. Bradenhead pressure survey.
2. Remedial work procedures to shut off waterflow.
3. Tabulation of temp log analyses.
4. Remedial work procedures for determining validity of temp log interpretation.
5. Pressure data on cycling and monitoring.

R. J. Anthony, Texaco
C. L. Pyle, Mobil
W. J. Mueller, Phillips
F. Schuman, Phillips

RECOMMENDATIONS

1. Attempt to determine a feasible procedure for "blowdown" of the salt section. Localized depressurizing will first be attempted through Texaco's State "M" #6. This well is to be back-flowed from the salt section through tubing. Surrounding wells will be monitored continuously.

2. Re-survey each well in the Vacuum Area that had indicated pressure and/or flow on previous surveys.

EXHIBIT "A"
INITIAL CASING PRESSURE SURVEY RESULTS
WELLS WITH FLUID FLOW
JUNE 1976

Township-Range Section	Unit	Well	S.I. Pressure Prior to Flow Test Weak Flow	Strong Flow
T-16-S None				
T-17-S; 34-E				
10	L	Shell #4-VH	20#	
	P	Shell Angle St. W-202		300#
11	F	Mobil B.S. W-217		80#
	H	" " W-216		220#
13	B	" " 152		50#
14	B	" " 146	240#	
21	H	Gulf Ritts #2		235#
	J	PPCo #25	15#	
	N	PPCo #26	20#	
22	D	Exxon #1-CQ		230#
23	J	Mobil B.S. #156		950#
	K	Amerada "VA" W-3		500# repaired
	L	" " 2	84#	
	M	" " W-6	795#	
24	O	Arco State E #1	100#	
	P	Arco State C #2	130#	
25	H	Texaco "T" #2	640#	
	H	" "T" #3	535#	
	J	" "Q" #8	425#	
27	B	Mobil B.S. #143		730# repaired
	F	Texaco "D" #4		1010#
	L	" " #6		1000#
	N	" " #7		1130#
31	F	Sohio Phillips Lea State "B" #1	275#	
32	C	Arco State B #4	25#	
33	H	Texaco O #17	350#	
34	N	Texaco "V" #35		110#
	P	" " #37		repaired
35	B	Cont. H-35 #3	380#	
	C	" " #6	295#	
	G	" " #5	500#	
	H	" " #12	200#	
36	E	Texaco "O" #20	480#	
	J	" #6	repaired	
	L	Mobil State "I" #1		repaired
	M	Texaco "O" #22	220#	
	N	" " #13	610#	
	N	" " #17	960#	
	P	" " #24	960#	
	P	" " #7	860#	
T-17-S; 35-E				
19	D	Mobil B.S. #206	25#	
	J	Josaline "C" 1-K		120#
	L	Exxon State "J" #4		55#

Township-Range Section	Unit	Well	S.I. Pressure Prior to Flow Test Weak Flow	Strong Flow
T-17-S; 35-E				
19	N	Arco "J" #1	160#	
22	P	Mobil "P" #2	0#	
25	E	Great Western #1	375#	
26	J	Shell "W" #1	50#	
27	D	Chevron State-S #8		350#
	G	CS State "V" #1	55#	
	P	Shell "J" #6	90#	
28	H	Shell "N" #5	20#	
29	M	Shell State-F #1	390#	
	N	" " " #2	140#	
	N	" " " #4		130#
	O	Shell State M #2		120#
30	E	Texaco N #7	700#	
	P	Shell B #4		140#
31	B	Shell "St-A" #7		350#
	E	Phillips Santa Fe #88	45#	
	G	Shell St-A #6		300#
	H	" " " #3		300#
	M	" " D #2	90#	
	M	" " D #1		repaired
	N	" " E #1		"
	N	" " E #2		"
32	A	Exxon St-K #7		545#
	D	Chevron St-B #2		555#
	E	" " B #6	460#	
	J	Exxon St-K #22		405#
	P	" " #6		550#
33	B	Phillips Santa Fe #32	125#	
	D	Skelly St-P #1	340#	
	M	Getty St-H #1	660#	
	P	Phillips Vac Abo 11-6	160#	
34	C	Mobil "M" #1	320#	
	D	" " #13	130#	
	E	" " #3	0#	
	J	Chevron St #12		225#
	L	" St #11		460#
18-S; 34-E				
1	A	Texaco St-L #7	175#	
	C	" " M #6		550#
	G	" VGSAU #42	860#	
	H	" St-L #9		875#
	I	" VGSAU #16	150#	
11	A	" VGSAU #1	175#	
18-S; 35-E				
4	C	Phillips Vac Abo #13-3	240#	

Township-Range Section	Unit	Well	Weak Flow	Strong Flow
18-S; 35-E				
5	C	Phillips Santa Fe #98	320#	
	D	" " " #99	660#	
	E	" " " #112	285#	
6	B	Texaco St-R #2		repaired
	B	" " " #10		950#
	K	Marathon St. Warn #17	15#	
	N	" " " #8	300#	
	P	Texaco St-AB #8	550#	
7	J	Getty St-N #5	385#	
	N	Exxon St-BP #2	45#	

Total number of Gas Flows = 14

EXHIBIT "B"

SHELL STATE "E" NO. 1

Disconnected wellhead. Ran 5½" casing spear. Picked up 60,000 lbs. No indication of casing part. Broke circulation down 8-5/8" casing at 500 psi. Ran packer and bridge plug. Found casing leak between 920' and 1094'. Ran 5½" casing cutter and cut off casing at 1254'. Pulled casing. Found 3 small holes. Ran 5½" lead seal bowl and 1244' 5½" casing. Casing bowl set at 1254'. Pressured up on 5½" casing to 1000 psi. Held ok. Established injection rate down 8-5/8" surface casing at 2 BPM at 800 psi. Mixed and pumped 350 sx Class "C" cement containing 10 lbs. salt per sx, 2% $CaCl_2$ and ¼ lb. Floccle per sx. Slurry weight 14.8 lbs. per gal. Pressure rose to 1400 psi and held. Could not pump into surface casing at 1500 psi. Ran Sonan log to 4631'. No indication of fluid flow behind the pipe.

SHELL STATE "E" NO. 2

On December 8, 1975, discovered water flowing out of surface casing at 50 bbls. per hour at 400 psi. Rigged up Howco. Established injection rate down 13-3/8" surface casing at 4 BPM at 400 psi. Mixed and pumped 500 sx Class "C" cement containing 12% salt and 2% $CaCl_2$. Displaced cement 50' below surface. S.I.P. - 350 psi.

SHELL STATE "D" NO. 1

Established injection rate at 7.5 BPM at 1400 psi down 8-5/8" casing. Pressured up on 5½" casing to 1000 psi. Mixed and pumped 1000 sx cement with 18% salt and 2% $CaCl_2$. Flushed cement with 40 bbls. fresh water treated with sodium chromate. After 20 hrs., 8-5/8" casing pressure = 0.

EXHIBIT "C"

Tabulation of Temperature Log Analyses

Bridges State #17 - Mobil
Injection - 275 b/d @ 1900 psi
Cmt. top - 2664' (calc)

Interval	Gradient	Remarks
4000'-3600'	0.57°/100'	
3600'-3250'	0.38	
3050'-2800'	0.36	
2650'-2500'	0.00	
2500'-2380'	1.10	
2380'-2050'	0.45	
1800'-1690'	0.00	

Conclusion: Indication of activity 2380'-3100'

Bridges State #29 - Mobil
Injection - 450 b/d @ 2000 psi
Cmt. top - 2675' (calc)

Interval	Gradient	Remarks
4200'-3520'	0.00°/100'	Possible shoe leak
3500'-3200'	0.60	
3200'-2950'	0.86	
2850'-1500'	1.10	

Conclusion: No activity in salt. Possible shoe leak.

Bridges State #32 - Mobil
Injection - 370 b/d @ 2200 psi
Cmt. top - 2625' (calc)

Interval	Gradient	Remarks
4300'-3600'	0.60°/100'	
3600'-3100'	0.52	
2700'-2100'	0.54	2660'-2580' Flat, may be cmt. top.
1900'-1800'	0.55	
1770'-1620'	0.20	

Conclusion: Indication of activity 1680'-2020'

Bridges State #42 - Mobil
Injection - 150 b/d @ 2600 psi
Cmt. top - 2714' (calc)

Interval	Gradient	Remarks
4150'-3400'	0.27°/100'	
3250'-2750'	0.32	
2750'-2050'	0.43	
2050'-1500'	0.40	

Conclusions: 30 min & 24 hr curves run parallel throughout which is usually indicative of no problems. The low gradients may have been a logging problem.

Bridges State #47 - Mobil
Injection - 300 b/d @ 2500 psi
Cmt. top - 2784' (calc)

Interval	Gradient	Remarks
4020'-3660'	0.60°/100'	
3660'-3060'	0.53	
3060'-2300'	0.53	Flattening 2620'-3040'
2300'-1820'	0.50	
2020'-1720'	0.00	with several flat areas

Conclusions: Major storage 4560'-4620'. Possible movement 1720'-2020' & 2640'-3040'.

Bridges State #48 - Mobil
Injection - 375 b/d @ 2000 psi. Csg shoe @ 4185'
Cmt. top - 2649' (calc)

Interval	Gradient	Remarks	
3950'-3600'	0.51°/100'	3900'-4000'	.3°/100
3600'-3150'	0.33		
3150'-2850'	0.57		
2850'-2350'	0.36		
2350'-2150'	0.95		
2150'-1750'	0.44		
1750'-1500'	0.00		

Conclusions: Possible shoe leak. Fluid activity 1550'-1850'.

Bridges State #52 - Mobil
Injection - 180 b/d @ 2350 psi
Cmt. top - 2638' (calc)

Interval	Gradient	Remarks
4150'-3850'	0.86°/100'	
3850'-3450'	0.00	
3100'-2600'	0.55	
2100'-1600'	0.56	

Conclusions: Fluid storage 3814'-40' & 3856'-74'; fluid movement 3450'-3875'.

Bridges State #167 - Mobil
Injection - 75 b/d @ 2500 psi
Cmt. top - Circulated to surface

Interval	Gradient	Remarks
4600'-3200'	0.59°/100'	
3200'-2800'	0.53	
2800'-2000'	0.40	
2000'-1600'	0.45	

Conclusions: No apparent activity.

State C-3 - Mobil
Injection - 300 b/d @ 2350 psi
Cmt. top - 2700' (calc)

Interval	Gradient	Remarks
4100'-3100'	0.66°/100'	
2800'-1850'	0.58	
1850'-1750'	0.00	
1750'-1600'	1.16	

Conclusions: Possible activity 1750'-1850'

State J-1 - Mobil
Injection - 250 b/d @ 1975 psi
Cmt. top - 2930' (calc)

Interval	Gradient	Remarks
4050'-3300'	0.8°/100'	
3300'-3000'	0.67	
2900'-2400'	0.68	
2400'-1600'	0.45	

Conclusions: No apparent activity

State J-4 - Mobil
Injection - 350 b/d @ 2475 psi
Cmt. top - 2675' (calc)

Interval	Gradient	Remarks
4100'-3850'	0.72°/100'	
3850'-3200'	0.25	
3050'-2620'	0.00	
2620'-2520'	(-0.20)	
2520'-1500'	0.00	

Conclusions: Crossflow 1886'-2274', 2400'-2530' & 2672'-2888'

West Vacuum Unit #11 - Texaco
Injection - 200 b/d @ 2375 psi
Cmt. top - 2900'

Interval	Gradient	Remarks
4100'-2900'	0.70°/100'	
2900'-2000'	0.77	
1930'-1750'	0.97	
1750'-1600'	0.00	
1550'-800'	0.93	

Conclusions: Storage interval 1600'-1750'

West Vacuum Unit #18 - Texaco
Injection - 650 b/d @ 2600 psi
Cmt. top - 2940'

Interval	Gradient	Remarks
4000'-3850'	0.00°/100'	
3850'-3220'	0.53	
3220'-2720'	0.48	
2720'-2610'	0.00	Possible pen shift problem.
2400'-1560'	0.50	
1750'-1640'	0.00	
1560'-860'	0.74	

Conclusions: (1) Shoe leak @ 3850'± - tracer agrees
(2) Storage area 1640'-1750'

West Vacuum Unit #20 - Texaco
Injection - 400 b/d @ 2400 psi
Cmt. top - 3200'

Interval	Gradient	Remarks
4200'-4000'	0.00°/100'	
4000'-3800'	0.50	
3800'-2700'	0.59	
2700'-1450'	0.50	
1450'-1150'	0.83	
1150'-400'	0.66	

Conclusions: Possible storage area 1500'-1800'. Possible shoe leak - tracer agrees.

West Vacuum Unit #32 - Texaco
Injection - 475 b/d @ 2450 psi
Cmt. top - 2270'

Interval	Gradient	Remarks
4300'-3150'	0.65°/100'	
3150'-2150'	0.50	
2150'-1900'	0.50	
1900'-1580'	0.00	
1580'-250'	1.00	

Conclusions: Fluid storage 1580'-1900'.

West Vacuum Unit #36 - Texaco
Injection - 1000 b/d @ 900 psi
Cmt. top - 2860'

Interval	Gradient	Remarks
4150'-3750'	0.50°/100'	
3750'-2850'	0.38	
2850'-2750'	0.00	
2750'-1200'	0.44	
1200'-1000'	0.50	
1000'-750'	0.00	Probably water temp. vs. form. temp anomoly.

Conclusions: Difficult to call 2750'-3300' storage because flat area is hot rather than cool. Area coincides with top of cement.

West Vacuum Unit #48 - Texaco
Injection - 450 b/d @ 2000 psi
Cmt. top - 2890'

Interval	Gradient	Remarks
4000'-3300'	0.50°/100'	
3300'-2950'	0.43	
2900'-2150'	0.44	Flat 2840'-2740'
2000'-1700'	0.00	
1700'-1200'	0.64	

Conclusions: Storage 1700'-2200'.

Vacuum Grayburg San Andres #5 - Texaco
Injection - 3000 b/d @ 1000 psi
Cmt. top - 2680'

Interval	Gradient	Remarks
4300'-3750'	0.50°/100'	
3750'-3300'	0.58	
3300'-2650'	0.46	
2650'-2450'	0.75	
2450'-2300'	0.59	
2300'-2000'	0.38	
2000'-1750'	0.40	1820'-1890' flat
1750'-1200'	0.75	
1200'-800'	1.00	
800'-400'	0.69	

Conclusions: (1) No clearcut storage area in injection interval.
(2) Possible offender well.
(3) All fluid apparently leaving wellbore through one perforation.

Vacuum Grayburg San Andres #15 - Texaco
Injection - 2200 b/d @ 1250 psi
Cmt. top - 2400'

Interval	Gradient	Remarks
4150'-3050'	0.55°/100'	
3050'-2550'	0.36	
2550'-2200'	0.45	
2200'-1850'	0.77	
1850'-1730'	0.00	
1730'-1450'	0.40	
1450'-1300'	0.00	
1300'-1050'	1.00	
1050'-450'	0.73	

Conclusions: Fluid behind pipe from 3050' to top of storage area (1300').

Vacuum Grayburg San Andres #17 - Texaco
Injection - 3121 b/d @ 1500 psi
Cmt. top - 2710'

Interval	Gradient	Remarks
4250'-3900'	0.29°/100'	
3860'-3750'	0.00	
3750'-3100'	0.49	
3100'-1350'	0.00	
1350'-1150'	0.71	
1150'-450'	1.05	

Conclusions: Fairly clearcut example of channel from 4410'-1610'.
Storage area 1520'-1610'.

Vacuum Grayburg San Andres #19 - Texaco
Injection - 4000 b/d @ 1000 psi
Cmt. top - 3510'

Interval	Gradient	Remarks
4200'-4000'	0.00°/100'	
4000'-3600'	0.38	
3600'-3400'	0.75	
3400'-3250'	2.00	
3250'-2600'	0.46	
3070'-3000'	--	Hot spot
2800'-2600'	--	Hot spot
2600'-2200'	0.19	
2200'-1980'	0.00	1/2° shift @ 1950' & 2150'
1940'-1620'	0.00	
1620'-1530'	0.00	w/hot spot
1530'-1100'	0.47	
1100'-100'	0.80	

Conclusion: Definite channel up from perfs to 1600'±.
Storage 1600'-2200'.

Vacuum Grayburg San Andres #29 - Texaco
Injection - 757 b/d @ 1100 psi; 24 hr S.I. press. - 750 psi
Cmt. top - 2770'

Interval	Gradient	Remarks
4400'-4050'	0.00°/100'	
4050'-3750'	0.42	
3750'-3300'	0.53	
3000'-2250'	0.60	Flats - 2960'-3080', 2630'-2780', 2250'-2400'
2250'-1950'	--	Hot spot
1750'-1430'	0.60	
1430'-1200'	0.22	
1220'-600'	0.32	
600'-surf.	0.00	

Conclusions: (1) Storage area 1200'-2770' (cmt top).
(2) Possible channel down 2770'-4530'.

Vacuum Grayburg San Andres #33 - Texaco
Injection - 2193 b/d @ 1250 psi
Cmt. top - 2370'

Interval	Gradient	Remarks
4200'-3000'	0.53°/100'	
3000'-2200'	0.15	
2200'-1100'	0.59	
1100'-700'	1.13	

Conclusions: No activity.

Vacuum Grayburg San Andres #31 - Texaco
Injection - 3125 b/d @ 1500 psi
Cmt. top - 2620'

Interval	Gradient	Remarks
4100'-2950'	0.41°/100'	
2950'-2600'	0.00	with shifts
2600'-1800'	0.00	with shifts
1800'-1450'	0.64	
1450'-1050'	0.00	Warmer - probably formation
1050'-500'	0.67	

Conclusions: 1800'-2950' storage area.

Vacuum Grayburg San Andres #35 - Texaco
Injection - 1374 b/d @ 1000 psi
Cmt. top - 2450'

Interval	Gradient	Remarks
4100'-3700'	0.40°/100'	
3700'-3100'	0.58	
3100'-2350'	0.49	
2450'-2100'	0.86	
2100'-1850'	0.40	
1850'-550'	0.70	Some areas of 0°/100' slope

Conclusions: Storage area 1480'-1800'.

Vacuum Grayburg San Andres #45 - Texaco
Injection 1660 b/d @ 900 psi
Cmt. top - 2470'

Interval	Gradient	Remarks
4300'-4000'	0.73°/100'	
4000'-3700'	0.73	
3700'-2350'	0.50	
2350'-2050'	0.70	
2050'-1800'	0.56	
1800'-1300'	0.84	

Conclusions: No channel, no storage out of zone.

Vacuum Grayburg San Andres #47 - Texaco
Injection - 2864 b/d @ 900 psi
Cmt. top - 2650'

Interval	Gradient	Remarks
4200'-3690'	0.44°/100'	
3690'-2900'	0.49	
2900'-2500'	0.38	
2500'-2350'	1.00	
2350'-2280'	--	steep shift
2280'-1830'	0.44	
1800'-1600'	0.00	
1600'-1300'	0.66	
1300'-1200'	0.00	
1100'-680'	0.70	

Conclusions: Storage area 1600'-1800'. No channel.

Vacuum Grayburg San Andres #49 - Texaco
Injection - 4670 b/d @ 900 psi
Cut. top - 2450'

Interval	Gradient	Remarks
4150'-3900'	0.00°/100'	
3900'-3550'	0.57	
3550'-3000'	0.64	
3000'-2450'	0.00	
2450'-2100'	0.57	
2100'-1800'	--	shifts and flats
1750'-1500'	0.00	
1500'-surf.	--	parabolic curve

Conclusions: Storage 1500'-1750'. Possible minor channel 4373'-3900'.

EXHIBIT "D"

TEXACO INC.
VACUUM GRAYBURG SAN ANDRES UNIT #49

Ran E-2 drill cement retainer to 4175'. Perforated 4½" casing at 4065'. Swabbed well down, no fluid entry. Spotted 200 gals. 15% acid across perfs and broke down perfs. Pumped 10 bbls. water into perfs at 2000 psi. Swabbed well down. No fluid entry. Shut well in 14 hrs. No pressure buildup. Checked fluid level. No fluid entry. Went in with injection tubing and stabbed into cement retainer at 4175'. Placed well on injection. On December 15, 1976, well taking 3300 BWPD at 1160 psi. No pressure buildup on tubing-casing annulus to date.

TEXACO INC.
VACUUM GRAYBURG SAN ANDRES UNIT #19

Ran step-rate test. Found frac pressure at 650 psi surface pressure (without friction). Set cement retainer at 4200'. Perforated [illegible]" casing at 3415' (above cmt. top). No pressure or fluid entry encountered. Established circulation down 4½" and up the back side. Shut well in overnight. No pressure buildup or fluid entry. Ran injection tubing and stabbed into cement retainer. Placed well on injection with pressure recorder on bradenhead. Injected over weekend. Brought injection pressure up to 950 psi. No pressure change on bradenhead. Pulled injection tubing and pumped 2500 sx cement. Cement top 1900' by temperature survey. Drilled out retainers and returned well to injection.

MOBIL
BRIDGES STATE NO. 29

Pulled injection tubing and ran 2-3/8" workstring. Set bridge plug at 3875' and set packer at 3725'. Perforated 7" casing at 3798'. Swabbed tubing dry. No fluid entry. Shut well in overnight. Checked fluid level. No fluid entry. Pulled packer and bridge plug. Ran tubing and injection packer. Started injection at 460 BWPD at 0 tubing pressure. Injected 8 days. Tubing pressure 2200 psi. Casing pressure zero. Pulled injection packer and ran bridge plug and packer. Acidized perfs at 3798' with 1000 gals. 15% HCl acid. Pulled packer and bridge plug and ran injection packer. Started injection at 800 BWPD at 100 psi. No pressure on casing. Injected 5 days. Rate 230 BWPD. Pressure 2300 psi. Casing pressure zero. Pulled injection packer. Squeezed perfs at 3798' with 50 sx Class "C" cement. Cleaned out to T.D. and returned well to injection.

Mobil
Bridges State No. 52

EXHIBIT "D"

MOBIL
BRIDGES STATE NO. 52

12/10/76 - Total depth 4900'. Open hole 4248 to 4900'. MIRU. Pull out of hole with tbg & 7" pkr. GIH w/RBP & FB pkr. Set RBP @ 3871' and FB pkr @ 3809. Test RBP to 2000 lbs. - OK. POH w/pkr - perf 7" csg 3830 to 3833 w/4 jspf. Ran pkr & set @ 3860. Swabbed - no feed in. 14 hr SI tbg press 30 psi. Ran swab; found no feed in. Pulled RBP. GIH w/FB pkr to 3918'. Begin injection @ 200 BWPD. Csg press - 0; tbg press - 0; injected 11 days. Csg press - 0; tbg press - 24.20. POH w/tbg & pkr. Set RBP @ 3918'. Attempt to pump in perfs 3830 to 3833 w/3000 psi. No success. Acidized w/1000 gals 15% + 5 gals FR @ 3000 psi at 2.5 BPM. ISIP 2500 psi. 14 hrs SI tbg press 2300 psi. Release pressure, swab - no feed in. Set FB pkr @ 3779'. Squeeze perfs 3830 to 3833. Drill cmt 3742 to 3840. Test squeeze - OK. POH w/RBP. GIH w/injection equipment.

EXHIBIT "E"

Injection Well S.I. Pressures on 12-20-76
Wells Have Been S.I. Since 9-1-76

BRIDGES STATE WELL NO.	TBG (PSI)	CSG (PSI)
5	760	-0-
17	25	-0-
29	Vacuum	-0-
30	550	-0-
32	30	-0-
35	700	-0-
42	Vacuum	-0-
48	325	-0-
52	*	-0-
105	1025	-0-
132	975	-0-

* Bridges State #52 currently under workover to determine credibility of temp. log interpretation.

Monitor Wells Casing Pressure 12-23-76

		CSG (PSI)
N.M. "D" St. (NCT-1)	#4	1225
	#6	775
	#7	175
Exxon St. "J" No. 4		220
Gulf "Ritts" St. No. 2		253

BEFORE THE
OIL CONSERVATION COMMISSION-
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 5B
CASE 5941

COUNTY	PROJECT & OPERATOR	PRODUCING FORMATION	AVERAGE DEPTH	NUMBER ACRES	AVG. PAY THICKNESS	AVG. PSI	NO. INJ. WELLS	NO. PROD. WELLS	CUMULATIVE GAS - WATER INJECTION	CUMULATIVE GAS - WATER PRODUCTION	CUMULATIVE OIL PROD. FOR PROJ.	CUMULATIVE OIL RECOV. PER ACRE	DATE PROJECT STARTED
Lea	LANGLIE MATTIX (continued)												
	Gulf Coast Western Oil Company	Y-SR-Q	3300	360	72	2200	3	6	796,051w	9,945w	10,658	29.60	2/58
	Humble Oil & Refining Co.	Y-SR-Q	3300	240	72	919	1	5	243,744w		6,968	29.03	6/57
	Skelly Oil Company	Y-SR-Q	3300	240	30-70	1175	2	4	793,220w	10,148w	24,699	102.91	1/58
Eddy	LOCO HILLS												
	Newmont Oil Company	GB-SA	2815	320	40	203	6	7	106,173w		2,489	7.77	11/58
	Operating Committee Press.Maint.Program	GB-SA		NA		NA		176	NA	NA	15,194,403		1/41
Lea	MALJAMAR												
	Mewanee Oil Company	GB-SA	4200	480	55	1614	4	14	435,717w 1,461,018g	7,559w 465,543g	151,927	316.5	7/58*
	Maljamar Coop. Repress.	GB-SA	3800	7840	30	NA	35	197	*	20,312,737g	31,292,048	3,991.3	1/53
	Mewanee & Maljamar Coop. new l project		8320				39	211	*85%	20,778,280g	31,443,975	3,779.32	
	*85% gas produced returned to formation.15% was used for lease use and flared-per Engineering Report.												
Lea	PENROSE SKELLY												
	Socony Mobil Oil Co.	GB-Queen	3680	120	15	925	1	2	762,055w	21,797w	26,037	30.99	11/50
Eddy	RED LAKE												
	Hersey & Company Red Lake Premier Ut.	Grayburg	1900	1320	14	875	13	31	1,363,709w	63,374w	77,806	58.94	6/55
Eddy	RUSSELL												
	Will H. Wills	Yates-ss	775	640	12	596	25	29	2,859,096w	603,242w	40[illegible]5 8	675.89	4/53
Eddy	NORTH SHUGART												
	Moxwell Oil Company	Queen-ss	3500	240	22	1600	1	6	293,806w	16,038w	137,750	573.95	4/52
Eddy	SQUARE LAKE												
	Ambassador Oil Corp.	GB-SA	3500	520	22	700	6	7	114,041w		6,982	13.42	2/58

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
OCC EXHIBIT No. 7
CASE 5941

January 7, 1977

OIL CENTER - MONUMENT COMMITTEE REPORT

This Sub-Committee was appointed by the New Mexico Oil Conservation Commission (NMOCC) Appointed Committee on April 20, 1976. The purpose of this Sub-Committee was to study and locate the source of waterflow problems in the Oil Center-Monument Area and to suggest solutions.

The Committee met on the afternoon of the 20th and prepared the following objectives:

1. That the Study Area would consist of the following area:

   T-19-S, R-37-E, Sec. 15, 16, 21, 22, 26, 27, 28, 33, 34, 35, & 36

   T-20-S, R-37-E, Sec. 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 35, and 36

   T-20-S, R-36-E, Sec. 13, 14, and 25

   T-20-S, R-38-E, Sec. 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, and 31

   T-21-S, R-36-E, Sec. 1 and 12

   T-21-S, R-37-E, Sec. 5, 6, 7, and 8

   (SEE ATTACHED PLAT)

2. That all Operators would submit to the Committee downhole well schematics on all wells (i.e., injection, producing, NIO, and P & A) in the above discribed area.

3. That bradenhead surveys would be run on all wells with surface or intermediate casing set through the red bed section.

4. That from the bradenhead survey, monitor wells would be picked.

5. That the waterfloods in the Oil Center-Monument Area would be cycled (i.e., each flood would be shut-in for a given period of time) so that pressures on monitor wells could be observed and the source of the problem located.

The following summarizes the accomplishments of the Committee to date:

1. Wellbore schematics have been made and received on 99% of the wells in the Oil Center-Monument Study Area. This consists of approximately 1000 wellbores.

2. It was generally thought that wells with short surface and/or short intermediate casing (i.e., 250 to 500') would probably not show bradenhead pressures even if they had them, due to the red bed sluffing in around the pipe. Therefore, bradenhead surveys were run only on those wells which had surface or intermediate casing of 1000' in length (thru the red bed section).

The Committee received approximately 415 bradenhead surveys. Of the 415, 206 were found with pressure on the bradenheads. Sixty-three wells showed pressure in the range 300 psi to 599 psi; fifty wells were in the pressure range 600 psi to 699 psi; and 9 wells had pressure in excess of 900 psi. One hundred seventeen wells in the survey had waterflows on the bradenhead. See attachments of surveys.

3. From the bradenhead survey the following wells were chosen as monitor points:

1.	Getty	East Eumont Unit #58	M-22-19-37
2.	Byrom	Williams #2	O-34-19-37
3.	Shell	Cooper "A" #1	B-4-20-37
4.	Rice	SWD M-9	M-9-20-37
5.	Texaco	C.H. Weir B #5	G-11-20-37
6.	Getty	East Eumont #130	F-12-20-37
7.	Texaco	C.H. Weir A #11	G-12-20-37
8.	Texaco	Skaggs Grayburg Unit #2	J-12-20-37
9.	Texaco	M.B. Weir "B" #7	M-12-20-37
10.	Texaco	Skaggs GB Unit #11	D-13-20-37
11.	Texaco	L.R. Kershaw #10	F-13-20-37
12.	Conoco	Britt B #8	J-15-20-37
13.	Conoco	Britt B #7	N-15-20-37
14.	Marathon	Hanson State #2	G-16-20-37
15.	Getty S	State "I" #2	K-16-20-37
16.	Skelly	State "F" #1	P-17-20-37
17.	Texaco	Eunice Monument Unit #21	L-19-20-37
18.	Amoco	Gillully "B" Fed. #6Y	A-21-20-37
19.	Amoco	Gillully "B" Fed. #9	D-22-20-37
20.	Texaco	Skaggs Grayburg Unit #7	L-12-20-37
21.	Byrom	Williams No. 3	N-34-19-37

Each of the above wells was equipped with a 7 day pressure recorder on or by June 9, 1976.

4. The Texaco Skaggs Grayburg Unit was shut-in on June 14, 1976. By July 7, 1976 all but 5 of Texaco's injectors had fallen to zero or to pressures below the shut-in pressures of the monitor wells. It was decided to back-flow 3 of Texaco's injection wells to speed up the evaluation. It was also decided at this time that all pressure on injection wells when shut-in should be maintained below 500 psi. Backflowing and injection well pressure declines continued through July and August on the Texaco Skaggs Flood. No unusual declines had been noted on any of the monitor wells, except for the Skaggs Grayburg Unit Well No. 7. This well is monitoring a casing leak in the 7-Rivers Formation.

Water injection into the Conoco SEMU was shut-in on August 11, 1976. Shut-in tubing pressures began to fall after one week. In order to speed up the process, wells with pressures in excess of 500 psi were backflowed. Thru August 23, 1976 no unusual pressure declines had been noted on the monitor wells. The South Segment of the Getty East Eumont Unit was shut-in on the above date. Backflowing was started on September 1, 1976 from selected wells. At this time several wells were still being backflowed on the Skaggs and SEM Units.

Injection on the Eumont Hardy Unit and the Eumont Monument Unit was stopped On September 29, 1976. The Central Segment of the Getty EEU was shut-in on October 28, 1976. Thru this period of time, still no major response had been noted on the monitor wells. By November 17, 1976 all injection wells were

below 500 psi, except for a scattered few still being backflowed and wells that scaled up and periodically have to be shut-in to clean out their injection lines.

5. In November, 1976 Texaco ran cement bond and sonar logs on their M. B. Weir "B" Well No. 7 while injecting in the adjacent Skaggs Grayburg #5 injection well. There was no indication of fluid movement around the wellbore with the well shut-in. Anamolies were found in the salt section between 2200' and 2300'.

6. On November 17, 1976 the Committee recommended flowing the bradenheads on the Getty State "I" Well No. 2 and Amoco Gillully "B" #6Y monitor wells. Each well backflowed a small amount of saturated salt water before the pressure bled down. After bleeding down the State "I" #2 was shut-in and the pressure built up to 750#. However, upon opening it again the pressure dropped rapidly, apparently indicating salt bridging. On January 12, 1977, Amoco was unable to pump fresh water into bradenhead on Gillully "B" 6Y with 400-500 psi in an attempt to dissolve the salt bridge.

7. In the January 6, 1977 Meeting, the Committee recommended flowing the bradenheads on the Getty EEU #131 and the Texaco S-GR Unit #11. The EEU #131 backflowed approximately 425 barrels of saturated salt water and bled down. Texaco is in the process of preparing to backflow the Skaggs Grayburg #11.

This committee has had no success in determining the source of the waterflow in the area from the data collected. In conclusion, this committee recommends that the salt section be bled down.

MONUMENT - OIL CENTER

WATER FLOW

ATTACHMENTS

1. Monitor Well Pressures

2. Injection Well Pressures and Backflowing

3. Bradenhead Flow Test Surveys

4. Plat of Study Area with Monitor Wells

HAO/bh

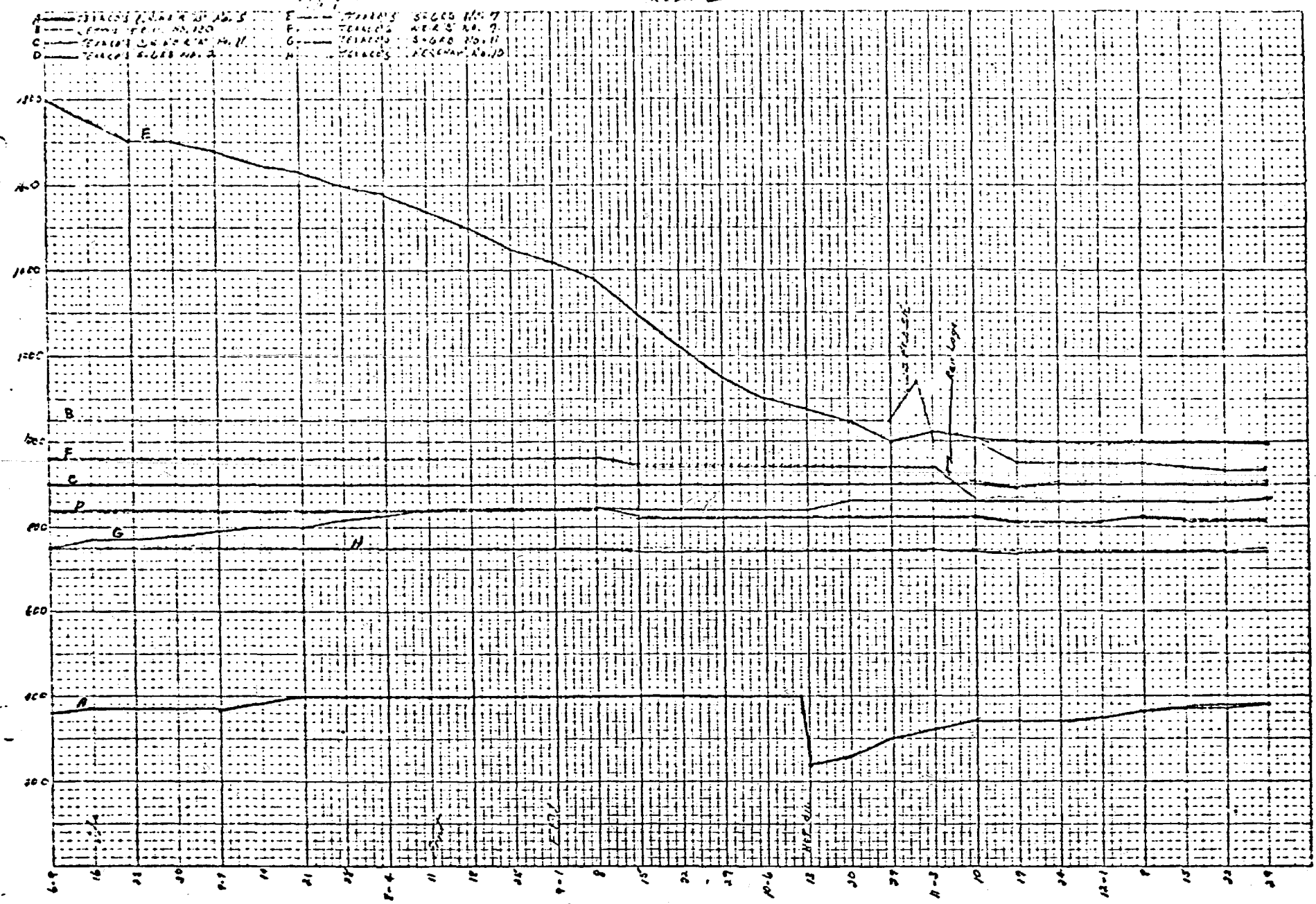
1-13-77

MONTHLY OIL CONSERVATION FLOW
AREA I



DISHAROON - OIL CENTER WATER FLOW

AREA II


A — TEXACO [illegible] NO. 5
B — [illegible] NO. 120
C — TEXACO [illegible] NO. 11
D — TEXACO SLOAN NO. 2
E — TEXACO SLOAN NO. 7
F — TEXACO KERR NO. 9
G — TEXACO SLOAN NO. 11
H — TEXACO MCCLAIN NO. 10
1800
1600
1400
1200
1000
800
600
400
200
Pump Shut
Pump Started
Pump Stopped
Pump Started
Pump Stopped
Pump Started
Pump Stopped

MONUMENT - OIL CENTER WATER FLOW
AREA III

A —— LILES S. L.C.D. NO. #-9 ... F —— MARATHON'S HANCOCK STATE NO. 2
B —— CONOCO'S EA. YT. "2" NO. 8 ... G —— TEXAS' PAN-AM NO. 51
C —— CONOCO'S BRITT "B" NO. 7 ... H —— SKELLY'S STATE "F" NO. 1
D —— GETTY'S STATE "E" NO. 2 ... I —— AMOCO'S GILLULLY "B" NO. 9
E —— AMOCO'S GILLULLY "B" NO. 8

1800
1600
1400
1200
1000
800
600
400
200

Change in direction

D
H
E
B
C
E
G
I
A

Bradenhead Gas
Fluid Level
Oil
Water

6-7 4 30 15 10-11 14 21 28 8-9 11 18 25 9-10 8 15 22 29 10-6 13 20 27 11-3 10 17 24 12-1 8 15 22 29

EUGENE DIETZGEN CO.
MADE IN U.S.A.
NO. 3400-LR DIETZGEN GRAPH PAPER
10 X 10 PER INCH

INJECTION WELLS

MONUMENT-OIL CENTER WATER FLOW

COMPANY: GETTY OIL COMPANY
UNIT: EAST [illegible]

WELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK-FLOWED	REMARKS
42	1850	90	0 BBL	
45	1850	205	190 "	
46	1925	125	[illegible] "	
48	1300	160	12 "	
51	1500	225	58 "	
53	2100	100	2,044 "	
55	1425	VACUUM	142 "	
58	1625	100	1,[illegible]2 "	
60	1850	160	2,951 "	
62	1425	225	0 "	
64	1960	165	1,[illegible]4 "	
66	1825	200	518 "	
68	1170	225	4,138 "	
70	1580	120	239 "	
72	1300	150	23 "	
73	1450	125	1,143 "	
75	1950	210	4,731 "	
78	1250	140	172 "	
827	1550	160	499 "	
856	1725	220	303 "	
80	1800	250	325 "	
82	725	0	0 "	
83	VACUUM	225	503 "	
85	1625	0	827 "	
87	1800	0	0 "	
89	1300	90	420 "	
91	1900	250	3294 "	
93	1900	225	10,904 "	
95	2000	225	12,398 "	
96	1850	250	2,932 "	
98	1700	25	163 "	
101	1300	500	3,399 "	
103	2000	200	417 "	
105	400	500	838 "	
107	1750	0	2,822 "	
109	2100	375	2,479 "	
112	1700	500	2,231 "	
115	2000	500	2,573 "	
117	1500	500	1,022 "	
121	VACUUM	350	0 "	
123	1750	500	1,818 "	
125	1900	525	3,055 "	
126	VACUUM	350	0 "	
128	1400	500	1,[illegible] "	
131	1900	500	1,[illegible]2 "	
[illegible]	VACUUM	0	0 "	
9[illegible]	1900	50	2,[illegible] "	
114	1800	400	1,435 "	
TOTAL	—	—	81,[illegible]45 "	

MONUMENT-OIL CENTER WATER FLOW

COMPANY: CONOCO

UNIT: SKAGGS UNIT WATER FLOOD PROJECT

NU Pattern WELL NO.	INITIAL SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976(PSIG)	VOLUME OF WATER BACK FLOWED	REMARKS
11	1550	80		Unable to produce
18	1725	0		Produced water in
20	1725	0		low of the wells.
23	1825	100		
25	1675	0		
26	1500	25		
29	1650	0		
31	1625	0		
32	1400	0		
40	1775	0		
49	1725	0		
35	1700	100		
36	2000	100		
44	2100	95		
45	1400	100		
76	1000	0		
78	2100	100		
79	2000	100		

MONUMENT-OIL CENTER WATER FLOW

COMPANY: Conoco

UNIT: Eumont Penrose Upper Yates

Monument Eumont Unit Well No.	Tubing Shut In Pressure	Pressure on Dec. 31, 1976	Volume of Water Back Flowed	Remarks
2	1[illegible]	0		Unable to get [illegible]
3[illegible]	1[illegible]	0		[illegible]
4[illegible]	1[illegible]	0		[illegible]
2[illegible]	1[illegible]	0		
2[illegible]	1[illegible]	0		
3[illegible]	1[illegible]	0		
13	1[illegible]	0		
17	1[illegible]	0		
20	1[illegible]	0		
5	1731	0		
9	1[illegible]	0		
3[illegible]	1[illegible]	0		
32	1[illegible]	0		
47	1460	0		
27	1400	0		
31	1[illegible]	0		
35	1[illegible]	0		
15	1[illegible]	0		
19	1[illegible]	0		
23	1425	1		
7	1[illegible]	0		
11	1425	0		
25	1725	0		

MONUMENT-OIL CENTER WATER FLOW

COMPANY: TEXACO CORP.
UNIT: EUMONT UNIT

WELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
13	1250	100	—	Produced water 15 [illegible]
15	750	0	—	[illegible]
23	1400	0	—	when Water is [illegible]
24	700	0	—	Pressure on these [illegible]
30	1600	0	—	increased to 2050 [illegible]
32	0	0	—	then drop to 0 [illegible]
				Injection ceased. Volume
				Average 1 - 2 BWD.

MONUMENT-OIL CENTER WATER FLOW

COMPANY: [illegible]
UNIT: [illegible]

WELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
1	[illegible]	0	—	
3	1025	300	12 [illegible]	[illegible]
5	200	0	—	
7	1200	900	—	[illegible]
9	420	220	19 3/4	[illegible]
12	25	0	—	
14	1925	1130	42 141	[illegible]
21	1490	0	—	
22	560	1125	—	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILLIAMS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	3	P	16-20-3?							Ref r back to previous 3-193

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILLIAMS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	2	P	16-20-3?	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A WILLIAMS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	1	C	16-20-3?	5-15-76	12½	0	0	0	None	None
					8⅝	35	0	0	NONE	GAS

I hereby certify that the information submitted is true, known and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, Jr.

COMPANY _____

612-05-75

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt "A"	1	N	6-20S-37E	6-10-7	13"	145#	0	0	0	
					9-5/8"	0	0	0	0	
					7"	0	0	0	0	
Britt "A"	2 ✓	N	6-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	655#	0	655#	0	Bled down in 5 seconds. Gas Press. built up to 400# in one min. after shuting in.
					7"	0	0	0	0	
Britt "A"	3	K	6-20S-37E	6-11-76	13-3/8"	10#	0	0	0	
					8-5/8"	220#	150#	150#	0	Flowing Gas
					5-1/2"	10#	0	0	0	
Britt "A"	6		6-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					9-5/8"	40#	0	5#	0	Bled down in 1-½ minutes
					5-1/2"	35#	0	15#	0	Bled down in 1 minute
Britt "B"	1	N	6-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	--	--	--	--	Selling Gas
					7"	0	0	0	0	
Britt "B"	2	N	6-20S-37E	6-11-76	13-3/8"	0	0	0	0	
					8-5/8"	655#	0	655#	0	Bled down in 5 seconds. Gas Press. built up to 400# in one min. after shuting in.
					5-1/2"	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	13	J	7-20S-37E	6-11-76	13-3/8"	0	0	0	0	
					8-5/8"	30#	0	0	0	
					5-1/2"	0	0	0	0	
Britt	1	F	7-20S-37E	6-10-76	10"	0	0	0	0	
					8-5/8"	60#	0	0	0	Bled down in 6 minutes.
					6-7/8"	0	0	0	0	
Britt	2	C	7-20S-37E	6-14-76	13-3/8"	0	0	0	0	
					9-5/8"	520#	0	450#	0	Bled down in 20 seconds.
					7"	0	0	0	0	
Britt	3	G	7-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	470#	0	20#	0	Bled down in 3 minutes.
					7"	--	--	--	--	Selling Gas
Britt	4	B	7-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					9-5/8"	50#	0	40#	1-1/2 gals	Est. Flowing 1 Bbl H_2O/24hr
					7"	35#	0	0	0	
Britt	5	K	7-20S-37E	6-10-76	13"	40#	0	0	0	
					9-5/8"	560#	520#	560#	0	Gas well-opened valve on 9-5/8" press. on 7" dropped the same amt. possible hole in casing.
					7"	570#	520#	560#	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	11	G	7-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					8-5/8"	0	0	0	0	
					5-1/2"	0	0	0	0	
Britt	12	C	7-20S-37E	6-10-76	13-3/8"	60#	0	0	0	
					8-5/8"	700#	10#	30#	0	Flowing Gas
					5-1/2"	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

By: Shirley A. Foster

COMPANY Union Texas Petroleum Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Campbell & Hedrick

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID CASING TEST	REMARKS (Oil-Water-Gas-etc.)
Alexander	1	L	7-21-37	6/3/76	4½-7"	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Olloyd Hedrick Jr

COMPANY Campbell & Hedrick

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Sabie Petr Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID CASING TEST	REMARKS (Oil-Water-Gas-etc.)
Azus A	1	P	Sec 7 T21S R37E	6-1-76	17½" OD 9⅝" - surface	24 Hrs	0	0	0	Braden Head Test
Azus A	2	M	Sec 8 T21S R37E	6-1-76	12¼" OD 9⅝" surface	24 Hrs	890 PSI	10 PSI	Very Small Amount	Braden Head Test Small amount of drlg mud + water Flowed out of Braden Head
Azus B	1	F	Sec 8 T21S R37E	6-1-76	21" OD 8⅝" surface	24 Hrs	0	0	0	Braden Head Test

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: R B Rountree

COMPANY Sabie Petr Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	3	F	16-20-37							Refer back to previous C-103

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	2	F	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	1	C	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	35	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dfs

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY Cleary Petroleum Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "E"	1	L	21-19-37	5/12/76		25#	5#	40#	None	
New Mexico State "E"	2	E	21-19-37	5/12/76		35#	8#	130#	None	
New Mexico State "E"	3	D	21-19-37	5/12/76		20#	0#	25#	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Wilma Lee Ferguson

COMPANY Cleary Petroleum Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER—MONUMENT AREA

COMPANY APCO Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Carter	1	G	12, 21S, 32E	5-24-76	Surface	125 psi	0 psi	0 psi	TSTM	Air
Christmas	1	D	11, 20S, 31E	5-26-76	Surface	10 psi	0 psi	0 psi	TSTM	Air
Currie	1	N	5, 21S, 31E	5-28-76	Intermed	20 psi	0 psi	10 psi	TSTM	Gas (?)
Huston	1	K	21, 19S, 37E	5-26-76	Surface	120 psi	100 psi	120 psi	1 BBl	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: L. W. Hall

COMPANY APCO Oil Corporation

P.O Box 1027

Odessa, Texas 79760

Phone: 915-381-2944

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Curry Sprague

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Kechane	1	N	4	6-17	SURFACE	0	0	0	0	

HAVE LES OR NATHAN
INSPECT - WELL

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Curry Sprague

COMPANY Curry Sprague

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Great Western Drilling Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bordages	1	D	S-33 T-19S R-37E	6/4/76	tubing Prod.	7½ PSI	0	0	0	No Oil, Water, or Gas 15 Min. no change 1 hour no change
					Prod. Inter-mediate	0	0	0	0	
					Inter-mediate Surface	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Curtiss McInnay

COMPANY Curtiss McInnay / ~~Great Western Drilling Co.~~

DATA SHEET FOR FLOW TEST IN OIL CENTER—NONPERMIT AREA

COMPANY Shell Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION-TOWNSHIP-RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State E	1		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	2		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	3		[illegible]	[illegible]		-115	-0-	-30-	-0-	gas
	4		[illegible]	[illegible]		-50-	-0-	-50-	-min-	water & gas
Cooper A	1		[illegible]	[illegible]		1000	-1000-	-1000-	full	water
Cooper B	1		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	2		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	4		[illegible]	[illegible]		-50-	-0-	-50-	-min-	water
State Sec 3	1		[illegible]	[illegible]		-30-	-0-	-30-	-min-	gas & water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible]

COMPANY Shell Oil Co

DATA SHEET FOR FLOW TEST IN OIL CENTER—NONPERMIT AREA

COMPANY Exxon Co. U.S.A.

1 LEASE	2 WELL NO.	3 UNIT LETTER	4 SECTION-TOWNSHIP-RANGE	5 DATE OF TEST	6 CASING STRING TESTED	7 SHUT IN PRESSURE BEFORE TEST	8 PRESSURE IMMEDIATELY AFTER TEST	9 PRESSURE 1-HR. AFTER TEST	10 EST. VOLUME OF FLUID DURING TEST	11 REMARKS (Oil-Water-Gas-etc.)
Exmont Gas Com. No. 1	1	—	S-4 T-20-S R-37-E	5-25-76	8⅝"	#130	#100	#130	0	OPEN VALVE FOR 15 min. GAS PRESSURE FROM #130 to #100
										0 - ON SURFACE

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: John Pearce

COMPANY Exxon Co U.S.A.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Critchfield "32"	1	I	32-19-37	5-19-[illegible]	8 5/8	0	0	0	0	None

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gilluly "A"	1	M	8-20-37	5-19-76	13 3/8	0	0	0	0	NONE
					9 5/8	105	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	9	O	7-20-37	5-12-76	13	0	0	0	NONE	NONE
					9 5/8	60	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	7	J	7-20-37	5-12-76	13	0	0	0	NONE	NONE
					9 5/8	110	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, Jr.

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "A"	10	D	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	140	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	7	L	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	6	M	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	25	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	5	I	12-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	0	0	0	0	None

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: O. E. Haygood, Jr.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY ASHMUN & HELLIARD

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. W. COOPER	1	F	3-20-37	6-30-76	Surface	0	0	0	0	
					Interm.	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY ASHMUN & HELLIARD

Duncan

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Mallard Exploration, Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Laughlin	1	H	9-20S-37E	5-25-76	20#	-0-	-0-	-0-	TSTM	Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Mallard Exploration, Inc.
200 Wilco Bldg.
Midland, Texas 79701

DATA SHEET FOR FLOW TEST IN OIL CENTER--[illegible] AREA

COMPANY [illegible] OIL PRODUCERS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E. Laughlin	2	M	1-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	120	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKA OIL PRODUCERS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E. Laughlin	1	G	1-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	15	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	4	A	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					9 5/8	40	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper	B	P	2-20-37	5-24-76	13 3/8	0	0	0	NONE	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	5	P	1-20-37	5-17-76	12 1/2	0	0	0	0	None
					9 5/8	40	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Aubrey E. Kenyon W. E. Kenyon, Jr.

COMPANY John H. Hendrix Production

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	1	H	7-20-32	5-17-7[illegible]	15[illegible]	0	0	0	0	[illegible]
					7 5/8	45	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	4	M	17-20-3[illegible]	5-14-7[illegible]	10-3/4	0	0	0	NONE	NONE
					7 5/8	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	3	L	17-20-3[illegible]	5-14-7[illegible]						
					10 3/4	0	0	0	None	None
					7 5/8	15	0	0	None	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	2	N	17-20-3[illegible]	5-14-7[illegible]						
					10 3/4	0	0	0	None	None
					7 5/8	0	0	0	None	None

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. P. Kannan A. P. Kannan, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "BB"	1	K	17-20-37	5-16-56						
					10 3/4	0	0	0	0	None
					7 5/8	85	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	6	I	7-20-37	5-17-56						
					12½	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	4	D	8-20-37	5-17-56						
					12½	0	0	0	0	None
					9 5/8	110	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	3	L	8-20-37	5-17-56						
					12½	0	0	0	0	None
					9 5/8	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY [illegible]

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	2	A	[illegible]	[illegible]						
					12[illegible]	0	0	0	0	None
					9 5/8	60	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	12	J	7-20-37	5-19-[illegible]6						
					13 3/8	0	0	0	0	None
					9 5/8	45	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	11	H	12-20-3[illegible]	5-19-76						
					13 3/8	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "X"	1	L	26-20-37	5-21-76						
					8 5/8	210	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

NAME: A. E. Keegan L. E. Keegan, Jr.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOUNUMENT AREA

COMPANY Continental Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#7	N	15-20-37	5-28-76	S	0	0	0	(1) 0	
					I	800	800	800	1½ Bbl 0	would not bleed off
					P	540	0	120		
Britt B	#8	J	15-20-37	5-28-76	S	800	800	800		would not bleed down
					P	460	0	360	0	
Britt B	#12	E	15-20-37	5-28-76	S	540	0	10	½	water
					P	40	40	40	0	
Britt B	#13	D	15-20-37	5-28-76	S	850	0	25	½	water
					P	50	0	10	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOUNUMENT AREA

COMPANY Conti. Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#3	L	15-20-37	5-28-76	S	0	0	0	0	
					I	900	0	100	0	
					P	40	40	40	0	
Britt B	#4	M	15-20-37	5-28-76	S	0	0	0	0	
					I	200	0	10	¼	Bbl. water
					P	540	0	120	0	
Britt B	#5	K	15-20-37	5-28-76	S	0	0	0	0	
					I	0	0	0	0	
					P	525	0	100	0	
Britt B	#6	F	15-20-37	5-28-76	S	0	0	0	0	
					I	540	0	15	½	water
					P	325	0	125	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER—HOBBS AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B-18	#1	O	18-20-37	5-27-76	S	0	0	0		Has TSTM
					I	50	0	0		
					P	210	210	210		
Britt B-18	#2	F	18-20-37	5-27-76	S	0	0	0		Water TSTM
					I	350	0	200		2 sec. blow down
					P	20	20	20		
Britt B-18	#3	J	18-20-37	5-27-76	S	0	0	0	1	water
					I	440	0	200		4 sec. blow down
					P	20	20	20		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER—HOBBS AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B-18	#4	I	18-20-37	5-27-76	S	0	0	0		
					I	340	0	0	1/2	water
					P	20	20	20		4 sec. blow down
Britt B-18	#5	E	18-20-37	5-27-76	S	0	0	0		
					I	450	10	50		
					P	440	440	440	1/2	water
Britt B-18	#6	P	18-20-37	5-27-76	S	0	0	0		
					I	360				Has TSTM
					P	630	630	630		2 sec. blow down.
Britt B-18	#7	O	18-20-37	5-27-76	S	0	0	0		
					I	120	0	0		Has
										4 sec. blow down.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--NONRESIDENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION-TOWNSHIP-RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B-8	#1	C	8-20-37	5-27-76	S	0	0	0		Has TSTM
					I	5	0	0		1 sec. blow down.
					P					unable to open valve
Britt B-8	#2	C	8-20-37	5-27-76	S	0	0	0		
					I	10	0	0		Has TSTM
					P	40	40	40		2 sec. blow down
Britt B-8	#3	C	8-20-37	5-27-76	S	0	0	0		
					I	10	0	0		Has TSTM.
					P	50	50	50		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--NONRESIDENT AREA

COMPANY Exxon Co. U.S.A.

1 LEASE	2 WELL NO.	3 UNIT LETTER	4 SECTION-TOWNSHIP-RANGE	5 DATE OF TEST	6 CASING STRING TESTED	7 SHUT IN PRESSURE BEFORE TEST	8 PRESSURE IMMEDIATELY AFTER TEST	9 PRESSURE 1-HR. AFTER TEST	10 EST. VOLUME OF FLUID DURING TEST	11 REMARKS (Oil-Water-Gas-etc.)
Everett Gas Com "A"	1	—	S-25 T-20-S R-36-E	5-25-76	7 5/8"	#610	#625	#300	0	OPEN 2" VALVE BLEW FOR 20 SECOND. THEN ONLY SLIGHT TRACE OF GAS
										0- ON SURFACE

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: M M Reese

COMPANY Exxon Co. U.S.A.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "H"17	2	D	17-20-3[illegible]	5-21-7[illegible]	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Petty	1	B	19-20-37	5-20-76	13 3/8	0	0	0	0	
					9 5/8	190	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	2	O	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					9 5/8	85	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	3	P	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					9 5/8	15	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Vaughn A. E. Vaughn Dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "Y"	2	J	17-20-3[illegible]	5-21-76	12 1/2	0	0	0	0	
					8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "T"	7	L	29-19-3[illegible]	5-21-76	12 1/2	0	0	0	0	
					8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "T"	8	K	29-19-3[illegible]	5-21-76	8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "H"17	1	E	17-20-3[illegible]	5-20-76	12 3/4	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon W. E. Kenyon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alaska Cooper	1	A	15-20-37	5-24-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alaska Cooper	2	E	7-20-37	5-24-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "X"	1	L	16-20-37	5-21-76	12 1/2	0	0	0	0	NONE
					8 5/8	60	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "Y"	1	I	17-20-37	5-21-76	12 1/2	0	0	0	0	
					8 5/8	40	0	0	0	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. R. Kenyon A. R. Kenyon, Jr.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt Phillips	#1	E	10-20-37	5-27-38	S	550	0	20	1 661	
					P	150	0	100	0	
Britt Skaggs	#1	P	19-20-37	5-28-38	S	0	0	0	0	
					P	625	0	100	0	
Britt B	#1	O	15-20-37	5-28-38	S	0	0	0	0	
					I	540	0	20	346	water
					P	0	0	0	0	
Britt B	#2	E	15-20-37	5-28-38	S	0	0	0	0	
					I	540	0	15	1	water
					P	625	0	175	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eumont Hardy Unit	#9	D	36-20-37	5-31	S	0	0	0	0	
					P	0	0	0	0	
Eumont Hardy Unit	#16	I	36-20-37	5-31	S	0	0	0	0	
					I	100	0	5	1/8	wtr.
					P	40	40	40	40	
Eumont Hardy Unit	#23	P	36-20-37	5-31	S	0	0	0	0	
					I	70	0	5	0	
					P	0	0	0	0	
Eumont Hardy Unit	#31	A	1-21-36	5-31	S	0	0	0	0	
					P	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#14	L	15-20-37	5-28-76	S	850	0	125	0	
					P	650	0	200	0	
Britt B	#15	M	10-20-37	5-27-76	S	0	0	0	0	
					I	600	0	20	1/4	water
					P	150	450	150	0	
Britt B	#18	N	10-20-37	5-27-76	S	625	0	10	1/2	water
					*P	40	40	40	0	
Britt B	#19			5-28-76	S	620	0	10	1/2	bbl. water
					*P	40	40	40	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#21	L	10-20-37	5-27-76	S	550	0	0	1	
					*P	40	40	40	0	
Britt B	#21	J	10-20-37	5-27-76	S	650	0	10	0	
					*P	40	40	40	0	
Britt B	#22	P	10-20-37	5-27-76	S	150	0	12	0	
					*P	40	40	40	0	
Britt B	#24			5-28-76	S	550	0	70	1/4	water
					P	625	0	175	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Monument Hardy Unit	#41	L	6-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	40	0	0		
Monument Hardy Unit	#43	M	6-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	40	0	0	0	
Monument Hardy Unit	#44	O	6-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	0	0	0		
Monument Hardy Unit	#37	J	6-21-37	5-31	S	0	0	0	0	
					I	280	0	20	¼	wtr.
					* P	40	40	40	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Monument Hardy Unit	#35	H	1-21-36	5-28	S	0	0	0	0	
					I	0	0	0	0	
					P	0	0	0		
Monument Hardy Unit	#37	D	6-21-37	5-31	S	0	0	0	0	
					I	375	0	10	¼	wtr.
					P	0	0	0	0	
Monument Hardy Unit	#39	E	6-21-37	5-31	S	0	0	0	0	
					I	200	0	15	¼	wtr.
					* P	40	40	40	0	
Monument Hardy Unit	#40	K	6-21-37	5-31	S	0	0	0	0	
					I	100	0	5	¼	wtr.
					P	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
[illegible]	[illegible]	[illegible]	[illegible]	5-31	S	0	0	0	0	
					P	0	0	0	0	
HAWK A	#6	G	8-21-37	5-30	S	700	0	0	0	
					P	45	45	45	0	
HAWK B-1	#14	J	8-21-37	5-31	S	230	230	230	1 bbl.	SALT WTR.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Reed B	#11	N	24-20-35	5-27-76	S	0	0	0		
					I	150		0		Water TSTM
					P	50	50	30		
Reed B	#12	K	24-20-36	5-27-76	S	0	0			
					I	120	0	0		Gas TSTM
					P	75	75	25		
Reed B	#13	M	24-20-36	5-27-76	S	0	0	0	0	
					I	0	0	0	0	
					P	50				
Reed B	#14	L	24-20-36	5-27-76	S	0	0	0		
					I	0	0	0		TSTM
					P	50	50	50		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EMU Tubb	#53	G	13-20-37	5-27-76	S	100	0	10	0	
					P	50	0	60	0	
EMU Tubb	#54			5-28-76	S	650	0	10	0	
					*P	40	40	40	0	
EMU Tubb	#55	H	15-20-37	5-25-76	S	0	0	10	1/4	water
					*P	40	40	40	40	
EMU Tubb	#86	D	14-20-37	5-23-76	S	625	0	10	1/2	water
					*P	40	40	40	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
SEMU Tubb	#57	M	14-20-37	5-28-76	S	700	0	10	566	oil, water, mud
					P	340	0	125	0	
SEMU Tubb	#88	F	14-20-37	5-28-76	S	900	0	25	66	water, mud
SEMU Pearsons	#14	I	24-20-37	5-28-76	S	0	0	0	0	
					I	400	0	75	1/2	water
					P	0	0	0	0	
Phillips Hooper	#1	O	27-20-37	5-31-76	S	open-0	0	0	0	
					P	50	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State F-1	#1	O	1-21-36	5-28-76	S	0	0	0	0	
					I	600	0	10	0	
					P	300	0	150	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Rice Engineering & Operating, Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
ice-Monument-	2-37	K	35,T19S, R37E	5-27-76	9-5/8"	95	0	6	None	Bled air off in 132 minutes
at Salt Wate										
isposal System	1-20	H	20,T20S, R37E	5-27-76	9-5/8"	20	0	1	None	Bled air off in 6 minutes
X	2-9	M	9,T20S, R37E	5-27-76	9-5/8"	460	30	410	4 bbls.	Salt water to surface in 20 seconds-flowing by heads at end of 15 minutes flow test
	1-5	M	5,T20S, R37E	5-27-76	13-3/8"	0	-	-	-	
					9-5/8"	810	740	740	None	Gas flow restricted. possible choke nipple inside of 9-5/8" casing valve
					9-5/8"	740	8	12	None	Bled gas off 9-5/8" casing over 18 hour period

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: L. D. Goodheart, Division Manager

COMPANY Rice Engineering & Operating, Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Aztec Oil & Gas Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State Unit X	1	M	35-20-37	5/27	7 5/8	125	0	0	0	----------

I Hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Glenda T. Cobb

COMPANY Aztec Oil & Gas Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--NONPRORATED AREA

COMPANY TEXACO Inc.

POOL	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Grayburg	1	K	Sec. 12 20S, 37E	5-12-76	7-5/8 X 9-5/8	-0-	-0-	-0-	-	
X	2	J	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	820 ✓	60 ✓	825 ✓	192	Water
	3	I	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	620 ✓	-0-	240 ✓	96	Water
	4	J	Sec. 12 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-	
	5	M	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	900 ✓	-0-	750 ✓	672	Water
	6	N X	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-	
	7	O	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	410 ✓	-0-	160 ✓	96 ✓	Water
	8	P X	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	100 ✓	-0-	60 ✓	Trace ✓	Water
	9	N	Sec. 7 20S, 37E	"	7-5/8 X 9-5/8	-0-	-0-	-0-	-0-	
	10	K	Sec. 7 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	11	O	Sec. 13 20S, 37E	"	7X9-5/8	710 ✓	710 ✓	710 ✓	7690	Water
	12	C	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

NAME

COMPANY TEXACO Inc.

*Calculated 24 hour rate based on 1 hour or less flow test = Barrels of water per day.

DATA SHEET FOR FLOW TEST IN OIL CENTER--NONPRORATED AREA

COMPANY TEXACO Inc.

POOL	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Grayburg	13	B	Sec. 13 20S, 37E	5-12-76	5-1/2 X 9-5/8	310 ✓	-0-	110 ✓	24 ✓	Water
	14	A	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	200 ✓	-0-	60 ✓	24 ✓	Water
	15	D	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	280 ✓	-0-	100 ✓	48 ✓	Water
	16	C	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	17	B	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	18	E	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	19	F	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	700 ✓	-0-	700 ✓	Not Est	Gas - Bled to 0 in 15 Mins.
	20	H	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	200 ✓	-0-	90 ✓	Not Est	Gas
	21	E	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	300 ✓	10 ✓	65 ✓	40 ✓	Water
	22	K	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	20 ✓	-0-	20 ✓	Not Est	Gas - Bled to 0 in 5 Mins.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

NAME

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Bull Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State A-20	1	L	20-20-37	5-A-76	7 7/8	350	12	180	7 gal/hr	Casing Strings 13 3/8 - 230' 7 5/8 - 1962' 5 1/2 - 3650' Water Surface Pipe - 0# pressure No Flow
	2	J	20-20-37	5-18-76	7 7/8	0	0	0	Nabbing	Casing Strings 7 5/8 - 2' 4 1/2 - 3548'
	3	O	20-20-37	5-18-76	10 3/4	0	0	0	Nabbing	Casing Strings 10 3/4 - 130' 5 1/2 - 3584'

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Bull Inc

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY THE SUPERIOR OIL COMPANY

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE-A	5		S-13 T-20-S R-36-E	5-26-76	9-5/8	775	-0-	-0-	No Fluid	Dry Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. B. Taylor [signature]

COMPANY THE SUPERIOR OIL COMPANY

WITNESSED BY:

Mr. John Runyan
New Mexico Oil Conservation Commission

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Cities Service Oil Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State F	1	O	Sec. 30 T20S R37E	5-26-76	Interme-diate	Int. 140# Surf 0#	Int. 0# Surf 0#	Int. 42# Surf 0#	No Fluid	Bled off gas - no fluid recovered
State F	2	I	Sec. 30 T20S R37E	5-26-76	Interme-diate	Int. 200# Surf 0#	Int. 0# Surf 0#	Int. 78 Surf 0#	No Fluid	Bled off gas - no fluid recovered
Laughlin B	5	O	Sec. 5 T20S R37E	5-26-76	Interme-diate	Int. 0# Surf 0#	Int. 0# Surf 0#	Int. 0# Surf 0#	No Fluid	No gas - no fluid recovered

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Robert H Johnson Jr

COMPANY Cities Service Oil Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Sun Oil

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
[illegible] Laughlin	1	I	5-20-37	[illegible]	[illegible]	0 50#	0	0	0	
[illegible] Laughlin	2	L	4-20-37	[illegible]	[illegible]	0 0	0 0	0 0	0 0	
A B Reeves	1	G	29-20-37	[illegible]	9 5/8	190 ✓	75 ✓	193 ✓	0	ALL GAS (Line Plugged)
A Cooper	1	D	7-20-37	[illegible]	13-3/8 9 5/8 7	0 21 55	0 0 0	0 0 0	0 0 0	
A Cooper	3	D	7-20-37	5-25-76	13-3/8 9 5/8 7	0 0 112	0 0 0	0 0 0	0 0 0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W D Wilson

COMPANY Sun Oil Company

WITNESSED BY LES CLEMONS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	6	N	7-20-37	5-12-76	13	0	0	0	NONE	NONE
					9 5/8	35	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	5	J	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	190	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	4	O	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	30	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	3	N	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	60	0	0	NONE	GAS

I Hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID CASING TEST	REMARKS (Oil-Water-Gas-etc.)
J. M. Cooper	1	O	Sec. 5 20S, 37E	5-12-76	7 X 9-5/8	-0-	-0-	-0-	-0-	
	2	A	Sec. 5 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	3	G	Sec. 5 20S, 37E	"	7 X 9-5/8	40 ✓	-0-	-0-	Not Est.	Gas
	4	H	Sec. 5 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	5	G	Sec. 5 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is true and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID CASING TEST	REMARKS (Oil-Water-Gas-etc.)
Vacuum Monument Unit	1	D	Sec. 19 20S, 37E	5-17-76	7X9-5/8	110 ✓	-0-	-0-	Not Est.	Gas
	2	C	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	500 ✓	10 ✓	10 ✓	Not Est.	Gas
	3	B	Sec. 19 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	4	A	Sec. 19 20S, 37E	"	7X9-5/8	75 ✓	-0-	20 ✓	Not Est.	Gas
	5	D	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	-0-	
	6	C	Sec. 20 20S, 37E	"	7X9-5/8	100 ✓	-0-	95 ✓	Not Est.	Gas
	7	G	Sec. 20 20S, 37E	"	7X9-5/8	20 ✓	-0-	-0-	Not Est.	Gas
	8	A	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	9	D	Sec. 21 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	10	C	Sec. 21 20S, 37E	"	7X9-5/8	650 ✓	500 ✓	860 ✓	672	Water - 5 Minutes pressured to 860 psi.
	11	E	Sec. 19 20S, 37E	"	7X9-5/8	230 ✓	-0-	120 ✓	11	Water

I hereby certify that the information submitted is true and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

*Calculated 24 hour rate based on 1 hour or less flow test - Barrels of water per day.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION, TOWNSHIP AND RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
C. H. Weir 'A'	4	L	Sec. 12 20S, 37E	5-12-76	5-1/2 X 8-5/8	50 ✓	-0-	50 ✓	276 ✓	Oil
	7	L	Sec. 12 20S, 37E	"	7-5/8 X 10-3/8	700 ✓	-0-	25 ✓	Not Est	Gas
	8	F	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	800 ✓	200 ✓	800 ✓	1440 ✓	Water
	9	K	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	800 ✓	-0-	400 ✓	672 ✓	Water
	10	J	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	720 ✓	50 ✓	740 ✓	384 ✓	Water
	11	G	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	920 ✓	570 ✓	830 ✓	3552 ✓	Water
C. H. Weir 'B'	1	H	Sec. 11 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	Not Est.	Gas
	2	A	Sec. 11 20S, 37E	"	5-1/2 X 9-5/8	400 ✓	-0-	110 ✓	25 ✓	Water
	4	I	Sec. 11 20S, 37E	"	7-5/8 X 10-3/4	-0-	-0-	-0-	-0-	
	5	G	Sec. 11 20S, 37E	"	5-1/2 X 8-5/8	460 ✓	-0-	200 ✓	192 ✓	Water
	6	P	Sec. 11 20S, 37E	"	2-7/8 X 8-5/8	450 ✓	-0-	185 ✓	96 ✓	Water
	7	J	Sec. 11 20S, 37E	"	2-7/8 X 9-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION, TOWNSHIP AND RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M. C. Weir 'B'	7	M	Sec. 12 20S, 37E	5-12-76	2-7/8 X 9-5/8	1040 ✓	-0-	1000 ✓	1584 ✓	Water
	8	N	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	600 ✓	-0-	-0-	192 ✓	Water
	9	O	Sec. 12 20S, 37E	"	2-7/8 X 7-5/8	100 ✓	-0-	50 ✓	-0-	
	10	P	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	140 ✓	140 ✓	140 ✓	Not Est.	Gas - Blew down in 1 sec.
L. R. Kershaw	7	C	Sec. 13 20S, 37E	"	2-7/8 X 9-5/8	850 ✓	-0-	310 ✓	Trace ✓	Water & Gas
	8	D	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	710 ✓	710 ✓	710 ✓	7690	Water - Same well as Skaggs Grayburg Unit #11
	9	C	Sec. 13 20S, 37E	"	2-7/8 X 9-5/8	250 ✓	-0-	70 ✓	Not Est.	Gas - Blew down in 2 Mins.
	10	F	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	800 ✓	10 ✓	600 ✓	240 ✓	Water
	11	E	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	800 ✓	10 ✓	225 ✓	400 ✓	Water
E.N.B. Phillips 'D'	1	F	Sec. 10 20S, 37E	"	2-7/8 X 9-5/8	20 ✓	-0-	20 ✓	Not Est.	Gas
	2	G	Sec. 10 20S, 37E	"	2-7/8 X 9-5/8	275 ✓	-0-	100 ✓	48 ✓	Water
E.N.B. Phillips 'C'	1	A	Sec. 10 20S, 37E	"	2-7/8 X 8-5/8	20 ✓	-0-	20 ✓	Not Est.	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice Monument Unit	12	F	Sec. 19 20S, 37E	5-17-76	5-1/2 X 7-5/8	-0-	-0-	-0-	-0-	
	13	G	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	250 ✓	-0-	-0-	Not Est.	Gas
	14	H	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	160 ✓	-0-	-0-	Not Est.	Gas
	15	E	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	100 ✓	-0-	-0-	Not Est.	Gas
	16	F	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-0-	
	17	G	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	420 ✓	-0-	130 ✓	34 —	Water
	18	H	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	-0-	
	19	E	Sec. 21 20S, 37E	"	7X9-5/8	450 ✓	-0-	120 ✓	90 ✓	Water
	20	I	Sec. 24 20S, 36E	"	7X9-5/8	125 ✓	-0-	-0-	2 ✓	Water
	21	L	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	525 ✓	-0-	380 ✓	80 ✓	Water
	22	K	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	510 ✓	-0-	510 ✓	-0-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice Monument Unit	23	J	Sec. 19 20S, 37E	5-17-76	5-1/2 X 7-5/8	-0-	-0-	-0-	-	
	24	I	Sec. 19 20S, 37E	"	4-1/2 X 9-5/8	420 ✓	-0-	20 ✓	-	
	25	L	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	100 ✓	-0-	-0-	Not Est.	Gas
	26	K	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-	
	27	P	Sec. 24 20S, 36E	"	7 X 9-5/8	-0-	-0-	-0-	-	
	28	M	Sec. 19 20S, 37E	"	7 X 9-5/8	550 ✓	25 ✓	260 ✓	96 ✓	Water
	29	N	Sec. 19 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	Not Est.	Gas
	30	O	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-	
	31	P	Sec. 19 20S, 37E	"	7 X 9-5/8	110 ✓	-0-	200 ✓	208 ✓	Water
	32	~~O~~ M	Sec. ~~19~~ 20 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-	
	33	N	Sec. 20 20S, 37E	"	4-1/2 X 7-5/8	-0-	-0-	-0-	-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

Lease	Well No.	Unit Letter	Section, Township, Range	Date of Test	Casing Size & Wt. Tested	Shut-in Pressure, Csg. Prior to Test	Pressure Immediately After Test	Pressure 5 Min. After Test	*Est. Volume of Fluid During Test	Remarks (Oil-Water-Gas-etc.)
ice Monument	36	D	Sec. 30 20S, 37E	5-17-76	7 X 9-5/8	-0-	-0-	-0-	-0-	
t	37	A	Sec. 30 20S, 37E	"	7 X 9-5/8	500 ✓	-0-	330 ✓	Not Est.	Gas
	38	D	Sec. 29 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	39	C	Sec. 29 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	40	B	Sec. 29 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
y Riddell	1	N	Sec. 12 21S, 36E	"	5-1/2 X 8-5/8	600 ✓	-0-	210 ✓	Not Est.	Gas
Mexico "H" ate NCT-2	26	B	Sec. 20 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
Mexico "B" ate NCT-4	27	G	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	220 ✓	50 ✓	220	Not Est.	Gas
Mexico "H" ate NCT-3	25	D	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	75 ✓	-0-	40 ✓	Not Est.	Gas
Mexico "C" ate NCT-2	9	C	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	140 ✓	-0-	20 ✓	Not Est.	Gas

I hereby certify that the information submitted is true and complete to the best of my knowledge.

