

Case No.

1309

Application, Transcript,  
Small Exhibits, Etc.

CASE 1309: Application of Operators Committee  
of Maljamar Cooperative Repressuring Agree-  
ment for order expanding Kewanee Oil Co.  
pilot water flood project.

1309)

BEFORE THE  
OIL CONSERVATION COMMISSION  
STATE OF NEW MEXICO  
Santa Fe, New Mexico

September 18, 1957

TRANSCRIPT OF HEARING

Case 1309

DEARNLEY - MEIER & ASSOCIATES  
INCORPORATED  
GENERAL LAW REPORTERS  
ALBUQUERQUE, NEW MEXICO  
3-6691 3-9546

BEFORE THE  
OIL CONSERVATION COMMISSION  
STATE OF NEW MEXICO  
Santa Fe, New Mexico

September 18, 1957

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IN THE MATTER OF:

Application of the Operators Committee of the Mal-  
jamar Cooperative Repressuring Agreement for an  
order expanding the Kewanee Oil Company pilot water  
flood project and for the approval of an additional  
pilot water flood project in the Maljamar Coopera-  
tive Repressuring Agreement Area, Maljamar Pool,  
Lea County, New Mexico, and for the promulgation  
of rules to govern the operation of said projects.  
Applicant, in the above-styled cause, seeks an  
order authorizing the expansion of the Kewanee Oil  
Company pilot water flood project authorized by  
Order No. R-841, to permit the conversion from a  
producing oil well to a water injection well of  
its Pearl "B" No. 21 Well located in the NW/4 SW/4  
of Section 25, Township 17 South, Range 32 East,  
Lea County, New Mexico; and further, for the W/2  
SE/4 and the SW/4 of Section 21, E/2 SE/4 of Sec-  
tion 20, W/2 NE/4 and the NW/4 of Section 28, E/2  
NE/4 of Section 29, Township 17 South, Range 32  
East, Lea County, New Mexico. The applicant pro-  
poses to convert gas injection wells IP No. 11  
and IP No. 35 in said Section 28 into water injec-  
tion wells and to convert a presently producing oil  
well known as the Buffalo Oil Company Baish "A"  
No. 21 Well in said Section 21 to a water injection  
well, and to drill six additional water injection  
wells within the above-described pilot area; and  
further, to authorize the transfer of the oil allow-  
ables assigned to the above-described water input  
wells, which are now producing oil, to other wells  
on the same basic leases; and further, for a provi-  
sion authorizing administrative approval, without  
notice and hearing, for additions to or deletions  
from the pilot areas and/or injection wells.

Case  
1309

BEFORE:

Mr. A. L. Porter  
Mr. Murray Morgan  
Honorable Edwin L. Mechem

TRANSCRIPT OF HEARING

MR. PORTER: The meeting will come to order. Before we go into Case 1309 I would like to announce that the Oil Allowable for October will be 37 barrels normal unit allowable.

At this time I would like to recognize three guests who have been here all day, but I didn't find it out until noon. Mr. Henderson, the Chairman of the Utah Oil and Gas Conservation Commission, Mr. Tompson, a member of that Commission, and Mr. Fight, Secretary to the Commission.

We will take up next Case 1309.

(Marked Exhibits Nos 1 through  
17 of applicant, for identification.)

MR. HINKLE: If the Commission please, Clarence Hinkle of Hervey, Dow and Hinkle of Roswell, representing the Operators Committee for Maljamar Cooperative Repressuring Agreement. If the Commission please, we have two witnesses and seventeen exhibits. If it's all right with the Commission, we will go through the exhibits as rapidly as we can and save as much time as possible and wait until the close of each witness's testimony before offering the exhibits in evidence. Those on the board and on the walls are all the exhibits except one, 11, 12, and 13. We have placed before each member of the

Commission and before the Staff, a copy of the application and attached to the application are the same exhibits as we will offer as one, 11, 12 and 13. As we progress we will furnish to the Commission and the Staff, copies of the exhibits which we have on the board.

MR. PORTER: Mr. Hinkle, may I interrupt here and go off the record?

(Discussion off the record.)

MR. PORTER: Mr. Hinkle, you may proceed.

MR. HINKLE: The first witness is ~~William J. Wright~~, will you stand and be sworn?

MR. COOLEY: Will all the witnesses stand and be sworn?

(Witnesses sworn.)

WILLIAM J. WRIGHT

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

DIRECT EXAMINATION

By MR. HINKLE:

Q State your name, please. A William J. Wright.

Q Whom are you employed by?

A Maljamar Cooperative Repressuring Agreement.

Q By the Operators Committee?

A Operators Committee of the Maljamar.

Q Are you a graduate petroleum engineer?

A Yes.

Q What year?

A 1928

Q What university?

A Lousiana State.

Q Have you previously testified on several occasions before this Commission?

A I think twice.

MR. HINKLE: Are the qualifications acceptable to the Commission?

MR. PORTER: Yes, sir.

Q When was the Maljamar Cooperative Agreement entered into?

A In 1941, it was a joint agreement between the six or seven operators in the Maljamar Field.

Q Has it been approved by the Secretary of the Interior?

A Approved by the Secretary of the Interior and approved by the Land Commission.

Q Also by this Commission?

A We came before the Commission in September 1941 and it was approved at that time. We were requesting a pilot pressure maintenance project for the area.

Q It was approved under Order R-485 of the Commission?

A Yes, sir.

MR. PORTER: Pardon me, Mr. Hinkle. I believe that was prior to the institution of the R. for our orders. Priot to that time up through order 850 we didn't have a prefix. Apparently on that date it

should be just --

A 485?

MR. PORTER: It should be 485 rather than R.

MR. HINKLE: We would like the record to show that is 485.

Q Mr. Wright, will you please refer to the exhibit on the board that's marked Maljamar C. R. Exhibit No. 1 and explain to the Commission what it is and what it shows?

A In 1941 when the Cooperative area was formed, it covered an area of that type and extended again in 1946 and again in 1952. So this is the present boundary of the Maljamar Cooperative Re-pressuring area.

Q When was the little area that juts out to the east included?

A '54, I think.

Q '54. And all the rest of the area was included prior to that time?

A In 1941, and they had a supplement in 1946 which added something over in this part of the area.

Q All of those extensions have been approved?

A Both by the Secretary of the Interior and New Mexico Land Commissioner and the Conservation Commission.

Q Does the Cooperative area include both federal and state lands?

A Yes, we have designated the state land on that and federal land. We've also designated the operators' holdings and their

leases and have also all the producing wells and the present injection wells which ~~are~~ shown. We have also shown the present water pilot which has been conducted by Cornell Oil Company, and the extension we are requesting, and also showing the present pilot that we would like to inaugurate in the Maljamar Pool.

Q The wells which are at the present time being used for gas injection are circled in red, is that right?

A Circled in yellow, an orange probably. The water wells are in red.

Q Explain to the Commission briefly the object of forming the Maljamar Cooperative Repressuring Agreement.

A Well, the operators definitely felt that it was a dissolved type of gas reservoir and they would drill most of these wells, 99% were drilled with cable tools. We found that the porosity was not too high, somewhere around 12 or 15%, the permeability was extremely low. We think it might average out ten millidarcies, and in a dissolved gas type reservoir we realized that our recovery of the oil in place would be very very low, ranging somewhere from 1 to 15% if we produced the well just on the primary types of production.

Therefore, they organized the Maljamar Cooperative Repressuring Agreement to handle the pressure maintenance part, which constituted gathering of the produced gas and returned it to the reservoir. Of course, the pilot flood in 1941 started with only

thirteen wells and there were only two wells to the section.

It proved very very successful, and like lots of pilots, we got into trouble trying to handle sour gas, and wet gas and corrosion ate up more equipment than we could afford. The pilot was so successful in 1946 we began to drill wells for injection purposes only. You will note that these injection wells were drilled on the boundary lines so there would be a minimum of migration from one lease to the other. We found that in the Maljamar type of reservoir that if we could maintain pressure, we could keep our oil at a very nice viscosity value, about one centipose, but if the pressure dropped any great extent, why the centipose value increased very very rapidly.

We did get into difficulty in about 1945. We were trying to produce the Maljamar field on the same basis as the State of New Mexico was allocating the oil, just 40 acre unit, but we found the productive ability of considerable of our wells couldn't keep up the state allowable. We came and asked our own allocation formula, which you granted to us in 1945 under your Order 595, Case 56. Since that date we have been producing Maljamar Field from roughly a thousand, fifteen hundred barrels, under the state top.

Q What kind of a plant do you operate in connection with your pressure maintenance system?

A We are gathering gas, of course, from the field separators at five or ten pounds of pressure, and we found to get the volumes

of gas necessary in the reservoir, our injection pressure had to be around 1500, so we tried a straight compress or plant which was very successful, so we went to straight gasoline absorption. During the absorption operation we are taking all the casinghead butane and propane and putting a fairly dry gas back into the reservoir. As the field has continued to increase in ratio, why of course, we have continued to increase the size of the plant.

For instance, in our pilot we had a plant that was returning only about two and a half million to the reservoir. The fifteen years it has been in operation, the plant has now increased to where we're running somewhere a little over nine million feet per day to the reservoir and still at 1500 pound reservoir. I think to date we have injected, roughly speaking, twenty million feet of gas. We have succeeded very well in not maintaining our reservoir pressure, but we are keeping the decline from being very severe.

Q You consider that the ~~operation~~ of the maintenance program as a whole has been quite successful?

A I think very successful. We're very well pleased. We have done everything we can to conserve our gas energy. We will disagree to what extent, but all six of the operators are very pleased with that.

Q Can you go on indefinitely with an operation of this kind, injecting gas?

A There is a limitation to how large a plant, and then,

of course, as our ratio, the original ratios in the field around 800, we are now up to 3,000 cubic feet per barrel. We still feel we have another six or seven years that we can produce the field on pressure maintenance. We thought that from pressure maintenance we could go into a gas drive type of operation, but a gas type drive operation wouldn't be very successful in our low permeabilities and very low porosities.

Q Because of the increased volumes of gas as time goes on it will finally reach a point where you reach an economic limit?

A Just as a rule of thumb, it costs you ten cents for every thousand cubic feet of gas that you would compress up to 1500; you can see as the volumes would go up those ten cents would go up to where it would be uneconomical to try and continue over a certain period of years.

Q Is that the reason you are considering the installation of a water flood project?

A We feel we have ten years to continue. We feel there is additional oil left in the reservoir. We wouldn't like to be checked on this, but we feel that with pressure maintenance, we'll recover at least 20 to 25% of the oil in place, which under primary, we couldn't have recovered over 15 in place.

Q Now, refer to Exhibit 2 and explain to the Commission what it is and what it shows.

A Exhibit 2 is a structural map of the Maljamar Field based

on the top of the San Andres, showing how flat this long anticline dropping off very fast into the basin and to the north flattening out, but due to a lack of porosity and permeability, there is no productive definity of any kind up there. Coming over to the east, the well drops about, I would say, something like fifty feet per mile, but to the south maybe two hundred feet per mile.

Q What are your contours drawn on?

A Fifty foot intervals.

Q On the top --

A (Interrupting) Of the San Andres.

Q (Continuing) -- San Andres.

A It also shows location structurally of our recommended pilot and the location structurally of the present pilot.

Q Are all the wells which are now under the pressure maintenance system or project, producing from the Grayburg-San Andres formation?

A Yes. We had to throw the Grayburg and San Andres all in to a common reservoir and produce them as a common reservoir rather than separate.

Q Is that a common source of supply?

A Common source of supply.

Q The structural map indicates that to be the case?

A No, the structure map indicates the structure of the San Andres. We do have others displaying the cross section and this

which shows that we have thrown all four of the producing zones into the common reservoir.

Q Refer to Exhibit 3, the cross section map, and explain it to the Commission, please.

A We noticed in here, which I neglected, that we have cross sections right through the middle of the field north and south, and a cross section through here running east and west. This is the north and south cross section, these red lines.

Q Please refer to Exhibit 3 first. I believe the top one is Exhibit 3, is it not?

A Well, Exhibit 3 then would be the east-west cross section, which shows you a very small drop as you come west. To these pays, more or less roughly speaking, here is the top of the line; top of the Grayburg, would be somewhere in here, and the top of the San Andres and the casing is set on top of the ~~south~~ zone and all those pays are thrown in as a common reservoir and treated as a common reservoir.

Q Have you indicated on the cross section the crest of the structure?

A The crest of the structure would be right in through north of here, right in through here, the high point which would, as it shows here, be right in through there. These two lines here indicate the location of our pilot structurally recommended pilot, requested pilot, and these two show structurally the present pilot

that we conduct.

MR. PORTER: Mr. Wright, would you identify what you mean by these two?

A This red line and this red line.

MR. PORTER: I mean for the record.

Q On Exhibit 3.

A The red line on the right-hand side.

MR. COOLEY: Can you somehow identify the crest?

A The crest of the structure is shown as the highest point on the west end of the east-west cross section.

Q Could you identify it by the well number?

A The well number would be this well right here which is Copper Simonds 4, would be the highest well structurally.

Q Now, refer to Exhibit 4 and explain to the Commission what it is.

A Exhibit 4 is the north-south cross section showing in the northern end of the field how flat it is. Here is the highest well structurally.

Q What point is that, between what wells?

A The highest wells would be Buffalo Baish G A structurally, and then as you go into the basin you can see how rapidly it falls. These two red lines here between Baish A and Baish 14 and Baish 15 and Baish 25 represents the location structurally on the cross section that we are requesting for the pilot.

Q Now, refer to Exhibit No. 5 on the board and explain to the Commission what that is.

A Exhibit 5 is a very few wells in the Maljamar Field as it was drilled back in '38 and '39 which were cored. This is well No., input well No. 27 which was cored. We, therefore, ran a radioactive log and we also showed the permeabilities and the porosities of the three, four zones encountered, and also a sample log. You can see that the permeabilities of these pays are very very low, and also in porosity are very low in value. The radioactive log which we ran on there is a comparison, so we could compare some of our other radioactive logs in the field as to porosity and permeability. The sample log is a typical log showing the anhydrites and sands and dolomites as they occur in drilling.

Q Have you kept a monthly record reflecting the operations and indicating the reservoir pressure and oil production since the beginning of the pressure maintenance project?

A Yes, we have kept complete records.

Q Refer to Exhibit 6 and explain to the Commission what it shows.

A Exhibit 6 is the one that we refer to as our monthly reservoir operations of the Maljamar area as it was prior to 1954. You will observe that pressure maintenance operations started in 1942, gas volumes were being injected, and when we revised our operation, the plant was done for approximately a year drilling

new input wells and going to four wells to a section instead of two, and since that date we have been in continuous operation injecting gas.