Name: C. L. [illegible]

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1 HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
					Surf	0	0	0		
V. Laughlin	1	D	1-20S-32E	5-24-76	Inter	112	0	0	None	Gas Blow
					Surf	0	0			
	2	C	1-20S-32E	5-24-76	Inter	210	50	50	None	Gas Blow
					Surf	0	0	0		
	3	B	1-20S-32E	5-24-76	Inter	160	0	160	Less than	Water (Spray)
	4	A	1-20S-32E	5-24-76	Surf	580	50	125	Less than	Water (Spray)
					Surf	0	0	0		
C. Phillips	1	N	35-19S-32E	5-24-76	Inter	1250	0	0	Less than	Water - Dead in 10 min
					Surf	105	0	0		
	2	K	35-19S-32E	5-24-76	Inter	120	10	45	Less than	Water
					Surf	0	0	0		
Vivian McKee Unit	101	B	18-20S-38E	5-24-76	Inter	550	425	525	None	Air
					Surf	0	0	0		
	102	L	8-20S-38E	5-24-76	Inter	0	0	0	None	
					Surf	0	0	0		
	201	I	7-20S-38E	5-24-76	Inter	0	0	0	None	
					Surf	0	0	0		
	202	J	7-20S-38E	5-24-76	Inter	2	0	0	None	Slight Gas - 1 min blow
					Surf	0	0	0		
	203	K	7-20S-38E	5-24-76	Inter	35	0	3	None	✓ ✓ - 4 min blow
					Surf	0	0	0		
	110	G	18-20S-38E	5-25-76	Inter	160	135	135	None	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J.W. Petzel

COMPANY Amerada Hess Corp.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1 HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
					Surf	0	0	0		
Vivian McKee Ut.	111	I	18-20S-38E	5-24-76	Inter	(2)	0	0	None	Gas - Dead in 3 min
					Surf	0	0	0		
	112	F	18-20S-38E	5-25-76	Inter	100	75	100	None	Gas
					Surf	0	0	0		
	113	P	18-20S-38E	5-24-76	Inter	45	35	35	None	Gas
					Surf	0	0	0		
	114	A	18-20S-38E	5-24-76	Inter	25	0	0	None	Gas - Dead in 15 min
					Surf	0	0	0		
	117	H	18-20S-38E	5-25-76	Inter	15	0	0	None	Air - Dead in 8 min
					Surf	0	0	0		
	119	J	18-20S-38E	5-24-76	Inter	2	0	0	None	Gas
					Surf	0	0	0		
	121	D	17-20S-38E	5-24-76	Inter	20	0	0	None	Gas - Dead in 5 sec.
					Surf	0	0	0		
	124	C	17-20S-38E	5-24-76	Inter	4	0	0	None	Gas - Dead in 5 min
					Surf	0	0	0		
	141	M	17-20S-38E	5-24-76	Inter	2	0	0	None	
					Surf	0	0	0		
	142	L	17-20S-38E	5-24-76	Inter	2	0	0	None	
					Surf	0	0	0		
	401	N	7-20S-38E	5-25-76	Inter	15	1	0	None	Gas
					Surf	0	0	0		
	402	C	18-20S-38E	5-24-76	Inter	1275	1125	1125	None	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J.W. Petzel

COMPANY Amerada Hess Corp.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Rhodes NCT	501	O	1-20S-37E	5-24-76	Surf	5	0	0		Air - Died in 7 min
					Inter	220	225	225	None	Air
	601	P	1-20S-37E	5-24-76	Surf	0	0	0		
					Inter	155	0	0	Gas BL	Gas to Salt Spray Died in Less
	701	D	12-20S-37E	5-24-76	Surf	0	0	0		
					Inter	90	25	25	None	
	702	M	2-20S-37E	5-24-76	Surf	5	0	0		Air
					Inter	550	225	225	None	Gas
	901	A	18-20S-37E	5-24-76	Surf	0	0	0		
					Inter	40	0	0	None	Gas - Died in 10 min
State Q	1	J	14-20S-37E	5-24-76	Surf	0	0	0		
					Inter	25	0	0	None	Slight Gas Blow
	2	I	2-20S-37E	5-24-76	Surf	0	0	0		
					Inter	75	0	0	None	✓ ✓ ✓
	3	O	14-20S-37E	5-24-76	Surf	0	0	0	None	
	4	I	14-20S-37E	5-24-76	Surf	675	25	675	None	Slight mist, Test released well bled off to 0#
	5	O	14-20S-37E	5-24-76	Surf	1225	700	325	None	Gas
	6	P	14-20S-37E	5-24-76	Surf	350	0	0	None	Gas Blow
State W	1	H	30-20S-37E	5-24-76	Surf	0	0	0		
					Inter	280	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Petzel

COMPANY Amerada Hess Corp

1

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State W	2	G	30-20S-37E	5-25-76	Surf	0	0	0		
					Inter	575	0	185	0.25 BBL	Slight Spray
	3	E	30-20S-37E	5-25-76	Surf	0	0	0		
					Inter	310	0	100	0.25 BBL	Slight Spray - Died in 13 min
	4	E	30-20S-37E	5-25-76	Surf	0	0	0		
					Inter	TSTD	8	60	None	Gas
State M	2	J	13-20S-36E	5-25-76	Surf	0	0	0		
					Inter	220	10	150	None	Gas
State Z	1	A	13-20S-36E	5-26-76	Surf	0	0	0		
					Inter	485	0	115 *	1.5 BBL	* water flowed for short time, Gas for rest of test
	2	A	13-20S-36E	5-25-76	Surf	0	0	0		
					Inter	40	9	18	None	Gas
T. Anderson	1	K	8-20S-37E	5-25-76	Surf	85	60	85		Air
					Inter	15	0	0	None	Air - Died in 6 min
	2	K	8-20S-37E	5-25-76	Surf	0	0	0		
					Inter	330	0	0	None	Gas - Died in 30 sec.
	3	K	8-20S-37E	5-25-76	Surf	0	0	0		
					Inter	[illegible]	[illegible]	[illegible]	None	Gas - Died in 10 min
	4	K	8-20S-37E	5-25-76	Surf	0	0	0		
					Inter	10	0	0	None	Air - Died in 8 min
Adkins	1	M	5-20S-37E	5-25-76	Surf	0	0	0		
					Inter	0	0	0	None	
	3	M	5-20S-37E	5-25-76	Surf	0	0	0		
					Inter	600	—	—	None	Gas well completed thru intermediate string

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Petzel

COMPANY Amerada Hess Corp

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DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HRS. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "H"	1	F	25-20-36	5-27-76	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	
↓	2	D	25-20-36	5-27-76	13 x 9⅝	0	0	0	0	
					9⅝ x 7	300#	5#	150#	5 BBLS	GAS & WATER (MIST)

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HRS. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "G"	1	J	20-20-37	5-27-76	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 3-HRS. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "F" X	1	P	17-20-37	5-27-76	13 x 9⅝	0	0	0	0	
					9⅝ x 7	850#	850#	850#	15 BBLS	WATER (MIST)
↓	2	O	17-20-37	5-27-76	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Nelia Hendry

COMPANY SKELLY OIL CO.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. WINNETTE II	1	L	9-20-37	5-27-74	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	0	0	0	0	
	7	I	9-20-37	5-27-74	13 x 7	0	0	0	0	
	8	P	9-20-37	5-27-74	13 x 7	0	0	0	0	
	9	J	9-20-37	5-27-74	13 x 7	0	0	0	0	
	10	O	9-20-37	5-27-74	13 x 7	0	0	0	0	
	11	I	9-20-37	5-27-74	9 5/8 x 5 1/2	1170#	0	120#	1/2 BPH	GAS & WATER (SALTY)
✓	13	O	9-20-37	5-27-74	9 5/8 x 5 1/2	500#	0 #	11.5#	3 1/2 BPH	GAS & WATER (SALTY)

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Odie Hunley

COMPANY SKELLY OIL CO.

N.M.O.C.C.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. WINNETTE II	1	L	9-20-37	5-27-74	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	0	0	0	0	
	2	M	9-20-37	5-27-74	13 x 9 5/8	WELDED	TO 9 5/8 x 7		CASING VOLUME	
					9 5/8 x 7	420#	0	150#	1 1/2 BPH	GAS & WATER (SALTY)
	3	N	9-20-37	5-27-74	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	435#	5	30#	0	GAS
	4	K	9-20-37	5-27-74	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	430#	3#	25#	0	GAS
✓	5	J	9-20-37	5-27-74	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	540#	0	200#	MIST	GAS & WATER (SALTY)

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Odie Hunley

COMPANY SKELLY OIL CO.

Phillips Petroleum Company
Room 606, Phillips Building
COMPANY Odessa, Texas 79761

DATA SHEET FOR FLOW TEST IN OIL CENTER--PENWELL AREA

FIELD	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE CASING TEST	PRESSURE DIFFERENTIAL ACROSS TEST	PRESSURE TIME LIMIT TEST	EVIDENCE OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
[illegible]	1	K	[illegible],20,37	-20-76	Surface 9-5/8	0 [illegible]	0 [illegible]	0 [illegible]	None [illegible]	Gas Only
[illegible]	2	L	[illegible],20,37	-20-76	Surface 9-5/8	0 [illegible]	0 10[illegible]	0 [illegible]	None [illegible]	Gas Only
[illegible]	3	M	18,20,37	-20-76	Surface 9-5/8	[illegible]	0 [illegible]	0 10#	None [illegible]	Gas Only
[illegible]	4	N	18,20,37	-20-76	Surface 9-5/8	No valve [illegible]	170#	580#	None	No valve on surface csg. Gas Only
Mexico	1	A	18,20,37	-20-76	Surface 9-5/8	0 [illegible]	0 0	0 0	None None	Gas Only
Mexico	2	G	18,20,37	-20-76	Surface 9-5/8	0 [illegible]	0 0	0 0	None None	Gas Only
Mexico	3	H	18,20,37	-20-76	Surface 9-5/8	0 [illegible]	0 0	0 50#	None None	Gas Only
Quapaw	1	P	19,20,37	-20-76	Surface 9-5/8	0 100#	0 5#	0 15#	2 B. Hr.	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible] L. L. Frantz

COMPANY Phillips Petroleum

DATE: May 25, 1976

13-5/8 Valves on all wells bottom valve
9-5/8 " " " " Middle "
7. " " " " Top "

NOTE: Per conversation between Messrs. Jerry Sexton/C. L. Sumerwell, these tests were not witnessed by NMOCC representative.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Ian "DC" State	1	D	26-19-37	5-18-76	9-5/8"	50	0#	0#	0	Gas
F.W.Kutter "B"	1	H	21-19-37	5-18-76	10-3/4"	0	0	0		
"	2	E	21-19-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	550#	0	50#	1 bbl	Gas and water
"	3	D	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	4	F	"	"	8-5/8"	0	0	0		
E.Shipp "A"	1	F	21-19-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
T. Anderson	1	O	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	2	C	17-20-37	"	10-3/4"	125	12#	75#	0	Gas
"	"	"	"	"	7-5/8"	25	0	0	0	#
"	3	P	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	4	B	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	6	A	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	7	H	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	8	G	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
R.R.Bell "C"	1	P	13-20-36	5-19-76	10-3/4"	0	0	0		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
R.R. Bell "C"	1	P	13-20-36	5-19-76	7-5/8"	105	0	0	0	Gas (dual)
"	2	O	13-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	375#	0	225#	1 bbl ✓	Water & gas
Graham St. "H"	1	L	13-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
B.Whitmire	1	G	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	20#	0	20#	0	Gas
"	2	B	8-20-37	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	3	F	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	5	F	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	6	B	"	"	13-3/8"	50#	20#	50#	0	Gas
"	"	"	"	"	9-5/8"	0	0	0		
"	8	F	"	"	13-3/8"	0	0	0		
"	"	"	"	"	[illegible]	0	0	0		
"	9	H	"	5-18-76	9-5/8"	0	0	0		
A. B. Reeves	1	L	29-20-37	5-20-76	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	2	E	"	"	16"conductor	0	0	0		
"	"	"	"	"	9-5/8"	375#	0	175#	2 bbls water ✓	
Sunshine	1	N	30-20-37	5-19-76	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR.AFTER TEST	EST.VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Sunshine	2	H	33-20-37	5-19-76	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	10#	0	0	0	Gas
"	3	K	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	100#	0	100#	0	Gas
H.T.Orcutt "C"	1	E	2-20-37	"	9-5/8"	0	0	0		
L.W.White "A"	1	P	25-20-36	5-20-76	10-3/4"	175#	50#	175#	2 bbls	Gas & water
"	"	"	"	"	7-5/8"	100#	70#	100#	1 bbl	Gas & oil
L.W.White "A"	2	I	25-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	700#	200#	300#	0	Gas (dual csg compl)
"	3	H	25-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	5	A	"	"	10-3/4"	30#	0	30#	½ bbl	Water
"	"	"	"	"	7-5/8"	200#	0	50#	0	Gas
Bell-Ramsay "B"	1	K	29-20-37	"	16"conductor 0#		0	0		
"	"	"	"	"	9-5/8"	400#	0	75#	1 bbl	Gas & water
"	2	N	33-20-37	"	16"conductor 0		0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	3	L	28-20-37	"	9-5/8"	0	0	0		
Bell-Ramsay "D"	1	G	35-20-37	5-19-76	9-5/8"	0	0	0		
H.T.Orcutt "D"	1	B	13-20-36	5-25-76	10-3/4"	20#	0	0		gas
"	"	"	"	"	7-5/8"	900#	100#	300#	Spray	water - gas
"	2	G	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
H.T.Orcutt "C"	1	E	11-20-37	"	8-5/8"	430#	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Gossard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR.AFTER TEST	EST.VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
H.T.Mattern "C"	9	P	7-21-37	5-19-76	8-5/8"	10#	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Gossard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EJ Becker	5	D	S-20S-37E	5-25-71	Sur.	51	0	22	2 BO	Water & Gas - Bled off 11 min.
EJ Becker	5	D	S-20S-37E	5-25-71	Tub.	60	0	5	None	Gas - Bled off 1 min.
EJ Becker	7	A	S-20S-37E	5-25-71	Sur.	0	0	0	None	
EJ Becker	7	A	S-20S-37E	5-25-71	Tub.	60	0	7	None	Gas - Bled off 5 sec.
EJ Becker	14	H	S-20S-37E	5-25-71	Sur.	17	0	0	None	Gas - Bled off 45 sec.
EJ Becker	14	H	S-20S-37E	5-25-71	Tub.	22	0	0	None	Gas - Bled off 1 min.
EJ Becker	15	H	S-20S-37E	5-25-71	Sur.	0	0	0	None	
EJ Becker	15	H	S-20S-37E	5-25-71	Tub.	27	0	4	None	Gas - Bled off 5 sec.
EJ Becker	10	E	S-20S-37E	5-25-71	Sur.	41	0	0	None	Gas - Bled off 1 sec
EJ Becker	10	E	S-20S-37E	5-25-71	Tub.	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Thomas Benham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EJ Becker	13X	E	S-20S-37E	5-25-71	Sur.	170	0	2	None	Gas - Bled off 7 sec
EJ Becker	13X	E	S-20S-37E	5-25-71	Tub.	47	0	16	None	Gas - Bled off 3 min
Becker Gas Unit	1	E	S-20S-37E	5-25-71	Sur.	0	0	0	None	
Becker Gas Unit	1	E	S-20S-37E	5-25-71	Tub.	0	0	0	None	
EJ Becker	11	L	S-20S-37E	5-25-71	Sur.	80	0	28	None	Gas - Bled off 5 sec.
EJ Becker	11	L	S-20S-37E	5-25-71	Tub.	130	90	130	None	Gas
EJ Becker	11	L	S-20S-37E	5-25-71	Sur.	2	0	0	None	Gas - Bled off 10 sec.
EJ Becker	11	L	S-20S-37E	5-25-71	Tub.	80	0	5	None	Gas - Bled off 2 min.
EJ Becker	19	I	S-20S-37E	5-25-71	Sur.	0	0	0	None	
EJ Becker	19	I	S-20S-37E	5-25-71	Tub.	35	0	10	None	Gas - Bled off 5 sec.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Thomas Benham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
[illegible]	22	I	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	220 psi	None	Gas - Med. est. 11 mcf.
[illegible]	22	I	[illegible]	[illegible]	[illegible]	240	0	120	None	Gas - Med. est. 6 mcf.
[illegible]	12	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	None	
[illegible]	12	A	[illegible]	[illegible]	[illegible]	[illegible]	0	2	None	Gas - Med. est. 6 mcf.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State P	1	F	25-20S-36E	5-23-74	Sqz.	0	0	0	None	
State P	1	F	25-20S-36E	5-23-74	Tst.	0	0	0	None	
State P	2	C	25-20S-36E	5-23-74	Sqz.	0	0	0	None	
State P	2	C	25-20S-36E	5-23-74	Tst.	0	0	0	None	Gas - Med. est. 2 mcf.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amoco Production Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gillully "A" Fed.	2	A	24 20 36	S-18	Int.	20	10	10	0	Gas
"	3	G	25 20 36	S-17	Int.	300	0	60	1 Bbl	Water flow with gas
"	5	B	"	S-18	Int.	500	0	30	10 Bbl	Water
"	6	K	"	S-17	Int.	30	0	0	0	Gas
"	8	J	24 20 36	S-18	Int.	190	0	120	10 Gal	Water - Standing full of water
"	9	C	"	"	Int.	20	0	0	0	Gas - Bled off 5 min.
"	10	H	"	"	Int.	55	0	0	0	Gas - Surf. 55#, bled int. - surf. 0 in 3-1/2 min.
"	11	G	"	"	Int.	20	0	20	0	Gas - Bled off 1 min.
"	12	D	"	S-17	Int.	320	0	0	0	Standing full of water - bled off 2 min.
"	13	F	"	S-18	Int.	40	0	20	2 Gal	Water
"	14	E	"	"	Int.	0	0	0	0	
Gillully Fed. Gas Co	4	B	24 20 36	S-18	Int.	0	0	0	0	Light blow - less than 1#
"	7	D	"	"	Int.	25	0	10	0	Gas
Gillully "B" Fed.	1	L	25 20 36	S-17	Int.	0	0	0	0	
"	2	B	21 20 37	S-18	Int.	0	0	0	0	
"	4	D	22 20 37	S-17	Int.	0	0	0	0	
"	5	C	"	"	Int.	640	300	640	9 Bbl	Water flow
"	6Y	A	21 20 37	"	Int.	720	130 (30 min test)	540	100 Bbl	Water flow - 200 bbl. per hour

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA (Page 2)

COMPANY Amoco Production Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gillully "B" Fed.	7	K	22 20 37	S-17	Int.	0	0	0	0	
"	8	C	"	"	Int.	580	100	220	2 Bbl	Water flow
"	9	D	"	"	Int.	775	20	630	38 Bbl	Water flow - Gas 775# to 500#
"	10	B	"	"	Int.	460	0	10	0	Gas
"	11	F	"	"	Int.	635	30	150	1 Bbl	Water flow

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: B. W. Grayson

COMPANY Amoco Prod[illegible]any

Note: Witnessed by Mr. Nathan Clegg, Field Representative - NMOCC

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J.H. Williams	1	A	[illegible]	5-23-74	Int.	0	0	0	None	
J.H. Williams	2	C	[illegible]	5-23-74	Int.	TSI	0	0	None	Gas Well est 3 mcfd

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
U.S. Section B	1	M	S-18-37E	5-23-74	Int	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY GETTY OIL COMPANY

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
[illegible] UNIT	50	M	22-19-37	5-12-76	SURFACE	600 PSI	0 PSI	240 PSI	1.25 Bbls.	Water-Oil String Pressure was 580 PSI. Fell to 0 PSI during Flow Period. Built up to 240 PSI 1 hr. after Flow Test.
[illegible] UNIT	59	N	22-19-37	5-12-76	SURFACE	400 PSI	0 PSI	40 PSI	.75 Bbl.	Flow Oil & a Little Gas.
[illegible] UNIT	67	N	20-19-37	5-13-76	SURFACE	50 PSI	0 PSI	0 PSI	TSTM	Blew Down to 0# in 2 Sec.
[illegible] UNIT	82	O	20-19-37	5-12-76	SURFACE	0 PSI	0 PSI	0 PSI	TSTM	Flowed Water for 5 Sec.
[illegible] UNIT	92	F	35-19-37	5-12-76	SURFACE	293 PSI	0 PSI	0 PSI	1 Bbl.	Flow Oil & a Little Gas
[illegible] UNIT	130	F	12-20-37	5-12-76	SURFACE	930 PSI	930 PSI	940 PSI	19 Bbls.	Water.
[illegible] UNIT	131	G	12-20-37	5-12-76	SURFACE	920 PSI	650 PSI	790 PSI	5 Bbls.	Water.
[illegible] UNIT	915	K	2-20-37	5-12-76	SURFACE	425 PSI	0 PSI	220 PSI	-	Gas blew for 30 Sec., then Slight Blow.
E. LAUGHLIN	2	K	4-20-37	5-13-76	SURFACE	400 PSI	50 PSI	50 PSI	-	Gas.
MORRISON	2	I	8-20-37	5-13-76	INTERMED.	145 PSI	0 PSI	20 PSI	-	Gas Blew Off in 2 Min.
STATE "E"	2	K	16-20-37	5-13-76	INTERMED.	980 PSI	150 PSI	960 PSI	7 Bbls.	Water.
STATE "K"	1	K	13-20-36	5-13-76	INTERMED.	290 PSI	0 PSI	20 PSI	3 Bbls.	Water.
[illegible]	1	H	12-20-37	5-13-76	[illegible]	200 PSI	0 PSI	100 PSI	TSTM	WATER. Flow of Oil. Gas.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: C. L. Wade, AREA SUPERINTENDENT

COMPANY GETTY OIL COMPANY
P.O. Box 249
Hobbs, New Mexico 88240

MSS/bb
5-18-76

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY El Paso Natural Gas Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Shell State	11	C	13-20-36	5-24-76	Surf. 8 5/8	1600	0	0	0	Blew to 0 psi in approx. 5 seconds.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: C. D. Kyser

COMPANY El Paso Natural Gas Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY W. K. Byrom

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. H. Williams	2	O	34-19-37	5-19-76	85/8	700	0	70	1/8"stream	Salt Water
Williams	3	N	34-19-37	5-19-76	85/8	400	0	0	1/8"stream	Salt Water
J. W. Cooper C (Eumont)	3	B	3-20-37	5-19-76	85/8	100	0	0	1/8"stream	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY W. K. Byrom

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY W. K. Byrom

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY W. K. Byrom

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Marathon Oil Company

[illegible]	WELL NO.	UNIT-LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
rtha Barber	2	C	S-20S-37E	5-25-76	9-5/8"	110	45	140	11 Gallons	1 Gallon oil; 10 Gallons water
	4	K	S-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	5	D	S-20S-37E	5-25-76	9-5/8"	400	0	175	3 Gallons	3 Gallons oil
	6	L	S-20S-37E	5-25-76	9-5/8"	360	50	90	4 Barrels	4 Barrels oil
	7	F	S-20S-37E	5-25-76	9-5/8"	600	100	195	2.5 Barrels	2.5 Barrels oil
	8	E	S-20S-37E	5-25-76	9-5/8"	5	0	0	No Fluid	
	9	E	S-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	10	L	S-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	11	D	S-20S-37E	5-25-76	8-5/8"	5	0	*0	No Fluid	
	12	L	S-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
.R. Laughlin	1	E	9-20S-37E	5-25-76	9-5/8"	50	0	20	.5 Barrel	.5 Barrel oil
	2	F	9-20S-37E	5-25-76	9-5/8"	525	25	210	1 Barrel	.5 Barrel oil; .5 Barrel water
	3	G	9-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
nsen State	1	B	16-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	2	G	16-20S-37E	5-25-76	9-5/8"	800	795	860	21 Barrels	21 Barrels water(salt)
	5	H	16-20S-37E	5-25-76	8-5/8"	0	0	0	No Fluid	
	6	G	16-20S-37E	5-25-76	10-3/4"	560	45	120	2 Barrels	2 Barrels oil & drilling mud

* Slight Puff

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

NAME: Dayle Stinson

COMPANY Marathon Oil Company

CAMPBELL, BINGAMAN AND BLACK, P. A.
LAWYERS

JACK M. CAMPBELL
JEFF BINGAMAN
BRUCE D. BLACK
MICHAEL B. CAMPBELL

POST OFFICE BOX 2208
JEFFERSON PLACE
SANTA FE, NEW MEXICO 87501
TELEPHONE (505) 988-4421

OIL CONSERVATION COMM.
Santa Fe
JUN - 9 1977

June 6, 1977

Mr. Joe Ramey
Director
Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

Re: OCC Case #5941, Show Cause Hearing
to Restrict or Suspend Fluid Injection,
Lea County, New Mexico - Entry of Appearance

Dear Mr. Ramey:

This is to advise the Commission of my entry of appearance on behalf of Gulf Oil Corporation in the hearing on the captioned matter now set for June 13, 1977, at 9 a.m.

You are advised that Mr. Morgan Copeland, or Mr. Jeffrey G. Shrader, both of whom are members of the Texas Bar, may participate with me in connection with this matter.

Very truly yours,

Jack M. Campbell

JMC:bf
cc: Mr. Morgan Copeland
Mr. Jeffrey G. Shrader

Dockets Nos. 21-77 and 22-77 are tentatively set for hearing on June 22 and July 6, 1977. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - MONDAY - JUNE 13, 1977

OIL CONSERVATION COMMISSION - 9 A.M. - MORGAN HALL
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 5872: In the matter of Case 5872 being reopened pursuant to the provisions of Order No. R-5373 which order suspended Rules 15(A) and 15(B) of the General Rules for Prorated Gas Pools as promulgated by Order No. R-1670, as amended, to permit overproduced wells to continue to produce gas during the severe winter weather conditions without danger of being shut in for overproduction. All interested parties may appear and show cause why said suspension should not be rescinded. Also to be considered will be the matter of final disposition of overproduction accrued during the period of suspension of Rules 15(A) and 15(B), and what, if any, special consideration should be given to underproduction accrued to gas wells during the period of suspension of said rules.

Upon application of El Paso Natural Gas Company, this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 5941: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in the following areas in Lea County, New Mexico:

NORTH AREA

Township 17 South, Range 33 East: Section 36;
Township 17 South, Range 34 East: Sections 1 thru 4, 9 thru 16, E/2 of 20, 21 thru 29, E/2 of 30, and 31 thru 36;
Township 17 South, Range 35 East: W/2 of Section 6, all of 7, S/2 of 8, and all of 17 thru 36;
Township 18 South, Range 34 East: Sections 1 thru 3, N/2 of 4, NE/4 of 5, and all of 11 and 12;
Township 18 South, Range 35 East: Sections 2 thru 8.

CENTRAL AREA

Township 19 South, Range 37 East: Sections 15, 16, 21, 22, 26 thru 28, and 33 thru 36;
Township 20 South, Range 36 East: Sections 13, 24, and 25;
Township 20 South, Range 37 East: Sections 1 thru 5, 7 thru 30, and 35 and 36;
Township 20 South, Range 38 East: Sections 5 thru 8, 17 thru 20, and 29 thru 31;
Township 21 South, Range 36 East: Sections 1 and 12;
Township 21 South, Range 37 East: Sections 5 thru 8.

SOUTH AREA

Township 22 South, Range 37 East: Sections 13 thru 36;
Township 23 South, Range 37 East: Sections 1 thru 12.

Docket No. 20-77

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 15, 1977

9 A.M. OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

ALLOWABLE: (1) Consideration of the allowable production of gas for July, 1977, from fifteen prorated pools in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(2) Consideration of the allowable production of gas for July, 1977, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

13

Jewett - Com'n Hearing

In the matter of the hearing called by the OCC on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in the following areas in Lea County, New Mexico:

(See next page)

SOUTH AREA

T 22S, R 37E

Sections 13 - 36

T 23S - R 37E

1-12

CENTRAL AREA

T 19S, R 37E

15, 16, 21, 22, 26-28, 33-36

T 20S, R 37E

1-5, 7-30, 35, 36

T 20S, R 36E

13, 24, 25

T 20S, R 38E

5-8, 17-20, 29-31

T 21S, R 36E

1, 12

T 21S, R 37E

5-8

NORTH AREA

T 17S, R 34E

1-4, 9-16, E/2 20, 21-29, E/2 30, 31-36

T 17S, R 33E

36

T 17S, R 35E

W/2 6, 7, S/2 8, 17-36

T 18S, R 35E

2-8

T 18S, R 34E

1-3, N/2 4, NE/4 5, 11, 12

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
13 June 1977

COMMISSION HEARING

IN THE MATTER OF:

The hearing called by the Oil Conservation Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County, New Mexico.

CASE 5941

BEFORE: Commissioner Joe Ramey
Commissioner Emery Arnold
Commissioner Phil Lucero

TRANSCRIPT OF HEARING

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CHAIRMAN RAMEY: Case 5941. The hearing will come to order.

MS. TESCHENDORF: Case 5941. In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County, New Mexico.

CHAIRMAN RAMEY: I'll ask for appearances at this time.

MS. TESCHENDORF: Lynn Teschendorf, appearing on behalf of the Commission. I have one witness.

MR. KELLY: Booker Kelly, White, Koch, Kelly & McCarthy, Santa Fe, on behalf of Texaco. We reserve the right to call two witnesses.

MR. ABBOTT: Bill Abbott with Agua. I'll have a statement.

MR. EATON: Paul Eaton, of the Hinkle firm in Roswell, representing Atlantic Richfield. We will have one witness.

MR. BLODGET: Chester Blodget, Getty Oil Company. I'm entering an appearance with Bill Carr as my local counsel and myself. And we'll have three witnesses.

MR. SHRADER: Jeff Shrader with Gulf Oil in Midland,

Texas. Jack Campbell is preparing a letter of appearance for us. We'll have one witness, who just wishes to make a statement.

MR. SPERLING: Jim Sperling, with the Modrall firm in Albuquerque, appearing on behalf of Mobil Oil Corporation. We'll have one witness.

MR. KELLAHIN: Tom Kellahin of Kellahin and Fox, Santa Fe, appearing on behalf of Phillips Petroleum Company, Anadarko Production Corporation, and Continental Oil Company. I may have three witnesses.

MR. GOODHEART: Lloyd Goodheart, Rice Engineering, Hobbs, and I'll have a statement.

MR. LOPEZ: Owen Lopez, with the Montgomery firm for Shell Oil Company.

CHAIRMAN RAMEY: Do you have any witnesses, Mr. Lopez?

MR. LOPEZ: We have one witness who will present a statement, a prepared statement.

CHAIRMAN RAMEY: I think we'll recess until 1:00 o'clock.

(Thereupon the noon recess was taken.)

CHAIRMAN RAMEY: The hearing will come to order. I would ask that those who have statements that aren't subject to any cross examination, if you could submit those as written statements, it might make things go a little smoother

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and faster.

All right, Ms. Teschendorf, would you proceed?

MS. TESCHENDORF: Call Jerry Sexton.

(At this time the witnesses were duly sworn.)

JERRY SEXTON

calles as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MS. TESCHENDORF:

Q State your name and residence, please?

A Jerry Sexton, Hobbs, New Mexico.

Q By whom are you employed and in what capacity?

A Oil Conservation Commission of New Mexico as District Supervisor, over District One.

Q Have you previously testified before the Commission and are your credentials a matter of record?

A Yes.

MS. TESCHENDORF: Is the witness considered qualified?

CHAIRMAN RAMEY: Yes, we consider him a qualified witness.

Q (Ms. Teschendorf continuing.) Are you familiar with Case Number 5941?

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A Yes.

Q And what is the purpose of this case?

A To permit operators of injection wells and all other interested parties to appear and show cause why the injection of fluids for salt water disposal or secondary recovery should not be restricted or suspended in certain areas in Lea County.

Q An orientation map has been prepared for the benefit of the Commissioners. Would you please point out the three areas in question?

A We have three problem areas. This is -- the north area is what we call the Vacuum Area, that we've been working on. The central area is called the Monument, or Oil Center Area, and the south area is called the Eunice Area, and these are -- all three are similar and have the same properties.

Q Would you please refer to Exhibit One and identify that?

A It just shows the geological sections from the San Andres back up to the ground level, and it shows what formations are involved, and what we'll be talking about.

Q Okay. Using Exhibit One, could you describe, generally, what problems exist in the three areas?

A Well, water from either waterflood or disposal wells have not been confined to the disposal or flood intervals, and the water has migrated up to the salt sections,

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which apparently has the first horizontal fracture, and at this point it extends over large areas of ground, and pressure measures in all three areas are fairly uniform; mostly 800 and 900 pound pressure at the surface, and right now it covers approximately 150 sections, the best we can tell, have been pressured up in the salt section in these three areas. The salt lies between, oh, from 1200 to 2500 feet down at Eunice; and 15 to 2700 feet in the Vacuum Area, approximately. And the flow in the salt section is not at any consistent depth. It can be right at the base; it can be in the Morrow; it can be at the top; but logs have been run to show that it is a fairly narrow interval, but it varies throughout this section where the flows are coming from.

And I think it might be good to explain how the problem could be this extensive without it being detected before it got this size.

There are several reasons, but the first reason was that in our area it's common practice to set your surface string at just below the fresh water sand, around 300 to 400 feet; then you'll drill your production string to the San Andres or Queen formation, and set a longer string.

We found that the bradenheads had caved in, apparently, and sealed off the pressure from the salt section so it's really not noticed, except those that have longer casing strings.

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And, also, most operation practices were to set your surface head below ground level and many times it won't be checked until problems occur, and for this reason we've had to go back in and dig out bradenheads in the collars and, consequently, what you see up here is about the size of the area where it was when we found the problem.

Usually, what brought on these problems are either collpased casing, or a valve blow-off, or in the Eunice area, we have had a fresh water well went bad, and this brought the condition to the light of the Commission.

Q Would you please refer to Exhibit Two and explain that?

A Okay. This is a map of the Eunice area, and we've got the red is ones that had waterflow, or still do have waterflow out of the salt section. And these are -- these hexagons, they're where the pressures were monitored for our study committee. And the green squares, these are ones that have been gone into and repaired at the Commission request, cemented off.

Q Okay. And this is the area that was called the south area on the docket, correct?

A Yes.

Q What is the history of the problems in the Eunice area?

A Well, it came to light in January, 1974, there

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was a fresh water well in Section 2, right here (indicating), and it went good water to salt water with a flouride content of approximately 87,000. At this time the fresh water well was an abandoned oil well, and we thought maybe it was coming from down below, and the well was re-entered and due to mechanical failure they couldn't get down to the bottom, but they did get down low enough, below the water sand, to find out that the water was not coming up from the bottom part of the wellbore. And so, at this point, they took casing surveys of the surrounding wells. It was found out that the Armer Well, at that time, which is now Petro-Search, has bought out Armer, it was found that this well, located within a couple hundred yards of the fresh water well, had water coming up around the intermediate casing, and up to the fresh water sand and out, causing the contamination. This well was perforated at the lower part of the salt and squeezed. They did get a squeeze job, by temperature survey, up the hole to prevent any movement. This was confirmed by logs, but the waterflow was so severe there, that they never really got the perforation squeezed off, and for awhile they used straddle packers to be able to produce the well, and then eventually the water did get down to where they could pull the straddle packers and just pump what water was coming in with a conventional pump.

And then from this -- it was right here (indi-

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cating), and offsetting Skelly's well, why, we want in --

Q What section is that, please?

A This is Section 2; this outlines Skelly, which borders where the problems arise.

Q Okay.

A And at that time the Commission had Skelly, or now Getty, run pressures and temperature surveys on all their injection wells, and we found some problems but nothing that would really indicate anything of this -- of air getting out of the zones.

Then, in June, '74, Skelly had an LPG well which started to flow back water, and after they bled the LPG off of it, it had 800 pounds surface pressure and had a flow rate of between 350 and 1400 barrels a day out of the salt section. And this well was located right here (indicating), in Section 27.

Of course, this is in the center of Anadarko's flood, and so at that time we had Anadarko run temperature surveys, or profiles. This also, although minor problems were found, nothing of the size that would indicate that it was coming all the way up and pressuring up the salt section to any extent.

But due to both of these added problems covering such a big area, in December of '74 an industry committee was formed by the Commission to study this area, consisting

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of 36 sections, and make recommendations back to the Commission on the problems and how they could be solved.

From this study Order R-5003 was issued, and essentially what it said was that in the deep wells in this area and this is a multi-pay area, where you have deep wells through the flood zone, they went back in and studied all the deep wells, and the order issued them to bring cement back up through the flood zone, and then any well with a surface flow, it ordered to perforate at the top of the salt and bring cement back to the surface to prevent contamination of the fresh water sands.

And at this time Anadarko and Skelly, Getty now, were to reduce their water injection to a voidage figure, which Anadarko was based on 100 percent and Skelly then, was based also at a 100 percent, and then in July of '75 Skelly, or Getty, had theirs increased to 150 percent voidage figure.

And I might point out the one thing that R-5003 did bring up, that once you have a waterflow in such a large extent, it's hard to really solve it by cementing techniques. Several wells -- this Petro-Search well finally had a collapsed casing, and another well got in such a condition that they were unable to squeeze it off, and $100,000 squeeze jobs weren't that uncommon in this area.

I think this also left the industry with some questions on how to approach the problem as far as economics,

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whether it would be worthwhile to perforate a zone.

Q What about Agua?

A All right, and Agua was injecting in their salt water disposal well A-35, and in September of 1975 we ordered them to cease injection into this well, and at the time it was injecting above the parting pressure of the zone.

Q I've furnished the Commission with a copy of Order R-5003, and that order originally came from Case 5403 and the hearing for that was held on January 22nd, 1975. The case was re-opened on November 19th, 1975, and an order hasn't been issued, but I would ask that the Commission incorporate the records in those two cases in this hearing.

CHAIRMAN RAMEY: They will be incorporated.

Q (Ms. Teschendorf continuing.) Would you now refer to Exhibit Three and explain that?

A This is Exhibit Three. The red indicates where there's waterflow from the bradenheads, and the squares are where there are monitor wells that were used by the committee.

Q The Vacuum Area, right?

A Right. And these arrows right here (indicating) are where we had original problems that brought the Vacuum Area problem to light.

Q What is the history of the problems in the Vacuum Area?

A Well, in July of '75 Shell had a waterflow from

Case 5403 incorporated Case 5377 P 1 11/14/75 (case nee P 5 1/22/75)

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the intermediate casing on the State B Number 1, Unit K in Section 31, 17 South, 35 East. Since this well offset the Texaco - San Andres flood, why, we had Texaco run temperatures or profiles on their injection wells on this flood, and this was done by December. And at this time we really didn't have any reason but what to think that -- I might add, also, in December of '75 Shell had two more wells offsetting this break out with water, with flow rates up to 100 barrels an hour from the bradenhead.

At this time, in January of '76, the Commission Order R-5003 was an adequate way to go about approaching the problem, so at this time we sent Texaco a letter, which essentially was the same outline as 5003, where you cemented up through the zone, or confirmed it, and then you perforated any of them with waterflow and brought your cement back to the surface. This was discontinued because of other problems that came up, that will be explained.

Q. Would you now refer to Exhibit Four and explain that?

A. This is the Oil Center Area; it's called Eunice - Monument, but we have been referring to it in committees as the Oil Center - Monument Area, and the symbols are the same. The red shows where we have water pressure on the casing annulus, and the hexagons are the monitor wells, and the green is where we've got the backflow of water out of the

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salt section.

Q What is the history of the problems in this area?

A This came up in February of '75. W. K. Bryan, an operator out of Hobbs, reported that he had four wells collapsed due to pressure in the salt section, or right below, and they didn't just occur there. But he repaired two of them and had to plug two, but it was brought to our light at this time.

And in the Texaco Skaggs Unit their Number 6 Well had water break up around the outside of their surface casing, and it was determined there was a hole in the intermediate casing at 60 to 100 foot, which was corrected by perforation and squeezing of cement.

And Amoco had a well in their Delulee (sic) lease that had a valve blow off and flowed 5,700 barrels of water before it could be replaced.

And Getty had a hole come in their riser of their intermediate casing on their State I Number 2.

And these are outlined on the map, but it showed the extent, that we weren't just looking at one area, that we had three areas that all had the same problems, and it was much more serious than we'd considered.

Q There was a problem with the Skaggs Unit Number 7, too, wasn't there?

A It had a hole in the casing and was flowing out of

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Yates sand, I think, at around 1800 pounds.

Q What events have occurred in these areas since 1975?

A Well, in April of '76 the Commission had an industry meeting up here in Santa Fe, and these, almost the same problems were explained a that time, and the extent of the problem area was pretty well outlined at this time. And it was proposed that the industry set up committees to find out what was causing the problem and what was being done in southeast New Mexico in waterflooding in general, to allow these problems to get this large and this extensive before they were being defined, and to solve this problem.

Q Were any procedures put together by this committee?

A Yes. We had some meetings in Hobbs and then we had one committee working on how to approach and find a solution to this problem that everyone would be agreed on that it would be the best approach that the industry could come up with.

And at that time the committee presented the following steps on how to find a solution to this problem:

One, was a bradenhead, bradenheads should be pressured and perforated in order to provide sufficient monitoring locations while the waterfloods were being cycled. The deadline for this survey work to be completed -- to be completed about June 1st. Each annulus that is found capable

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of flowing water should be closed for up to twenty-four hours, recording dates and volumes. It should then be shut in and pressure -- pressure build-up recorded. This procedure, test, would indicate that if the pressure is connected to the main problem area, and its value as a monitor point.

Then the New Mexico OCC must set up its schedule to successfully shut in and cycle on each waterflood, or portion of a waterflood, all injectors that are injecting water at pressures equal to or above the pressure of the monitoring point. The shut in wellhead projecting falling pressures should be compared to the monitor point pressure with the time of shut in.

And they give, for example, if the water shut in injection pressure drops below all monitors in the area, that the injector could then, probably, be eliminated as a source of water contamination. If a response pressure fall-off is found in monitor wells during the shut in of a flood, further pinpointing of the problem area could be made by selectively beginning injection in a smaller area and observing the reaction of the monitor wells.

Five, after all floods in the area have been cycled and the problem area identified, the completion of all wells in the area must be reviewed for possible leakage out of the zone, flood zone. This includes not only injectors that cause pressure response, but all producing wells, deep and shallow,

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flood walls, and injection wells, et cetera.

At this point the selected well should be surveyed with the appropriate logs and surveys that are required to identify the problem.

Remedial work on all potential problem wells should be decided at this point.

And, Eight, pressure zones should be bled down, especially in the area where remedial work is being performed.

Nine, water pressure can be effectively bled down, and would eliminate the necessity of squeezing off the monitor points, to protect the fresh water and protect the casing from collapsing. Further, the monitor points can be left open. They can be watched for re-occurrence of the pressure, and normal water injection should be resumed.

Q Were these procedures implemented by the committee, by the industry?

A Yes, to as much as possible; although, each committee did approach it in a somewhat different way; the committees did use this outline form as an attempt to find the problem.

Q Would you now refer to Exhibits Five through Seven, identify them, and summarize their contents?

A These are the reports made by the individual committees as of January 20th, 1977, and this tells pretty much in detail -- consists of some two hundred pages -- of

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what had been done and what had been tried, and what the committees had accomplished in this year of working on the problem.

Also included in this is a Secondary Recovery, from New Mexico OCC, 1958. We found one well in the Eunice area that had a flow while drilling it in 1959, but also at this time this report points out that there was a million barrels of oil -- or water injected into this area at pressures up to 2200 pounds, so while it does indicate that there may have been natural waterflows in the salt area, it also indicates that we had water injection at high pressures at this time that the flow occurred.

Q Would you identify each of those by number, please?

A Yes. Exhibit Number Five-A is a report furnished to the Commission by the Eunice Area. Five-B is the page out of the statistical report put out by New Mexico OCC of 1958 waterflood.

The Vacuum Committee report, as of January 20th, is Exhibit Number Six.

The Exhibit Number Seven is the report from the Oil Center - Monument Area, as to what had been done up to this date.

Q Would you please summarize the work done by each of the committees?

A Yes. We'll start out with the Eunice Area. The

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Eunice Area, due to 5003, were already further down the line. They had had some previous bradenheads surveys and much of their work on well schematics and flows had already been determined.

So, they started out almost immediately cycling injection wells. They started out around this Petro-Search well that had had such a -- broke through into the fresh water zone, and they would cycle it down to where the injection pressure -- shut the injection well in and when the pressure got below 700 pounds, they felt like it would be safe to then start up if they didn't have any sign of the pressure drop on the monitor point.

And this was continued until there got to be numerous wells that weren't falling below this 700 pounds which had been required, set up by the committee as the pressure to reach that assured safety that the well wasn't furnishing pressure into the salt.

At that time they started flowing back the wells. They could get the pressure down below this point and it would stay to the end of twenty-four hours that it was shut in, then they considered it safe.

And this continued, stepping up, getting more as the injection wells -- as they met, could meet this standard, until September of 1976. And at this time, this Petro-Search well had broken back into the wellbore, and it had rods in it

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and normal, standard fittings, and they felt like it was just too dangerous, this well had to be plugged. And so they built a 50,000 barrel plastic-lined pit and opened the well up to get enough of the salt water off to where they could safely re-enter the well and plug it. And after sixty hours it flowed 40,000 barrels of water out of this well into the pit. At the end of ten days it flowed back 63,000 barrels. At that time flow was down to about 2 barrels a minute and they could rig up on it and go in and plug the well.

And also during this interval, there were 18 wells that were either Getty's or Anadarko's, were relogged in an attempt to find additional information on how the water was escaping from the flood zone.

And, as this Exhibit Number Five-A states in the conclusions, testing and investigations of this to date have failed to identify the water source.

Q What was done in the Oil Center Area?

A The Oil Center Area was in the most ideal area to implement the plans that -- that had been proposed by the industry. They had their floods drawn at the lower end of their economic range, and so they, instead of shutting down the wells, they would shut down entire floods. In between the 6th and 14th of '76, and October 28th, 1976, all injection to this area went to produce water and the pressure on these injection zones were reduced to -- other than in a few isolated

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cases where the pressure reservoir was pressured up -- all their wells, injection well pressures, went below 500 pounds, which to me is what the industry outlines. They've been on produced water since this time, and as of yet we've had no conclusive response in the monitoring wells.

Q What was done in the Vacuum Area?

A The Vacuum Area approached the problem as being a mechanical problem, and it was close to the wellbore in the injection wells. And Mobil and Texaco ran an additional 28 either temperature or tracer logs. Texaco also ran 17 bond logs and attempted to try to find a wellbore condition that would allow this pressuring up to be observed. They also took some pressure fall-off tests and step rate tests without indicating what the problem was.

Q Following these studies, how did the three committees decide to approach the problem?

A Well, by January of this year I think it was pretty well decided that the way we had chosen to go about it hadn't really furnished us with any of the problems. So, at a meeting, then, with all three committees, with Mr. Ramey of the Commission, indicated at this time they would like to blow the salt section down and leave the floods essentially how they were, and after the salt section was blown down, then they could find the problem. And all three of the areas were in different status.

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The Eunice Area, it was on a voidage figure; it was a little bit more than produced water.

Oil Center and Monument Area was on produced water and had been for some seven months.

And the Vacuum Area, which was the smallest area in the extent, although they skip -- the waterflow skips on it; they felt like this was the smallest area and was just really getting started, and if they could blow the salt section down and leave the injection the way it was, which hadn't been altered, then they might have a chance of finding the problem, in working the reverse of what had been proposed by the entire industry committee.

Q. What additional data has been obtained?

A. Well, in March of this year, or April, we got new pressures in from the Vacuum Area, and this showed that the problem in this area had been increasing. On the east edge, a Chevron well that had 420 pounds pressure taken last year, now had 825.

Q. Would you give the section number, please?

A. Section 34, 17, 35 -- wait a minute, 4, 68, 30. This happened several places.

And then over on the west side, Arco had encountered two waterflows on their wells that they were working on to expand a waterflood in this area.

Then in the Eunice Area, Skelly, or Getty, had a

well, B-54, start flowing water and they perforated it at this time and were getting 1000 barrels a day out of it, and with a lot of pressure, which also indicated that the problem may be growing in that area. This is a hard area to evaluate, the Eunice Area, because R-5003 essentially, covered up all the bradenhead survey material, so you kind of had to work from the outside edge. And the pressures haven't increased any and I don't feel like we've done that much good in the area.

And also in the Vacuum Area, Texaco, on their R-5 well, had a hole come in the casing and it's been flowing 1000 barrels a day since the first of April, and since the first of June they've recovered 51,000 barrels of water out of the salt section.

In the Oil Center - Monument Area, Gulf, on their Cutler (sic) well that they'd gone in and perforated and squeezed several years ago, had a casing leak repaired and it was right in the middle of the salt section. The first part of '77 it started flowing salt water, and I estimated the flow about 20,000 barrels out of this well, and the pressure hasn't decreased; it's still flowing, depending on whether it's fresh water or not, it's still flowing out 300-400 barrels a day.

Q Given these problems, what recommendations do you have to make to the Commission at this time?

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A Number One, is to reduce water injection in the problem areas to produced water, if the injection pressure is above the parting pressure of the formation. If the injection pressure is below the parting pressure, step rate tests should be sumitted to the Oil Commission within sixty days to determine the parting pressure of each well and the pressure limited to below this preasure.

There are several reasons for this recommendation. Number One, is the recommendation will allow the reservoir pressure to decrease, which will definitely reduce the water going out of the zone.

Also, for the Oil Center Area, where the injection pressures have been decreased for over seven months, we did not show a reversal of flow, and this may indicate to me, that maybe it's entirely pressure oriented problem and that lowering the pressure may take care of it. And also, if we just halt injection in these areas, it's going to have to require disposal lines and everything else, all the associated equipment to be installed, and there's a time lag, I would estimate, at least six months before this could be done, and by allowing it to go to produced water we will accomplish the same thing as halting injection.

Number Two, recommend that the pressure be bled off of the salt section in existing problem areas within a one-year period. The District Office will review the status

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of depressurization of the salt section in ninety days, and at six months a review by the Oil Commission should be made to determine if the plans to implement this are satisfactory or if additional steps are required by the Commission to assure depressurization of the salt zone is accomplished.

And the reason for this recommendation are that depletion of the water from the salt section will assure a protection of the fresh water.

And the reason it put a year down is that to bleed the water from the salt section requires special design in surface equipment and downhole equipment, and to date they've made some headway but this hasn't been perfected, and I think they'll need every bit of this time, while working diligently, to do this. Also, it now appears like they may have to add twenty-five to fifty percent either produced water or fresh water to this water from the salt section to be able to accomplish this.

And to dispose of water in another reservoir will be difficult in the Eunice Area. Reservoirs that will take large amounts of water are hard to find in this area and some time will be required to do this.

Number Three is have the companies operating within the problem areas submit quarterly bradenhead tests to allow monitoring of the area.to see whether it's decreasing in size of the problem, or whether the problem is expanding.

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Number Four, before any increase in injection rates from produced water, well schematics and plugged wells in the area would be reviewed and any repairs made. Where the floods are operating below parting pressure, a review of these wells should be made in thirty days and any remedial work done within another sixty days. And I think the Commission should review this, the whole scope of the problem, in six months to make sure that satisfactory headway is being made.

Q. In your opinion, will the failure to adopt measures rectifying the situation endanger fresh water of the State of New Mexico?

A. We're going to lose some, and at the present time, I think Skelly, on its B-54, their well salted off while they were backflowing it, and flow occurred outside the surface casing, which has to have had some contamination.

The thing that has probably saved us more than anything else from already being in trouble with the fresh water, is that this salt water is so hard to handle that we've got cases of wellbores plugging off in several days have occurred, and in some cases they've had lines plug off in a matter of hours, so while this also makes it harder to deplete the salt section, it also probably saved us in the water contamination of the fresh water. Eventually, it's going to hit the right wellbore, like this Citgo - State, and

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large volumes are going to be put into the fresh water then if it's not corrected.

Q. Do you have anything further to add to your testimony?

A. I don't believe I do.

Q. Were Exhibits One through Four prepared by you or under your supervision?

A. Yes.

Q. And Exhibits Five through Seven are the committee reports.

MS. TESCHENDORF: And I'll offer Exhibits One through Seven as evidence.

CHAIRMAN RAMEY: They will be admitted.

CROSS EXAMINATION

BY MR. ARNOLD:

Q. Mr. Sexton, let me get this straight. Going to your Exhibit One, I assume water is being injected into the Queen, perhaps the Grayburg and the San Andres, in these areas?

A. Yes.

Q. And you feel that it is somehow escaping out of these zones, going upward some way?

A. Yes. I think many of the wells, especially in the Oil Center Area and the others, were drilled by cable tools

and now, in this last few years, the water has been noticed in the salt section, and I feel like almost everyone who has worked on the committees agrees that it's come from some sort of injection, whether disposal wells or producing wells.

Q Okay, but you feel that it is migrating through some -- by some means, and you feel vertical fractures up to the -- into the salt bed?

A I feel that's the next best possible place to look. I'm not sure -- I don't think anyone's sure, but that's the next logical step to approach.

Q They haven't been able to determine to date anything else?

A No.

Q Any other method. And in the Eunice Area they've done extensive cementing work and there are still indications that new and different problems are occurring?

A Yes, and definitely there is not a decrease. After the Petro-Search well was flowed back to 63,000 barrels, why, there was some pressure decrease on some of the moniter wells after several months, and then they're just starting to rise back up, which indicates that the area isn't stable.

Q Okay. On your three exhibits, then, the red dots are wells which have indicated waterflow?

A Yes.

Q Could you give us an idea of the magnitude of some

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of these flows?

A Yes. This is the well that flowed the 63,000 barrels out (indicating); and this is the well that's flowing -- probably has the capability of 1000 barrels a day, or close to it (indicating). In the Vacuum Area, this well is flowing right at 1000 barrels a day (indicating).

MS. TESCHENDORF: Jerry could you identify where you're at on those maps, please?

A Yes, this is the R-5 well in the -- excuse me, over here is the R-5, in Section 6, 17 South, 35 East. These wells had a flow of 100 barrels an hour, and I think we had one well in the Oil Center Area that flowed something like 200-300 barrels an hour for a short period of time, up here in the Skaggs.

Q Would you identify those first two wells you referred to and what exhibit it's from?

A Excuse me, this is the Petro-Search - Armer Well, Citgo - State Number 1, Section 2, 23 South, 37 East; and Skelly's B-54 is in Section 9, 23 South, 22 East; and this is either Skelly or Getty LPG Well that originally had a flow of 300 to 1400 barrels a day out of the salt section.

MR. RAMEY: What's the location of that?

A In Section 27, 22 South, 37 East.

Q (Mr. Arnold continuing.) Is that well still flowing?

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A. It's flowing just barely and this salting off of the wellbores makes a problem, you know, whether the well has actually been depleted or whether it's actually just a salting off problem. I think now it's flowing something like a tenth of a barrel per minute.

Q. What was the pressure on that well?

A. After we got the LPG bled back off of it, it was 800 pounds. Our original field notes showed that the pressure was 1700 pounds, and much of this was the pressure of the LPG.

Q. What's the depth of the casing in that well?

A. Approximately the top of the salt; it would be around 1100 or 1200 feet, and I might add, these wells, injection wells in two colors with arrows on them, these are the wells which water was injected to in 1958, when Texaco had the flow some distance away in wells in Section 16.

Q. Mr. Sexton, you need to identify these sections, those two sections, if you can.

A. In 1958 injection was occurring in Section 27, 22 South, 37 East; and Section 34, 22 South, 37 East; and Section 33, 22 South, 37 East.

Q. And your waterflows --

A. Were in Section 16, 23 South, 37 East.

Q. Some two and a half miles away?

A. Right, which isn't that unusual. As you see over

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here, we've got pressures --

Q Over here is where?

A In the Vacuum Area, we have pressures some three to four miles away from the closest injection point; wells with pressure. This is also true in the Oil Center Area.

Q Those descriptions are off of exhibit what? Which one of the exhibits are you referring to giving all this description? The reason, I'm telling you, I'd hate to be the judge reviewing this, if it goes to court, unless you identify what exhibit.

A Exhibit Number Two.

Q Okay. You mentioned something about where you first saw some contamination or something like that, when you started to testify, you referred to some well there?

A Yes, it was also in Section 2 of 23 South, 37 East.

Q Thank you.

A Now, I think you'll find much of this information that I've given to you in detail by the unit, section, township, and range, in the exhibits. The companies did a good job of preparing exhibits and the information that I've presented is, I think, in detail in these exhibits.

Q Okay, Mr. Sexton, to date, now, you've had one water well contaminated.

A Yes.

Q And you've had at least two problems of highly con-

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centrated salt water, I assume, outside the surface pipe of wells?

A Yes.

Q And you feel if the water is flowing to the surface, outside the surface pipe, that some of the water would be going into fresh water?

A Yes, I do. I feel like there would. I believe that.

Q Do you feel that this is a real potential threat to fresh water here?

A Yes, it is. And I feel like that there can be headway to be made on it, but it is a serious problem, and I think we've approached it like industry has recommended and I think now these are additional recommendations, although they'll take a year to implement, will take care of any major water contamination.

Q And you've also stated that there have been some wells that had to be plugged?

A Yes.

Q As a result of these waterfloods?

A I think one of them they were able to go in with a casing patch; they were never able to seal off the waterflow but the Petro-Search well had to be plugged, and I think this was the only one that actually was, but several of them have been repaired, and have not actually been able to repair the

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casing for operating.

Q Then didn't you testify there were two wells in the Oil Center Area that were plugged?

A Yes, there were two wells plugged because of collapsed casing and they couldn't re-enter and get back to the pay.

Q Now, do you feel that this is a waste that's been created by --

A Well, it -- I'm sure everyone has to -- I think probably there has been some waste; I mean, it's been fairly well confined with these additional steps, but we haven't found any -- any solution to date of what's causing it, and there is water, I feel, out of zone.

Q But if wells have been plugged and have replacement wells been drilled?

A On part of them, yes.

Q On the Petro-Search well, has --

A No. No.

Q So there's a possibility that reserves were left in the ground?

A Yes.

Q And there's a possibility of more wells collapsing if the pressure isn't relieved off the salt bed?

A Yes, I definitely think we'll see an increase in this.

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CHAIRMAN RAMEY: Any other questions of this witness? Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Sexton, in your testimony you indicated that all of this testing had failed to identify the source of the water in the salt. Did you mean to say that the testing had not identified any particular well or any group of wells as the source, rather than it hadn't identified all injection wells as the source?

A. Well, to try to solve the problem we had -- what we were looking for is a certain area or certain condition, and this condition wasn't found, but it still, as far as I was concerned, we generally felt that it was due to water injection of some sort, whether disposal wells or injection wells.

Q. Is that your opinion?

A. Yes.

Q. In your testimony you indicated that many of the possible avenues of water getting into the salt section had been eliminated, and you didn't come right out and say that you thought -- you were certain it was due to vertical pressure. Have all the other possibilities been eliminated?

A. No, they haven't, and I'm not saying that vertical

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fracturing is the case. I'm saying, in my opinion, it's the next best place to look; that we've looked under all the convential tools that's available to the oil industry and we haven't been able to find the problem, and these areas all have one thing in common and that's their high injection pressures. And to me, the next, only from a scientific or -- the way engineers would think, would be to pressure, and I'd be willing to stick by it, that we have some indication that it may be directly pressure oriented, but we also don't have the evidence to say conclusively, but I believe this would be the next approach to the problem. In fact, I know of no other approach other than this.

Q I believe that you answered my question affirmatively with a no. Let me restate this. It would appear to me that my interpretation of your testimony is that everything that you have looked for, you've tried to find old P & A wells that could be causing the water to flow out into the salt; you've tried to find wells that had improper cementing; and you've found two of these and these have been corrected; these have not resolved the problem; and you have tended to eliminate all of the possibilities except water migration through vertical fractures, is that correct?

A. That's true, except for the cases -- until you re-enter every plugged well or find out absolutely, you can't say a hundred percent that this is the problem. I don't think

we may not ever be able to find out a hundred percent what causes these kinds of problems, but I do think that the next step would be fracturing; fracturing has got to be considered, as far as I am concerned, it's the best possible solution right now that it is causing the problem.

Q In your four points, you discussed reducing the injection to produced water in the areas where the pressure is above the parting pressure. How are you going to determine those areas where parting pressure has already been exceeded?

A I feel like there are several accepted ways to approach this. One is step rate tests, which the industry use. Another method is immediate pressure after fracturing a well, which may be available on some wells from previous treatments; this data may be available on this particular well. I don't think you can be an entire field and say that we've got four dead wells here that show fracturing pressure at 1400; I don't think this would be satisfactory. It's almost going to have to be on a per-well basis.

In the Vacuum Area, Texaco did run step rate tests and they found the fracture pressure varied from up to 500 pounds to 900, and maybe some of them, I feel like they'll find are up around 1400 or so. It's not something you can accept one figure and take the entire field.

Q Well, if parting pressure had already been exceeded would you have to run a reverse step rate test, lower the in-

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jection pressure a 100 pounds and see what happens; lower it another 100 pounds and see what happens, until the injection dropped off?

A. This is something I'm not that sure how to get that; this may be a possible way, and it may be that as soon as it falls below this, you can take two points and feel fairly safe, where one would take a way smaller amount over 50 pound increments, because it will be, the pressure will be declining in a fairly slow rate, and you may be able to take a 50 pound pressure drop and say at the point of pressure it's taking 100 barrels a day or 200 barrels a day, and at 50 pounds lower it's taking 50 barrels a day or 100 barrels a day, and I'd feel fairly safe that you probably passed over this parting pressure.

Q. In those areas where parting pressure has been exceeded, or in any area, well, in the areas where parting pressure has been exceeded if the wells can be used as injection wells at pressures below the parting pressure and still get in more water than just produced water, it would be your recommendation that additional waters be allowed in those projects?

A. Yes, as long as they have plans to depressurize the salt section.

Q. Now, is there some figure that you think would be a safe figure below the parting pressure, 50 pounds, 100 pounds?

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A. Whatever it can be mechanically shown that you can control the pressure at, at some point below this. I think right now it would be hard to find equipment that could regulate it less than 50, but this might be possible, also.

Q. What was your fourth recommendation? I did not get that written down properly.

A. Well, it's like primarily, if you're going to inject at above produced water rates, then I think the well schematics and plugged wells in the area should be examined to make sure there's cement across the flood zone and the wells are properly plugged. I think this is accepted by the industry that this should be done before any flooding is continued, because, obviously, if you have not covered up your flood zone by cement, you've got a potential problem, whether it is a problem or not.

Q. This would be on existing projects within your problem areas?

A. Yes.

MR. STAMETS: That's all the questions I have.

CROSS EXAMINATION

BY MR. RAMEY:

Q. What about other projects? Should this be done on other projects, also, whether you have a problem at this time?

A. I think a review should be made of all areas. I

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really would like to see us come up with some answers, but this might not be possible. We know we've got problems over approximately 150 sections; we might as well go ahead and try to find out if we've got problems in other areas before they get out of hand, and I think bradenhead tests on this, which is one of the recommendations the original industry committee did make, would tell us whether any problem was starting in different areas.

RECROSS EXAMINATION

BY MR. ARNOLD:

Q Do you know of any other projects where an operator is reviewing potential, let's say, plugged wells that might be a hazard to injection?

A I know some that have reviewed any wells for pressure on the bradenhead just to see if this problem does exist on any of the other wells; how extensive this is, I'm not sure, but it is now required that any flow be reported to the Commission and we have checked out a couple of more flows and found them to be just, as far as I can see, isolated points, but this has been a help in determining just where the problem areas are and if there are additional problem areas.

Q Well, let me ask, do you know of any operators of waterfloods that are not checking to see if any potential --

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A Yes, I don't feel like right now, of course, I don't feel like all floods in Lea County or southeast New Mexico have been checked out to see that the offsetting wells have been cemented through the zone.

MR. ARNOLD: I might comment, it sounds like you've been reading the EPA's underground injection control program.

A Well.

MR. RAMEY: Any other questions of the witness? Mr. Kelly.

CROSS EXAMINATION

BY MR. KELLY:

Q Mr. Sexton, you served on these committees that you've testified about?

A Yes.

Q And the exhibits that you identified were the official reports of those committees, is that correct?

A Yes, but I might add that I did not participate in the writing of these reports, although at the time it looked like we were headed to where we are now, that we hadn't found the problems and I really didn't -- I've been on almost all the committee meetings and had been in on everything that had happened up to date, yes.

Q Now, one of the purposes of those study committees was to determine the source of the pressurization of the salt

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zone, is that correct?

A Yes.

Q And, as I understand it, those exhibits do not contain any definitive statements of causation.

A I'm not sure; you'd have to read the actual statements. I think most of them did state that they hadn't found the cause of it, and I'm not sure whether they -- in the minutes of the meetings I think you'll find some discussion on whether it was an injection problem or whether it wasn't, if that's what you're indicating.

Q But the study committees themselves did not come to the specific conclusion that you've testified to here, that the source of the problems were either injection wells or the waterflood programs, did they?

A Yes, I thought they did.

Q You thought they did?

A Yes.

Q Well, okay.

MR. KELLY: Mr. Chairman, I would suggest that the best evidence of those reports would be the reports, rather than the conclusion of the witness.

MR. RAMEY: I might say, Mr. Kelly, that in a meeting I attended, why, I believe several operators concluded that they didn't feel this was a natural occurrence.

MR. KELLY: Well, I think we have to keep our in-

formation on the record.

Q (Mr. Kelly continuing.) Certainly, the -- you would admit that the evidence adduced by those study committees was basically inconclusive as to where the source of the problem was.

A Yes, I think you could definitely say this.

Q In fact, some of the information that was developed did not appear to be consistent with a causation being attributed to the waterflow of the injection wells.

A No, I don't -- I disagree with this.

Q Now, you mentioned, say, in the Vacuum Area that a Texaco well was -- recorded 51,000 barrels of water out of the salt section. Do you recall that?

A Yes.

Q There wasn't any evidence of any hydrocarbons in that water, was there?

A This is true, and this is the reason that the Vacuum Area spent -- oh, I would hate to venture how much money was spent in the Vacuum Area, with the belief that it was a wellbore problem, and at one time, they even, through log interpretation, everyone, including myself, thought we'd found the problem, due to the perforation -- perforating those wells up higher, then injecting into the lower zone. This was proved inconclusive, that it wasn't coming from these wells. But I think you'll find that the radius investigation

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of these surveys are within, oh, probably not over a couple feet at the maximum, and most of them closer to the wellbore. But your observation that there is no oil, that we can tell, in the salt section, is somewhat, in my view, that it is close to the wellbore problem and partially supports vertical fracturing being the problem.

Q In your opinion, have the studies eliminated horizontal fracturing as the cause?

A Well, horizontal fracturing, as the word indicates, will tend to keep everything in zone, and if your water starts out in a zone and you get horizontal fracturing, you would then have it confined to whatever zone you were injecting. But I think most of the fracture tests, and also the fracturing companies, would agree that at the depths we're talking about vertical fractures do occur and not horizontal fractures.

Q Mr. Sexton, you testified as to these profile surveys that Texaco did in the Vacuum Field. Could you tell us what those surveys showed?

A Yes. They showed, generally, that the water was going into the formation that was being flooded. The surveys as a whole were in very good condition.

Q Now, how about the cement bond logs on Texaco's wells in that field?

A They did show bonding.

MR. KELLY: That's all I have.

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RECROSS EXAMINATION

BY MR. KANEY:

Q Were all of Texaco's wells in the Vacuum Field cemented in the way that they were supposed to have been cemented for protection?

A. No, and we also have a problem with running bond logs on slim, open places, which they have numerous of. If you have two strings of pipe, from what I understand, that bond logs are -- when pipe lays together -- are very inconclusive, and so when you have slim, open places, which is two strings of pipe down one wellbore, they can be wrapped around each other, and undoubtedly are, that your bond log doesn't show this. The cement wasn't up as high as the original commission's order, but right now it also doesn't show that this is or is not a problem.

Q And when you run a tracer survey, how far out from the wellbore can the radioactive material be picked up?

A It's -- this varies with opinions -- but I imagine six inches, or less, probably, on a tracer survey. A temperature survey tends to reach out further. How far out into the formation it actually shows what's happening is due to a difference of opinion.

Q So if you have a fracture system a foot away from the wellbore, there would be no way to detect it by a radioactive tracer survey?

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A No, I don't believe a tracer would.

Q Could possibly pick it up with a temperature survey?

A Right.

CHAIRMAN RAMEY: Any other questions? Mr. Lucero?

CROSS EXAMINATION

BY MR. LUCERO:

Q Do you feel, in your opinion, that these recommendations you're making for future action might help further define the specific cause of the problem?

A Yes, I think we've been on this over a year constantly, and I think these are good places to start out with. Now, later on as we get information on the total problems, it may be we would vary some recommendations, but right now I feel like these recommendations will do the most the quickest, to prevent any contamination and also prevent additional damage in these areas.

CHAIRMAN RAMEY: Any other questions? Mr. Nutter.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Sexton, you've mentioned in your recommendations curtailment of injection rates on water injection projects. Do you have any recommendation with regard to salt water dis-

posal wells?

A Well, I think the same recommendations, if they can show they're below fracture pressure, then continuation up to that point should be allowed unless we find some reason to change this.

Q So your recommendation for reduced injection rates to below parting pressure would apply to disposal wells as well as waterflood injection?

A All flood injection in the area.

CHAIRMAN RAMEY: Does anybody else --

RECROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Sexton, in your testimony concerning the Vacuum Area, I believe you indicated that during the course of your investigation the area with water in the salt expanded, is that correct?

A Yes, we've had indications that -- what we did was, or what we recommended, they just survey the wells with problems that were found a year ago, and on these cases there was enough indication that pressures had increased to indicate the problem was worse, but really, we hadn't changed injection rates in the area that much and I guess it really wasn't to be unexpected.

And on the west side Arco did work on several wells

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and found additional waterflows in areas where we didn't think at the time it was that far, so I felt like it, whether it was due to new information or the information that we had that the pressures were increasing, I felt like it was time to make a change in the way we were going.

Q. Well, could there be any other source for this increased pressure in the salt in Vacuum, increased amount of water in the Vacuum Pool, other than the water injection wells in the area?

A. I think this was discussed in most of the committees and I don't know of any other -- any other zones in any of the three areas that had the pressures to put a column of salt water with 800 to 900 pounds at the surface, except through injection wells.

MR. STAMETS: That's all.

CHAIRMAN RAMEY: Mr. Kellahin.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Sexton, that Order Number R-5003 was entered when?

A. This was entered in -- well, let me get --

MS. TESCHENDORF: April, 1975. I believe April 29th.

Q. (Mr. Kellahin continuing.) That order required

the industry to make certain remedial repairs on certain wells?

A Yes.

Q Did this include that?

A Yes.

Q And those repairs were made?

A I believe there was one well that wasn't, and I might add that this was overlapping when these other problem areas came up, and one of the recommendations of the next industry committee was that we suspend working on wells and give everyone an opportunity to reduce injection pressures and cycle these floods and try to find out where the problem was, thinking that even if it was, say, a plugged well, if you shut down injection it would show up through shutting of the injection wells down, and for this reason we had -- we didn't go ahead and push it, but I believe they were all done except one well.

Q Since the effective date of that order has any fresh water well in any of these three areas been contaminated?

A No, there haven't, but if I --

Q Since -- yes, sir?

A If I may add to it, in my opinion this -- like I say, we've had several areas where the water had to be contaminated in some way.

Q All right. You've indicated that there were, I

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thought, two areas where you had salt water flow at the surface outside of the casing string. There were two instances, were there?

A. Yes.

Q. Did those occur before or after the effective date of R-5003?

A. After; one occurred this month.

Q. Would you identify which well that was and where?

A. It was on the Skelly B-54 that that occurred, oh, last week or the week before, and at which time they went in and perforated.

Q. That's in section what?

A. Section 9, 23 South, 37 East.

Q. Now, apart from that well there was another well that broke out at the surface outside of the casing?

A. In the Oil Center Area, yes.

Q. And which is that well?

A. Texaco Skaggs -- I'll have to get it on my notes here. Texaco Skaggs Well Number 6, Unit N, Section 12, 20, 37.

Q. What was the date of that breakout?

A. It was in March of '75.

Q. Other than those two breakouts in all the 150 sections there have been no others, to your knowledge?

A. That's right.

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Q In response to Mr. Nutter's question you said that it was your recommendation that the order also apply to salt water disposal wells in the area?

A Yes.

Q How many disposal wells are in these areas?

A Well, I think Eunice has one that is under operation, that's Agua's well, which was recently completed, and it is operating under this condition; they ran step rate tests and pressure was limited on the well.

The other areas have disposal wells but they're on a vacuum or low pressure.

Q What is the frac pressure in that Agua well?

A I believe it came out 1475 or -- excuse me, I wouldn't say that. It was in between 14 and 15, as I remember.

Q Is that well disposing of produced water that is produced from areas other than what you've labeled the problem areas?

A Yes.

Q Is it your recommendation that Aqua be precluded from doing that?

A No. As long as they conform to the recommendations that I make, I wouldn't see where this would be necessary.

Q There wouldn't be any prohibition, then, on the source of the produced water to be disposed of in the Agua so long as they didn't exceed the frac pressure?

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A. That's correct.

Q. Are there any areas where capacity allowables or bonus allowables have been allowed in any of these units?

A. Now, that someone else will have to answer because I'm not that aware and I haven't been working with allowables.

Q. Well, if there are areas where bonus allowables and capacity allowables have been granted either for a pressure maintenance project or waterflood, whatever, do you intend to make a recommendation that would restrict those allowables to what we would think of as the normal, standard allowable for a 40-acre unit?

A. No, I would, as long as they conform to these recommendations, which to me your reservoir would determine, probably somewhat on how much allowable you're going to be able to produce anywhere; out here in a tight reservoir obviously, you wouldn't expect to get as much oil out as if you were in a forced reservoir, and I think these recommendations would allow only for your reservoir characteristics.

Q. In your statement of recommendations in response to Ms. Teschendorf's question you said that if the initial recommendation about reducing water injection to produced water, if that is ineffective, you talked in terms of additional steps the Commission might require. Have you given any thought as to what those steps would be or are you prepared to make recommendations about what additional steps

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may be required?

A. No, I really don't think this is the time for it.

Q. Okay. Mr. Sexton, what steps would it take to bleed down the salt section?

A. Well, this is one of those things I really hope that -- I don't believe it should be -- I can't believe you'd like to have any more interference from the government than is necessary, and I would hope that you would take these steps, too many steps are obvious for me to point them out; I don't think it's necessary right now.

Q. Is it your intention to propose an administrative solution so that separate waterflood areas could be allowed exceptions to the proposed order?

A. By exceptions, what are you --

Q. To dispose of water in volumes in excess of produced water?

A. I would say only on a temporary basis. I think right now the -- I'm sure you're talking about water from the salt section, and I don't feel like we could bleed the whole entire salt section back into the reservoir we'll see the response in the time we need. What I would hope is that we could work in the area with disposal wells to give them time to -- a substitute disposal well could be found.

MR. KELLAHIN: Thank you. I have no further questions.

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CHAIRMAN RAMEY: Any other questions? The witness may be excused.

MS. TESCHENDORF: I have nothing further.

MR. BLODGET: We may have a couple of questions to put in, if you'll excuse us a minute.

CHAIRMAN RAMEY: Okay.

CROSS EXAMINATION

BY MR. SPERLING:

Q While we're waiting, I might ask Mr. Sexton a question with respect to the question that was concerning an exception, or possible exception, that was suggested by Mr. Kellahin.

Would you feel that an exception would be warranted in those instances where produced water is of such low magnitude that it would be impractical to confine a flood project to that, that is to continue?

A I think this would probably be considered. The main thing is to reduce the pressure in a certain time period to below fracturing pressure.

Q Let me be specific with you, Mr. Sexton. I'm thinking of the North Vacuum - Abo Project, which has, I am informed, produces a water volume of 71 barrels per day, which obviously is inadequate to continue the project. Now, would you think under those circumstances that the injection

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of other than produced water might be the proper subject of exception?

A. I would think this would need to be considered. I might add that the committee really didn't consider the Abo formation as a cause of the -- but I don't think it should be completely ruled out. It's my understanding that if you're below parting pressure, if this is the case, then this is what we ask of you, and if you're not below parting pressure, why, I think it should be -- should fall under the same guidelines.

Q. Well, then the key to your recommendation is the parting pressure.

A. Right, now --

Q. As long as injection is below that by some measure, then you would be satisfied insofar as the criteria that you've suggested?

A. Yes, this was my recommendation.

RECROSS EXAMINATION

BY MR. RAMEY:

Q. So if a waterflood is injecting and below parting pressure, then you would not suggest any restriction on that particular flood?

A. Not at this time. If we can get the salt bled off in a -- everything ties up with getting the salt pressure bled

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off, then I think -- I didn't recommend anything being done to floods operating below the fracture pressure. And we feel that the salt will be bled off and at this time we'll have a lot better idea of being able to find out, really, not only if pressure causes it, or what causes it, in what area it is being caused.

CHAIRMAN RAMEY: Did you have a question, Mr. Blodget?

MR. BLODGET: No, he's asked it, I think.

CHAIRMAN RAMEY: Any other questions? The witness may be excused.

Mr. Kelly, you're next on the list.

MR. KELLY: That's the mistake I make for standing up first.

JOHN GANNON

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. KELLY:

Q. Would you state your full name and by whom employed and in what capacity?

A. My name is John Gannon. I'm District Superintendent for Texaco in Hobbs.

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Q Have you previously qualified as an expert witness before this Commission?

A No, I haven't.

Q Would you give the Commission a summary of your educational and professional background?

A I have a BS degree in Chemical Engineering from the University of Colorado in 1948, and I've been employed by Texaco for twenty-nine years; the first thirteen years as a Petroleum Engineer, and since that time in various supervisory capacities in drilling and production.

Q Do part of your responsibilities cover the Vacuum and Monument waterflood areas that have been discussed today?

A Yes, sir.

Q And did you serve on any of the committees that have been discussed this morning -- this afternoon?

A Yes, sir, personally I served on the Monument - Oil Center committee, and Texaco had membership on the Vacuum committee, and I attended a number of the Vacuum committee meetings.

MR. KELLY: Are the witness' qualifications acceptable?

CHAIRMAN RAMEY: Yes.

Q (Mr. Kelly continuing.) Now, can you tell us whether the committees that you have experience with that have been identified and marked as Exhibits, I think, Five,

Six, and Seven, came to any conclusion as to the source of the water that is found pressuring up these salt zones?

A No, sir, we have not been able to come to any conclusions as to the source.

Q Now, specifically, you heard the testimony of Mr. Sexton, who determined, in his opinion, the source of this high pressurization was either injection wells or waterflood projects in the area. Do you have any evidence that would contradict that opinion?

A We have no evidence that would verify it. Mr. Sexton has suggested that the pressure in the salt zone is coming from the waterfloods, but all the work done by the committees has failed to identify a single offending well in any areas that I've been involved with to show that the waterfloods are the direct cause of the pressuring in the salt zone.

Q Well, let me refer you to what has been marked Exhibit Number -- Texaco's Exhibit Number One. Could you identify what that is?

A Yes, this is a map of the Monument - Oil Center study area, and on this map, indicated by the red dots, are locations of a number of Eumont gas wells. This is not the complete list of Eumont gas wells. This is a large field and extends both south and north of the Monument - Oil Center area; however, it does show the Eumont gas wells located within the Monument - Oil Center study area. In addition, in

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black on a number of the wells in the southern part of the study area, we have indicated the shut-in pressures. These are 72-hour shut-in pressures that were taken in 1976. This is required annually.

I might particularly refer to Texaco's Eunice - Monument Unit, which is one of the floods in consideration in this study area, and also one of the floods that is currently shut in. Within that Eunice - Monument area, waterflood area, there are six Eumont gas wells. Four of these are operated by Texaco and I might just point out that the shut-in pressures on these wells are as follows: These can be identified from this map. State of New Mexico B-26, in 1975 the 72-hour shut-in pressure was 383 pounds and in 1976, 335 pounds.

State of New Mexico C Number 9, in 1975, 363; 1976, 320.

C-25, 1975, 314; 1976, 271.

And C-27, in 1975, 293; 1976, 255.

Now, I think there's some significant things about that. One is that the bottom hole pressures are declining in a normal manner as these wells are being depleted. The second thing is that these shut-in pressures are well below the shut-in pressures of monitor wells, and we do have one monitor well within the Eunice - Monument waterflood project, which has a shut-in pressure of approximately 650 pounds.

Immediately to the east we have other monitor

wells on Getty's State I lease and Amoco's Delulee (sic) leases, and these also show shut-in pressures from the salt zone much higher than the shut-in pressures in the Monument in the Eumont gas wells.

When our flood was in operation the injection pressure was much, much higher than these shut-in pressures shown on the Eumont gas wells.

Now, it's been suggested that the salt zone is being pressured through a fracture system from the flood up to the salt. It appears to us that if this is occurring, that the Eumont gas wells should have watered out. It would be impossible for the water to fracture through the Eumont gas zone all the way up to the salt without flooding out the Eumont gas zone, and this hasn't occurred.

And for those of you who might not be familiar with it, the depth of the Eumont gas zone is 3400 to 3550 feet, which is between the Grayburg zone being flooded and the salt zone, which is pressured.

Q Now, on Exhibit One is there another waterflood project that you have the same basic situation?

A Yes, there are also Eumont gas wells located within Texaco's Skaggs - Grayburg, and as far as other operators are concerned, down to the south there are Eumont gas wells located within the areas of Conoco's waterflood.

Q And do you have a similar situation of lower pres-

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sures in these intermediate zones?

A. Yes. The pressures that we have plotted on this exhibit, the maximum pressure shown is 513 pounds. Most of the pressures are in the range 200 to 300 pounds.

Q. In your opinion, this would be inconsistent with the theory of vertical fracturing?

A. Yes, it would.

Q. Now, in the Texaco wells that have produced water from the salt zones, has there been any evidence of hydrocarbons?

A. No, there has not. Currently we're backflowing in the Vacuum Field. We're backflowing our State of New Mexico R-NTC Number 5. We have flowed approximately 55,000 barrels of saturated salt water from this well. As recently as Friday we rechecked the injection well for any evidence of hydrocarbons, and found none. Mr. Sexton mentioned that this well was flowing 1000 barrels a day and this was correct at the outset, but the well has now declined to approximately 300 barrels per day.

Q. Now, you have an exhibit that shows evidence of natural high pressurization in salt zones in the area?

A. Yes, I do.

Q. Is that Exhibit Number Two?

A. Yes.

Q. Would you explain that to the Commission?

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A. This also was referred to by Mr. Sexton, and this is our State of New Mexico BZ Tract 8 Number 5. This is a well that was drilled in 1959 and during the drilling of this well, while going through the salt section, a serious waterflow was encountered. To give you an idea of the magnitude of this, after surface pipe had been set at 1095 feet, the well was drilled on to 1690 feet, when the well started flowing. The well initially was flowing salt water at the rate of 1100 barrels per hour from the zone from 1688 feet to 1690 feet. When the well was shut in, it exhibited a shut-in pressure of 600 pounds. We attempted to squeeze the well off and then drill out, and after drilling out, we again broke into salt water and flowed at the rate of 300 barrels per hour. We continued drilling, handling the salt water as best we could, and by the time we had reached the depth of 1814 feet, the rate, water rate, had increased to 1500 barrels per hour.

Eventually, the well was drilled to a depth of 2460 feet, string of pipe run, and successfully cemented.

I think Mr. Sexton pointed out at this time there was a Skelly pilot waterflood approximately two and a half miles to the north, and on a volume basis, strictly speaking, it would be possible for this water to have come through the salt to Texaco's location; however, it seems very unlikely to us that a pilot flood, which showed excellent response in the zone that was being flooded, and had good injection-withdrawal

ratio characteristics, could have migrated a distance of two and a half miles and flowed in the volumes that flowed from this well. We think that's unlikely.

Q. Now, did the studies that you participated in reveal any other evidence that would appear to be inconsistent with the theory of vertical fracturing?

A. In the Vacuum Field I have no direct evidence that there is no vertical fracture; however, again, Mr. Sexton mentioned some fall-off tests that were run by Texaco and these fall-off tests that we conducted were in every way normal for a zone that was being properly flooded.

Q. In your opinion, is the -- is the waterflood or salt water injection wells the cause of this salt pressurization?

A. All of the indications, tests, surveys, and so forth, that have been run by Texaco, and Texaco has been a participant on two of these committees and has expended a considerable amount of money in an attempt to find offending wells, and in no case have we been able to find either an offending well or an offending flood. I might mention the work that was done on our Vacuum - Grayburg - San Andres unit. This is a two section waterflood and it is the closest waterflood to the area of highest pressure in the salt zone in the Vacuum Field. This is also the most recent flood in the Vacuum area until Arco started their flood; the second

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most recent flood. In this particular project all of the injection wells were drilled; in no case was an old well converted to injection; all of our wells were drilled in 1973. These were wells that we mentioned that we had run injectivity profiles and all of these profiles indicated the water to be going in zone. These are also wells on which we ran cement bond logs, which indicated competent cement jobs on each of these injection wells. This is also the project in which we perforated some temperature anomolies from temperature surveys and attempted to establish an indication from the injection zone back up the hole to the perforated interval. In neither case on our wells Number 19 and 49 were we able to communicate back with these holes.

Now, it has been mentioned that the cement bond logs and the injectivity profile, too, have a short distance from the bore hole of investigation. But we might also point out that the theory has been suggested that we're fracturing up through the zone and that this might be occurring away from the wellbore, so we might also mention that the high at the point of highest pressure in a waterflood is at the wellbore of the injection well; that from that wellbore of that injection well to the producing well, the pressure is continually decreasing, and consequently, if fracture would occur, the most likely place for it to occur would be in the wellbore of the injection well. Furthermore, it appears to

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us that the bond between cement and open hole, or between cement and pipe, is a much weaker bond than the natural fracture pressured formation, and that if this would occur, we would have detected it in the wellbores of these injection wells.

Q So in your opinion, in the Vacuum Texaco's injection program is keeping the water isolated to the injection zone?

A Yes, that's our opinion.

Q And how about the Monument?

A We haven't done as extensive surveys in the Monument - Oil Center Area, but the survey work we have done indicates that the water is going in zone. We have made attempts to determine if water were channeling from an injection well to the twin deep producer, and the survey that we ran on one well indicated that there was no fluid movement in the deep producer at all. By the way, these were both wells that did have break-in (sic) pressure in the salt zone.

Q What would Texaco's conclusions and recommendations be to the Commission?

A Texaco concludes that from the study work that has been done, investigations which were made, that there is no evidence that the waterfloods are the cause of this problem, and Texaco recommends that in the Monument - Oil Center area, that we resume normal injection and that injection be continued in our waterfloods in the Vacuum Field without any

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restriction.

Q Now, assuming that the Commission follows the recommendation of Mr. Sexton and limits injection to below fracture pressure, do you have an opinion as to the effect this will have on the waterflood project as far as causing waste?

A We do have an opinion. We're not prepared to present an exhibit, but we have in other fields run profile surveys at low pressures and then again at higher pressures, and our profiles indicate that at higher pressures we often get better water distribution than at the lower pressures, which indicates that some of the lower permeability zones accept water at higher pressure and they will not accept any water at lower pressure. If we are limited to a lower pressure this means that portions of the reservoir will simply not be swept and that this oil will be left in the reservoir.

Q Now, were Exhibits One and Two prepared by you or under your supervision?

A Yes, they were.

MR. KELLY: At this time I would move the introduction of Texaco's Exhibits One and Two.

CHAIRMAN RAMEY: They will be accepted. Any questions of the witness?

MR. SEXTON: I have one.

CHAIRMAN RAMEY: Mr. Sexton.

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CROSS EXAMINATION

BY MR. SLATON:

Q Did you have waterflows when you drilled your State -- or did you encounter any waterflows when you drilled your injection wells in '73?

A No, sir.

Q Are there any zones around that could cause this pressure in the salt section or to cause it -- is there any reason it should be migrating at this last few years?

A We're not prepared to offer a solution as to how the salt zone is being pressured, other than to say that we have no evidence that it's coming from the waterflood.

Q In your wells where, as you pointed out, in the Eunice - Monument area you have shallow gas wells that haven't been affected by waterflow. Also, in your flood area you do have, am I right, that you do have one flow that's in a zone that produces gas in the other areas, that's producing water in the --is it Number 7?

A Our Well Number 7 has a casing leak at a depth -- I forget the exact depth of that; it does have a waterflow but I have not tried to correlate this with the Eumont gas zone.

Q But there aren't too many gas wells in the area of your Skaggs flood, is that correct?

A Not too many, no; there are some.

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Q. So these -- these could or could not be on a general basis like your statement further over in the part of the gas field that they could have water in the flood areas themselves?

A. We have two producing wells in the Skaggs area or the Skaggs waterflood but neither one of them had water. I believe that's correct.

MR. SEXTON: That's all I have.

CHAIRMAN RAMEY: Mr. Stamets?

CROSS EXAMINATION

BY MR. STAMETS:

Q. You presented Exhibit Number Two and said this was two, two and a half miles south of the closest waterflood, is that correct?

A. Yes, actually, this well was drilled before any large scale waterflooding had been started in this part of the country. There was one pilot waterflood.

Q. Do you know what the operator -- who the operator of that pilot was at the time? Mr. Sexton's exhibit here, the secondary recovery report of 1958 shows three Langlie - Mattix projects, Gulf Coast, Western Oil Company, and Humble, and Skelly. Were any of those projects the ones that --

A. It was Skelly.

Q. Skelly project.

A. Yes.

Q. And that had started the first of 1958. How about that Gulf Coast - Western project, do you know whether --

A. I'm not familiar with it.

MR. STAMETS: That's all the questions I have.

CHAIRMAN RAMEY: Mr. Arnold?

CROSS EXAMINATION

BY MR. ARNOLD:

Q. You say you don't have any solution as to how the water might have gotten into the salt section. Could you even provide a theory as to it?

A. I could provide a theory but I'd rather not, because a theory is not defensible.

Q. Actually, it would sound like maybe Mr. Sexton arrived at his conclusions through the process of elimination. The water is there and it wasn't there, so it is reasonable to think that operations in the area might be causing it.

A. This is a difficult problem. It's not nearly as simple as we thought it would be when we first started studying it. And this was a conclusion, I think, that was made by a number of people, that waterfloods were the cause of it, but all of the evidence that we can see indicates no, that they are not the cause of it.

CHAIRMAN RAMEY: Mr. Lucero.

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CROSS EXAMINATION

BY MR. LUCERO:

Q. Can we then conclude it's your recommendation that normal injection pressures continue, then?

A. Yes.

Q. But the water is still there?

A. The water is still there.

Q. So the problem hasn't been solved?

A. No, sir. However, I might say that in no way is Texaco saying that the problem should be ignored. I think the purpose of this hearing today is simply to discuss what should be done with the waterflood, but I might add that Texaco has probably done as much or more than any operator in the entire area as far as actually relieving pressure. Right now we are bleeding down one well; we have plans to bleed down another. We have specially equipped a disposal well to handle the backflow of water from the salt zone. So in no way is Texaco backing off from any responsibility for our portion of whatever solution comes from bleeding down the salt zone.

Q. My questions didn't intend to indicate that we felt that way.

A. Oh, I'm sorry.

Q. But you are, then, taking action to bleed down some of these wells as was suggested by Mr. Sexton?

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A. Yes. At the present time we are bleeding down our Tract 1 Number 5 and we have plans to bleed down our State 11 Number 6, which is also in the Vacuum Field and we are equipped to do this.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Gannon, on your -- how many wells are on your BZ-NTCA lease?

A. Fifteen wells.

Q. Number 5, I assume, was the fifth well drilled?

A. Yes.

Q. Since that time you've drilled ten wells?

A. Right.

Q. Did you encounter any waterflows in any of the other wells?

A. There were waterflows reported on two other wells but nowhere near the magnitude of this. Of course, this drilling occurred several years ago and no great significance was attached to waterflows other than that we recorded, and from a review of the drilling reports, there were two other wells that did indicate they had a waterflow, but they didn't mention anything about volume or -- and, apparently, from the way the wells were drilled there was no great difficulty encountered.

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Q This well, I assume, is one of the red wells on Exhibit Two, in the south tier of sections, right, on OCC Exhibit Two?

A This is the well, right here, (indicating) yes.

Q Do you know of any other reported waterflows to the north?

A No, I don't.

Q Okay. Say, on your Eunice - Monument Unit, do you have any idea as to the volume of water that's been injected into that unit compared to the barrels of oil recovered?

A No, I don't. These numbers are certainly available and we'll be happy to provide them; I don't remember any at this time. The Eunice - Monument Unit is a pilot flood. At one time we were injecting into two -- five spots and we have since reduced that to one, but the daily volume was in the vicinity of three thousand barrels of water a day we were injecting into the project.

Q And how long were you injecting?

A For about four years.

Q Have you had favorable response to your pilot project?

A We thought we had some indication of response until we ceased injecting make-up water.

Q You injected at the rate of three thousand barrels a day into the pilot area and thought you had response for a

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period of four years?

A. Yes.

Q. Injected for a period of four years and all of that time you thought you had response?

A. Right.

Q. What about your Skaggs flood, was that a long operated flood?

A. Yes, this has been in operation for at least ten years.

Q. Do you have any idea of the ratio of water injected to the oil recovered in that area?

A. It will be in the range of 7 barrels injected per barrel recovered.

Q. Is that normal for waterfloods?

A. It's not desireable. We pay for every barrel of water that we inject, you know, it's not -- but in some of the limestone-dolomite reservoirs that we have oftentimes this is the type of injection-withdrawal situation we get into.

Q. Could this be similar to a situation a friend of mine was telling me about in Texas, where he said for years we wondered where all that water was going and now we're finding out?

A. We like to think that we do a reasonably good job of monitoring our floods and getting the water going where we

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want it to go, because certainly, it's to our economic advantage not to put water out into barren zones. We certainly attempt to get it into the oil productive zones where it will do us the most good.

Q. Okay, in your Eunice - Monument Unit how many -- how many tracer surveys have you run in the four years that you've been operating it?

A. I can't give you an exact number but we have run a number of them.

Q. The same with the Skaggs Unit?

A. Yes.

Q. Same in the Vacuum area?

A. Right, we've run many in the Vacuum Area.

Q. I mean prior to the problem arising had you run any tracer surveys or temperature surveys?

A. Yes, we had.

Q. That was normal? Periodically you normally would run to determine where your water is going?

A. That's right, yes. We use profile surveys as a tool to check the efficiency of injection, right.

CHAIRMAN RAMEY: Any other questions of the witness? You may be excused.

Let's take a fifteen minute recess.

(Thereupon a recess was taken.)

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CHAIRMAN RAMEY: Mr. Abbott, you're next on the list. Do you want to wait?

MR. ABBOTT: I'm not putting on any testimony but I'd like to give a statement.

CHAIRMAN RAMEY: Why don't we wait till the end for you?

MR. ABBOTT: Right.

CHAIRMAN RAMEY: Mr. Eaton.

JERRY TWEED

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. EATON:

Q. Please state your name and by whom you are employed.

A. Jerry Tweed, and I'm employed as a District Engineer for Atlantic Richfield in Midland, Texas.

Q. Mr. Tweed, have you previously testified before this Commission on a number of occasions?

A. Yes, I have.

Q. Does Atlantic Richfield operate any of the waterflood projects which have been discussed today?

A. We operate one waterflood project in the Vacuum

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Area, State Vacuum Unit Number 1, and are working on numerous other projects in the three areas involved.

Q Would you please state the position of your company with respect to the subject before the Commission today?

A. First of all, we think that the continuation of water injection in secondary recovery projects is necessary in order to recover the maximum economical reserves. The discontinuation of injection would cause waste by reducing the ultimate recovery of the waterflood projects.

What I would suggest, or what I am suggesting, is that injection be restricted on the basis of pressure; that we be allowed to inject within 100 pounds of the parting pressure of the formation, and not be restricted on a volume basis or be restricted to produced water only.

We'd rather be restricted on a pressure basis.

Q Is your suggestion one that has been followed at any time in the past?

A Yes. I would like to refer to Exhibit One, which is Commission Order R-5295. This order was given in Atlantic Richfield's case requesting a waterflood project in the State Vacuum Unit. In this case the Commission ordered that Arco's injection pressure be restricted to 860 psi surface pressure, with the Secretary-Director could administratively authorize a higher pressure when informed by the operator that the higher pressure would not be fracture producing.

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And what we plan to do here is to inject into the State Vacuum 1 well. When our pressure reaches 700 psi, or approximately that pressure, we would then go in and take step rate tests on the injection well to determine the parting pressure and make application to the Secretary-Director that we be given a pressure that would be 100 psi below the parting pressure, as determined by these step rate tests. And we think this would adequately protect, as far as the injection well itself, from losing water outside the horizon.

Q. Does Atlantic Richfield have any policy or try to follow any policy with respect to parting pressure?

A. Generally, we attempt to stay below the parting pressure of the formation in our injection projects. I would like to state that I believe there are cases where you can exceed parting pressure without damage, and there are probably cases where it is dangerous to exceed the parting pressure in your injection, for one reason or another.

Q. Mr. Tweed, I believe there has been some discussion today with respect to the status of plugged and abandoned wells.

A. Yes, sir. One thing I would like to add in addition on the parting pressure, after we make application that we be allowed to inject within 100 psi of the parting pressure, periodically we would then take step rate tests on the wells, approximately once every year for the first three

years, and about once every three years thereafter, to see if the parting pressure is staying the same or increasing. If the parting pressure were increasing, then we would again make application that our allowed injection pressure be increased to within 100 psi of the parting pressure.

Q Do you consider 100 pounds a reasonable differential?

A I consider it reasonable and something that would get us enough latitude to where we wouldn't, well, on a normal basis exceed that parting pressure.

Q All right. Now, I started to ask you about the status of plugged and abandoned wells to which there was some testimony earlier. What is the position of your company with respect to such wells?

A Well, we think inside the unit boundary on existing waterfloods or proposed waterfloods, that you ought to submit a wellbore diagram on all plugged and abandoned wells that penetrated the proposed or existing secondary recovery zone. If these wells are not plugged in a manner which would allow for the performance of the secondary recovery project, we think the operator should have the option to either properly plug the wells so that he can conduct his secondary operation, or else not be allowed to inject offsetting or diagonally offsetting plugged and abandoned wells.

Q Has your company had any experience with any parti-

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cular plugged and abandoned well?

A Exhibit Two is a plat map of the State Vacuum Unit, which we made application. The Commission required that we re-enter and plug the Hale State Number 1, which is in the far northwestern corner of unit, prior to injecting either offsetting or diagonally offsetting that forty acres.

Exhibit Number Three is a wellbore diagram of how that well was plugged. There was a cement plug set in the middle of the San Andres in the open hole section and there was a section of the San Andres that was open with no plugs set up until the base of the salt, and it was our opinion, as it was the Commission's, that if we injected an offset well it would fracture the San Andres and then it would migrate in this well from the pressured San Andres on up to the base of the salt; therefore, we were required to re-enter it and plug it, which we did.

I think these, obviously, a well like this, if it isn't adequately plugged, could be a source of lost water in a waterflood project.

Q How do you handle the situation where your plugged well lies outside the unit boundary?

A Well, the only thing I could say to that, I think it would have to be handled on an individual basis, and on individual circumstances. There might be times when the operator, or the unit operator would be required to plug it;

there might be times then when the operator or owner of that lease would be required to plug that well satisfactorily.

Q. Mr. Sexton offered four recommendations. What is your opinion concerning those recommendations?

A. I had no disagreement with the last three recommendations and would endorse them. The only difference that I had with the first one is that I would not, where a flood is injecting above frac pressure, I would not restrict the injection to just produced water; I would recommend that we put a limit on the injection pressure, not on the amount of water injected.

Q. So that the injection pressure would be below the frac pressure, or parting pressure?

A. Yes, sir.

Q. Were Exhibits Two and Three prepared by you or under your supervision?

A. Yes, they were.

Q. And Exhibit One is a copy of the Commission order, is that correct?

A. Yes, sir.

Q. Do you have anything else to add?

A. That is all.

MR. EATON: We have no further questions.

CHAIRMAN RAMEY: Will you tender your exhibits, Mr. Eaton?

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MR. EATON: Oh, I'm sorry. We offer Atlantic Richfield's Exhibits One, Two, and Three into evidence.

CHAIRMAN RAMEY: They will be accepted. Any questions of the witness? Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Tweed, you have recommended 100 pounds pressure limitation below the parting pressure, and Mr. Sexton indicated he thought perhaps 50 pounds might be a sufficient differential. Do you disagree with 50 pounds or not?

A No, I don't. It can get to be a matter of where you're talking about the pressure differential, also. I think -- I was thinking, probably, we'd operate our 100 pounds at the wellhead, but 50 pounds I think also would be adequate. There isn't essentially any difference in 50 and 100 pounds.

MR. STAMETS: That's all.

CROSS EXAMINATION

BY MR. RAMEY:

Q Mr. Tweed, in addition to plugged and abandoned wells, or inadequately plugged and abandoned wells, would you think that a review should be made of deeper wells to see if they have adequate cement to cover the injection zone?

A Yes, sir, I certainly do. The reason that I didn't

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testify to this is the fact that we don't operate the flood in this area that has that problem, so I thought I would leave it to the other operators to cover that point.

CHAIRMAN RAMEY: Thank you, Mr. Tweed. Any other questions of the witness? He may be excused.

Mr. Blodget, you're next on the list.

WILLIAM T. THOMAS

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. BLODGET:

Q Will you please state your name, your occupation, and by whom you are employed?

A I'm Bill Thomas, I'm employed by Getty Oil Company in Hobbs, New Mexico, area.

Q Have you previously testified before the New Mexico Oil Commission and your qualifications been accepted?

A Yes, I have.

MR. BLODGET: Any other questions?

CHAIRMAN RAMEY: He is qualified, Mr. Blodget.

MR. BLODGET: Thank you.

Q (Mr. Blodget continuing.) Now, there's been some reference to a statement of the Eunice Area Waterflood Com-

mittee. Would you care to read a statement concerning that?

A. Yes. I have a statement to present from the Eunice Area Waterflood Committee.

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee at that time was to collect, analyze data, and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source, or sources, feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of fifteen wells were initially shut in for observation. The wells consisted of 7 injection wells, 6 producing wells, 1 shut-in producing well, and 1 disposal well. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure in the shut-in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the Citgo State well.

The Petro-Search Citgo State Number 1, located in Unit E, Section 2, Township 23 South, Range 37 East -- I believe Mr. Sexton pointed the location of this well out -- had been found to have water entering the wellbore hole behind the four and one-half inch O. D. production casing from 2470 to 2500 and moving up the hole, and had 1185 pounds

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wellhead pressure.

The Committee recommended to the Commission that injection be resumed into the injectors and plans be made to blow down the pressured up salt section in the Citgo State Number 1. Thoughts at the time were to discontinue cycling and attempt to determine if we were dealing with a localized or widespread pressure situation.

The NMOCC felt that cycling and monitoring should be continued. An alternate recommendation was made to the NMOCC at this time. Injection wells with approximately 700 pound wellhead pressure or less be reactivated and cycling expanded to take in more injectors. The Commission agreed to the alternate proposal and this procedure was implemented. During the monitoring and cycling the pressure on the Citgo-State well had remained practically constant at 1150 pounds.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976, meeting that, one, injectors which are high pressure and low volume, and two, those which have shown little or no pressure variation during shut in, be backflowed and tested in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and build up procedure were: Backflow the well for a minimum of forty-eight hours and at such time as the flow rate is 100 barrels

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per day or less, shut the well in for pressure build up, and if pressure does not build up past 800 pounds in forty-eight hours, return the well to injection. From this time forward wells were checked for pressure drop, backflowed, rates and pressures monitored, and build ups ran following backflow.

Upon recommendation from the Committee, and approval from the NMOCC, wells were returned to injection as warranted by results.

At the Committee meeting on August 26, 1976, approval was given by the NMOCC to suspend the present testing procedure and make plans to backflow the Citgo-State well. Fourteen Skelly and Anadarko wells were to be shut in one week prior to backflow.

On September 19, 1976, backflowing of the Citgo-State well was begun. At the time of opening the well had 1010 pounds on the surface. After sixty hours the well had backflowed approximately 40,000 barrels of 9.9 pound brine. Initial flowing pressure was 210 pounds at a rate of 9 barrels per minute. After sixty hours flow pressure had decreased to 70 pounds and the rate was 2 to 3 barrels per minute. During the ten-day flowing period the well flowed back an estimated 63,000 barrels. The fourteen wells were closely monitored during backflow with pressure recorders. No pressure interference was noted on any of the wells. As soon as pressure and flow rate would permit, Petro-Search re-entered,

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plugged and abandoned the well.

The test wells were later returned to injection and monitoring discontinued, with the exception of four wells which had previously shown bradenhead pressures. These wells still have pressure recorders attached and have consistently fell off in pressure since backflowing the Citgo-State and return to injection of surrounding wells. These wells are Skelly Penrose "A" Number 44, from 725 to 15; Skelly Penrose "B" Number 54 -- give you more of that in a minute -- and Skelly Penrose "B" Number 52 from 120 to 60, and also had the Skelly Penrose "A" 38, which lost pressure.

Subsequent work of the Committee has consisted of re-evaluation of all available temperature and tracer logs in the area and analyzing our logs as they became available.

Wells which had abnormal temperature gradients have been, and are being, re-logged to confirm data as interpreted from previous logs. Several noise logs have been, and are now being run. Skelly perforated the Skelly Penrose "A" Number 64 at 1460 feet opposite a waterflow which was encountered during drilling of the well, approximately two years ago. Prior to perforating the well was producing 9 barrels of oil and 40 barrels of water per day. Current producing rate is approximately 8 barrels of oil and 43 barrels of water per day. These perforations were acidized and broken down but attempts -- but we did not establish any

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waterflow, and also, based on the waterflow which was encountered in the lower salt section, of the same well, additional perforating was done, acidizing and breakdown failed to establish flow from the lower salt section.

On January 14, 1977, a noise log was ran on the Skelly J. V. Baker Number 11 in an attempt to determine if cycling was occurring between Anadarko's injection well Number 13-C7 and J. V. Baker Number 11, which is a Drinkard producer. It appeared that possibly water which was being injected into the Penrose section might be channeling across to the Baker well and moving up and back to the injection well. No upward or downward movement adjacent to the injection zone was indicated by the log. Logs ran during 1975 on the Anadarko well had shown possible migration across the salt section. Recent logging by two different companies have failed to confirm this.

On March 27, 1977, a surface flow from the oil string annulus was noted on the Skelly Penrose "B" Number 54. A noise log was run and water movement confirmed at 1180, which was the top of the salt, two holes were perforated in the casing at 1180, and to date the well has flowed back approximately 45,000 barrels of salt water. Frequent washing with fresh water is required to prevent salting up. Recently the flow back has been decreasing and steps are being taken to insure that the well is kept free and clear of any restrictio

which might hinder the flow. I might add, in the last couple of days the Skelly Penrose "B" well has ceased to flow, so we either have depleted the well of its flow or possibly salted it back up in the formation, but we can pump water in the tubing and establish circulation.

Subsequent logging of wells on the Anadarko Langlie-Mattix Penrose Sand Unit and Skelly Penrose "A" and Penrose "B" waterfloods have failed to indicate major storage of water which would warrant perforation of casing to establish flow.

And that completes the Committee statement.

Q All right. Let me call your attention to an exhibit that's been marked Exhibit A, Getty Oil Company. Would you identify that, please?

A Yes. This plat is a portion of a current land map prepared by Midland Map Company, showing data on well locations and lease ownership. The 36-section area covered by this hearing is outlined in red. Getty operated leases are shown in green and partnership leases in yellow. As indicated by the plat, it can be seen that Getty operations in the area consists of waterfloods in the Getty Penrose "A" and Penrose "B" Units, and disposal operations by Getty's, formerly Skelly, manufacturing department in section 27, Township 22 South, Range 37 East. The other Getty operated leases on the plat have no injection or disposal facilities

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of their own. These are served by the Agua operated Blinebry-Drinkard Salt Water Disposal System, with the exception of the Ellen Sims "A" lease which is served for disposal purposes by the Getty Penrose "A" unit.

Q With the exception of the Ellen Sims "A" --

A With the exception of the Ellen Sims "A" lease, which is served for disposal purposes by the Getty Penrose "A" unit.

Q All right.

A Exhibit B is a current performance curve on the Getty Penrose "A" operated waterflood.

Exhibit C is a current performance curve on the Getty Penrose "B" operated waterflood.

Q Were these exhibits prepared by you or under your supervision?

A Yes, they were.

MR. BLODGET: We offer these exhibits in evidence.

CHAIRMAN RAMEY: They will be admitted.

Q (Mr. Blodget continuing.) Would you give us a brief summary of the operations concerning the Getty Penrose "A" Unit and the Getty Penrose "B" Unit?

A The Getty, formerly Skelly, Penrose "A" Unit became effective May 1, 1967. A pilot flood was in operation on Skelly's H. O. Sims lease prior to unitization, and this is within the unit area. Cumulative injection into these two

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wells was 2,639,018 barrels prior to effective date of the unit. Cumulative injection since unitization into the unit area was 24,743,905 barrels as of April 1, 1977. The daily average water injection rate during April, '77, was 5,222 barrels per day at 1683 psi. Total cumulative injection into the unit area to date is 27,382,923 barrels as of April 1, 1977.

The Penrose "A" Unit contained sixty wells on the effective date in 1967; of these sixty wells, eleven were drilled and completed after 1942. The remaining wells were drilled and completed between 1936 and 1942.

It is a recognized fact that wells in this area have potential for considerable casing problems in all intervals, particularly within the upper 900 feet, where the exterior is subjected to corrosion from the Santa Rosa and upper water sands. In the interim period from the effective date of the unit until now, we have located and performed remedial operations on leaks within the upper 1200 foot interval in a considerable number of wells. It was recognized early that this was a problem, and as the record shows, we have monitored and checked regularly to detect and remedy these problems as they become evident. Additionally, we have located and repaired leaks or water flows behind pipe in the intervals from 1500 to 2500 feet on wells within the unit area. From start of injection to date, injection into this

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unit has been monitored by temperature logs and/or selected injection profiles at irregular intervals. During late 1971 and 1972 a program was initiated to install stub liners in several of the open hole wells to improve control of injected water. Eighteen liners were installed in injection wells in this unit during 1972 and 1973. Injection profiles run immediately following these liners installations indicated that all injection was being confined to the unitized interval. We feel the record of casing leak repairs, repairs to waterflows behind casing, and liner installations within this unit area should be considered as solid evidence that we have diligently attempted to confine water to the unitized interval in this waterflood project.

The first evidence of waterflow in the Penrose "A" area occurred during May of 1973, when waterflow was detected outside the casing of Well Number 29. The well was subsequently repaired.

Waterflow was encountered in July, 1973, during drilling operations on the Ellen Sims "A" Number 1 well, which is located immediately northeast of the unit area. This waterflow was encountered at approximately 2500 feet.

During September, 1973, Unit Well Number 9 developed a leak at 2569. When the Ellen Sims "A" Number 2, which is north offset to the Number 1 well, was drilled during February of '74, no waterflow was encountered.

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In March, 1974, a waterflow outside the casing developed in Unit Well Number 47, and this was followed during the next month, April, 1974, by waterflows in Well Number 63, which was being drilled as an infill well, at approximately 1200 and 2500 feet. Well Number 64 was drilled in August, 1974, and encountered a waterflow at 2500 feet. And two more wells were drilled with not a waterflow being encountered. Waterflows occurred outside casing on Wells Number 3 and 28; these were repaired.

We were requested by the Hobbs Office of the New Mexico Oil Conservation Commission to perform necessary surveys in February, 1974, to determine if there was any injection water leaving the unitized interval. A program was designed, undertaken, and completed during March, 1974, covering twenty-eight wells within the unit area.

This survey included all included all injection wells in the unit at that time. Analysis of data from injection profiles, temperature decay, and 24-hour temperature surveys, shut-in temperature surveys, on these wells indicated three wells which were not confining injection to the unitized interval. These wells were subsequently repaired. Several wells indicated varying degrees of channeling within the unitized interval. These wells were repaired. It was our intention then, as it is now, to confine all injection to the unitized interval.

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There are two wells within the unit area which had been plugged and abandoned, as recommended by Getty, and approved by the Hobbs office of the NMOCC. They requested we re-enter and replug these wells to provide sufficient cement across the Penrose Sand interval and across intervals above which could be charged from stray water so any movement within the wells would be eliminated. These wells were re-entered and replugged as requested by the Commission.

The R. D. Sims, and others, Number 2 was drilled and completed during 1948 and the Ellen Sims Number 6, also. Location of these wells is southeast quarter of the northwest quarter of Section 3, and northwest quarter of the southeast quarter of Section 3, respectively, all located in Township 23 South, Range 37 East. Approximately 23,000,000 barrels of water had been injected into the Penrose "A" unit area at this point in time.

Cumulative oil production from the unit area since unitization was 3,067,404 barrels as of April 1, 1977. Average daily oil production during April of 1977 was approximately 650 barrels per day, as compared to the average daily production of 1,538 barrels of oil per day during October, 1974. This was prior to the Commission order which restricted injection rates. Several wells were drilled and seven wells had been recently stimulated, which had contributed to increasing and maintaining a maximum production rate. Estimated

remaining recoverable secondary reserves at that time were approximately 1.7 million barrels, under conditions and pattern configuration in existence at that time.

As may be noted on Exhibit B, the waterflood is rate sensitive and, as the curve shows, daily oil production has steadily declined from approximately 1600 barrels -- approximately 1600 barrels per day to a current rate of approximately 650 barrels. This amounts to a forty-one percent decline in daily production over the past two and one-half years.

We feel, based on past history, that any further restrictions on injection rates, for any appreciable length of time, would do irreparable damage to the reservoir as well as extending the life of the project beyond economic limits, resulting in loss of revenue to the state and federal government, as well as parties to the unit.

Q Now, do you have a summary of Getty operations on the Penrose "B" Unit?

A Yes, sir, I do. The Getty Penrose "B" Unit, containing sixty-three wells became effective July 1, 1965. The unit now contains twenty-eight injection wells and thirty-one active producing wells.

Cumulative injection into the Getty Penrose "B" Unit to April 1, 1977, was 24,717,893 barrels of water. The daily average injection rate during April, 1977, was 4419

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barrels at an average wellhead injection pressure of 1782 pounds.

From start of injection to date, injection into this unit has been monitored by temperature logs and/or selected injection profiles at irregular intervals. There have been no indications from this data that injection water was going outside the unitized interval. During March of 1972 a casing leak was located in well Number 32 in the interval 226 to 446 and was squeezed off during the course of other operations on the well. Well Number 53 developed a waterflow between the casing string and surface casing; this problem was repaired. Cumulative oil production from the unit area since unitization was 1,277,039 barrels of oil as of March 1, 1977. Current oil producing rate is approximately 170 barrels of oil per day.

Recently a waterflow was noted on the Skelly Penrose "B" 54 well, between the surface and production casing. The waterflow was found to be entering the casing at approximately 1180. Two holes were perforated in the casing at that point and to date approximately 45,000 barrels have been backflowed from the well.

Plans are underway to conduct temperature, profile, and possibly noise logs, on all injection wells surrounding the Penrose "B" 54 injection well.

On the Penrose "B" plans are to continue monitoring

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of bradenhead pressures and periodic surveys of injection wells, as required and dictated by performance to insure that confinement of injected fluid is maintained. A study is now underway to evaluate the feasibility of doing additional work in the northern portion of the unit to increase ultimate reserves.

Q. All right. Does Getty operate some deeper wells in this particular area?

A. Yes. In addition to the secondary flood units, Getty operates wells on primary production status in the area, as indicated on Exhibit A. These include the Hobbs "M" lease in Section 20; the J. V. Baker in Section 22 and 27; and the Baker "A" leases in Section 26; and the Baker "C" lease in Section 26; and the Ellen Sims "A" lease in Section 3.

Wells on the Baker "A", the Baker "C", and J. V. Baker leases were completed deeper in zones below the Penrose Sand unit. Four of these wells experienced cacing leaks during the period 1973 and 1974.

We were directed by the Hobbs office of the NMOCC on October 24, 1974, to re-enter seven wells which were in this deeper category and run cement bond logs, perforate, and bring cement back either into the next casing shoe or provide sufficient cement to tie back into the base of the salt. We concurred with the idea that itwas the responsibility of the

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operator of the deeper wells in the area to take remedial action which would insure the placement of cement across the producing interval for shallower zones within the area of these floods. Procedures were developed, and these were approved by the Hobbs office of the Oil Commission. All of the well work, as recommended by Skelly at the time, and approved by the Commission has since been completed. This remedial work should insure that these wells will not continue to be a possible pipeline to transmit stray water within the area, as well as protecting the wells from collapsed casing due to external corrosion on the casing and pressure on the outside of the casing. The possibility exists that one or more of these deeper wells could have been providing a pathway to transmit stray water and have had a significant role concerning the pressured up salt section. If this was the case, it is possible that the source or sources have been masked through recementing and replugging of wells in the area.

Q Now, does Getty have a salt water disposal well in the Eunice Area?

A Yes, we do. The Eunice Salt Water Disposal Well Number 1 operated by the manufacturing department of Getty Oil Company is located 2580 feet from the south line, 1200 feet from the west line of Section 27, Township 22 South, Range 37 East, Lea County, New Mexico. This well is completed open hole 4010 to 4550 in the San Andres zone with ten and

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three-quarter inch casing set at 300 feet and cemented to the surface and seven inch casing set at 4010 feet and cemented back to the surface. Based on surveys on the well, water is being contained in the San Andres zone and no problems are known to exist at this time. Continued disposal of this water into the well is considered vital by Getty's Manufacturing Department to continue operation of this plant for hydrocarbon extraction from casinghead gas in the area.

Q Now, Getty also has an LPG Storage Well in this area, does it not?

A Yes. The Eunice Gasoline Plant Number 1 Storage Well Number 3 is located 1650 feet from the west line and 2310 feet from the north line of Section 27, Township 22 South, Range 37 East. This well was drilled to a TD of 2075 feet with eight and five-eighths inch casing set at 1848 feet and five and one-half inch tubing set at 2045. Completion is open hole, 1848 to 2075. A cavern is washed out in the salt interval for LPG storage. This well was completed in June, 1953, and no problems were experienced until June, 1974, at which time the well had product in storage. On June 29, 1974, the well developed a casing pressure of approximately 1700 pounds. After delivery or removal of 220,000 gallons of propane from the well, with no water input the casing pressure dropped to 1050 pounds. Pressure was normally 700 pounds on this well when delivering to the pipeline. Surveys were

ran on the well which indicated the well had no casing leak but that foreign water was entering the well within the cavern. The tracer survey indicated that water was entering below the bottom of the casing in the cavern. A decision was made to tap the well and leave the water flowing through an open casing valve to surface pits to avoid pressuring the cavern. This storage well has remained inactive since that time. This LPG storage well is no longer considered safe or satisfactory for its designed purpose.

A test conducted June 3, 1977, on this well, by the manufacturing department showed the well to be flowing approximately one-half gallon per hour of water. After being shut in for six hours, the pressure at the surface was 78 pounds. It appears that the problem in this area is approaching stabilization.

Q Now, after all that information, do you have any conclusions and summary?

A Recently a survey was conducted in an effort to determine fracturing or parting pressures on the Penrose "A" and Penrose "B" units. Current fracturing jobs were checked to evaluate the instantaneous shut in pressures. As may be noted on the attached tabulation, next sheet, 1600 pounds is an approximate average. And also Wells Number 63 and 64, which are newly drilled wells, were fractured on completion, as the tabulation shows. The instantaneous shut-in pressure

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on the two new wells are very similar to the older ones.

Using 3500 feet as midpoint of perforations and .4775 psi per foot for 9.2 pounds per gallon fracturing fluid, calculations indicate a bottom hole fracture pressure of 3271 psi per foot. Using the same data, the frac gradient calculates to be .935 psi per foot.

Water analyses have shown the density of the Penrose "A" and "B" produced water to be 8.6 pounds per gallon and make up water 8.45 pounds per gallon. Assuming a hundred percent produced water, neglecting friction, the surface pressure could be 1710 pounds without exceeding bottom hole frac pressure, and assuming a hundred percent make up water the surface pressure could be 1727 pounds without exceeding bottom hole frac pressure. Basedon April, 1977, C-120 reports average surface injection pressures were 1683 on the Penrose "A" and 1782 on the Penrose "B" .

We have no evidence to indicate that we are presently injection water at sufficient pressure to cause formation fracturing, or to be fracturing in the upper zone. These injection pressures might be lowered somewhat through an extensive program of backflowing of injection wells, acidizing, and so forth. Accumulation of iron sulfide, scale, and other materials in the vicinity of the borehole are definitely a contributing factor to the pressure requirements to inject water.

In summary, we do not feel that we are presently injecting above parting pressure and feel that physical evidence supports this conclusion. One, no apparent channeling between wells; no wells accepting water at excessively low pressure or vacuum; three, no oil or hydrocarbons have been present in backflow water from the salt section; difficulty in proving or disproving that communication exists between the salt section and the pay zone out in the reservoir. We concur with the Eunice Area Committee recommendations as set forth at the NMOCC meeting in Hobbs during January, 1977. Getty Oil Company requests that no further requirements be placed on our operations in the area, or restrictions. We will continue to work toward relieveing the pressured up salt section and will put forth every effort possible to achieve this end. We are fully aware of the gravity of the situation and all Federal, State, and interested parties and others can be assured of our hundred percent cooperation in solving and eliminating the problem.

MR. BLODGET: Pass the witness.

CHAIRMAN RAMEY: Have you offered your exhibits?

MR. BLODGET: I think I did, but if I haven't, I'll offer them again.

CHAIRMAN RAMEY: Yes, they will be accepted. Any questions of the witness?

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CROSS EXAMINATION

BY MR. RAMEY:

Q Mr. Thomas, do you feel that these waterfloods are normal operating waterfloods?

A Yes, I do, particularly on our Penrose "A" and Penrose "B" has never been near -- it's required more injection.

CHAIRMAN RAMEY: Any other questions?

CROSS EXAMINATION

BY MR. SEXTON:

Q You said your flood decline dropped forty percent from the time water curtailment occurred. How much of this do you feel was normal decline?

A It's difficult to say because the flood at that time was on the decline. Now, this, as I stated, was partly because some wells were being drilled and some stimulation work we had done; as the performance curve will show, back in October, 1974, it would be on a decline.

CHAIRMAN RAMEY: Any other questions?

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Thomas, you indicated that your current injection pressures were something just in excess of 1700 pounds

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in the Penrose projects. Looking here at the 1976 District One Secondary Recovery Projects Report, and there the pressure is indicated at -- the average pressure, 1800 and 1900 for the "A" and "B" projects. Have you lowered the injection pressure --

A Yes, we have, we have lowered it. We have lowered injection pressures.

Q So, in the past you have been injecting at pressures higher than --

A Yes.

Q -- parting pressure?

A Somewhat, yes.

MR. STAMETS: Okay, thank you.

CHAIRMAN RAMEY: Any other questions?

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Would you locate that Skelly Penrose "B" Number 54 well for me? What is the section and township and range?

A Township 23 South, Range 37 East, in Section 9.

Q And where was that Anadarko injection well Number 13 C-7 that you made reference to? I think it was in Section 27, was it not?

A Right here.

Q What is that section?

A. 27.

Q. Of what township and range?

A. Range 37 East, Township 23 South.

Q. Thank you.

CHAIRMAN RAMEY: Any other questions?

MR. CLEMENTS: May I ask one?

CHAIRMAN RAMEY: Yes.

CROSS EXAMINATION

BY MR. CLEMENTS:

Q. Mr. Thomas, do you know whether or not any effort has been made to find out where that LPG well Number 3 is being bridged off by salt or not?

A. Not at this time, Les, they don't -- they don't think it is. They are testing on that well right now.

But I do know for a period of time the flow rate had been coming way down along with the pressure.

Does that answer your question?

Q. Okay. Thank you.

CHAIRMAN RAMEY: The witness may be excused.

MR. BLODGET: In order, Mr. Chairman, in order to save time, we have another written summary of the Getty Oil Company East Eumont Unit, and I can put the man on that wrote it and qualify him, or I can just hand you the statement now to save time; either way.

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CHAIRMAN RAMEY: I think the statement would be fine.

MR. BLODGET: I think we have to qualify him as an expert witness, maybe.

CHAIRMAN RAMEY: Why don't you put your witness on and have him qualified and then give us the copies.

HAL A. OWENS

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. BLODGET:

Q Would you state your name and by whom you are employed and in what capacity?

A Hal Owens. I'm employed with Getty Oil Company as a Staff Engineer in Hobbs, New Mexico.

Q All right. Have you previously testified before this Commission and your qualifications been accepted?

A No, I haven't.

Q All right. Would you give us a short summary of your educational background and experience background?

A I have a B. S. in Petroleum Engineering from Louisiana State University, and have worked for Getty Oil Company two and a half years in Hobbs, New Mexico.

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Q Are you familiar with the East Dumont Unit and its operations?

A Yes, I am.

Q Were you assigned to that project?

A Yes, sir.

Q Okay. Have you written a statement concerning the operation of that particular unit?

A Yes, sir, I have.

Q And we probably ought to have you hand copies of that unit statement to the members of the Commission. We'd like to mark that whatever it will be, Exhibit, Getty Oil Exhibit Number -- it would be D.

Now, was this statement prepared by you?

A Yes, sir, it was.

MR. BLODGET: We'd just like to introduce the statement for the record, please.

CHAIRMAN RAMEY: That would be fine.

A The Eumont structure --

Q We've just introduced it by record. You don't have to read it.

Do you have anything further, Mr. Owen?

A No, sir.

CHAIRMAN RAMEY: Do you have anything further, Mr. Blodget?

MR. BLODGET: I think that's it. Thank you.

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CHAIRMAN RAMEY: Mr. Shrader?

MR. SHRADER: I just have a statement.

CHAIRMAN RAMEY: Mr. Sperling?

A. J. HANKINSON

called as a witness, having been first duly sworn, was examined, and testified as follows:

DIRECT EXAMINATION

BY MR. SPERLING:

Q Would you please state your name?

A Jim Hankinson.

Q Where do you live, Mr. Hankinson?

A 1442 Scenic Ridge, Houston, Texas.

Q What is the name of your employer? And in what capacity are you employed?

A Mobil Oil Corporation, Reservoir Engineer.

Q In that capacity are you familiar with the waterflood projects operated by Mobil in New Mexico?

A Yes, sir.

Q Would you identify those, please, by name and by area?

A The two involved in the subject of this hearing are located principally in the north area of Vacuum Field, and they're called our North Vacuum Abo Unit, outlined in red,

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and the Bridges-State Grayburg-San Andres Co-op flood, outlined in blue. They're in T17South, R34East, of the North Area of the section.

Q All right, now you're referring to what's been marked as Mobil's Exhibit Number 1?

A Yes, sir.

Q Now, would you give us the benefit of a short history of these two projects in whatever order you choose?

A Yes, sir, I certainly will. We've identified firstly, the location of these projects, and I will provide a brief review of the history that we believe will show that they've been operating prudently and injection water has been confined to the flood zones.

I would like to discuss these individually. First we'll start with the Grayburg-San Andres. The pilot waterflood -- the field was discovered in 1929. The pilot waterflood, which began in December of '58, was probably one of the first Grayburg-San Andres floods in the State Of New Mexico. It's been expanded several times. It started in the pilot area in the north central portion and developed southward and northward, and it's been in operation eighteen years.

The project is now in what we call the advanced stage of secondary recovery after recovering 13.5 million barrels of oil and 7 million barrels of water.

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Our Exhibit Number Two is a performance history of the project, and you might note on the exhibit that we submitted other historical data is shown in tabular form on the bottom of the first page there.

We would like to sort of outline what our guidelines, what we think are necessary for a successful flood project.

Number One, that the producing horizons in producing wells and injection wells be completed in correlative zones.

Item Two, that we confine injection to the approved flood zone; and Item Three, that we do frequent -- make frequent analyses of flood performance to insure the confinement is maintained.

We started running a few tracer surveys on the Grayburg-San Andres Co-op project back in 1966. The technique has been described previously. And we've done a few -- I think up until 1976, about ten surveys. Then as a part of the Co-op and industry and NMOCC project, we ran, I think was it eleven radioactive surveys, twelve temperature surveys, in eleven injection wells. None of these surveys indicated that water was leaving the intended flood zone. In addition, as other witnesses testified, we selected two wells that have some temperature anomalies that were unexplainable, deliberately perforated these zones, swabbed them to see if they would give

up fluid; they did not. Ran a tubing and packer and injected below to see if we could establish communication; that we did not. Came out of the hole with injection equipment and acidized the zone, reset the packer as before; still no communication. So we finally gave up and cemented those perforations and put the wells back as they were.

Also as part of this Co-op industry investigation we shut in eleven injectors in this area of the project, right here, Sections 25, 26, and 27, T17South, R34East. And on certain selected wells on the offset properties to the south, and I think there was one to the east and one to the west, we installed pressure recorders on the annular spaces to record the effect, if any, on the annular pressures. The wells were shut in on September 1st, 1976, and injection resumed, I think, May 17th. During this time there was no noticeable change on the so-called monitor wells.

We've also used step rate testing, discussed earlier, as a means of controlling injection at conditions below frac pressure. There again, step rate testing has been discussed.

During '76 we ran what we call pumping tests to determine the frac pressure in this area in question. This is an old, mature flood in the late stages of secondary recovery, and the indicated surface frac pressure was from 2400 to 2700 pounds and we had been injecting below these pressures in our wells.

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So, more or less in summary on the San Andres here, we can see no evidence of injected water leaving the intended Grayburg-San Andres flood zone.

Gentlemen, I would like to introduce Exhibit Three which identifies the various geological intervals in the multipay Vacuum Field. You've got a copy on your desk there and this one, I think if we could tape it up on the board and talk about it, we might shed a little more light.

Gentlemen, this marker, I'm sure from the audience cannot be seen too well, but this identifies the zones, the geologic horizons from the Abo down here about 8400 feet on up the hole to the Blinebry, Glorieta, base of San Andres, top of San Andres, Grayburg, Queen, Yates, base of salt, top of salt, Rustler Anhydrite -- we didn't unfold it far enough, did we.

Q What is the thickness of the salt zone in this area? Approximately?

A 1700, Jim, to the -- about 1000 feet; 1700 to 2700.

Q Okay. Well, obviously, this is a multi-pay zone?

A Yes, it is a multi-pay field.

Q What is the situation with respect to the cement program that Mobil has observed in connection with the development of this project?

A There have been some 190 wells drilled in this area that have penetrated the flood zone, and on two occasions

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we've made a complete review of every wellbore and all wells in the area that we are conducting flood operations have cement opposite the approved flood zone.

Q That's within the Grayburg-San Andres flood?

A Yes, sir.

Q Does that include the Abo, also?

A Yes, sir, all wellbores.

Q Okay.

A One point that we would like to make on this Exhibit Three, from the San Andres standpoint, we believe that any water injected into the Grayburg-San Andres interval, which the flood zone in our interval is poor quality pay, this is the flood zone here down to the, more or less, you might say, the waterlog contact, would preferentially, rather than going up the hole, would go to this zone; this is a low pressure disposal zone. It takes water by gravity in this area. We think it would be more likely that it would go there than come up the wellbore to higher intervals.

This pretty well concludes the comments on San Andres, we'll proceed to the Abo.

Q Yes, would you proceed and discuss the Abo situation?

A The Abo was discovered with completion of Mobil's Bridges-State Number 112 on June 15th of '66. Development of the field proceeded rather slowly in the early years of

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'66 to '69, because of the rapid decline indications on some wells and the indicated low recovery indicated from this solution gas drive reservoir. It wasn't until we considered the benefits of fluid injection in this reservoir that our development pace accelerated in the years 1970 and 1972. The NMOCC approved unitization on October 27, '72, and we began injection on August 1st of '73. The project is currently in the response stage and our production exceeds our primary by some 2700 barrels per day.

Q. Would you refer to what's been marked as Exhibit 4 and explain its purpose?

A. Yes, sir. Exhibit Four is the production history of our North Vacuum Abo Unit.

Q. Would you explain the procedures that have been employed in connection with the operation of this flood?

A. Yes, sir, I certainly will. Firstly, injection profiles have been run on 35 of the 36 injectors in the field. The only reason for not running the additional well was it was such a low capacity injector that we didn't feel that it would warrant the cost. This type of work was initiated early in the life, as soon as we did see wells with pressures indicating some degree of fill-up.

We have also -- by the way, none of these surveys indicated that water was leaving the Abo zone or this zone here, approximately 8400 feet. We have also run some sixty-

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two step rate tests to confirm that our injection pressures have been below fracture pressures.

We've also performed a reservoir simulator study. For those not familiar with this, it consists simply of describing the reservoir on a low cell basis, many cells wide and maybe 20 or 30 cells wide and 40 to 50 or however, and describing each of these cells in terms of porosity, thickness, permeability, and other reservoir characteristics, and then using a high speed computer to solve the reservoir flow equations and describe flow. The results of these simulator studies indicate good agreement with actual performance when we start comparing, you know, well by well; there are a few anomalies, but basically, from the modeling standpoint, it was good agreement. This would not be so if injection water was escaping from the reservoir; you would not get the agreement between your actual performance and your model performance.

As stated previously, we've injected in the Abo below frac pressure. We want to go into this performance history right here. If you gentlemen can see there, we started our injection approximately mid-year, or August there, of '73. We've injected about 11,000,000 barrels of water, or at about seventy-one percent fill-up, have seen our oil production go from about 1110 barrels a day up to 3700 barrels a day and our water production, which is the lower dashed curve, actually decrease down to about -- this shows fifty-some barrels

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current production is about seventy barrels. We're producing seventy-one barrels of water a day out of this project, and one of the best indicators of fracturing is the production of water in nearby wells, call it channeling, call it fracturing, we have not seen any water production. This has been an excellent response and has performed in a very satisfactory manner. But there again I mentioned fill-up; at the present time it's estimated to be seventy-one percent. The initial response was about fifty percent, which is quite normal for a flood project.

And finally, I'd like to refer to this Exhibit Three again. As you will note on this, if you can see it, here's the upper hundred feet of the Abo, what we consider to be the production interval; lower intervals here contain a little water. The Blinebry is productive in this area; that's located right in here. The Glorieta is productive, quite extensively all across this area. The San Andres is productive; this is a low pressure zone. The point I'm trying to make is that even if water was escaping by fracturing or by any other means, we would believe that we would see this in these shallower pay zones, the Blinebry, the Glorieta, or even San Andres. And, Gentlemen, we haven't seen it. We haven't seen it either by water analyses or by extraneous amounts of water above what you'd normally expect, so that it's our conclusion that water is not leaving the Abo, it is

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being confined here and we do not see any water production in these shallow reservoirs, and furthermore, this zone right here is a gravity disposal zone, and we would --if it did get past these two, it would be most likely that it would be retained in this low pressure disposal zone. This is logical, and from operating results that we've seen.

This pretty well indicates that to our extent, that we have operated this project very prudently; we do not exceed the frac pressure; and that water is being confined to these reservoirs.

Q Do you have any recommendations?

A Yes, sir. We recommend continuation of present operations in the Grayburg-San Andres and Abo reservoirs and that injection in these projects neither be restricted nor curtailed beyond the limitations of frac pressure. We were at seventy-one barrels a day when this happened, and if we're curtailed to produced water, it really puts a cramp in our operation. We'd like to point out that such a reduction we believe, would reduce production immediately by about 2800 barrels a day. It would also decrease the New Mexico royalty income by some 350 barrels a day, and would furthermore jeopardize the recovery of eight to twelve million barrels of fluid injection reserves on these projects.

Q Do you have anything else?

A No, sir.

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MR. SPERLING: I'd like to offer Mobil's Exhibits One through Four at this time.

CHAIRMAN RAMEY: They will be accepted.

MR. SPERLING: Mr. Hankinson, I made the grievous error in failing to establish your qualifications. I think, so far as I'm concerned, you've demonstrated them in the course of your testimony, but for the record, have you on any previous occasion testified before the Commission so that your qualifications are a matter of record?

A. Yes, sir.

Q. And your qualifications have been accepted?

A. Yes, sir.

Q. All right.

MR. SPERLING: I submit the witness is qualified.

CHAIRMAN RAMEY: I have to agree with you, Mr. Sperling. Any questions of Mr. Hankinson?

CROSS EXAMINATION

BY MR. SEXTON:

Q. Did you run a reservoir simulator on your San Andres flood?

A. No, sir, we have not.

Q. And also, would you explain about your fracture pressure in the Grayburg, how you determinad it?

A. Determined it, what we did there, there are a

couple of techniques. Step rate tests are one way. Our pump station is only capable of going to 2500, putting out approximately 2450 or 2400 at the wellheads. We were trying to determine frac pressure and we were trying to determine quickly for the committee. So we deliberately called out a pump truck that had the capability of injecting in the range of a barrel a minute or a barrel and a half a minute, which we knew was beyond the capability of the clay -- we are in the edge, or the upper zone, we're edge oil company in the San Andres here, and these were pump-in tests and these range -- wellhead pressures were an indication of 2400 to 2700 pounds. This is an old, mature flood project. This is the way these were determined.

Q. They haven't been confirmed by step rate tests, then?

A. Let me just a second -- let me verify this with one of my cohorts.

Gentlemen, Jerry, I've been provided information that we ran two tests, what is considered a normal step rate test, here recently, and both these data indicate this range of pressure. Well 7 indicates a frac pressure of 2480, or somewhere in there, and this other one did not get up to a rate which you would expect in the curve. In other words, our injection is normally at the range of 137 is the average on the San Andres. This particular rate of 600 barrels a day

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and the pressure was still increasing in a linear direction, indicating that the frac pressure had not increased but this is much beyond the injection rate of this well, what it is normally injected in.

CROSS EXAMINATION

BY MR. STAMETS:

Q Is it possible that the 2400 pound pressure is already above the parting pressure of the formation and what you're seeing here in your test of 2700 pounds is secondary fracture?

A I think no. I think your first pressure break will be your highest pressure break. Subsequent breaks will be, perhaps, lower. This is only an opinion.

Q Do you have any evidence to show any, say, frac pressures when these wells were completed or were these wells fraced when completed?

A Well, they were probably not when they were completed. I think the bigger part of them were drilled probably in the '40s. I'd just have to investigate that. I really can't answer you at this time. Some of them were fractured later during the -- after the reservoir in that area was semi-depleted, but I can't answer that.

Q If there were any tests taken at that time, any instantaneous shut-in pressures that were recorded, that

would be evidence to verify your step rate tests?

A. No, sir, it would not be evidence to verify my step rate tests, because your frac pressure to a large extent is a function of fill-up in the reservoir, pressure in effect then, and the pressure then could have been a good deal different, much lower, for example, than the pressure now, which would have indicated a lower frac pressure; therefore, the two data are not necessarily compatible.

RECROSS EXAMINATION

BY MR. SEXTON:

Q. Did you take friction pressure out of your calculations?

A. Did we take what?

Q. Friction pressure out of your calculations?

A. I don't know. Friction pressure is negligible, in the range of 250 to 300 barrels a day judging rates. Jerry, we did not, but it would be very, very low.

CHAIRMAN RAMEY: Any other questions of the witness? He may be excused.

And we'll recess the hearing until 9:00 o'clock tomorrow morning.

(Thereupon the hearing was in recess until 9:00 o'clock a. m. on 14 June 1977.)

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REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, prepared to the best of my knowledge, skill, and ability.

Sally Walton Boyd, C. S. R.

VACUUM WATERFLOW COMMITTEE

STATUS REPORT

JANUARY 20, 1977

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT NO. 6
CASE 5941

VACUUM WATERFLOW COMMITTEE REPORT

The Vacuum Waterflow Committee was appointed by the NMOCC and began its existence April 20, 1976, with Mobil designated as chairman. The purpose of the committee was to identify the extent of waterflow problems in the Vacuum Field and to suggest solutions.

The committee met on the afternoon of the 20th and prepared the following objectives:

1. Operators in the Vacuum Field shall report all annulus pressures.
2. Wells that will flow will be tested to determine flow rate and type of fluid.
3. The NMOCC and another committee member will be notified 48 hours prior to the survey.
4. Operators will furnish wellbore sketches on all wells in the field.
5. Problem wells identified above will not be repaired unless at NMOCC request.
6. The Vacuum Waterflow Committee will meet periodically to prepare final recommendations.

The following summarizes the accomplishments of the committee to date:

1. Wellbore sketches have been made of virtually every well in the Vacuum Field which consists of approximately 1150 wellbores.

2. Bradenhead pressures were obtained on each of the 1150 wells. It was found that 74 wells exhibited some form of waterflows and 14 wells exhibited only gas pressure. (See attached Exhibit A.) In addition to these findings, Shell had experienced waterflows in three wellbores and repaired these prior to the formation of the committee. (See Exhibit B.) Based on this data the committee conducted a more detailed study of wellbores in the vicinity of a concentrated area of waterflows in the south central segment of the field.

3. Texaco, at the request of the committee, ran sound logs on several wells in the problem area that had low cement tops or other irregularities. The results are as tabulated below:

LEASE & WELL NO. (TEXACO)	APPARENT FLUID ENTRY AS DETERMINED BY SONAN
N.M. "R" St. (NCT-1) #10	5500' *
N.M. "O" St. (NCT-1) #3	1900'
N.M. "O" St. (NCT-1) #17	3250'
N.M. "L" St. #9	3000'
N.M. "M" St. #6	2175'-2350'
N.M. "AC" St. #8	None **
N.M. "AB" St. #5	None **

* BP set @ 5500'

** These wells have never exhibited surface waterflows or press.

4. Forty-eight hour fall-off tests were conducted at the request of the committee by Mobil and Texaco on 22 Grayburg-San Andres injection wells. All wells exhibited normal fall-off characteristics.

5. The committee recommended that Texaco be allowed to repair their State "R" #10 which had a rather severe waterflow. This action was prompted by the productive capacity of the well. The work has not been performed to date.

6. Mobil and Texaco ran temperature and tracer logs on 28 wells in the Vacuum Area in an effort to identify the source of the waterflows and to develop a method of future investigations to help prevent further waterflow problems. Texaco also ran cement bond logs on 17 wells to validate cement tops and adequate protection. The bond logs indicated that the San Andres was adequately protected in every case. The tracer surveys did not reveal movement of extraneous water behind the casing. The temperature logs were evaluated in detail due to the many temperature anomolies apparent on them. The two logging companies provided personnel to aid in interpretation of each log as described in Attachment C.

7. As a result of the temperature log interpretation, the committee recommended that Texaco and Mobil conduct perforating and testing work on six wells. Based on temperature log interpretation, these wells exhibited obvious flow or storage of extraneous water. The first four of these wells were worked over and showed virtually no storage or movement of water behind pipe. Based on these data the workovers on the remaining two wells were not performed. The workover data indicated that the committee's interpretation of the temperature logs was incorrect and invalid. The workover procedures on the four wells are included in Attachment D.

8. Mobil cycled 11 injectors while 5 known waterflow wells on offset leases were monitored. These wells have been shut in for 3 months with no reaction on monitor wells. A number of these wells have gone to zero wellhead pressure. (See Attachment E for pressure data.)

9. Mobil and Texaco were asked to perform tests on 13 injection wells for the purpose of determining fracture pressure data. Due to the relatively low injection rates and high pressures (50-400 b/d @ 1900-2500 psi), the traditional step-rate method of determining frac pressures was found to be unacceptable on Mobil's eight injectors. An alternate method was attempted but was also found to be invalid. Texaco, however, was able to determine frac pressure of their wells with some success. Frac pressures were found to be 550-950 psi at the surface (friction loss deducted from wellhead pressure in the Vacuum Grayburg-San Andres Unit).

Exhibits attached:

1. Bradenhead pressure survey.
2. Remedial work procedures to shut off waterflow.
3. Tabulation of temp log analyses.
4. Remedial work procedures for determining validity of temp log interpretation.
5. Pressure data on cycling and monitoring.

R. J. Anthony, Texaco
C. L. Pyle, Mobil
W. J. Mueller, Phillips
F. Schuman, Phillips

RECOMMENDATIONS

1. Attempt to determine a feasible procedure for "blowdown" of the salt section. Localized depressurizing will first be attempted through Texaco's State "M" #6. This well is to be back-flowed from the salt section through tubing. Surrounding wells will be monitored continuously.