During this period of time you can see how rapidly, but prior to pressure maintenance you can see how rapidly the reservoir pressure of the Maljamar Field was dropping very very fast as pressure maintenance gas injection we began to ~~go~~<sup>notice</sup> a considerable retard in our reservoir pressure. We observed every well in the field every six months trying to use it on an allocation formula as well as keeping records. This pressure over here is quite misleading; in 1954 we stopped observing quite a number of the wells that were down to marginal stage, and therefore the arithmetic average showed an increase which isn't quite correct, but you can see along with that the well had a peak when pressure maintenance started right in 1942 of roughly 145,000 barrels a month. We have been able to practically maintain that withdrawal rate with a small decline through '51, '52, '53 and with the assistance of remedial work on the wells, increase in the plant and enlarging our withdrawal rates into the reservoir after fifteen years of operation, our peak at the end of '56 is the same as the field was back in 1941.

Q Mr. Wright, have you compiled any information to show the decline in production in the Maljamar Pool as compared with other pools in the state?

A Yes, one other thing that I neglected, you can see that the ratio started at 800 and you can see that the ratios are up to around 3,000 cubic feet.

Q Refer to Exhibit 7.

A Exhibit 7, it is hard to take one reservoir and compare it to another. Of course, we all would like to know what would have been the production decline in the Maljamar, primary decline in the Maljamar Field. Trying to get something as a basis to evaluate what our drop in production would have been under primary type of operations, we have taken four or five of the same gas dissolved type reservoirs on the Grayburg Jackson ~~traced~~ and hit an average on those which shows those wells to date are producing somewhere around 300 barrels a year. Where in the injection area right now, why we are producing in the neighborhood of a little over, the right line, about ten thousand barrels a year from those wells. We feel as though this might be, we felt as though it might be a little too severe using our average, so you can see the line we have used is a little high what we call. But using that primary against the Maljamar Field on our next exhibit.

Q Is that Exhibit 8?

A That is Exhibit 8.

Q Okay.

A This primary of the Maljamar Field would have been produced on a primary. Their recovery to date would have been roughly a little over fifteen million barrels. But under our pressure

maintenance operations, accumulated oil to date is roughly twenty million barrels. This is based on what we refer to as the injection area where the majority of the gas has been returned into an area there that roughly 4,300 acres where 125 wells are being produced. You'll also notice the pressure decline curve of those 125 wells in uniform right on through and doesn't show that increase like we have shown on the field as a whole.

Q Does that show in effect then, that by the pressure maintenance operation you have already recovered approximately five million barrels of oil that you wouldn't have otherwise?

A Just about. That is our interpretation of it.

Q Now, I believe that you mentioned at the beginning of your testimony that the Operators Committee have the allocation planned which they submitted to the Conservation Commission each month. Do you have a typical copy of that.

A We have a typical copy of that. It's quite complicated, that was brought out in 1945, we had to do something and ---

Q Is that Exhibit No. 9 that you referred to?

A Exhibit No. 9. When we found out that our main objection in returning gas was filling void space and some of the wells were losing pressure producing tremendous volumes of gas, it was voiding space in the reservoir tremendously. For instance, a well with say a thousand pound pressure and 800 pound ratio was voiding the

reservoir maybe a barrel, barrel two tenths, barrel three tenths per barrel of stock tank oil. Where some of the wells who had extremely low pressure, five or six hundred pounds, producing at five and six thousand ratios were voiding the reservoir, fifteen or twenty barrels of space per barrel of stock tank oil. So we have been allocating our nomination on what we call our void space factor. We still have the 195 wells that we handled under our last sheet allocation, we still have 135 top allowable wells which we are still applying our formula to. We have 60 wells that are marginal wells that produce under 25 barrels a day. Of these 135 wells are now averaging 29.4 barrels per unit, and it is our understanding that the state, along with the top wells does not exceed the state unit top, why we can continue to ask monthly nominations for the field. We especially brought that up because with our pilot flood we would like to continue nominating our own oil.

Q Do you prepare a monthly statement which reflects the entire operation such as the water produced, the oil produced, the status of each well and whether flowing or pumping?

A Well, it's not quite a monthly statement. I think that is called our Exhibit No. 10. We have been making a study of the reservoir of the field and we worked up the recovery on each individual well, the recovery by each lease, the recovery per acre by each lease, and the total recovery by each company, and also

the recovery per acre by each company. You'll notice some of the leases in the field have recovered over 5,000 barrels per acre, and, of course, some of the poor leases down around a thousand. The field as a whole has recovered a little over 29,000,000 barrels as of July 1st, which gives it a recovery per acre of 3,461 barrels.

The injection area which we showed in here where there is 125 barrels had a recovery of around 4,000, 5,000 barrels per acre.

Q Explain to the Commission briefly the manner in which you propose, or the Operators Committee, propose to inaugurate this new pilot water flood in the cooperative area.

A We picked the heart of the field, the pilot over here on the eastern edge being only from the sixth zone, trying the sixth zone where in the heart of the field right in here we'll try our pilot in all four of the zones. We have two injection wells in there now, that gas injection wells that we'll convert to water injection wells. We have one producer that we'll convert to water injection well and necessary --

Q (Interrupting) What is the number of the producer that you are going to convert to?

A The two injection wells are I.P. 11 and I.P. 35, and we'll have to drill six new wells entirely for injection purposes.

Q Is that the Baisb or Buffalo? A Buffalo Baisb.

Q Buffalo Baisb? A A-21.

Q 21-A. What is the well capable of producing at the present

A I imagine, off hand I wouldn't know. We are, on our present allocation plan, we are allowing it a nomination of 23 barrels. It's capability would be in excess of that.

Q By your application, are you requesting that the allowable of that 23 barrels from that well be reallocated to the other wells on the same lease?

A To the rest of the wells on the Baish lease.

Q Now identify, refer to Exhibit No. 11 and explain to the Commission what that is.

A Exhibit 11 was given to you with the application. It is the sample log of the two I.P. wells. I.P. 11 and I.P. 35 right in the heart of the field. It's a sample log and therefore as most cable tool sample logs are, it's quite misleading when you want a considerable amount of knowledge like we are hoping to obtain for our water. Of course, the six new wells in the field will be cored where we can actually get porosities and permeabilities, and the exact zones encountered and things on that order. It is the best we have to offer to you right now on these two wells.

Q Do you have a log of the well which you propose --

A (Interrupting) The Baish A-21, we have a radioactive log.

Q What exhibit are you now referring to?

A That is Exhibit No. 12. That is the radioactive log of the producing well. It shows the gama ray, neutron ray and also a calibration of the whole. It's very interesting, thinking that you

might notice up at the top of this well, was acidized, it was shot, it was sand fractured, and I don't know what other type of remedial work we haven't tried in the Maljamar Field to get the maximum recovery.

You can also notice the shot factors, the caliper hole where they broke right in the pays of the seventh zone and the ninth zone where it shattered just the pays in through there. We hope by coring our water injection wells and running radioactive logs on the present producing wells, that a considerable amount of additional knowledge will be obtained where we can conduct our water flooding operation.

Q I believe you stated that you proposed to drill six new injection wells in connection with the pilot water flood. Have you formulated any casing program for these wells?

A Yes, of course, we ~~also~~ <sup>always</sup> look back and wish we had completed wells in a certain way, but since the majority of the wells in the Maljamar Field ~~was~~ <sup>were</sup> drilled during the old cable tool days, and we would have loved to have set pipe through the pays and run perforated fract, but since the fracting wasn't in existence at that time, we were afraid to set pipe through these six pays and cement because with the low permeability we felt definitely we would never get back to the pay section with anything at that time.

But now, with fract and so that we can control the water if it's necessary down the line by water flooding and make it go into

whichever zone we desire. we will set pipe entirely through the pay and, of course, gun perforate and fract the various zones, so therefore, we can control our water.

Q That casing program is shown by Exhibit 13?

A 13, which will either run five and a half and four and a half J, 55, which is good for at least 3,000 pounds.

Q Mr. Wright, where do you propose to get the water to carry on this water flood project?

A It's a good question. We have been very disappointed in that we have had three deep wells in the Cooperative area, one to about ten thousand, tested all available pays, we couldn't find oil or water, one to about eleven thousand we have drilled one well to fifteen five hundred to the Devonian which will make some water. We have also gone over into this part of the field.

Q What part are you pointing to?

A The eastern edge of the field at Section 25 and 30 where their pilot have gotten very very poor water well for anything like we would have to have to conduct a pilot. So we have been unable to find any source within distance of the Maljamar Field that we could even start a pilot, much less develop this pilot into water flooding operations. So, we went to the Land Commission and asked for water leases up on the Caprock, which is within ten or twelve miles of the field.

Q Now refer to Exhibit 14, does that show the area that

you have just mentioned?

A That shows the Maljamar Cooperative area and shows the water, the sections which we are applying for water rights.

Q What is the status of your application to appropriate water from this area?

A We have applied to the Land Commission and we have also applied through the State Engineer. I think our application --

Q (Interrupting) Is this in the so-called declared area where the State Engineer declares water to be public waters and subject to appropriation?

A That is my understanding.

Q Has any water been developed contiguous to the area shown in yellow on Exhibit 14?

A Yes. There's quite a bit, all the potash mines have quite a bit of water acreage more or less to the west.

Q It is contiguous to the part shown in yellow to the west?

A Yes.

Q Is that where the potash companies obtain their water supply for the use in the mines which are east of Carlsbad?

A Yes.

Q They have a pipeline from that area down to the mining area?

A Yes.

Q Have you been able to get the appropriation from the State Engineer as yet?

A Yes. We have been, I understand it's our application

No. L3927, L3928 and L3929. It is our understanding that the Roswell Engineers saw no objection whatsoever to use this water for water flooding and have made the recommendation to their Santa Fe office.

Q Have the rights been granted as yet?

A I think so.

Q What is the character of the land shown in yellow on Exhibit 14, is it state land?

A It is state land.

Q Have you obtained from the Commissioner of Public Lands water leases covering that area?

A Yes.

Q They have already been issued?

A With twenty-two as I understand it.

Q What is the depth at which you expect to develop water in that area?

A From 250 to 350 feet.

Q And because of the development which has been carried on by the potash companies, do you believe that you would find a source of water supply that will be sufficient to carry on this water flood project?

A We feel that way. We have checked into the area quite a bit and the way those wells are holding up for the potash company and their withdrawals, we feel as though the thickness of the sand body in there would give us an adequate supply.

Q Have Exhibits 1 through 14 been prepared by you or under

your direction?

A Some by me and some under my direction.

Q To the best of your knowledge, they portray the correct facts in each situation?

A Yes.

MR. HINKLE: I would like to offer in evidence Exhibits 1 through 14.

MR. PORTER: Without objection the exhibits will be admitted.

Q I believe you have already indicated upon Exhibit 1 the location of the Kewanee pilot plant at the present time. When was that first inaugurated?

A I think they inaugurated the gas injection in '52 and water about '53, I'd say and came into the Cooperative in '54.

MR. HINKLE: I might state to the Commission that Mr. Mills, the other witness, will testify with respect to the operation of that plant and how successful it has been.

Q Now, Mr. Wright, in the event this proposed additional pilot is approved and proved successful in operation, do you intend to expand that operation?

A We hope to. We feel definitely --

Q (Interrupting) Will that be expanded in cooperation with the other pilot plant?

A Yes, we hope both pilots prove successful as we hope to we will all operate from one source and one source of oil.

Q So it will eventually encompass the entire area?

A The entire area.

Q Do you propose to the Commission that any future expansions, if it does prove successful on approval of drilling of additional wells or converting present wells to injection wells, to be approved by the Commission administratively or come back each time and have a hearing on those matters?

A It might be asking too much administratively. We feel we have fifteen years of operation that the operators have conducted every form of conservation, and we would certainly appreciate if the Commission would grant us that, and I'm sure we will continue to do the best we can, the operators will do the best they can to extract the greatest amount of oil from the Maljamar Field under the conservation methods they can.

Q Is it your opinion this will greatly facilitate the handling of the whole project?

A It certainly would.

Q It would eliminate the necessity of advertisement and formal hearing with each phase of the expansion program?

A It certainly will.

Q If this water flood is successful, do you anticipate that considerable additional oil will be ~~recovered~~ from the Maljamar Pool?

A Once again we are talking with not too much reservoir data to go by, and more or less under the watching of our present performance, we feel as though we'll, if water flooding is successful

in the Maljamar Field, that we can at least get another 25% or 50, a little over to 50 to 60% of the oil in place will be recovered. We feel as though we are talking somewhere in the neighborhood of forty or fifty million barrels of additional oil.

Q That, I guess, would be in the interest of conservation, would it not?

A I think you can entitle that conservation.

Q Are you asking for any increased allowable in connection with additional pilot water flood?

A No. We feel under our present allocation plan that we can operate the field without any additional nomination.

Q Do you intend to operate under the existing proration rules?

A Yes.

Q No change in that?

A That's right.

Q Now, has this project, or proposed project, been approved by the United States Geological Survey?

A We made an application and it is my understanding it has been approved.

Q And they're willing to go along on this same project?

A On the project.

MR. HINKLE: I believe that's all from this witness.

MR. PORTER: Does anyone have a question of Mr. Wright?

Mr. Nutter.

CROSS EXAMINATION

DEARNLEY - MEIER & ASSOCIATES  
INCORPORATED  
GENERAL LAW REPORTERS  
ALBUQUERQUE, NEW MEXICO  
3-6691 5-9546

By MR. NUTTER:

MR. NUTTER: First, Mr. Hinkle, is your other witness going to testify as to the result on the pilot flood?

MR. HINKLE: Yes. He is a representative of the Kewanee and familiar with the entire operation.

Q Just a couple of questions of Mr. Wright. Mr. Wright, have you made any tests of the water that's been obtained by the potash companies up on top of the Caprock there to see if that water would be compatible with the fluids in your reservoir in the Maljamar Pool?

A Yes, we have.

Q Are the waters compatible? A They are compatible.

Q Would your application for a system of administrative approval of expansion of this water flood be limited to an expansion within the limits of the Maljamar Cooperative Repressuring Agreement area?

A Definitely.

Q Would your application for administrative approval also include administrative approval of transfer of allowables in the event that any oil producing wells were converted into water injection wells?

A Yes, that is my understanding, transfer of allowable to the lease.

Q Yes. That's all.

RE-DIRECT EXAMINATION

By MR. HINKLE:

Q You wouldn't propose to increase generally or deviate from the statewide allowable by reason of the administrative order?

A Not at all. We'll still produce the field under the regular proration which would be up to or under the unit allowable as set by the state.

MR. HINKLE: That's all we have of Mr. Wright.

MR. PORTER: Mr. Cooley, did you have a question?

RE-CROSS EXAMINATION

By MR. JOHNSON:

Q Did you anticipate increasing the allowable after the flood is fully in effect?

A Mr. Johnson, that would be hard to say, but I don't think that we'll flood the field at that rate of speed. We're talking of perhaps drilling somewhere around 30 to 35 injection wells.

Q There has been quite a bit of discussion about curtailing the flood and so on.

A We realize that, and consequently our development will be fairly slow. Our thoughts are if we can maintain present withdrawal from the field at around 4,800 barrels per day. If we got up to the state top, it would be somewhere around 5,000, 5,067. We feel as though we will not have to exceed the state top.