2. Re-survey each well in the Vacuum Area that had indicated pressure and/or flow on previous surveys.

EXHIBIT "A"
INITIAL CASING PRESSURE SURVEY RESULTS
WELLS WITH FLUID FLOW
JUNE 1976

Township-Range Section	Unit	Well	S.I. Pressure Prior to Flow Test Weak Flow	Strong Flow
T-16-S None				
T-17-S; 34-E				
10	L	Shell #4-VH	20#	
	P	Shell Angle St. W-202		300#
11	F	Mobil B.S. W-217		80#
	H	" " W-216		220#
13	B	" " 152		50#
14	B	" " 146	240#	
21	H	Gulf Ritts #2		235#
	J	PPCo #25	15#	
	N	PPCo #26	20#	
22	D	Exxon #1-CQ		230#
23	J	Mobil B.S. #156		950#
	K	Amerada "VA" W-3		500# repaired
	L	" " 2	84#	
	M	" " W-6	795#	
24	O	Arco State E #1	100#	
	P	Arco State C #2	130#	
25	H	Texaco "T" #2	640#	
	H	" "T" #3	535#	
	J	" "Q" #8	425#	
27	B	Mobil B.S. #143		730# repaired
	F	Texaco "D" #4		1010#
	L	" " #6		1000#
	N	" " #7		1130#
31	F	Sohio Phillips Lea State "B" #1	275#	
32	C	Arco State B #4	25#	
33	H	Texaco O #17	350#	
34	N	Texaco "V" #35		110#
	P	" " #37		repaired
35	B	Cont. H-35 #3	380#	
	C	" " #6	295#	
	G	" " #5	500#	
	H	" " #12	200#	
36	E	Texaco "O" #20	480#	
	J	" #6	repaired	
	L	Mobil State "I" #1		repaired
	M	Texaco "O" #22	220#	
	N	" " #13	610#	
	N	" " #17	960#	
	P	" " #24	960#	
	P	" " #7	860#	
T-17-S; 35-E				
19	D	Mobil B.S. #206	25#	
	J	Josaline "C" 1-K		120#
	L	Exxon State "J" #4		55#

Township-Range Section	Unit	Well	S.I. Pressure Prior to Flow Test Weak Flow	Strong Flow
T-17-S; 35-E				
19	N	Arco "J" #1	160#	
22	P	Mobil "P" #2	0#	
25	E	Great Western #1	375#	
26	J	Snell "W" #1	50#	
27	D	Chevron State-S #8		350#
	G	CS State "V" #1	55#	
	P	Shell "J" #6	90#	
28	H	Shell "N" #5	20#	
29	M	Shell State-F #1	390#	
	N	" " " #2	140#	
	N	" " " #4		130#
	O	Shell State M #2		120#
30	E	Texaco N #7	700#	
	P	Shell B #4		140#
31	B	Shell "St-A" #7		350#
	E	Phillips Santa Fe #88	45#	
	G	Shell St-A #6		300#
	H	" " " #3		300#
	M	" " D #2	90#	
	M	" " D #1		repaired
	N	" " E #1		"
	N	" " E #2		"
32	A	Exxon St-K #7		545#
	D	Chevron St-B #2		555#
	E	" " B #6	460#	
	J	Exxon St-K #22		405#
	P	" " #6		550#
33	B	Phillips Santa Fe #32	125#	
	D	Skelly St-P #1	340#	
	M	Getty St-H #1	660#	
	P	Phillips Vac Abo 11-6	160#	
34	C	Mobil "M" #1	320#	
	D	" " #13	130#	
	E	" " #3	0#	
	J	Chevron St #12		225#
	L	" St #11		460#
18-S; 34-E				
1	A	Texaco St-L #7	175#	
	C	" " M #6		550#
	G	" VGSAU #42	860#	
	H	" St-L #9		875#
	I	" VGSAU #16	150#	
11	A	" VGSAU #1	175#	
18-S; 35-E				
4	C	Phillips Vac Abo #13-3	210#	

Township-Range Section	Unit	Well	Weak Flow	Strong Flow
18-S; 35-E				
5	C	Phillips Santa Fe #98	320#	
	D	" " " #99	660#	
	E	" " " #112	285#	
6	B	Texaco St-R #2		repaired
	B	" " " #10		950#
	K	Marathon St. Warn #17	15#	
	N	" " " #8	300#	
	P	Texaco St-AB #8	550#	
7	J	Getty St-N #5	385#	
	N	Exxon St-BP #2	45#	

Total number of Gas Flows = 14

EXHIBIT "B"

SHELL STATE "E" NO. 1

Disconnected wellhead. Ran 5½" casing spear. Picked up 60,000 lbs. No indication of casing part. Broke circulation down 8-5/8" casing at 500 psi. Ran packer and bridge plug. Found casing leak between 920' and 1094'. Ran 5½" casing cutter and cut off casing at 1254'. Pulled casing. Found 3 small holes. Ran 5½" lead seal bowl and 1244' 5½" casing. Casing bowl set at 1254'. Pressured up on 5½" casing to 1000 psi. Held ok. Established injection rate down 8-5/8" surface casing at 2 BPM at 800 psi. Mixed and pumped 350 sx Class "C" cement containing 10 lbs. salt per sx, 2% $CaCl_2$ and ¼ lb. Flocele per sx. Slurry weight 14.8 lbs. per gal. Pressure rose to 1400 psi and held. Could not pump into surface casing at 1500 psi. Ran Sonan log to 4631'. No indication of fluid flow behind the pipe.

SHELL STATE "E" NO. 2

On December 8, 1975, discovered water flowing out of surface casing at 50 bbls. per hour at 400 psi. Rigged up Howco. Established injection rate down 13-3/8" surface casing at 4 BPM at 400 psi. Mixed and pumped 500 sx Class "C" cement containing 12% salt and 2% $CaCl_2$. Displaced cement 50' below surface. S.I.P. - 350 psi.

SHELL STATE "D" NO. 1

Established injection rate at 7.5 BPM at 1400 psi down 8-5/8" casing. Pressured up on 5½" casing to 1000 psi. Mixed and pumped 1000 sx cement with 18% salt and 2% $CaCl_2$. Flushed cement with 40 bbls. fresh water treated with sodium chromate. After 20 hrs., 8-5/8" casing pressure = 0.

EXHIBIT "C"

Tabulation of Temperature Log Analyses

Bridges State #17 - Mobil
Injection - 275 b/d @ 1900 psi
Cmt. top - 2664' (calc)

Interval	Gradient	Remarks
4000'-3600'	0.57°/100'	
3600'-3250'	0.38	
3050'-2800'	0.36	
2650'-2500'	0.00	
2500'-2380'	1.10	
2380'-2050'	0.45	
1800'-1690'	0.00	

Conclusion: Indication of activity 2380'-3100'

Bridges State #29 - Mobil
Injection - 450 b/d @ 2000 psi
Cmt. top - 2675' (calc)

Interval	Gradient	Remarks
4200'-3520'	0.00°/100'	Possible shoe leak
3500'-3200'	0.60	
3200'-2950'	0.86	
2850'-1500'	1.10	

Conclusion: No activity in salt. Possible shoe leak.

Bridges State #32 - Mobil
Injection - 370 b/d @ 2200 psi
Cmt. top - 2625' (calc)

Interval	Gradient	Remarks
4300'-3600'	0.60°/100'	
3600'-3100'	0.52	
2700'-2100'	0.54	2660'-2580' Flat, may be cmt. top.
1900'-1800'	0.55	
1770'-1620'	0.20	

Conclusion: Indication of activity 1680'-2020'

Bridges State #42 - Mobil
Injection - 150 b/d @ 2600 psi
Cmt. top - 2714' (calc)

Interval	Gradient	Remarks
4150'-3400'	0.27°/100'	
3250'-2750'	0.32	
2750'-2050'	0.43	
2050'-1500'	0.40	

Conclusions: 30 min & 24 hr curves run parallel throughout which is usually indicative of no problems. The low gradients may have been a logging problem.

Bridges State #47 - Mobil
Injection - 300 b/d @ 2500 psi
Cmt. top - 2784' (calc)

Interval	Gradient	Remarks
4020'-3660'	0.60°/100'	
3660'-3060'	0.53	
3060'-2300'	0.53	Flattening 2620'-3040'
2300'-1820'	0.50	
2020'-1720'	0.00	with several flat areas

Conclusions: Major storage 4560'-4620'. Possible movement 1720'-2020' & 2640'-3040'.

Bridges State #48 - Mobil
Injection - 375 b/d @ 2000 psi. Csg shoe @ 4185'
Cmt. top - 2649' (calc)

Interval	Gradient	Remarks	
3950'-3600'	0.51°/100'	3900'-4000'	.3°/100
3600'-3150'	0.33		
3150'-2850'	0.57		
2850'-2350'	0.36		
2350'-2150'	0.95		
2150'-1750'	0.44		
1750'-1500'	0.00		

Conclusions: Possible shoe leak. Fluid activity 1550'-1850'.

Bridges State #52 - Mobil
Injection - 180 b/d @ 2350 psi
Cmt. top - 2638' (calc)

Interval	Gradient	Remarks
4150'-3850'	0.86°/100'	
3850'-3450'	0.00	
3100'-2600'	0.55	
2100'-1600'	0.56	

Conclusions: Fluid storage 3814'-40' & 3856'-74'; fluid movement 3450'-3875'.

Bridges State #167 - Mobil
Injection - 75 b/d @ 2500 psi
Cmt. top - Circulated to surface

Interval	Gradient	Remarks
4600'-3200'	0.59°/100'	
3200'-2800'	0.53	
2800'-2000'	0.40	
2000'-1600'	0.45	

Conclusions: No apparent activity.

State G-3 - Mobil
Injection - 300 b/d @ 2350 psi
Cmt. top - 2700' (calc)

Interval	Gradient	Remarks
4100'-3100'	0.66°/100'	
2800'-1850'	0.58	
1850'-1750'	0.00	
1750'-1600'	1.16	

Conclusions: Possible activity 1750'-1850'

State J-1 - Mobil
Injection - 250 b/d @ 1975 psi
Cmt. top - 2930' (calc)

Interval	Gradient	Remarks
4050'-3300'	0.8°/100'	
3300'-3000'	0.67	
2900'-2400'	0.68	
2400'-1600'	0.45	

Conclusions: No apparent activity

State J-4 - Mobil
Injection - 350 b/d @ 2475 psi
Cmt. top - 2675' (calc)

Interval	Gradient	Remarks
4100'-3850'	0.72°/100'	
3850'-3200'	0.25	
3050'-2620'	0.00	
2620'-2520'	(-0.20)	
2520'-1500'	0.00	

Conclusions: Crossflow 1886'-2274', 2400'-2530' & 2672'-2888'

West Vacuum Unit #11 - Texaco
Injection - 200 b/d @ 2375 psi
Cmt. top - 2900'

Interval	Gradient	Remarks
4100'-2900'	0.70°/100'	
2900'-2000'	0.77	
1930'-1750'	0.97	
1750'-1600'	0.00	
1550'-800'	0.93	

Conclusions: Storage interval 1600'-1750'

West Vacuum Unit #18 - Texaco
Injection - 650 b/d @ 2600 psi
Cmt. top - 2940'

Interval	Gradient	Remarks
4000'-3850'	0.00°/100'	
3850'-3220'	0.53	
3220'-2720'	0.48	
2720'-2610'	0.00	Possible pen shift problem.
2400'-1560'	0.50	
1750'-1640'	0.00	
1560'-860'	0.74	

Conclusions: (1) Shoe leak @ 3850'± - tracer agrees
(2) Storage area 1640'-1750'

West Vacuum Unit #20 - Texaco
Injection - 400 b/d @ 2400 psi
Cmt. top - 3200'

Interval	Gradient	Remarks
4200'-4000'	0.00°/100'	
4000'-3800'	0.50	
3800'-2700'	0.59	
2700'-1450'	0.50	
1450'-1150'	0.83	
1150'-400'	0.66	

Conclusions: Possible storage area 1500'-1800'. Possible shoe leak - tracer agrees.

West Vacuum Unit #32 - Texaco
Injection - 475 b/d @ 2450 psi
Cmt. top - 2270'

Interval	Gradient	Remarks
4300'-3150'	0.65°/100'	
3150'-2150'	0.50	
2150'-1900'	0.50	
1900'-1580'	0.00	
1580'-250'	1.00	

Conclusions: Fluid storage 1580'-1900'.

West Vacuum Unit #36 - Texaco
Injection - 1000 b/d @ 900 psi
Cmt. top - 2860'

Interval	Gradient	Remarks
4150'-3750'	0.50°/100'	
3750'-2850'	0.38	
2850'-2750'	0.00	
2750'-1200'	0.44	
1200'-1000'	0.50	
1000'-750'	0.00	Probably water temp. vs. form. temp anomoly.

Conclusions: Difficult to call 2750'-3300' storage because flat area is hot rather than cool. Area coincides with top of cement.

West Vacuum Unit #48 - Texaco
Injection - 450 b/d @ 2000 psi
Cmt. top - 2890'

Interval	Gradient	Remarks
4000'-3300'	0.50°/100'	
3300'-2950'	0.43	
2900'-2150'	0.44	Flat 2840'-2740'
2000'-1700'	0.00	
1700'-1200'	0.64	

Conclusions: Storage 1700'-2200'.

Vacuum Grayburg San Andres #5 - Texaco
Injection - 3000 b/d @ 1000 psi
Cmt. top - 2680'

Interval	Gradient	Remarks
4300'-3750'	0.50°/100'	
3750'-3300'	0.58	
3300'-2650'	0.46	
2650'-2450'	0.75	
2450'-2300'	0.59	
2300'-2000'	0.38	
2000'-1750'	0.40	1820'-1890' flat
1750'-1200'	0.75	
1200'-800'	1.00	
800'-400'	0.69	

Conclusions: (1) No clearcut storage area in injection interval.
(2) Possible offender well.
(3) All fluid apparently leaving wellbore through one perforation.

Vacuum Grayburg San Andres #15 - Texaco
Injection - 2200 b/d @ 1250 psi
Cmt. top - 2400'

Interval	Gradient	Remarks
4150'-3050'	0.55°/100'	
3050'-2550'	0.36	
2550'-2200'	0.45	
2200'-1850'	0.77	
1850'-1730'	0.00	
1730'-1450'	0.40	
1450'-1300'	0.00	
1300'-1050'	1.00	
1050'-450'	0.73	

Conclusions: Fluid behind pipe from 3050' to top of storage area (1300').

Vacuum Grayburg San Andres #17 - Texaco
Injection - 3121 b/d @ 1500 psi
Cmt. top - 2710'

Interval	Gradient	Remarks
4250'-3900'	0.29°/100'	
3860'-3750'	0.00	
3750'-3100'	0.49	
3100'-1350'	0.00	
1350'-1150'	0.71	
1150'-450'	1.05	

Conclusions: Fairly clearcut example of channel from 4410'-1610'. Storage area 1520'-1610'.

Vacuum Grayburg San Andres #19 - Texaco
Injection - 4000 b/d @ 1000 psi
Cmt. top - 3510'

Interval	Gradient	Remarks
4200'-4000'	0.00°/100'	
4000'-3600'	0.38	
3600'-3400'	0.75	
3400'-3250'	2.00	
3250'-2600'	0.46	
3070'-3000'	--	Hot spot
2800'-2600'	--	Hot spot
2600'-2200'	0.19	
2200'-1980'	0.00	1/2° shift @ 1950' & 2150'
1940'-1620'	0.00	
1620'-1530'	0.00	w/hot spot
1530'-1100'	0.47	
1100'-100'	0.80	

Conclusion: Definite channel up from perfs to 1600'±.
Storage 1600'-2200'.

Vacuum Grayburg San Andres #29 - Texaco
Injection - 757 b/d @ 1100 psi; 24 hr S.I. press. - 750 psi
Cmt. top - 2770'

Interval	Gradient	Remarks
4400'-4050'	0.00°/100'	
4050'-3750'	0.42	
3750'-3300'	0.53	
3000'-2250'	0.60	Flats - 2960'-3080', 2630'-2780', 2250'-2400'
2250'-1950'	--	Hot spot
1750'-1430'	0.60	
1430'-1200'	0.22	
1220'-600'	0.32	
600'-surf.	0.00	

Conclusions: (1) Storage area 1200'-2770' (cmt top).
(2) Possible channel down 2770'-4530'.

Vacuum Grayburg San Andres #33 - Texaco
Injection - 2193 b/d @ 1250 psi
Cmt. top - 2370'

Interval	Gradient	Remarks
4200'-3000'	0.53°/100'	
3000'-2200'	0.45	
2200'-1100'	0.59	
1100'-700'	1.13	

Conclusions: No activity.

Vacuum Grayburg San Andres #31 - Texaco
Injection - 3125 b/d @ 1500 psi
Cmt. top - 2620'

Interval	Gradient	Remarks
4100'-2950'	0.41°/100'	
2950'-2600'	0.00	with shifts
2600'-1800'	0.00	with shifts
1800'-1450'	0.64	
1450'-1050'	0.00	Warmer - probably formation
1050'-500'	0.67	

Conclusions: 1800'-2950' storage area.

Vacuum Grayburg San Andres #35 - Texaco
Injection - 1374 b/d @ 1000 psi
Cmt. top - 2450'

Interval	Gradient	Remarks
4100'-3700'	0.40°/100'	
3700'-3100'	0.58	
3100'-2350'	0.49	
2450'-2100'	0.86	
2100'-1850'	0.40	
1850'-550'	0.70	Some areas of 0°/100' slope

Conclusions: Storage area 1480'-1800'.

Vacuum Grayburg San Andres #45 - Texaco
Injection 1660 b/d @ 900 psi
Cmt. top - 2470'

Interval	Gradient	Remarks
4300'-4000'	0.73°/100'	
4000'-3700'	0.73	
3700'-2350'	0.50	
2350'-2050'	0.70	
2050'-1800'	0.56	
1800'-1300'	0.84	

Conclusions: No channel, no storage out of zone.

Vacuum Grayburg San Andres #47 - Texaco
Injection - 2864 b/d @ 900 psi
Cmt. top - 2650'

Interval	Gradient	Remarks
4200'-3690'	0.44°/100'	
3690'-2900'	0.49	
2900'-2500'	0.38	
2500'-2350'	1.00	
2350'-2280'	--	steep shift
2280'-1830'	0.44	
1800'-1600'	0.00	
1600'-1300'	0.66	
1300'-1200'	0.00	
1100'-680'	0.70	

Conclusions: Storage area 1600'-1800'. No channel.

Vacuum Grayburg San Andres #49 - Texaco
Injection - 4670 b/d @ 900 psi
Cmt. top - 2450'

Interval	Gradient	Remarks
4150'-3900'	0.00°/100'	
3900'-3550'	0.57	
3550'-3000'	0.64	
3000'-2450'	0.00	
2450'-2100'	0.57	
2100'-1800'	--	shifts and flats
1750'-1500'	0.00	
1500'-surf.	--	parabolic curve

Conclusions: Storage 1500'-1750'. Possible minor channel 4373'-3900'.

EXHIBIT "D"

TEXACO INC.
VACUUM GRAYBURG SAN ANDRES UNIT #49

Ran E-2 drill cement retainer to 4175'. Perforated 4½" casing at 4065'. Swabbed well down, no fluid entry. Spotted 200 gals. 15% acid across perfs and broke down perfs. Pumped 10 bbls. water into perfs at 2000 psi. Swabbed well down. No fluid entry. Shut well in 14 hrs. No pressure buildup. Checked fluid level. No fluid entry. Went in with injection tubing and stabbed into cement retainer at 4175'. Placed well on injection. On December 15, 1976, well taking 3300 BWPD at 1160 psi. No pressure buildup on tubing-casing annulus to date.

TEXACO INC.
VACUUM GRAYBURG SAN ANDRES UNIT #19

Ran step-rate test. Found frac pressure at 650 psi surface pressure (without friction). Set cement retainer at 4200'. Perforated 4½" casing at 3415' (above cmt. top). No pressure or fluid entry encountered. Established circulation down 4½" and up the back side. Shut well in overnight. No pressure buildup or fluid entry. Ran injection tubing and stabbed into cement retainer. Placed well on injection with pressure recorder on bradenhead. Injected over weekend. Brought injection pressure up to 950 psi. No pressure change on bradenhead. Pulled injection tubing and pumped 2500 sx cement. Cement top 1900' by temperature survey. Drilled out retainers and returned well to injection.

MOBIL
BRIDGES STATE NO. 29

Pulled injection tubing and ran 2-3/8" workstring. Set bridge plug at 3875' and set packer at 3725'. Perforated 7" casing at 3798'. Swabbed tubing dry. No fluid entry. Shut well in overnight. Checked fluid level. No fluid entry. Pulled packer and bridge plug. Ran tubing and injection packer. Started injection at 460 BWPD at 0 tubing pressure. Injected 8 days. Tubing pressure 2200 psi. Casing pressure zero. Pulled injection packer and ran bridge plug and packer. Acidized perfs at 3798' with 1000 gals. 15% HCl acid. Pulled packer and bridge plug and ran injection packer. Started injection at 800 BWPD at 100 psi. No pressure on casing. Injected 5 days. Rate 230 BWPD. Pressure 2300 psi. Casing pressure zero. Pulled injection packer. Squeezed perfs at 3798' with 50 sx Class "C" cement. Cleaned out to T.D. and returned well to injection.

1105.2
Bridges State No. 52

EXHIBIT "D"

MOBIL
BRIDGES STATE NO. 52

12/10/76 - Total depth 4900'. Open hole 4248 to 4900'. MIRU. Pull out of hole with tbg & 7" pkr. GIH w/RBP & FB pkr. Set RBP @ 3871' and FB pkr @ 3809. Test RBP to 2000 lbs. - OK. POH w/pkr - perf 7" csg 3830 to 3833 w/4 jspf. Ran pkr & set @ 3860. Swabbed - no feed in. 14 hr SI tbg press 30 psi. Ran swab, found no feed in. Pulled RBP. GIH w/FB pkr to 3918'. Begin injection @ 200 BWPD. Csg press - 0; tbg press - [illegible] injected 11 days. Csg press - 0; tbg press - 24.20. POH w/tbg & pkr. Set RBP @ 3918'. Attempt to pump in perfs 3830 to 3833 w/3000 psi. No success. Acidized w/1000 gals 15% + 5 gals FR @ 3000 psi at 2.5 BPM. ISIP 2500 psi. 14 hrs SI tbg press 2300 psi. Release pressure, swab - no feed in. Set FB pkr @ 3779'. Squeeze perfs 3830 to 3833. Drill cmt 3742 to 3840. Test squeeze - OK. POH w/RBP. GIH w/injection equipment.

EXHIBIT "E"

Injection Well S.I. Pressures on 12-20-76
Wells Have Been S.I. Since 9-1-76

BRIDGES STATE WELL NO.	TBG (PSI)	CSG (PSI)
5	760	-0-
17	25	-0-
29	Vacuum	-0-
30	550	-0-
32	30	-0-
35	700	-0-
42	Vacuum	-0-
48	325	-0-
52	*	-0-
105	1025	-0-
132	975	-0-

* Bridges State #52 currently under workover to determine credibility of temp. log interpretation.

Monitor Wells Casing Pressure 12-23-76

		CSG (PSI)
N.M. "D" St. (NCT-1)	#4	1225
	#6	775
	#7	175
Exxon St. "J" No. 4		220
Gulf "Ritts" St. No. 2		253

January 7, 1977

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 7
CASE 5941

OIL CENTER - MONUMENT COMMITTEE REPORT

This Sub-Committee was appointed by the New Mexico Oil Conservation Commission (NMOCC) Appointed Committee on April 20, 1976. The purpose of this Sub-Committee was to study and locate the source of waterflow problems in the Oil Center-Monument Area and to suggest solutions.

The Committee met on the afternoon of the 20th and prepared the following objectives:

1. That the Study Area would consist of the following area:

   T-19-S, R-37-E, Sec. 15, 16, 21, 22, 26, 27, 28, 33, 34, 35, & 36

   T-20-S, R-37-E, Sec. 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 35, and 36

   T-20-S, R-36-E, Sec. 13, 14, and 25

   T-20-S, R-38-E, Sec. 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, and 31

   T-21-S, R-36-E, Sec. 1 and 12

   T-21-S, R-37-E, Sec. 5, 6, 7, and 8

   (SEE ATTACHED PLAT)

2. That all Operators would submit to the Committee downhole well schematics on all wells (i.e., injection, producing, NIO, and P & A) in the above discribed area.

3. That bradenhead surveys would be run on all wells with surface or intermediate casing set through the red bed section.

4. That from the bradenhead survey, monitor wells would be picked.

5. That the waterfloods in the Oil Center-Monument Area would be cycled (i.e., each flood would be shut-in for a given period of time) so that pressures on monitor wells could be observed and the source of the problem located.

The following summarizes the accomplishments of the Committee to date:

1. Wellbore schematics have been made and received on 99% of the wells in the Oil Center-Monument Study Area. This consists of approximately 1000 wellbores.

2. It was generally thought that wells with short surface and/or short intermediate casing (i.e., 250 to 500') would probably not show bradenhead pressures even if they had them, due to the red bed sluffing in around the pipe. Therefore, bradenhead surveys were run only on those wells which had surface or intermediate casing of 1000' in length (thru the red bed section).

The Committee received approximately 415 bradenhead surveys. Of the 415, 206 were found with pressure on the bradenheads. Sixty-three wells showed pressure in the range 300 psi to 599 psi; fifty wells were in the pressure range 600 psi to 899 psi; and 9 wells had pressure in excess of 900 psi. One hundred seventeen wells in the survey had waterflows on the bradenhead. See attachments of surveys.

3. From the bradenhead survey the following wells were chosen as monitor points:

1.	Getty	East Eumont Unit #58	M-22-19-37
2.	Byrom	Williams #2	O-34-19-37
3.	Shell	Cooper "A" #1	B-4-20-37
4.	Rice	SWD M-9	M-9-20-37
5.	Texaco	C.H. Weir B #5	G-11-20-37
6.	Getty	East Eumont #130	F-12-20-37
7.	Texaco	C.H. Weir A #11	G-12-20-37
8.	Texaco	Skaggs Grayburg Unit #2	J-12-20-37
9.	Texaco	C.B. Weir "B" #7	M-12-20-37
10.	Texaco	Skaggs GB Unit #11	D-13-20-37
11.	Texaco	L.R. Kershaw #10	F-13-20-37
12.	Conoco	Britt B #8	J-15-20-37
13.	Conoco	Britt B #7	N-15-20-37
14.	Marathon	Hanson State #2	G-16-20-37
15.	Getty S	State "I" #2	K-16-20-37
16.	Skelly	State "F" #1	P-17-20-37
17.	Texaco	Eunice Monument Unit #21	L-19-20-37
18.	Amoco	Gillully "B" Fed. #6Y	A-21-20-37
19.	Amoco	Gillully "B" Fed. #9	D-22-20-37
20.	Texaco	Skaggs Grayburg Unit #7	L-12-20-37
21.	Byrom	Williams No. 3	N-34-19-37

Each of the above wells was equipped with a 7 day pressure recorder on or by June 9, 1976.

4. The Texaco Skaggs Grayburg Unit was shut-in on June 14, 1976. By July 7, 1976 all but 5 of Texaco's injectors had fallen to zero or to pressures below the shut-in pressures of the monitor wells. It was decided to back-flow 3 of Texaco's injection wells to speed up the evaluation. It was also decided at this time that all pressure on injection wells when shut-in should be maintained below 500 psi. Backflowing and injection well pressure declines continued through July and August on the Texaco Skaggs Flood. No unusual declines had been noted on any of the monitor wells, except for the Skaggs Grayburg Unit Well No. 7. This well is monitoring a casing leak in the 7-Rivers Formation.

Water injection into the Conoco SEMU was shut-in on August 11, 1976. Shut-in tubing pressures began to fall after one week. In order to speed up the process, wells with pressures in excess of 500 psi were backflowed. Thru August 23, 1976 no unusual pressure declines had been noted on the monitor wells. The South Segment of the Getty East Eumont Unit was shut-in on the above date. Backflowing was started on September 1, 1976 from selected wells. At this time several wells were still being backflowed on the Skaggs and SEM Units.

Injection on the Eumont Hardy Unit and the Eumont Monument Unit was stopped On September 29, 1976. The Central Segment of the Getty EEU was shut-in on October 28, 1976. Thru this period of time, still no major response had been noted on the monitor wells. By November 17, 1976 all injection walls were

below 500 psi, except for a scattered few still being backflowed and wells that scaled up and periodically have to be shut-in to clean out their injection lines.

5. In November, 1976 Texaco ran cement bond and sonar logs on their M. B. Weir "B" Well No. 7 while injecting in the adjacent Skaggs Grayburg #5 injection well. There was no indication of fluid movement around the wellbore with the well shut-in. Anamolies were found in the salt section between 2200' and 2300'.

6. On November 17, 1976 the Committee recommended flowing the bradenheads on the Getty State "I" Well No. 2 and Amoco Gillully "B" #6Y monitor wells. Each well backflowed a small amount of saturated salt water before the pressure bled down. After bleeding down the State "I" #2 was shut-in and the pressure built up to 750#. However, upon opening it again the pressure dropped rapidly, apparently indicating salt bridging. On January 12, 1977, Amoco was unable to pump fresh water into bradenhead on Gillully "B" 6Y with 400-500 psi in an attempt to dissolve the salt bridge.

7. In the January 6, 1977 Meeting, the Committee recommended flowing the bradenheads on the Getty EEU #131 and the Texaco S-GR Unit #11. The EEU #131 backflowed approximately 425 barrels of saturated salt water and bled down. Texaco is in the process of preparing to backflow the Skaggs Grayburg #11.

This committee has had no success in determining the source of the waterflow in the area from the data collected. In conclusion, this committee recommends that the salt section be bled down.

MONUMENT - OIL CENTER

WATER FLOW

ATTACHMENTS

1. Monitor Well Pressures

2. Injection Well Pressures and Backflowing

3. Bradenhead Flow Test Surveys

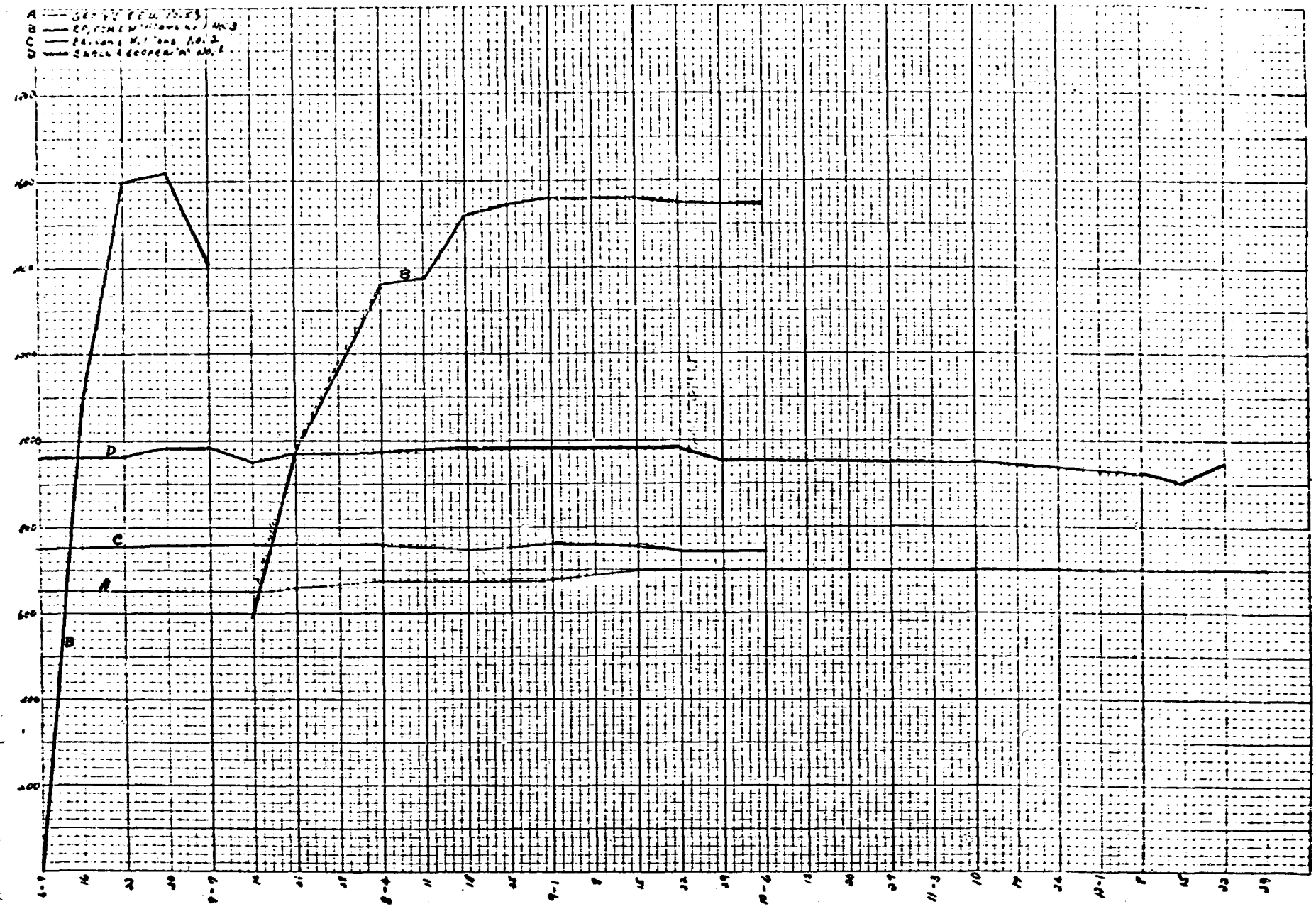
4. Plat of Study Area with Monitor Wells

HMO/bh

1-13-77

MONUMENT - OIL CONSERVATION COMM.

AREA I



MONUMENT - OIL TO TOR WATER FLOW
AREA III

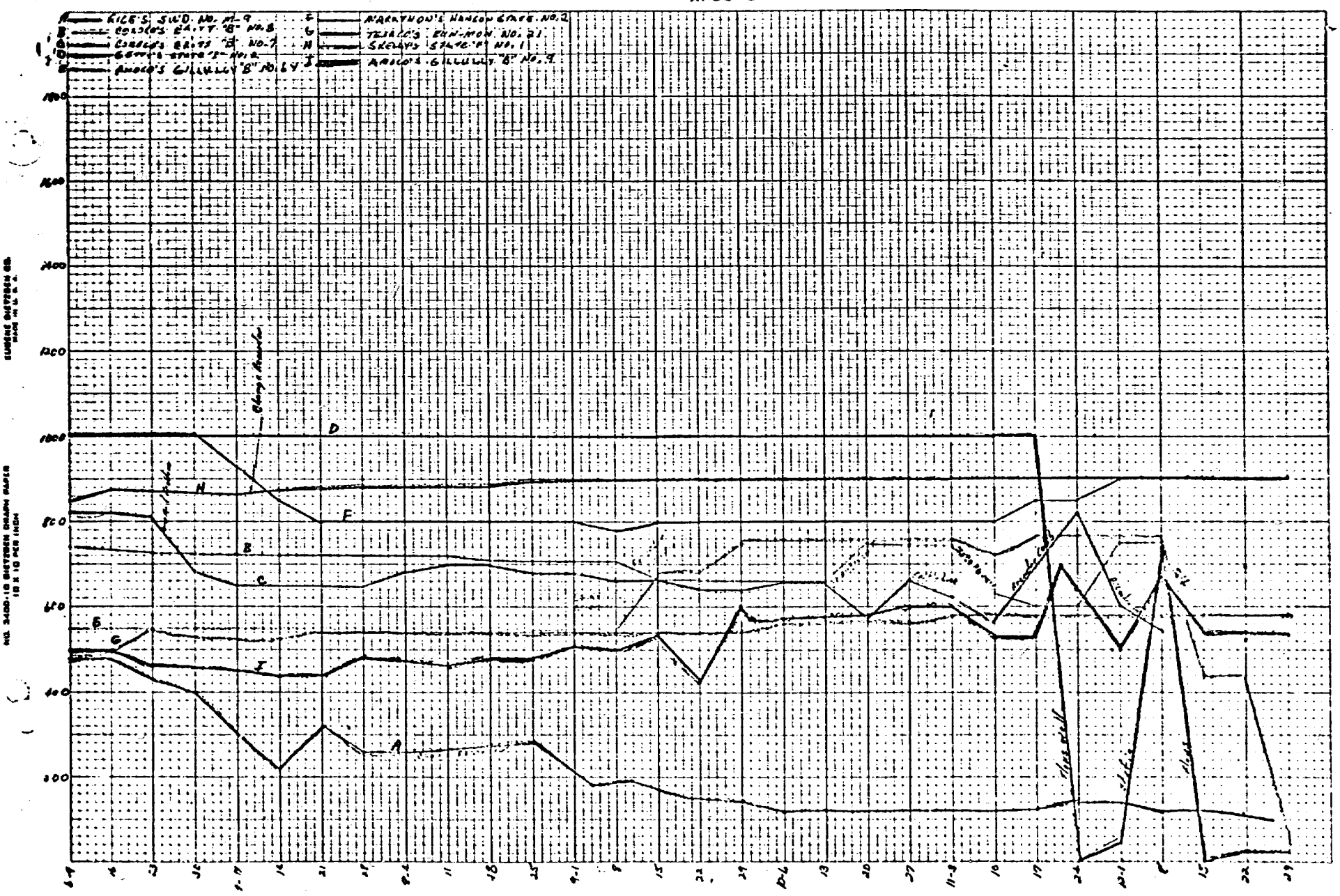
A —— TEXACO [illegible] No. 5
B —— [illegible] No. 130
C —— TEXACO [illegible] No. 11
D —— TEXACO [illegible] No. 2
E —— TEXACO SIGRO No. 7
F —— TEXACO NEAL'S No. 7
G —— TEXACO SIGRO No. 11
H —— TEXACO KERNAM No. 10

1800
1600
1400
1200
1000
800
600
400
200

Gas Flare
Gas Flare

EUGENE DIETZGEN CO.
MFR. 3400-10 DIETZGEN GRAPH PAPER
10 X 10 PER INCH

MONUMENT - OIL LEVEL WATER FLOW
AREA III



MONUMENT-OIL CENTER WATER FLOW

INJECTION WELLS

COMPANY: GETTY OIL COMPANY
UNIT: EAST FUHRMAN

WELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
43	1150	40	0 bbls.	
45	1150	205	190 "	
47A	1925	155	[illegible] "	
48	1200	460	12 "	
51	1500	375	52 "	
53	2100	190	2,014 "	
55	1425	VACUUM	142 "	
58	1625	190	1,[illegible] "	
60	1850	210	2,951 "	
62	1425	225	0 "	
64	1960	165	1,[illegible] "	
66	1825	260	518 "	
68	1170	225	1,136 "	
70	1580	180	239 "	
72	1300	150	23 "	
73	1450	155	1,143 "	
75	1850	215	4,741 "	
78	1250	140	172 "	
827	1550	160	499 "	
856	1725	220	202 "	
80	1600	250	325 "	
82	725	0	0 "	
83	VACUUM	225	503 "	
85	1625	0	827 "	
87	1800	0	0 "	
89	1200	90	420 "	
91	1700	250	2294 "	
93	1900	225	10,904 "	
95	2000	225	12,398 "	
96	1650	250	2,932 "	
98	1700	25	163 "	
101	1200	500	3,399 "	
103	2000	200	417 "	
105	600	500	835 "	
107	1750	0	2,922 "	
109	2100	375	2,199 "	
112	1700	500	2,231 "	
115	2000	500	2,573 "	
117	1500	500	1,092 "	
121	VACUUM	350	0 "	
123	1750	500	1,818 "	
125	1900	725	3,088 "	
126	VACUUM	250	0 "	
128	1200	500	2,[illegible] "	
131	1800	500	1,342 "	
132	VACUUM	0	0 "	
912	1900	50	2,[illegible] "	
114	1800	400	6,425 "	
TOTAL	—	—	81,715 "	

MONUMENT-OIL CENTER WATER FLOW

COMPANY: CONOCO

UNIT: SKAGGS WATERFLOOD PROJECT

SEMU Formation WELL NO.	INITIAL SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976 (psig)	VOLUME OF WATER BACK FLOWED	REMARKS
11	1600	30		UNABLE TO FRACTURE
13	1725	0		BREAKDOWN PRESSURES ON
20	1725	0		ANY OF THE WELLS.
23	1825	100		
25	1675	0		
26	1500	25		
29	1650	0		
31	1625	0		
32	1400	0		
40	1775	0		
49	1725	0		
35	1700	100		
36	2000	100		
44	2100	75		
45	1400	100		
76	1000	0		
78	2100	100		
79	2000	100		

NONUMENT-OIL CENTER WATER FLOW

COMPANY: Conoco

UNIT: Eumont Hardy Unit - Monument

Eumont Hardy Unit WELL NO.	Jan. '77 SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
2	1500	0		Unable to determine
6A	1480	0		accurate volumes on
4A	1500	0		on top of the water.
28	1600	0		
2	1500	0		
32	1500	0		
15	1500	0		
17	1500	0		
20	1500	0		
5	1700	0		
9	1450	0		
12	1500	0		
42	1525	0		
47	1450	0		
27	1400	0		
31	1500	0		
35	1425	0		
15	1500	0		
17	1450	0		
23	1425	0		
7	1450	0		
11	1425	0		
25	1725	0		

MONUMENT-OIL CENTER WATER FLOW

COMPANY: TEXACO CORP.
UNIT: EUNICE UNIT

WELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
13	1250	100	—	Produced water is injected
15	750	0	—	intermittently to Well #15 #24.
22	1100	0	—	When Valve is Twice Daily
24	900	0	—	Pressure on these two wells
30	1900	0	—	increased to 2050 PSI, but
32	0	0	—	then drop to 0# when
				Injection ceases. Volume
				Average 1# = 2 BWPD.

MONUMENT-OIL CENTER WATER FLOW

COMPANY: [illegible]
UNIT: [illegible]

WELL NO.	SHUT IN PRESSURE	PRESSURE ON DEC. 31, 1976	VOLUME OF WATER BACK FLOWED	REMARKS
1	[illegible]	0	—	
2	1925	[illegible]	[illegible]	[illegible]
5	200	0	—	
7	[illegible]	905	—	Monitoring well. Level is 905.
9	900	900	19,317	Back flow [illegible]
12	25	0	—	
14	1925	1130	43,171	[illegible]
21	1280	0	—	
22	560	1125	—	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	3	P	16-20-37							Refer back to previous C-103

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	2	P	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8 5/8	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	1	C	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8 5/8	35	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and comple' to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt "A"	1	N	6-20S-37E	6-10-7	13"	145#	0	0	0	
					9-5/8"	0	0	0	0	
					7"	0	0	0	0	
Britt "A"	2 ✓	N	6-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	655#	0	655#	0	Bled down in 5 seconds. Gas
					7"	0	0	0	0	Press. built up to 400# in one min. after shuting in.
Britt "A"	3	K	6-20S-37E	6-11-76	13-3/8"	10#	0	0	0	
					8-5/8"	220#	150#	150#	0	Flowing Gas
					5-1/2"	10#	0	0	0	
Britt "A"	6		6-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					9-5/8"	40#	0	5#	0	Bled down in 1-½ minutes
					5-1/2"	35#	0	15#	0	Bled down in 1 minute
Britt "B"	1	N	5-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	--	--	--	--	Selling Gas
					7"	0	0	0	0	
Britt "B"	2	N	5-20S-37E	6-11-76	13-3/8"	0	0	0	0	
					8-5/8"	655#	0	655#	0	Bled down in 5 seconds. Gas
					5-1/2"	0	0	0	0	Press. built up to 400# in one min. after shuting in.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	13	J	7-20S-37E	6-11-76	13-3/8"	0	0	0	0	
					8-5/8"	30#	0	0	0	
					5-1/2"	0	0	0	0	
Britt	1	F	7-20S-37E	6-10-76	10"	0	0	0	0	
					8-5/8"	60#	0	0	0	Bled down in 6 minutes.
					6-7/8"	0	0	0	0	
Britt	2	C	7-20S-37E	6-14-76	13-3/8"	0	0	0	0	
					9-5/8"	520#	0	450#	0	Bled down in 20 seconds.
					7"	0	0	0	0	
Britt	3	C	7-20S-37E	6-11-76	13"	0	0	0	0	
					9-5/8"	470#	0	20#	0	Bled down in 3 minutes.
					7"	--	--	--	--	Selling Gas
Britt	4	B	7-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					9-5/8"	50#	0	40#	1-1/2 gals	Est. Flowing 1 Bbl H_2O/24hr
					7"	35#	0	0	0	
Britt	5	K	7-20S-37E	6-10-76	13"	40#	0	0	0	
					9-5/8"	560#	520#	560#	0	Gas well-opened valve on
					7"	570#	520#	560#	0	9-5/8" press. on 7" dropped the same amt. possible hole in casing.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Union Texas Petroleum Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	11	G	7-20S-37E	6-10-76	13-3/8"	0	0	0	0	
					8-5/8"	0	0	0	0	
					5-1/2"	0	0	0	0	
Britt	12	C	7-20S-37E	6-10-76	13-3/8"	60#	0	0	0	
					8-5/8"	700#	10#	30#	0	Flowing Gas
					5-1/2"	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Shirley M Pratt

COMPANY Union Texas Petroleum Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Campbell & Hedrick

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alexander	1	L	7-21-37	6/3/76	4½-7"	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Olen H. Hedrick Jr

COMPANY Campbell & Hedrick

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Sabie Petr Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Atwell A	1	P	Sec 7 T21S R37E	6-1-76	179' of 9⅝" casing	24 Hrs	0	0	0	Braden Head Test
Atwell A	2	M	Sec 8 T21S R37E	6-1-76	1234' of 8⅝" casing	24 Hrs	890 PSI	10 PSI	Very Small Amount	Braden Head Test Small Amount of drlg mud & water flowed out of Braden Head
Atwell B	1	F	Sec 8 T21S R37E	6-1-76	211' of 8⅝" casing	24 Hrs	0	0	0	Braden Head Test

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: L.D. Rountree

COMPANY Sabie Petr Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	3	F	16-20-37							Refer back to previous C-103

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A. WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	2	F	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BRUCE A WILBANKS

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
WOOD STATE "A"	1	C	16-20-37	5-15-76	12½	0	0	0	NONE	NONE
					8⅝	35	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon D. E. Kenyon, Jr.

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Cleary Petroleum Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "E"	1	L	21-19-37	5/12/76		25#	5#	40#	None	
New Mexico State "E"	2	E	21-19-37	5/12/76		35#	8#	130#	None	
New Mexico State "E"	3	D	21-19-37	5/12/76		20#	0#	25#	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Vivian Ferguson

COMPANY Cleary Petroleum Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY APCO Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Carter	1	G	12, 21S, 37E	5-27-76	Surface	125 psi	0 psi	0 psi	TSTM	Air
Christmas	1	D	11, 20S, 37E	5-28-76	Surface	10 psi	0 psi	0 psi	TSTM	Air
Currie	1	N	5, 21S, 37E	5-27-76	Intermed	20 psi	0 psi	10 psi	TSTM	Gas (T)
Huston	1	K	21, 19S, 37E	5-27-76	Surface	120 psi	100 psi	120 psi	± 3 bbl	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. H. Hanna

COMPANY APCO Oil Corporation
P.O. Box 1027
Odessa, Texas 79760
Phone: 915-381-2744

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Davis Sprague

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Keohane	1	N	4	6-27	SURFACE	0	0	0	0	

HAVE LES OR NATHAN
INSPECT - CHECK

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Davis E Sprague

COMPANY Davis Sprague

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Great Western Drilling Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bordages	1	D	S-33 T-19S R-37E	6/4/76	tubing Prod.	7½ PSI	0	0	0	No Oil, Water, or Gas 15 Min. no change 1 hour no change
					Prod. Inter-mediate	0	0	0	0	
					Inter-mediate Surface	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Curtis McLaney

COMPANY Curtis Mahaney ~~Great Western Drilling Co.~~

DATA SHEET FOR FLOW TEST IN OIL CENTER--[illegible] AREA

COMPANY Shell Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State E	1		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	2		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	3		[illegible]	[illegible]		-115	-0-	-30-	-0-	gas
	4		[illegible]	[illegible]		-50-	-0-	30-	-min-	water & gas
Cooper A	1		[illegible]	[illegible]		1100-	-1100-	-1100-	Full	water
Cooper B	1		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	2		[illegible]	[illegible]		-0-	-0-	-0-	-0-	
	4		[illegible]	[illegible]		-50-	-0-	-0-	-min-	water
State sec 3	1		[illegible]	[illegible]		-30-	-0-	-30-	-min-	gas & water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [illegible]

COMPANY Shell Oil Co

DATA SHEET FOR FLOW TEST IN OIL CENTER--[illegible] AREA

COMPANY Exxon Co. U.S.A.

1 LEASE	2 WELL NO.	3 UNIT LETTER	4 SECTION TOWNSHIP RANGE	5 DATE OF TEST	6 CASING STRING TESTED	7 SHUT IN PRESSURE BEFORE TEST	8 PRESSURE IMMEDIATELY AFTER TEST	9 PRESSURE 1-HR. AFTER TEST	10 EST. VOLUME OF FLUID DURING TEST	11 REMARKS (Oil-Water-Gas-etc.)
Exxon Gas Comi. No. 1	1	—	S-4 T-20-S R-37-E	5-25-76	8⅝"	#130	#100	#130	0	open valve for 15 min. Gas pressure from #130 to #100
										0 - on surface

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: M. L. Pearce

COMPANY Exxon Co. U.S.A.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Critchfield "32"	1	T	32-19-37	5-19-76	8 5/8	0	0	0	0	None

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Tillully "A"	1	M	8-20-37	5-19-76	13 3/8	0	0	0	0	NONE
					9 5/8	105	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY VKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	9	O	7-20-37	5-13-76	13	0	0	0	None	None
					9 5/8	60	0	0	None	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY VKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt	7	J	7-20-37	5-13-76	13	0	0	0	None	None
					9 5/8	110	0	0	None	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, Jr.

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY [illegible]

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	10	D	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	140	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	7	L	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	6	M	7-20-37	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	25	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	5	I	12-20-36	5-18-76						
					13 3/8	0	0	0	0	None
					9 5/8	0	0	0	0	None

I hereby certify that the information submitted is the true and complete to the best of my knowledge.

BY: W. E. Keagy, Jr.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY ASHMUN & HILLIARD

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. W. COOPER	1	F	3-20-37	6-30-76	Surface	0	0	0	0	
					Interm.	0	0	0	0	

I Hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY ASHMUN & HILLIARD

Duncan

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Mallard Exploration, Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Laughlin	1	H	8-20S-37E	5-25-76	20#	-0-	-0-	-0-	TSTM	Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Mallard Exploration, Inc.
200 Wilco Bldg.
Midland, Texas 79701

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Pritt	6	N	7-20-37	5-12-76	13	0	0	0	NONE	NONE
					9 5/8	35	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	5	J	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	190	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	4	O	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	30	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MKA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E.Laughlin	3	K	4-20-37	5-13-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	60	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, Jr.

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MSA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E. Laughlin	2	M	4-20-37	5-13-76	10 3/4	0	0	0	None	None
					7 5/8	120	0	0	None	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY MSA OIL PROPERTIES

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M.E. Laughlin	1	G	4-20-37	5-13-76	10 3/4	0	0	0	None	None
					7 5/8	15	0	0	None	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	4	A	5-20-37	5-20-76	12 1/2	0	0	0	None	
					9 5/8	40	0	0	None	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper	8	P	12-20-37	5-21-76	13 3/8	0	0	0	None	
					7 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	5	P	7-20-37	5-17-76	12	0	0	0	0	None
					9 5/8	40	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Aubrey E. Kenyon A. E. Kenyon, dj

COMPANY John H. Hendrix Production

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	1	H	7-20-37	5-17-7[illegible]	15[illegible]	0	0	0	0	None
					7 5/8	45	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	4	M	17-20-37	5-14-76	10 3/4	0	0	0	NONE	NONE
					7 5/8	0	0	0	NONE	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	3	L	17-20-37	5-14-76						
					10 3/4	0	0	0	None	None
					7 5/8	15	0	0	None	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "P"	2	N	17-20-37	5-14-76						
					10 3/4	0	0	0	None	None
					7 5/8	0	0	0	None	None

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kennon A. E. Kennon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
New Mexico State "BB"	1	K	17-20-37	5-14-[illegible]						
					10 3/4	0	0	0	0	None
					7 5/8	85	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	6	I	7-20-37	5-17-[illegible]						
					12[illegible]	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	4	D	8-20-37	5-17-[illegible]						
					12[illegible]	0	0	0	0	None
					9 5/8	110	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	3	L	8-20-37	5-17-[illegible]						
					12[illegible]	0	0	0	0	None
					9 5/8	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

NAME: A. E. Kenyon A. E. Kenyon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY [illegible]

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	2	A	[illegible]	5-17-76						
					12[illegible]	0	0	0	0	None
					9 5/8	60	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	12	D	12-20-37	5-19-76						
					13 3/8	0	0	0	0	None
					9 5/8	45	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cooper "B"	11	H	12-20-37	5-19-76						
					13 3/8	0	0	0	0	None
					9 5/8	10	0	0	0	Gas

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "X"	1	L	14-20-37	5-21-76						
					8 5/8	210	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon /s/ E. Kenyon, Dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#7	N	15-20-37	5-28-76	S	0	0	0	0	
					I	800	800	800	1/4 bbl	would not bleed off
					P	540	0	120	1½ bbl	
Britt B	#8	J	15-20-37	5-28-76	S	800	800	800		would not bleed down
					P	460	0	360	0	
Britt B	#12	E	15-20-37	5-28-76	S	540	0	10	½	water
					P	40	40	40	0	
Britt B	#13	D	15-20-37	5-28-76	S	850	0	25	½	water
					P	50	0	10	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#3	L	15-20-37	5-28-76	S	0	0	0	0	
					I	900	0	100	0	
					P	40	40	40	0	
Britt B	#4	M	15-20-37	5-28-76	S	0	0	0	0	
					I	200	0	10	¼	ltl. water
					P	540	0	120	0	
Britt B	#5	K	15-20-37	5-28-76	S	0	0	0	0	
					I	0	0	0	0	
					P	525	0	100	0	
Britt B	#6	F	15-20-37	5-28-76	S	0	0	0	0	
					I	540	0	15	½	water
					P	325	0	125	0	

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BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B-18	#1	O	18-20-37	5-27-76	S	0	0	0		
					I	50	0	0		Has TSTM
					P	210	210	210		
Britt B-18	#2	F	18-20-37	5-27-76	S	0	0	0		
					I	350	0	200		Water TSTM
					P	20	20	20		2 sec. blow down
Britt B-18	#3	J	18-20-37	5-27-76	S	0	0	0	1	water
					I	440	0	200		4 sec. blow down
					P	20	20	20		

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BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B-18	#4	I	18-20-37	5-27-76	S	0	0	0		
					I	340	0	0		
					P	20	20	20	1/2	water
										4 sec. blow down
Britt B-18	#5	E	18-20-37	5-27-76	S	0	0	0		
					I	450	10	50		
					P	440	440	440	1/2	water
Britt B-18	#6	P	18-20-37	5-27-76	S	0	0	0		
					I	360				Has TSTM
					P	630	630	630		2 sec. blow down.
Britt B-18	#7	O	18-20-37	5-27-76	S	0	0	0		
					I	130	0	0		Has
										4 sec. blow down.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B-8	#1	C	8-20-37	5-27-76	S	0	0	0		Has TSTM
					I	5	0	0		1 sec. blead down
					P					unable to open valve
Britt B-8	#2	C	8-20-37	5-27-76	S	0	0	0		
					I	10	0	0		
					P	40	40	40		Has TSTM 2 sec. blead down
Britt B-8	#3	C	8-20-37	5-27-76	S	0	0	0		
					I	10	0	0		Has TSTM.
					P	50	50	50		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Exxon Co. U.S.A.

1 LEASE	2 WELL NO.	3 UNIT LETTER	4 SECTION TOWNSHIP RANGE	5 DATE OF TEST	6 CASING STRING TESTED	7 SHUT IN PRESSURE BEFORE TEST	8 PRESSURE IMMEDIATELY AFTER TEST	9 PRESSURE 1-HR. AFTER TEST	10 EST. VOLUME OF FLUID DURING TEST	11 REMARKS (Oil-Water-Gas-etc.)
Eumont Gas Com "A"	1	-	S-25 T-20-S R-36-E	5-25-76	7 5/8"	*610	*25	*300	0	OPEN 1" VALVE BLEW FOR 20 SECOND. THEN ONLY SLIGHT TRACE OF GAS
										0- ON SURFACE

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: D. M. Pearce

COMPANY Exxon Co. U.S.A.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "H" 17	2	J	17-20-3[illegible]	5-21-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY JOHN H. HENDRIX

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Patsy	1	B	19-20-37	5-20-76	13 3/8	0	0	0	0	
					9 5/8	190	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	2	O	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					9 5/8	85	0	0	NONE	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Cleary Laughlin	3	P	5-20-37	5-20-76	12 1/2	0	0	0	NONE	
					9 5/8	15	0	0	NONE	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, Dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "Y"	2	J	17-20-32	5-21-76	12 1/2	0	0	0	0	
					8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "T"	7	L	28-19-33	5-21-76	12 1/2	0	0	0	0	
					8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "T"	8	K	28-19-33	5-21-76	8 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "H"17	1	E	17-20-33	5-20-76	12 3/4	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, dj

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alaska Cooper	1	A	12-20-37	5-24-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Alaska Cooper	2	E	7-20-37	5-24-76	13 3/8	0	0	0	0	
					9 5/8	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "X"	1	L	16-20-37	5-21-76	12 1/2	0	0	0	0	NONE
					8 5/8	60	0	0	0	GAS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY John H. Hendrix

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State "Y"	1	I	17-20-37	5-21-76	12 1/2	0	0	0	0	
					8 5/8	40	0	0	0	GAS

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. E. Kenyon A. E. Kenyon, Jr.

COMPANY John H. Hendrix

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt Phillips	#1	E	10-20-37	5-27-½	S	550	0	20	1 bbl.	
					P	150	0	100	0	
Britt Skaggs	#1	P	10-20-37	5-28-½	S	0	0	0	0	
					P	625	0	100	0	
Britt B	#1	O	15-20-37	5-28-½	S	0	0	0	0	
					I	540	0	20	3 bbl.	water
					P	0	0	0	0	
Britt B	#2	E	15-20-37	5-28-½	S	0	0	0	0	
					I	540	0	15	1	water
					P	625	0	175	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eumont Hardy Unit	#9	D	35-20-37	5-31	S	0	0	0	0	
					P	0	0	0	0	
Eumont Hardy Unit	#16	I	36-20-37	5-31	S	0	0	0	0	
					I	100	0	5	⅛	wtr.
					P	40	40	40	40	
Eumont Hardy Unit	#23	P	36-20-37	5-31	S	0	0	0	0	
					I	70	0	5	0	
					P	0	0	0	0	
Eumont Hardy Unit	#31	A	1-21-36	5-31	S	0	0	0	0	
					P	0	0	0	0	

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BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#14	L	15-20-37	5-28-76	S	850	0	125	0	
					P	650	0	200	0	
Britt B	#15	M	10-20-37	5-27-76	S	0	0	0	0	
					I	600	0	20	1/4	water
					P	150	150	150	0	
Britt B	#18	N	10-20-37	5-27-76	S	625	0	10	1/2	water
					*P	40	40	40	0	
Britt B	#19			5-28-76	S	620	0	10	1/2	Hd. water.
					*P	40	40	40	0	

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BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Britt B	#20	L	10-20-37	5-27-76	S	550	0	0	1	
					*P	40	40	40	0	
Britt B	#21	J	10-20-37	5-27-76	S	650	0	10	0	
					*P	40	40	40	0	
Britt B	#22	P	10-20-37	5-27-76	S	650	0	12	0	
					*P	40	40	40	0	
Britt B	#24			5-28-76	S	550	0	70	1/4	water
					P	625	0	175	0	

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BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eumont Hardy Unit	#41	L	5-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	40	0	0		
Eumont Hardy Unit	#43	N	5-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	40	0	0	0	
Eumont Hardy Unit	#44	O	5-21-37	5-31	S	0	0	0	0	
					I	0	0	0	0	
					P	0	0	0		
Eumont Hardy Unit	#37	J	5-21-37	5-31	S	0	0	0	0	
					I	280	0	20	¼	wtr.
					* P	40	40	40	0	

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BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eumont Hardy Unit	#32	H	1-21-36	5-28	S	0	0	0	0	
					I	0	0	0	0	
					P	0	0	0	0	
Eumont Hardy Unit	#29	D	5-21-37	5-31	S	0	0	0	0	
					I	375	0	10	⅛	wtr.
					P	0	0	0	0	
Eumont Hardy Unit	#36	E	5-21-37	5-31	S	0	0	0	0	
					I	200	0	15	⅛	wtr.
					* P	40	40	40	0	
Eumont Hardy Unit	#40	K	5-21-37	5-31	S	0	0	0	0	
					I	100	0	5	⅛	wtr.
					P	0	0	0	0	

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BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
[illegible]	[illegible]	S	[illegible]	5-31	S	0	0	0	0	
					P	0	0	0	0	
HAWK A	#6	G	8-21-37	5-30	S	700	0	0	0	
					P	45	45	45	0	
HAWK B-1	#14	J	8-21-37	5-31	S	230	230	230	1 Bbl.	SALT WTR.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Read B	#11	N	24-20-36	5-27-76	S	0	0	0		
					I	150				
					P	50	50	50		Water TSTM
Read B	#12	K	24-20-36	5-27-76	S	0	0			
					I	120	0	0		
					P	75	75	75		Gas TSTM
Read B	#13	M	24-20-36	5-27-76	S	0	0	0	0	
					I	0	0	0	0	
					P	50				
Read B	#14	L	24-20-36	5-27-76	S	0	0	0		
					I	0	0	0		
					P	50	50	50		TSTM

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
SEMU Tubb	#83	G	13-20-37	5-27-76	S	100	0	10	0	
					P	50	0	60	0	
SEMU Tubb	#54			5-28-76	S	650	0	10	0	
					*P	40	40	40	0	
SEMU Tubb	#85	H	15-20-37	5-28-76	S	0	0	10	1/4	water
					*P	40	40	40	40	
SEMU Tubb	#86	D	14-20-37	5-28-76	S	625	0	10	1/2	water
					*P	40	40	40	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
SEMU Tubb	#87	M	14-20-37	5-28-76	S	700	0	10	Slight	oil, water, mud
					P	340	0	125	0	
SEMU Tubb	#88	F	14-20-37	5-28-76	S	900	0	25	Slight	water, mud
SEMU Permian	#19	I	24-20-37	5-28-76	S	0	0	0	0	
					I	400	0	75	1/2	water
					P	0	0	0	0	
Phillips Hooper	#1	O	23-20-37	5-28-76	S	open-0	0	0	0	
					P	30	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Continental Oil Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State F-1	#1	O	1-21-36	5-28-76	S	0	0	0	0	
					I	600	0	10	0	
					P	300	0	150	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Rice Engineering & Operating, Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice-Monument-Eumont Salt Water Disposal System	1-22	K	35,T19S, R37E	5-27-76	9-5/8"	95	0	0	None	Bled air off in 15 minutes
	1-20	H	20,T20S, R37E	5-27-76	9-5/8"	20	0	1	None	Bled air off in 6 minutes
	1-9	M	9,T20S, R37E	5-27-76	9-5/8"	400	30	410	4 bbls.	Salt water to surface in 20 seconds-flowing by heads at end of 15 minutes flow test
	1-5	M	5,T20S, R37E	5-27-76	13-3/8"	0	-	-	-	
					9-5/8"	810	740	740	None	Gas flow restricted-possible choke nipple inside of 9-5/8" casing valve
					*9-5/8"	740	8	12	None	*Bled gas off 9-5/8" casing over 18 hour period

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: L. D. Goodheart, Division Manager

COMPANY Rice Engineering & Operating, Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Aztec Oil & Gas Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State Unit E	1	M	35-20-37	5/27	7 5/8	125	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: James W. Cobb

COMPANY Aztec Oil & Gas Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Skaggs Grayburg Unit	1	K	Sec. 12 20S, 37E	5-12-76	7-5/8 X 9-5/8	-0-	-0-	-0-	-	
	2	J	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	820 ✓	60 ✓	825 ✓	192	Water
	3	I	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	620 ✓	-0-	240 ✓	96	Water
	4	J	Sec. 12 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-	
	5	H	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	800 ✓	-0-	750 ✓	672	Water
	6	[illegible]	Sec. [illegible] 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-	
	7	O	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	410 ✓	-0-	160 ✓	96 ✓	Water
	8	P	Sec. 12 20S, 37E	"	5-1/2 X 8-5/8	100 ✓	-0-	60 ✓	Trace ✓	Water
	9	M	Sec. 7 20S, 37E	"	7-5/8 X 9-5/8	-0-	-0-	-0-	-0-	
	10	N	Sec. 7 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	11	O	Sec. 13 20S, 37E	"	7X9-5/8	710 ✓	710 ✓	710 ✓	7690	Water
	12	C	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	

Hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY TEXACO Inc.

*Calculated 24 hour rate based on 1 hour or less flow test - Barrels of water per day.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Skaggs Grayburg Unit	13	D	Sec. 13 20S, 37E	5-12-76	5-1/2 X 8-5/8	310 ✓	-0-	110 ✓	24 ✓	Water
	14	A	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	260 ✓	-0-	60 ✓	24 ✓	Water
	15	D	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	280 ✓	-0-	100 ✓	48 ✓	Water
	16	C	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	17	B	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	18	E	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	19	F	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	700 ✓	-0-	700 ✓	Not Est	Gas - Bled to 0 in 15 Mins.
	20	H	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	200 ✓	-0-	90 ✓	Not Est	Gas " " " " " "
	21	E	Sec. 18 20S, 38E	"	5-1/2 X 8-5/8	300 ✓	10 ✓	65 ✓	48 ✓	Water
	22	K	Sec. 13 20S, 37E	"	5-1/2 X 8-5/8	20 ✓	-0-	20 ✓	Not Est	Gas - Bled to 0 in 5 Mins.

Hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY BWE Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State A-20	1	L	20-20-37	5-A-76	7 5/8	350	12	280	7 gallons	Casing Shoe @ 5½ - 240' 7 5/8 - 1192' Water 5½ - 3450' Surface Pipe - 0# pressure Nothing
	2	J	20-20-37	5-10-76	7 5/8	0	0	0	Nothing	Casing Shoe 7 5/8 - 1' 4½ - 2542'
	3	O	20-20-37	5-10-76	10 3/4	0	0	0	Nothing	Casing Shoe 10 3/4 - 130' 5½ - 3504'

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: H. Hollabaugh

COMPANY BWE Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY THE SUPERIOR OIL COMPANY

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE-A	5		S-13 T-20-S R-36-E	5-26-76	9-5/8	775	-0-	-0-	No Fluid	Dry Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: A. B. Taylor A. B. Taylor

COMPANY THE SUPERIOR OIL COMPANY

WITNESSED BY:

Mr. John Runyan
New Mexico Oil Conservation Commission

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Cities Service Oil Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State F	1	O	Sec. 30 T20S R37E	5-26-76	Interme-diate ✓	Int. 140# Surf 0#	Int. 0# Surf 0#	Int. 47# Surf 0#	No Fluid	Bled off gas - no fluid recovered
State F	2	I	Sec. 30 T20S R37E	5-26-76	Interme-diate ✓	Int. 200# Surf 0#	Int. 0# Surf 0#	Int. 78# Surf 0#	No Fluid	Bled off gas - no fluid recovered
Laughlin B	5	O	Sec. 5 T20S A37E	5-26-76	Interme-diate	Int. 0# Surf 0#	Int. 0# Surf 0#	Int. 0# Surf 0#	No Fluid	No gas - no fluid recovered

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Robert H Johnson Jr

COMPANY Cities Service Oil Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Sun Oil

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M E Laughlin	1	I ✓	5-20-37	5-25-76	7"	20# ✓	0	0	0	
M E Laughlin	2	L ✓	9-20-37	5-25-76	13-3/8 9-5/8	0 0	0 0	0 0	0 0	
A B Reeves	1	G	29-30-37	5-25-76	9-5/8	190 ✓	75 ✓	193 ✓	0	ALL GAS (Little Gas Blow)
A Cooper	1	D ✓	9-30-37	5-25-76	13-3/8 9-5/8 7	0 21 55	0 0 0	0 0 0	0 0 0	
A Cooper	3	D ✓	7-30-37	5-25-76	13-3/8 9-5/8 7	0 0 112	0 0 0	0 0 0	0 0 0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W Jack Mo...

COMPANY Sun Oil Company

WITNESSED By LES CLEMONS

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. M. Cooper	1	B	Sec. 5 20S, 37E	5-12-76	7 X 9-5/8	-0-	-0-	-0-	-0-	
	2	A	Sec. 5 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	3	G	Sec. 5 20S, 37E	"	7 X 9-5/8	40 ✓	-0-	-0-	Not Est.	Gas
	4	H	Sec. 5 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	5	G	Sec. 5 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is true and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice Monument Unit	1	D	Sec. 19 20S, 37E	5-17-76	7X9-5/8	110 ✓	-0-	-0-	Not Est.	Gas
	2	C	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	500 ✓	10 ✓	10 ✓	Not Est.	Gas
	3	B	Sec. 19 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	4	A	Sec. 19 20S, 37E	"	7X9-5/8	75 ✓	-0-	20 ✓	Not Est.	Gas
	5	D	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	-0-	
	6	C	Sec. 20 20S, 37E	"	7X9-5/8	100 ✓	-0-	95 ✓	Not Est.	Gas
	7	E	Sec. 20 20S, 37E	"	7X9-5/8	20 ✓	-0-	-0-	Not Est.	Gas
	8	A	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	9	D	Sec. 21 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	None	
	10	C	Sec. 21 20S, 37E	"	7X9-5/8	650 ✓	500 ✓	060 ✓	672	✓Water - 5 Minutes pressured to 000 psi.
	11	E	Sec. 19 20S, 37E	"	7X9-5/8	230 ✓	-0-	120 ✓	11	Water

I hereby certify that the information submitted is true and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

*Calculated 24 hour rate based on 1 hour or less flow test - Barrels of water per day.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION, TOWNSHIP, RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
C. H. Weir 'A'	4	E	Sec. 12 20S, 37E	5-12-70	5-1/2 X 8-5/8	50 ✓	-0-	50 ✓	288 ✓	Oil
	7	L	Sec. 12 20S, 37E	"	7-5/8 X 10-3/8	760 ✓	-0-	25 ✓	Not Est	Gas
	8	F	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	680 ✓	200 ✓	660 ✓	1440 ✓	Water
	9	K	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	800 ✓	-0-	400 ✓	672 ✓	Water
	10	J	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	780 ✓	50 ✓	740 ✓	384 ✓	Water
*	11	G	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	920 ✓	570 ✓	830 ✓	3552 ✓	Water
C. H. Weir 'B'	1	H	Sec. 11 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	Not Est.	Gas
	2	A	Sec. 11 20S, 37E	"	5-1/2 X 9-5/8	400 ✓	-0-	110 ✓	25 ✓	Water
	4	I	Sec. 11 20S, 37E	"	7-5/8 X 10-3/4	-0-	-0-	-0-	-0-	
*	5	G	Sec. 11 20S, 37E	"	5-1/2 X 8-5/8	460 ✓	-0-	200 ✓	192 ✓	Water
	6	P	Sec. 11 20S, 37E	"	2-7/8 X 8-5/8	450 ✓	-0-	185 ✓	96 ✓	Water
	7	J	Sec. 11 20S, 37E	"	2-7/8 X 9-5/8	-0-	-0-	-0-	-0-	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION, TOWNSHIP, RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
M. D. Weir 'B' *	7	M	Sec. 12 20S, 37E	5-12-70	2-7/8 X 9-5/8	1040 ✓	-0-	1000 ✓	1584 ✓	Water
	8	N	Sec. 12 20S, 37E	"	2-7/8 X 7-5/8	680 ✓	-0-	-0-	192 ✓	Water
	9	O	Sec. 12 20S, 37E	"	2-7/8 X 8-5/8	100 ✓	-0-	50 ✓	-0-	
	10	P	Sec. 12 20S, 37E	"	2-7/8 X 9-5/8	140 ✓	140 ✓	140 ✓	Not Est.	Gas - Blew down in 1 sec.
L. R. Kershaw	7	C	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	850 ✓	-0-	310 ✓	Trace ✓	Water & Gas
*	8	D	Sec. 13 20S, 37E	"	2-7/8 X 9-5/8	710 ✓	710 ✓	710 ✓	7690	Water - Same well as Skaggs Grayburg Unit #11
	9	B	Sec. 13 20S, 37E	"	2-7/8 X 9-5/8	250 ✓	-0-	70 ✓	Not Est.	Gas - Blew down in 2 Mins.
*	10	F	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	800 ✓	10 ✓	600 ✓	240 ✓	Water
	11	E	Sec. 13 20S, 37E	"	2-7/8 X 8-5/8	800 ✓	10 ✓	225 ✓	400 ✓	Water
E.H.B. Phillips 'B'	1	F	Sec. 10 20S, 37E	"	2-7/8 X 9-5/8	20 ✓	-0-	20 ✓	Not Est.	Gas
	2	G	Sec. 10 20S, 37E	"	2-7/8 X 9-5/8	275 ✓	-0-	100 ✓	48 ✓	Water
E.H.B. Phillips 'C'	1	A	Sec. 10 20S, 37E	"	2-7/8 X 8-5/8	20 ✓	-0-	20 ✓	Not Est.	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil--water--Gas--etc.)
Eunice Monument Unit	12	F	Sec. 19 20S, 37E	5-17-76	5-1/2 X 7-5/8	-0-	-0-	-0-	-0-	
	13	G	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	250 ✓	-0-	-0-	Not Est.	Gas
	14	H	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	160 ✓	-0-	-0-	Not Est.	Gas
	15	E	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	100 ✓	-0-	-0-	Not Est.	Gas
	16	F	Sec. 20 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	17	G	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	420 ✓	-0-	130 ✓	34 —	Water
	18	H	Sec. 20 20S, 37E	"	7X9-5/8	-0-	-0-	-0-	-0-	
	19	E	Sec. 21 20S, 37E	"	7X9-5/8	450 ✓	-0-	120 ✓	96 ✓	Water
	20	I	Sec. 24 20S, 36E	"	7X9-5/8	125 ✓	-0-	-0-	2 ✓	Water
	21	L	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	525 ✓	-0-	380 ✓	68 ✓	Water
	22	K	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	510 ✓	-0-	510 ✓	-0-	

hereby certify that the information submitted is a truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil--water--Gas--etc.)
Eunice Monument Unit	23	J	Sec. 19 20S, 37E	5-17-76	5-1/2 X 8-5/8	-0-	-0-	-0-	-	
	24	I	Sec. 19 20S, 37E	"	4-1/2 X 9-5/8	420 ✓	-0-	20 ✓	-	
	25	L	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	100 ✓	-0-	-0-	Not Est.	Gas
	26	K	Sec. 20 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-	
	27	P	Sec. 24 20S, 36E	"	7 X 9-5/8	-0-	-0-	-0-	-	
	28	M	Sec. 19 20S, 37E	"	7 X 9-5/8	550 ✓	25 ✓	260 ✓	96 ✓	Water
	29	N	Sec. 19 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	Not Est.	Gas
	30	O	Sec. 19 20S, 37E	"	5-1/2 X 7-5/8	-0-	-0-	-0-	-	
	31	P	Sec. 19 20S, 37E	"	7 X 9-5/8	110 ✓	-0-	200 ✓	288 ✓	Water
	32	[illegible]	Sec. ~~19~~ 20 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-	
	33	N	Sec. 20 20S, 37E	"	4-1/2 X 7-5/8	-0-	-0-	-0-	-	

hereby certify that the information submitted is a truth and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY TEXACO Inc.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	*EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Eunice Monument Unit	34	D	Sec. 30 20S, 37E	5-17-76	7 X 9-5/8	-0-	-0-	-0-	-0-	
	37	A	Sec. 30 20S, 37E	"	7 X 9-5/8	500 ✓	-0-	330 ✓	Not Est.	Gas
	38	D	Sec. 29 20S, 37E	"	7 X 9-5/8	-0-	-0-	-0-	-0-	
	39	C	Sec. 29 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
	40	B	Sec. 29 20S, 37E	"	4-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
Roy Riddell	1	N	Sec. 12 21S, 36E	"	5-1/2 X 8-5/8	600 ✓	-0-	210 ✓	Not Est.	Gas
New Mexico 'H' State NCT-2	26	B	Sec. 20 20S, 37E	"	5-1/2 X 8-5/8	-0-	-0-	-0-	-0-	
New Mexico 'H' State NCT-4	27	G	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	220 ✓	50 ✓	220	Not Est.	Gas
New Mexico 'H' State NCT-3	25	D	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	75 ✓	-0-	40 ✓	Not Est.	Gas
New Mexico 'C' State NCT-2	9	C	Sec. 19 20S, 37E	"	5-1/2 X 8-5/8	140 ✓	-0-	20 ✓	Not Est.	Gas

I hereby certify that the information submitted is true and complete to the best of my knowledge.

BY: _____

COMPANY TEXACO Inc.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
V. Laughlin	1	D	9-20S-32E	5-24-76	Surf Inter	0 112	0 0	0 0	None	Gas Blow
	2	C	9-20S-32E	5-24-76	Surf Inter	0 50	0 50	0 50	None	Gas Blow
	3	B	9-20S-32E	5-25-76	Surf Inter	0 960	0 0	0 100	1.5 BBl	Water (Spray)
	4	A	9-20S-32E	5-26-76	Surf	580	20	125	1.5 BBl	Water (Spray)
S. Phillips	1	N	33-19S-37E	5-24-76	Surf Inter	0 1250	0 0	0 0	1.0 BBl	Water - Dead in 10 min
	2	K	33-19S-37E	5-26-76	Surf Inter	105 130	0 10	0 45	6.25 Bbl	Water
Warren McKee Unit	101	B	18-20S-38E	5-24-76	Surf Inter	0 550	0 425	0 525	None	Air
	102	L	8-20S-38E	5-24-76	Surf Inter	0 0	0 0	0 0	None	
	201	I	7-20S-38E	5-24-76	Surf Inter	0 0	0 0	0 0	None	
	202	J	7-20S-38E	5-24-76	Surf Inter	0 2	0 0	0 0	None	Slight Gas - 1 min blow
	203	K	7-20S-38E	5-24-76	Surf Inter	0 35	0 0	0 3	None	" " - 4 min. blow
	110	G	18-20S-38E	5-25-76	Surf Inter	0 160	0 135	0 135	None	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J.W. Pitzner

COMPANY Amerada Hess Corp

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Warren McKee Ut.	111	I	18-20S-38E	5-24-76	Surf Inter	0 (2)	0 0	0 0	None	Gas - Dead in 3 min
	112	F	18-20S-38E	5-25-76	Surf Inter	0 100	0 75	0 100	None	Gas
	113	P	18-20S-38E	5-24-76	Surf Inter	0 45	0 35	0 35	None	Gas
	114	A	19-20S-38E	5-24-76	Surf Inter	0 25	0 0	0 0	None	Gas - Dead in 15 min
	117	H	18-20S-38E	5-25-76	Surf Inter	0 15	0 0	0 0	None	Air - Dead in 8 min
	119	J	18-20S-38E	5-24-76	Surf Inter	0 3	0 3	0 0	None	Gas
	121	D	17-20S-38E	5-24-76	Surf Inter	0 20	0 0	0 0	None	Gas - Dead in 5 sec.
	132	D	20-20S-38E	5-24-76	Surf Inter	0 45	0 0	0 0	None	Gas - Dead in 10 min
	141	M	17-20S-38E	5-24-76	Surf Inter	0 2	0 0	0 0	None	
	142	L	17-20S-38E	5-24-76	Surf Inter	0 2	0 0	0 0	None	
	401	N	7-20S-38E	5-25-76	Surf Inter	0 15	0 0	0 0	None	Gas
	402	C	18-20S-38E	5-24-76	Surf Inter	0 1275	0 1125	0 1125	None	Gas

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BY: J.W. Pitzner

COMPANY Amerada Hess Corp

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Haven McKee Ut.	601	O	7-20S-38E	5-24-76	Surf	5	0	0		Air - Dead in 4 min
					Inter	320	215	300	None	Air
	601	P	7-20S-38E	5-26-76	Surf	0	0	0		
					Inter	65	0	0	0.25 Bbl	Gas & Oil Spray And in Lines
	701	D	17-20S-38E	5-24-76	Surf	0	0	0		
					Inter	30	25	25	None	
	702	M	8-20S-38E	5-24-76	Surf	3	0	0		
					Inter	850	225	225	None	Air Gas
	901	A	18-20S-38E	5-25-76	Surf	0	0	0		
					Inter	10	0	0	None	Gas - Dead in 10 Min.
State Q	1	J	16-20S-37E	5-24-76	Surf	0	0	0		
					Inter	25	0	0	None	Slight Gas Blow
	2	I	16-20S-37E	5-24-76	Surf	0	0	0		
					Inter	70	0	0	None	" " "
	3	O	16-20S-37E	5-24-76	Surf	0	0	0	None	
	4	I	16-20S-37E	5-24-76	Surf	675	25	675	None	Slight mist. Test returned & well blew off to 0#
	5	O	16-20S-37E	5-24-76	Surf	1225	700	825	None	Gas
	6	P	16-20S-37E	5-24-76	Surf	730	0	0	None	Gas Blow
State W	1	H	30-20S-37E	5-26-76	Surf	0	0	0		
					Inter	280	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Petzel

COMPANY Amerada Hess Corp.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Amerada Hess Corp.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State W	2	G	30-20S-37E	5-26-76	Surf	0	0	0		
					Inter	575	0	185	0.25 Bbl	Slight Spray
	3	F	30-20S-37E	5-26-76	Surf	0	0	0		
					Inter	310	0	100	0.25 Bbl	Slight Spray - Dead in 13 min
	4	E	30-20S-37E	5-25-76	Surf	0	0	0		
					Inter	610	8	60	None	Gas
State M	2	J	13-20S-36E	5-25-76	Surf	0	0	0		
					Inter	220	10	150	None	Gas
State Z	1	A	13-20S-36E	5-26-76	Surf	0	0	0		
					Inter	485	0	115 *	1.5 Bbl	* Water flowed for short time, Gas for rest of test
	2	A#	13-20S-36E	5-25-76	Surf	0	0	0		
					Inter	410	9	18	None	Gas
J. Anderson	1	K	8-20S-37E	5-25-76	Surf	85	60	85		Air
					Inter	15	0	0	None	Air - Dead in 6 min
	2	FN	8-20S-37E	5-4-76	Surf	0	0	0		
					Inter	330	0	0	None	Gas - Dead in 30 sec.
	3	K	8-20S-37E	5-25-76	Surf	0	0	0		
					Inter	5	0	0	None	Gas - Dead in 10 min
	4	K	8-20S-37E	5-25-76	Surf	0	0	0		
					Inter	10	0	0	None	Air - Dead in 8 min
Adkins	1	M	5-20S-37E	5-25-76	Surf	0	0	0		
					Inter	0	0	0	None	
	3	M	5-20S-37E	5-25-76	Surf	0	0	0		
					Inter	600	—	—	None	Gas well completed thru intermediate string

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: J. W. Petzel

COMPANY Amerada Hess Corp.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "H"	1	F	25-20-34	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	
↓	2	D	25-20-34	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	500#	5#	150#	5 BBLS	GAS & WATER (SALTY)

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "G"	1	J	30-20-37	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
STATE "F"	1	P	17-20-37	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	850#	850#	850#	55 BBLS	WATER (SALTY)
↓	2	O	17-20-37	5-27-74	13 x 9⅝	0	0	0	0	
					9⅝ x 7	0	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W. L. Hill

COMPANY SKELLY OIL CO.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID GIVING TEST	REMARKS (Oil-Water-Gas-etc.)
L. VAN-ETTEN	6	O	9-20-37	5-27-76	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	8#	0	0	SLIGHTS	WATER (SALTY) GAS
	7	I	9-20-37	5-27-76	13 x 7	0	0	0	0	
	8	P	9-20-37	5-27-76	13 x 7	0	0	0	0	
	9	L	9-20-37	5-27-76	10 3/4 x 7	0	0	0	0	
	10	O	9-20-37	5-27-76	10 3/4 x 7	0	0	0	0	
	11	I	9-20-37	5-27-76	9 5/8 x 5 1/2	470#	0	120#	1/2 BBL	GAS & WATER (SALTY)
↓	12	O	9-20-37	5-27-76	9 5/8 x 5 1/2	500#	0 #	115#	3 1/2 BBLS	GAS & WATER (SALTY)

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Odie Hankey

COMPANY SKELLY OIL CO.

N.M.O.C.C.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY SKELLY OIL CO

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID GIVING TEST	REMARKS (Oil-Water-Gas-etc.)
L. VAN-ETTEN	1	L	9-20-37	5-27-76	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	0	0	0	0	
	2	M	9-20-37	5-27-76	13 x 9 5/8	11" WELDED	TO 0#	x 7	CONNECTIONS	
					9 5/8 x 7	420#	0	150#	1 1/2 BBLS	GAS & WATER (SALTY)
	3	N	9-20-37	5-27-76	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	135#	5	30#	0	GAS
	4	K	9-20-37	5-27-76	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	130#	3#	25#	0	GAS
↓	5	J	9-20-37	5-27-76	13 x 9 5/8	0	0	0	0	
					9 5/8 x 7	540#	0	200#	1 BBL	GAS & WATER (SALTY)

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Odie Hankey

COMPANY SKELLY OIL CO.

Phillips Petroleum Company
Room 806, Phillips Building
COMPANY Odessa, Texas 79761

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Hobbs	1	K	18,20,37	5-20-76	Surface	0	0	0	None	
				"	6-5/8	0	0	66#	None	Gas Only
Hobbs	2	L	18,20,37	5-20-76	Surface	0	0	0	None	
				"	9-5/8	600#	100#	110#	None	Gas Only
Hobbs	3	M	18,20,37	5-20-76	Surface	0	0	0	None	
				"	9-5/8	10[illegible]	0#	10#	None	Gas Only
Hobbs	4	N	18,20,37	5-20-76	Surface	No valve				No valve on surface csg.
				"	9-5/8	(600#)	120#	580#	None	Gas Only
Mexico	1	A	18,20,37	5-20-76	Surface	0	0	0	None	
				"	9-5/8	260#	0	0	None	Gas Only
Mexico	2	G	18,20,37	5-20-76	Surface	0	0	0	None	
				"	9-5/8	180#	0	0	None	Gas Only
Mexico	3	H	18,20,37	5-20-76	Surface	0	0	0	None	
				"	9-5/8	120#	0	50#	None	Gas Only
Quepaw	1	P	19,20,37	5-20-76	Surface	0	0	0		
				"	9-5/8	100#	5#	15#	2 B. Wtr	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: L. L. Franta

COMPANY Phillips Petroleum

DATE: May 25, 1976

13-3/8 Valves on all wells bottom valve
9-5/8 " " " " Middle "
7" " " " " Top "

NOTE: Per conversation between Messrs. Jerry Sexton/C. L. Sumerwell, these tests were not witnessed by NMOCC representative.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Ida "BB" State	1	D	16-19-37	5-18-76	9-5/8"	50#	0#	0#	0	Gas
F.W.Kutter "B"	1	H	21-19-37	5-18-76	10-3/4"	0	0	0		
"	2	E	21-19-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	550#	0	50#	1 bbl	Gas and water
"	3	D	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	4	F	"	"	8-5/8"	0	0	0		
E.Shipp "A"	1	F	21-19-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
T. Anderson	1	O	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	2	C	17-20-37	"	10-3/4"	75#	12#	75#	0	Gas
"	"	"	"	"	7-5/8"	25#	0	0	0	"
"	3	P	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	4	B	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	6	A	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	7	H	17-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	8	G	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
R.R.Bell "G"	1	P	13-20-36	5-19-76	10-3/4"	0	0	0		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
R.R. Bell "G"	1	P	13-20-36	5-19-76	7-5/8"	100#	0	0	0	Gas (dual)
"	2	O	13-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	375#	0	225#	1 bbl ✓	Water & gas
Graham St. "B"	1	L	13-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
B.Whitmire	1	G	8-20-37	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	20#	0	20#	0	Gas
"	2	B	8-20-37	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	3	F	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	5	F	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	6	B	"	"	13-3/8"	50#	20#	50#	0	Gas
"	"	"	"	"	9-5/8"	0	0	0		
"	8	F	"	"	13-3/8"	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	9	H	"	5-18-76	9-5/8"	0	0	0		
A. B. Reeves	1	L	29-20-37	5-20-76	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	2	E	"	"	16" conductor	0	0	0		
"	"	"	"	"	9-5/8"	375#	0	175#	2 bbls water ✓	
Sunshine	1	H	30-20-37	5-19-76	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Sunshine	2	H	30-20-37	5-19-76	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	10#	0	0	0	Gas
"	3	K	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	10#	0	10#	0	Gas
H.T.Orcutt "E"	1	E	2-20-37	"	9-5/8"	0	0	0		
L.W.White "A"	1	P	25-20-36	5-20-76	10-3/4"	175#	50#	175#	2 bbls	Gas & water
"	"	"	"	"	7-5/8"	100#	70#	100#	1 bbl	Gas & oil
L.W.White "A"	2	I	25-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	700#	200#	300#	0	Gas (dual csg compl)
"	3	H	25-20-36	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
"	5	A	"	"	10-3/4"	30#	0	30#	1 bbl	Water
"	"	"	"	"	7-5/8"	50#	0	50#	0	Gas
Bell-Ramsay "B"	1	H	29-20-37	"	16" conductor	0#	0	0		
"	"	"	"	"	9-5/8"	400#	0	75#	1 bbl	Gas & water
"	2	M	33-20-37	"	16" conductor	0	0	0		
"	"	"	"	"	9-5/8"	0	0	0		
"	3	L	28-20-37	"	9-5/8"	0	0	0		
Bell-Ramsay "D"	1	G	35-20-37	5-19-76	9-5/8"	0	0	0		
H.T.Orcutt "D"	1	B	13-20-36	5-25-76	10-3/4"	20#	0	0		gas
"	"	"	"	"	7-5/8"	900#	100#	300#	Spray	Water - gas
"	2	G	"	"	10-3/4"	0	0	0		
"	"	"	"	"	7-5/8"	0	0	0		
H.T.Orcutt "H"	1	E	11-20-37	"	8-5/8"	430#	0	0	0	Gas

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Gulf Oil Corporation

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
H.T.Mattern "C"	9	P	7-21-37	5-19-76	8-5/8"	10#	0	0	0	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Leland Leonard

COMPANY Gulf Oil Corporation

DATA SHEET FOR FLOW TEST IN OIL CENTER--MOVEMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EJ Barker	5	D	S-20S-37E	5-25-76	Surf.	57	0	20	2 bbl	Wtr + Gas - Bled off 15 min
EJ Barker	5	D	S-20S-37E	5-25-76	Int.	70	0	8	None	Gas - Bled off 1 min.
EJ Barker	7	A	S-20S-37E	5-25-76	Surf.	0	0	0	None	
EJ Barker	7	A	S-20S-37E	5-25-76	Int.	(48)	0	7	None	Gas - Bled off " "
EJ Barker	14	H	S-20S-37E	5-25-76	Surf.	17	0	0	None	Gas - Bled off 45 sec.
EJ Barker	14	H	S-20S-37E	5-25-76	Int.	22	0	0	None	Gas - Bled off 1 min.
EJ Barker	15	H	S-20S-37E	5-25-76	Surf.	0	0	0	None	
EJ Barker	15	H	S-20S-37E	5-25-76	Int.	(27)	0	4	None	Gas - Bled off 5 sec.
EJ Barker	16	E	S-20S-37E	5-25-76	Surf.	41	0	0	None	Gas - Bled off 1 sec
EJ Barker	16	E	S-20S-37E	5-25-76	Int.	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Thomas Benham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EJ Barker	13X	F	S-20S-37E	5-25-76	Surf.	130	0	2	None	Gas - Bled off 7 sec
EJ Barker	13X	E	S-20S-37E	5-25-76	Int.	47	0	16	None	Gas - Bled off 3 min
Barker Gas Unit	1	E	S-20S-37E	5-25-76	Surf.	0	0	0	None	
Barker Gas Unit	1	E	S-20S-37E	5-25-76	Int.	0	0	0	None	
RJ Barker	16	L	S-20S-37E	5-25-76	Surf.	80	0	22	None	Gas - Bled off 5 sec.
RJ Barker	16	L	S-20S-37E	5-25-76	Int.	130	90	120	None	Gas.
EJ Barker	11	L	S-20S-37E	5-25-76	Surf.	7	0	0	None	Gas - Bled off 15 sec.
EJ Barker	11	L	S-20S-37E	5-25-76	Int.	80	0	5	None	Gas - Bled off 2 min.
EJ Barker	17	I	S-20S-37E	5-25-76	Surf.	0	0	0	None	
EJ Barker	17	I	S-20S-37E	5-25-76	Int.	35	0	10	None	Gas - Bled off 5 sec.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Thomas Benham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
El Paso	20	P	[illegible]	[illegible]	Sec.	[illegible]	[illegible]	220	None	Gas - Bled off 10 sec.
El Paso	20	P	[illegible]	[illegible]	Tub.	220	0	125	None	Gas - Bled off 1 min.
El Paso	12	A	[illegible]	[illegible]	Sec.	[illegible]	[illegible]	[illegible]	None	
El Paso	12	A	[illegible]	[illegible]	Tub.	[illegible]	0	2	None	Gas - Bled off 6 sec

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
State P	1	F	25-20S-35E	5-23-76	Sec.	0	0	0	None	
State P	1	F	25-20S-35E	5-23-76	Tub.	0	0	0	None	
State P	2	C	25-20S-35E	5-23-76	Sec.	0	0	0	None	
State P	2	C	25-20S-35E	5-23-76	Tub.	7	0	0	None	Gas - Bled off 2 sec.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: [signature]

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOBBS AREA

COMPANY Amoco Production Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gillully "A" Fed.	2	A	24 20 36	5-18	Int.	20	10	10	0	Gas
"	3	G	25 20 36	5-17	Int.	390	0	60	1 Bbl	Water flow with gas
"	5	B	"	5-18	Int.	500	0	30	10 Bbl	Water
"	6	K	"	5-17	Int.	30	0	0	0	Gas
"	8	J	24 20 36	5-18	Int.	100	0	120	10 Gal	Water - Standing full of water
"	9	C	"	"	Int.	20	0	0	0	Gas - Bled off 5 min.
"	10	H	"	"	Int.	55	0	0	0	Gas - Surf. 55#, bled int. - surf. 0 in 3-1/2 min.
"	11	G	"	"	Int.	20	0	20	0	Gas - Bled off 1 min.
"	12	D	"	5-17	Int.	320	0	0	0	Standing full of water - bled off 2 min.
"	13	F	"	5-18	Int.	40	0	20	2 Gal	Water
"	14	E	"	"	Int.	0	0	0	0	
Gillully Fed. Gas Com	4	B	24 20 36	5-18	Int.	0	0	0	0	Light blow - less than 1#
"	7	D	"	"	Int.	25	0	10	0	Gas
Gillully "D" Fed.	1	L	25 20 36	5-17	Int.	0	0	0	0	
"	2	B	21 20 37	5-18	Int.	0	0	0	0	
"	4	D	22 20 37	5-17	Int.	0	0	0	0	
"	5	C	"	"	Int.	640	300	640	9 Bbl	Water flow
"	6Y	A	21 20 37	"	Int.	720	130 (30 min test)	540	100 Bbl	Water flow - 200 bbl. per hour

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: _____

COMPANY _____

DATA SHEET FOR FLOW TEST IN OIL CENTER--HOBBS AREA

(Page 2)

COMPANY Amoco Production Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Gillully "B" Fed.	7	K	22 20 37	5-17	Int.	0	0	0	0	
"	8	C	"	"	Int.	580	100	220	2 Bbl	Water flow
"	9	D	"	"	Int.	775	20	630	38 Bbl	Water flow - Gas 775# to 500#
"	10	B	"	"	Int.	460	0	10	0	Gas
"	11	F	"	"	Int.	635	30	150	1 Bbl	Water flow

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: B. W. Grayson

COMPANY Amoco Production Company

Note: Witnessed by Mr. Nathan Clegg, Field Representative - NMOCC

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J.H. Williams	1	A	7-18S-37E	5-23-74	Int.	0	0	0	None	
J.H. Williams	2	O	7-18S-37E	5-23-74	Int.	12	0	0	None	Gas Bled off 2 sec

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Marvin Denham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Atlantic Richfield Co.

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
U.S. Skelly B	1	M	8-18S-37E	5-23-74	Int	0	0	0	None	

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Marvin Denham

COMPANY Atlantic Richfield Co.

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY GETTY OIL COMPANY

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
EAST EUNICE UNIT	50	M	22-19-37	5-12-76	SURFACE	600 PSI	0 PSI	240 PSI	1.25 Bbls.	Water-Oil String Pressure was 580 PSI. Fell to 0 PSI during Flow Period. Built to to 240 PSI 1 hr. after Flow Test.
EAST EUNICE UNIT	59	N	22-19-37	5-12-76	SURFACE	490 PSI	0 PSI	40 PSI	.75 Bbl.	Flow Oil & a Little Gas.
EAST EUNICE UNIT	67	H	20-19-37	5-13-76	SURFACE	50 PSI	0 PSI	0 PSI	TSTM	Blew down to 0# in 2 Sec.
EAST EUNICE UNIT	82	O	26-19-37	5-12-76	SURFACE	0 PSI	0 PSI	0 PSI	TSTM	Flowed Water for 5 Sec.
EAST EUNICE UNIT	92	F	35-19-37	5-12-76	SURFACE	290 PSI	0 PSI	0 PSI	1 Bbl.	Flow Oil & a Little Gas
EAST EUNICE UNIT	130	F	12-20-37	5-12-76	SURFACE	940 PSI	940 PSI	940 PSI	19 Bbls.	Water.
EAST EUNICE UNIT	131	G	12-20-37	5-12-76	SURFACE	820 PSI	650 PSI	790 PSI	5 Bbls.	Water.
EAST EUNICE UNIT	915	K	2-20-37	5-12-76	SURFACE	425 PSI	0 PSI	220 PSI	-	Gas blew for 30 Sec., then Slight Blow.
M. E. LAUGHLIN	2	K	4-20-37	5-13-76	SURFACE	460 PSI	50 PSI	50 PSI	-	Gas.
T. ANDERSON	2	I	8-20-37	5-13-76	INTERMED.	145 PSI	0 PSI	20 PSI	-	Gas Blew Off in 2 Min.
STATE "A"	2	K	16-20-37	5-13-76	INTERMED.	960 PSI	150 PSI	960 PSI	7 Bbls.	Water.
STATE "K"	1	K	13-20-36	5-13-76	INTERMED.	290 PSI	0 PSI	20 PSI	3 Bbls.	Water.
STATE "A"	1	H	23-20-37	5-13-76	INTERMED.	200 PSI	0 PSI	100 PSI	TSTM	WATER. Blew off in 4 min.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: C. L. Wade: C. L. Wade, AREA SUPERINTENDENT

COMPANY GETTY OIL COMPANY
P.O. Box 249
Hobbs, New Mexico 88240

RBS/bh
5-18-76

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY El Paso Natural Gas Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Shell State	11	C	13-20-36	5-24-76	Surf. 8 5/8	1600	0	0	0	Blew to 0 psi in approx. 5 seconds.

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: C. D. Kysar

COMPANY El Paso Natural Gas Company

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY W. K. Byrom

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. H. Williams	2	O	34-19-3	5-19-7	85/8	700	0	70	1/8"stream	Salt Water
Williams	3	N	34-19-3	5-19-7	85/8	400	0	0	1/8"stream	Salt Water
J. W. Cooper C (Eumont)	3	B	3-20-37	5-19-7	85/8	100	0	0	1/8"stream	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W. K. Byrom

COMPANY W. K. Byrom

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY W. K. Byrom

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
J. H. Williams	2	O	34-19-3	5-19-7	85/8	700	0	70	1/8"stream	Salt Water
Williams	3	N	34-19-3	5-19-7	85/8	400	0	0	1/8"stream	Salt Water
J. W. Cooper C (Eumont)	3	B	3-20-37	5-19-7	85/8	100	0	0	1/8"stream	Salt Water

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: W. K. Byrom

COMPANY W. K. Byrom

DATA SHEET FOR FLOW TEST IN OIL CENTER--MONUMENT AREA

COMPANY Marathon Oil Company

LEASE	WELL NO.	UNIT LETTER	SECTION TOWNSHIP RANGE	DATE OF TEST	CASING STRING TESTED	SHUT IN PRESSURE BEFORE TEST	PRESSURE IMMEDIATELY AFTER TEST	PRESSURE 1-HR. AFTER TEST	EST. VOLUME OF FLUID DURING TEST	REMARKS (Oil-Water-Gas-etc.)
Bertha Barber	2	C	5-20S-37E	5-25-76	9-5/8"	110	45	140	11 Gallons	1 Gallon oil; 10 Gallons water
	4	K	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	5	D	5-20S-37E	5-25-76	9-5/8"	400	0	175	3 Gallons	3 Gallons oil
	6	L	5-20S-37E	5-25-76	9-5/8"	360	50	90	4 Barrels	4 Barrels oil
	7	I	5-20S-37E	5-25-76	9-5/8"	600	100	195	2.5 Barrels	2.5 Barrels oil
	8	E	5-20S-37E	5-25-76	9-5/8"	5	0	0	No Fluid	
	9	F	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	10	L	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	11	D	5-20S-37E	5-25-76	8-5/8"	5	0	*0	No Fluid	
	12	L	5-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
W.H. Laughlin	1	E	9-20S-37E	5-25-76	9-5/8"	50	0	20	.5 Barrel	.5 Barrel oil
	2	F	9-20S-37E	5-25-76	9-5/8"	525	25	210	1 Barrel	.5 Barrel oil; .5 Barrel water
	3	G	9-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
Hansen State	1	B	16-20S-37E	5-25-76	9-5/8"	0	0	0	No Fluid	
	2	G	16-20S-37E	5-25-76	9-5/8"	800	795	860	21 Barrels	21 Barrels water(salt)
	5	H	16-20S-37E	5-25-76	8-5/8"	0	0	0	No Fluid	
	6	G	16-20S-37E	5-25-76	10-3/4"	560	45	120	2 Barrels	2 Barrels oil & drilling mud

* Slight Puff

I hereby certify that the information submitted is the truth and complete to the best of my knowledge.

BY: Ralph Skinner

COMPANY Marathon Oil Company

C O N T E N T S

(1) Progress Report

(2) Report Given at Last Meeting in Santa Fe

(3) CITGO - State C-103

(4) Minutes of Meetings and Supporting Data

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 5A
CASE 5941

PROGRESS REPORT

EUNICE AREA WATERFLOW COMMITTEE

DISCUSSION OF ACTIVITIES

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee was to collect, analyze data and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of thirteen wells were initially shut-in for observation. The wells consisted of 5 injection wells, 6 producing wells, 1 shut-in producing well and 1 disposal well. Due to a slight pressure drop on the Citgo-State No. 1, the closest and most significant monitor point, two additional wells were shut-in. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure on the shut-in injection wells had decreased substantially below readings on monitor points and with virtually no change in recorded pressure on the Citgo well. The Committee recommended to the NMOCC that injection be resumed into the injectors, and plans be made to "blow-down" the pressured up salt section in the Citgo-State No. 1. Thoughts at this time were to discontinue cycling, and attempt to determine if we were dealing with a localized or widespread pressure problem. The NMOCC felt that cycling and monitoring should be continued because it appeared that one of the other study groups was making some headway through this procedure. An alternate recommendation was made to the NMOCC at

this time. Injection wells with approximately 700# wellhead pressure or less be reactivated and cycling expanded to take in more injectors. The NMOCC agreed to this proposal and this procedure was implemented. During all the monitoring and cycling, the pressure on the Citgo-State well had remained practically constant at 1150#.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976 meeting that (1) injectors which are high pressure and low volume, and (2) those which have shown little or no pressure variation during shut-in be backflowed and tested, in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and buildup procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 barrels per day or less, shut the well in for pressure build-up. If pressure does not build up past 800# in 48 hours, return the well to injection". From this time forward, wells were checked for pressure drop, backflowed, (rates and pressures monitored) and buildups ran following backflow. Upon recommendation from the Committee and approval from the NMOCC, wells were returned to injection as warranted by results.

At the Committee meeting on August 26, 1976, approval was given by the NMOCC to suspend the present testing procedure and go ahead with plans to backflow the Citgo-State. Fourteen Skelly and Anadarko wells were to be shut-in one week prior to backflow. On September 19, 1976, backflowing of the Citgo-State well was begun. At time of opening, the well had 1010# on surface. After

60 hours well had flowed back approximately 40,000 barrels of 9.9# brine. Initial flowing pressure was 210# at a rate of 9 BPM. After 60 hours flow pressure had decreased to 70# and rate was approximately 2 - 3 BPM. During the ten day flowing period, the well flowed back an estimated 63,000 barrels. The fourteen wells were closely monitored during backflow with pressure recorders. No pressure interference was noted on any of the wells. As soon as pressure and flow rate would permit, Petro-Search re-entered, plugged and abandoned the well.

The test wells were later returned to injection and monitoring discontinued, with the exception of 4 wells which had previously shown bradenhead pressures. These wells still have pressure recorders attached and have consistently fell off in pressure since backflowing of the Citgo-State and return to injection of surrounding wells. These wells are: Skelly Penrose "A" Water Injection Well No. 38 from 275# to 45#; Skelly Penrose "A" No. 44 from 725# to 95#; Skelly Penrose "B" No. 54 from 90# to vacuum and Skelly Penrose "B" No. 52 from 120# to 65#. Subsequent work of the Committee has consisted of re-evaluating all available temperature and tracer logs in the area and analyzing new logs as they become available.

Wells which had abnormal temperature gradients have been, and are being re-logged to confirm data as interpreted from previous logs. Several noise logs have been and are now being run.

Skelly recently perforated the Skelly Penrose "A" No. 64 at 1460' opposite a water flow which was encountered during drilling of the well approximately 2 years ago. Prior to perforating, the well was producing 9 BO and 40 BW per day. Current producing rate is 8 BO and 43 BW per day.

On January 14, 1977, a noise log was ran on the Skelly J. V. Baker No. 11 in an attempt to determine if cycling was occuring between Anadarkos' injection Well No. 13-C7 and the J. V. Baker No 11, which is a Drinkard producer. It appeared that possibly water which was being injected into the Penrose section might be channelling across to the Baker Well and moving up and back to the injection well. No upward or downward movement adjacent to the injection zone was indicated by the log, however, an increase in noise intensity was noted from 920' to 1430', which could be indicative of water migration. Logs ran during 1975 on the Anadarko well had shown possible migration across the salt section. Recent logging by two different companies have failed to confirm this. At present the well is operating at reduced pressure and rates, but still has approximately a 20 BWPD flow out the bradenhead.

CONCLUSION

(1) All wells drilled in the area have surface pipe set at regulatory agency approved depth and there is no evidence of surface water being contaminated at this time.

(2) Some formation shallower than the waterflood objective formation contains pressured salty water in certain areas within the area of investigation.

(3) Testing and investigations, to date, have failed to identify the water source

(4) Previous surveys which indicated anomalies or temperature variations have proven difficult to confirm from recent surveys.

RECOMMENDATIONS

(1) Attempt to blow-down "salt section" through selected wells.

(2) Record pressure and volume before, during and after "blow-down" operation. Continue to monitor for a sufficient length of time to determine if "salt section" is being re-pressured.

(3) Continue periodic injection well surveys to determine distribution of injected water. Conduct necessary remedial operations to confine water to unitized interval.

(4) Continue committee efforts to determine & eliminate source of pressured water.

(5) In order to prevent masking data from "blow-down" no further restrictions be imposed on injection operations, until "blow-down" operations are complete and results are evaluated.

RECENTLY RUN SURVEYS - EUNICE AREA

Skelly Oil Company

J. V. Baker #11
Skelly Penrose "A" #26
Skelly Penrose "A" #28
Skelly Penrose "A" #34

Anadarko Production Company

Langlie Mattix Penrose Sand Unit #34-4
Langlie Mattix Penrose Sand Unit #27-1
Langlie Mattix Penrose Sand Unit #13-B-2
Langlie Mattix Penrose Sand Unit #40-1
Langlie Mattix Penrose Sand Unit #13-C7
Langlie Mattix Penrose Sand Unit #1-2
Langlie Mattix Penrose Sand Unit #8-1
Langlie Mattix Penrose Sand Unit #7-1
Langlie Mattix Penrose Sand Unit #7-3
Langlie Mattix Penrose Sand Unit #13-A1
Langlie Mattix Penrose Sand Unit #13C-5
Langlie Mattix Penrose Sand Unit #15-2
Langlie Mattix Penrose Sand Unit #17-1
Langlie Mattix Penrose Sand Unit #21-2

REPORT OF N.M.O.C.C. APPOINTED SUB-COMMITTEE ASSIGNED TO STUDY WATER FLOWS IN AND AROUND THE EUNICE AREA

In March, 1976, the N.M.O.C.C. called a meeting for April 8, 1976 of operators from the Southeast Lea County area " to discuss water flows which have developed in and around several waterfloods and disposal systems in Lea County." At this meeting it was pointed out that the waterflow problems were much more widespread than earlier thought; and that measures in the original problem area had contained, but not eliminated the problem, an industry committee was designated to investigate these problems.

On April 13, 1976, the industry committee met in Hobbs, New Mexico. Sub-committees were formed to study: (1) Injection pressures to be allowed in waterfloods and disposal wells, and to determine if injection volume/fluid withdrawal ratios can be used as a tool to determine problems in waterfloods. (2) Measures to deal with problems of pressured up salt section and shallow zones. (3) To determine what information is required to monitor waterfloods, and (4) To determine what data is necessary before a new waterflood can be approved. These sub-committees reported back to the industry committee on April 20, 1976, and were then dissolved. Three committees were then appointed to develop recommendations on an area basis to implement the ideas advanced by the prior sub-committees. One of the three appointed committees was designated to study the Eunice Area. This committee is chaired by Skelly and is made up of representatives from Gulf, Anadarko, Arco, Reserve, and AGUA, Inc.

The Eunice area committee became operational on May 10, 1976 and has met at weekly intervals there-after to collect, analyze data, and present recommendations to the N.M.O.C.C. District Supervisor on measures considered pertinent to developing data on the waterflow problem in this area and to locating source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use, these wells were:

Skelly Penrose "A" Unit			
	# 26-J	3-23-37	Water injection well
	# 23-F	3-23-37	Water injection well
	# 13-B	3-23-37	Water injection well
	# 40-P	3-23-37	Water injection well
Anadarko Langlie Mattix Penrose Sand Unit			
	# 3-P	34-22-37	Water injection well
Morenco			
	# 36-1K	36-22-37	Producing well
Petro-Search			
	Citgo-St. # 1-E	2-23-37	Producing well S.I.
	Fluor # 1-M	35-22-37	Producing well
	Gulf St. # 2-F	2-23-37	Producing well
Summit Energy, Inc.			
	Gulf St. # 1-F	36-22-37	Producing well
	Gulf Sims # 1-P	25-22-37	Producing well
Texas Pacific Oil Co.			
	Ella Drk. # 2-E	25-22-37	Producing well

AGUA, Inc.
Hinebry-Drk. # 35-H 35-22-37 SWD well

The four Skelly and one Anadarko wells were to be shut in during the monitoring period, with pressure recorders attached to the injection well-head.. The producing and disposal well were also to have pressure recorders attached. All concerned operators were notified by telephone or letter, seven day recorders were installed. Due to a slight pressure drop on the Petro-Search Citgo-State no. 1, Skelly water injection wells no. 28-L and 38-N were subsequently shut in and pressure recorders attached.

Pressure recorders were used to monitor performance on the initially shut in wells until June 17, 1976. Pressure at that time on the shut in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the salt section. Daily production from the Skelly Penrose "A" Unit decreased from 846 to 824 BOPD during this period. The committee recommended that the six shut in Skelly and one Anadarko wells be returned to injection and an attempt be made to "blow down" the pressured salt section through the Citgo-State no. 1. This procedure would relieve pressure on the wellhead and provide information as to whether or not the pressure might be localized or widespread. The N.M.O.C.C. was not in agreement with this proposal and felt that the shut in wells remain shut-in.

During the week of June 17th to June 24th, five additional Skelly water injection wells (nos. 42-B, 44-D, 36-P, 21-H and 12-N) and Anadarko 4-H and 1-J were shut in and pressure recorders attached. Reason for the additional installations was to extend the test area out to take in another row of wells.

A meeting between chairmen of the three study groups and members of the N.M.O.C.C. from the Hobbs and Santa Fe office was held at 10:00 a.m. June 24th at the Hobbs office of the N.M.O.C.C. At this time the three study groups presented a review of progress being made in their respective areas. None of the groups had any definite answers to the problem at this time. General consensus was to continue cycling and testing as recommended and agreed to by the N.M.O.C.C. At this meeting the chairman of the Eunice Study Group requested that arrangements be made to backflow the Citgo-State well: Due to the fact that testing and cycling of wells to date had not provided the answer concerning communication between the shut in injection wells and the Citgo-State well.

At the July 1st meeting of the Eunice Study Group a request was made by the committee to the N.M.O.C.C. to permit a 24-48 hr. backflow of the monitor well in an effort to determine if a pressure-trapped condition might exist in the well. An alternate recommendation was made to the N.M.O.C.C., at this time: If they would not permit backflowing of the Citgo-State; then the injection wells with approximately 700# or less should be re-activated and recycling expanded to another row of injectors.

At the next committee meeting on July 8th, the N.M.O.C.C. reported that they felt the monitor well should not be backflowed or disturbed, at least for the time being, until more injectors in the area had been shut in and monitored. Jerry Sexton of the N.M.O.C.C. agreed to the following proposals by the committee: Return Skelly Penrose "A" Unit water injection wells no. 13, 26, 23, 38 and 28 to injection. Shut in and attach pressure recorders to Skelly Penrose "A" injection wells no. 2, 10, 17, 30, 32, 34, 46, 48, 50, 52, 61,

and Anadarko Langlie Mattix Penrose Sand Unit wells no. 21-7 and 36-1. This would extend the test area out to take in another complete row of injectors. Due to the larger pressure drop indicated by the Skelly injection well no. 28, a decision was made to leave the well shut in with pressure recorder attached. At this point in time it was felt by the committee that results from the testing had been inconclusive and no definite communication between the shut in injection wells and producing wells, temporarily abandoned wells or disposal well had been established.

At the committee meeting on July 15, 1976, further discussion took place concerning the feasibility of backflowing the high pressure low volume injectors which have shown little, if any, pressure variation during the shut in periods.

During the week of July 21st to July 28th, approximately 10 barrells of water was backflowed from the Citgo State well with no apparent pressure change.

A recommendation was made by the committee at the July 21st meeting that injection wells which are high pressure and low volume, and those which had shown little or no pressure variation during shut in be backflowed and tested, in a further attempt to determine if any communication exists between the concerned injection wells and the Citgo-State well.

Several wells were scheduled for backflow the following week: Skelly Penrose "A" no. 40, 42, 21, and 44. Anadarko Langlie Mattix Penrose Sand Unit no. 3-P and 4-H. Based on pressure response from shut-in, and results from backflowing and testing, the following wells were returned to injection status; Skelly Penrose "A" Unit nos. 12, 34, 36, 40, 42, 46. Anadarko wells nos. 37-3P, 36-4H. Wells to be shut in for observation with pressure recorders attached: Skelly Penrose "A" nos. 4, 8, 53, 55, 57. Skelly Penrose "B" nos. 17, 29, 40, 42. Anadarko Langlie Mattix Penrose Sand Unit 18-2, 19-2, 21-3, 21-2. Wells recommended to be backflowed and tested: Skelly Penrose "A" Unit nos. 21, 44, 50, 61, (the 9 5/8" and 7" to be checked individually on no 44.) Skelly Penrose "B" Unit no. 52. (casing and tubing tested individually.) Anadarko Langlie Mattix Penrose Sand Unit no. 36-1B.

From this time forward wells were checked for pressure drop, backflowed (rates and pressures monitored) and buildups ran following backflow. Data was gathered, charts were read and analyzed, other pertinent information was evaluated. Upon approval from the committee and the N.M.O.C.C., wells were returned to injection status as warranted by results from testing. Guidelines for the backflowing and buildup procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 bbls per day or less, shut the well in for pressure build up. If pressure does not build up past 800# in 48 hours then return the well to injection. Instructions will be given by the committee on wells that do not meet this guideline."

At the committee meeting on August 26, 1976 a decision was made, with approval of the N.M.O.C.C., to suspend the present testing procedure and shut in wells around the Citgo-State for pressure monitoring during backflow and drawdown of the well. Wells to be shut in 1 week prior to backflowing of the Citgo-State were: Skelly Penrose "A" no. 13, 23, 26, 40, 12, 21, 28, 38, 42 and 52. Skelly Penrose "B" no. 52. Anadarko tract 37-3P, 37-1J, 36-4H. All other wells were returned to injection. Date of re-shut down and installation of pressure recorders was August 31 (to allow 1 week for stabilization). Anticipated date of flow back of the Citgo-State was September 7, 1976.

Secondary Recovery for 1958

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 5B
CASE 5941

COUNTY-PROJECT & OPERATOR	PRODUCING FORMATION	AVERAGE DEPTH	NUMBER ACRES	AVG. PAY THICKNESS	AVG. PSI	NO. INJ. WELLS	NO. PROD. WELLS	CUMULATIVE GAS - WATER INJECTION	CUMULATIVE GAS-WATER PRODUCTION	CUMULATIVE OIL PROD. FOR PROJ.	CUMULATIVE OIL RECOV. PER ACRE	DATE PROJECT STARTED
Lea	LANGLIE MATTIX (continued)											
	Gulf Coast Western Oil Company	Y-SR-Q	3300	360	72	2200	3	6	796,051w	9,945w	10,658	29.60	2/58
	Humble Oil & Refining Co.	Y-SR-Q	3300	240	72	919	1	5	243,744w		6,968	29.03	6/57
	Skelly Oil Company	Y-SR-Q	3300	240	30-70	1175	2	4	793,220w	10,148w	24,699	102.91	1/58
Eddy	LOCO HILLS												
	Navajo Oil Company	GB-SA	2815	320	40	203	6	7	106,179w		2,489	7.77	11/53
	Operating Committee Press.Maint.Program	GB-SA		NA		NA		176	NA	NA	15,194,403		1/41
Lea	MALJAMAR												
	Newmee Oil Company	GB-SA	4200	480	55	1614	4	14	435,717w 1,461,018g	7,559w 465,543g	151,927	316.5	7/58w
	Maljamar Coop. Repress.	GB-SA	3800	7840	30	NA	35	197	*	20,312,737g	31,292,048	3,991.3	1/53
	Newmee & Maljamar Coop. new l project		8320				79	211	*85%	20,778,280g	31,443,975	3,779.32	

*85% gas produced returned to formation.15% was used for lease use and flared-per Engineering Report.

Lea	PENROSE SKELLY												
	Socony Mobil Oil Co.	GB-Queen	3680	120	15	925	1	2	762,055w	21,797w	26,037	30.99	11/50
Eddy	RED LAKE												
	Hersey & Company Red Lake Premier Ut.	Grayburg	1900	1320	14	875	13	31	1,363,709w	63,374w	77,806	58.94	6/55
Eddy	RUSSELL												
	N-41 H. Wills	Yates-ss	775	6[illegible]	12	596	25	29	2,859,796w	623,242w	40[illegible],5 8	675.89	4/53
Eddy	NORTH SHUGART												
	Maxwell Oil Company	Queen-ss	3500	240	22	1600	1	6	293,806w	16,038w	137,750	573.95	4/52
Eddy	SQUARE LAKE												
	Ambassador Oil Corp.	GB-SA	3500	520	22	700	6	7	114,041w		6,982	13.42	2/58

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCC EXHIBIT No. 5B
CASE 5941

Secondary Recovery for 1958

COUNTY	PROJECT & OPERATOR	PRODUCING FORMATION	AVERAGE DEPTH	NUMBER ACRES	AVG. PAY THICKNESS	AVG. PSI	NO. INJ. WELLS	NO. PROD. WELLS	CUMULATIVE GAS - WATER INJECTION	CUMULATIVE GAS - WATER PRODUCTION	CUMULATIVE OIL PROD. FOR PROJ.	CUMULATIVE OIL RECOV. PER ACRE	DATE PROJECT STARTED
Lea	LANGLIE MATTIX (continued)												
	Gulf Coast Western Oil Company	Y-SR-Q	3300	360	72	2200	3	6	796,051w	9,945w	10,658	29.60	2/58
	Humble Oil & Refining Co.	Y-SR-Q	3300	240	72	919	1	5	243,744w		6,968	29.03	6/57
	Shelly Oil Company	Y-SR-Q	3300	240	30-70	1175	2	4	793,220w	10,148w	24,699	102.91	1/58
Eddy	LOCO HILLS												
	Newmont Oil Company	GB-SA	2815	320	40	203	6	7	116,179w		2,489	7.77	11/58
	Operating Committee Press.Maint.Program	GB-SA		NA		NA		176	NA	NA	15,194,403		1/41
Lea	MALJAMAR												
	Newmee Oil Company	GB-SA	4200	480	55	1614	4	14	435,717w 1,461,018g	7,559w 465,543g	151,927	316.5	7/58w
	Maljamar Coop. Repress.	GB-SA	3800	7840	30	NA	35	197	*	20,312,737g	31,292,048	3,991.3	1/53
	Newmee & Maljamar Coop. new l project		8320				79	213	*85%	20,778,280g	31,443,975	3,779.32	
	*85% gas produced returned to formation.15% was used for lease use and flared-per Engineering Report.												
Lea	PENROSE SKELLY												
	Socony Mobil Oil Co.	GB-Queen	3680	120	15	925	1	2	762,055w	21,797w	26,037	30.99	11/50
Eddy	RED LAKE												
	Hersey & Company Red Lake Premier Ut.	Grayburg	1900	1320	14	875	13	31	1,363,709w	63,374w	77,806	58.94	6/55
Eddy	RUSSELL												
	Neil H. Wills	Yates-ss	775	64	12	596	25	29	2,859,796w	623,242w	40[illegible]5 8	675.89	4/53
Eddy	NORTH SHUGART												
	Maxwell Oil Company	Queen-ss	3500	240	22	1600	1	6	293,806w	16,038w	137,750	573.95	4/52
Eddy	SQUARE LAKE												
	Ambassador Oil Corp.	GB-SA	3500	520	22	700	6	7	114,041w		6,982	13.42	2/58

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NEW MEXICO OIL CONSERVATION COMMISSION

Form C-103
Supersedes Old C-102 and C-103
Effective 1-1-65

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.: E-2387

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [X] GAS WELL [ ] OTHER- Temporarily Abandoned

7. Unit Agreement Name: -

2. Name of Operator: Petro-Search, Inc.

8. Farm or Lease Name: CITGO State

3. Address of Operator: 825 Petroleum Club Building, Denver, Colorado 80202

9. Well No.: 1

4. Location of Well: UNIT LETTER E, 2138 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE, SECTION 2 TOWNSHIP 23S RANGE 37E NMPM.

10. Field and Pool, or Wildcat: Langlie-Mattix SR

15. Elevation (*Show whether DF, RT, GR, etc.*): 3301' GR 3311' RKB

12. County: Lea

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	[ ]	PLUG AND ABANDON	[ ]	REMEDIAL WORK	[ ]	ALTERING CASING	[ ]
TEMPORARILY ABANDON	[ ]			COMMENCE DRILLING OPNS.	[ ]	PLUG AND ABANDONMENT	[ ]
PULL OR ALTER CASING	[ ]	CHANGE PLANS	[ ]	CASING TEST AND CEMENT JOB	[ ]		
				OTHER			[ ]
OTHER	[ ]						

17. Describe Proposed or Completed Operations (*Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work*) SEE RULE 1103.

The CITGO State #1 well was completed by Armer Oil Company, predecessor to Petro-Search, Inc., on 1-22-74 from Penrose sand perforations from 3568'-82' with a 24-hour pumping potential of 29 BO and 150 BW with estimated GOR 2000:1.

Because of a water flow in the salt section behind the 4-1/2" OD production casing in the subject well, no allowable was assigned by the NMOCC to the well until corrective action was taken to remedy this situation.

On the basis of a temperature survey ran on 2-8-74, a water flow was found to be entering the well bore behind the 4-1/2" OD production casing from 2470'-2500' and moving up the hole.

The 4-1/2" OD production casing was perforated at 2460' immediately above the water entry zone on 2-11-74, and after several unsuccessful attemp to squeeze the water flow zone with cement, braden head cement squeeze, cal-seal, sand, fix-mix, barite, etc. during February and early March, 1974, Western Company's Flow Control-1 was utilized on 3-7-74 to stop the movement of water up the hole behind the 4-1/2" OD production casing and to confine the water flow to the interval from 2470'-2500'.

Subsequent to the above workover, the NMOCC granted an allowable to the well on 3-15-74, and the well was placed on production on 3-27-74.

(Over)

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED C. W. Stumhoffer (C. W. Stumhoffer) TITLE Agent DATE 10-4-76

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

The well was produced from the Penrose sand perforations from 3568'-82' until 11-26-75 when water suddenly broke inside of the 4-1/2" OD production casing. The well was shut-in after this water break-in, and well head pressure was recorded at 1185 psig.

An effort was made to pull the 3/4" rods and 2-3/8" OD tubing from the well during 12-75, but due to a water flow rate of an estimated 7-8 BPM at pressures of 1000 psig, this work was abandoned due to inadequate disposal equipment and facilities in the area.

Subsequent to the above work, the well has been shut-in and utilized as a monitor well to evaluate other work being done in the area to locate the source of this water flow.

By August, 1976, it was noted that (1) the source of this water flow had not been definitely located as indicated by the 1050 psig shut-in pressure on the CITGO State #1 well and (2) the CITGO State #1 well was beginning to leak around the well head. At this time, it was decided that the CITGO State #1 well should be plugged and abandoned.

With the approval of the NMOCC, a plastic-lined pit with a storage capacity of approximately 50,000 barrels was constructed adjacent to the CITGO State #1 well. This pit was for the purpose of flowing the well in an effort to reduce well head pressure and water flow rates to a point where the rods and tubing could be pulled before proceeding with plugging operations.

The well was opened to the pit at 7:00 pm MST 9-18-76. Initial flow rate was an estimated 9 BPM that declined to an estimated 1 BPM on 9-27-76 when a well service rig was moved onto well to attempt pulling the rods and tubing. During the ten-day flowing period, the well produced an estimated 63,000 barrels of 9.9# brine water.

On 9-28-76, the rods were startedout of the hole, but the 1-3/4" tubing pump hung in the 2-3/8" OD tubing at an approximate depth of 2500'. Rods unscrewed at the top of the pump while attempting to pull the pump through a tight place in the tubing, and all rods were recovered. Subsequent attempts to pull the 2-3/8" OD tubing were not successful, indicating that the 4-1/2" OD production casing had collapsed opposite the water flow zone from 2470'-2500'.

With telephone approval from Mr. Jerry Sexton, District Director of the NMOCC in Hobbs, New Mexico, the 2-3/8" OD tubing was cut off at 2468' - 18' above tight place inside of 2-3/8" OD tubing at 2486' - and pulled, and the well was plugged with 1,000 sacks of Class C cement with 2% CaCl pumped down 4-1/2" OD production casing with job completed at 5:25 pm MST 9-28-76. Top of cement inside of 4-1/2" OD production casing was found at 280' by wireline measurement at 9:00 am MST 9-29-76.

Marker has been placed on well, location has been cleared, and 50,000-barrel pit will be back-filled when water has been disposed.

END OF ROLL

138

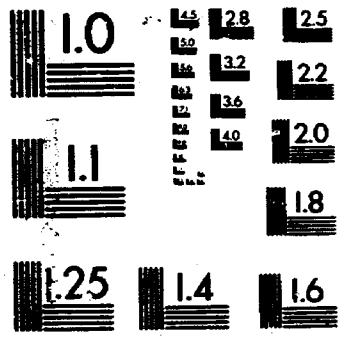
ROLL NUMBER

DOCUMENT TYPE NM OIL CONSERVATION DIVISION

DATE OF FILMING SEPTEMBER 5th 1985

CAMERA OPERATOR PHIL A. WILDE

ENDING DOCUMENT Box 30 of 34/CASE # 5941 - SUNDRY NOTICES AND REPORTS ON WELLS 10/4/76'



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

STATEMENT OF DOCUMENT CERTIFICATION

All microphotgraphics images of documents following this certificate are of authorized documents in the possession of this Agency. These documents are routinely microfilmed as a necessary operation in the generation of an inviolate document file.

R. David Ortez
SUPERVISOR

STATE OF NEW MEXICO)
) SS.
COUNTY OF VALENCIA)

Sworn and Subscribed to me, A Notary Public,

This 1st day of November, 1993

Sylvia Aragon
NOTARY PUBLIC

MY COMMISSION EXPIRES: 10-2-96

- -

CERTIFICATE OF AUTHENICITY

THIS IS TO CERTIFY that the microphotographs appearing on this Roll of Film are accurate and complete reproductions of the records of the, N M OIL CONSERVATION DIVISION as delivered in the regular course of business for Micro Filming.

Philip A. Dibbe
CAMERA OPERATOR

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R. David Ortiz
SUPERVISOR

STATE OF NEW MEXICO)
) SS.
COUNTY OF VALENCIA)

Sworn and Subscribed to me, A Notary Public,

This 1st day of December, 1993

Lynni Aragon
NOTARY PUBLIC

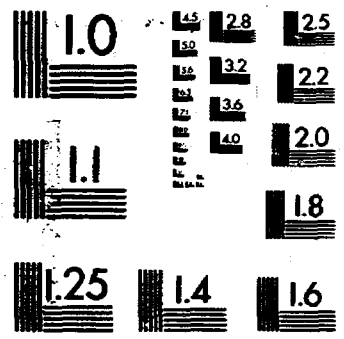
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Philip A. Dibble
CAMERA OPERATOR



MICROCOPY RESOLUTION TEST CHART
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START OF ROLL

138-B

ROLL NUMBER

DOCUMENT TYPE NM OIL CONSERVATION DIVISION

DATE OF FILMING SEPTEMBER 5th 1985

CAMERA OPERATOR PHIL A. WILDE

BEGINNING DOCUMENT Box 30 of 34 / CASE 5941 (CONTINUED) - SKELLY OIL CO. May 11, 76'

SKELLY OIL COMPANY

May 11, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 A.M. May 10, 1976. Purpose of this meeting was to evaluate data which has been submitted by operators in the vicinity, and to determine and select monitor points for study.

After analyzing data on all wells which appeared to have possible value as monitor points, 13 wells were selected for the initial phase, these wells are as follows:

Skelly Penrose "A" Unit			
	# 26-J	3-23-37	Water Injection Well
	# 23-F	3-23-37	" " "
	# 13-B	3-23-37	" " "
	# 40-P	3-23-37	" " "
Anadarko Langlie Mattix Penrose Sand Unit			
	# 3-P	34-22-37	Water Injection Well
Moranco			
	# 36-IK	36-22-37	Producing Well
Petro-Search			
	Citgo St. # 1-E	2-23-37	Producing Well
	Flour # 1-M	35-22-37	" "
	Gulf St. # 2-F	2-23-37	" "
Summit Energy, Inc.			
	St. # 1-F	36-22-37	Producing Well
	Gulf Sims # 1-P	25-22-37	" "
Texas Pacific Oil Co.			
	Ella Drk. # 2-E	25-22-37	Producing Well (T.A.)
Agua, Inc.			
	Blinebry-Drk. # 35-H	35-22-37	Salt Water Disp. Well

The four Skelly and one Anadarko wells will be shut in during the monitoring period, with pressure recorders attached to the injection well head. The producing and disposal wells will have recorders attached. Bradenhead pressures will be monitored on the producers and injection pressure monitored on the Petro-Search # 1-M and surface pressure monitored on the shut-in Agua Disposal well. Plans are to install pressure recorders and begin monitoring of the 13 wells at 9:00 A.M. on May 19, 1976. The N.M.O.C.C. will notify all concerned operators by telephone or letter. Seven day recorders will be installed on the wells and they will be checked daily by a N.M.O.C.C. representative from the Hobbs office of the N.M.O.C.C.

Another meeting of the "Eunice Area Sub-Committee" will be called when sufficient data becomes available for evaluation.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

9:30 A.M. May 10, 1976 - Skelly's Hobbs Office

Name	Co.	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Elmer Teel	Texas Pacific	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
J. D. Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Erd Johnson	Reserve O & G	Midland, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
L. C. Hudry	Arco	Hobbs, New Mexico

Meeting adjourned at 3:00 P.M. May 10, 1976

May 27, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 A.M. May 27, 1976. Purpose of the meeting was to analyze pressure data which was furnished by operators of the thirteen wells which have been selected by the committee for use as monitor points. The wells which were shut in and pressure data recorded and analyzed are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
120 hr. shut in, pressure at beginning 1850#, ending pressure 1200#
23-F 3-23-37 Water Injection Well
168 hr. shut in, pressure at beginning 1400#, ending pressure 750#
13-B 3-23-37 Water Injection Well
168 hr. shut in, pressure at beginning 1650#, ending pressure 1065#
40-P
120 hr. shut in, pressure at beginning 1750#, ending pressure 1670#
38-N 3-23-37 Water Injection Well
48 hr. shut in, pressure at beginning 1600#, ending pressure 1200#
28-L 3-23-37 Water Injection Well
48 hr. shut in, pressure at beginning 1550#, ending pressure 950#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in, pressure at beginning 1500#, ending pressure 1300#

Moranco

36-IK 36-22-37 Producing Well
168 hr. shut in, pressure at beginning 0#, ending pressure 0#

Petro-Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in, pressure at beginning 1150#, ending pressure ~~1125~~#
1-M Fluor 35-22-37 Producing Well
168 hr. shut in, pressure at beginning 600#, ending pressure 575#
2-F Gulf St. 2-23-37 S.W.D. Well
168 hr. shut in, pressure at beginning 150#, ending pressure 75#

Summit Energy, Inc.

1-F St. 36-22-27 Producing Well
168 hr. shut in, pressure at beginning 750#, ending pressure 725#
1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in, pressure at beginning 800#, ending pressure 800#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in, pressure at beginning 625#, ending pressure 625#

Agua, Inc.
35-H Blinebry-Drk. 35-22-37 S.W.D. Well
168 hr. shut in, pressure at beginning 200#, ending pressure 250#

A slight decrease in pressure was noted on the Petro-Search Citgo State # 1; this occurred between 6:00 PM Friday May 21, and 9:00AM Saturday May 22. A pressure drop of 75# occurred on the Petro-Search Gulf State # 2. Skelly Penrose "A" injection wells # 38-N and 28-L had been shut in for 48 hrs, from Wednesday morning to Friday morning. On Friday morning the recorders were removed and installed on Skelly Penrose "A" injection wells 26-J and 40-P. Due to the pressure drop occurring when it did, a decision was made by the committee to recommend installation of pressure recorders on the Skelly Penrose "A" injection wells 38-N and 28-L, this was concurred with by Les Clements of the N.M.O.C.C. Pressure recorders are now being attached. All previously listed monitor wells still have pressure recorders hooked up, plus the 2 additional Skelly wells. The charts will be removed at 9:00 AM on June 2, 1976 and will be submitted to the committee through the N.M.O.C.C.

Another meeting of the "Eunice Area Sub-Committee" has been called for Thursday June 3, 1976 at Skelly's Hobbs office. At that time charts will be studied and further recommendations made.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

Name	Company	Location
Bill Thomas (Chairman)	Skelly	Hobbs, New Mexico
W. G. Abbott	Agua, Inc.	Hobbs, New Mexico
Erd M. Johnson	Reserve O&G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

Meeting adjourned at 11:00 AM

June 3, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met in Skelly's office in Hobbs, New Mexico at 9:30 AM June 3, 1976. Purpose of the meeting was to analyze pressure data which was furnished by operators of the fifteen wells on which pressure recorders are attached and are being monitored. The wells on which pressures were recorded and analyzed are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
1200# - 950#
Total shut in time since beginning of test 288 hrs.
initial pressure 1850#, ending pressure 950#

23-F 3-23-37 Water Injection Well
168 hr. shut in
750# - 640#
Total shut in time since beginning of test 336 hrs.
initial pressure 1400#, ending pressure 640#

13-B 3-23-37 Water Injection Well
168 hr. shut in
1065# - 910#
Total shut in time since beginning of test 336 hrs.
initial pressure 1650#, ending pressure 910#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1640# - 1600#
Total shut in time since beginning of test 288 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
120 hr. shut in
1720# - 1050#
Total shut in time since beginning of test 168 hrs.
initial pressure 1600#, ending pressure 1050#

28-L 3-23-37 Water Injection Well
120 hr. shut in
1625# - 650#
Total shut in time since beginning of test 168 hrs.
initial pressure 1550#, ending pressure 650#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1280# - 1200#
Total shut in time since beginning of test 336 hrs.
initial pressure 1500#, ending pressure 1200#

Moranco
36-IK 36-22-37 Producing Well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 336 hrs.
initial pressure 0#, ending pressure 0#

Petro-Search
1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1090#
Total shut in time since beginning of test 336 hrs.
initial pressure 1150#, ending pressure 1090#
1-M Fluor 35-22-37 Producing Well
168 hr. shut in
610# - 590#
Total shut in time since beginning of test 336 hrs.
initial pressure 600#, ending pressure 590#
2-F Gulf St. 2-23-37 Producing Well
168 hr. shut in
75# - 75#
Total shut in time since beginning of test 336 hrs.
initial pressure 150#, ending pressure 75#

Summit Energy, Inc.
1-F Gulf-St. 36-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 336 hrs.
initial pressure 750#, ending pressure 740#
1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
800# - 830#
Total shut in time since beginning of test 336 hrs.
initial pressure 800#, ending pressure 830#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 635#
Total shut in time since beginning of test 336 hrs.
initial pressure 625#, ending pressure 635#

Agua, Inc.
35-H 35-22-37 S.W.D. Well
168 hr. shut in
250# - 230#
Total shut in time since beginning of test 336 hrs.
initial pressure 200#, ending pressure 230#

Pressure recorders are still attached on all of the above mentioned wells, with exception of the Moranco well. The Committee feels this well can eliminated as a monitor point because no pressure response of any sort has been observed. Pressure response on all concerned wells was generally less than anticipated. Pressure charts will be removed at 9:00 AM on June 9, 1976 and will be submitted to the Committee thru the N.M.O.C.C.

Plans are to open up the Petro-Search Citgo State well at 1:00 PM on June 10th and flow at maximum rate for 2-3 hours, then choke the well back to 100 barrells per hour. Negotiations are now underway to see if an arrangement can be worked out between Skelly, Petro-Search and the N.M.O.C.C. whereby Skelly could dispose of the backflow water into their Skelly Penrose "A" Unit waterflood. Rate and pressure will be monitored on the Citgo State well, as well as the other wells, which already have recorders attached, to determine if and where any pressure communication does exist.

Another meeting of the "Eunice Area Sub-Committee" has been called for 9:30 AM on June 10, 1976, at which time another weeks run of pressure charts will be analyzed and evaluated.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

9:30 AM June 3, 1976 - Skelly's Hobbs office

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
Erd. M. Johnson	Reserve O & G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Elmer Teel	Texas Pacific Oil	Eunice, New Mexico
J. D. Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. V. Ryan Jr.	Agua	Hobbs, New Mexico
L. C. Hudry	Arco	Hobbs, New Mexico

Meeting adjourned at 11:00 AM June 3, 1976

June 10, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met at Skelly"s office in Hobbs, New Mexico at 9:30 AM June 10, 1976. Pressure charts were read and data evaluated.

Pressure data from the wells are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
950# - 775#
Total shut in time since beginning of test 456 hrs.
initial pressure 1850#, ending pressure 775#

23-F 3-23-37 Water Injection Well
168 hr. shut in
640# - 575#
Total shut in time since beginning of test 504 hrs.
initial pressure 1400#, ending pressure 575#

13-B 3-23-37 Water Injection Well
168 hr. shut in
850# - 675#
Total shut in time since beginning of test 504 hrs.
initial pressure 1650#, ending pressure 675#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 456 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
168 hr. shut in
1050# - 900#
Total shut in time since beginning of test 336 hrs.
initial pressure 1600#, ending pressure 900#

28-L 3-23-37 Water Injection Well
168 hr. shut in
650# - 350#
Total shut in time since beginning of test 336 hrs.
initial pressure 1550#, ending pressure 350#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1200# - 1050#
Total shut in time since beginning of test 504 hrs.
initial pressure 1500#, ending pressure 1050#

Petro- Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 504 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing Well
168 hr. shut in
590# - 560#
Total shut in time since beginning of test 504 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
75# - 25#
Total shut in time since beginning of test 504 hrs.
initial pressure 150#, ending pressure 25#

Summit Energy, Inc.

1-F Gulf-St. 36-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 504 hrs.
initial pressure 750#, ending pressure 740#

1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
750# - 740#
Total shut in time since beginning of test 504 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 635#
Total shut in time since beginning of test 504 hrs.
initial pressure 625#, ending pressure 635#

Agua, Inc.

35-H 35-22-37 S.W.D. Well
168 hr. shut in
230# - 275#
Total shut in time since beginning of test 504 hrs.
initial pressure 200#, ending pressure 275#

Pressure recorders are still attached on all of the above wells. A letter has been mailed to Petro-Search from the N.M.O.C.C., requesting that they contact Skelly to work out an arrangement whereby Skelly may dispose of backflow water from their Citgo-State No. 1. Water breakthrough occurred on the Skelly Penrose "B" Unit well No. 52-F on Wednesday of this week, flow is from the 8 5/8 and 5 1/2 annulus. A dual pen recorder is now being hooked up on the well, to monitor tubing and bradenhead pressure, the chart will be removed next Wednesday and submitted, through the N.M.O.C.C., to the committee for evaluation.

Another meeting of the "Eunice Area Sub-Committee" has been set for 9:30 AM on June 17, 1976, at which time another weeks run of pressure charts will be analyzed and evaluated.

EUNICE AREA SUB-COMMITTEE ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
Clarence R. Chandler	Reserve O & G	Midland, Texas
J. V. Ryan Jr.	Agua	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

Meeting adjourned at 10:30 AM June 10, 1976

June 17, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY THE NMOCC TO STUDY THE EUNICE AREA

The "Eunice Area Sub-Committee" met at Skelly's office in Hobbs, New Mexico at 9:30 AM June 17, 1976. Pressure charts were read and data evaluated. Pressure from charts are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water Injection Well
168 hr. shut in
775# - 650#
Total shut in time since beginning of test 624 hrs.
initial pressure 1850#, ending pressure 650#

23-F 3-23-37 Water Injection Well
168 hr. shut in
575# - 510#
Total shut in time since beginning of test 672 hrs.
initial pressure 1400#, ending pressure 510#

13-B 3-23-37 Water Injection Well
168 hr. shut in
675# - 560#
Total shut in time since beginning of test 672 hrs.
initial pressure 1650#, ending pressure 560#

40-P 3-23-37 Water Injection Well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 624 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water Injection Well
168 hr. shut in
900# - 775#
Total shut in time since beginning of test 504 hrs.
initial pressure 1600#, ending pressure 775#

28-L 3-23-37 Water Injection Well
168 hr. shut in
350# - 175#
Total shut in time since beginning of test 504 hrs.
initial pressure 1550#, ending pressure 175#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water Injection Well
168 hr. shut in
1050# - 1050#
Total shut in time since beginning of test 672 hrs.
initial pressure 1500#, ending pressure 1050#

Petro-Search

1-E Citgo State 2-23-37 Producing Well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 672 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing Well
168 hr. shut in
560# - 560#
Total shut in time since beginning of test 672 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
25# - 25#
Total shut in time since beginning of test 672 hrs.
initial pressure 150#, ending pressure 25#

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing Well
168 hr. shut in
740# - ? recorder malfunction
Total shut in time since beginning of test 672 hrs.
initial pressure 750#, ending pressure ?

1-P Gulf Sims 25-22-37 Producing Well
168 hr. shut in
740# - 740#
Total shut in time since beginning of test 672 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.

2-E Ella Drinkard 25-22-37 Producing Well
168 hr. shut in
635# - 640#
Total shut in time since beginning of test 672 hrs.
initial pressure 625#, ending pressure 640#

Agua, Inc.

35-H 35-22-37 S.W.D. Well
168 hr. shut in
275# - 275#
Total shut in time since beginning of test 672 hrs.
initial pressure 230#, ending pressure 275#

Pressure recorders are to be removed Friday morning from the Skelly Penrose "A" Unit wells no. 26-J, 23-F, 13-A, 40-P and 38-N, guages will be installed for monitoring pressure. Due to the larger pressure drop shown by the Skelly Penrose "A" well no. 28-L, the pressure recorder will be left in place.

To date results from testing have been inconclusive as to establishing any definite communication between the shut in injection wells and producing wells.

Plans are to extend the testing out and shut in the next row of water injection wells. Additional wells to be shut in are; Skelly Penrose "A"

Unit wells no. 42, 44, 36, 21 and 12, Anadarko Langlie Mattix Penrose Sand Unit injection wells no. 4-H and 1-J.

Another meeting of the "Eunice Area Sub-Committee" has been set for 8:00 AM on June 24, 1976, at which time pressure charts will be analyzed and evaluated. A meeting of the three Area Committee Chairmen and Mr. Joe Ramey, Secretary-Director of the N.M.O.C.C is scheduled for 10:00 AM Thursday June 24, 1976 at the Hobbs office of the N.M.O.C.C.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
W. G. Abbott	Agua	Hobbs, New Mexico
J. V. Ryan, Jr.	Agua	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
L. C. Rudry	Arco	Hobbs, New Mexico
Erd M. Johnson	Reserve O & G	Midland, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

Meeting adjourned at 11:30 AM June 17, 1976

June 24, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committe" met at Arco's office in Hobbs, New Mexico at 8:00 AM June 24, 1976. Pressure charts were read and data evaluated. Five Skelly Penrose "A" Unit waterflood injection wells and two Anadarko injection wells were shut in during the past week. The Skelly wells are: 42-B, 44-D, 36-P, 21-H, and 12-N. The Anadarko wells are 4-H and 1-J. Pressure and changes from charts and gauges are as follows.

Skelly Penrose "A" Unit

26-J 3-23-37 Water injection well
168 hr. shut in
650# - 525#
Total shut in time since beginning of test 792 hrs
initial pressure 1850#, ending pressure 525#

23-F 3-23-37 Water injection well
168 hr. shut in
510# - 450#
Total shut in time since beginning of test 840 hrs.
initial pressure 1400#, ending pressure 450#

13-B 3-23-37 Water injection well
168 hr. shut in
560# - 500#
Total shut in time since beginning of test 840 hrs.
initial pressure 1650#, ending pressure 560#

40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 792 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water injection well
168 hr. shut in
775# - 750#
Total shut in time since beginning of test 672 hrs.
initial pressure 1600#, ending pressure 750#

28-L 3-23-37 Water injection well
168hr. shut in
175# - 35#
Total shut in time since beginning of test 672 hrs
initial pressure 1550#, ending pressure 35#

42-B 10-23-37 Water injection well
114 hr. shut in
1850# - 1675#
Total shut in time since beginning of test 114 hrs.
initial pressure 1850#, ending pressure 1675#

44-D 10-23-37 Water injection well
116 hr. shut in
1775# - 1600#
Total shut in time since beginning of test 116 hrs.
initial pressure 1775#, ending pressure 1600#

36-P 4-23-37 Water injection well
117 hr. shut in
1800# - 1400#
Total shut in time since beginning of test 117 hrs.
initial pressure 1800#, ending pressure 1400#

21-H 4-23-37 Water injection well
115 hr shut in
1850# - 1700#
Total shut in time since beginning of test 115 hrs.
initial pressure 1850#, ending pressure 1700#

12-N 34-22-37 water injection well
113 hr shut in
1600# - 1020#
Total shut in time since beginning of test 113 hrs.
initial pressure 1600#, ending pressure 1020#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 water injection well
168 hr shut in
1050# - 1050#
Total shut in time since beginning of test 840 hrs.
initial pressure 1500#, ending pressure 1050#

4-H 34-22-37 Water injection well
121 hr. shut in
1625# - 1275#
Total shut in time since beginning of test 121 hrs.
initial pressure 1625#, ending pressure 1275#

1-J 34-22-37 Water injection well
121 hr. shut in
1280# - 1120#
Total shut in time since beginning of test 121 hrs.
initial pressure 1280#, ending pressure 1120#

Petro Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 840 hrs
initial pressure 1150#, ending pressure 1140#

1-M . Flour 35-22-37 Producing well
168 hr. shut in
560# -560#
Total shut in time since beginning of test 840 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing Well
168 hr. shut in
25# - 0#
Total shut in time since beginning of test 840 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing well
168 hr. shut in
Chart not available
Total shut in time since beginning of test 840 hrs.
initial pressure 750#, ending pressure?