MR. JOHNSON: That answers my questions.

By MR. PORTER:

Q Mr. Wright, there seems to be a question still in the minds

of some of us as to the proration and the allowable system that<sup>be</sup> you are asking for. My understanding is that it would a continuation of Order 595 under which the pool is prorated at the present time. There would be no deviation whatever from the provision of that order?

A That's right.

By MR. COOLEY:

Q These wells will be treated just as though they were not in the water flood?

A Yes. Under our present formulas, as the ratio on the well drops, it entitles them to more oil. Therefore, under water flooding, when water flooding becomes effective, the first thing you observe in a water flood operation is the ratio dropping on the producing well, so therefore we'll automatically give that well a top allowable, which under our formula, is 44 barrels per day. But we can't get too many 44 tops because our 130, 140 formula wells will still have to stay, on the average of those formula wells will still have to stay, will not be able to exceed your state top, which is now 37. We have our average for 135 wells at 28 barrels per day. Under your order we could go up to 37 barrels per day.

Q Then the only deviation from the allowable standpoint will be that the allowable which would have been assigned to the Baish A-21, isn't it?

A That's right.

Q Will be produced from one or more of the other producing wells in the pilot area?

A On that pilot area.

MR. HINKLE: On that lease. The same lease.

A The same lease. That's also coming up, we have one on 20 lease down here which we are also asking the same thing.

By MR. NUTTER:

Q Also when administrative approval is given for expansion of the pilot flood, that any oil wells converted will have their allowables transferred by administrative approval?

A Yes, by administrative approval.

By MR. UTZ:

Q What is your anticipated rate of injection?

A We feel we will start somewhere around 500 barrels per well per day.

MR. UTZ: That's all I have.

A That might change after we get into it, but that's what we are basing on right now, 500 barrels of oil per day. We'll start our pilot with the nine wells we feel as though we will have to have 5400 barrels per day.

MR. PORTER: Mr. Cooley.

By MR. COOLEY:

Q Mr. Wright, do you feel that you can effectively operate an associating water flood project after it goes out of the pilot stage within the allowable formula established by 595?

A We hope we can. We are not definite, but we will continue our pressure maintenance operation and extend our pilot very

slowly. Just what we are getting into is hard to say.

Q Is it your opinion that the reservoirs in question here would be rate sensitive?

A Right under our present type of operation we found that a well in the Maljamar Field could not be produced continuously over a 24 hour period of time. Every well in the Maljamar Field is on pressure intermittance or time cycle intermittance, the feeding rate has been very very slow. An average well produces thirty minutes four times a day.

Q Will your water flood producers produce under the same system?

A I'm just telling you that, so from that I think our water recovery will be at a fairly slow rate. Our production will not be too excessive. If it becomes too excessive, 500 barrels a day, which we will find out from our pilot, it might require 300. We will produce it at 300 or 800.

Q However, you feel at the present time it will not be rate sensitive?

A That is our present thoughts on that.

MR. PORTER: Any more questions of Mr. Wright?

MR. HINKLE: On the discussion here as to the allowables, I would like to have Mr. Ralph Gray sworn to make a statement.

(Witness sworn.)

RALPH GRAY

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

DIRECT EXAMINATION

By MR. HINKLE:

Q Mr. Gray, do you care to make a statement to the Commission with respect to the injection operation of the water flood project?

A I would like to make a statement in clarification.

Q Just a minute before you proceed, by whom are you employed?

A By the Buffalo Oil Company.

Q Are they one of the operators in the Maljamar Cooperative Repressuring area?

A They are.

Q One of the largest operators? A We have a large interest.

Q Are you a member of the Operating Committee?

A Yes.

Q In what capacity?

A Secretary of the Operators Committee.

Q How long have you been with the Buffalo Company?

A Nine and a half years.

Q Are you a petroleum engineer? A Yes.

Q Have you previously testified before the Commission?

A I have.

MR. PORTER: His qualifications are accepted.

A I would like to explain to the Commission that we have

several operators involved in this cooperative project and appreciate Mr. Wright's position here in trying to represent all of the thoughts of the various companies, he's rather handicapped to some extent. I would like to clarify to some extent some of the statements that have been made in regard to the allowables and the allowables that might be expected in the future.

This application, of course, is being made with no recommendation for a change. The intention of our project at this time is to follow the existing allocation plan for the field with no change whatsoever. Now, the operators have not attempted to look into the future and to ascertain what our future allowable situation might be. We have no intention at this time to make any statement in regard to our future allowables under the full scale water flood.

Q By that, you mean that if you in the future should ask for an increased allowable on account of the success of the water flood, you wouldn't expect to do that administratively, but through hearing before the Conservation Commission?

A That's right. In the event there is any change in the allocation desired later under a full scale project, it's our intention at that time to request a separate hearing for that matter.

Q Which would be a formal hearing before the Conservation Commission?

A Yes, sir.

MR. PORTER: Does anyone have a question of Mr. Gray?

The witness may be excused.

(Witness excused.)

MR. HINKLE: My next witness is Mr. Mills.

W. H. MILLS

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

DIRECT EXAMINATION

By MR. HINKLE:

- Q State your name, please. A W. H. Mills.
- Q Where do you live, Mr. Mills? A Odessa, Texas.
- Q By whom are you employed? A Kewanee Oil Company.
- Q How long have you been with the Kewanee?
- A Eight years.
- Q Are you a graduate engineer? A Yes, sir.
- Q What university?
- A University of New Mexico.
- Q What year? A '47.
- Q Have you previously testified before the New Mexico Oil Conservation Commission? A I have.

MR. HINKLE: Qualifications accepted?

MR. PORTER: Yes, sir.

Q Have you been familiar or observed the operations of the pressure maintenance project in the Maljamar Cooperative Repressuring area?

A I have.

Q Over a number of years? A Yes, sir.

Q Does the Kewanee have a number of leases involved in the area?

A Yes, sir.

Q They are one of the largest owners of leases in the area?

A We have a large share of the cooperative area.

Q Did you do the preliminary engineering work or were you associated with it?

A I did the preliminary engineering work on the Pearl pilot water flood.

Q Now, the Pearl pilot water flood is the one shown on Exhibit No. 1 on the east side of the small project in blue?

A That's right. That is the eastern extension area of the cooperative area.

Q Was the inauguration of that pilot water flood approved by the Oil Conservation Commission?

A It was approved by the Oil Conservation Commission.

Q Do you remember when?

A On the 9th day of July, 1956 by Order R-841.

Q Mr. Mills, explain to the Commission briefly how that pilot ~~was~~ inaugurated and how it has progressed.

A Prior to the expansion of the cooperative area, the area referred to as the eastern extension area known as our Pearl lease was not included in the MCRA area.

Q Was this pilot inaugurated prior to that inclusion in the MCRA area?

A Yes, it was. Kewanee desired to initiate a pilot water flood on the lease to determine whether or not it was feasibly economical to water flood that portion of the reservoir. In accordance with that line of thinking we started a pilot flood utilizing our, ~~the~~ our Kewanee Pearl No. 26 that flood has progressed through the years to the current time and we feel that the flood has been an economic success.

Q How many injection wells have been involved up to the present time?

A Present time just one injection well.

Q When was that pilot first inaugurated?

A We started it in 1954 merely to determine whether or not we could pump water into the ground, and then it was shut down for a period of time and started again in September of '55.

Q Where have you been obtaining your water for injection?

A We obtain water from our Pearl No. 12 XWS, which is located in the southeast quarter of the southeast quarter of Section 25, Township 17 South, Range 32 East.

Q That well is shown on Exhibit No. 1?

A That's right.

Q What has been your rate of injection since March, 1955?

A Since March, 1955, we have been maintaining an approximate rate of 350 barrels of water per day.

Q At what pressure?

A The pressure has gradually increased until now it is approximately 2900 pounds per square inch.

Q Mr. Mills, refer to Exhibit 15 and explain to the Commission what it is, what it shows.

A Exhibit 15 shown here is a plot of the average injection pressure for Pearl pilot water flood, the average rate of water injected into Pearl No. 26, the cumulative water injected into the reservoir surrounding Pearl 26, and the average down time for the pumping equipment that we utilized in the flood.

Q That is from the time the pilot was first inaugurated up to the present time?

A That's right.

Q Now, refer to Exhibit 16 and explain to the Commission what it is.

A Exhibit 16 is a plot of the average gas-oil ratio, average oil production, average water production of the six wells surrounding Pearl input No. 26, which is the pilot water injection well. It shows the gas-oil ratio has been declining here within the last two years, the oil rate curve shows it declined until we had an increase in production, approximately in May of 1956, about the same time the water from these six wells showed a substantial increase.

We feel now that we definitely are producing water flood oil, from not all of these six wells, but from some of these wells offsetting the Pearl Input No. 26.

Q Do you consider generally that this pilot water flood so far has been successful?

A We consider the pilot water flood a success yes, sir.

Q Have you any way of estimating the additional amount of oil that might have been produced on account of this pilot?

A As of the first of September, 1957, we estimate the cumulative oil produced as a result of water injection now amounts to 15,075 barrels. The cumulative water flood production as of the same date, 3,851 barrels.

Q So there has been a considerable increase in the amount of oil produced on account of the pilot water flood?

A Yes, sir.

Q Now, explain to the Commission your proposed expansion of this pilot.

A We propose to expand the pilot, if the Commission please, to take in additional area to the west of the current pilot area.

Q You are referring now to Exhibit 1?

A That's right. And using our Pearl No. 21 as a water input well, initiate an operation similar to the one that we have now in operation on our Pearl No. 26.

Q In other words, your well 21-B would be converted to water injection well?

A Yes, sir.

Q What is that well capable of producing at the present time?

A That well is capable of producing approximately 15 barrels

of oil per day.

Q By this application, are you requesting that the 15 barrels be allocated to the same lease?

A Yes, sir, we are requesting that the 15 barrel allowable that is assigned to the well now be allocated to other wells on the same lease.

Q Are you asking for any increased allowable in any way?

A No, sir.

Q Do you have a log of Well 21-B? A Yes, sir.

Q Is that Exhibit No. 17? A That's right.

Q You might explain to the Commission anything that you think might be pertinent concerning that log.

A Merely for the benefit of the Commission, this well was completed initially August 28, 1948. It has been on production since that time, the well was originally completed at 4,190 feet, seven inch pipe was set at 3,920 feet, cemented with 200 sacks of cement. The well was initially shot with nitroglycerin in the intervals 4,004, 4,040, 4,104, 4,190. Initial production of the well was 64.8 barrels of oil. The gas-oil ratio of 758 cubic feet per barrel.

Q Mr. Mills, were Exhibits 15, 16 prepared by you?

A Yes.

Q And 17 is a true and correct copy of the log of that well?

A Yes, sir.

MR. HINKLE: I would like to offer Exhibits 15, 16 and 17 in evidence.

MR. PORTER: Without objection they will be admitted.

Q Mr. Mills, you have referred to converting Well 21-B to an injection well. Is this at an unorthodox location or is it at a regular location? By that I mean in the center of a 40 or of 40?

A It is an unorthodox location. It is what is referred to commonly as a five-spot well.

Q Are there any other wells in your proposed expansion?

A Yes, sir.

Q That are unorthodox? A Pardon me.

Q That are unorthodox locations? A Yes, sir, there are.

Q What are those wells?

A Those wells are including Pearl 21, Pearl 23, Pearl 26, Input No. 42, No. 44, No. 45.

Q Have those unorthodox locations all been heretofore approved by the Conservation Commission? A Yes, sir, they have.

Q Under what order, do you remember?

A Under Order No. 770 dated May 25, 1948.

Q Do you anticipate that if this expansion of the pilot is successful that other expansions will be necessary and that you will cooperate with the Operators Committee of the Maljamar Cooperative Repressuring Agreement in the event that they desire to eventually expand the initial pilot plant that they are inaugurating?

A Yes, sir.

Q Is it your intention that with these two pilot projects that eventually you will encompass the entire Maljamar Cooperative Repressure area?

A That is the ultimate plan.

Q Is it your opinion, as an engineer, by carrying on this water flood project you will recover a considerable amount of additional oil?

A Yes, sir.

MR. HINKLE: I believe that's all we have.

MR. PORTER: Does anyone have a question of Mr. Mills?

Mr. Nutter.

CROSS EXAMINATION

By MR. NUTTER:

Q Do you plan to keep No. 42 and No. 45 on the Pearl leases as injection wells?

A At the present time, Mr. Nutter, Pearl 42, 45 and 46 are gas input wells. We plan to continue injecting gas into those three wells.

MR. PORTER: Mr. Cooley, did you have a question?

MR. COOLEY: Yes, please.

By MR. COOLEY:

Q Mr. Mills, I think you testified that the allowable presently being assigned under the formula to the Pearl B Well No. 21 is 15 barrels per day?

A That's right.

Q Your proposal that the figure remain constant through the life of this flood as a transfer figure?

A For that particular well.

Q Yes. Will there be a monthly calculation to be assigned to this non-producing well?

A I think that in our original application we are proposing to transfer the allowable of any producing well that has been established as of the first date of the month for that particular well, so in this case Pearl 21 has an allowable of 15 barrels per day. We propose to transfer that 15 barrels to other wells on the lease, and I presume that will be the case from here on out.

Q Maybe, Mr. Wright can help straighten me out on this.

MR. COOLEY: Will there be a monthly assignment of maybe 15, maybe some other figure, to this well, or will it always remain 15? If so, how do you determine it?

MR. WRIGHT: I think it will remain 15 until we feel that this 15 additional barrels will be harmful to the other wells in the lease.

MR. COOLEY: Harmful, do you say?

MR. WRIGHT: Harmful. In other words, you can take the 15 and 16 wells and assign it 15 barrels and not hurt the withdrawal from the large lease. You get into a lease with three or four wells and assign 15 barrels to other leases, it becomes detrimental under the pressure maintenance.

MR. COOLEY: Under your pressure formula, there would be no way to calculate a formula for the well without production figures?

MR. WRIGHT: It is quite complicated. Just like he was talking about the five-spot, there are two wells to the 40. Those two wells to the 40 can end up over 44 barrels top. Therefore, we assign that well 15 barrels. The other well in that 40 is taking the other 44 barrels. We therefore figure it out under our formula, it might end up 65 barrels, and therefore, proportioned down to where they end up with the 44 barrels.

A I think to definitely answer your question, Mr. Cooley, I think that the allowable as is established as of the first day of the month for any well, we propose to transfer the allowable on, will be transferred in that amount from there on out because --

Q (Interrupting) As of the first day of which month?

A The month that the allowable is transferred. In other words, the well has an allowable established 15 barrels right now as of the first of September.

Q Say we write the order tomorrow proving it is.---

A We want the authority to transfer from that well to other wells on the lease.

Q The effect of the order will be to fix the 15 barrels for every open well, will it not?

A That's right.

MR. HINKLE: At least it could never exceed that amount.

A That's right.

MR. COOLEY: Is that also true, Mr. Wright, of the Balish 21-A?

MR. WRIGHT: That is another large lease, 16 well lease, so I don't think it would be harmful.

MR. COOLEY: It would be workable to fix that, to fix that, what was the estimate at, 25?

MR. WRIGHT: 25.

MR. COOLEY: It would be fixed at the day --

MR. WRIGHT: (Interrupting) It is converted into a water well.

MR. COOLEY: Until the day it is converted and remains so forever?

MR. WRIGHT: Yes.

Q Will the transfer be only to such wells inside the pilot area as outlined?

A Let me explain to you in the pilot area in the different parts of the field there are several different operators in that area. It will have to be transferred to his lease and not the entire pilot area. On the Pearl lease we control the entire Pearl lease.

Q The ownership is not common --

A (Interrupting) Not in the proposed pilot area in the center of the field. It is not common.

Q But on the Pearl it is? A Yes.

Q Would it be satisfactory to transfer to one of the six

wells included in the pilot area?

A We would want the authority.

Q To any one or all of them? A That's right.

Q But limited to the six wells? It couldn't be transferred to the 17-B out here to the south?

A My original statement, I said transfer to the lease. The lease, the Pearl lease encompasses the entire Section 25 and the west half of Section 30.

Q Do you think that the pilot water flood is affecting the 17-B? This is, transfer is being requested as a result of the pilot water flood project? A Yes.

Q It seems to me it should be transferred to the well that you reasonably anticipate will be affected by the pilot water flood.

A In all probability it would be the case.

Q It would be satisfactory to transfer to the six wells inside the pilot area?

A Well, I would rather not, I don't think that's the intent of the original application. I think the intent of the original application was the authority to transfer the allowable to other wells on the same basic lease.

Q Are you prepared to testify that any other well outside the pilot area will be affected by the pilot flood?

A Not at the present time. I might point out to clarify ~~this particular situation, Mr. Cooley, it so happens that the~~

Pearl 21 Well is in the same 40 acre unit as our, as what is known as our Pearl No. 9 Well, so that well would automatically would have to have its allowable transferred over to the No. 9 Well, which is on the same basic 40 acre unit.

Q You didn't clarify a thing.

A I was merely trying to bring it out to you in this particular case those two wells are on the same 40 acre unit.

Q Same 40 acre unit, and as a unit, it is entitled to so much allowable?

A That's right.

MR. HINKLE: You would be transferring the 15 barrels to the other well on the other well on that 40 acres.

Q If the 9-B can produce the 15 barrels, fine, but if it doesn't, you would want to transfer it to some other well?

A That's right.

MR. COOLEY: That's all.

MR. PORTER: Any further questions of the witness? Mr. Utz.

By MR. UTZ:

Q Mr. Mills, referring to your Exhibit No. 1, and particularly to your Pearl 26-B, what is the location of that well?

A Pearl No. 26 is located 2615 feet from the south line and 25 feet from the west line of Section 30, Township --

Q (Interrupting) It is to the northwest of the southwest of Section 30?

A Yes.

MR. UTZ: That's all.

MR. PORTER: Any further questions? The witness may be excused.

(Witness excused.)

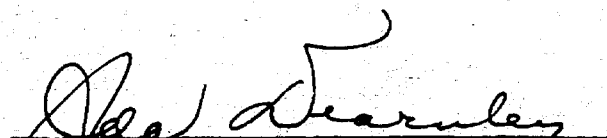
MR. PORTER: Does anyone have anything further to say in this case? We'll take the case under advisement and we will take up next Case 1310.

C E R T I F I C A T E

STATE OF NEW MEXICO )  
: SS  
COUNTY OF BERNALILLO )

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this *7th* day of *October*, 1957.

  
Notary Public-Court Reporter

My commission expires:

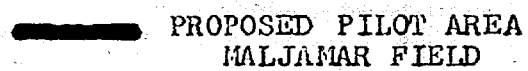
June 19, 1959.

Form C-120  
(Revised 2/1/56)

COMPANY Kewanee Oil Company POOL Maljamar - Maljamar Unit Area  
COUNTY Lea MONTH August 1952 through June 19 57

[illegible][illegible]

NAME Ramsell  
TITLE District Superintendent



**EXHIBIT      B**

- Producing well
- Present gas input well
- Proposed water input well
- Proposed water injection lines

PROPOSED CASING PROGRAM

"A"

150', 8-5/8" OD, J-55, 8Rd casing. To be cemented with sufficient cement to circulate to surface.

"B"

4200' 5½" OD or 4½" OD, J-55, 8Rd casing. To be cemented with sufficient cement to circulate back to a depth above the salt section.

CASING TESTS

Production casing string (B) will be tested at 3000 psi for 30 minutes prior to starting completion operations.

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO  
MC99 EXHIBIT No. 13  
CASE 1309

CASE No. \_\_\_\_\_

EXHIBIT "E"

KEWANEE OIL COMPANY

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO  
74519 EXHIBIT No. 17  
CASE 1369

WELL HISTORY OF PEARL NO. 21

Location: 2615' from South and 1295' from  
East lines of Section 25, NE/4,  
SE/4, Section 25, 17S, 32E, N.M.  
P.M., Lea County, New Mexico.

Elevation: 4002.6'

Top of Lime: 3810'

Drilling Commenced: June 23, 1948

Completion Date: August 28, 1948

Drilled with rotary to 1272' and with cable  
tools from 1272' to total depth by Marshall  
& Smith Drilling Company.

On July 14, 1948 ran 1265' 7" (thds. off) of  
8-5/8" O. D., 24#, J-55, 8 Rd. Thd., National,  
new Seamless casing with new Larkin, Texas  
Pattern, casing shoe welded on bottom.  
Circulated 4 sacks of Aquagel ahead of cement  
and cemented with 100 sacks of Trinity Common  
cement. Cementing done by Halliburton Oil  
Well Cementing Company.

Let well stand for 72 hours for cement to set.

7-17-48

Drilled out plugs and bailed hole dry, and tested  
for water shut off for 2 hours. Found water to  
be completely shut off. Started drilling ahead.

8- 6-48

Found Red Sand from 3455' to 3500' and got a  
show of oil.

Drilling was continued to 3920' and then began  
preparations for running 7" O. D. casing.

8-13-48

Ran 3920' (thds. off) of 7" O. D., 23#, J-55,  
8 Rd. Thd., National, new Seamless casing  
with new Larkin, Fig. #101, Texas Pattern  
casing shoe on bottom of bottom joint and new  
Larkin, Fig. #401 float collar on top of bottom  
joint, both welded on. Circulated 8 sacks of  
Aquagel ahead of cement and cemented with 200  
sacks of Trinity Common cement. Pumped plug  
to 3869' and circulated to surface. Cementing  
done by Halliburton Oil Well Cementing Company.

Let well stand for 72 hours for cement to set.

8-17-48

Drilled out plug, bailed hole dry and tested  
water shut off for 2 hours. Found water to be  
completely shut off. Started drilling ahead.

Well History of Pearl No. 21  
Page 2

8-11-48	3780' to 3790' 3790' to 3810' 3810' to 3840'	Anhydrite and Red Shale. Anhydrite and Sand. Gray Lime.
8-12-48	3840' to 3885'	Gray Lime.
8-13-48	3885' to 3910'	Gray Lime.
		Steel Line Measurement corrected to 3920'.
8-13-48 to 8-17-48		Ran and cemented 7" O.D. casing, drilled plugs and tested water shut off.
8-17-48	3920' to 3930'	Light Brown Sandy Lime. Show of oil.
8-18-48	3930' to 3940' 3940' to 3945' 3945' to 3953' 3953' to 3961'	Light Brown Lime. Gray Sandy Lime, Light Tan Stain. Gray Sandy Lime, Light Tan Stain. Blue Lime.
8-19-48	3961' to 3972' 3972' to 3978' 3978' to 3988' 3988' to 3995'	Gray Lime, Little Tan Stain. Gray Lime, Little Tan Stain. White and Gray Lime, Little Tan Stain. White and Gray Lime, Little Tan Stain.
8-20-48	3995' to 4005' 4005' to 4022' 4022' to 4035'	White and Gray Lime, Little Tan Stain. Gray Sandy Lime, Little Tan Stain. Gray and White Lime.
8-21-48	4035' to 4048' 4048' to 4065' 4065' to 4070'	White Lime. Gray and White Lime. White Sandy Lime.
8-22-48	4070' to 4080' 4080' to 4087' 4087' to 4097'	White Lime. White Lime. White Lime.
8-23-48	4097' to 4104' 4104' to 4120' 4120' to 4125'	White Lime. White Sandy Lime, Faint Stain. Dolomite, Light Tan Stain.
8-24-48 to 8-25-48		Shut down while repairing bull wheel and machine.
8-26-48	4125' to 4135'	Dolomite, Very Light Tan Stain.
		Steel Line Measurement correction to 4133'.
	4133' to 4142'	Light Sand.
8-27-48	4142' to 4146' 4146' to 4154'	Light Sand, Very Little Tan Stain. Light Sand, Little Tan Stain.
		Swab Test @ 4152' — 8.05 bbls. in 24 hours.
	4154' to 4165' 4165' to 4182'	Light Sand, show of gas & oil. 400' OIH. Light Sand, more oil show. 800' OIH.

8-28-48	4182' to 4188'	Swab Test @ 4188' — 16.25 bbls. in 24 hrs. Light Sandy Lime, Little Tan Stain.
	4188' to 4190'	Sandy Lime, Little Tan Stain.
	4190'	Total Depth. Finished drilling August 28, 1948.
		After reaching total depth this well was tested for water. No water showed up.
		Started swabbing and swabbed for 24 hours. 1st 8 hrs. — Swabbed 12.65 BO. 2nd 8 hrs. — Swabbed 6.90 BO. 3rd 8 hrs. — Swabbed 8.05 BO.
8-29-48		While loading hole with oil, ran bailer in hole and bailer stuck 5' off bottom. Fished for bailer until August 30, 1948, at which time it was fished out of hole and hole was cleaned up for shot.
8-31-48		Ran 270 quarts of liquid Nitroglycerin in 4½" shells from 4190' to 4104'. Tamped shot with pea gravel and 8 sacks of Calseal. Top of Calseal 4040'. Shot went off on time at 8:25 A.M. on September 1, 1948.
9- 1-48		After shot went off ran steel line measurement which showed top of Calseal at 4040'. Then ran a 9½' gravel filled shell and set from 4040' to 4030.5'. Then ran 90 quarts of liquid Nitro- glycerin in 4½" shells from 4030.5' to 4004.5'. Tamped shot with pea gravel and 6 sacks of calseal. Top of calseal 3946'. Shot went off on time at 8:30 A.M. on September 2, 1948 and did not come out.
9- 6-48		Moved in Beckman, Inc. reverse circulation unit, rigged up, and started cleaning out. Went in hole and found top of calseal at 3951'. Cleaned out until September 12, 1948, at which time depth of 4190' was reached.
10-1-48		Took a Gas-Oil Ratio Test and well made 64.80 barrels of oil in 5 hours and 49120 cubic feet of gas for a ratio of 758. Gravity of oil: 36.0.

MALJAMAR COOPERATIVE REPRES  
Artesia, New Mexico

Water, Oil and Well  
July 1, 1957

Company, Lease & Well	Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957
<b>ALLEN &amp; FAIR OPERS., INC.</b>					
Baish 1-B	P	22-17-32	56	166,536	Flowing
2-B	H	27-17-32	-	124,566	Flowing
3-B	B	"	31	112,013	Flowing
4-B	G	22-17-32	-	125,123	Flowing
5-B	I	"	-	146,388	Flowing
Total:			87	674,626	
Recovery Per Acre:	5 x 40 =	200		3,373	
Johns 1-A	G	26-17-32	56	129,018	Flowing
2-A	B	"	-	101,141	Flowing
Total:			56	230,159	
Recovery Per Acre:	2 x 40 =	80		2,876	
Johns 1-B	J	26-17-32	4,714	128,830	Pumping
Recovery Per Acre:	1 x 40 =	40		3,220	
Company Total:			4,857	1,033,615	
Recovery Per Acre:	8 x 40 =	320		3,230	
<b>BUFFALO OIL COMPANY</b>					
Baish 1-A	A	21-17-32	49,017	361,186	Pumping
2-A	B	"	22	470,735	Flowing
3-A	C	"	508	464,825	Pumping
4-A	H	"	5,390	356,005	Flowing
5-A	G	"	1,510	112,124	Pumping
6-A	J	"	17,289	240,299	Pumping
7-A	F	"	1,084	108,081	Flowing
8-A* (-20)	E	"	-	12,705	Input Well
9-A	D	"	1,714	128,688	Pumping
10-A* (-24)	E	22-17-32	3,181	107,368	Shut in
11-A	D	"	7,307	267,455	Pumping
12-A	M	21-17-32	-	195,629	Flowing
13-A	N	"	-	195,492	Flowing
14-A	L	"	270	207,105	Flowing
15-A* (-21)	K	"	7	35,647	Shut in
16-A	I	"	3,659	161,877	Flowing
20-A* (-8)	E	"	-	58,958	Flowing
21-A* (-15)	K	"	-	72,049	Flowing
24-A* (-10)	E	22-17-32	-	20,877	Flowing
Total:			90,058	3,577,105	
Recovery Per Acre:	16 x 40 =	640		5,789	

SURING AGREEMENT  
xjco

BEFORE THE  
RESERVATION COMMISSION  
SANTA FE, NEW MEXICO  
M.C. R. 9 EXHIBIT No. 10  
CASE 1309

Status

Company, Lease & Well	Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957
<b>BUFFALO (Con't.)</b>					
Baish 2-B	N	22-17-32	54	202,274	Flowing
3-B	J	"	"	180,555	Flowing
4-B	M	"	"	204,872	Flowing
5-B	P	21-17-32	"	190,106	Flowing
6-B	O	"	"	97,252	Flowing
7-B	H	22-17-32	"	77,625	Flowing
8-B	L	"	39	125,395	Flowing
9-B	K	"	"	93,852	Flowing
10-B	F	"	"	84,122	Flowing
11-B	H	"	496	73,243	Flowing
<b>Total:</b>			589	1,329,296	
<b>Recovery Per Acre:</b>		10 x 40 = 400		3,323	
Hudson 1	M	15-17-32	"	86,593	Pumping
<b>Recovery Per Acre:</b>		1 x 40 = 40		2,164	
<b>Mitchell</b>					
3-A	H	20-17-32	896	238,510	Flowing
4-A	A	"	2,100	189,721	Pumping
5-A	D	19-17-32	938	116,558	Pumping
6-A	G	20-17-32	27	251,870	Flowing
7-A	F	"	304	206,147	Flowing
8-A	E	"	81	191,778	Flowing
9-A	H	19-17-32	65	207,047	Flowing
10-A	G	"	"	177,990	Flowing
11-A	F	"	41	111,815	Flowing
12-A	E	"	173	141,113	Pumping
13-A	C	"	"	21,277	Pumping
14-A	B	"	"	72,339	Pumping
15-A	A	"	18	65,954	Pumping
16-A	D	20-17-32	"	206,773	Flowing
17-A	C	"	24	161,910	Flowing
18-A	B	"	"	187,881	Flowing
<b>Total:</b>			4,667	2,548,683	
<b>Recovery Per Acre:</b>		16 x 40 = 640		3,982	
<b>Mitchell</b>					
1-B	I	20-17-32	2,210	272,778	Flowing
2-B	P	"	1,690	234,445	Flowing
3-B	J	"	87	237,649	Flowing
4-B	O	"	5,135	144,105	Flowing
5-B	K	"	46	198,814	Flowing
6-B	N	"	29	218,659	Flowing
7-B	L	"	16	225,270	Flowing