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
740# - Chart not available
Total shut in time since beginning of test 840 hrs.
initial pressure 800#, ending pressure?

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
640# - 625#
Total shut in time since beginning of test 840 hrs
initial pressure 625#, ending pressure 625#

Agua Inc.
35-H 35-22-37 S.W.D. well
168 hr. shut in
275# - 275#
Total shut in time since beginning of test 840 hrs.
initial pressure 230#, ending pressure 275#

Skelly Penrose "B" Unit # 52 Injection well
has been shut in for approximately
360 hrs. has 350# on casing
and 1150# on tubing

Pressure recorders removed from Skelly Penrose "A" Water Injection Wells nos. 26, 23, 13, 40 and 38 and pressure gauges installed. The recorders were installed on Skelly Penrose "A" injection wells nos. 42, 44, 36, 21 and 12. Pressure recorders were also put on Anadarko injection wells nos. 4-H and 1-J. Reason for the additional installations was to extend the test area out to take in another row of wells. A meeting between chairmen of the study groups and members of the N.M.O.C.C. from the Hobbs and Santa Fe office was held at 10:00 A.M. June 24 at the Hobbs office. The three Study Groups presented a review of progress being made in their respective areas. None of the Study Groups have come up with any definite answers and plans are to continue cycling and testing as recommended and agreed to by the N.M.O.C.C. The Eunice Group requested that the N.M.O.C.C. request that Petro-Search make arrangements to backflow their Citgo - State No. 1 well. Testing to date has been inconclusive as to establishing communication between any of the shut in injection wells and the Citgo - State well. Another meeting of the Eunice Area sub-committee is scheduled for 10:00 AM July 1, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs
Val Ryan	Agua	Hobbs
Herb Henderson	Anadarko	Eunice
Jimmie Christner	Anadarko	Houston
Clarence Chandler	Reserve O&G	Midland
L.C. Hudry	Arco	Hobbs
Jim Gibson	Gulf	Hobbs

July 1, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 10:00 a.m. July 1, 1976. Pressure charts were read and data evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

#26-J 3-23-37 Water injection well
168 hr. shut-in
525# - 450#
Total shut-in time since beginning of test 960 hrs.
initial pressure 1850#, ending pressure 450#

#23-F 3-23-37 Water injection well
168 hr. shut-in
450# - 400#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1400#, ending pressure 400#

#13-B 3-23-37 Water injection well
168 hr. shut-in
500# - 430#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1650#, ending pressure 430#

#40-P 3-23-37 Water injection well
168 hr. shut-in
1600# - 1600#
Total shut-in time since beginning of test 960 hrs.
initial pressure 1750#, ending pressure 1600#

#38-N 3-23-37 Water injection well
168 hr. shut-in
750# - 650#
Total shut-in time since beginning of test 840 hrs.
initial pressure 1600#, ending pressure 650#

#28-L 3-23-37 Water injection well
168 hr. shut-in
35# - 20" vacuum
Total shut-in time since beginning of test 840 hrs.
initial pressure 1550#, ending pressure 20" vacuum

#42-B 10-23-37 Water injection well
168 hr. shut-in
1675# - 1675#
Total shut-in time since beginning of test 282 hrs.
initial pressure 1850#, ending pressure 1675#

#44-D 10-23-37 Water injection well
168 hr. shut-in
1600# - 1575#
Total shut-in time since beginning of test 284 hrs.
initial pressure 1775#, ending pressure 1575#

#36-P 4-23-37 Water injection well
168 hr. shut-in
1400# - 1175#
Total shut-in time since beginning of test 285 hrs.
initial pressure 1800#, ending pressure 1175#

#21-H 4-23-37 Water injection well
168 hr. shut-in
1700# - 1725#
Total shut-in time since beginning of test 283 hrs.
initial pressure 1850#, ending pressure 1725#

#12-N 34-22-37 Water injection well
168 hr. shut-in
1020# - 950#
Total shut-in time since beginning of test 281 hrs.
initial pressure 1600#, ending pressure 950#

Anadarko Langlie Mattix Penrose Sand Unit

3-P 34-22-37 Water injection well
168 hr. shut-in
1050# - 1050#
Total shut-in time since beginning of test 1008 hrs.
iniital pressure 1500#, ending pressure 1050#

4-H 34-22-37 Water injection well
168 hr. shut-in
1275# - 1200#
Total shut-in time since beginning of test 289 hrs.
initial pressure 1625#, ending pressure 1200#

1-J 34-22-37 Water injection well
168 hr. shut-in
1120# - 1020#
Total shut-in time since beginning of test 289 hrs.
initial pressure 1280#, ending pressure 1020#

Petro Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut-in
1140# - 1140#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Flour 35-22-37 Producing well
168 hr. shut-in
560# - 560#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 600#, ending pressure 560#

2-F Gulf State 2-23-37 Producing well
168 hr. shut-in
0# - 100#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 150#, ending pressure 100#.

Summit Energy, Inc.

1-F Gulf St. 36-22-37 Producing well
168 hr. shut-in
750# - 750# (Pressure variations indicated during day)
Total shut-in time since beginning of test 1008 hrs.
initial pressure 750#, ending pressure 750#
(N.M.O.C.C. to check for reasons for pressure variations. Looks like possible pump action for SWD).

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut-in
760# - 760#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 800#, ending pressure 760#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut-in
655# - 630#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 625#, ending pressure 630#

Agua, Inc.
#35-H 35-22-37 SWD well
168 hr. shut-in
310# - 310#
Total shut-in time since beginning of test 1008 hrs.
initial pressure 230#, ending pressure 310#

Skelly Penrose "B" Unit #52 Injection well
168 hrs. shut-in
has been shut-in for approximately
528 hrs. has 300# on casing
and 1100# on tubing

The Eunice group restated recommendation that injection wells where pressure had declined to 600-700# range or less be returned to active status since no variation in pressure was noted at the monitoring point. Request was restated that the N.M.O.C.C. request Petro-Search to make arrangements to backflow their Citgo-State No. 1 well for 24-48 hours to determine if a pressure-trapped condition exists in this well. Recommendation was made that if the N.M.O.C.C. will not permit flowing the Citgo-State No. 1 well; then the injection wells with 700# pressure or less should be re-activated and recycling expanded to another row of injectors. Mr. Sexton agreed to take this matter under advisement for discussion with Mr. Ramey and report back to the chairman by Wednesday, July 7, 1976. Another meeting of the Eunice Area Sub-committee is scheduled for 9:00 a.m. July 8, 1976, at Arco's Hobbs office.

O. V. Stuckey

O. V. Stuckey

OVS/ss

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
O. V. Stuckey (Chairman)	Skelly	Midland
Val Ryan	Agua	Hobbs
Herb Henderson	Anadarko	Eunice
Jimmie Christner	Anadarko	Houston
Clarence Chandler	Reserve O&G	Midland
L. C. Hudry	Arco	Hobbs
Clem Korzekna	Gulf	Hobbs
Jerry Sexton	N.M.O.C.C.	Hobbs

July 8, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 8, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

#26-J 3-23-37 Water injection well
168 hr. shut in
450# - 375#
Total shut in time since beginning of test 1128 hrs.
initial pressure 1850#, ending pressure 375#

#23-F 3-23-37 Water injection well
168 hr. shut in
400# - 350#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1400#, ending pressure 350#

#13-B 3-23-37 Water injection well
168 hr. shut in
430# - 325#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1650#, ending pressure 325#

#40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 1128 hrs.
initial pressure 1750#, ending pressure 1600#

#38-N 3-23-37 Water injection well
168 hr. shut in
650# - 575#
Total shut in time since beginning of test 1008 hrs.
initial pressure 1600#, ending pressure 575#

#28-L 3-23-37 Water injection well
168 hr. shut in
20" vacuum--22" vacuum
Total shut in time since beginning of test 1008 hrs.
initial pressure 1550#, ending pressure 22" vacuum

#42-B 10-23-37 Water injection well
168 hr. shut in
1675# - 1650#
Total shut in time since beginning of test 450 hrs.
initial pressure 1850#, ending pressure 1650#

#14-D 10-23-37 Water injection well
168 hr. shut in
1575# - 1550#
Total shut in time since beginning of test 452 hrs.
initial pressure 1775#, ending pressure 1550#

#36-P 4-23-37 Water injection well
168 hr. shut in
1175# - 1050#
Total shut in time since beginning of test 453 hrs.
initial pressure 1800#, ending pressure 1050#

#21-H 4-23-37 Water injection well
168 hr. shut in 1725# - 1750#
Total shut in time since beginning of test 451 hrs.
initial pressure 1850#, ending pressure 1750#

#12-N 34-22-37 Water injection well
168 hr. shut in
950# - 925#
Total shut in time since beginning of test 449 hrs.
initial pressure 1600#, ending pressure 925#

Anadarko Langlie Mattix Penrose Sand Unit
#3-P 34-22-37 Water injection well
168 hr. shut in
1050# - 1050#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1500#, ending pressure 1050#
#4-H 34-22-37 Water injection well
168 hr. shut in
1200# - 1100#
Total shut in time since beginning of test 457 hrs.
initial pressure 1625#, ending pressure 1100#
#1-J 34-22-37 Water injection well
168 hr. shut in
1020# - 900#
Total shut in time since beginning of test 457 hrs.
initial pressure 1280#, ending pressure 900#

Petro-Search
#1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1176 hrs.
initial pressure 1150#, ending pressure 1140#
#1-M Fluor 35-22-37 Producing well
168 hr. shut in
560# -560#
Total shut in time since beginning of test 1176 hrs.
initial pressure 600#, ending pressure 560#
#2-F Gulf State 2-23-37 Producing well
168 hr. shut in
100# - 0#
Total shut in time since beginning of test 1176 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.
#1-F Gulf State 36-22-37 Producing well
168 hr. shut in
750# - 750# (chart still showing pressure variations)
Total shut in time since beginning of test 1176 hrs.
initial pressure 750#, ending pressure 750#
(N.M.O.C.C. to check for reasons for pressure variation)
#1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
760# - 740#
Total shut in time since beginning of test 1176 hrs.
initial pressure 800#, ending pressure 740#

Texas Pacific Oil Co.
#2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1176 hrs.
initial pressure 625#, ending pressure 630#

Agua, Inc.
#35-H 35-22-37 SWD well
168 hr. shut in
310# - 310#
Total shut in time since beginning of test 1176 hrs.
initial pressure 230#, ending pressure 310#

Skelly Penrose "B" Unit
#52-F 9-23-37 Water injection well
168 hr. shut in
300# - 250# (casing)
1100# - 1040# (tubing)
Total shut in time since beginning of test 696 hrs.
casing -- ending pressure 250#
tubing -- ending pressure 1040#

Jerry Sexton met with the committee to discuss the N.M.O.C.C. position concerning a prior request of the committee that all injection wells in the test area that have declined to 600# - 700# range or less be returned to active injection status, as no apparent communication exists between such wells and the monitor well. A request had also been made by the sub-committee concerning a 24-48 hr. backflow of the Petro-Search Citgo-State no. 1 well, in an effort to determine if a pressure-trapped condition might exist in the well: The N.M.O.C.C. feels that this well should not be disturbed, at least for the time being, until more injectors in the area have been shut in and monitored.

Mr. Sexton agreed to the following proposals by the committee: Return Skelly Penrose "A" Unit injection wells no. 13, 26, 23, 38 and 28 to injection, well no. 28 will be surveyed as soon as injection has stabilized. Skelly Penrose "A" injection wells no. 2, 10, 17, 30, 32, 34, 46, 48, 50, 52, 61 and Anadarko Langlie Mattix Penrose Sand Unit wells no. 21-7 and 36-1 will be shut in and pressure recorders attached. This extends the test area out to take in another complete row of injectors. Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 15, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
O. V. Stuckey	Skelly	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
Erd M Johnson	Reserve O & G	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
W. G. Abbott	AGUA, Inc.	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico

July 15, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY NMOCC TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 15, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

26-J 3-23-37 Water injection well
144 hr. shut in
375# - 360#
Total shut in time since beginning of test 1272 hrs.
initial pressure 1850#, ending pressure 360#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 890 BWPD at 1675# tubing pressure

23-F 3-23-37 Water injection well
144 hr. shut in
350# - 325#
Total shut in time since beginning of test 1320 hrs.
initial pressure 1400#, ending pressure 325#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 540 BWPD at 1400# tubing pressure

13-B 3-23-37 Water injection well
144 hr. shut in
325# - 275#
Total shut in time since beginning of test 1320 hrs.
initial pressure 1650#, ending pressure 275#
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 625 BWPD at 1580# tubing pressure

40-P 3-23-37 Water injection well
168 hr. shut in
1600# - 1600#
Total shut in time since beginning of test 1296 hrs.
initial pressure 1750#, ending pressure 1600#

38-N 3-23-37 Water injection well
144 hr. shut in
575# - 500#
Total shut in time since beginning of test 1152 hrs.
initial pressure 1600#, ending pressure 500#
well was returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 660 BWPD at 1550#

28-L 3-23-37 Water injection well
144 hr. shut in
22" vacuum - 22" vacuum
Total shut in time since beginning of test 1152 hrs.
initial pressure 1550#, ending pressure 22" vacuum
well returned to injection status at 8:00 a.m. July 12, 1976
on July 15, 1976 well was taking 450 BWPD at 1500# tubing pressure

42-B 10-23-37 Water injection well
168 hr. shut in
1650# - 1640#
Total shut in time since beginning of test 618 hrs.
initial pressure 1850#, ending pressure 1640#

44-D 10-23-37 Water injection well
168 hr. shut in
1550# - 1550#
Total shut in time since beginning of test 620 hrs.
initial pressure 1775#, ending pressure 1550#
on July 10, 1976 at 2:00 p.m., water broke through the 9 5/8" X 7" casing annulus--immediate shut in pressure was 750#, estimated flow was 75 BWPD. On July 12, 1976 @ 10:00 a.m. a dual pen recorder was hooked up to this well--tubing pressure was 1550#, casing pressure was 660# July 14, 1976 (when chart was changed) had 1550# on tubing and 630# on casing.

36-P 4-23-37 Water injection well
168 hr. shut in
1050# - 925#
Total shut in time since beginning of test 621 hrs.
initial pressure 1800#, ending pressure 925#

21-H 4-23-37 Water injection well
168 hr. shut in
1750# - 1640#
Total shut in time since beginning of test 619 hrs.
initial pressure 1850#, ending pressure 1640#

12-N 34-22-37 Water injection well
168 hr. shut in
925# - 850#
Total shut in time since beginning of test 617 hrs.
initial pressure 1600#, ending pressure 850#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
250# - 240# (casing)
1040# - 1000# (tubing)
Total shut in time since beginning of test 864 hrs.
casing -- ending pressure 240#
tubing -- ending pressure 1000#

The following wells were shut in for observation on July 12 and 13: Skelly Pen. "A" U.

2-L 34-22-37 Water injection well
43 hr. shut in
1920# - 1830#
Total shut in time since beginning of test 43 hrs.
initial pressure 1920#, ending pressure 1830#

10-P 33-22-37 Water injection well
42 hr. shut in
1775# - 1540#
Total shut in time since beginning of test 42 hrs.
initial pressure 1775#, ending pressure 1540#

17-B 4-23-37 Water injection well
44 hr. shut in
1850# - 1750#
Total shut in time since beginning of test 42 hrs.
initial pressure 1850#, ending pressure 1750#

30-J 4-23-37 Water injection well
41 hr. shut in
1800# - 1700#
Total shut in time since beginning of test 41 hrs.
initial pressure 1800#, ending pressure 1700#

#32-L 4-23-37 Water injection well
40 hr. shut in
1790# - 1700#
Total shut in time since beginning of test 40 hrs.
initial pressure 1790#, ending pressure 1700#

#34-N 4-23-37 Water injection well
46 hr. shut in
1350# - 950#
Total shut in time since beginning of test 46 hrs.
initial pressure 1350#, ending pressure 950#

#46-B 9-23-37 Water injection well
47 hr. shut in
1350# - 1175#
Total shut in time since beginning of test 47 hrs.
initial pressure 1350#, ending pressure 1175#

48-H 9-23-37 Water injection well
45 hr. shut in
1725# - 1700#
Total shut in time since beginning of test 45 hrs.
initial pressure 1725#, ending pressure 1700#

#50-F 10-23-37 Water injection well
48 hr. shut in
1900# - 1625#
Total shut in time since beginning of test 48 hrs.
initial pressure 1900#, ending pressure 1625#

#52-H 10-23-37 Water injection well
27 hr. shut in
1900# - 1625#
Total shut in time since beginning of test 27 hrs.
initial pressure 1900#, ending pressure 1625#

#61-F 4-23-37 Water injection well
42 hr. shut in
1790# - 1675#
Total shut in time since beginging of test 42 hrs.
initial pressure 1790#, ending pressure 1675#

Anadarko Langlie Mattix Penrose Sand Unit

#3-P 34-22-37 Water injection well
168 hr. shut in
1050# - 910
Total shut in time since beginning of test 1344 hrs.
initial pressure 1500#, ending pressure 910#

#4-H 34-22-37 Water injection well
168 hr. shut in
1100# - 1020#
Total shut in time since beginning of test 625 hrs.
initial pressure 1625#, ending pressure 1020#

#1-J 34-22-37 Water injection well
168 hr. shut in
900# - 800#
Total shut in time since beginning of test 625 hrs.
initial pressure 1625#, ending pressure 800#

The following wells were shut in for observation on July 12, 1976: Anadarko (L.M.P.S.U.)

Tr 21-7F 34-22-27 Water injection well
40 hr. shut in
1700# - 1600#
Total shut in time since beginning of test 40 hrs.
initial pressure 1700#, ending pressure 1600#

Tr 36-1 B 34-22-37 Water injection well
40 hr. shut in
1500# - 1440#
Total shut in time since beginning of test 40 hrs.
initial pressure 1500#, ending pressure 1440#

Petro-Search
1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1344 hrs.
initial pressure 1150#, ending pressure 1140#
1-M Fluor 35-22-37 Producing well
168 hr. shut in
560# - 560#
Total shut in time since beginning of test 1344 hrs.
initial pressure 600#, ending pressure 560#
2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
0# - 75#
Total shut in time since beginning of test 1344 hrs.
initial pressure 150#, ending pressure 75#

Summit Energy, Inc.
1-F Gulf State 36-22-37 Producing well
168 hr. shut in
750# - 720# (chart still showing press. variation)
Total shut in time since beginning of test 1344 hrs.
initial pressure 750#, ending pressure 720#
1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
740# - 730#
Total shut in time since beginning of test 1344 hrs.
initial pressure 800#, ending pressure 730#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1344 hrs.
initial pressure 625#, ending pressure 630#

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
310# - 340#
Total shut in time since beginning of test 1344 hrs.
initial pressure 230#, ending pressure 340#

Further discussion took place concerning the feasibility of backflowing the high pressure, low volume injectors which have shown little, if any, pressure variation during the shut in periods. Also, the committee reaffirms its position concerning backflowing and testing of the Petro-

Search Citgo State No. 1.

The committee recommends that high pressure low volume injectors which have shown little or no variations in pressure be backflowed and tested, in a further attempt to determine if communication does or does not exist between these wells and the monitor well. We also reaffirm our prior recommendation that the Citgo State No. 1 be backflowed, even if for a short period of time, to be sure that we are not dealing with a pressure trapped condition in this well.

Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 22, 1976 at Arco's Hobbs office. The chairman of the committee is to meet with the N.M.O.C.C. before the next regular committee meeting to strongly urge and request that we be permitted to proceed as per recommendations.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Bill Thomas (chairman)	Skelly	Hobbs, N.M.
Odis Henley	Skelly	Hobbs, N.M.
J.W. Gibson	Gulf	Hobbs, N.M.
Jimmie Christner	Anadarko	Houston, Tex
Herb Henderson	Anadarko	Eunice, N.M.
Val Ryan	AGUA	Hobbs, N.M.
Erd Johnson	Reserve	Midland, Tex.
Lad Hudry	Arco	Hobbs, N.M.

July 21, 1976

MINUTES OF SUB-COMMITTE APPOINTED BY N.M.O.C.C TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 21, 1976. Pressure charts were read and data evaluated.

Pressure and chenges from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Water injection well
168 hr. Shut in
1600# - 1575#
Total shut in time since beginning of test 1464 hrs.
initial pressure 1750#, ending pressure 1575#

42-B 10-23-37 Water injection well
168 hr. Shut in
1640# - 1640#
Total shut in time since beginning of test 786 hrs.
initial pressure 1850#, ending pressure 1640#

44-D 10-23-37 Water injection well
168 hr. Shut in
1550# - 1525# (tubing)
630# - 630# (casing)
Total shut in time since beginning of test 788 hrs.

36-P 4-23-37 Water injection well
168 hr. shut in
925# - 825#
Total shut in time since beginning of test 789 hrs.
initial pressure 1800#, ending pressure 825#

21-H 4-23-37 Water injection well
168 hr. shut in
1640# - 1550#
Total shut in time since beginning of test 787# hrs.
initial pressure 1850#, ending pressure 1550#

12-N 34-22-37 Water injection well
168 hr. shut in
850# - 750#
Total shut in time since beginning of test 785 hrs.
initial pressure 1600#, ending pressure 750#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
240# - 200# (casing)
1000# - 775# (tubing)
Total shut in time since beginning of test 1032 hrs.
casing -- ending pressure 200#
tubing -- ending pressure 775#

The following wells were shut in for observation on July 12 & 13, 1976

Skelly Penrose "A" Unit

2-L 34-22-37 Water injection well
168 hr shut in
1830# - 1680#

#4-H 34-22-37 Water injection well
168 hr. shut in
1020# - 970#
Total shut in time since beginning of test 793 hrs.
initial pressure 1625#, ending pressure 970#

#1-J 34-22-37 Water injection well
168 hr. shut in
800# - 610#
Total shut in time since beginning of test 793 hrs.
initial pressure 1625#, ending pressure

The following wells were shut in for observation on July 12, 1976

Ansadarko (L.M.P.S.U.)

Tr. 21-7F 34-22-37 Water injection well
168 hr. shut in
1600# - 1300#
Total shut in time since beginning of test 208 hrs.
initial pressure 1700#, ending pressure 1300#

Tr. 36-1B 34-22-37 Water injection well
168 hr. shut in
1440# - 1300#
Total shut in time since beginning of test 208 hrs.
initial pressure 1500#, ending pressure 1300#

Petro - Search

#1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1140 hrs.
initial pressure 1150#, ending pressure

#1-M Fluor 35-22-37 Producing well
168 hr shut in
560# - 500# (no change in chart)
Total shut in time since beginning of test 1512 hrs.
initial pressure 600#, ending pressure 500#

#2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
75# - 0#
Total shut in time since beginning of test 1512 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy Inc.

#1-F Gulf State 31-22-37 Producing well
168 hr. shut in
720# - 720# (chart showing pres. variation)
Total shut in time since beginning of test 1512 hrs.
initial pressure 750#, ending pressure 720#

#1-P Gulf Sims 25-22-37 Producing well
168 hr shut in
730# - 720#
Total shut in time since beginning of test 1512 hrs.
initial pressure 800#, ending pressure 720#

Texas Pacific Oil Co.

#2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1512 hrs.
initial pressure 625#, ending pressure 630#

APPA, INC

Total shut in time since beginning of test 211 hrs.
initial pressure 1920#, ending pressure 1680#

10-P 33-22-37 Water injection well
168 hr. shut in
1540# - 1375#
Total shut in time since beginning of test 210 hrs.
initial pressure 1775#, ending pressure 1375#

17-B 4-23-37 Water injection well
168 hr. shut in
1750# - 1525#
Total shut in time since beginning of test 210 hrs.
initial pressure 1850#, ending pressure 1525#

30-J 4-23-37 Water injection well
168 hr shut in
1700# - 1575#
Total shut in time since beginning of test 209 hrs.
initial pressure 1800#, ending pressure 1575#

32-L 4-23-37 Water injection well
168 hr. shut in
1700# - 1600#
Total shut in time since beginning of test 208 hrs.
initial pressure 1790#, ending pressure 1600#

34-N 4-23-37 Water injection well
168 hr. shut in
950# - 750#
Total shut in time since beginning of test 214 hrs.
initial pressure 1350#, ending pressure 750#

46-B 9-23-37 Water injection well
168 hr shut in
1175# - 975#
Total shut in time since beginning of test 215 hrs.
initial pressure 1350#, ending pressure 975#

48-H 9-23-37 Water injection well
168 hr. shut in
1700# - 1650#
Total shut in time since beginning of test 213 hrs.
initial pressure 1725#, ending pressure 1650#

50-F 10-23-37 Water injection well
168 hr. shut in
1625# - 1565#
Total shut in time since beginning of test 216 hrs.
initial pressure 1900#, ending pressure 1565#

52-H 10-23-37 Water injection well
168 hr. shut in
1625# - 1400#
Total shut in time since beginning of test 195 hrs.
initial pressure 1900#, ending pressure 1400#

61-F 4-23-37 Water injection well
168 hr shut in
1675# - 1575#
Total shut in time since beginning of test 210 hrs.
initial pressure 1790#, ending pressure 1575#

Amerada Langlie Mattix Penrose Sand Unit

3-P 33-22-37 Water injection well
168 hr. shut in
910# - 890#
Total shut in time since beginning of test 1512 hrs,
initial pressure 1500#, ending pressure 890#

35-H 35-22-37 SWD well
168 hr. shut in
340# - 340#
Total shut in time since beginning of test 1512 hrs.
initial pressure 230#, ending pressure 340#

Plans are to backflow and test the following injection wells:

Skelly Penrose "A" Unit no. 40-P
" " " " " 42-B
" " " " " 21-H
" " " " " 44-D

Anadarko Langlie Mattix Penrose Sand Unit 3-P
" " " " " " 4-H

These wells will be backflowed to approximately 500 lbs. or until stabilization is reached. Following backflow, pressure recorders will be attached and pressures monitored.

The committee and the N.M.O.C.C. feel that this procedure will provide adequate data to determine if pressure communication exists between the wells and the monitor well. The committee and the N.M.O.C.C. feel that this testing procedure will accelerate the study, as well as being able to return wells to injection status thereby providing adequate facilities to accommodate the shutting in of additional injection wells for testing and study. During the past week approximately 10 bbls. of water was backflowed from the Citgo-State no. 1 with no apparent pressure change. Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. July 29, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Name	Company	Location
Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Otis Henley	Skelly	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Ed Johnson	Reserve O&G	Midland, Texas
J.C. Gibson	Gulf	Hobbs, New Mexico

July 29, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. July 29, 1976. Pressure charts were read and data evaluated.

Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Water injection well
Well was backflowed 40 hrs. Backflowed 325 bbls. of water. Results of backflow and observation of Citgo St. well indicate no apparent communication. Committee and N.M.O.C.C. agree that this well can be returned to injection status.

42-B 10-23-37 Water injection well
Well was backflowed approximately 40 hrs. Backflowed 350 bbls. of water. Results from backflow and observation of Citgo St. well indicate no apparent communication. Committee and N.M.O.C.C. agree that this well can be returned to injection status.

44-D 10-23-37 Water injection well
168 hr. shut in
1525# - 1525# (tubing)
630# - 630# (casing)
Total shut in time since beginning of test 956 hrs.
This well will be backflowed and tested this week and if communication with the monitor well is not indicated it will be returned to injection.

36-P 4-23-37 Water injection well
168 hr. shut in
825# - 750#
Total shut in time since beginning of test 950 hrs.
initial pressure 1800#, ending pressure 825#
The committee recommends, and the N.M.O.C.C. approves, that based on data obtained through the shut in period, this well can be returned to injection status.

21-H 4-23-37 Water injection well
168 hr. shut in
1550# - 1525#
Total shut in time since beginning of test 955 hrs.
initial pressure 1850#, ending pressure 1525#
The committee recommends and N.M.O.C.C. approves that this well be backflowed and tested this week. If no communication exists between it and the monitor well a recommendation will be made that the well be returned to injection status.

12-N 34-22-37 Water injection well
168 hr. shut in
750# - 700#
Total shut in time since beginning of test 953 hrs.
initial pressure 1600#, ending pressure 700#
This well will be returned to injection status.

2-L 34-22-37 Water injection well
168 hr. shut in
1680# - 1620#
Total shut in time since beginning of test 379 hrs.
initial pressure 1920#, ending pressure 1620#

10-P 33-22-37 Water injection well
168 hr. shut in
1375# - 1225#
Total shut in time since beginning of test 378 hrs.
initial pressure 1775#, ending pressure 1225#

17-B 4-23-37 Water injection well
168 hr. shut in
1525# - 1450#
Total shut in time since beginning of test 378 hrs.
initial pressure 1850#, ending pressure 1450#

30-J 4-23-37 Water injection well
168 hr. shut in
1575# - 1525#
Total shut in time since beginning of test 377 hrs.
initial pressure 1800#, ending pressure 1525#

32-L 4-23-37 Water injection well
168 hr. shut in
1600# - 1550#
Total shut in time since beginning of test 376 hrs.
initial pressure 1790#, ending pressure 1550#

34-N 4-23-37 Water injection well
168 hr. shut in
750# - 700#
Total shut in time since beginning of test 382 hrs.
initial pressure 1350#, ending pressure 700#
This well will be returned to injection status.

46-B 9-23-37 Water injection well
168 hr. shut in
975# - 875#
Total shut in time since beginning of test 383 hrs.
initial pressure 1350#, ending pressure 875#
This well will be returned to injection status.

48-H 9-23-37 Water injection well
168 hr. shut in
1650# - 1600#
Total shut in time since beginning of test 381 hrs.
initial pressure 1725#, ending pressure 1600#

50-F 10-23-37 Water injection well
168 hr. shut in
1565# - 1565#
Total shut in time since beginning of test 384 hrs.
initial pressure 1900#, ending pressure 1565#
This well is to be backflowed and tested.

52-H 10-23-37 Water injection well
168 hr. shut in
1400# - 1275#
Total shut in time since beginning of test 363 hrs.
initial pressure 1900#, ending pressure 1275#

61-F 4-23-37 Water injection well
168 hr. shut in
1575# - 1525#
Total shut in time since beginning of test 378 hrs.
This well is to be backflowed and tested.

Shelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in

200# - 200# (casing)
775# - 800# (tubing)
Both casing and tubing will be backflowed and tested, separately.

Anadarko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
32 hr. shut in (prior to backflow)
890# - 890#
Total shut in time since beginning of test 1544 hrs.
initial pressure 1500#, ending pressure 890#
This well was backflowed and tested during the past week and is to be returned to injection status.

36-4E 34-22-37 Water injection well
31 hr. shut in (prior to backflow)
970# - 970#
Total shut in time since beginning of test 824 hrs.
initial pressure 1625#, ending pressure 970#
Returned to injection status following backflow.

37-1J 34-22-37 Water injection well
168 hr. shut in
610# - 510#
Total shut in time since beginning of test 871 hrs.
initial pressure 1625#, ending pressure 510#
The committee recommended and N.M.O.C.C. agreed to return this well to injection status.

21-7F 34-22-37 Water injection well
54 hr. shut in
1300# - 1250#
Total shut in time since beginning of test 262 hrs.
initial pressure 1700#, ending pressure 1250#
This well was backflowed--continue to backflow and will shut in and test.

36-1B 34-22-37 Water injection well
168 hr. shut in
1300# - 1160#
Total shut in time since beginning of test 376 hrs.
initial pressure 1500#, ending pressure 1160#
This well is to be backflowed.

Petro-Search

1-E Citgo State 2-23-37 Producing well
168 hr. shut in
1140# - 1140#
Total shut in time since beginning of test 1680 hrs.
initial pressure 1150#, ending pressure 1140#

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 1680 hrs.
initial pressure 600#, ending pressure 500#

2-F Gulf St. 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 1680 hrs.
initial pressure 150#, ending pressure 0#

Summit Energy, Inc.
1-F Gulf St. 31-22-37 Producing well
168 hr. shut in
720# - 720# (chart still showing pressure variation)
Total shut in time since beginning of test 1680 hrs.
initial pressure 750#, ending pressure 720#
1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# - 720#
Total shut in time since beginning of test 1680 hrs.
initial pressure 800#, ending pressure 720#

Texas Pacific Oil Co.
2-E Ella Drinkard 25-22-37 Producing well
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 1680 hrs.
initial pressure 625#, ending pressure 630#

AGUA, Inc.
35-H 35-22-37 SWD well
168 hr. shut in
340# - 340#
Total shut in time since beginning of test 1680 hrs.
initial pressure 230#, ending pressure 340#

The following wells are to be returned to injection status:
Skelly Penrose "A" Unit no. 12,34,36,40,42,46

Anadarko Langlie Mattix Penrose Sand Unit no. 37-3P, 36-4H

Wells to be shut in for observation with pressure recorders attached:
Skelly Penrose "A" Unit no. 4,8,53,55,57
Skelly Penrose "B" Unit no. 17,29,40,42

Anadarko Langlie Mattix Penrose Sand Unit no. 18-2, 19-2, 21-3, 21-2

Wells to be backflowed and tested
Skelly Penrose "A" Unit no. 21,44,50,61,44, the 9 5/8 and 7" will be checked individually on the no. 44 well.
Skelly Penorse "B" # 52 (casing and tubing tested individually)

Anadarko Langlie Mattix Penrose Sand Unit no. 36-1B

Another meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 5, 1976 at Arco's Hobbs office.

EUNICE AREA SUB-COMMITTEE MEETING ATTENDANCE

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Odis Henley	Skelly	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
W. G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve C&G	Midland, Texas
L. C. Rudry	Arco	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. D. Christner	Anadarko	Houston, New Mexico

August 5, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a. m. August 5, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

40-P 3-23-37 Returned to injection 7/30/76

42-B 10-23-37 Returned to injection 7/30/76

44-D 10-23-37 Water injection well
120 hr. shut in
1525#--1500# (tubing)
630#--630# (9 5/8" X 7")
Total shut in time since beginning of test 1076 hrs.
Backflowed two days, recovered 340 barrels of water
No pressure communication with casing indicated.
Committee and N.M.O.C.C. agreed to return to injection and put pressure recorder on casing.

36-P 4-23-37 Return to injection 7/30/76

21-H 4-23-37
30 hrs. shut in
1525#--1525#
Total shut in time since beginning of test 985 hrs.
initial pressure 1850#, ending pressure 1525#
The well was backflowed 71 hrs. recovered 980 barrels of water
Returned to injection 8/2/76

12-N 34-22-37 Returned to injection 8/2/76

2-L 34-22-37
168 hr. shut in
1620#--1520#
Total shut in time since beginning of test 547 hrs.
initial pressure 1920#, ending pressure 1520#
Committee and N.M.O.C.C agreed to backflow and return to injection if there is no pressure interferance with the Citgo-State well.

10-P 33-22-37 Water injection well
168 hr. shut in
1225#--1240#
Total shut in time since beginning of test 546 hrs.
initial pressure 1775#, ending pressure 1240#
will check gauge and leave shut in another week

17-B 4-23-37 Water injection well
168 hr. shut in
1450#--1300#
Total shut in time since beginning of test 546 hrs.
initial pressure 1850#, ending pressure 1300#
will leave shut in another week

30-J 4-23-37 Water injection well
168 hr. shut in
1525#--1475#
Total shut in time since beginning of test 545 hrs.
initial pressure 1800#, ending pressure 1475#
Committee and N.M.O.C.C. agree to backflow two days and return to injection if there is no pressure interferance with Citgo-State well.

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
146 hr. shut in
800#--800#
Total shut in time since beginning of test 1200 hrs.
initial pressure 775#, ending pressure 800#
Backflowed 22 hrs. recovered 9 barrels of water.
No pressure communication between tubing and casing.
Casing pressure 200#. Bled casing pressure down, had small waterflow on the second day. Committee and N.M.O.C.C agreed to return the well to injection and install a pressure recorder on the casing for further testing.

17-D 4-23-37 Water injection well
112 hr. shut in
1950#--1775#

29-H 5-23-37 Water injection well
116 hr. shut in
2200#--1950#
Committee agreed pressures abnormally high. Will check recorder and continue test till next meeting.

40-P 5-23-37 Water injection well
112 hr. shut in
1600#--1175#

42-D 9-23-37 Water injection well
113 hr. shut in
975#--875#
Committee and N.M.O.C.C. agreed to return to injection.

Anadarko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
Returned to injection 7/29/76

36-4H 34-22-37 Water injection well
Returned to injection 7/29/76

37-1J 34-22-37 Water injection well
Returned to injection 7/29/76

21-7F 34-22-37 Water injection well
Backflowed 71 hrs. recovered 534 barrels of water. Closed well in tubing pressure 8:00 a.m. 7/30/76 was 640# and at 8:00 a.m. 8/4/76 was 800#. Committee and N.M.O.C.C. agreed to return to injection.

36-1B 34-22-37 Water injection well
Backflowed 76 hrs. recovered 420 barrels of water
Returned to injection 8/2/76

18-2L 26-22-37 Water injection well
144 hr. shut in
1890#--1890#
Backflowing well at this time.

19-2P 27-22-37 Water injection well
72 hr. shut in
1400#--1250#

21-3D 34-22-37 Water injection well
72 hr. shut in
1850#--1850#
Backflowing well now.

21-2N 27-22-37 Water injection well
120 hr. shut in
1760#--1520#

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1140#-1100#
Total shut in time since beginning of test ~~1196~~ 1848 hrs.
initial pressure 1150#, ending pressure 1100#
Committee and N.M.O.C.C. decided that a more sensitive recorder was necessary to monitor this well. N.M.O.C.C. to handle with company.

1-M Flour 35-22-37 Producing well
168 hr. shut in
500#-500#
Total shut in time since beginning of test 1848 hrs.
initial pressure 500#, ending pressure 500#
N.M.O.C.C. to handle more sensitive recorder change with the company.

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0#-0#
Total shut in time since beginning of test 1848 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.

1-M 2-23-37 SWD well
To install pressure recorder. N.M.O.C.C. to handle with company

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
720#-720#
Total shut in time since beginning of test 1848 hrs.
initial pressure 750#, ending pressure 720#
Pressure variations are becoming more pronounced and uniform.
Committee and N.M.O.C.C. to check for activities in area that is causing pressure flucuations.

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# -720#
Total shut in time since beginning of test 1848 hrs.
initial pressure 800#, ending pressure 720#
Will continue to monitor till next meeting

Texas Pacific Oil Company

2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630#--630#
Total shut in time since beginning of test 1848 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.

35-H 35-22-37 SWD well
168 hr. shut in
340# -340# (Bradenhead)
Total shut in time since beginning of test 1848 hrs.
initial pressure 230#, ending pressure 340#
Tubing is backflowing

The following wells are to be returned to injection status: (if backflow tests are satisfactory)

Skelly Penrose "A" 44-D, 36-P, 21-H, 12-N, 2-L, 30-J, 32-L, 48-H, 50-F, 52-H, 61-F

Skelly Penrose "B" 52-F and 42-D

Anadarko Langlie Mattix Penrose Sand Unit no. 21-7F, 36-1B

The following well is to be returned to producing status:

Petro-Search no. 2F Gulf State

The following well is to be monitored with a pressure recorder:

Petro-Search 1-M Gulf State

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 12, 1976 in Arco's Hobbs office.

ATTENDANCE AT AUGUST 5, 1976 MEETING

Bert Brown (chairman)	Skelly	Hobbs, New Mexico
Odis Henley	Skelly	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Val Ryan	AGUA	Midland, Texas
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
C. R. Korzekwa	Gulf	Hobbs, New Mexico
J. D. Christner	Anadarko	Houston, Texas

August 12, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in Arco's office in Hobbs, New Mexico at 8:00 a.m. August 12, 1976. Pressure charts were read and evaluated. Pressure and changes from charts and gauges are as follows:

Skelly Penrose "A" Unit

- # 40-P 3-23-37 Returned to injection 7/30/76
- # 42-B 10-23-37 Returned to injection 7/30/76
- # 44-D 10-23-37 Water injection well
  Well returned to injection 8/5/76
- # 36-P 4-23-37 Returned to injection 7/30/76
- # 21-H 4-23-37 Returned to injection 8/2/76
- # 21-N 34-22-37 Returned to injection 8/2/76
- # 2-L 34-22-37
  Backflowed well 48 hrs. (2920 bbls)
  Will hook up recorder and monitor pressure
- # 10-P 33-22-37 Water injection well
  168 hr. shut in
  1240# - 1180#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1775#, ending pressure 1180#
  Continue shut in another week
- # 17-B 4-23-37 Water injection well
  168 hr. shut in
  1300# - 1235#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1850#, ending pressure 1235#
  Continue shut in another week
- # 30-J 4-23-37 Water injection well
  Backflowed well 48 hrs. (865 bbls.)
  Will hook up recorder and monitor pressure
- # 32-L 4-23-37 Water injection well
  168 hr. shut in
  1500# - 1495#
  Total shut in time since beginning of test 714 hrs.
  initial pressure 1600#, ending pressure 1495#
  Committee and N.M.O.C.C. agree to backflow well two days, shut in for 48 hrs. pressure build up and return to injection if there is no pressure interference with the Citgo-State well.
- # 34-N 4-23-37 Water injection well
  Returned to injection 7/30/76
- # 46-B 9-23-37 Water injection well
  Returned to injection 7/30/76
- # 48-H 9-23-37 Water injection well
  Backflowed well 48hrs. (1290 bbls.)
  Put back on injection 8/9/76
- # 50-F 10-23-37 Water injection well
  Well returned to injection 8/2/76

52-H 10-23-37 Water injection well
Backflowed well 48 hrs. (980 bbls.)
Returned to injection 8/9/76
Continue to monitor pressure

61-F 4-23-37 Water injection well
168 hr. shut in
1525# - 1540#
Total shut in time since beginning of test 714 hrs.
initial pressure 1575#, ending pressure 1540#
Committee and N.M.O.C.C. agree to backflow two days, shut in for 48 hr. pressure build up and return to injection if there is no pressure interference with the Citgo-State well.

4-J 33-22-37 Water injection well
168 hr. shut in
1850# - 1850#
Total shut in time since beginning of test 284 hrs.
initial pressure 1950#, ending pressure 1850#

8-N 33-22-37 Water injection well
168 hr. shut in
1650# - 1490#
Total shut in time since beginning of test 284 hrs.
initial pressure 1950#, ending pressure 1490#

53-J 10-23-37 Water injection well
168 hr. shut in
1850# - 1765#
Total shut in time since beginning of test 285 hrs.
initial pressure 1900#, ending pressure 1765#

55-L 10-23-37 Water injection well
168 hr. shut in
1550# - 1390#
Total shut in time since beginning of test 284 hrs.
initial pressure 1900#, ending pressure 1390#

57-J 9-23-37 Water injection well
168 hr. shut in
1100# - 850#
Total shut in time since beginning of test 285 hrs.
initial pressure 1850#, ending pressure 850#

Skelly Penrose "B" Unit

52-F 9-23-37 Water injection well
168 hr. shut in
Total shut in time since beginning of test 1368 hrs.
Returned to injection 8/6/76
Gauge on annulus has 200# on casing.

17-D 4-23-37 Water injection well
168 hr. shut in
1775# - 1750#
Total shut in time since beginning of test 280 hrs.
initial pressure 1950#, ending pressure 1750#

29-H 5-23-37 Water injection well
168 hr. shut in
1950# - 1700#
Total shut in time since beginning of test 284 hrs.
initial pressure 2200#, ending pressure 1700#

40-P 5-23-37 Water injection well
168 hr. shut in
1175# - 1125#
Total shut in time since beginning of test 280 hrs.
initial pressure 1600#, ending pressure 1125#

42-D 9-23-37 Water injection well
168 hr. shut in
875# - 875#
Total shut in time since beginning of test 281 hrs.
initial pressure 975#, ending pressure 875#
Returned to injection 8/5/76
Committee and N.M.O.C.C. agreed to return to injection

Anaderko Langlie Mattix Penrose Sand Unit

37-3P 34-22-37 Water injection well
Returned to injection 7/29/76

36-4H 34-22-37 Water injection well
Returned to injection 7/29/76

37-1J 34-22-37 Water injection well
Returned to injection 7/29/76

21-7F 34-22-37 Water injection well
Returned to injection 8/6/76

36-1B 34-22-37 Water injection well
Returned to injection 8/2/76

18-2L 26-22-37 Water injection well
Well to be returned to injection

19-2P 27-22-37 Water injeciton
168 hr. shut in
1250# - 1070#
Total shut in time since beginning of test 240 hrs.
initial pressure 1400#, ending pressure 1070#

21-3D 34-22-37 Water injection well
Well now being backflowed

21-2N 27-22-37 Water injection well
Well now shut in, recording build up

Petro-Search

1-E Citgo-State 2-23-37 Producing well
168 hr. shut in
1100# - 1100#
Total shut in time since beginning of test 2016 hrs.
initial pressure 1150#, ending pressure 1100#
A more sensitive recorder has been installed on this well.

1-M Fluor 35-22-37 Producing well
168 hr. shut in
500# - 500#
Total shut in time since beginning of test 2016 hrs.
initial pressure 500#, ending pressure 500#

2-F Gulf State 2-23-37 Producing well
168 hr. shut in
0# - 0#
Total shut in time since beginning of test 2016 hrs.
initial pressure 0#, ending pressure 0#
Committee and N.M.O.C.C. agreed to return to production and to record pressure on the bradenhead.

1-M 2-23-37 SWD well
Pressure recorder has been installed

Summit Energy, Inc.

1-F Gulf State 36-22-37 Producing well
168 hr. shut in
720# - 660#
Total shut in time since beginning of test 2016 hrs.
initial pressure 750#, ending pressure 660#

1-P Gulf Sims 25-22-37 Producing well
168 hr. shut in
720# - 700#
Total shut in time since beginning of test 2016 hrs.
initial pressure 800#, ending pressure 700#
Will continue to monitor till next meeting

Texas Pacific Oil Company
2-E Ella Drinkard 25-22-37 Producing well (TA)
168 hr. shut in
630# - 630#
Total shut in time since beginning of test 2016 hrs.
initial pressure 625#, ending pressure 630#
Will continue to monitor

AGUA, Inc.
35-H 35-22-37 SWD
168 hr. shut in
340# - 375# (Bradenhead)
Total shut in time since beginning of test 2016 hrs.
initial pressure 230#, ending pressure 340#
Tubing is backflowing

The following wells have been returned to injection status.
Skelly Penrose "A" 44-D, 36-P, 21-H, 12-N, 48-H, 50-F, 52-H
Skelly Penrose "B" 52-F and 42-D
Anadarko Langlie Mattix Penrose Sand Unit no. 21-7F, 36-1B

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. August 19, 1976 an Arco's Hobbs office.

ATTENDANCE AT AUGUST 12, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Val Ryan	AGUA	Hobbs, New Mexico
Clarence Chandler	Reserve	Midland, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Glyn Stone	Gulf	Hobbs, New Mexico

September 16, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at Arco's office in Hobbs, New Mexico at 8:00 a.m. September 16, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	144	312	1460	725-740
13	144	312	960	585-460
21	144	312	1725	1675-1660
23	144	312	1340	550-440
26	144	312	1500	850-700
28	144	312	1500	340-110
38	144	312	1100	700-655
40	144	312	1625	1590-1590
42	144	312	1775	1590-1590
44 annulus	144	2060	760	760-730
52	144	312	1775	1325-1200
Skelly Penrose "B" Unit				
52 casing	144	20	110	110-115
tubing	144	312	1875	1350-1350
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	336	1550	1275-1120
37-1J	168	264	1750	950-560
36-4H	168	336	1525	1100-1000
Petro-Search				
Citgo-State				
1-E	168	2832	1150	1010-1010
Fluor 1-M	168	2832	500	490-490
Gulf-State				
2-F	168	2832	4	0-4
Gulf State 1-M (intermittant injection Max. 1250 Min. 500)				
Summit Energy, Inc.				
Gulf-State 1-F	168	2832	750	660-660
Gulf-Sims 1-P	168	2832	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	2832	625	630-630
AGWA, Inc.				
SWD 35-H csg	168	2832	230	400-400
tbg (backflowing)				0-0

The Citgo-State well is being prepared for backflowing. A Pit is being dug and lined to contain the water that is expected to flow from the well. The well will reportedly be ready to flow by Sept. 19, 1976. The shut-in injection wells will have approximately two weeks shut-in stabilization time by the time the Citgo-State is opened to the pit. Close observation of the pressure recorders will be conducted after the flow begins.

The next meeting of the Eunice area Sub-Committee is scheduled for 8:00 a.m. September 23, 1976 at Arco"s conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 16, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Rudry	Arco	Hobbs, New Mexico
Val Ryan	AGUA, Inc.	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Erd Johnson	Reserve	Midland, Texas
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
C.R. Korzekwa	Gulf	Hobbs, New Mexico
W.G. Abbott	AGUA, Inc.	Hobbs, New Mexico

September 23, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. September 23, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	168	480	1460	740-760
13	168	480	960	460-350
21	168	480	1725	1660-1660
23	168	480	1340	440-350
26	168	480	1500	700-550
28	168	480	1500	110-0
38	168	480	1100	655-525
40	168	480	1625	1590-1510
42	168	480	1775	1590-1535
44 annulus	168	2228	760	730-90*
52	168	480	1775	1200-1110
Skelly Penrose "B" Unit				
52 casing	168	188	110	115-120
tubing	168	480	1875	1350-1185
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	504	1550	1120-1050
37-1J	168	432	1750	560-500
36-4H	168	504	1525	1000-950
Petro-Search Citgo-State				
1-E	108	2940	1150	1010-1010
backflowing	60	60	210	210-70
Fluor 1-M	168	2940	500	490-490
Gulf-State				
2-F	168	2940	4	0-4
Gulf State 1-M (intermittant injection max. 1250 min.450)				
Summit Energy, Inc.				
Gulf-State 1-F	168	2940	750	660-660
Gulf-Sims 1-P	168	2940	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	2940	625	630 630
AGUA, Inc.				
SWD 35-H csg	168	2940	230	400-450
tbg (backflowing)				

*Pressure bled off to repair tubing leak

The Citgo-State well is backflowing. It has been flowing for 60 hours and has produced an estimated 35 to 40 thousand barrels of 9.9# salt water. The flowing pressure and the flow rate are decreasing. Initial flowing pressure was 210# but after 60 hours was 70#. Close monitoring of shut-in injection and monitor wells has been conducted but no pressure interferance has been noted as yet.

The committee began a study of temperature survey on injection wells in the area. The log study is aimed at determining whether or not the survey can be used to indicate water intrusion into the beds above the reservior.

The next meeting of the Eunice Area Sub-Committee is scheduled for 8:00 a.m. September 30, 1976 at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 23, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
W.G. Abbott	AGUA	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Clarence Chandler	Reserve O & G	Midland, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
J.D. Willingham	Cardinal Surveys	Hobbs, New Mexico
C.A. Adams, Jr.	Cardinal Surveys	Midland, Texas

EUNICE WATERFLOW MEETING

The Eunice area waterflow study group met on Thursday, September 23 and Monday, September 27. Skelly's Penrose "A" waterflood temperature logs from injection wells were analyzed and gradients were calculated. Representatives from Cardinal Surveys and Western Company assisted in interpretation. The data derived from this has been tabulated. Additional consideration by the committee is necessary to determine further use and disposition of the data.

September 30, 1976

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. September 30, 1976. Pressure charts were read and evaluated.

Pressure and changes from charts and gauges are as follows:

Operator Lease Well no.	Shut-in Time since last report (hrs)	Total shut-in Time, (hrs)	Initial Pressure (psi)	Pressure change this reporting period, (psi)
Skelly Penrose "A" Unit				
12	168	648	1460	740-760
13	168	648	960	350-300
21	168	648	1725	1660-1660
23	168	648	1340	350-300
26	168	648	1500	550-500
28	168	648	1500	0-0
38	168	648	1100	525-420
40	168	648	1625	1510-1510
42	168	648	1775	1535-1535
44 annulus	168	2396	760	90-200
52	168	648	1775	1110-1050
Skelly Penrose "B" Unit				
52 casing	168	356	110	120-120
tubing	168	648	1875	1185-1185
Anadarko Langlie Mattix Penrose Sand Unit				
37-3P	168	672	1550	1050-1040
37-1J	168	600	1750	500-450
36-4H	168	672	1525	950-910
Petro-Search				
Citgo-State backflowing	168	228	210	70-10
Fluor 1-M	168	3108	500	490-490
Gulf-State 2-F	168	3108	4	4-14
Gulf State 1-M (intermittant injection max. 1375 min. 680)				
Summit Energy, Inc.				
Gulf-State 1-F	168	3108	750	660-660
Gulf-Sims 1-P	168	3108	800	680-680
Texas Pacific Oil Co.				
Ella Drk 2-E	168	3108	625	630-630
AGUA, Inc.				
SWD 35-H csg	168	3108	230	400-450
tbg (backflowing)				

The Citgo-State well is P & A. It backflowed for 228 hours and produced an estimated 65 to 75 thousand barrels of salt water. Initial flowing pressure was 210#. After 228 hours it was 10#. Close monitoring of shut-in injection and monitor wells has been conducted but no pressure interferance was detected.

During the week temperature surveys were run on Skelly Penrose "A" well no. 13 and no. 40, after extended shut-in periods. These and others were examined and studied by the committee. The committee was assisted by service company personnel. More detailed logging proceedures are to be conducted on selected wells at the recommendation of the committee. The purpose is to determine the optimum logging program that gives the maximum information, with all factors being considered.

The next meeting of the Eunice Area Sub-Committee will be called when a more detailed temperature log is available for study, at the N.M.O.C.C. conference room in Hobbs, New Mexico.

ATTENDANCE AT SEPTEMBER 30, 1976 MEETING

Bill Thomas (chairman)	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Val Ryan	AGUA	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
C.R. Korzekwa	Gulf	Hobbs, New Mexico
John W. Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

October 26, 1976

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

RE: NEW MEXICO "BZ" STATE NCT-8 LEASE

ATTENTION: MR. JOE D. RAMEY
SECRETARY-DIRECTOR

Gentlemen:

The following information has been compiled concerning the salt water flows on Texaco's New Mexico "BZ" State NCT-8 Lease as discussed during your telephone conversation with Don Craig on October 25, 1976. Attached is a typed copy of the original drilling report on Well No. 5 covering the time interval where the salt water flow was encountered, a Sonic log covering the interval where the water flow occurred, and a plat showing all the wells on the "BZ" NCT-8 lease.

Also, a salt water flow was mentioned on the drilling report when Well No. 7 was drilled. Salt water was encountered at 1684' with a flowing pressure of 200 psi. No other information was included in the drilling report.

Yours very truly,

J. V. GANNON

J. V. Gannon
District Superintendent

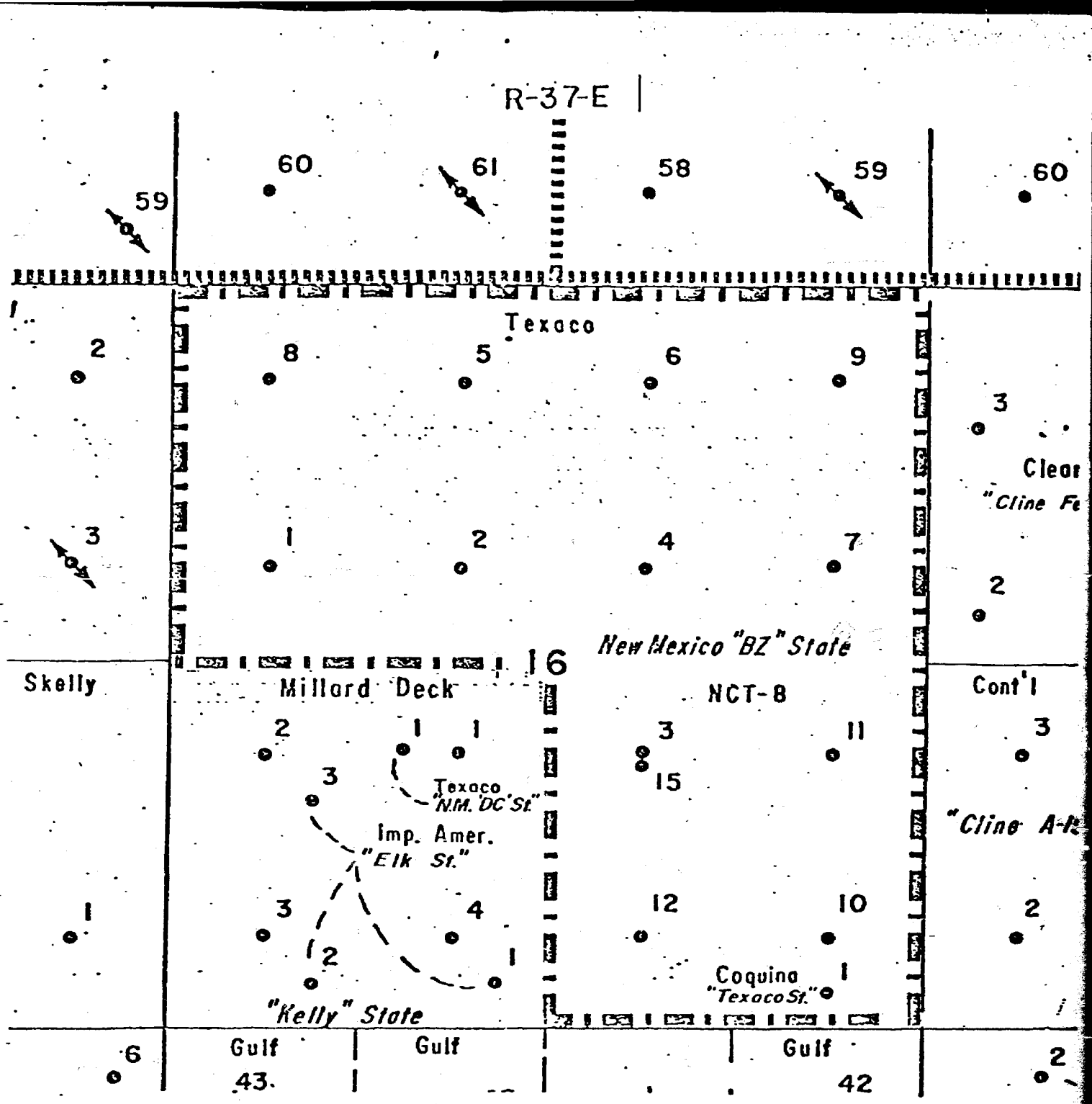
DRC:las
Attachments

NMOCC - Hobbs, N.M.

HAS, JR.

File
Chron

3/1-2/59	6-3/8" hole from 1095'. Press. up on 8-5/8" csg @ 10:15 to 10:45 A.M. 2-28-59. 1000# for 30 min. Drill plug and cement and approx. one foot of formation. Press. up on formation. 1000# in 30 min. @ 11:15 to 11:45 A.M. 1000# O.K. T.D. 1690'. Well started to flow back salt water. Well started flowing 1100 bbls. salt water per hour from 1688' to 1690'. Shut well in. 600# press. Bradenhead squeeze open hole from 1095' to 1690' by Howco w/2500 sx Reg cmt w/ 2% calcium chloride down 8-5/8" csg.
3/3/59	Drilled cement plug from 1146' to 1160'. No show of water. Drilled plug to 1690'. Water broke. Returns of 300 bbls. salt water per hr. Drilled ahead in formation. Drilled formation from 1690' to 1814'. Water and air increasing. Pulled 360' of drill pipe. Water increased to 1500 bbls. per hour. Pulled drill pipe. Bradenhead squeezed formation w/2500 sx of Reg Neat cement plus 2% calcium chloride from 1095' to 1814' by Howco. Pumping. Press. on cement 650 lbs. Comp. at 8:45 P.M. 3-2-59.
3/4/59	No report.
3/5/59	Trying to squeeze off salt water w/ cement.
3/6/59	No report.
3/7/59	No report.
3/10/59	Drlg salt and anhy 1986'. Increased to 7-7/8" hole from 1095'.
3/11/59	Drlg.
3/12/59	T.D. 7-7/8" hole @ 2460'. Anhy.
3/13/59	7-7/8" hole to 2460'. Comp @ 5:15 A.M. 3-12-59. Snubbing pipe out of hole. Snub 7" in hole. Ran 64 jts hydril and collared pipe.(2445' of 26#). Set @ 2460'. Cement by Howco w/ 200 sx Neat cement. Top cmt by T.S. @ 1760'. Second stage down bradenhead w/ 200 sx Reg cmt. Job complete 3:00 P.M. 3-12-59. WOC 9 hrs.
3/14/59	Tested 7" csg w/ 1200 psi for 30 min. from 5:00 A.M. to 5:30 A.M. on 3-14-59. Tested O.K. Now WOC.



TEXACO Inc.
HOBBS DISTRICT

NEW MEXICO "BZ" STATE (NCT-8)
LANGLIE-MATTIX FIELD
LEA COUNTY, NEW MEXICO

DATE 7-30-76 DRAWN BY CRC

Bill Thomas

October 28, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at the N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. October 28, 1976. The temperature gradient data was discussed and it was decided to file the work copies for possible future reference.

Mr. Jerry Sexton handed out a letter and drilling record on Texaco's State of New Mexico "BZ" NCT-8 well no. 5 located in section 6, T23S R37E. The drilling record showed that an extensive water flow was encountered in the salt section during drilling operations in 1959. This was prior to any extensive waterflooding in the area. The letter also states that well no. 7 on the same lease encountered the water flow.

The committee had expected to consider the recently run Anadarko temperature surveys, however the logging company representative was not present with the logs. The committee was informed that these logs would be ready for study Friday the 28th.

Therefore, the next meeting is scheduled for 8:00 a.m. Friday October 29, 1976 at the N.M.O.C.C. office in Hobbs, New Mexico.

ATTENDANCE AT ~~AUGUST 12~~ Oct 28, 1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
W. G. Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve O&G	Midland, Texas
L. C. Hudry	Arco	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico

October 29, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met at N.M.O.C.C. office in Hobbs, New Mexico at 8:00 a.m. October 29, 1976. Mr. Billy P. Morris presented an analysis of temperature and tracer surveys that were run on two of Anadarko's wells. The wells on which the surveys were run were considered to be potential problem wells. The surveys indicated no problems in these wells that would contribute to the problem of water getting into the salt section. One log showed a slight anomalie in the salt section could possibly be water storage from a transient source.

It was decided that a study group meeting would be held November 8, 1976 at the N.M.O.C.C. office in Hobbs, New Mexico for the purpose of reviewing Skelly's old temperature survey's to determine potential problem wells for additional survey studies on Skelly's Penrose "A" and Penrose "B" units.

ATTENDANCE AT OCTOBER 29, 1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
C. R. Korzekwa	Gulf	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Joe Ramey	N.M.O.C.C.	Santa Fe, New Mexico
Billy Morris	McCollough Surveys	Odessa, Texas

November 8th and 9th, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The study group met at the N.M.O.C.C. office in Hobbs, New Mexico, from 8:00 a.m. to 5:30 p.m. on November 8th and from 8:00 a.m. to 4:30 p.m. on November 9, 1976. Temperature and tracer surveys on Skelly's Penrose "A" and Penrose "B" Units and Anadarko's Langlie Mattix Unit wells were studied and analyzed under the guidance of Mr. Billy P. Morris of the McCollough Company.

Various data from logs were tabulated. Particular attention being given to temperature anomalies in the salt section, and or channeling up the well bores. Plans are to map the data and determine if certain areas of water intrusion can be defined.

Another meeting of the committee has not been scheduled at this time.

ATTENDANCE 11-8-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas
Rick Alderman	McCollough	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico

ATTENDANCE 11-9-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

November 8th and 9th, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The study group met at the N.M.O.C.C. office in Hobbs, New Mexico, from 8:00 a.m. to 5:30 p.m. on November 8th and from 8:00 a.m. to 4:30 p.m. on November 9, 1976.

Temperature and tracer surveys on Skelly's Penrose "A" and Penrose "B" Units and Anadarko's Langlie Mattix Unit wells were studied and analyzed under the guidance of Mr. Billy P. Morris of the McCollough Company.

Various data from logs were tabulated. Particular attention being given to temperature anomalies in the salt section, and or channeling up the well bores.

Plans are to map the data and determine if certain areas of water intrusion can be defined.

Another meeting of the committee has not been scheduled at this time.

ATTENDANCE 11-8-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L.C. Hudry	Arco	Hobbs, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas
Rick Alderman	McCollough	Hobbs, New Mexico
Les Clements	N.M.O.C.C.	Hobbs, New Mexico

ATTENDANCE 11-9-76

Bert Brown	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico
Billy Morris	McCollough	Odessa, Texas

November 18, 1976

MINUTES OF SUB-COMMITTEE MEETING APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The group met at the N.M.O.C.C. office in Hobbs, New Mexico on November 18, 1976 from 8:00 a.m. to 10:00 a.m. Further discussion of recent log analysis in the area took place.

Several ideas were presented by members present as to what steps should be taken to expedite the study.

The committee and N.M.O.C.C. feel that we are at the point to begin consideration of attempting to "blow down" the pressured up salt section. This decision being based on the recent two day study session during which time all temperature and tracer injection well logs were analyzed and evaluated, as well as data which has been gathered during the past several months through monitoring.

The group felt that suspect wells should be re-logged due to work having been done on wells in the area, possible changes in the salt section due to blowing down of the Citgo-State well and questions as to the different logging procedures and interpretive techniques used.

Plans are to proceed with logging of the suspect wells for re-evaluation. Before the next meeting on December 2, 1976 each member is to study his companies injection and/or disposal facilities in the area to determine, how much, if any, of the backflow water he can accomodate once blowing down of the salt section is began. Due to restrictions now in effect on injection and disposal facilities in the area, this is the major problem at the present time.

Another meeting has been scheduled for 8:00 a.m. (MST) at the Hobbs, New Mexico office of the N.M.O.C.C.

ATTENDANCE AT NOVEMBER 18,1976 MEETING

Bill Thomas	Skelly	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
Clem Korzekwa	Gulf	Hobbs, New Mexico
Bill Abbott	AGUA	Hobbs, New Mexico
Erd Johnson	Reserve	Midland, Texas
Jerry Sexton	N.M.O.C.C.	Hobbs, New Mexico
John Runyan	N.M.O.C.C.	Hobbs, New Mexico

MINUTES OF SUB-COMMITTEE APPOINTED BY N.M.O.C.C. TO STUDY THE EUNICE AREA

The Eunice Area Sub-Committee met in N.M.O.C.C. office in Hobbs, New Mexico at 8:00 AM January 5, 1977.

Recently run surveys on injection wells were discussed as was other data and activities conducted by operators in the area. Skelly had recently run surveys on Skelly Penrose "A" Wells No. 26, 28, and 34. Skelly also had perforated the Skelly Penrose "A" Well No. 64 at 1460' opposite a water flood encountered while drilling the well. After acidizing perforations, the well initially produced around 40 BWPD but has declined and settled at around 6 BWPD. The Temperature and Tracer Logs on Skelly wells indicated no channeling or water intrusions or water flows of any irregular nature. Penrose "A" Well No. 26 had shown some fluid storage in the base of the salt section and a short channel up to 3200' on a previous survey. It had not been repaired between surveys.

Anadarko had run logs on 13 wells recently. Two temporary abandoned wells (#34-4 and #27-1) were surveyed with a noise tool in addition to survey tools, in an effort to locate storage of water in the salt section that would be prospects for perforating and draining the salt section. No indication of water in the salt were evident. Additional wells surveyed by Anadarko were #13-B2, #10-1, #13-C7, #1-2, #8-1, #7-1, #7-3, #13-A1, #13C-5, #15-2, #17-1 & #21-2. Only the #13-C7 indicated a problem of any kind. It showed to be communicating from the salt section up to the surface. The #13-C7 is a twin to Skellys' J. V. Baker No. 11. The Committee recommended and Skelly has approved, logging the

Baker well to determine if it is contributing to the upward migration of water in the #13-C7.

Mr. Jerry Sexton informed the Committee that Mr. Joe Ramey would be in Hobbs for a combined meeting of the three appointed Sub-Committees on January 20, 1977. Mr. Ramey has requested that the Sub-Committees present recommendations for future action aimed at a solution to the water migration problems in the area.

Skelly is still monitering pressures on the Penrose "A" Well No. 38, #44, Penrose "B" #52 & #54, bradenheads. All have shown declining pressure since the "blow-down" of the Citgo-State well.

The next meeting will be held 8:00 AM Friday January 7, 1977 at Skelly Oil Co.- Hobbs, New Mexico.

ATTENDANCE

Bill Thomas	Skelly Oil Co.	Hobbs, New Mexico
Bert Brown	Skelly Oil Co.	Hobbs, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Herb Henderson	Anadarko	Eunice, New Mexico
L. C. Hudry	ARCO	Hobbs, New Mexico
Erd Johnson	Reserve Oil	Midland, Texas
Val Ryan	Agua, Inc.	Hobbs, New Mexico
Jerry Sexton	NMOCC	Hobbs, New Mexico
C. R. Korzekwa	Gulf Oil	Hobbs, New Mexico
Billy P. Morris	McCullough	Midland, Texas

MINUTES OF SUB-COMMITTEE APPOINTED TO STUDY EUNICE AREA

The Sub-Committee met at 8:00 AM January 7, 1977, in Skelly's Hobbs Office.

Discussion, conclusions and recommendations were formulated and approved for presentation to the Joint Sub-Committee meeting. These are presented by seperate instrument.

The next meeting will be a Joint Sub-Committee meeting to be held Thursday, Jan. 13, 1977 at 9:00 AM in Shell Oil Company Office - Hobbs, New Mexico.

ATTENDANCE

Bill Thomas	Skelly	Hobbs, New Mexico
Bert Brown	Skelly	Hobbs, New Mexico
Herb Henderson	Anadarko	Eunice, New Mexico
Jimmie Christner	Anadarko	Houston, Texas
Erd Johnson	Reserve Oil, Inc.	Midland, Texas
C. R. Korzekwa	Gulf Oil Co.	Hobbs, New Mexico
W. G. Abbott	Agua, Inc.	Hobbs, New Mexico

EXHIBIT 1

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5762
Order No. R-5295

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR A WATERFLOOD PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 15, 1976, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 12th day of October, 1976, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Atlantic Richfield Company, seeks authority to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through 11 injection wells located in Unit M of Section 29, Units A and I of Section 31 and Units C, E, G, I, K, M, N, and O of Section 32, all in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico.

(3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.

(4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the Cole Darden Oil Company Hale State Well No. 1 in Unit A, Section 31, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico, was not plugged and abandoned in a manner such as to assure that water injected through said State Vacuum Unit injection wells will not migrate from the Grayburg-San Andres formation to other formations or the surface.

Exhibit 1 - pg. 2

(6) That injection pressure around said Cole Darden Oil Company Hale State Well No. 1 should be limited to prevent such migration.

(7) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(8) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Atlantic Richfield Company, is hereby authorized to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through the following-described wells in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico:

State Vacuum Unit Well No.	Unit	Section	Township	Range
1	H	29	17S	34E
2	A	31	17S	34E
4	C	32	17S	34E
7	E	32	17S	34E
9	G	32	17S	34E
11	I	31	17S	34E
13	K	32	17S	34E
15	J	32	17S	34E
17	M	32	17S	34E
19	O	32	17S	34E
21	M	32	17S	34E

(2) That injection into each of said wells should be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation, or in the case of an open-hole completion, to the casing shoe; that the casing-tubing annulus of each injection well shall be tested for leaks, be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device, and that the injection wells or system shall be equipped in such a manner as to limit wellhead pressure to no more than 860 psi.

(3) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of 860 psi upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

Exhibit 1 - pg. 3

(4) That there shall be no injection under pressure into the Cole Darden Oil Company Hale State Well No. 1 in Unit A of Section 31, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, or into any well on said 40-acre tract or any 40-acre tract directly or diagonally offsetting said well, until said well has been reentered and replugged in accordance with a Commission approved plugging program or said well has been equipped in such a manner as to monitor for leaks below the salt section.

(5) That the operator shall immediately notify the supervisor of the Commission's Hobbs district office of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(6) That the subject waterflood project is hereby designated the ARCO State Vacuum Unit Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(7) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(8) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

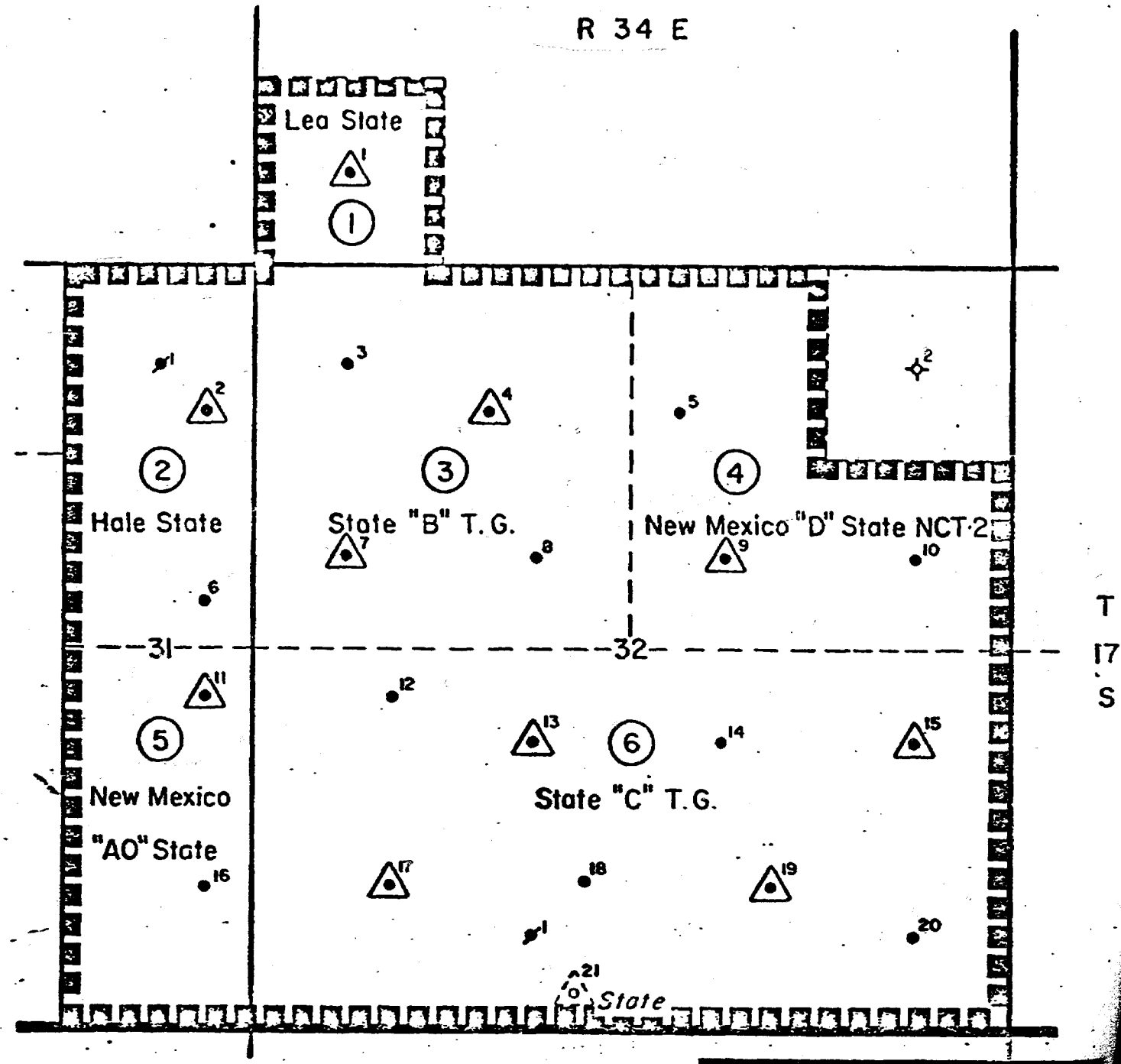
EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

EXHIBIT 2



UNIT BOUNDARY

(1) TRACT NUMBER

INJECTOR

PRODUCER

INJECTOR – TO BE DRILLED

AtlanticRichfieldCompany
North American Producing Division
Permian District Midland, Texas

STATE VACUUM UNIT

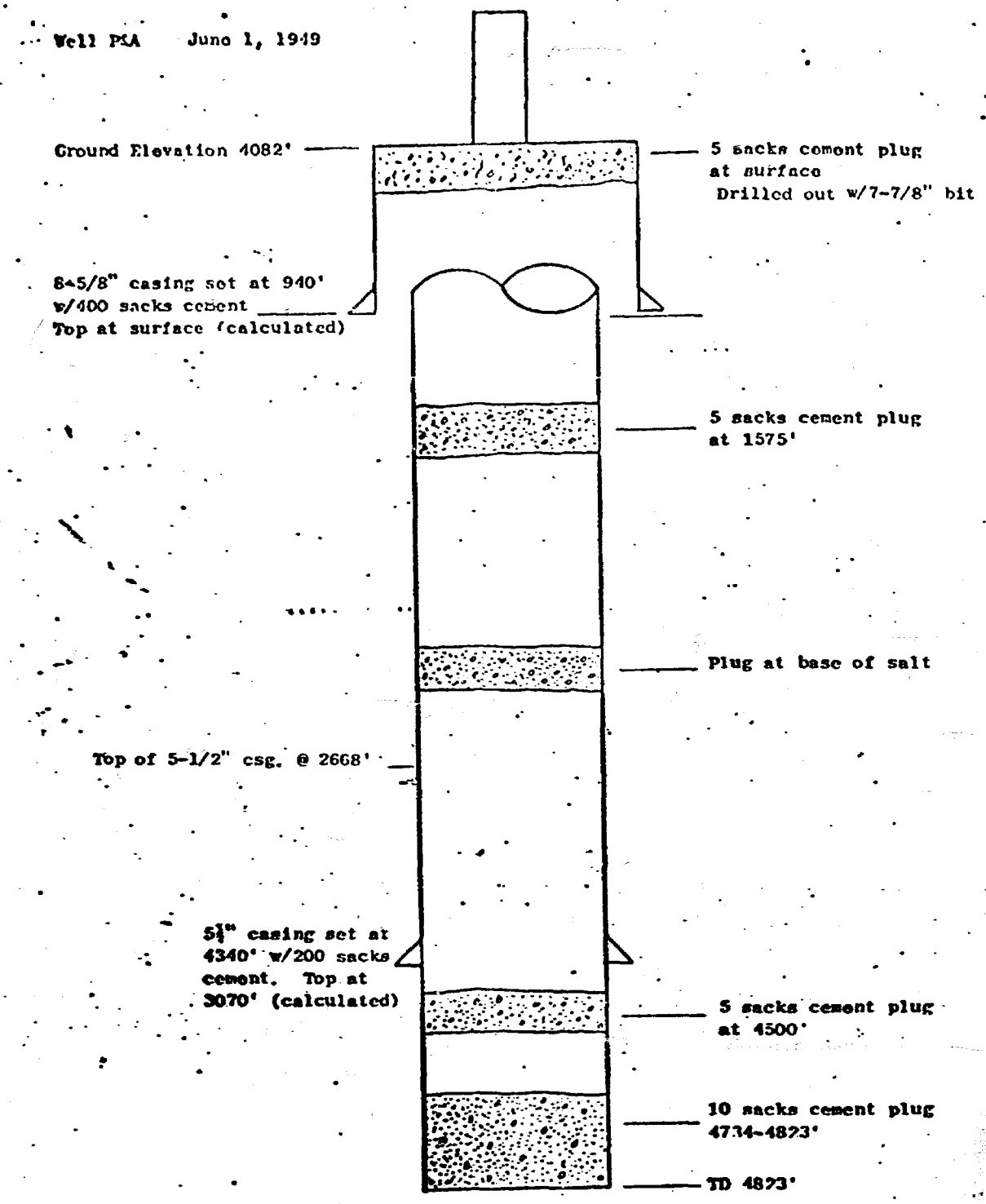
LEA COUNTY, NEW MEXICO

Scale: 1"=1000'

EXHIBIT 3

COLE-DARDEN OIL COMPANY
BALE STATE NO. 1
Schematic Drawing of Plugged and Abandoned Well
660' FNL & 660' FEL Section 31, T-17S, R-34E
Lea County, New Mexico

All measurements are from KB 8' above GL



MOBIL TESTIMONY FOR NMOCC HEARING

CASE 5941 JUNE 13, 1977

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STATEMENT

EUNICE AREA WATERFLOW COMMITTEE

DISCUSSION OF ACTIVITIES

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee was to collect, analyze data and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of fifteen wells were initially shut-in for observation. The wells consisted of 7 injection wells, 6 producing wells, 1 shut-in producing well and 1 disposal well. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure in the shut-in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the Citgo well. The Petro-Search Citgo State No. 1, located in unit E, Section 2, T235, R37E, had been found to have water entering the well bore behind the 4 1/2" O.D. production casing from 2470' - 2500' and moving up the hole, and had 1185# well head pressure. The Committee recommended to the NMOCC that injection be resumed into the injectors, and plans be made to "blow down" the pressured up salt section in the Citgo State No. 1. Thoughts at the time were to discontinue cycling, and attempt to determine if we were dealing with a localized or widespread pressure situation. The NMOCC felt that cycling and monitoring should be continued. An alternate recommendation was made to the NMOCC at this time: "Injection wells with approximately 700# well head pressure or less be reactivated and cycling expanded to take in more injectors." The NMOCC agreed to the alternate proposal and this procedure was implemented. During the monitoring and cycling, the pressure on the Citgo-State well had remained practically constant at 1150#.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976, meeting that (1) injectors which are high pressure and low volume, and (2) those which have shown little or no pressure variation during shut-in be backflowed and tested, in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and build up procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 barrels per day or less, shut the well in for pressure build up. If pressure does not build up past 800# in 48 hours, return the well to injection." From this time forward, wells were checked for pressure drop, backflowed, (rates and pressures monitored) and build ups ran following backflow. Upon recommendation from the Committee, and approval from the NMOCC, wells were returned to injection as warranted by results.

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across the salt section. Recent logging by two different companies have failed to confirm this. On March 27, 1977, a surface flow from the oil string annulus was noted on the Skelly Penrose "B" No. 54. A noise type log was run and water movement was confirmed at 1180', two holes were perforated at 1180' and to date the well has flowed back approximately 45,000 barrels of salt water. Frequent washing with fresh water is required to prevent salting up. Recently the flow back has been decreasing and steps are being taken to insure that the well is kept free and clear of any restrictions which might hinder the flow. Subsequent logging of wells on the Anadarko Langlie Mattix Penrose Sand Unit and Skelly Penrose A and Penrose B waterfloods have failed to indicate major storage of water which would warrant perforating of casing to establish flow.

TESTIMONY
Case No. 5941

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EXHIBIT B

This is a current performance curve on the Getty Penrose "A" operated waterflood.

EXHIBIT C

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GETTY PENROSE "A" UNIT

The Getty (Skelly) Penrose "A" Unit became effective May 1, 1967. A pilot waterflood was in operation on Skelly's H.O. Sims lease prior to unitization. This is within the unit area. Cumulative injection into these two wells was 2,639,018 bbls. prior to effective date of the unit Cumulative injection since unitization into the unit area was 24,743,905 as of April 1, 1977. The daily average water injection rate during April 1977 was 5222 bbls. at 1683 psi. Total cumulative injection into the unit area to date is 27,382,923 as of April 1, 1977. The Penrose "A" Unit contained 60 wells on the effective date in 1967, of these 60 wells, 11 were drilled and completed after 1942. The remaining wells were drilled and completed from 1936 to 1942. It is a recognized fact that wells in this area have potential for considerable casing problems in all intervals, particularly within the upper 900', where the exterior is subjected to corrosion from the Santa Rosa and upper water sands. In the interim period from the effective date of the unit until now, we have located and performed remedial operations on leaks within the upper 1200' interval in a considerable number of wells. It was recognized early that this was a problem. As the record shows, we have monitored and checked regularly to detect and remedy these problems as they became evident. Additionally, we have located and repaired leaks or water flows behind pipe in the intervals from 1500' to 2500' on wells within the unit area. From start of injection to date, injection into this unit has been monitored by temperature logs/and or selected injection profiles at irregular intervals. During late 1971 and 1972 a program was initiated to install stub liners in several of the open hole wells to improve control of injected water. Eighteen liners were installed in injection wells in this unit during 1972 an[illegible].

Injection profiles run immediately following these liner installations indicated that all injection was being confined to the unitized interval. We feel the record of casing leak repairs, repairs to waterflows behind casing, and liner installations within this unit should be considered as solid evidence that we have diligently attempted to confine water to the unitized interval in this waterflood project.

The first evidence of waterflow in the Penrose "A" area occurred during May of 1973 when waterflow was detected outside the casing of unit well No. 29. the well was subsequently repaired, waterflow was encountered in July 1973 during drilling operations on the Ellen Sims "A" No. 1 well, which is located immediately northeast of the unit area. Waterflow was encountered at approximately 2500'. During September 1973 unit well no. 9 developed a leak at 2569'. When the Ellen Sims "A" No. 2 well (north offset to the No. 1 well) was drilled during February 1974, no waterflow was encountered. During March 1974 a waterflow outside the casing developed in unit well no. 47; and this was followed during the next month (April 1974) by waterflows in well no. 63, which was being drilled as an infill well, at approximately 1200' and 2500'. Well no. 64 was drilled in August 1974 and encounted a waterflow at 2500'. No waterflows were encounted during drilling operations on wells 65 and 66 in October 1974. Waterflows occurred outside casing on wells no. 3 and 28, these were repaired.

We were requested by the Hobbs Office of the New Mexico Oil Conservation Commission to perform necessary surveys in February 1974 to determine if there was any injection water leaving the unitized interval. A program was designed, undertaken and completed during March 1974 covering 28 wells within the unit area. This survey included all injection wells in the unit at that time. Analysis of data from injection profiles, temperature decay, and 24 hour temperature surveys on these wells indicated 3 wells which were not confining injection to the unitized interval, these wells were repaired. Several wells

indicated varying degrees of channeling within the unitized interval, these wells were repaired. It was our intention then, as it is now, to confine all injection to the unitized interval.

There are two wells within the unit area which had been plugged and abandoned, as recommended and approved by the Hobbs Office of the NMOCC. They requested that we re-enter and replug these wells to provide sufficient cement across the Penrose Sand interval and across intervals above which could be charged from stray water so that any movement within the wells would be eliminated. These wells were re-entered and replugged as requested by the NMOCC. The R. D. Sims etal "D" No. 2 was drilled and completed during 1948 and the Ellen Sims No. 6 during 1948. Location of these wells is southeast quarter of the Northwest quarter of Section 3 and Northwest quarter of the southeast quarter of Section 3, respectively, all located in T23S R37E. Approximately 23,000,000 barrels of water had been injected into the Penrose "A" unit area at this point in time.

Cumulative oil production from the unit area since unitization was 3,067,404 on April 1, 1977. Average daily oil production during April 1977 was approximately 650 BOPD as compared to average daily production of 1588 BOPD during October 1974 (prior to the NMOCC Order which restricted injection rates). Several wells were drilled and 7 wells had been recently stimulated which had contributed to increasing and maintaining a maximum production rate. Estimated remaining recoverable secondary reserves (as of November 1, 1974) were 1.715,000 BO. under conditions and pattern configuration in existence at that time. As may be noted on Exhibit "B" the waterflood is rate sensitive and, as the curve shows, daily oil production has steadily declined from approximately 1600 BOPD to a current rate of approximately 650 BOPD. This amounts to a 41% decline in daily production over the past two and one half years.

We feel, based on past history, that any further restrictions on injection rates, for any appreciable length of time, would do irrepairable damage to the reservoir as wells as extending the life of the project beyond economic limits: Resulting in loss of revenue to the state and federal government as well as parties to the unit.

GETTY PENROSE "B" UNIT

The Getty Penrose "B" Unit containing 63 wells became effective July 1, 1965. The Unit now contains 28 injection wells and 31 active producing wells.

Cumulative injection into the Getty Penrose "B" Unit to April 1, 1977 was 24,717,893 barrels of water. The average daily injection rate during April 1977 was 4419 BWPD at an average well head injection pressure of 1782 psig.

From start of injection to date, injection into this unit has been monitored by temperature logs and/or selected injection profiles at irregular intervals. There have been no indications from this data that injection water was going outside the unitized interval. During March 1972, a casing leak was located in well no. 32 in the interval 226' - 446' and was squeezed off during the course of other operations on the well. Well no. 53 developed a waterflow between the casing string and surface casing, this problem was repaired. Cumulative oil production from the unit area since unitization was 1,277,039 barrels of oil as of March 1, 1977. Current oil producing rate is approximately 170 barrels of oil per day.

Recently a waterflow was noted on the Penrose "B" #54 well, between the surface and production casing. The waterflow was found to be entering the casing at approximately 1180'. Two holes were perforated in the casing at that point and to date approximately 45,000 barrels have been backflowed from the well.

Plans are underway to conduct temperature, profile and possibly noise logs on all injection wells surrounding the Penrose "B" #54 injection well.

Plans are to continue monitoring of bradenhead pressures and periodic surveys of injection wells, as required and dictated by performance to insure that confinement of injected fluid is maintained. A study is now underway to evaluate the feasibility of doing additional work in the northern portion of the unit to increase ultimate reserves.

DEEPER WELLS IN THE AREA

In addition to the secondary flood units, Getty operates wells on primary production status in the area, as indicated on exhibit A. These include the Hobbs "M" lease in section 20, the J.V. Baker in section 22 and 27, and the Baker "A" leases in section 26; the Baker "C" lease in section 26, and the Ellen Sims "A" lease in section 3.

Wells on the Baker "A", Baker "C", and J.V. Baker leases were completed deeper in zones below the Penrose Sand unit. Four of these wells experienced casing leaks during the period 1973 and 1974. We were directed by the Hobbs Office of the N.M.O.C.C. on October 24, 1974 to re-enter 7 wells which were in this deeper category and run cement bond logs, perforate and bring cement back either into the next casing shoe or provide sufficient cement to tie back into the base of the salt. We concurred with the idea that it was the responsibility of the operator of the deeper wells in the area to take remedial action which would insure the placement of cement across the producing interval for shallower zones within the area of these floods. Procedures were developed, and these were approved by the Hobbs Office of the N.M.O.C.C. All of the well work, as recommended and approved by the N.M.O.C.C., has since been completed. This remedial work should insure that these wells will not continue to be a possible pipeline to transmit stray water within the area, as well as protecting the wells from collapsed casing due to external corrosion on the casing and pressure on the outside of the casing. The possibility exists that one or more of these deeper wells could have been providing a pathway to transmit stray water and have had a significant role concerning the pressured up salt section. If this was the case it is possible that the source (sources) has been "masked" through re-cementing and replugging of wells in the area.

EUNICE SALT WATER DISPOSAL WELL

The Eunice Salt Water Disposal Well No. 1 operated by the manufacturing Department of Getty Oil Company is located 2580' FSL and 1200' FWL, of Section 27, T22S, R37E, Lea County, New Mexico. This well is completed open hole 4010' to 4550' in the San Andres zone with 10 3/4" casing set at 300' and cemented to the surface and 7" casing set at 4010' and cemented back to the surface. Based on surveys on the well, water is being contained in the San Andres zone and no problems are known to exist at this time. Continued disposal of this water into the well is considered vital by Getty's Manufacturing Department to continue operation of this plant for hydrocarbon extraction from casing head gas in the area.

LPG STORAGE WELL NO. 3

The Eunice Gasoline Plant No. 1 Storage Well No. 3 is located 1650' FWL and 2310' FNL of section 27, T22S, R37E. This well was drilled to a TD of 2075' with 8 5/8" casing set at 1848' and 5 1/2" tubing set at 2045'. Completion is open hole 1848' - 2075'. A cavern is washed out in the salt interval for LPG storage. This well was completed in June 1953 and no problems were experienced until June 1974, at which time the well had product in storage. On June 29, 1974 the well developed a casing pressure of approximately 1700#. After delivery of 220,000 gallons of propane from the well, with no water input the casing pressure dropped to 1050#. Pressure was normally 700 psi on the well when delivering to the pipeline. Surveys were ran on the well which indicated the well had no casing leak but that foreign water was entering the well within the cavern. The tracer survey indicated that water was entering below the bottom of the casing in the cavern. A decision was made to cap the well and leave the water flowing thru an open casing valve to surface pits to avoid pressuring the cavern. This storage well has remained inactive since that time. This LPG storage well is no longer considered safe or satisfactory for its designed purpose.

A test conducted June 3, 1977 on this well, by the manufacturing department showed the well to be flowing approximately one half gallon per hour of water. After being shut-in for 6 hours, pressure at the surface was 78#. It appears that the problem in this area is approaching stabilization.

CONCLUSIONS AND SUMMARY

Recently a survey was conducted in an effort to determine fracturing or parting pressures on the Penrose "A" and Penrose "B" units. Current fracturing jobs were checked to evaluate the instantaneous shut in pressures. As may be noted on the tabulation, 1600# is an approximate average. Wells no. 63 & 64 were newly drilled wells when they were fractured. As the tabulation shows, the ISIP's on the 2 new wells are very similiar to the older ones.

Using 3500' as midpoint of perforations and .4775 psi/ft. for 9.2# gallon fracturing fluid, calculations indicate a bottom hole frac pressure of 3271 psi/ft. Using same data, the frac. gradient calculates to be .935 psi/ft.

Water analysis have shown density of the Penrose "A" and "B" produced water to be 8.6#/gal and make up water 8.45#/gal. Assuming 100% produced water (neglecting friction) the surface pressure could be 1710 psi without exceeding bottom hole frac pressure; and, assuming 100% makeup water the surface pressure could be 1727 psi without exceeding bottom hole frac pressure. Based on April 1977 C-120 reports, average surface injection pressures were 1683 psig on the Penrose "A" unit and 1782 psig. on the Penrose "B" unit.

We have no evidence to indicate that we are presently injecting water at sufficient pressure to cause formation fracturing. These injection pressures might be lowered somewhat through an extensive program of backflowing of injection wells, acidizing, etc. Accumulation of iron sulfide, scale and other materials in the vicinity of the borehole are definitely a contributing factor to the pressure requirements to inject water.

In summary, we do not feel that we are presently injecting above parting pressure and feel that physical evidence supports this conclusion: (1) No apparent channeling between wells (2) No wells accepting water at excessively low pressure or vacuum (3) No oil or hydrocarbons have been present in back-

flow water from the salt section. (4) Difficulty in proving or disproving that communication exists between the salt section and the pay zone, out in the reservoir. We concurr with the Eunice Area Committee recommendations as set forth at the N.M.O.C.C. meeting in Hobbs during January 1977. Getty Oil Co. requests that no further requirements be placed on our operations in the area. We will continue to work toward relieving the pressured up salt section and will put forth every effort possible to achieve this end. We are fully aware of the gravity of the situation and all Federal, State, interested parties, and others can be assured of our 100% co-operation in solving and eliminating the problem.

Penrose "A" wells	Date of Frac Job	ISIP(PSI)	Penrose "B" wells	Date of Frac Job	ISIP(PSI)
3	7/74	1500	17	11/74	1700
16	5/74	1525	23	11/74	1600
29	6/74	1650	31	9/74	1600
31	10/74	1700	44	8/74	1550
35	12/74	1600			
45	12/74	1625			
54	7/74	1600			
63	3/74	1600			
64	8/74	1600			
		1600 avg.			1600 avg.

Frac jobs consisted of approximately 50,000 gallons gelled 9.2#/gal. brine with 75,000 of sand.

(1) To determine the bottom hole frac pressure.

Mid point of pay 3500'
Surface press = 1600 psi.
9.2#/gal. frac fluid = .4775 psi/ft.

(3500FT) (.4775psi/ft) = 1671 psi press. due hydrostatic head
1600 surface press
3271 - bottom hole frac pressure

(2) To determine the frac gradient.

3271 = bottom hole frac press
3500 = mid pt. of perfs

3271 psi / 3500 ft = .935 psi/ft frac gradient

(3) To determine wellhead frac press of Penrose A & B assuming only makeup water used or produced water used.

8.45# gal - Density of makeup water
(.441 psi/ft) (3500 ft) = 1544 psi
3271 - 1544 = 1727 psi - surface frac press with makeup water

8.6# gal - Density of produced water
(.446 psi/ft) (3500) = 1561 psi
3271 -1561 = 1710 psi - surface frac press with produced water

STATEMENT

EUNICE AREA WATERFLOW COMMITTEE

DISCUSSION OF ACTIVITIES

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee was to collect, analyze data and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of fifteen wells were initially shut-in for observation. The wells consisted of 7 injection wells, 6 producing wells, 1 shut-in producing well and 1 disposal well. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure in the shut-in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the Citgo well. The Petro-Search Citgo State No. 1, located in unit E, Section 2, T235, R37E, had been found to have water entering the well bore behind the 4 1/2" O.D. production casing from 2470' - 2500' and moving up the hole, and had 1185# well head pressure. The Committee recommended to the NMOCC that injection be resumed into the injectors, and plans be made to "blow down" the pressured up salt section in the Citgo State No. 1. Thoughts at the time were to discontinue cycling, and attempt to determine if we were dealing with a localized or widespread pressure situation. The NMOCC felt that cycling and monitoring should be continued. An alternate recommendation was made to the NMOCC at this time: "Injection wells with approximately 700# well head pressure or less be reactivated and cycling expanded to take in more injectors." The NMOCC agreed to the alternate proposal and this procedure was implemented. During the monitoring and cycling, the pressure on the Citgo-State well had remained practically constant at 1150#.

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We were requested by the Hobbs Office of the New Mexico Oil Conservation Commission to perform necessary surveys in February 1974 to determine if there was any injection water leaving the unitized interval. A program was designed, undertaken and completed during March 1974 covering 28 wells within the unit area. This survey included all injection wells in the unit at that time. Analysis of data from injection profiles, temperature decay, and 24 hour temperature surveys on these wells indicated 3 wells which were not confining injection to the unitized interval, these wells were repaired. Several wells

indicated varying degrees of channeling within the unitized interval, these wells were repaired. It was our intention then, as it is now, to confine all injection to the unitized interval.

There are two wells within the unit area which had been plugged and abandoned, as recommended and approved by the Hobbs Office of the NMOCC. They requested that we re-enter and replug these wells to provide sufficient cement across the Penrose Sand interval and across intervals above which could be charged from stray water so that any movement within the wells would be eliminated. These wells were re-entered and replugged as requested by the NMOCC. The R. D. Sims etal "D" No. 2 was drilled and completed during 1948 and the Ellen Sims No. 6 during 1948. Location of these wells is southeast quarter of the Northwest quarter of Section 3 and Northwest quarter of the southeast quarter of Section 3, respectively, all located in T23S R37E. Approximately 23,000,000 barrels of water had been injected into the Penrose "A" unit area at this point in time.

Cumulative oil production from the unit area since unitization was 3,067,404 on April 1, 1977. Average daily oil production during April 1977 was approximately 650 BOPD as compared to average daily production of 1588 BOPD during October 1974 (prior to the NMOCC Order which restricted injection rates). Several wells were drilled and 7 wells had been recently stimulated which had contributed to increasing and maintaining a maximum production rate. Estimated remaining recoverable secondary reserves (as of November 1, 1974) were 1.715,000 BO. under conditions and pattern configuration in existence at that time. As may be noted on Exhibit "B" the waterflood is rate sensitive and, as the curve shows, daily oil production has steadily declined from approximately 1600 BOPD to a current rate of approximately 650 BOPD. This amounts to a 41% decline in daily production over the past two and one half years.

We feel, based on past history, that any further restrictions on injection rates, for any appreciable length of time, would do irrepairable damage to the reservoir as wells as extending the life of the project beyond economic limits: Resulting in loss of revenue to the state and federal government as well as parties to the unit.

GETTY PENROSE "B" UNIT

The Getty Penrose "B" Unit containing 63 wells became effective July 1, 1965. The Unit now contains 28 injection wells and 31 active producing wells.

Cumulative injection into the Getty Penrose "B" Unit to April 1, 1977 was 24,717,893 barrels of water. The average daily injection rate during April 1977 was 4419 BWPD at an average well head injection pressure of 1782 psig.

From start of injection to date, injection into this unit has been monitored by temperature logs and/or selected injection profiles at irregular intervals. There have been no indications from this data that injection water was going outside the unitized interval. During March 1972, a casing leak was located in well no. 32 in the interval 226' - 446' and was squeezed off during the course of other operations on the well. Well no. 53 developed a waterflow between the casing string and surface casing, this problem was repaired. Cumulative oil production from the unit area since unitization was 1,277,039 barrels of oil as of March 1, 1977. Current oil producing rate is approximately 170 barrels of oil per day.

Recently a waterflow was noted on the Penrose "B" #54 well, between the surface and production casing. The waterflow was found to be entering the casing at approximately 1180'. Two holes were perforated in the casing at that point and to date approximately 45,000 barrels have been backflowed from the well.

Plans are underway to conduct temperature, profile and possibly noise logs on all injection wells surrounding the Penrose "B" #54 injection well.

Plans are to continue monitoring of bradenhead pressures and periodic surveys of injection wells, as required and dictated by performance to insure that confinement of injected fluid is maintained. A study is now underway to evaluate the feasibility of doing additional work in the northern portion of the unit to increase ultimate reserves.

DEEPER WELLS IN THE AREA

In addition to the secondary flood units, Getty operates wells on primary production status in the area, as indicated on exhibit A. These include the Hobbs "M" lease in section 20, the J.V. Baker in section 22 and 27, and the Baker "A" leases in section 26; the Baker "C" lease in section 26, and the Ellen Sims "A" lease in section 3.

Wells on the Baker "A", Baker "C", and J.V. Baker leases were completed deeper in zones below the Penrose Sand unit. Four of these wells experienced casing leaks during the period 1973 and 1974. We were directed by the Hobbs Office of the N.M.O.C.C. on October 24, 1974 to re-enter 7 wells which were in this deeper category and run cement bond logs, perforate and bring cement back either into the next casing shoe or provide sufficient cement to tie back into the base of the salt. We concurred with the idea that it was the responsibility of the operator of the deeper wells in the area to take remedial action which would insure the placement of cement across the producing interval for shallower zones within the area of these floods. Procedures were developed, and these were approved by the Hobbs Office of the N.M.O.C.C. All of the well work, as recommended and approved by the N.M.O.C.C., has since been completed. This remedial work should insure that these wells will not continue to be a possible pipeline to transmit stray water within the area, as well as protecting the wells from collapsed casing due to external corrosion on the casing and pressure on the outside of the casing. The possibility exists that one or more of these deeper wells could have been providing a pathway to transmit stray water and have had a significant role concerning the pressured up salt section. If this was the case it is possible that the source (sources) has been "masked" through re-cementing and replugging of wells in the area.

EUNICE SALT WATER DISPOSAL WELL

The Eunice Salt Water Disposal Well No. 1 operated by the manufacturing Department of Getty Oil Company is located 2580' FSL and 1200' FWL, of Section 27, T22S, R37E, Lea County, New Mexico. This well is completed open hole 4010' to 4550' in the San Andres zone with 10 3/4" casing set at 300' and cemented to the surface and 7" casing set at 4010' and cemented back to the surface. Based on surveys on the well, water is being contained in the San Andres zone and no problems are known to exist at this time. Continued disposal of this water into the well is considered vital by Getty's Manufacturing Department to continue operation of this plant for hydrocarbon extraction from casing head gas in the area.

LPG STORAGE WELL NO. 3

The Eunice Gasoline Plant No. 1 Storage Well No. 3 is located 1650' FWL and 2310' FNL of section 27, T22S, R37E. This well was drilled to a TD of 2075' with 8 5/8" casing set at 1848' and 5 1/2" tubing set at 2045'. Completion is open hole 1848' - 2075'. A cavern is washed out in the salt interval for LPG storage. This well was completed in June 1953 and no problems were experienced until June 1974, at which time the well had product in storage. On June 29, 1974 the well developed a casing pressure of approximately 1700#. After delivery of 220,000 gallons of propane from the well, with no water input the casing pressure dropped to 1050#. Pressure was normally 700 psi on the well when delivering to the pipeline. Surveys were ran on the well which indicated the well had no casing leak but that foreign water was entering the well within the cavern. The tracer survey indicated that water was entering below the bottom of the casing in the cavern. A decision was made to cap the well and leave the water flowing thru an open casing valve to surface pits to avoid pressuring the cavern. This storage well has remained inactive since that time. This LPG storage well is no longer considered safe or satisfactory for its designed purpose.

A test conducted June 3, 1977 on this well, by the manufacturing department showed the well to be flowing approximately one half gallon per hour of water. After being shut-in for 6 hours, pressure at the surface was 78#. It appears that the problem in this area is approaching stabilization.

CONCLUSIONS AND SUMMARY

Recently a survey was conducted in an effort to determine fracturing or parting pressures on the Penrose "A" and Penrose "B" units. Current fracturing jobs were checked to evaluate the instantaneous shut in pressures. As may be noted on the tabulation, 1600# is an approximate average. Wells no. 63 & 64 were newly drilled wells when they were fractured. As the tabulation shows, the ISIP's on the 2 new wells are very similiar to the older ones.

Using 3500' as midpoint of perforations and .4775 psi/ft. for 9.2# gallon fracturing fluid, calculations indicate a bottom hole frac pressure of 3271 psi/ft. Using same data, the frac. gradient calculates to be .935 psi/ft.

Water analysis have shown density of the Penrose "A" and "B" produced water to be 8.6#/gal and make up water 8.45#/gal. Assuming 100% produced water (neglecting friction) the surface pressure could be 1710 psi without exceeding bottom hole frac pressure; and, assuming 100% makeup water the surface pressure could be 1727 psi without exceeding bottom hole frac pressure. Based on April 1977 C-120 reports, average surface injection pressures were 1683 psig on the Penrose "A" unit and 1782 psig. on the Penrose "B" unit.

We have no evidence to indicate that we are presently injecting water at sufficient pressure to cause formation fracturing. These injection pressures might be lowered somewhat through an extensive program of backflowing of injection wells, acidizing, etc. Accumulation of iron sulfide, scale and other materials in the vicinity of the borehole are definitely a contributing factor to the pressure requirements to inject water.

In summary, we do not feel that we are presently injecting above parting pressure and feel that physical evidence supports this conclusion: (1) No apparent channeling between wells (2) No wells accepting water at excessively low pressure or vacuum (3) No oil or hydrocarbons have been present in back-

flow water from the salt section. (4) Difficulty in proving or disproving that communication exists between the salt section and the pay zone, out in the reservoir. We concurr with the Eunice Area Committee recommendations as set forth at the N.M.O.C.C. meeting in Hobbs during January 1977. Getty Oil Co. requests that no further requirements be placed on our operations in the area. We will continue to work toward relieving the pressured up salt section and will put forth every effort possible to achieve this end. We are fully aware of the gravity of the situation and all Federal, State, interested parties, and others can be assured of our 100% co-operation in solving and eliminating the problem.

Penrose "A" wells	Date of Frac Job	ISIP(PSI)	Penrose "B" wells	Date of Frac Job	ISIP(PSI)
3	7/74	1500	17	11/74	1700
16	5/74	1525	23	11/74	1600
29	6/74	1650	31	9/74	1600
31	10/74	1700	44	8/74	1550
35	12/74	1600			
45	12/74	1625			
54	7/74	1600			
63	3/74	1600			
64	8/74	1600			
		1600 avg.			1600 avg.

Frac jobs consisted of approximately 50,000 gallons gelled 9.2#/gal. brine with 75,000 of sand.

(1) To determine the bottom hole frac pressure.

Mid point of pay 3500'
Surface press = 1600 psi.
9.2#/gal. frac fluid = .4775 psi/ft.

(3500FT) (.4775psi/ft) = 1671 psi press. due hydrostatic head
1600 surface press
3271 - bottom hole frac pressure

(2) To determine the frac gradient.

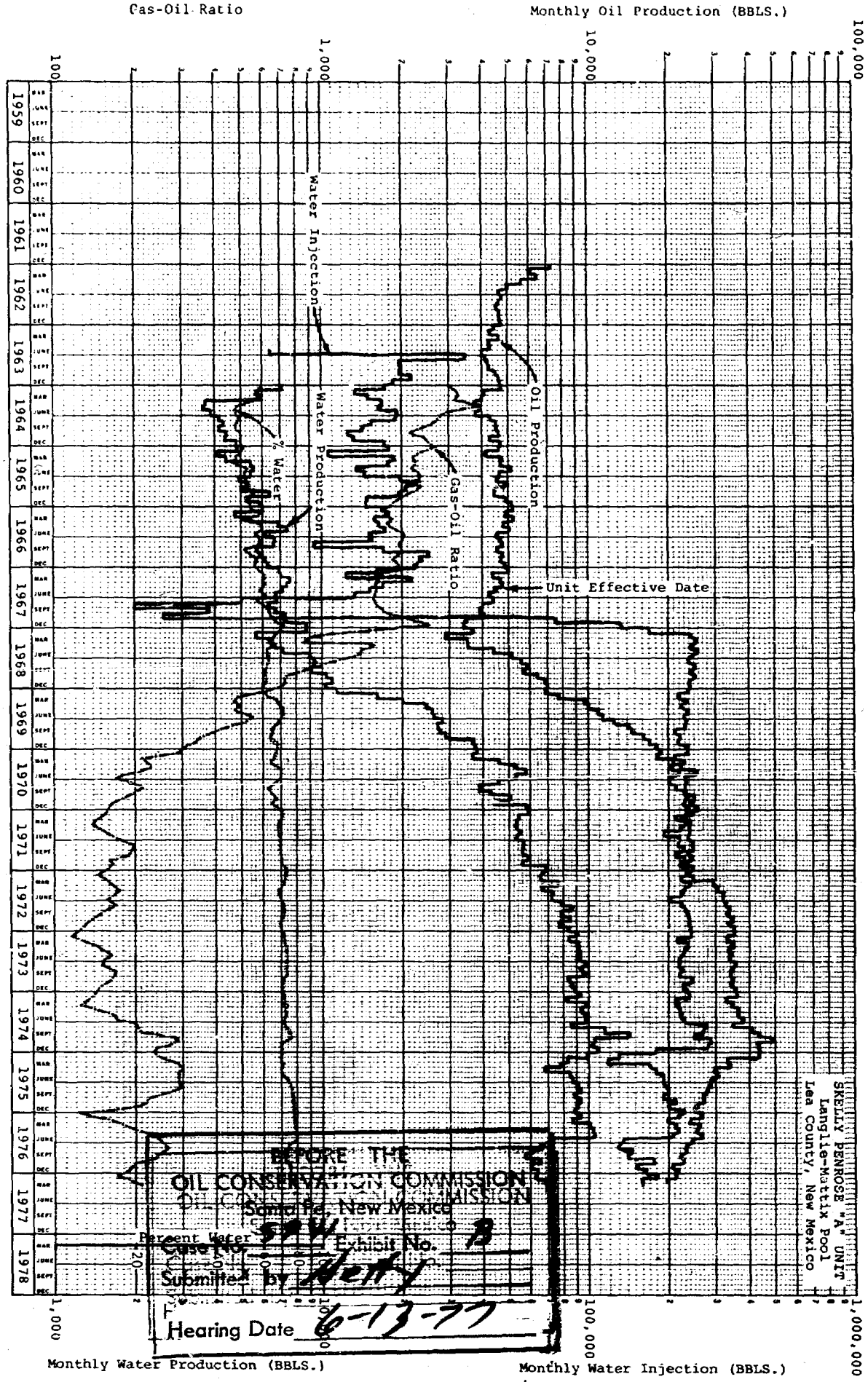
3271 = bottom hole frac press
3500 = mid pt. of perfs

3271 psi = .935 psi/ft frac gradient
3500 ft

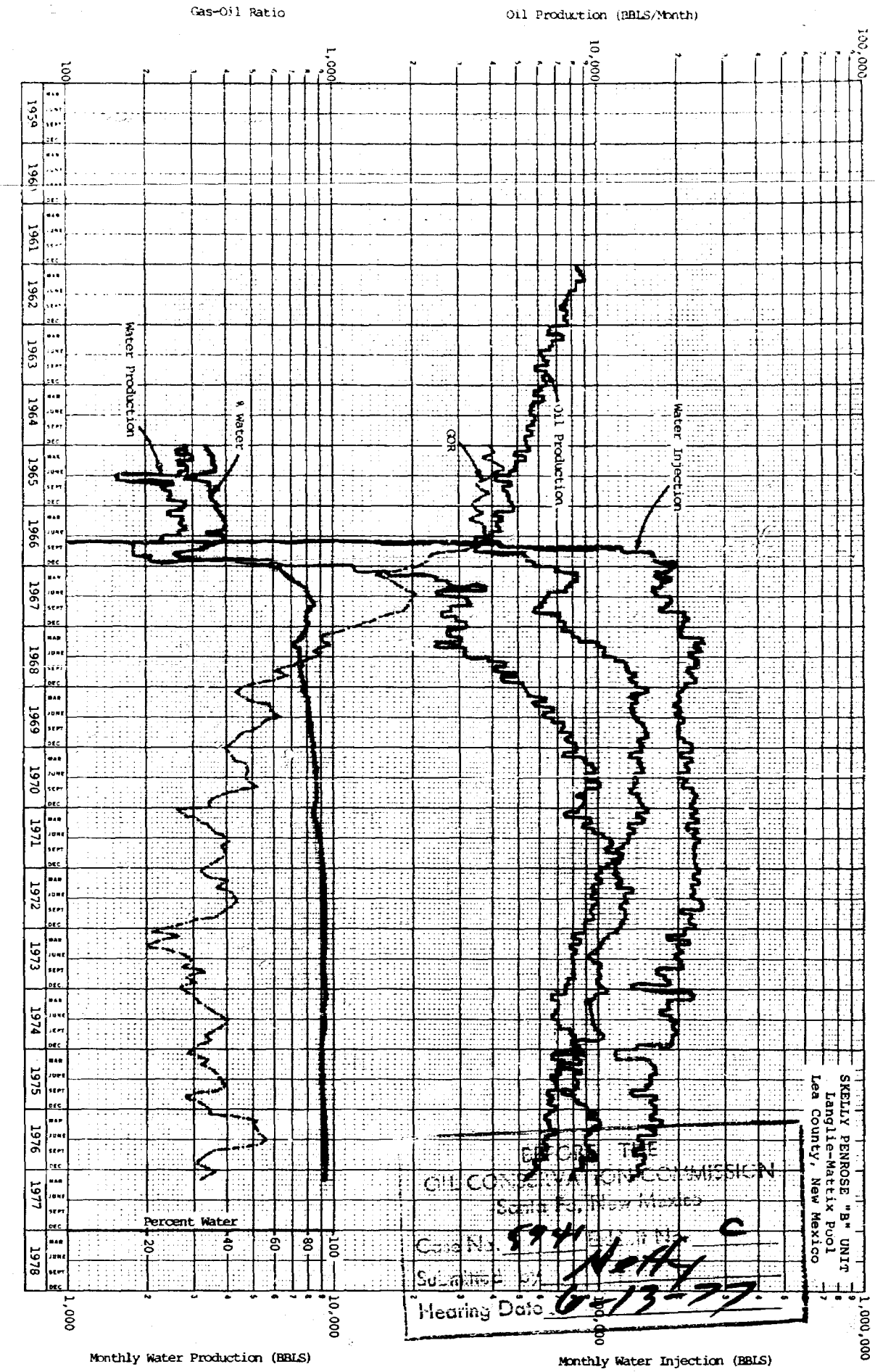
(3) To determine wellhead frac press of Penrose A & B assuming only makeup water used or produced water used.

8.45# gal - Density of makeup water
(.441 psi/ft) (3500 ft) = 1544 psi
3271 - 1544 = 1727 psi - surface frac press with makeup water

8.6# gal - Density of produced water
(.446 psi/ft) (3500) = 1561 psi
3271 -1561 = 1710 psi - surface frac press with produced water



BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5944 Exhibit No. 2
Submitted by Kelly
Hearing Date 6-13-77


Gas-Oil Ratio
Oil Production (BBLS/Month)
100,000
10,000
1,000
100
Water Production
% Water
GOR
Oil Production
Water Injection
1955
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
MAR
JUNE
SEPT
DEC
Percent Water
20
40
60
80
100
1,000
10,000
100,000
1,000,000
Monthly Water Production (BBLS)
Monthly Water Injection (BBLS)
SKELLY PENROSE "B" UNIT
Langlie-Mattix Pool
Lea County, New Mexico
OIL CONSERVATION COMMISSION
Case No. 594
Hearing Date 6-13-77

TESTIMONY
Case No. 5941

GETTY OIL COMPANY
East Eumont Unit

The Eumont structure, located in Southeast New Mexico, is primarily a gas reservoir in the Penrose Queen. Oil is produced from a rim held in place by the gas from the huge gas cap and a pinchout structure. The oil rim was discovered in 1953 and was developed on 40 acre spacing after that time.

By 1961, it was apparent that the oil rim was depleting inefficiently and additional secondary oil may be available. Unit negotiations were begun and after producing 2,956,031 barrels of primary oil (ultimate primary was estimated to be approximately 3,200,000 BO), the East Eumont Unit, consisting of 5,560 acres, was formed and made effective July 1, 1965.

The flood was developed by installing a 5-spot pilot test in the South end (most prolific portion) of the unit. While the pilot was responding, the south sector was converted to flood. In 1969 the central sector was converted to flood. The north sector is yet to be developed pending the study of water-flow problems in Southeast New Mexico.

San Andres water is used for make up water in the south sector and fresh water is used for make up water in the central sector. Both sectors have water supply wells which supplies the make up water. Two plants utilize plunger pumps powered by gas engines. The injection systems are completely protected from corrosion by coatings and linings. The gathering system consists of 5 satellites where in the gas is separated and sold and wells are tested. These satellites then pump their fluid to 2 central facilities where the oil is sold and the water is redistributed to the injection wells.

In 1970 a review of the unit was made and recommendations to survey a majority of the injectors. By the end of 1971 this had been done and all wells surveyed showed to be going into the desired intervals.

In 1973, two producers, EEU #65 and EEU # 74, were selected to be refraced in and attempt to increase their productivity. Both wells were fraced using 20,000 gallons of 9.2#/gal gelled brine water containing 20,000# 20/40 mesh sand. From this data a frac gradient on each well can be calculated.

(1) EEU # 65
BHFP = ISIP + P_h
ISIP = 2200 psi
Midpoint of perfs = 3814
P_h = 9.2 x .052 x 3814 = 1824 psi

BHFP = 2200 + 1824 = 4024 psi
Fracture gradient = 4024 ÷ 3814 = 1.06 psi/ft

(2) EEU # 74
ISIP = 2300 psi
Midpoint of perfs = 3819
P_h = 9.2 x .052 x 3819 = 1827

BHFP = 2300 + 1827 = 4127 psi
Fracture gradient = 4127 ÷ 3819 = 1.08 psi/ft.

The values of 1.06 and 1.08 psi/ft compare closely and are believed to hold true for both the south and central sectors of the East Eumont Unit.

Since unitization and thru 5-1-77 the central sector had produced 508,487 BO and 1,213,920 BW. The central sector has injected 6,928,395 BW of which 5,716,180BW was make up water. The south sector has produced 1,668,252 BO and 5,401,377 BW The south sector has injected 17,421,377 BW of which 11,997,513 was San Andres make up water. Over the life of the flood the injectors were limited to 2200 psi of surface injection pressure and not more than 350 BW/D. Over the history of the flood, the injectors slowly pressured up to the limit of 2200 psi, starting on the eastside and moving west. By early 1976 all injectors but 5 were injecting

at maximum pressure. All wells on the east flank were injecting little or no water at all, while holding 2200 psi. Based on the fore mentioned EEU #'s 65 & 74 a pressure injection gradient can be calculated. From water analysis made on the injection water the specific Gravity was found to be 1.0075 or 8.39 lb/gal. Using the average midpoint of perfs for #65 and #74 of 3815 and a surface injection pressure of 2200#

$$\therefore \frac{3864}{3815} = 1.01 \text{ psi/ft}$$

$$\begin{aligned} BHIP &= P_i + P_h \\ &= 2200 + (3815 \times .052 \times 8.39) \\ &= 3864 \text{ psi} \end{aligned}$$

This is 160 to 263 psi lower than the fracture pressures calculated earlier. Based on the above and the fact that a large no. of wells are taking little or no water with 2200# of surface pressure, the wells do not appear to be fracing out of zone.

Water injection was stopped in the south sector in August 1976 and October 1976 in the central sector. Three wells in the south sector are now being used to reinject the produced water, all at below 500 psi injection pressure. Before re-injection was limited to produced water only, the flood had an annual decline rate 12%/yr. Since August when the flood was shutdown and only produced water re-injected, the annual decline rate has been 40%/yr+. Before the unit was restricted to injection of produced water only the unit use 1.57 bbls. of make up water for each bbl. of produced water along with maintaining the 2200 psi injection pressure, thus maximizing effiency and maintain a fairly low decline rate.

From the information stated above, it can be said the unit appears to be operating below the fracture pressure of the reservoir, the zone of interest is being flooded, and make up water is required to maintain maximum efficiency.

Unless the unit is allowed to operate as before, it appears a larger portion of the secondary reserves could be lost, resulting in loss revenue for the operator, working interest owner, the state and federal government.

ATTACHMENTS

1. Figure 1 - Location of East Eumont Unit in relation to Permian Basin.
2. Figure 2 - East Eumont Unit - well plat
3. Figure 3 - East Eumont Unit - Primary and Secondary Production History

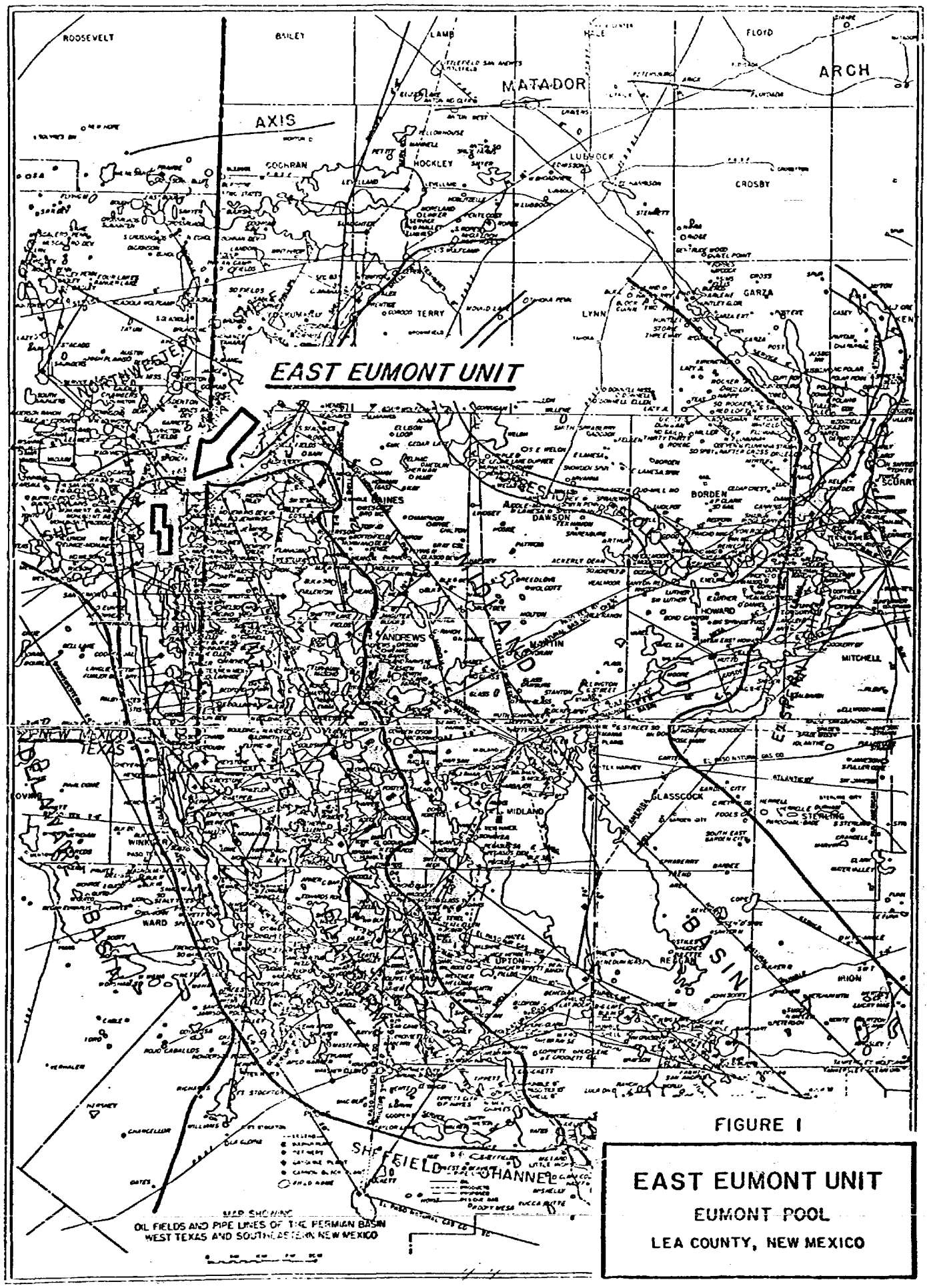


FIGURE I

EAST EUMONT UNIT

EUMONT POOL

LEA COUNTY, NEW MEXICO

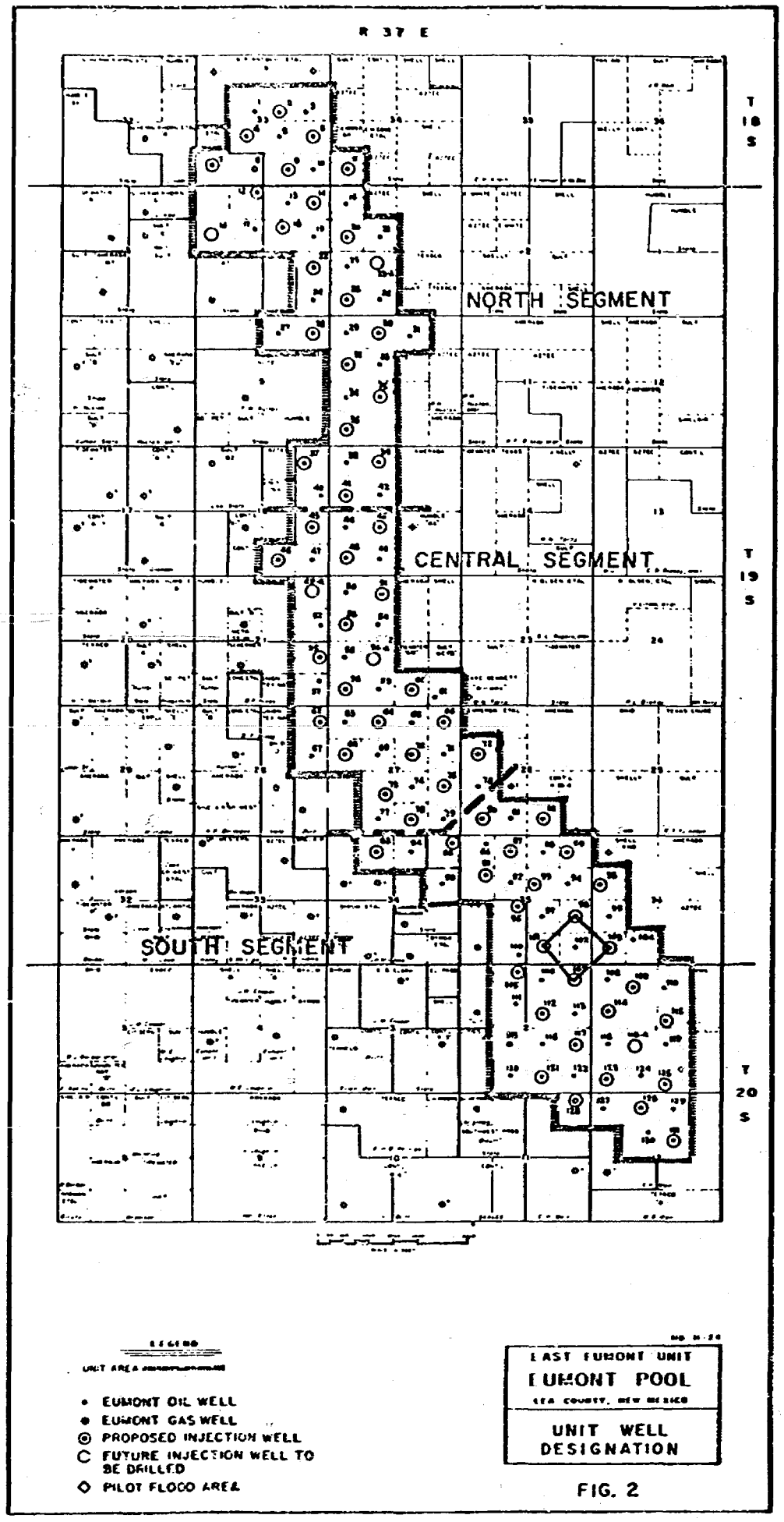

R 37 E
T 19 S
NORTH SEGMENT
CENTRAL SEGMENT
T 19 S
SOUTH SEGMENT
T 20 S
LEGEND
UNIT AREA
EUMONT OIL WELL
EUMONT GAS WELL
PROPOSED INJECTION WELL
FUTURE INJECTION WELL TO BE DRILLED
PILOT FLOOD AREA
EAST EUMONT UNIT
EUMONT POOL
LEA COUNTY, NEW MEXICO
UNIT WELL DESIGNATION

FIG. 2

GETTY OIL COMPANY
EAST EUMONT UNIT
EUMONT (Y-7R:-Q)
LEA COUNTY, NEW MEXICO

OIL PROD. (BOPM)
WATER PROD. (BWPM)

GOR (CF/B)
WATER INJ. (BBLS. X 100)

100,000
50,000
10,000
5,000
1,000
500
100

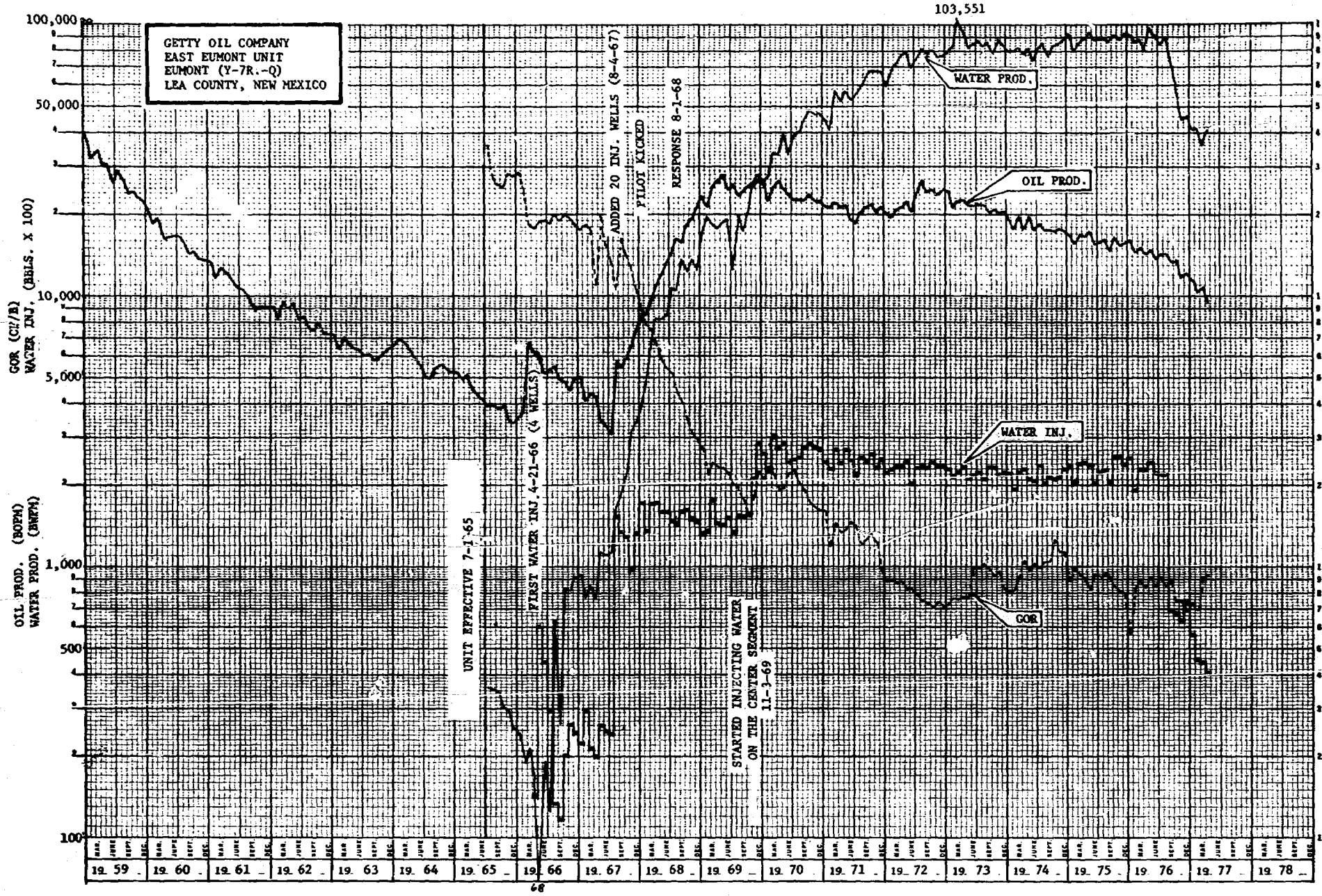
103,551

WATER PROD.
OIL PROD.
WATER INJ.
GOR

UNIT EFFECTIVE 7-1-65
FIRST WATER INJ. 4-21-66 (4 WELLS)
ADDED 20 INJ. WELLS (8-1-67)
PILOT KICKED
RESPONSE 8-1-68
STARTED INJECTING WATER ON THE CENTER SEGMENT 11-3-69

19 59 | 19 60 | 19 61 | 19 62 | 19 63 | 19 64 | 19 65 | 19 66 | 19 67 | 19 68 | 19 69 | 19 70 | 19 71 | 19 72 | 19 73 | 19 74 | 19 75 | 19 76 | 19 77 | 19 78

MAR. JUNE SEPT. DEC.


GETTY OIL COMPANY
EAST EUMONT UNIT
EUMONT (Y-7R.-Q)
LEA COUNTY, NEW MEXICO
GOR (CF/B)
WATER INJ. (BBLS. X 100)
OIL PROD. (BOPM)
WATER PROD. (BWPM)
100,000
50,000
10,000
5,000
1,000
500
100
103,551
WATER PROD.
OIL PROD.
WATER INJ.
GOR
UNIT EFFECTIVE 7-1-65
FIRST WATER INJ. 4-21-66 (4 WELLS)
ADDED 20 INJ. WELLS (8-4-67)
PILOT KICKED
RESPONSE 8-1-68
STARTED INJECTING WATER ON THE CENTER SEGMENT 11-3-69
MAR. JUNE SEPT. DEC.
19 59 19 60 19 61 19 62 19 63 19 64 19 65 19 66 19 67 19 68 19 69 19 70 19 71 19 72 19 73 19 74 19 75 19 76 19 77 19 78

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5403
Order No. R-5003

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION ON ITS OWN MOTION TO
FURTHER CONSIDER THE SUBJECT
MATTER OF CASE NO. 5377.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 22, 1975, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 29th day of April, 1975, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That on December 3, 1974, the Commission heard Case No. 5377, and thereafter entered Order No. R-4936 on December 5, 1974.

(3) That by said Order No. R-4936, the Commission found that all water being injected into the Queen and/or San Andres formations in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and in Sections 1 through 12, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico, is not being contained in the formation in which it is placed, and that injected water has appeared in formations above the top of the salt section found at a depth of approximately 1300 feet in the subject area, in the salt section from approximately 1300 feet to 2400 feet, and in formations from the base of the salt section at approximately 2400 feet to the top of the Queen formation at approximately 3400 feet.

(4) That by said Order No. R-4936, the Commission ordered that the operator of each secondary recovery injection project in Sections 14, 21, 22, 23, 26, 27, 28, 33, and 34, Township 22 South, Range 37 East, NMPM, and in Sections 3, 4, 9, and 10, Township 23 South, Range 37 East, NMPM, reduce the total injection of water into the Queen formation to an amount equalling the reservoir voidage of the Queen formation by wells in said area; further, that the operator of each secondary recovery injection project in Sections 19, 20, 29, 30, 31, and 32, Township 22 South, Range 37 East, NMPM, and in Sections 5, 6, and 8, Township 23 South, Range 37 East, NMPM, reduce the total injection of water into the Queen formation to an amount equalling 150 percent of the reservoir voidage of the Queen formation by wells in said area.

(5) That by said Order No. R-4936, the Commission further ordered that the Skelly Oil Company LPG Well No. 3, located in Unit F of Section 27, Township 22 South, Range 37 East, NMPM, be produced at the capacity of the well to flow water; further that Skelly Oil Company not dispose of any waters other than normal gasoline plant water effluent into its Eunice GP Well No. 1, located in Unit L of Section 27, Township 22 South, Range 37 East, NMPM, but that disposal into said well into the San Andres formation would be continued to be permitted; and further that continued disposal of water into the San Andres formation by Agua, Inc., and Armer Oil Company into their disposal wells located in Unit H of Section 35, Township 22 South, Range 37 East, NMPM, and Unit M of Section 2, Township 23 South, Range 37 East, NMPM, respectively, be permitted.

(6) That by said Order No. R-4936, the Commission further ordered that the operator of any well in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, or Sections 1 through 12, Township 23 South, Range 37 East, NMPM, when planning to cement or recement casing in the Queen and/or San Andres formations, notify the Hobbs district office of the Commission at least 24 hours prior to commencement of cementing operations; that the District Supervisor of the Commission notify the operator of any injection or disposal well within a radius of 1320 feet of the well to be cemented of the date and hour of commencement of cementing operations; and that the operator of such injection or disposal well cease injection into said well at least 12 hours prior to commencement of cementing operations and not resume injection for at least 36 hours after completion thereof.

(7) That by said Order No. R-4936 the Commission directed the Secretary-Director of the Commission to appoint a study committee to further investigate the condition of all wells in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and in Sections 1 through 12, Township 23 South, Range 37 East, NMPM, and that said committee report its findings and also make recommendations as to the proper remedial action or actions which should be taken or required.

(8) That the Secretary-Director of the Commission did appoint a study committee and that said committee, chaired by the Supervisor of the Hobbs District Office of the Commission, hereinafter referred to as the Supervisor, divided itself into two sub-committees, one to study and investigate the north area of the lands under consideration, being all of Sections 13 through 30, the N/2 of Section 31, the E/2 NE/4 of Section 32, the N/2 of Section 33, the N/2 and SE/4 of Section 34, and all of Sections 35 and 36, Township 22 South, Range 37 East, NMPM, and the other sub-committee to study and investigate the south area of the lands under consideration, being the S/2 of Section 31, the NW/4, W/2 NE/4 and S/2 of Section 32, the S/2 of Section 33, and the SW/4 of Section 34, Township 22 South, Range 37 East, NMPM, and all of Sections 1 through 12, Township 23 South, Range 37 East, NMPM.

(9) That in the hearing of the instant case, testimony, evidence and recommendations were presented concerning each of the aforesaid areas.

(10) That casing cement throughout the Queen formation and with a cement top of no more than 3100 feet beneath the surface of the ground has been established by the study committee as being necessary to ensure that fluids in the Queen formation and other formations beneath the Queen formation are contained in their respective formations and cannot migrate into formations above the top of the Queen formation; that the Commission concurs with said determination and hereby finds that all wells in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and in Sections 1 through 12, Township 23 South, Range 37 East, NMPM, completed in the Queen formation, or deeper, should be cemented, or recemented, to provide that there is casing cement throughout the Queen formation and immediately above, to a depth of 3100 feet beneath the surface of the ground, or less.

(11) That there exist in the "north" area some 37 deep wells which have been drilled through the Queen formation which either do not have intermediate casing strings or in which the intermediate casing string is set above 3100 feet, and in which cement around the production casing string is calculated to be insufficient to come back to at least 3100 feet beneath the surface of the ground.

(12) That the aforesaid 37 wells should be recemented with a sufficient amount of cement to ensure that there is cement around the production casing string throughout the Queen formation and immediately above to a depth of 3100 feet beneath the surface of the ground, or less; and that the aforesaid 37 wells are identified as follows:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Armer Oil Company	Keohane	1	I	26
Atlantic Richfield Co.	Boyd	2	D	23
Amerada-Hess Corp.	Walden	1	K	15
" " "	"	2	K	15
" " "	"	3	N	15
" " "	"	6	M	15
" " "	Wood	5	B	22
" " "	"	9	G	22
" " "	"	10	H	22
Cleary	Parks	7	K	14
"	"	8	J	14
"	"	9	N	14
Coquina Oil Corp.	Baker	1	B	26
Exxon Company, USA	Paddock Unit	98	H	15
Gulf Oil Corporation	Cole	5	O	16
John H. Hendrix	Cossatot F	1	C	23
Samedan Oil Corp.	Parks	3	P	14
" " "	"	4	I	14
" " "	"	5	O	14
Skelly Oil Co.	Baker A	5	E	26
" " "	Baker	9	N	22
" " "	"	10	A	27
" " "	"	11	B	27
" " "	Baker C	1	A	26
Sohio Petroleum Co.	Walden	3	F	15
" " "	"	4	E	15
" " "	"	5	E	15
Texas Pacific Oil Co., Inc.	Danglade	1	L	13
Texas Pacific Oil Co., Inc.	Walden	3	C	15
Texas Pacific Oil Co., Inc.	"	4	C	15
Texas Pacific Oil Co., Inc.	Boyd	1	G	23
Texas Pacific Oil Co., Inc.	"	2Y	H	23
Texas Pacific Oil Co., Inc.	"	3	A	23
Texas Pacific Oil Co., Inc.	"	5	B	23
Texas Pacific Oil Co., Inc.	Cary	7	F	22
Texas Pacific Oil Co., Inc.	"	8	L	22
Bruce A. Wilbanks	Baker	2	A	26

(13) That there exist in the "north" area two deep wells which have been drilled through the Queen formation which have intermediate casing strings set below 3100 feet and cemented, but in which cement around the production casing string is calculated to be insufficient to come back to the intermediate casing shoe.

(14) That the aforesaid two wells should be recemented with a sufficient amount of cement to ensure that there is cement around the production casing string throughout the Queen formation and coming up into the intermediate casing string to a depth of 3100 feet beneath the surface of the ground, or less; and that the aforesaid two wells are identified as follows:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE NAME	WELL NO.	UNIT	SECTION
Samedan Oil Corp.	Boyd	1	J	23
Skelly Oil Co.	Baker A	1	D	26

(15) That there are two plugged and abandoned wells in the "north" area which, according to the original casing and cementing programs and the plugging programs as reported, may provide passage for waters injected into the Queen and/or San Andres formations to migrate upward to the salt section.

(16) That the aforesaid two wells should be re-entered and re-plugged in such a manner as to prevent the migration of fluids from one formation to another; and that the aforesaid two wells are identified as follows:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE NAME	WELL NO.	UNIT	SECTION
Samedan Oil Corp.	Boyd	2	J	23
Wolfson Oil Co.	Boyd	1	L	23

(17) That there are five wells in the "south" area which indicate either a casing leak or waterflow on the bradenhead.

(18) That the aforesaid five wells should be entered and remedial work performed to eliminate the aforesaid conditions satisfactorily; and that the aforesaid five wells are identified as follows:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE NAME	WELL NO.	UNIT	SECTION
Skelly Oil Co.	Penrose "A" Unit	3	I	33

TOWNSHIP 23 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Skelly Oil Co.	Penrose "A" Unit	14	C	3
" " "	" " "	23	F	3
" " "	" " "	46	B	9
" " "	" " "	48	H	9

(19) That there are two plugged and abandoned wells in the "south" area which, according to the original casing and cementing programs and the plugging programs as reported may provide passage for waters injected into the Queen formation to migrate into other formations.

(20) That the aforesaid two wells should be re-entered and re-plugged in such a manner as to prevent the migration of fluids from one formation to another; and that the aforesaid two wells are identified as follows:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Skelly Oil Co.	H. O. Sims	16	M	34

TOWNSHIP 23 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Skelly Oil Co.	Sims "C"	1	N	3

(21) That there is one well in the south area which was originally drilled as a Queen sand well, but which was plugged back to an undetermined depth and converted to a fresh water well, said well being identified as the Intercoast Petroleum Corporation J. C. Clower State Well No. 1 (also known as the R. D. Sims Water Well) located in Unit E, Section 2, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico.

(22) That the plug-back procedures used on said well cannot be ascertained, but there is evidence that said procedures were inadequate to properly confine fluids in their respective strata; that said well should be re-entered and cleaned out to total depth, and re-plugged in such a manner as to prevent the migration of fluids from one formation to another.

(23) That a number of wells in the subject area, being Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and Sections 1 through 12, Township 23 South, Range 37 East, NMPM, other than those wells cited in Findings Nos. (11) through (22) above, are known to have abnormal pressures on the surface

casing or intermediate casing; that some of these wells, when the aforesaid surface- or intermediate-casing pressure was blown down, exhibited a waterflow from either the surface casing or the intermediate casing or both.

(24) That any such well which has heretofore shown a waterflow on the surface casing or intermediate casing or on which an abnormal surface casing or intermediate casing pressure has been encountered which indicates a likelihood of water movement behind the casing, should have conducted thereon a temperature survey, and remedial work performed on the well, if such work is deemed necessary by the Supervisor.

(25) That all wells in the subject area should be so equipped that periodic pressure tests can be conducted on the surface and intermediate casing strings; that such tests should be witnessed by a representative of the Commission; and that such tests should be conducted on a quarterly basis, provided that the Secretary-Director of the Commission should have the authority to change the pressure survey frequency from quarterly to semi-annually in any portion of the subject area where four such quarterly tests have been conducted and, in his opinion, the results thereof indicate that an accurate and continuous analysis of subsurface conditions may be made on the basis of such semi-annual tests.

(26) That the Supervisor should have authority to require temperature surveys (and water injection profile surveys on injection wells) on wells which exhibit abnormal surface casing or intermediate casing pressures during scheduled pressure tests or at any other time, and to require such remedial work to be performed as is necessary on such wells.

(27) That, pending additional information concerning the subject area, continued disposal of water into the San Andres formation through three wells should be permitted provided that injection not exceed certain amounts.

(28) That continued disposal into Skelly Oil Company's Eunice GP Well No. 1, located in Unit L, Section 27, Township 22 South, Range 37 East, NMPM, should be permitted provided that such disposal should be limited to gasoline plant water effluent only, and in no event should average more than 1500 barrels per day during any one-month period.

(29) That continued disposal into Agua, Inc.'s SWD Well No. H-35, located in Unit H, Section 35, Township 22 South, Range 37 East, NMPM, should be permitted provided that in no event should such disposal average more than 5500 barrels per day during any one-month period.

(30) That continued disposal into Armer Oil Company's Gulf State SWD Well No. 1, located in Unit M, Section 2, Township 23 South, Range 37 East, NMPM, should be permitted provided that in no event should such disposal average more than 350 barrels per day during any one-month period.

(31) That Skelly Oil Company should continue to produce, at its maximum capacity to flow, water currently being produced from its LPG Well No. 3, located in Unit F, Section 27, Township 22 South, Range 37 East, NMPM.

(32) That water injection volumes into the Queen formation in Sections 19, 20, 29, 30, 31, and 32, Township 22 South, Range 37 East, NMPM, and in Sections 5, 6, and 8, Township 23 South, Range 37 East, NMPM, should be limited to 150 percent of the reservoir voidage from the secondary recovery wells in said area, including oil, water, and gas produced.

(33) That water injection volumes into the Queen formation in Sections 14, 21, 22, 23, 26, 27, 28, 33, and 34, Township 22 South, Range 37 East, NMPM, and in Sections 3, 4, 9, and 10, Township 23 South, Range 37 East, NMPM, should be limited to 100 percent of the reservoir voidage from the secondary recovery wells in said area, including oil, water, and gas produced.