Water, Oil and Well  
July 1, 1957

Company, Lease & Well	Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957
<b>Buffalo (Con't)</b>					
Mitchell 8-B	M	20-17-32	7,711	226,441	Flowing
9-B	I	19-17-32	"	192,165	Flowing
10-B	P	"	40	194,335	Flowing
11-B	J	"	679	156,237	Flowing
12-B	O	"	21	116,974	Flowing
13-B	K	"	35	189,275	Flowing
14-B	N	"	26	176,171	Flowing
15-B	L	"	49	146,131	Flowing
16-B	M	"	125	195,210	Flowing
Total:			17,899	3,124,659	
Recovery Per Acre:		16 x 40 = 640		4,882	
<b>Mitchell 17-B</b>					
17-B	M	17-17-32	467	61,788	Pumping
18-B	N	"	"	104,290	Pumping
19-B	O	"	"	5,110	Abandoned
25-B	B	"	"	9,161	Pumping
27-B	G	"	"	8,366	Flowing
Total:			467	188,715	
Recovery Per Acre:		5 x 40 = 200		943	
<b>State</b>					
1-A	P	16-17-32	1,102	227,232	Pumping
1-B	O	"	573	111,646	Pumping
Total:			1,675	338,878	
Recovery Per Acre:		2 x 40 = 80		4,235	
<b>Company Total:</b>					
Recovery Per Acre:		66 x 40 = 2,640	116,255	11,193,929	
				4,240	
<b>CARPER DRILLING CO., INC.</b>					
Simon 1-A	A	29-17-32	"	232,474	Flowing
2-A	H	"	"	236,656	Flowing
3-A	K	"	"	178,596	Flowing
4-A	L	"	"	152,248	Flowing
5-A	M	"	2,045	103,744	Pumping
6-A	N	"	648	107,582	Flowing
1-N	C	"	"	229,799	Flowing
2-N	D	"	"	234,457	Flowing
3-N	F	"	"	215,735	Flowing
4-N	E	"	"	99,094	Flowing
5-N	I	"	"	125,861	Flowing
6-N	P	"	"	178,061	Flowing
7-N	J	"	"	186,495	Flowing
8-N* (-9)	O	"	"	9,057	Input Well
9-N* (-8)	D	"	"	57,878	Flowing
Total:			2,693	2,347,737	
Recovery Per Acre:		14 x 40 = 560		4,192	

1. Status

Company, Lease & Well		Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957
CARPER (Con't.)						
Simon	1-B	E	30-17-32	-	239,777	Flowing
	2-B	G	"	352	218,020	Flowing
	3-B	L	"	829	99,540	Flowing
	4-B	C	"	-	83,266	Flowing
	5-B	M	"	344	50,350	Flowing
	6-B	N	"	779	90,258	Flowing
	1-R	I	"	-	128,377	Pumping
	2-R	J	"	-	139,822	Flowing
	3-R	D	"	-	174,837	Flowing
	4-R	C	"	-	194,607	Flowing
	5-R	E	"	565	136,480	Flowing
	6-R	P	"	276	133,327	Flowing
	7-R	F	"	853	31,616	Pumping
	8-R	O	"	1,541	54,598	Flowing
Total:				5,539	1,774,875	
Recovery Per Acre:				14 x 40 = 560	3,169	
Company total:				8,232	4,122,612	
Recovery Per Acre:				28 x 40 = 1,120	3,680	
DRILLING & EXPLORATION CO.						
Johns	1-A	A	26-17-32	274	63,340	Pumping
	2-A	H	"	-	88,594	Pumping
Company Total:				274	151,934	
Recovery Per Acre:				2 x 40 = 80	1,899	
HUDSON & HUDSON						
1-X	1-X	L	15-17-32	-	7,014	Flowing
	Recovery Per Acre:	1 x 40 = 40			175	
KERSEY & COMPANY						
State	1-A	A	32-17-32	-	64,372	Flowing
	2-A	B	"	-	58,284	Flowing
	3-A	D	"	835	7,904	Abandoned
	4-A	G	"	2,647	39,973	Shut in
	5-A	H	"	68	67,617	Flowing
Company Total:				3,550	238,150	
Recovery Per Acre:				5 x 40 = 200	1,190	

Water, Oil & Well SI  
July 1, 1957

Company, Lease & Well	Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957
<b>KEWANEE OIL COMPANY</b>					
Baish	2-B	A	27-17-32	200,542	Flowing
	4-B	G	"	249,130	Flowing
	5-B* (-37)	J	"	216,556	Flowing
	6-B	F	"	5,744	Flowing
	7-B	G	"	1,300	Flowing
	8-B	I	"	208,862	Flowing
	9-B* (-34)	E	"	31,198	Input Well
	11-B* (-32)	O	"	27,901	Input Well
	12-B	K	"	217,898	Flowing
	13-B	P	"	173,918	Flowing
	14-B	D	"	201,894	Flowing
	18-B	N	"	216,808	Flowing
	19-B	L	"	169,997	Flowing
	27-B	N	"	203,664	Flowing
	32-B* (-11)	O	"	73,657	Flowing
	34-B* (-9)	E	"	106,342	Flowing
	37-B* (-5)	J	"	-	-
<b>Total:</b>			7,044	2,705,188	
<b>Recovery Per Acre:</b>			16 x 40 = 640	4,226	
Baish	3-B	D	28-17-32	254,784	Flowing
	10-B	C	"	210,305	Flowing
	15-B	E	"	120,959	Flowing
	16-B	F	"	196,191	Flowing
	17-B	B	"	836	Flowing
	20-B	A	"	196,985	Flowing
	21-B	G	"	209,847	Flowing
	22-B	H	"	184,253	Flowing
	23-B	L	"	3,030	Flowing
	24-B	K	"	190,074	Flowing
	25-B	J	"	921	Flowing
	26-B	I	"	4,481	Flowing
	28-B	P	"	216,215	Flowing
	29-B	O	"	79,348	Flowing
	30-B	N	"	185,689	Flowing
	31-B	M	"	147,335	Flowing
<b>Total:</b>			9,286	3,040,578	
<b>Recovery Per Acre:</b>			16 x 40 = 640	4,750	
Miller	5-A	N	23-17-32	87,694	Flowing
	6-A	E	26-17-32	43,442	Input Well
	7-A	M	23-17-32	84,248	Flowing
	8-A	K	"	3,452	Shut in
	9-A	F	26-17-32	127,789	Pumping
	10-A	I	23-17-32	98,246	Pumping
	11-A	J	"	44,375	Flowing
<b>Total:</b>			3,452	514,141	
<b>Recovery Per Acre:</b>			7 x 40 = 280	1,836	

status

Company, Lease & Well		Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957
KEWANEE (Con't.)						
Miller	5-AX	B	23-17-32	-	42,804	Flowing
	6-AX	O	"	-	74,061	Flowing
Total:				-	116,865	
Recovery Per Acre:				2 x 40 = 80	1,460	
Miller	1-B	E	23-17-32	466	115,107	Pumping
	2-B	F	"	-	49,472	Pumping
	3-B	C	"	4,185	32,415	Pumping
	4-B	D	"	1,601	53,315	Pumping
	5-B	H	"	385	51,813	Shut in
	6-B	G	"	-	39,313	Pumping
Total:				6,637	341,435	
Recovery Per Acre:				6 x 40 = 240	1,422	
Mitchell	1-B	P	17-17-32	-	15,455	Abandoned
	2-B	H	"	-	26,214	Pumping
	3-B	M	18-17-32	-	64,199	Pumping
	4-B	A	17-17-32	-	52,829	Pumping
	5-B	I	"	-	12,749	Pumping
Total:				-	171,446	
Recovery Per Acre:				5 x 40 = 200	857	
Pearsall	3-A	D	33-17-32	-	65,319	Pumping
	4-A	C	"	3,177	118,292	Flowing
	5-A	B	"	3,757	132,418	Flowing
	6-A	A	"	1,504	128,341	Flowing
	7-A	H	"	-	22,712	Flowing
	8-A* (-14)	G	"	-	162,198	Pumping
	12-A	F	"	3,949	109,911	Pumping
	13-A	E	"	-	112,991	Flowing
	14-A* (-8)	G	"	-	742	-
Total:				12,387	852,924	
Recovery Per Acre:				8 x 40 = 320	2,665	
Pearsall	1-B	C	34-17-32	4,604	104,580	Pumping
	Recovery Per Acre	1 x 40 = 40			2,614	
Pearsall	2-BX	B	34-17-32	16,910	60,392	Pumping
	5-BX	A	"	3,983	11,151	Abandoned
Total:				20,893	71,543	
Recovery Per Acre:				2 x 40 = 80	894	
Pearsall	1-BXY	D	34-17-32	2,898	140,363	Flowing
	3-BXY	E	"	30,673	152,156	Pumping
Total:				33,571	292,519	
Recovery Per Acre:				2 x 40 = 80	3,656	

Water, Oil & Well  
JULY 1, 1957

Company, Lease & Well	Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957	
KEWANEE OIL COMPANY						
Baish	2-B	A	27-17-32	-	200,542	Flowing
	4-B	G	"	-	249,130	Flowing
	5-B* (-37)	J	"	-	216,556	Flowing
	6-B	F	"	5,744	192,695	Flowing
	7-B	G	"	1,300	214,126	Flowing
	8-B	I	"	-	208,862	Flowing
	9-B* (-34)	E	"	-	31,198	Input Well
	11-B* (-32)	O	"	-	27,901	Input Well
	12-B	K	"	-	217,898	Flowing
	13-B	P	"	-	173,918	Flowing
	14-B	D	"	-	201,894	Flowing
	18-B	N	"	-	216,808	Flowing
	19-B	L	"	-	169,997	Flowing
	27-B	N	"	-	203,664	Flowing
	32-B* (-11)	O	"	-	73,657	Flowing
	34-B* (-9)	E	"	-	106,342	Flowing
	37-B* (-5)	J	"	-	-	-
Total:				7,044	2,705,188	
Recovery Per Acre:	16 x 40 = 640				4,226	
Baish	3-B	D	28-17-32	-	254,784	Flowing
	10-B	C	"	-	210,305	Flowing
	15-B	E	"	-	120,959	Flowing
	16-B	F	"	-	196,191	Flowing
	17-B	B	"	836	198,416	Flowing
	20-B	A	"	-	196,985	Flowing
	21-B	G	"	-	209,847	Flowing
	22-B	H	"	-	184,253	Flowing
	23-B	L	"	3,030	231,443	Flowing
	24-B	K	"	-	190,074	Flowing
	25-B	J	"	921	192,164	Flowing
	26-B	I	"	4,481	226,570	Flowing
	28-B	P	"	-	216,215	Flowing
	29-B	O	"	-	79,348	Flowing
	30-B	N	"	-	185,689	Flowing
	31-B	M	"	-	147,335	Flowing
Total:				9,286	3,040,578	
Recovery Per Acre:	16 x 40 = 640				4,750	
Miller	5-A	N	23-17-32	-	87,694	Flowing
	6-A	E	26-17-32	-	43,442	Input Well
	7-A	M	23-17-32	-	84,248	Flowing
	8-A	K	"	3,452	28,347	Shut in
	9-A	F	26-17-32	-	127,789	Pumping
	10-A	I	23-17-32	-	98,246	Pumping
	11-A	J	"	-	44,375	Flowing
Total:				3,452	514,141	
Recovery Per Acre:	7 x 40 = 280				1,836	

status

Company, Lease & Well	Well	S.T. & R.	Total Water Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Producing Status as of July 1, 1957
<b>Kewanee (Con't.)</b>					
Miller 5-AX	B	23-17-32	-	42,804	Flowing
6-AX	O	"	-	74,061	Flowing
Total:			-	116,865	
Recovery Per Acre:	2 x 40 =	80		1,460	
Miller 1-B	E	23-17-32	466	115,107	Pumping
2-B	F	"	-	49,472	Pumping
3-B	C	"	4,185	32,415	Pumping
4-B	D	"	1,601	53,315	Pumping
5-B	H	"	385	51,813	Shut in
6-B	G	"	-	39,313	Pumping
Total:			6,637	341,435	
Recovery Per Acre:	6 x 40 =	240		1,422	
Mitchell 1-B	P	17-17-32	-	15,455	Abandoned
2-B	H	"	-	26,214	Pumping
3-B	M	18-17-32	-	64,199	Pumping
4-B	A	17-17-32	-	52,829	Pumping
5-B	I	"	-	12,749	Pumping
Total:			-	171,446	
Recovery Per Acre:	5 x 40 =	200		857	
Pearsall 3-A	D	33-17-32	-	65,319	Pumping
4-A	C	"	3,177	118,292	Flowing
5-A	B	"	3,757	132,418	Flowing
6-A	A	"	1,504	128,341	Flowing
7-A	H	"	-	22,712	Flowing
8-A* (-14)	G	"	-	162,198	Pumping
12-A	F	"	3,949	109,911	Pumping
13-A	E	"	-	112,991	Flowing
14-A* (-8)	G	"	-	742	-
Total:			12,387	852,924	
Recovery Per Acre:	8 x 40 =	320		2,665	
Pearsall 1-B	C	34-17-32	4,604	104,580	Pumping
Recovery Per Acre	1 x 40 =	40		2,614	
Pearsall 2-BX	B	34-17-32	16,910	60,392	Pumping
5-BX	A	"	3,983	11,151	Abandoned
Total:			20,893	71,543	
Recovery Per Acre:	2 x 40 =	80		894	
Pearsall 1-BXI	D	34-17-32	2,898	140,363	Flowing
3-BXY	E	"	30,673	152,156	Pumping
Total:			33,571	292,519	
Recovery Per Acre:	2 x 40 =	80		3,656	