(34) That upon satisfactory completion of the remedial and other work described in Findings Nos. (12), (14), (16), (18), (20), (22), and (24) above, water injection volumes into the Queen formation in the area described in Finding No. (33) above should be permitted to increase to 150 percent of the reservoir voidage from the secondary recovery wells in said area, including oil, water, and gas produced.

(35) That in the event all of the remedial and other work prescribed for all wells in the "100 percent voidage" portion (Finding No. (33) above) of either the "north" area or the "south" area, as described in Finding No. (8) above, has been satisfactorily completed, the Supervisor should be authorized to permit injection volumes in that portion of said area to be increased to 150 percent of reservoir voidage, notwithstanding the fact that the prescribed remedial and other work for the other area of the 100 percent voidage portion is incomplete.

(36) That a reasonable period of time in which to accomplish the remedial and other work described in Findings Nos. (12), (14), (16), (18), (20), (22), and (24) above should be afforded, and six months from the date of entry of this order is a reasonable period of time.

(37) That workover operations are being and will continue to be conducted on certain wells in the subject area, said workover operations including the cementing or recementing of casing through the Queen and San Andres formations.

(38) That to enable the cement to properly set on said wells, water injection into any well within a radius of 1320 feet of the well being cemented or recemented should not occur for a minimum of 12 hours prior to commencement of actual cementing operations or 36 hours after completion thereof.

(39) That this case should be reopened in November, 1975, to reconsider all aspects of the case, including the possible curtailment or prohibition of underground water disposal in any or all of the three disposal wells described in Findings Nos. (28), (29), and (30).

(40) That approval of an order embodying the above findings will prevent waste of oil and gas, will protect correlative rights, and will alleviate the contamination of fresh water supplies.

IT IS THEREFORE ORDERED:

(1) That each of the following wells shall be recemented with a sufficient amount of cement to ensure that there is cement around the production casing string throughout the Queen formation and immediately above to a depth of 3100 feet beneath the surface of the ground, or less:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Armer Oil Company	Keohane	1	I	26
Atlantic Richfield Co.	Boyd	2	D	23
Amerada-Hess Corp.	Walden	1	K	15
" " "	"	2	K	15
" " "	"	3	N	15
" " "	"	6	M	15
" " "	Wood	5	B	22
" " "	"	9	G	22
" " "	"	10	H	22
Cleary	Parks	7	K	14
"	"	8	J	14
"	"	9	N	14
Coquina Oil Corp.	Baker	1	B	26
Exxon Company, USA	Paddock Unit	98	H	15
Gulf Oil Corporation	Cole	5	O	16
John H. Hendrix	Cossatot F	1	C	23

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY con'd

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Samedan Oil Corp.	Parks	3	P	14
" " "	"	4	I	14
" " "	"	5	O	14
Skelly Oil Co.	Baker A	5	E	26
" " "	Baker	9	N	22
" " "	"	10	A	27
" " "	"	11	B	27
" " "	Baker C	1	A	26
Sohio Petroleum Co.	Walden	3	F	15
" " "	"	4	E	15
" " "	"	5	E	15
Texas Pacific Oil Co., Inc.	Danglade	1	L	13
Texas Pacific Oil Co., Inc.	Walden	3	C	15
Texas Pacific Oil Co., Inc.	"	4	C	15
Texas Pacific Oil Co., Inc.	Boyd	1	G	23
Texas Pacific Oil Co., Inc.	"	2Y	H	23
Texas Pacific Oil Co., Inc.	"	3	A	23
Texas Pacific Oil Co., Inc.	"	5	B	23
Texas Pacific Oil Co., Inc.	Cary	7	F	22
Texas Pacific Oil Co., Inc.	"	8	L	22
Bruce A. Wilbanks	Baker	2	A	26

(2) That each of the following wells shall be recemented with a sufficient amount of cement to ensure that there is cement around the production casing string throughout the Queen formation and coming up into the intermediate casing string to a depth of 3100 feet beneath the surface of the ground, or less:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Samedan Oil Corp.	Boyd	1	J	23
Skelly Oil Co.	Baker A	1	D	26

(3) That each of the following wells shall be entered and remedial work performed to eliminate the existing casing leak or bradenhead water flow:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Skelly Oil Co.	Penrose "A" Unit	3	I	33

TOWNSHIP 23 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Skelly Oil Co.	Penrose "A" Unit	14	C	3
" " "	Penrose "A" Unit	23	F	3
" " "	Penrose "A" Unit	46	B	9
" " "	Penrose "A"	48	H	9

(4) That each of the following plugged and abandoned wells shall be re-entered, cleaned out into the Queen formation, and re-plugged in such a manner as to prevent the migration of fluids from one formation to another:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Samedan Oil Corp.	Boyd	2	J	23
Skelly Oil Co.	H. O. Sims	16	M	34
Wolfson Oil Co.	Boyd	1	L	23

TOWNSHIP 23 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Skelly Oil Co.	Sims "C"	1	N	3

PROVIDED HOWEVER, that in the event mechanical difficulties prevent clean-out of any of the aforesaid four wells to the prescribed depth or otherwise prevent compliance with the provisions of this order, the operator thereof shall consult with the Supervisor and arrive at a suitable plan for the satisfactory plugging of the well.

(5) That the Intercoast Petroleum Corporation-J. C. Clower State Well No. 1 (also known as the R. D. Sims Water Well) located in Unit E, Section 2, Township 23 South, Range 37 East, NMPM, shall be re-entered, cleaned out to total depth, and re-plugged in such a manner as to prevent migration of fluids from one formation to another.

PROVIDED HOWEVER, that in the event mechanical difficulties prevent clean-out of said well to total depth or otherwise prevent compliance with the provisions of this order, the operator thereof shall consult with the Supervisor and work out a plan for the satisfactory plugging of the well.

(6) That the operator of any well in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and Sections 1 through 12, Township 23 South, Range 37 East, NMPM, which well has shown a waterflow on the surface casing or intermediate casing or on which an abnormal surface casing or intermediate casing pressure has been encountered, shall notify the Supervisor of such fact, whereupon the operator and the Supervisor shall make arrangements for a temperature survey on said well; the Supervisor, upon receipt of the results of said temperature survey, shall prescribe such remedial action as in his opinion is deemed necessary on the well, which the operator of the well shall perform.

(7) That the Supervisor shall prepare and promulgate a schedule and rules for conducting quarterly pressure tests on the surface and intermediate casing strings of all wells in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, and Sections 1 through 12, Township 23 South, Range 37 East, NMPM, and he shall assign a Commission representative to witness all such tests.

(8) That the operator of each well in the area defined in Order No. (7) above shall equip each such well in such a manner that periodic pressure tests can be conducted on the surface and intermediate casing strings, and shall conduct such tests in accordance with the schedule promulgated by the Commission.

(9) That the Supervisor shall require temperature surveys (also, in the case of water injection wells, injection profile surveys) on wells which exhibit abnormal surface casing or intermediate casing pressures during the aforesaid scheduled pressure tests or at any other time. Further, he shall prescribe such remedial action to eliminate such conditions as in his opinion is deemed necessary on the well, which the operator of the well shall perform.

(10) That the Secretary-Director of the Commission shall have authority to change the frequency for the pressure tests required by Order No. (7) above from a quarterly basis to a semi-annual basis in any portion of the subject area where four such quarterly tests have been conducted and, in his opinion, the results thereof indicate that an accurate and continuous analysis of subsurface conditions may be made on the basis of such semi-annual tests.

(11) That the continued disposal of water into the Skelly Oil Company Eunice GP Well No. 1, located in Unit L, Section 27, Township 22 South, Range 37 East, NMPM, shall be permitted until further order of the Commission, provided however, that waters disposed of into said well shall be limited to normal gasoline plant water effluent, and said disposal shall not exceed an average of 1500 barrels of water per day during any one-month period.

(12) That the continued disposal of water into the Agua, Inc. SWD Well No. H-35, located in Unit H, Section 35, Township 22 South, Range 37 East, NMPM, shall be permitted until further order of the Commission, provided however, that said disposal shall not exceed an average of 5500 barrels of water per day during any one-month period.

(13) That the continued disposal of water into the Armer Oil Company Gulf State SWD Well No. 1, located in Unit M, Section 2, Township 23 South, Range 37 East, NMPM, shall be permitted until further order of the Commission, provided however, that said disposal shall not exceed an average of 350 barrels of water per day during any one-month period.

(14) That Skelly Oil Company, until further order of the Commission, shall continue to produce its LPG Well No. 3, located in Unit F, Section 27, Township 22 South, Range 37 East, NMPM, at the capacity of the well to flow water.

(15) That the operator of each secondary recovery injection well in Sections 14, 21, 22, 23, 26, 27, 28, 33, and 34, Township 22 South, Range 37 East, NMPM, and in Sections 3, 4, 9, and 10, Township 23 South, Range 37 East, NMPM, Langlie-Mattix Pool, Lea County, New Mexico, shall limit the total injection of water into the Queen formation in said sections to an amount equalling the reservoir voidage of the Queen formation by wells under his operation in said sections.

(16) That the operator of each secondary recovery injection well in Sections 19, 20, 29, 30, 31, and 32, Township 22 South, Range 37 East, NMPM, and in Sections 5, 6, and 8,

Township 23 South, Range 37 East, NMPM, Langlie-Mattix Pool, Lea County, New Mexico, shall limit the total injection of water into the Queen formation in said sections to an amount equalling 150 percent of the reservoir voidage of the Queen formation by wells under his operation in said sections.

(17) That the aforesaid limitations in water injection volumes shall take place and continue to take place on as near a current basis as possible, i.e., daily injection rates shall be in the required proportion of daily production rates as nearly as can be reasonably ascertained. In no event shall total injected volume for a given month exceed the permitted volume.

(18) That to calculate the permitted volume of water which may be injected into the Queen formation, produced oil, water, and gas shall be converted to reservoir barrels at the calculated reservoir pressure. Surface barrels of injection water shall be in the permitted proportion to reservoir barrels of voidage. The operator's Monthly Injection Report, Form C-120, shall be accompanied by the operator's calculations of reservoir voidage.

(19) That the Supervisor is hereby authorized to permit water injection into the Queen formation in wells located in Sections 14, 21, 22, 23, 26, 27, 28, the N/2 of Section 33, and the N/2 and SE/4 of Section 34, Township 22 South, Range 37 East, NMPM, to be increased to 150 percent of the reservoir voidage from the secondary recovery wells in said area, including oil, gas, and water produced, if he determines that the remedial and other work described in Findings Nos. (12), (14), and (16) above and on the applicable wells referred to in Findings Nos. (23) and (24) above has been satisfactorily completed.

(20) That the Supervisor is hereby authorized to permit water injection into the Queen formation in wells located in the S/2 of Section 33 and the SW/4 of Section 34, Township 22 South, Range 37 East, NMPM, and in Sections 3, 4, 9, and 10, Township 23 South, Range 37 East, NMPM, to be increased to 150 percent of the reservoir voidage from the secondary recovery wells in said area, including oil, gas, and water produced, if he determines that the remedial and other work described in Findings Nos. (18), (20), and (22) above and on the applicable wells referred to in Findings Nos. (23) and (24) above has been satisfactorily completed.

(21) That all work prescribed by Orders Nos. (1), (2), (3), (4), (5), and (6) above shall be completed within six months after date of entry of this order.

(22) That the operator of any well in Sections 13 through 36, Township 22 South, Range 37 East, NMPM, or Sections 1 through 12, Township 23 South, Range 37 East, NMPM, who is planning to cement or recement casing in the Queen and/or San Andres formations, shall notify the Supervisor at least 24 hours prior to commencement of cementing operations, whereupon the Supervisor shall notify the operator of any injection or disposal well within a radius of 1320 feet of said well of the date and hour the cementing operations are to be commenced. The operator of such injection well or wells shall cease injection into said wells at least 12 hours prior to commencement of cementing operations and shall not resume injection for at least 36 hours after completion thereof.

(23) That this case shall be reopened at public hearing in November, 1975, at which time all aspects of the case will be reconsidered, including the possible curtailment or prohibition of underground water disposal in any or all of the three disposal wells described in Orders Nos. (11), (12), and (13) above.

(24) That this order shall remain in full force and effect until further order of the Commission.

(25) That Commission Order No. R-4936, dated December 5, 1974, is hereby superseded.

(26) That jurisdiction of this cause is retained by the Commission for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

I. R. TRUJILLO, Chairman

PHIL R. LUCERO, Member

A. L. PORTER, Jr., Member & Secretary

S E A L

dr/

EXHIBIT A

This plat is a portion of current Land map prepared by Midland Map Co. showing data on well locations and lease ownership. The 36 section area covered by this hearing is outlined in red. Getty operated leases are shown in green and partnership leases in yellow. As indicated by the plat, it can be seen that Getty operations in the area consists of waterfloods in the Getty Penrose "A" and Penrose "B" Units, and disposal operations by Getty's (formerly Skelly) manufacturing department in section 27, T22S, R37E. The other Getty operated leases on the plat, have no injection or disposal facilities of their own; these are served by the Aqua operated Blinebry Drinkard Salt Water Disposal System, with the exception of the Ellen Sims "A" Lease which is served for disposal purposes by the Getty Penrose "A" Unit.

EXHIBIT B

This is a current performance curve on the Getty Penrose "A" operated waterflood.

EXHIBIT C

This is a current performance curve on the Getty Penrose "B" operated waterflood.

GETTY PENROSE "A" UNIT

The Getty (Skelly) Penrose "A" Unit became effective May 1, 1967. A pilot waterflood was in operation on Skelly's H.O. Sims lease prior to unitization. This is within the unit area. Cumulative injection into these two wells was 2,639,018 bbls. prior to effective date of the unit Cumulative injection since unitization into the unit area was 24,743,905 as of April 1, 1977. The daily average water injection rate during April 1977 was 5222 bbls. at 1683 psi. Total cumulative injection into the unit area to date is 27,382,923 as of April 1, 1977. The Penrose "A" Unit contained 60 wells on the effective date in 1967, of these 60 wells, 11 were drilled and completed after 1942. The remaining wells were drilled and completed from 1936 to 1942. It is a recognized fact that wells in this area have potential for considerable casing problems in all intervals, particularly within the upper 900', where the exterior is subjected to corrosion from the Santa Rosa and upper water sands. In the interim period from the effective date of the unit until now, we have located and performed remedial operations on leaks within the upper 1200' interval in a considerable number of wells. It was recognized early that this was a problem. As the record shows, we have monitored and checked regularly to detect and remedy these problems as they became evident. Additionally, we have located and repaired leaks or water flows behind pipe in the intervals from 1500' to 2500' on wells within the unit area. From start of injection to date, injection into this unit has been monitored by temperature logs/and or selected injection profiles at irregular intervals. During late 1971 and 1972 a program was initiated to install stub liners in several of the open hole wells to improve control of injected water. Eighteen liners were installed in injection wells in this unit during 1972 and 1973.

Injection profiles run immediately following these liner installations indicated that all injection was being confined to the unitized interval. We feel the record of casing leak repairs, repairs to waterflows behind casing, and liner installations within this unit should be considered as solid evidence that we have diligently attempted to confine water to the unitized interval in this waterflood project.

The first evidence of waterflow in the Penrose "A" area occurred during May of 1973 when waterflow was detected outside the casing of unit well No. 29. the well was subsequently repaired, waterflow was encountered in July 1973 during drilling operations on the Ellen Sims "A" No. 1 well, which is located immediately northeast of the unit area. Waterflow was encountered at approximately 2500'. During September 1973 unit well no. 9 developed a leak at 2569'. When the Ellen Sims "A" No. 2 well (north offset to the No. 1 well) was drilled during February 1974, no waterflow was encountered. During March 1974 a waterflow outside the casing developed in unit well no. 47; and this was followed during the next month (April 1974) by waterflows in well no. 63, which was being drilled as an infill well, at approximately 1200' and 2500'. Well no. 64 was drilled in August 1974 and encounted a waterflow at 2500'. No waterflows were encounted during drilling operations on wells 65 and 66 in October 1974. Waterflows occurred outside casing on wells no. 3 and 28, these were repaired.

We were requested by the Hobbs Office of the New Mexico Oil Conservation Commission to perform necessary surveys in February 1974 to determine if there was any injection water leaving the unitized interval. A program was designed, undertaken and completed during March 1974 covering 28 wells within the unit area. This survey included all injection wells in the unit at that time. Analysis of data from injection profiles, temperature decay, and 24 hour temperature surveys on these wells indicated 3 wells which were not confining injection to the unitized interval, these wells were repaired. Several wells

indicated varying degrees of channeling within the unitized interval, these wells were repaired. It was our intention then, as it is now, to confine all injection to the unitized interval.

There are two wells within the unit area which had been plugged and abandoned, as recommended and approved by the Hobbs Office of the NMOCC. They requested that we re-enter and replug these wells to provide sufficient cement across the Penrose Sand interval and across intervals above which could be charged from stray water so that any movement within the wells would be eliminated. These wells were re-entered and replugged as requested by the NMOCC. The R. D. Sims etal "D" No. 2 was drilled and completed during 1948 and the Ellen Sims No. 6 during 1948. Location of these wells is southeast quarter of the Northwest quarter of Section 3 and Northwest quarter of the southeast quarter of Section 3, respectively, all located in T23S R37E. Approximately 23,000,000 barrels of water had been injected into the Penrose "A" unit area at this point in time.

Cumulative oil production from the unit area since unitization was 3,067,404 on April 1, 1977. Average daily oil production during April 1977 was approximately 650 BOPD as compared to average daily production of 1588 BOPD during October 1974 (prior to the NMOCC Order which restricted injection rates). Several wells were drilled and 7 wells had been recently stimulated which had contributed to increasing and maintaining a maximum production rate. Estimated remaining recoverable secondary reserves (as of November 1, 1974) were 1.715,000 BO. under conditions and pattern configuration in existence at that time. As may be noted on Exhibit "B" the waterflood is rate sensitive and, as the curve shows, daily oil production has steadily declined from approximately 1600 BOPD to a current rate of approximately 650 BOPD. This amounts to a 41% decline in daily production over the past two and one half years.

We feel, based on past history, that any further restrictions on injection rates, for any appreciable length of time, would do irrepairable damage to the reservoir as wells as extending the life of the project beyond econcmic limits: Resulting in loss of revenue to the state and federal government as well as parties to the unit.

GETTY PENROSE "B" UNIT

The Getty Penrose "B" Unit containing 63 wells became effective July 1, 1965. The Unit now contains 28 injection wells and 31 active producing wells.

Cumulative injection into the Getty Penrose "B" Unit to April 1, 1977 was 24,717,893 barrels of water. The average daily injection rate during April 1977 was 4419 BWPD at an average well head injection pressure of 1782 psig.

From start of injection to date, injection into this unit has been monitored by temperature logs and/or selected injection profiles at irregular intervals. There have been no indications from this data that injection water was going outside the unitized interval. During March 1972, a casing leak was located in well no. 32 in the interval 226' - 446' and was squeezed off during the course of other operations on the well. Well no. 53 developed a waterflow between the casing string and surface casing, this problem was repaired. Cumulative oil production from the unit area since unitization was 1,277,039 barrels of oil as of March 1, 1977. Current oil producing rate is approximately 170 barrels of oil per day.

Recently a waterflow was noted on the Penrose "B" #54 well, between the surface and production casing. The waterflow was found to be entering the casing at approximately 1180'. Two holes were perforated in the casing at that point and to date approximately 45,000 barrels have been backflowed from the well.

Plans are underway to conduct temperature, profile and possibly noise logs on all injection wells surrounding the Penrose "B" #54 injection well.

Plans are to continue monitoring of bradenhead pressures and periodic surveys of injection wells, as required and dictated by performance to insure that confinement of injected fluid is maintained. A study is now underway to evaluate the feasibility of doing additional work in the northern portion of the unit to increase ultimate reserves.

DEEPER WELLS IN THE AREA

In addition to the secondary flood units, Getty operates wells on primary production status in the area, as indicated on exhibit A. These include the Hobbs "M" lease in section 20, the J.V. Baker in section 22 and 27, and the Baker "A" leases in section 26; the Baker "C" lease in section 26, and the Ellen Sims "A" lease in section 3.

Wells on the Baker "A", Baker "C", and J.V. Baker leases were completed deeper in zones below the Penrose Sand unit. Four of these wells experienced casing leaks during the period 1973 and 1974. We were directed by the Hobbs Office of the N.M.O.C.C. on October 24, 1974 to re-enter 7 wells which were in this deeper category and run cement bond logs, perforate and bring cement back either into the next casing shoe or provide sufficient cement to tie back into the base of the salt. We concurred with the idea that it was the responsibility of the operator of the deeper wells in the area to take remedial action which would insure the placement of cement across the producing interval for shallower zones within the area of these floods. Procedures were developed, and these were approved by the Hobbs Office of the N.M.O.C.C. All of the well work, as recommended and approved by the N.M.O.C.C., has since been completed. This remedial work should insure that these wells will not continue to be a possible pipeline to transmit stray water within the area, as well as protecting the wells from collapsed casing due to external corrosion on the casing and pressure on the outside of the casing. The possibility exists that one or more of these deeper wells could have been providing a pathway to transmit stray water and have had a significant role concerning the pressured up salt section. If this was the case it is possible that the source (sources) has been "masked" through re-cementing and replugging of wells in the area.

EUNICE SALT WATER DISPOSAL WELL

The Eunice Salt Water Disposal Well No. 1 operated by the manufacturing Department of Getty Oil Company is located 2580' FSL and 1200' FWL, of Section 27, T22S, R37E, Lea County, New Mexico. This well is completed open hole 4010' to 4550' in the San Andres zone with 10 3/4" casing set at 300' and cemented to the surface and 7" casing set at 4010' and cemented back to the surface. Based on surveys on the well, water is being contained in the San Andres zone and no problems are known to exist at this time. Continued disposal of this water into the well is considered vital by Getty's Manufacturing Department to continue operation of this plant for hydrocarbon extraction from casing head gas in the area.

LPG STORAGE WELL NO. 3

The Eunice Gasoline Plant No. 1 Storage Well No. 3 is located 1650' FWL and 2310' FNL of section 27, T22S, R37E. This well was drilled to a TD of 2075' with 8 5/8" casing set at 1848' and 5 1/2" tubing set at 2045'. Completion is open hole 1848' - 2075'. A cavern is washed out in the salt interval for LPG storage. This well was completed in June 1953 and no problems were experienced until June 1974, at which time the well had product in storage. On June 29, 1974 the well developed a casing pressure of approximately 1700#. After delivery of 220,000 gallons of propane from the well, with no water input the casing pressure dropped to 1050#. Pressure was normally 700 psi on the well when delivering to the pipeline. Surveys were ran on the well which indicated the well had no casing leak but that foreign water was entering the well within the cavern. The tracer survey indicated that water was entering below the bottom of the casing in the cavern. A decision was made to cap the well and leave the water flowing thru an open casing valve to surface pits to avoid pressuring the cavern. This storage well has remained inactive since that time. This LPG storage well is no longer considered safe or satisfactory for its designed purpose.

A test conducted June 3, 1977 on this well, by the manufacturing department showed the well to be flowing approximately one half gallon per hour of water. After being shut-in for 6 hours, pressure at the surface was 78#. It appears that the problem in this area is approaching stabilization.

CONCLUSIONS AND SUMMARY

Recently a survey was conducted in an effort to determine fracturing or parting pressures on the Penrose "A" and Penrose "B" units. Current fracturing jobs were checked to evaluate the instantaneous shut in pressures. As may be noted on the tabulation, 1600# is an approximate average. Wells no. 63 & 64 were newly drilled wells when they were fractured. As the tabulation shows, the ISIP's on the 2 new wells are very similiar to the older ones.

Using 3500' as midpoint of perforations and .4775 psi/ft. for 9.2# gallon fracturing fluid, calculations indicate a bottom hole frac pressure of 3271 psi/ft. Using same data, the frac. gradient calculates to be .935 psi/ft.

Water analysis have shown density of the Penrose "A" and "B" produced water to be 8.6#/gal and make up water 8.45#/gal. Assuming 100% produced water (neglecting friction) the surface pressure could be 1710 psi without exceeding bottom hole frac pressure; and, assuming 100% makeup water the surface pressure could be 1727 psi without exceeding bottom hole frac pressure. Based on April 1977 C-120 reports, average surface injection pressures were 1683 psig on the Penrose "A" unit and 1782 psig. on the Penrose "B" unit.

We have no evidence to indicate that we are presently injecting water at sufficient pressure to cause formation fracturing. These injection pressures might be lowered somewhat through an extensive program of backflowing of injection wells, acidizing, etc. Accumulation of iron sulfide, scale and other materials in the vicinity of the borehole are definitely a contributing factor to the pressure requirements to inject water.

In summary, we do not feel that we are presently injecting above parting pressure and feel that physical evidence supports this conclusion: (1) No apparent channeling between wells (2) No wells accepting water at excessively low pressure or vacuum (3) No oil or hydrocarbons have been present in back-

flow water from the salt section. (4) Difficulty in proving or disproving that communication exists between the salt section and the pay zone, out in the reservoir. We concurr with the Eunice Area Committee recommendations as set forth at the N.M.O.C.C. meeting in Hobbs during January 1977. Getty Oil Co. requests that no further requirements be placed on our operations in the area. We will continue to work toward relieving the pressured up salt section and will put forth every effort possible to achieve this end. We are fully aware of the gravity of the situation and all Federal, State, interested parties, and others can be assured of our 100% co-operation in solving and eliminating the problem.

Penrose "A" wells	Date of Frac Job	ISIP(PSI)	Penrose "B" wells	Date of Frac Job	ISIP(PSI)
3	7/74	1500	17	11/74	1700
16	5/74	1525	23	11/74	1600
29	6/74	1650	31	9/74	1600
31	10/74	1700	44	8/74	1550
35	12/74	1600			
45	12/74	1625			
54	7/74	1600			
63	3/74	1600			
64	8/74	1600			
		1600 avg.			1600 avg.

Frac jobs consisted of approximately 50,000 gallons gelled 9.2#/gal. brine with 75,000 of sand.

(1) To determine the bottom hole frac pressure.

Mid point of pay 3500'
Surface press = 1600 psi.
9.2#/gal. frac fluid = .4775 psi/ft.

(3500FT) (.4775psi/ft) = 1671 psi press. due hydrostatic head
1600 surface press
3271 - bottom hole frac pressure

(2) To determine the frac gradient.

3271 = bottom hole frac press
3500 = mid pt. of perfs

3271 psi / 3500 ft = .935 psi/ft frac gradient

(3) To determine wellhead frac press of Penrose A & B assuming only makeup water used or produced water used.

8.45# gal - Density of makeup water
(.441 psi/ft) (3500 ft) = 1544 psi
3271 - 1544 = 1727 psi - surface frac press with makeup water

8.6# gal - Density of produced water
(.446 psi/ft) (3500) = 1561 psi
3271 -1561 = 1710 psi - surface frac press with produced water

STATEMENT

EUNICE AREA WATERFLOW COMMITTEE

DISCUSSION OF ACTIVITIES

The Eunice Area Committee became operational on May 10, 1976. Charge to the Committee was to collect, analyze data and present recommendations to the NMOCC District Supervisor on measures considered pertinent to developing data on the waterflow problem in the area and to locate the source or sources feeding the waterflows.

Monitoring points with possible connection to the pressured salt section were selected for use. A total of fifteen wells were initially shut-in for observation. The wells consisted of 7 injection wells, 6 producing wells, 1 shut-in producing well and 1 disposal well. Pressure recorders were used to monitor performance on the shut-in wells until June 17, 1976. At this time, pressure in the shut-in injection wells had decreased substantially below readings on monitor points with virtually no change in recorded pressure on the Citgo well. The Petro-Search Citgo State No. 1, located in unit E, Section 2, T235, R37E, had been found to have water entering the well bore behind the 4 1/2" O.D. production casing from 2470' - 2500' and moving up the hole, and had 1185# well head pressure. The Committee recommended to the NMOCC that injection be resumed into the injectors, and plans be made to "blow down" the pressured up salt section in the Citgo State No. 1. Thoughts at the time were to discontinue cycling, and attempt to determine if we were dealing with a localized or widespread pressure situation. The NMOCC felt that cycling and monitoring should be continued. An alternate recommendation was made to the NMOCC at this time: "Injection wells with approximately 700# well head pressure or less be reactivated and cycling expanded to take in more injectors." The NMOCC agreed to the alternate proposal and this procedure was implemented. During the monitoring and cycling, the pressure on the Citgo-State well had remained practically constant at 1150#.

Due to discouraging results from cycling and testing, a recommendation was made by the Committee at the July 21, 1976, meeting that (1) injectors which are high pressure and low volume, and (2) those which have shown little or no pressure variation during shut-in be backflowed and tested, in a further attempt to determine if communication exists between the concerned injection wells and the Citgo-State well. Guidelines for the backflowing and build up procedure were: "Backflow the well for a minimum of 48 hours and at such time as the flow rate is 100 barrels per day or less, shut the well in for pressure build up. If pressure does not build up past 800# in 48 hours, return the well to injection." From this time forward, wells were checked for pressure drop, backflowed, (rates and pressures monitored) and build ups ran following backflow. Upon recommendation from the Committee, and approval from the NMOCC, wells were returned to injection as warranted by results.

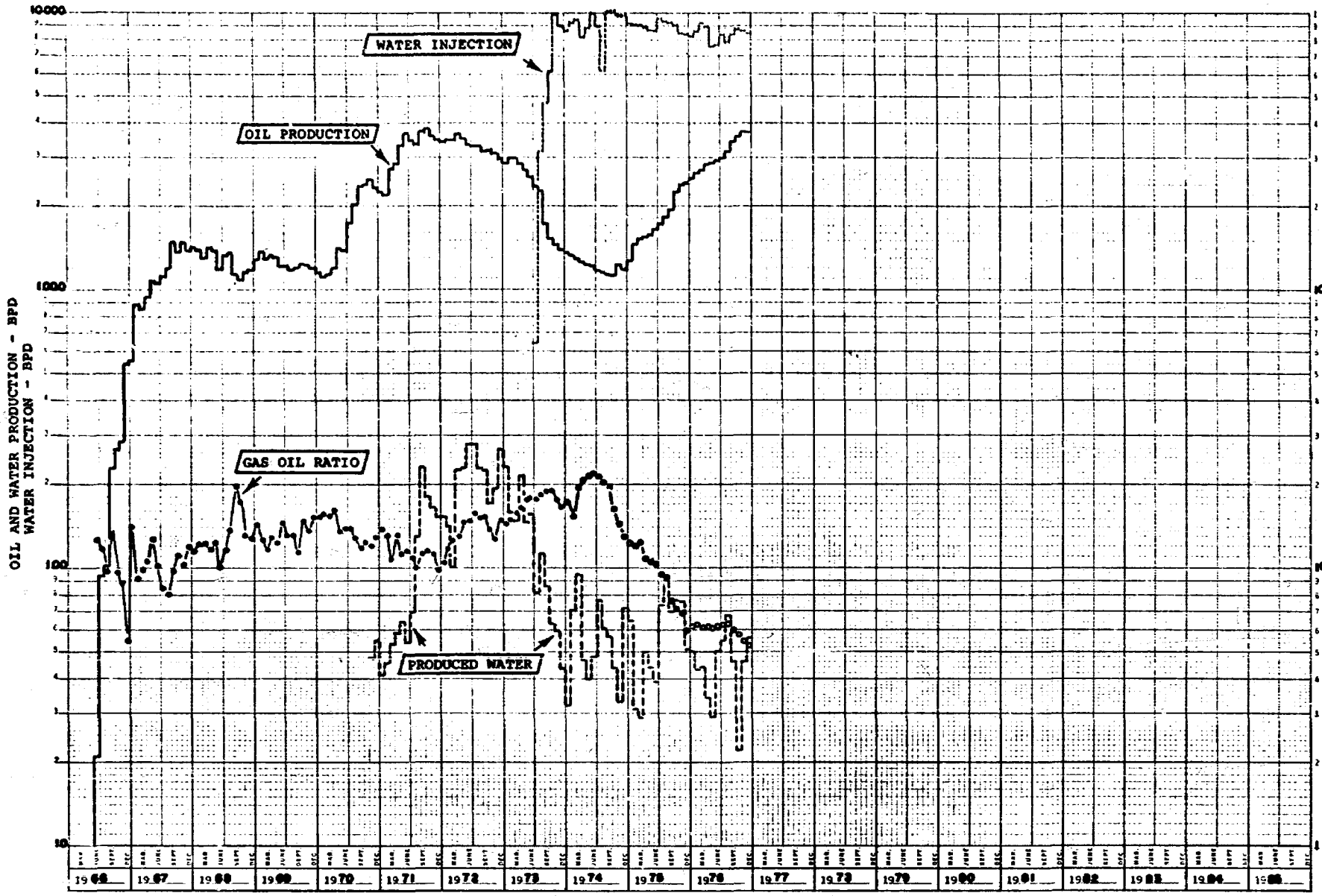
At the Committee meeting on August 26, 1976, approval was given by the NMOCC to suspend the present testing procedure and make plans to backflow the Citgo-State. Fourteen Skelly and Anadarko wells were to be shut-in one week prior to backflow. On September 19, 1976, backflowing of the Citgo-State well was begun. At time of opening, the well had 1010# on surface. After 60 hours the well had flowed back approximately 40,000 barrels of 9.9# brine. Initial flowing pressure was 210# at a rate of 9 BPM. After 60 hours flow pressure had decreased to 70# and rate was 2-3 BPM. During the ten day flowing period, the well flowed back an estimated 63,000 barrels. The fourteen wells were closely monitored during backflow with pressure recorders. No pressure interference was noted on any of the wells. As soon as pressure and flow rate would permit, Petro-Search re-entered, plugged and abandoned the well.

The test wells were later returned to injection and monitoring discontinued, with the exception of 4 wells which had previously shown bradenhead pressures. These wells still have pressure recorders attached and have consistently fell off in pressure since backflowing the Citgo-State and return to injection of surrounding wells. These wells are: Skelly Penrose "A" No. 44 from 725# to 15#; Skelly Penrose "B" No. 54 from 90# to vacuum and Skelly Penrose "B" No. 52 from 120# to 60#. Subsequent work of the Committee has consisted of re-evaluating all available temperature and tracer logs in the area and analyzing our logs as they become available.

Wells which had abnormal temperature gradients have been, and are being re-logged to confirm data as interpreted from previous logs. Several noise logs have been and are now being run. Skelly perforated the Skelly Penrose "A" No. 64 at 1460' opposite a waterflow which was encountered during drilling of the well approximately 2 years ago. Prior to perforating, the well was producing 9 BO and 40 BW per day. Current producing rate is 8 BO and 43 BW per day. The perforations were acidized and broken down but attempts were futile to establish the waterflow. Based on a waterflow which was encountered in the lower salt section, additional perforating was done, acidizing and breakdown failed to establish flow from the lower salt section.

On January 14, 1977, a noise log was ran on the Skelly J.V. Baker No. 11 in an attempt to determine if cycling was occuring between Anadarkos' injection well No. 13-C7 and J.V. Baker No. 11, which is a Drinkard producer. It appeared that possibly water which was being injected into the Penrose section might be channeling across to the Baker well and moving up and back to the injection well. No upward or downward movement adjacent to the injection zone was indicated by the log. Logs ran during 1975 on the Anadarko well had shown possible migration

across the salt section. Recent logging by two different companies have failed to confirm this. On March 27, 1977, a surface flow from the oil string annulus was noted on the Skelly Penrose "B" No. 54. A noise type log was run and water movement was confirmed at 1180', two holes were perforated at 1180' and to date the well has flowed back approximately 45,000 barrels of salt water. Frequent washing with fresh water is required to prevent salting up. Recently the flow back has been decreasing and steps are being taken to insure that the well is kept free and clear of any restrictions which might hinder the flow. Subsequent logging of wells on the Anadarko Langlie Mattix Penrose Sand Unit and Skelly Penrose A and Penrose B waterfloods have failed to indicate major storage of water which would warrant perforating of casing to establish flow.



TIME-YEARS

Mobil Oil Corporation
Houston E & P Division

PRODUCTION HISTORY
NORTH VACUUM ABO UNIT
LEA COUNTY, NEW MEXICO

Scale
Date 2-16-77
Drawn ECM
Checked
Approved
Revised

VACUUM N. ABO UN.

TESTIMONY
Case No. 5941

GETTY OIL COMPANY
East Eumont Unit

Exhibit D

The Eumont structure, located in Southeast New Mexico, is primarily a gas reservoir in the Penrose Queen. Oil is produced from a rim held in place by the gas from the huge gas cap and a pinchout structure. The oil rim was discovered in 1953 and was developed on 40 acre spacing after that time.

By 1961, it was apparent that the oil rim was depleting inefficiently and additional secondary oil may be available. Unit regotiations were begun and after producing 2,956,031 barrels of primary oil (ultimate primary was estimated to be approximately 3,200,000 BO), the East Eumont Unit, consisting of 5,560 acres, was formed and made effective July 1, 1965.

The flood was developed by installing a 5-spot pilot test in the South end (most prolific portion) of the unit. While the pilot was responding, the south sector was converted to flood. In 1969 the central sector was converted to flood. The north sector is yet to be developed pending the study of water-flow problems in Southeast New Mexico.

San Andres water is used for make up water in the south sector and fresh water is used for make up water in the central sector. Both sectors have water supply wells which supplies the make up water. Two plants utilize plunger pumps powered by gas engines. The injection systems are completely protected from corrosion by coatings and linings. The gathering system consists of 5 satellites where in the gas is separated and sold and wells are tested. These satellites then pump their fluid to 2 central facilities where the oil is sold and the water is redistributed to the injection wells.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5941 Exhibit No. D
Submitted by Getty Oil Co.
Hearing Date 6/15/72

In 1970 a review of the unit was made and recommendations to survey a majority of the injectors. By the end of 1971 this had been done and all wells surveyed showed to be going into the desired intervals.

In 1973, two producers, EEU #65 and EEU # 74, were selected to be refraced in and attempt to increase their productivity. Both wells were fraced using 20,000 gallons of 9.2#/gal gelled brine water containing 20,000# 20/40 mesh sand. From this data a frac gradient on each well can be calculated.

(1) EEU # 65
BHFP = ISIP + P_h
ISIP = 2200 psi
Midpoint of perfs = 3814
P_h = 9.2 x .052 x 3814 = 1824 psi

BHFP = 2200 + 1824 = 4024 psi
Fracture gradient = 4024 ÷ 3814 = 1.06 psi/ft

(2) EEU # 74
ISIP = 2300 psi
Midpoint of perfs = 3819
P_h = 9.2 x .052 x 3819 = 1827

BHFP = 2300 + 1827 = 4127 psi
Fracture gradient = 4127 ÷ 3819 = 1.08 psi/ft.

The values of 1.06 and 1.08 psi/ft compare closely and are believed to hold true for both the south and central sectors of the East Eumont Unit.

Since unitization and thru 5-1-77 the central sector had produced 508,487 BO and 1,213,920 BW. The central sector has injected 6,928,395 BW of which 5,716,180BW was make up water. The south sector has produced 1,668,252 BO and 5,401,377 BW The south sector has injected 17,421,377 BW of which 11,997,513 was San Andres make up water. Over the life of the flood the injectors were limited to 2200 psi of surface injection pressure and not more than 350 BW/D. Over the history of the flood, the injectors slowly pressured up to the limit of 2200 psi, starting on the eastside and moving west. By early 1976 all injectors but 5 were injecting

at maximum pressure. All wells on the east flank were injecting little or no water at all, while holding 2200 psi. Based on the fore mentioned EEU #'s 65 & 74 a pressure injection gradient can be calculated. From water analysis made on the injection water the specific Gravity was found to be 1.0075 or 8.39 lb/gal. Using the average midpoint of perfs for #65 and #74 of 3815 and a surface injection pressure of 2200#

$$\therefore \frac{3864\#}{3815} = 1.01\ psi/ft$$

$$\begin{aligned} BHIP &= P_i + P_h \\ &= 2200 + (3815 \times .052 \times 8.39) \\ &= 3864\ psi \end{aligned}$$

This is 160 to 263 psi lower than the fracture pressures calculated earlier. Based on the above and the fact that a large no. of wells are taking little or no water with 2200# of surface pressure, the wells do not appear to be fracing out of zone.

Water injection was stopped in the south sector in August 1976 and October 1976 in the central sector. Three wells in the south sector are now being used to reinject the produced water, all at below 500 psi injection pressure. Before re-injection was limited to produced water only, the flood had an annual decline rate 12%/yr. Since August when the flood was shutdown and only produced water re-injected, the annual decline rate has been 40%/yr+. Before the unit was restricted to injection of produced water only the unit use 1.57 bbls. of make up water for each bbl. of produced water along with maintaining the 2200 psi injection pressure, thus maximizing effiency and maintain a fairly low decline rate.

From the information stated above, it can be said the unit appears to be operating below the fracture pressure of the reservoir, the zone of interest is being flooded, and make up water is required to maintain maximum efficiency.

Unless the unit is allowed to operate as before, it appears a larger portion of the secondary reserves could be lost, resulting in loss revenue for the operator, working interest owner, the state and federal government.

ATTACHMENTS

1. Figure 1 - Location of East Eumont Unit in relation to Permian Basin.
2. Figure 2 - East Eumont Unit - well plat
3. Figure 3 - East Eumont Unit - Primary and Secondary Production History

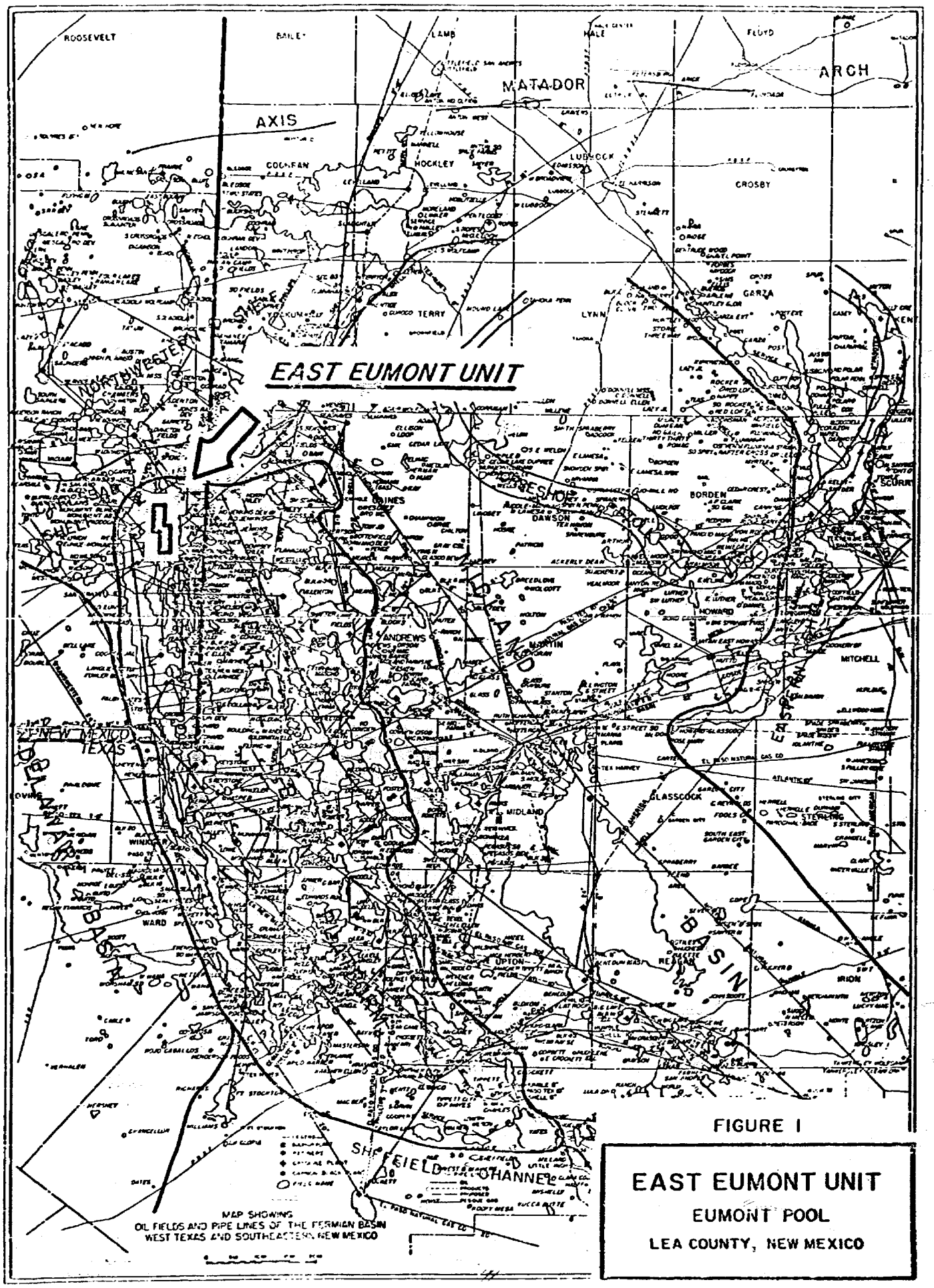


FIGURE 1

EAST EUMONT UNIT

EUMONT POOL

LEA COUNTY, NEW MEXICO

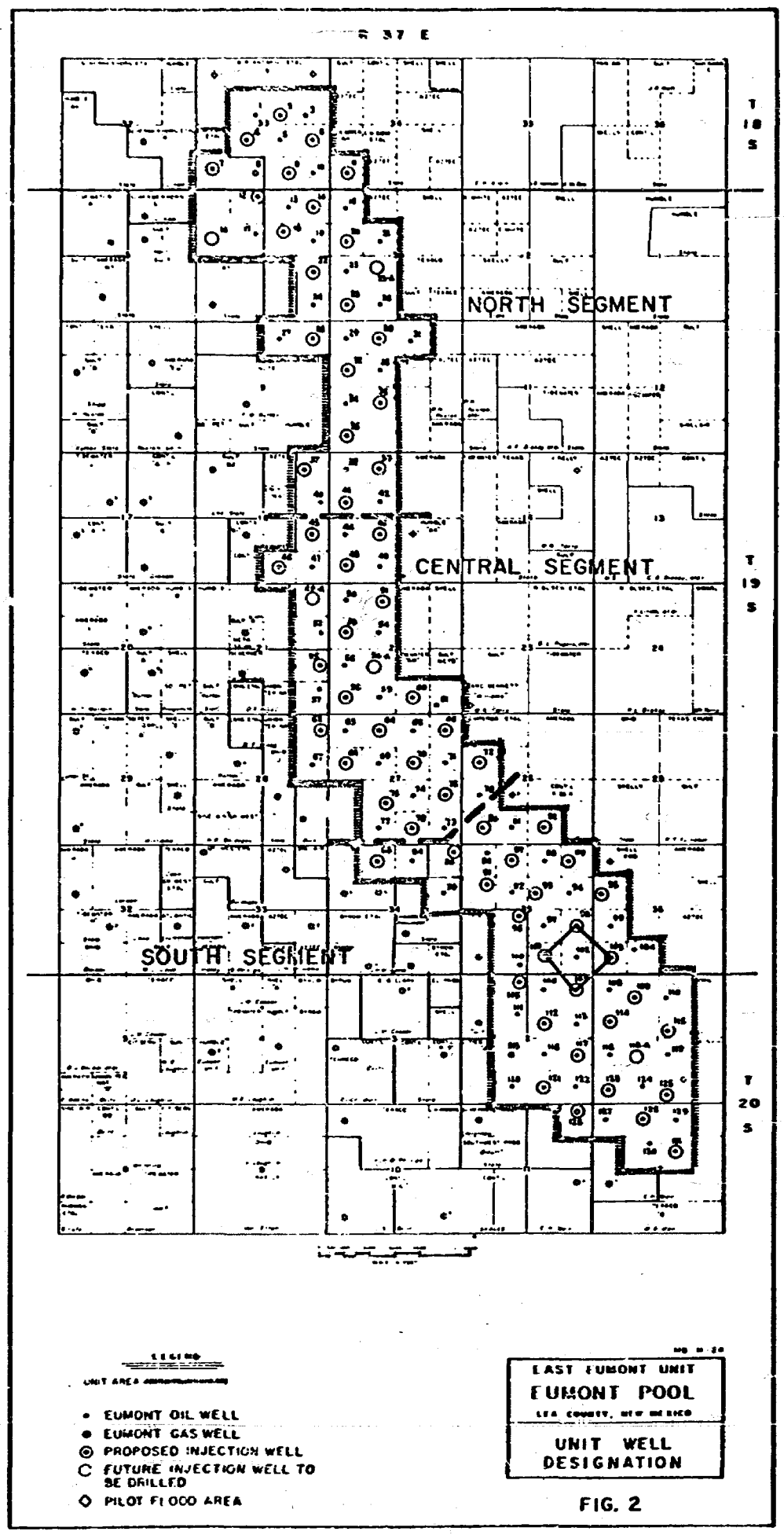

R 37 E
T 19 S
T 20 S
NORTH SEGMENT
CENTRAL SEGMENT
SOUTH SEGMENT
LEGEND
UNIT AREA
EUMONT OIL WELL
EUMONT GAS WELL
PROPOSED INJECTION WELL
FUTURE INJECTION WELL TO BE DRILLED
PILOT FLOOD AREA
EAST EUMONT UNIT
EUMONT POOL
LEA COUNTY, NEW MEXICO
UNIT WELL DESIGNATION

FIG. 2

GETTY OIL COMPANY
EAST EUMONT UNIT
EUMONT (Y-7R:-Q)
LEA COUNTY, NEW MEXICO

GOR (CF/B)
WATER INJ. (BBLS. X 100)
OIL PROD. (BOPM)
WATER PROD. (BWPM)

100,000
50,000
10,000
5,000
1,000
500
100

103,551

WATER PROD.
OIL PROD.
WATER INJ.
GOR

UNIT EFFECTIVE 7-1-65
FIRST WATER INJ. 4-21-66 (4 WELLS)
ADDED 20 INJ. WELLS (8-4-67)
PILOT KICKED
RESPONSE 8-1-68
STARTED INJECTING WATER ON THE CENTER SEGMENT 11-3-69

19. 59 | 19. 60 | 19. 61 | 19. 62 | 19. 63 | 19. 64 | 19. 65 | 19. 66 | 19. 67 | 19. 68 | 19. 69 | 19. 70 | 19. 71 | 19. 72 | 19. 73 | 19. 74 | 19. 75 | 19. 76 | 19. 77 | 19. 78

68

SKELLY PENROSE "A" UNIT
Langlie-Mattix Pool
Lea County, New Mexico

Monthly Oil Production (BBLS.)

Gas-Oil Ratio

Monthly Water Injection (BBLS.)

Monthly Water Production (BBLS.)

Percent Water

Unit Effective Date

Oil Production

Gas-Oil Ratio

Water Injection

Water Production

% Water

100,000
10,000
1,000
100
1,000,000
100,000
10,000
1,000
100
80
60
40
20

1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 7227
Hearing Date
Submitted by

SKELLY PENROSE "B" UNIT
Langlie-Mattix Pool
Lea County, New Mexico

Oil Production (BBLS/Month)

Gas-Oil Ratio

Monthly Water Injection (BBLS)

Monthly Water Production (BBLS)

Percent Water

Water Injection

Oil Production

GOR

% Wate

Water Production

100,000
10,000
1,000
100

1,000,000
100,000
10,000
1,000

100
80
60
40
20

1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978

BEFORE THE OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5791 Exhibit No. 5
Submitted by
Hearing Date 6-13-79

EXHIBIT 1

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5762
Order No. R-5295

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR A WATERFLOOD PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 15, 1976, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 12th day of October, 1976, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Atlantic Richfield Company, seeks authority to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through 11 injection wells located in Unit M of Section 29, Units A and I of Section 31 and Units C, E, G, I, K, M, N, and O of Section 32, all in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico.

(3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper wells.

(4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the Cole Darden Oil Company Hale State Well No. 1 in Unit A, Section 31, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico, was not plugged and abandoned in a manner such as to assure that water injected through said State Vacuum Unit injection wells will not migrate from the Grayburg-San Andres formation to other formations or the surface.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Case No. 5941 Exhibit No. 1
Submitted by ARCo.
Hearing Date 6-13-77.

Exhibit 1 - pg. 2

(6) That injection pressure around said Cole Darden Oil Company Hale State Well No. 1 should be limited to prevent such migration.

(7) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(8) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Atlantic Richfield Company, is hereby authorized to institute a waterflood project on its State Vacuum Unit, Vacuum Pool, by the injection of water into the Grayburg-San Andres formation through the following-described wells in Township 17 South, Range 34 East, NMPM, Lea County, New Mexico:

State Vacuum Unit Well No.	Unit	Section	Township	Range
1	N	29	17S	34E
2	A	31	17S	34E
4	C	32	17S	34E
7	E	32	17S	34E
9	G	32	17S	34E
11	I	31	17S	34E
13	K	32	17S	34E
15	I	32	17S	34E
17	M	32	17S	34E
19	O	32	17S	34E
21	M	32	17S	34E

(2) That injection into each of said wells should be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation, or in the case of an open-hole completion, to the casing shoe; that the casing-tubing annulus of each injection well shall be tested for leaks, be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device, and that the injection wells or system shall be equipped in such a manner as to limit wellhead pressure to no more than 860 psi.

(3) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of 860 psi upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5941 Exhibit No. 1
Submitted by: ARCO
Hearing Date 6-13-77

Exhibit 1 - pg. 3

(4) That there shall be no injection under pressure into the Cole Darden Oil Company Hale State Well No. 1 in Unit A of Section 31, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, or into any well on said 40-acre tract or any 40-acre tract directly or diagonally offsetting said well, until said well has been reentered and replugged in accordance with a Commission approved plugging program or said well has been equipped in such a manner as to monitor for leaks below the salt section.

(5) That the operator shall immediately notify the supervisor of the Commission's Hobbs district office of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(6) That the subject waterflood project is hereby designated the ARCO State Vacuum Unit Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(7) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(8) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

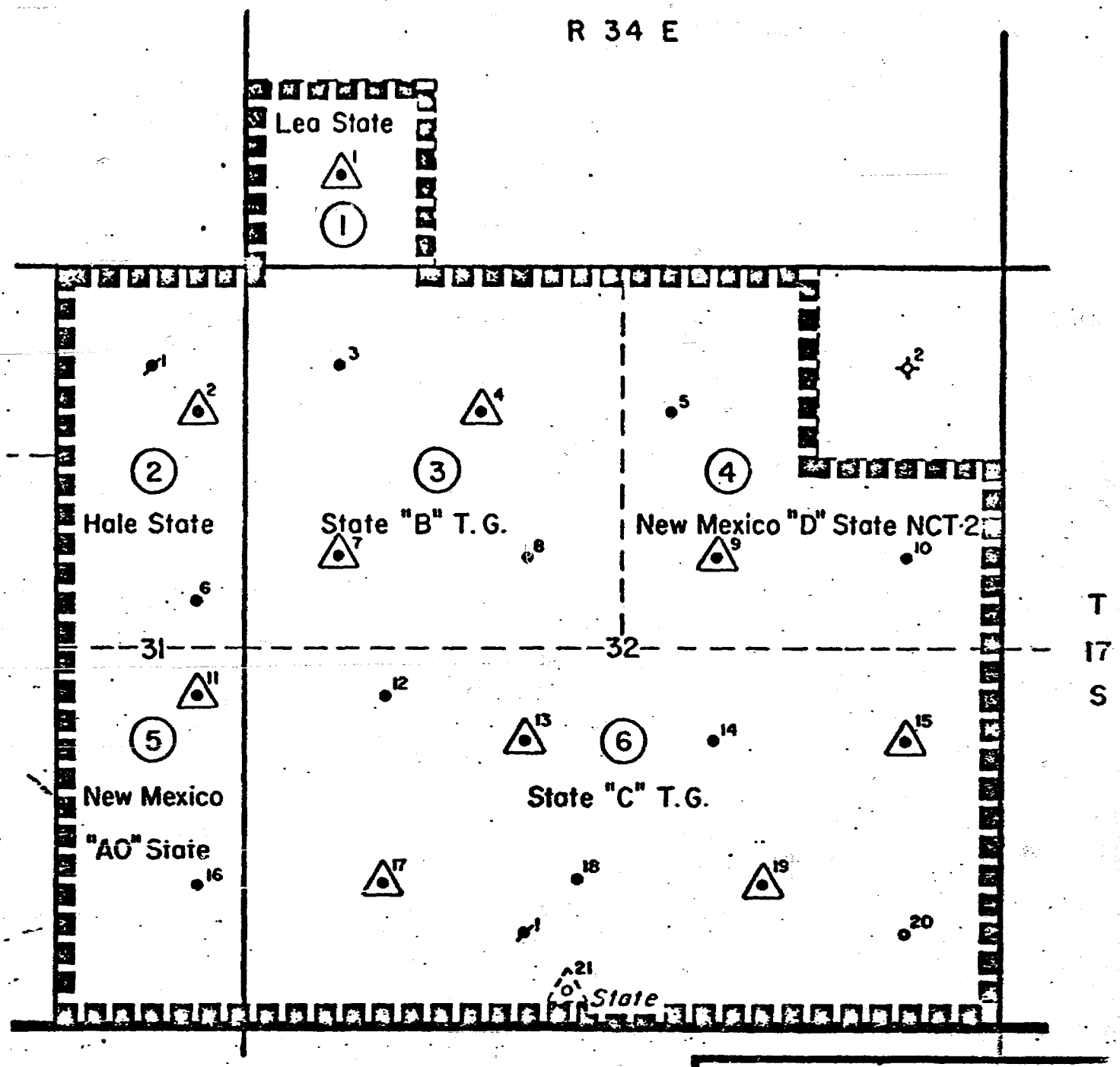
JOE D. RAMEY, Member & Secretary

SEAL

jr/

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5961 Exhibit No. 1
Submitted by ARCo
Hearing Date 6-13-77

EXHIBIT 2



UNIT BOUNDARY

TRACT NUMBER

INJECTOR

PRODUCER

INJECTOR – TO BE DRILLED

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5941 Exhibit No. 2
Submitted by ARCo
Hearing Date 6-13-77

Atlantic Richfield Company
North American Producing Division
Permian District Midland, Texas

STATE VACUUM UNIT

LEA COUNTY, NEW MEXICO

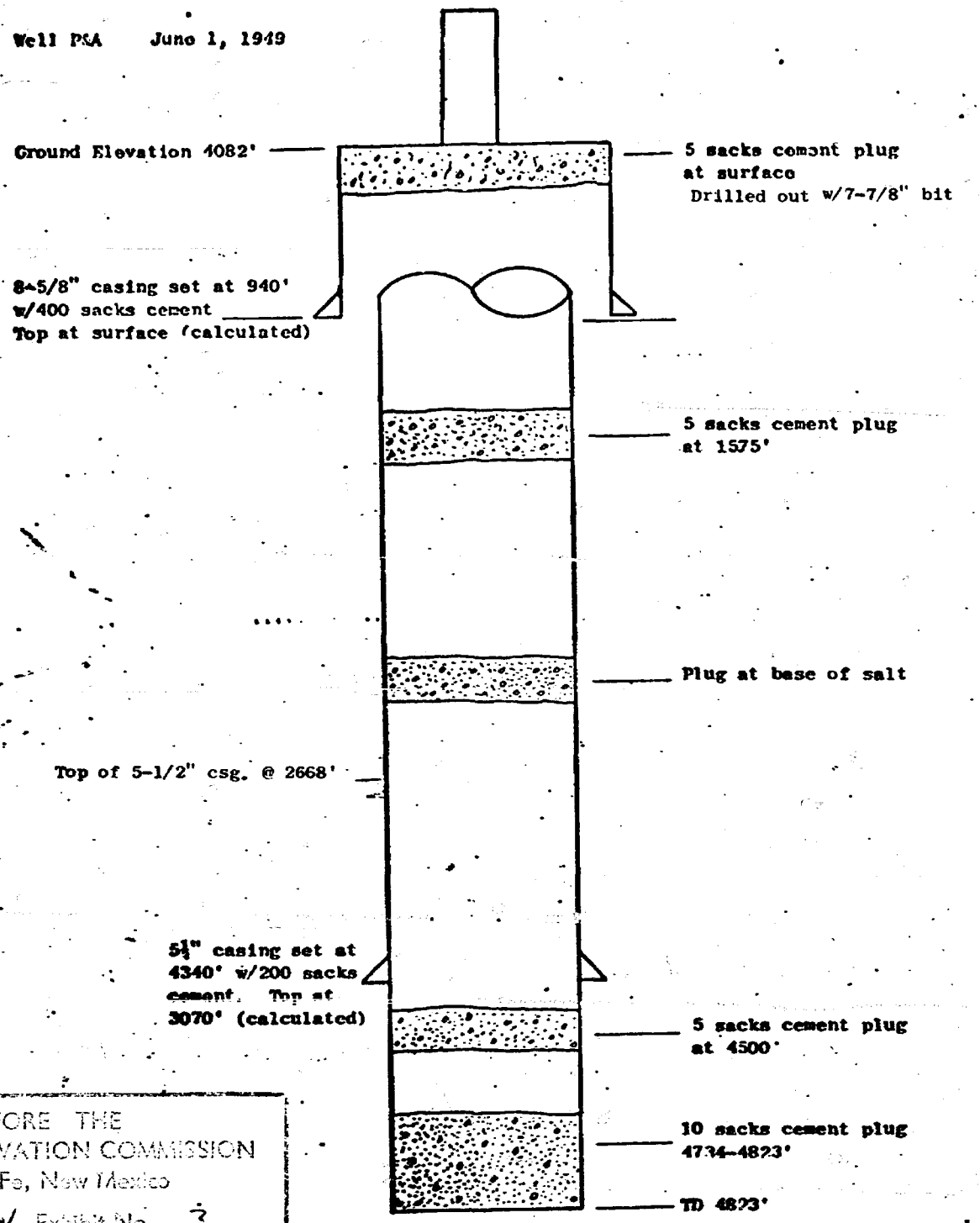
Scale: 1"=1000'

By	Drawn By J.L.	Date 4-27-77
Chkd	Reviewed By C.L.F.	Date 5-9-77
Dept	Dwg No.	

EXHIBIT 3

COLE-DARDEN OIL COMPANY
HALE STATE NO. 1
Schematic Drawing of Plugged and Abandoned Well
660' FNL & 660' FEL Section 31, T-17S, R-34E
Lea County, New Mexico

All measurements are from KB 8' above GL

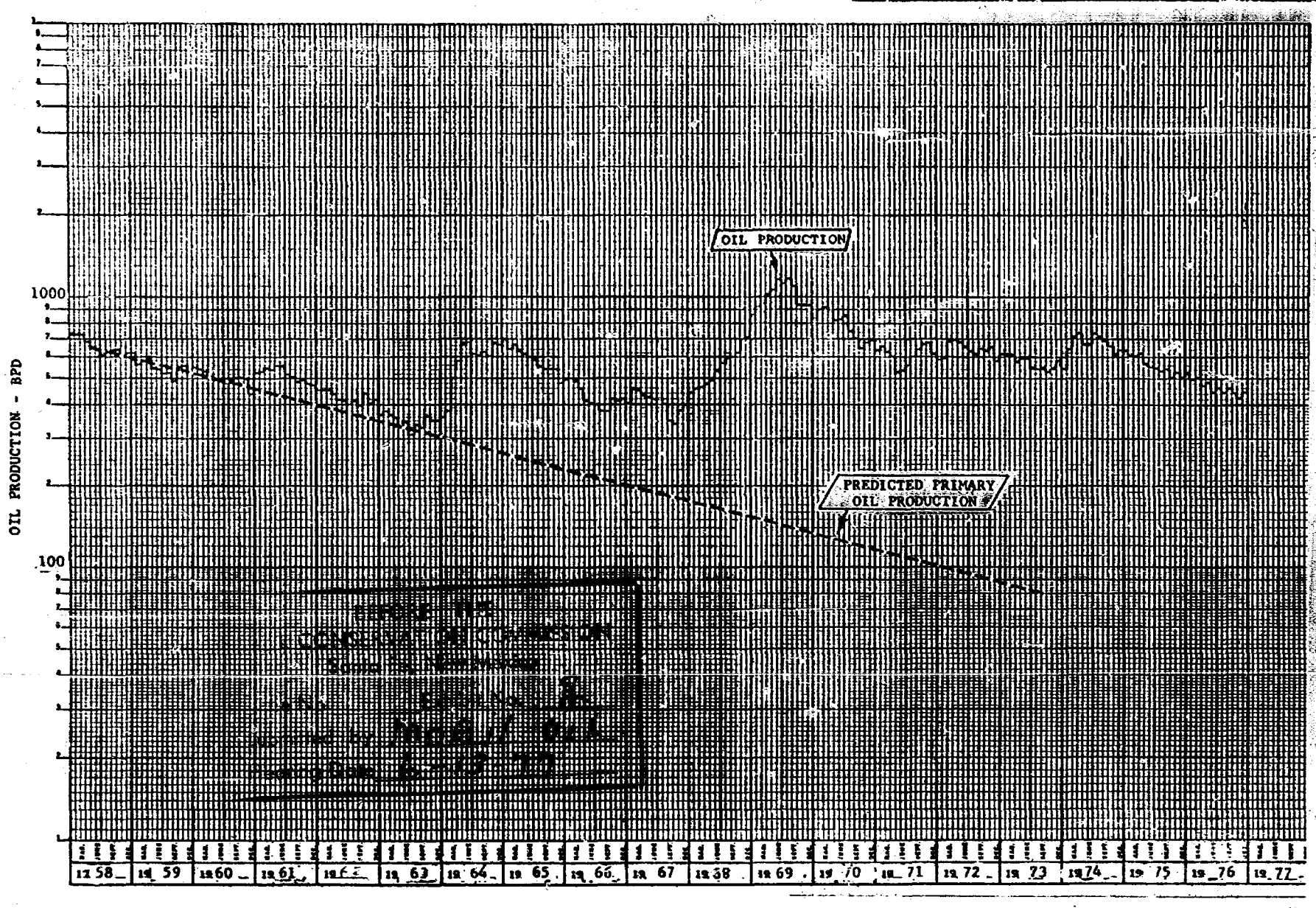


BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5941 Exhibit No. 3
Submitted by ARCo.
Hearing Date 6-13-77

STATE OF NEW MEXICO "BZ" NCT-8 No. 5

3/1-2/59	6-3/8" hole from 1095'. Press. up on 8-5/8" csg @ 10:15 to 10:45 A.M. 2-28-59. 1000# for 30 min. Drill plug and cement and approx. one foot of formation. Press. up on formation. 1000# in 30 min. @ 11:15 to 11:45 A.M. 1000# O.K. T.D. 1690'. Well started to flow back salt water. Well started flowing 1100 bbls. salt water per hour from 1688' to 1690'. Shut well in. 600# press. Bradenhead squeeze open hole from 1095' to 1690' by Howco w/2500 sx Reg cmt w/ 2% calcium chloride down 8-5/8" csg.
3/3/59	Drilled cement plug from 1146' to 1160'. No show of water. Drilled plug to 1690'. Water broke. Returns of 300 bbls. salt water per hr. Drilled ahead in formation. Drilled formation from 1690' to 1814'. Water and air increasing. Pulled 360' of drill pipe. Water increased to 1500 bbls. per hour. Pulled drill pipe. Bradenhead squeezed formation w/2500 sx of Reg Neat cement plus 2% calcium chloride from 1095' to 1814' by Howco. Pumping. Press. on cement 650 lbs. Comp. at 8:45 P.M. 3-2-59.
3/4/59	No report.
3/5/59	Trying to squeeze off salt water w/ cement.
3/6/59	No report.
3/7/59	No report.
3/10/59	Drlg salt and anhy 1986'. Increased to 7-7/8" hole from 1095'.
3/11/59	Drlg.
3/12/59	T.D. 7-7/8" hole @ 2460'. Anhy.
3/13/59	7-7/8" hole to 2460'. Comp @ 5:15 A.M. 3-12-59. Snubbing pipe out of hole. Snub 7" in hole. Ran 64 jts hydril and collared pipe.(2445' of 26#). Set @ 2460'. Cement by Howco w/ 200 sx Neat cement. Top cmt by T.S. @ 1760'. Second stage down bradenhead w/ 200 sx Reg cmt. Job complete 3:00 P.M. 3-12-59. WOC 9 hrs.
3/14/59	Tested 7" csg w/ 1200 psi for 30 min. from 5:00 A.M. to 5:30 A.M. on 3-14-59. Tested O.K. Now WOC.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5941 Exhibit No. 2
Submitted by Texaco
Hearing Date June 13, 1977



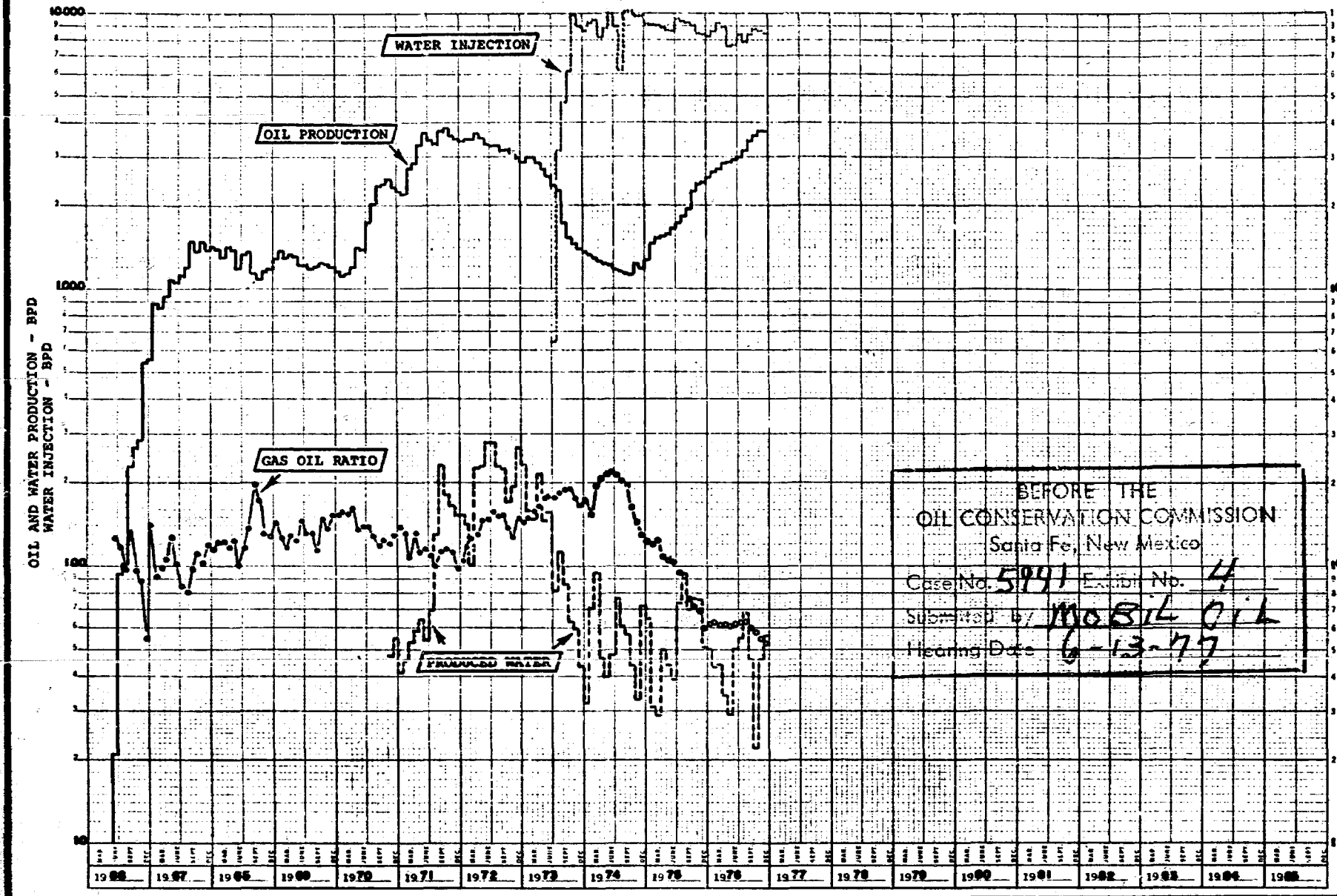
TIME-YEARS

CASE #5941

Ex. 2

Mobil Oil Corporation
Houston E&P Division
PERFORMANCE PREDICTION
VACUUM SA CO-OP FLOOD
BRIDGES STATE G,J, & II
LEA COUNTY, NEW MEXICO

VACUUM S. A. BRIDGES ST. LSES



TIME-YEARS

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5991 Exhibit No. 4
Submitted by Mobil Oil
Hearing Date 6-13-77

4

Mobil Oil Corporation
Houston E & P Division

PRODUCTION HISTORY
NORTH VACUUM ABO UNIT
LEA COUNTY, NEW MEXICO

Scale
Date 2-16-77
Drawn ECH
Checked
Approved
Revised

NVAU W. Area No.

SOUTHEASTERN NEW MEXICO

PLATFORM – SHELF				DELAWARE BASIN			
SYSTEM	SERIES	GROUP	FORMATION	FORMATION	GROUP	SERIES	SYSTEM
QUATERNARY			*Bolsom, Caliche & Alluvium*				QUATERNARY
TERTIARY			OGALLALA	OGALLALA			TERTIARY
CRETACEOUS	(Wedge on Shelf)						
TRIASSIC	DOCKUM	DOCKUM	CHINLE	CHINLE	DOCKUM	DOCKUM	TRIASSIC
			Santa Rosa	Sanic Rosa			
			Dewey Lake	Dewey Lake			
			Rustler	Rustler			
	OCHOAN	SALADO	"Salt"	Cowden Anhy. "Salt & Anhydrite"	SALADO / CASTILE	OCHOAN	
PERMIAN	GUADALUPIAN	ARTESIA GROUP / CHALK BLUFF / WHITEHORSE	TANSILL	Lamar Ls.	DELAWARE MOUNTAIN	GUADALUPIAN	PERMIAN
			YATES	BELL CANYON			
			SEVEN RIVERS				
			QUEEN	CHERRY CANYON			
			GRAYBURG				
		N.D.	SAN ANDRES	BUSHY CANYON			

Red Beds

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 1
CASE 5941