Water, Oil and Gas  
July 1, 1977

Company, Lease & Well	Well	Oil Recovered to Date	Oil Produced to Date	Status as of July 1, 1977
BARNES (Cont'd.)				
Gears 1-A	D	26-17-32	10,199	Pumping
2-A	C	"	4,916	Pumping
Total:			15,115	
Recovery Per Acre:	2 x 40 = 80		189.94	
Steele 1-0	W	18-17-32	11,872	Pumping
2-0	M	"	12,951	Pumping
3-0	E	"	22,959	Pumping
5-0	D	"	29,803	Pumping
6-0	C	"	10,297	Pumping
Total:		100	85,882	
Recovery Per Acre:	5 x 40 = 200		429.41	
Pearl 1-B	E	25-17-32	11,460	Flowing
2-B	C	"	108,521	Flowing
3-B	E	"	22,992	Pumping
4-B* (-24)	G	"	149,979	Pumping
5-B	B	"	100,482	Pumping
6-B* (-25)	C	"	116,566	Flowing
7-B	A	"	97,104	Pumping
8-B	H	"	99,650	Pumping
9-B* (-2)	L	"	151,263	Pumping
10-B* (-22)	J	"	143,800	Pumping
11-B	D	30-17-32	102,520	Flowing
12-B	P	25-17-32	37,309	Abandoned
13-B	E	30-17-32	4,096	Abandoned
14-B* (-23)	K	25-17-32	5,328	Pumping
15-B* (-26)	L	30-17-32	10,580	Pumping
16-B	K	"	140,507	Pumping
17-B	L	25-17-32	2,339	Pumping
18-B	F	30-17-32	153	Pumping
19-B	C	"	89	Pumping
21-B* (-9)	L	25-17-32	52,634	Pumping
22-B* (-10)	J	"	32,039	Input Well
23-B* (-14)	K	"	63,037	Flowing
24-B* (-14)	F	"	28,279	Input Well
25-B* (-6)	G	"	28,140	Input Well
26-B* (-15)	L	30-17-32	24,315	Water Inj.
Total:		22,945	2,296,514	
Recovery Per Acre:	19 x 40 = 760		3,021	
Company Total:		120,901	10,878,326	
Recovery Per Acre:	91 x 40 = 3,640		2,988	

1001-1000  
107

Company, Lease & Well		Well S.T. & R.		Water Total Produced to July 1, 1957	Total Oil Produced to July 1, 1957	Production Status as of July 1, 1957
SHAW-BA AL						
Miller	1-A	L	26-17-32	-	208,274	Flowing
	2-A	M	"	12,915	197,572	Flowing
	3-A	N	"	5,599	12,570	Abandoned
	4-A	K	"	2,241	125,557	Flowing
	5-A	H	"	-	94,183	Flowing
Company Total:				25,755	638,156	
Recovery Per Acre:				4 x 40 = 160	3,988	
WALLINGFORD & SMITH						
State	1-A	C	32-17-32	1,297	15,201	Abandoned
Recovery Per Acre:				1 x 40 = 40	380	
WEIER DRILLING COMPANY						
Miller	1-A	L	23-17-32	221	150,983	Flowing
Recovery Per Acre:				1 x 40 = 40	3,774	
E. G. WOODS						
Simon	1-A	B	29-17-32	-	199,043	Flowing
	2-A	G	"	-	203,963	Flowing
Total:				-	403,006	
Recovery Per Acre:				2 x 40 = 80	5,037	
Simon						
	1-B	A	20-17-32	-	191,362	Flowing
	2-B	H	"	-	187,198	Flowing
Total:				-	378,560	
Recovery Per Acre:				2 x 40 = 80	4,732	
Company Total:				-	781,566	
Recovery Per Acre:				4 x 40 = 160	4,881	
GRAND TOTAL:						
Recovery Per Acre:				281,342 211 x 40 = 8,440	29,211,486 3,461	

Case 1309

MAIN OFFICE 000  
J. H. HERVEY 1874-1955  
1957/8/20 PM 1:30  
HIRSH M. DOW  
CLARENCE E. HINKLE  
W. H. HINKLE, JR.  
GEORGE H. HINKLE, JR.  
HOWARD C. BRATTON  
S. B. CHRISTY IV  
J. PENROD TOLES  
LEWIS C. COX, JR.  
PAUL W. EATON, JR.

LAW OFFICES  
HERVEY, DOW & HINKLE  
FIRST NATIONAL BANK BUILDING  
ROSWELL, NEW MEXICO

TELEPHONE MAIN 2-6510  
POST OFFICE BOX 547

August 20, 1957

Mr. A. L. Porter, Jr., Director  
New Mexico Oil Conservation Commission  
State Capitol Building  
Santa Fe, New Mexico

Re: Maljamar Pilot Waterflood

Dear Mr. Porter:

Enclosed herewith please find three (3) copies of an Application of the Operators Committee of the Maljamar Cooperative Re-pressuring Agreement for an order approving an additional Pilot Waterflood project in the Maljamar Field of Lea County, New Mexico, and for the expansion of the project to include the entire Maljamar Re-pressuring Agreement area.

It would be appreciated if you would file this Application, and set the matter down for hearing at the September 18, 1957 hearing of the Commission.

If there is anything further which you may need in connection with this matter, please let us hear from you.

Very truly yours,

HERVEY, DOW & HINKLE

BY 

FCB:wh

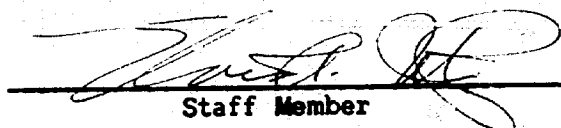
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

Date 10-1-57

CASE 1309 Hearing Date 9-18-57

My recommendations for an order in the above numbered cases are as follows:

*That the application of Matjamas  
Cooperative Representing agreement be  
approved as requested.*

  
Staff Member

OPERATORS COMMITTEE  
EMERY CARPER  
J. M. HARBISON  
R. L. GRAY  
E. G. WOODS  
GUS W. ARNOLD  
D. G. WEBB

MALJAMAR COOPERATIVE  
REPRESSURING AGREEMENT

ROOM 200 BOOKER BUILDING  
ARTESIA, NEW MEXICO

EMERY CARPER  
CHAIRMAN  
J. M. HARBISON  
VICE-CHAIRMAN  
R. L. GRAY  
SECRETARY

1957 OCT 6 PM 1:01  
MAIN OFFICE 086

October 7, 1957

Mr. Jack Cooley  
New Mexico Oil Conservation Commission  
Box 871  
Santa Fe, New Mexico

Dear Mr. Cooley:

We are inclosing herewith the locations of the proposed water input wells on both the proposed new pilot area and the present Kewanee pilot area and its extension.

This is my interpretation of what you requested by phone and if it is not according to your desire, please call us collect on this matter or any other that you may require, and we will be glad to assist in whatever possible way we can.

With kindest personal regards,

MALJAMAR COOPERATIVE  
REPRESSURING AGREEMENT

*William J. Wright*

William J. Wright  
Project Engineer

WJW:dp

Enclosure

OPERATOR COMMITTEE  
EMERY CARPER  
J. M. HARBISON  
R. L. GRAY  
E. G. WOODS  
GUS W. ARNOLD  
D. C. WEBB

## MALJAMAR COOPERATIVE REPRESSURING AGREEMENT

ROOM 200 HOOKER BUILDING  
ARTESIA, NEW MEXICO

EMERY CARPER  
CHAIRMAN  
J. M. HARBISON  
VICE-CHAIRMAN  
R. L. GRAY  
SECRETARY

October 3, 1957

### LOCATIONS OF PROPOSED WATER INPUT WELLS

#### Proposed new pilot area

- A. New well. 25' east of west and <sup>1325</sup>1320' north of south lines, Sec. 21-17-32.
- B. Buffalo Baish A-21, (presently producing) <sup>1395</sup>1395' north of south and 1347' east of west line, Sec. 21-17-32.
- C. New well. <sup>1325</sup>1320' north of south and 2615' east of west lines of Sec. 21-17-32.
- D. Kewanee Baish B, IP #11, (presently gas input well) 80' south of north and 25' east of west lines, Sec. 28-17-32.
- E. New well. 25' north of south and <sup>1325</sup>1320' east of west lines, Sec. 21-17-32.
- F. Kewanee Baish B, IP #35, presently gas input well. <sup>2560 FT from the</sup> ~~2560 FT from the~~ east line and 75' ~~south of north line~~ <sup>from the</sup> line of ~~corner of northeast quarter of~~ Sec. 28-17-32.
- G. New well. 25' east of west and <sup>1325</sup>1320' south of north lines, Sec. 28-17-32.
- H. New well. <sup>1325</sup>1320' east of west and <sup>1325</sup>1320' south of north lines, Sec. 28-17-32.
- I. New well. <sup>1325</sup>1320' south of north and <sup>2635</sup>2640' east of west lines, Sec. 28-17-32.

#### Kewanee proposed pilot extension

Pearl B #21. 2615' north of south and 1295' west of east lines, Sec. 25-17-32.

Pearl B-26, IP #46, presently water well. 2615' from the South line and 25' from the West line, Sec. 30-17-32.

MALINCO COOPERATIVE REPRESSURING AGREEMENT  
ARTESIA, NEW MEXICO

October 3, 1957

LOCATIONS OF PROPOSED WATER INPUT WELLS

Proposed new pilot area

- A. New well. 25' east of west and 1320' north of south lines, Sec. 21-T17S-R32E.
- B. Buffalo Baish A-21, presently producing. 1395' north of south and 1347' east of west line, Sec. 21-17-32.
- C. New well. 1320' north of south and 2615' east of west lines of Sec. 21-17-32.
- D. Kewanee Baish B, IP #11, presently gas input well. 80' south of north and 25' east of west lines, Sec. 28-17-32.
- E. New well. 25' north of south and 1320' east of west lines, Sec. 21-17-32.
- F. Kewanee Baish B, IP #35, presently gas input well. 80' east and 75' south of northwest corner of northeast quarter of Sec. 28-17-32.
- G. New well. 25' east of west and 1320' south of north lines, Sec. 28-17-32.
- H. New well. 1320' east of west and 1320' south of north lines, Sec. 28-17-32.
- I. New well. 1320' south of north and 2640' east of west lines, Sec. 28-17-32.

Kewanee proposed pilot extension

Pearl B #21. 2615' north of south and 1295' west of east lines, Sec. 25-17-32.

Pearl B-26, IP #46, presently water well. 2615' from the South line and 25' from the West line, Sec. 30-17-33.

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO.

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

CASE NO. 80

ORDER NO. 658

THE PETITION OF OPERATORS' COMMITTEE UNDER  
HALLAMER COOPERATIVE REPRESSURING AGREEMENT  
AND AMENDMENT TO ORDER NO. 485, AS AMENDED  
BY ORDER NO. 595 OF THE COMMISSION, TO  
PROVIDE FOR THE RUNNING OF BACK ALLOWABLE  
FROM THE HALLAMER COOPERATIVE REPRESSURING AREA.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at Santa Fe, New Mexico, at ten o'clock  
A.M., June 7, 1946, before the Oil Conservation Commission of New Mexico,  
hereinafter referred to as the "Commission".

NOW, on this 7th day of June, 1946, the Commission having before it  
for consideration the testimony adduced at the hearing of said case and being  
fully advised in the premises;

IT IS THEREFORE ORDERED THAT:

SECTION 1. Order 485 as amended by Order 595 is hereby further amended  
by the addition of a new section as follows:

"IX". Back allowable shall be permitted beginning with December 1,  
1945, but shall not exceed the maximum daily rate of back allowable currently  
prescribed by the Commission. Said nomination shall show back allowable in  
total barrels separately from the current allowable. A separate or additional  
column shall be provided in said schedule showing the number of barrels daily  
of back allowable for each proration unit in order to distinguish back  
allowable from current allowable shown in said schedule as computed by said  
formula".

SECTION 2. The order herein shall become effective July 1, 1946.

Done at Santa Fe, New Mexico, as of the day and year hereinabove  
designated.

OIL CONSERVATION COMMISSION

John J. Dempsey, Chairman

John E. Miles, Member

E. R. Spurrer, Secretary

(OFFICIAL SEAL)

June 28, 1946

ILLEGIBLE

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

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

CASE NO. 36  
ORDER NO. 485

THE PETITION OF THE OPERATORS' COMMITTEE  
UNDER MALJAMAR COOPERATIVE REPRESSURING  
AGREEMENT; WITH REGARD TO A CERTAIN AREA  
WITHIN THE MALJAMAR FIELD, LEA COUNTY, FOR  
AN ORDER APPROVING THE FOLLOWING, AND SUCH  
OTHER MATTERS AND THINGS INCIDENT THERETO  
AS MAY BE REQUIRED BY LAW TO BE APPROVED  
BY THE OIL CONSERVATION COMMISSION:  
UNITIZATION OF GAS, SELECTION OF KEY OR  
IN-PUT WELLS, MANNER OF COMPUTATION AND  
COMPENSATION FOR LOSS TO PRODUCTION UNITS  
UPON WHICH ARE LOCATED KEY OR IN-PUT WELLS,  
AND THE PROHIBITION OF A TOP ALLOWABLE  
EXCEEDING 44 BARRELS PER PRODUCTION UNIT  
PER DAY.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at two o'clock P.M., October 29, 1942, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this 14th day of November, 1942, the Commission having before it for consideration the testimony adduced at the hearing of said case and being fully advised in the premises, the Commission finds:

FINDINGS

1. That on August 5, 1941, an agreement was made and entered into by and between the parties signatory thereto, an original of which agreement is filed in this case as exhibit A; said agreement having as its general objects and purpose, the following:

(a) The erection and maintenance of a repressuring plant and system, for the purpose of using the natural gas produced from the area subject to the agreement for pressure maintenance, so as to secure the greatest ultimate recovery of oil and gas from such area.

(b) For the erection and maintenance of a natural gasoline plant to be operated in connection with the repressuring plant and system hereinabove referred to.

(c) For the purpose of conducting operations in the area subject to the agreement in such a manner as to provide for the most economical and efficient recovery of oil and gas to the end that the maximum ultimate recovery may be obtained without waste.

2. That said agreement provides for a cooperative area, hereinafter referred to as the cooperative area, and within the boundaries of the cooperative area a somewhat lesser area that is actually committed to said agreement, which lesser area is hereinafter referred to as the committed area. Both of said areas are more particularly described in Section II of the Order herein.

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All of the lands within the committed area are under oil and gas lease. All of the leases within the committed area, except the lease covering the E $\frac{1}{2}$  Sec. 16, T. 17S., R. 32E., are issued by the United States under and pursuant to the Act of Congress approved February 25, 1920. The lease covering the said E $\frac{1}{2}$  Sec. 16 was issued by the State of New Mexico, acting by and through its Commissioner of Public Lands. All of said lands being in the area commonly referred to and known as the Maljamar Oil & Gas Field.

It is contemplated by said agreement that other lands within the cooperative area may be committed to said agreement which adjoin the lands which are already committed, with the consent of the parties to said agreement, and where such lands will be benefited by the pressure maintenance operations.

3. That it is the purpose and intention of said agreement to operate the properties subject thereto, in so far as the oil produced is concerned in the same manner as they were operated prior to entering into said agreement; that is to say, each of the respective owners are to operate their properties individually and the oil is to belong to the lease from which produced, and each operator is to market his or its own oil.

In so far as the natural gas produced from the properties subject to the agreement is concerned, all of such gas except the amount used for development purposes or unavoidably lost is to be delivered to the repressuring plant, and after the extraction of the natural gasoline is to be returned to the formation from which oil is being produced in said field.

4. That said repressuring agreement provides for the selection by the parties thereto of a Committee to be known as "The Operators' Committee" for the purpose of carrying out the objects and purposes of the agreement, and for the purpose of operating and maintaining the repressuring plant and system and gasoline plant. That the following representatives of the parties to said agreement have been elected to constitute the Operators' Committee, namely, Henry Carper, Artesia, New Mexico, representing Carper Drilling Company; M.E. Baish, Artesia, New Mexico, representing Maljamar Oil & Gas Corporation; J.E. Steele, representing the Keweenaw Oil Company, the latter having acquired its interest from Barney Cookburn after the execution of the repressuring agreement; Barney Cookburn, Lubbock, Texas, representing himself, the Fair Oil Company and Johnny Cookburn; A.E. Shaw, representing E.C. Woods.

5. That the Operators' Committee has selected, subject to the approval of the Commission, thirteen in-put wells which have been selected after careful study by engineers, with the view of being the most effective and properly located so as to be of the greatest benefit in maintaining the pressure of the field in the repressuring operations. Said wells are shown on the map of the Maljamar Oil Field filed in this Case as exhibit B, and are more particularly described in Section V of the Order herein.

In addition to the said in-put wells, there is contemplated the selection of other in-put wells within the now committed area and in other areas within the cooperative area as the committed area is extended—a matter necessary for the fuller attainment of the objects and purposes aimed in Section 1 of the findings herein.

That such in-put wells as may be necessary to be selected from time to time should be submitted by the Operators' Committee to the Commission for approval administratively without the calling of a formal hearing therefor.

6. That sixty percent of the allowable to the proration units upon which are situated the in-put wells should be redistributed to the other proration units within the committed area capable of producing such additional oil without waste.

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7. That the proration units within the committed area should not exceed the production of 44 barrels of oil daily if the current allowable in the future exceeds said amount; subject, however, to the proviso set out in Section VII of the order herein. Such petition should be considered by the Commission administratively without further notice and formal hearing.

IT IS THEREFORE ORDERED:

I. That this project shall hereafter be known as the Maljamar Cooperative Repressuring Agreement.

II. That the cooperative area referred to in Section 2 of the findings herein consists of the following tracts: Sections 14 to 23 inclusive, and Sections 26 to 35, inclusive, in Twp. 17S. Rge. 32E., N.M.P.M., Lea County, New Mexico.

The committed area referred to in Section 2 of the findings herein is described as follows:

The E $\frac{1}{2}$  Sec. 14; E $\frac{1}{2}$  Sec. 16; all Sec. 17, 18, 19, 20, 21, 22, 27, 28, 29 and 30.  
The N $\frac{1}{2}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , S $\frac{1}{2}$ SW $\frac{1}{4}$  Sec. 23;  
S $\frac{1}{2}$ NW $\frac{1}{4}$ , SW $\frac{1}{4}$  Sec. 26; N $\frac{1}{2}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$ , Sec. 31;  
N $\frac{1}{2}$ , S $\frac{1}{2}$  Sec. 33; NE $\frac{1}{4}$ , W $\frac{1}{2}$ NW $\frac{1}{4}$  Sec. 34; W $\frac{1}{2}$  Sec. 35, all in Twp. 17S. Rge. 32E., N.M.P.M..

As the committed area within the boundaries of the cooperative area is enlarged as in Section 2 of the findings herein, the Operators' Committee shall notify the Commission promptly in writing as to such enlarged committed area named subject to the approval of the Commission administratively without further notice and formal hearing; provided, however, that any extension of the cooperative area and of the committed area beyond the limits of the cooperative area as set out in Section II of the order herein shall be upon formal petition, notice and hearing as provided by law.

III. There shall be no unitization of oil but the gas shall be utilized in the manner set out in Section 3 of the findings herein.

IV. That the management of said project shall be by the Operators' Committee as set out in Section 4 of the findings herein. Any change of membership of said Operators' Committee should be transmitted promptly in writing to the Commission.

V. That the in-put wells referred to in Section 5 of the findings herein are hereby authorized for use as such and are more particularly described as follows:

Company	Well	Section	Twp.	Rge.
Maljamar Oil & Gas Corp.	Wm. Mitchell	B-12	17S	32E.
"	"	B-4	20	"
"	"	A-8	20	"
"	"	A-5	21	"
"	"	A-1	21	"
"	"	B-6	21	"
Carper Drilling Company	Simon	A-N	29	"
"	Simon	B-N	29	"
Kewanee Oil Company	"	B-15	28	"
"	"	B-29	28	"
"	"	B-9	27	"
"	"	B-11	27	"
Barney Cockburn	Miller	A-6	26	"

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The selection of other in-put wells within the area committed and for the further area to be committed within the cooperative area described in Section II of the order herein shall be submitted to the Commission for its consideration of approval administratively without further notice and formal hearing thereupon.

VI. That said 13 in-put wells described in Section V of the order herein are hereby assigned the top allowable for one year beginning with the effective date of this order. Thereafter, said input wells if further used as such shall have such allowable for such period of time as determined by the Commission administratively; likewise, other in-put wells authorized to be selected as provided in Section V of the order herein shall have such allowable for such period of time as field tests to the Commission may seem advisable.

Sixty percent of the allowable lost by in-put wells shall be redistributed to all the other top allowable proration units within the committed area by dividing the above mentioned amount lost through the use of the in-put wells by the number of top allowable producing wells in the committed area and the amount so determined would be added to the regular top allowable for each well. If the operators subject to said agreement do not desire to produce such excess allowable during any month the Operators' Committee would in that event notify the Commission before the allowable for such month is fixed and not later than the 25th day of the month preceding.

VII. That the proration units within the committed area shall not exceed the production of 44 barrels of oil daily should the current allowable in the future exceed that amount; subject, however, to the right of the Operators' Committee to petition the Commission administratively, by the 25th day of the month before the fixing of any monthly allowable, to change or modify such maximum allowable for the committed area.

VIII. That this order shall become effective on the first day of the proration month next succeeding the month in which said Order is adopted.

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

OIL CONSERVATION COMMISSION

(Sgd) JOHN E. MELES, Chairman

H. A. JONES, Member

JOHN M. KELLY, Secretary

RECEIVED  
SANTA FE, N.M.

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BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

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

CASE NO. 56

THE PETITION OF THE OPERATORS' COMMITTEE  
UNDER MALJAMAR COOPERATIVE REPRESSURING  
AGREEMENT FOR A CHANGE IN METHOD OF  
ALLOCATION OF OIL PRODUCTION AND GAS  
CONTROL FOR THE COMMITTED AREA WITHIN  
THE MALJAMAR COOPERATIVE REPRESSURING AREA

ORDER 595

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at ten o'clock A.M., January 8, 1945, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this 28th. day of March, 1945, the Commission having before it for consideration the testimony adduced at the hearing of said case and being fully advised in the premises;

IT IS THEREFORE ORDERED:

SECTION 1. That VI of Order 485 be and is hereby amended to read as follows:

VI. (a) That the allocation to the committed area and the re-allocation to the respective proration units therein shall be made upon the following plan:

(b) The Operators' Committee shall submit monthly to the Commission for approval the nomination in total barrels daily and schedule of re-allocation to the respective proration units.

(c) In no event shall any proration unit producing from horizons other than the Grayburg or San Andres formations be prorated under this plan of allocation other than they shall not produce at a rate in excess of State top allowable.

(d) Each proration unit shall be assigned an acreage allowable in whatsoever amount production test shows that it is capable of making up to but not exceeding 15 barrels daily.

(e) Each proration unit capable of producing the acreage allowable but incapable of producing the additional allowable through the application of the void space factor hereinafter provided shall be permitted to produce that volume of oil as shown on its production test.

(f) All proration units capable of producing said acreage allowable plus the additional allowable through the application of the void space factor shall be assigned a proportionate part of the remaining designated allowable; such proportionate part to be determined on the ratio that the void space created by each individual proration unit bears to the total void space created by all proration units, or in strict accordance with the following formula:

$$\frac{\text{Unit Void Space}}{\text{Total Unit Void Space}} \times \frac{\text{void space allowable}}{\text{Number of bbls.}}$$

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(g) A proration unit upon which is located a newly completed or reconditioned well shall be assigned an allowable unit and including 10 barrels daily insofar as it is capable of producing such amount; that allowable being derived from the average void space created by all producing wells in the communitized area. Such allowable to prevail only for those allocation periods in accordance with Proration Schedule Order No. 235 and until well can be properly tested and its allowable rate determined.

(h) Said nomination and schedule shall be submitted to the Commission and a duplicate shall be supplied to the Proration Office not later than the 20th day of each month preceding the next proration month.

SECTION 2. That VII of Order 485 be and is hereby amended to read as follows:

VII. Tests necessary in connection with the foregoing plan shall be those designated by the Commission, made by such methods and means, in such manner, and at such periods as the Commission in its discretion may prescribe from time to time.

SECTION 3. That VIII of Order 485 be and is hereby amended to read as follows:

VIII. That the order herein shall be inapplicable to any non-committed proration units within the cooperative area; such non-committed units shall receive their respective allocations in accordance with the State-Wide Proration Order and field gas-oil ratio limitation.

That this order shall be effective on execution and applicable to the Commission's Proration Schedule beginning with the next proration month.

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

OIL CONSERVATION COMMISSION

(SGD) JOHN J. DEMPSEY, CHAIRMAN

JOHN E. MILES, MEMBER

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BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

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

CASE NO. 1072  
Order No. R-841

APPLICATION OF KEWANEE OIL COMPANY  
FOR AN ORDER GRANTING PERMISSION TO  
INJECT WATER INTO ITS PEARL WELL NO.  
26 IN THE NW/4 SW/4 OF SECTION 30,  
TOWNSHIP 17 SOUTH, RANGE 33 EAST,  
MALJAMAR POOL, LEA COUNTY, NEW MEXICO,  
FOR THE PURPOSE OF SECONDARY RECOVERY  
AND FURTHER FOR PERMISSION TO DISCONTINUE  
THE INJECTION OF GAS HERETOFORE AUTHORIZED  
FOR SAID WELL.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 20, 1956, at Hobbs, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico in accordance with Rule 1214 of the Rules and Regulations of the New Mexico Oil Conservation Commission.

NOW, on this 9th day of July 1956, the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," a quorum being present, having considered said application and the recommendations of the Examiner, Daniel S. Nutter, and being fully advised in the premises,

FINDS:

- (1) That notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.
- (2) That the oil and gas lease involved in the application is Federally owned, and the Supervisor of the United States Geological Survey has interposed no objection to the application.
- (3) That Kewanee Oil Company is the owner and holder of a federal oil and gas lease and said lease covers the following described land in Lea County, New Mexico, to-wit:

All Sec. 25, Twp. 17 South, Range 32 East;  
Lots 1, 2, 3, and 4, and the E/2 W/2 Sec. 30,  
Twp. 17 South, Range 33 East, containing  
968.56 acres, more or less.

which said lease is designated as Kewanee Oil Company's "Pearl" Lease.

(4) That applicant received authority for an unorthodox location for its Pearl Lease Well No. 26 by Order 770 on May 25, 1948, and that said well is located 2615 feet from the South line and 25 feet from the West line of Section 30, Township 17 South, Range 33 East, NMPM, Lea County, New Mexico. Further, that applicant received authority to inject gas into said well and into two other wells on said Pearl lease by Commission Order R-146, dated May 1, 1952, for the purpose of secondary recovery from the adjoining wells on said Pearl Lease, with the provision that no allowables from the aforesaid three gas injection wells would be transferred to the other wells on said Pearl Lease.

(5) That recent engineering studies have indicated that greater secondary recovery of oil can be accomplished by the initiation of a pilot water flood operation on the aforesaid Pearl Lease.

(6) That applicant has shown that to discontinue the injection of gas into its Pearl Well No. 26 and to convert said well to a water injection well will result in greater secondary recovery of oil.

(7) That said conversion of applicant's Pearl Well No. 26 to a water injection well is in the best interests of conservation and the prevention of waste.

IT IS THEREFORE ORDERED:

That the application of Kewanee Oil Company to discontinue the injection of gas into its Pearl Well No. 26, located 2615 feet from the South line and 25 feet from the West line of Section 30, Township 17 South, Range 33 East, NMPM, Lea County, New Mexico, and to convert said well to a water injection well be and the same is hereby approved.

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

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

JOHN F. SIMMS, Chairman

E. S. WALKER, Member

A. L. PORTER, Jr., Member & Secretary

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OIL CONSERVATION COMMISSION  
P. O. BOX 871  
SANTA FE, NEW MEXICO

October 24, 1957

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Y

Mr. Clarence Hinkle  
Hervey, Dow & Hinkle  
P.O. Box 547  
Roswell, New Mexico

Dear Sir:

On behalf of your client, The Maljamar Cooperative Repressuring Agreement, we enclose two copies of Order R-1075 issued October 23, 1957 by the Oil Conservation Commission in Case 1309, which was heard on September 18th.

Very truly yours,

A. L. Porter, Jr.  
Secretary - Director

bp  
Encls.

BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

IN THE MATTER OF THE APPLICATION OF THE  
OPERATORS COMMITTEE OF THE MALJAMAR  
COOPERATIVE REPRESSURING AGREEMENT FOR  
AN ORDER APPROVING AN ADDITIONAL PILOT  
WATERFLOOD PROJECT IN THE MALJAMAR FIELD,  
LEA COUNTY, NEW MEXICO, AND FOR THE EXPAN-  
SION OF SUCH PROJECT TO INCLUDE THE ENTIRE  
MALJAMAR COOPERATIVE REPRESSURING AGREEMENT  
AREA CONSISTING OF APPROXIMATELY 13,760  
ACRES, IN TOWNSHIP 17 SOUTH, RANGES 32 AND  
33 EAST.

Case No. \_\_\_\_\_

APPLICATION

Comes the undersigned, Emery Carper and Ralph Gray, chairman and secretary respectively of the Operators Committee acting under and pursuant to the Maljamar Cooperative Repressuring Agreement, and hereby make application for approval of an additional pilot waterflood project within the limits of the Maljamar Oil Field, Lea County, New Mexico, and for the expansion of such project to include the entire area covered by the Maljamar Cooperative Repressuring Agreement; and in support thereof respectfully show:

1. That the Maljamar Cooperative Repressuring Agreement was made and entered into on the 3 day of September, 1941, by and between the owners of oil and gas leases in the Maljamar Oil Pool situated in Lea County, New Mexico and was approved by the Secretary of the Interior on the 5 day of August, 1941, and has also been approved by the New Mexico Oil Conservation Commission by Order No. 485.

That the Maljamar Cooperative Repressuring Agreement was entered into for the purpose of inaugurating a pressure maintenance project and operation of a natural gasoline plant and a plant for the extraction of butane and propane. This pressure maintenance project has been in operation since April, 1942.

2. That there is attached hereto, made a part hereof, and for purposes of identification marked Exhibit "A", a plat showing the area embraced within the Maljamar Cooperative Repressuring Agreement, and the location of all of the wells drilled in said area and the wells

which have heretofore been used for the injection of gas in connection with the pressure maintenance project above referred to. Said plat also shows the oil and gas leases within the area and the owners of the oil and gas leases surrounding the cooperative area.

3. That the pressure maintenance project above referred to has been operated by the injection of gas into the Grayburg-San Andres Formations, which are the principal producing horizons in the Maljamar Oil Pool.

4. That in April, 1956, the Kewanee Oil Company made application to the New Mexico Oil Conservation Commission for an order granting permission to inject water into its Pearl Well No. 26 in the NW $\frac{1}{4}$ SW $\frac{1}{4}$  Section 30, Township 17 South, Range 33 East, N.M.P.M., and an order designated as R-841 was entered by the Commission on the 9th day of July, 1956, granting permission to the Kewanee Oil Company to inaugurate a pilot water flood project covering the oil and gas lease of the Kewanee Oil Company.

5. That due to the success so far attained in the pilot waterflood project of the Kewanee Oil Company, above referred to, the Operators Committee acting under and pursuant to the Maljamar Cooperative Repressuring Agreement, are desirous of inaugurating a second pilot waterflood project which would cover an area consisting of the W $\frac{1}{2}$ SE $\frac{1}{4}$  and the SW $\frac{1}{4}$  Section 21, E $\frac{1}{2}$ SE $\frac{1}{4}$  of Section 20, and the W $\frac{1}{2}$ NE $\frac{1}{4}$  and the NW $\frac{1}{4}$  Section 28, and the E $\frac{1}{2}$ NE $\frac{1}{4}$  Section 29, Township 17 South, Range 32 East. A plat of the proposed pilot area is attached hereto, made a part hereof, and for purposes of identification marked Exhibit "B". Said plat also shows the location of all producing wells drilled to and completed in the vertical limits of the Maljamar Oil Pool producing within the proposed pilot area and also the location of the proposed water injection wells. The two proposed injection wells designated as wells D and F on Exhibit "B" are being used at the present time for the injection of gas and these would be converted into water injection wells and six additional wells designated as A, C, E, G, H, and I on Exhibit "B" would be drilled for the purpose of injecting water at the location indicated on said exhibit. One of the proposed injection wells, indicated as water injection well B on Exhibit "B" and presently

designated as Buffalo Oil Company's Balish "A" 21 well, will be converted from an oil well producing from the vertical limits of the Maljamar Oil Pool to a water injection well in the proposed pilot waterflood project.

That there is attached hereto a copy of a generalized sample log of the 2 gas injection wells which it is proposed be converted to water injection wells, which copy is marked Exhibit "C" and made a part hereof. There is also attached hereto a radio-activity log of Buffalo Oil Company's Balish "A" # 21 oil well which it is proposed be converted to a water injection well, which log is marked Exhibit "D" and made a part hereof. It is indicated on these logs the depth at which casing is set in such wells. There is also attached hereto an exhibit showing the proposed casing program to be used in connection with the drilling of additional water injection wells and also the proposed method for testing casing before use of the water input wells which exhibit is marked "E" and made a part hereof.

It is estimated that approximately 500 barrels of water will be injected into the Grayburg-San Andres producing horizons in the Maljamar Oil Pool in each injection well.

6. The Operators Committee under the Maljamar Cooperative Repressuring Agreement has made application to the Commissioner of Public Lands for a water lease covering certain lands of the State of New Mexico situated in Township 16 South, Range 33 East, Township 16 South, Range 34 East, and Township 17 South, Range 33 East, and has also made application to the State Engineer for appropriation of the underground waters under these lands. These applications are now pending and the granting of the same are dependent upon the Oil Conservation Commission granting permission to inaugurate an additional pilot waterflood project. It is believed that upon granting said water lease and permit to appropriate the same that there will be ample water available to carry on the pilot waterflood projects as well as an expansion to eventually waterflood the entire area covered by the Maljamar Cooperative Repressuring Agreement.

The Kewanee Oil Company also desires to expand its initial pilot waterflood project as shown on Exhibit "A" by converting their Pearl B No. 21 well located in unit I Section 25, Township 17 South,

Range 32 East to a water injection well. It is anticipated that approximately 300 barrels of water per day will be injected into this well at a pressure of approximately 1800 p.s.i. It is the operator's plan to obtain water from the Maljamar Cooperative Repressuring Agreement proposed water supply wells to operate this pilot project.

7. The operators who are parties to the Maljamar Cooperative Repressuring Agreement are engaged in making a complete geological and engineering study of the Maljamar Pool, or area, on many aspects of secondary recovery, including waterflooding. It is anticipated that it will take approximately eight months to one year to complete this study and evaluate the results of the water pilot flood projects. It is anticipated that if the geological and engineering study and the results obtained from the pilot waterflood projects are successful, that the pilot projects will be expanded to encompass the entire area covered by the Maljamar Cooperative Repressuring Agreement which covers substantially all of the geological structure or reservoir from which the Maljamar Oil Pool is producing.

8. The results thus obtained in connection with the pilot waterflood project inaugurated by the Kewanee Oil Company have been encouraging and present indications are that it may be economically feasible to waterflood the entire Maljamar Oil Pool, and if so it is anticipated that a much greater recovery of oil and gas will be obtained than by the pressure maintenance project which has been carried on heretofore, and that said waterflood project will be in the interest of conservation and the prevention of waste.

~~X~~ 9. In connection with the pilot waterflood projects and any expansion thereof, it will be necessary to transfer the oil allowances of the designated water input wells where such wells are now producing oil to other wells on the same lease on which the respective wells are located, based on their allowable as of the first day of the month preceding the commencement of work, to convert each producing well to a water injection well.

10. Upon the inauguration of the second water pilot flood project in the area, applicant believes that it would be to the interest of all concerned that applicant be permitted to make additions to or deletions from the pilot areas and/or injection wells from time to

time which are deemed necessary to the successful operation and expansion of the pilot areas to eventually encompass the entire reservoir and that such additions or deletions should be approved administratively by the Oil Conservation Commission without notice and a formal hearing.

11. The operators of the pilot waterflood project will be the Operators Committee of the Maljamar Cooperative Repressuring Agreement and the various lease owners acting under the Maljamar Cooperative Repressuring Agreement whose names and principal addresses are:

Maljamar Cooperative Repressuring Agreement  
200 Booker Building  
Artesia, New Mexico

Allen & Fair Operators, Inc.  
P. O. Box 689  
Tyler, Texas

Buffalo Oil Company  
1500 First National Building  
Tulsa 3, Oklahoma

Carper Drilling Company, Inc.  
200 Carper Building  
Artesia, New Mexico

Drilling & Exploration Company  
800 San Jacinto Building  
Houston 2, Texas  
Attn: E. A. Roberts, Jr.

Kewanee Oil Company  
P. O. Box 2239  
Tulsa 1, Oklahoma

Ross Sears et al  
% Ralph Shugart  
102 Carper Building  
Artesia, New Mexico

Mrs. E. G. Woods  
P. O. Box 386  
Artesia, New Mexico

Respectfully submitted,

ATTEST:

Ralph L. Gray  
Secretary, Operators Committee

Emory Carper  
Chairman, Operators Committee,  
Maljamar Cooperative  
Repressuring Agreement

HERVEY, DOW & HINKLE

By \_\_\_\_\_  
Roswell, New Mexico  
Attorneys for Applicant

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

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

CASE NO. 1309  
Order No. R-1075

IN THE MATTER OF THE APPLICATION OF  
THE OPERATORS COMMITTEE OF THE  
MALJAMAR COOPERATIVE REPRESSURING  
AGREEMENT FOR AN ORDER EXPANDING THE  
KEWANEE OIL COMPANY PILOT WATER FLOOD  
PROJECT AND FOR THE APPROVAL OF AN  
ADDITIONAL PILOT WATER FLOOD PROJECT  
IN THE MALJAMAR COOPERATIVE REPRESSURING  
AGREEMENT AREA, MALJAMAR POOL, LEA COUNTY,  
NEW MEXICO, AND FOR THE PROMULGATION OF  
RULES TO GOVERN THE OPERATION OF SAID  
PROJECTS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on  
September 18, 1957, at Santa Fe, New Mexico, before the Oil  
Conservation Commission of New Mexico, hereinafter referred to  
as the "commission."

NOW, on this 23<sup>rd</sup> day of October, 1957, the Commission,  
a quorum being present, having considered the application and the  
evidence adduced, 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, The Operators Committee of the  
Maljamar Cooperative Repressuring Agreement, proposes to expand  
the Kewanee Oil Company pilot water flood project authorized by  
Commission Order No. R-841, dated July 9, 1956, by the conversion  
from a producing oil well to a water injection well of the Pearl  
"B" No. 21 Well, located 2615 feet from the South line and 1295  
feet from the East line of Section 25, Township 17 South, Range 32  
East, NMPM, Lea County, New Mexico.

(3) That the applicant further proposes to institute  
an additional pilot water flood project in the Maljamar Pool in  
the W/2 SE/4 and the SW/4 of Section 21, E/2 SE/4 of Section 20,  
W/2 NE/4 and the NW/4 of Section 28, and the E/2 NE/4 of Section  
29, all in Township 17 South, Range 32 East, NMPM, Lea County,

New Mexico, with the water to be injected through nine wells located in the above-described pilot area.

(4) That one of the proposed injection wells is the Buffalo Baish "A" No. 21 Well, located 1395 feet from the South line and 1347 feet from the West line of said Section 21, which well is presently producing oil from the Maljamar Pool, and that the aforementioned Pearl "B" No. 21 Well in the proposed extension of the Kewanee Oil Company pilot water flood project is also presently producing oil from the Maljamar Pool.

(5) That the applicant proposes to transfer the oil allowables for the said Baish "A" No. 21 Well and the Pearl "B" No. 21 Well to other wells on the same basic lease on which the respective wells are located, the allowables to be transferred being based on the wells' allowables for the month during which work is commenced to convert each producing well to a water injection well.

(6) That the applicant further proposes that it be authorized to make additions to or deletions from the pilot area and/or changes in the injection wells by administrative approval of the Commission without notice and hearing.

(7) That the area contained in both of the pilot water flood projects covered by the subject application is within the Maljamar Cooperative Repressuring Agreement Area and that the allowables for all wells in said area are computed and allocated in accordance with Order No. 485 dated November 14, 1942, as amended by Order No. 595 dated March 28, 1945.

(8) That the proposed program will promote conservation and will tend to prevent waste through the production of oil which might not otherwise be recovered.

(9) That the applicant should be permitted to expand the Kewanee Oil Company pilot water flood project and to institute an additional water flood project in the Maljamar Pool in accordance with its proposals as set forth above, and that it should be permitted to transfer the oil allowables for the designated water input wells, where such wells are now producing oil, to other wells in the same basic lease.

(10) That the applicant should be permitted to make additions to or deletions from the pilot areas and/or changes of injection wells after administrative approval by the Commission without notice and hearing provided the request for administrative approval is made in accordance with Rule 701 (b) of the Commission Rules and Regulations and provided said additions, deletions, and/or changes are confined to the boundaries of the Maljamar Cooperative Repressuring Agreement Area.

(11) That the applicant should submit periodic reports to the Commission disclosing the progress of the secondary recovery programs.

IT IS THEREFORE ORDERED:

(1) That the Kewanee Oil Company pilot water flood project authorized by Order R-841 be and the same is hereby expanded to permit the injection of water into the Maljamar Pool through the Kewanee Oil Company Pearl "B" No. 21 Well, located 2615 feet from the South line and 1295 feet from the East line of Section 25, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico.

(2) That the Operators Committee of the Maljamar Cooperative Repressuring Agreement be and the same is hereby authorized to institute a pilot water flood project in the Maljamar Pool in the E/2 SE/4 of Section 20, the W/2 SE/4 and the SW/4 of Section 21, the W/2 NE/4 and the NW/4 of Section 28, and the E/2 NE/4 of Section 29, all in Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, and that the following described wells be and the same are hereby authorized as water injection wells for said project:

New well. 25 feet from the West line and 1325 feet from the South line of Section 21, T 17S-R 32E.

Buffalo Baish "A" No. 21 Well. 1395 feet from the South line and 1347 feet from the West line of Section 21, T 17S-R 32E. (Presently producing oil)

New well. 1325 feet from the South line and 2615 feet from the West line of Section 21, T 17S-R 32E.

Kewanee Baish "B" IP #11 Well. 80 feet from the North line and 25 feet from the West line of Section 28, T 17S-R 32E. (Presently gas input well).

New well. 25 feet from the South line and 1325 feet from the West line of Section 21, T 17S-R 32E.

Kewanee Baish "B" IP #35 Well. 2560 feet from the East line and 75 feet from the North line of Section 28, T 17S-R 32E. (Presently gas input well).

New well. 25 feet from the West line and 1325 feet from the North line of Section 28, T 17S-R 32E.

New well. 1325 feet from the North line and 1325 feet from the West line of Section 28, T 17S-R 32E.

New Well. 1325 feet from the North line and 2635 feet from the West line of Section 28, T 17S-R 32E.

(3) That the applicant be and the same is hereby authorized to transfer the allowables for the aforementioned Baish "A" No. 21 Well and the Pearl "B" No. 21 Well to other wells on the same respective basic leases, and that the allowables to be

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Case No. 1309  
Order No. R-1075

transferred shall be based on the allowables assigned to each of said wells for the month during which work is commenced to convert each to a water injection well.

(4) That the Secretary-Director of the Commission shall have authority to approve any extension to or deletion from the pilot areas described above and any change in the number and/or location of the injection wells for either of the above-described pilot water flood projects, without notice and hearing; provided however, that all information required by Rule 701 (b) of the Commission Rules and Regulations shall be included in the application for administrative approval, and provided further that any such extension, deletion, and/or change shall be confined to the boundaries of the Maljamar Cooperative Repressuring Agreement Area.

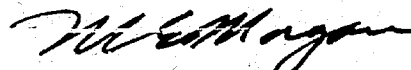
(5) That monthly progress reports on each of the above-described pilot water flood project shall be submitted to the Commission in accordance with Rule 704 and Rule 1119 of the Commission Rules and Regulations.

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

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION



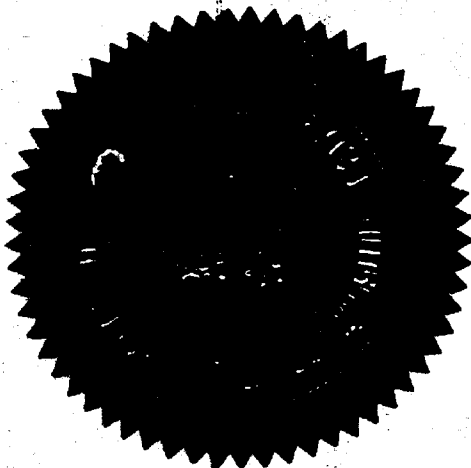
EDWIN L. MECHEM, Chairman



MURRAY E. MORGAN, Member



A. L. PORTER, Jr., Member & Secretary



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