CASE 1300: General American Oil Co. application to institute pilot water flood project Grayburg-Jackson Pool, Eddy Co. & for allowable formula for all wells in said project.

Case No.

1300

Application, Transcript,
Small Exhibits, Etc.

BEFORE THE
OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO
August 28, 1957

IN THE MATTER OF
CASE NO. 1300

TRANSCRIPT OF PROCEEDINGS

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
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C O P Y C O P Y C O P Y

Before Daniel S. Nutter,
Examiner

NEW MEXICO OIL CONSERVATION COMMISSION
OIL CONSERVATION COMMISSION
Hobbs, New Mexico

REGISTER

HEARING DATE AUGUST 28, 1957 TIME: 1:00 P.M.

NAME:	REPRESENTING:	LOCATION:
James I. Wright	State Engineer	Roswell, N. M.
H. Bernard	Sinclair	
Jack M. Campbell	Gen. Am. Oil Co. of Tex.	"
R. F. Miller	" " " " " "	Artesia, N. M.
N. W. Krouskop	" " " " " "	Dallas, Texas
S. B. Christy	Hervey Dow & Hinkle for Humble	Roswell, N. M.
Guy A. Swartz	Gulf Oil Corp.	Roswell, N. M.
W. V. Kastler	Gulf Oil Corporation	Roswell, N. M.
J. Don Walker	Gulf Oil Corporation	Fort Worth, Texas
R. N. Miller	Tidewater Oil Co.	Hobbs, N. M.
H. E. Wanat	Tidewater Oil Co.	Midland, Texas
E. V. Boynton	Continental Oil Co.	Hobbs, N. M.
E. J. Fischer	O C C	Hobbs
J. W. Runyan	O C C	Hobbs
J. A. Moore	Continental Oil Co.	Roswell
Leo S. Cichowicj	Continental Oil Co.	"

BEFORE THE
OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO
August 28, 1957

IN THE MATTER OF:

Application of General American Oil Company of Texas for permission to institute a pilot water flood program in the Grayburg-Jackson Pool in Eddy County, New Mexico, and for the establishment of an allowable formula for all wells involved in said project. Applicant, in the above-styled cause, seeks an order authorizing the injection of water into the Grayburg-Jackson Pool through five wells presently producing from said pool in Sections 18 and 19, Township 17, South, Range 30 East, Eddy County, New Mexico, the input volume not to exceed 400 barrels of water per day into each intake well. Applicant further requests the establishment of an allowable formula for all wells involved in the subject water flood project to permit the operation of the project at its maximum efficienty. The area covered by the subject applicetion is presently included in the Grayburg Ccoperative and Unit Area gas injection project authorized by Commission Orders No. 659 and No. 802.

CASE NO. 1300

BEFORE:

Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: The hearing will come to order, please. First case on the Docket this afternoon will be Case No. 1300.

MR. COOLEY: Case No. 1300. Application of General American Oil Company of Texas for permission to institute a pilot water flood program in the Grayburg-Jackson Pool in Eddy County, New Mexico, and for the establishment of an allowable formula for all wells involved in said project.

MR. CAMPBELL: Mr. Examiner, I am Jack M. Campbell of Roswell, New Mexico, appearing on behalf of the applicant, General American Oil Company of Texas. I have one witness, Mr. Krouskop, who I would like to be sworn in.

N. W. KROUSKOP

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

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A N. W. Krouskop.

Q Where do you live, Mr. Krouskop?

A Dallas, Texas.

Q By whom are you employed?

A General American Oil Company of Texas.

Q In what capacity? A Secondary Recovery Engineer.

Q Have you testified before the New Mexico Oil Conservation Commission previously in your professional capacity as an engineer?

A As an engineer, yes.

Q Have you previously testified before the Commission in connection with any secondary recovery project? A No, sir.

Q Will you briefly state to the Examiner what experience you have had with your company relative to the engineering work, or operation of secondary recovery projects? Not necessarily in New Mexico, wherever they maybe?

A Well, for the past two years I have been General American Oil Company's Secondary Recovery Engineer, and prior to that time, for about one year, I was their division engineer in Tulsa, and we had some fifteen floods that we took care of up in that area.

Q And you have been responsible for the establishment and operation generally, in the engineering sense, of those secondary recovery projects which you refer?

A Not necessarily the establishment of all of them, but directly responsible for the operation.

Q In your capacity as an engineer in charge of secondary recovery engineering for the company, are you generally acquainted with the application of General American Oil Company of Texas, Case No. 1300, involving proposed pilot water flood project in the Grayburg-Jackson -- in the Grayburg Cooperation and Unit Area in Eddy County, New Mexico? A Yes, I am.

Q Is the proposed pilot water flood situated within the boundaries of the Grayburg Cooperative and Unit Area? A Yes.

Q Who is the operator of that unit at this time?

A The General American Oil Company.

Q Who is the owner of all the leases within the unit area?

A General American Oil Company.

Q I have handed you there a copy of the original application of General American Oil Company of Texas in this case, and ask you to refer to Exhibit one in that application, or to a copy, if you have one there with you, and you will you state, Mr. Krouskop, what

that is?

A That's a plat of the Grayburg Cooperative and Unit Area. On the plat we have outlined a first phase pilot flood area and also we've shown an outline of the possible boundaries that the flood might be expanded too within the area, and also a possible flood plan that the proposed pilot flood could be expanded on, or pattern that --

Q (Interrupting) I note there some hatch marked lines appearing on the plat outside the boundaries indicated by the red lines, what does that show?

A Well, the boundaries of the Grayburg Cooperative and Unit Area are shown with the hatched lines, the blue hatched lines and the possible limits of the water flood operation are outlined in red, and of course, our pilot phase, initial pilot as proposed, is cross-hatched in blue, the area.

Q Was that plat prepared by you or under your supervision, Mr. Krouskop? A Yes.

MR. CAMPBELL: I would like to offer that as Applicant's Exhibit One.

MR. NUTTER: Exhibit One?

MR. CAMPBELL: It is a part of the application, and I assume maybe already it is a part of the record in the case.

MR. NUTTER: Without objection, the plat submitted by General American Oil Company will be entered as Exhibit One in this case.

Q Mr. Krouskop, has any portion of the area shown on Exhibit

One heretofore been a part of any gas injection?

A Yes, there was a gas injection program carried on here for a period of nine years. From 1944 to 1953.

Q Referring to Exhibit No. One, will you state which wells you would intend to use as input wells in the event this application for a pilot flood program were approved?

A All of the wells are located on the Burch A Lease, and we would propose to use Burch A No. 8, 9, 23, and 24 for input service on a five spot pattern, and also in addition to that, we would like to use Burch No. 14 A as an input well to check for channeling effects during this gas injection program. We noted channeling from Burch 14A to Burch 7A, immediately south of it, and we feel that if we are going to incur any channeling in the flood project, that probably it will show up here. We would like to see what is going to happen and evaluate it before making any plans to expand the flood, that's the reason the Burch 14A conversion.

Q From what formations are these proposed input wells producing at the present time?

A They are now producing from the zone locally called the Grayburg-Jackson zone of the San Andres Formation. This zone occurs throughout an interval of approximately 120 feet below the Lovington Sand marker, known locally there to be from 120 feet to 375 feet below that marker.

Q Do you have logs on all the proposed input wells to which you have referred? A Yes.

Q I refer you again to the application in this case, to which were attached Exhibits 2A, B, C, D, and E, and ask you to state what those are?

A Well, these are the complete well records as submitted to the United States Government on the United States Government Form, just a complete record of each well.

Q Those logs reflect the completion data and the casing record as to each of these proposed input wells?

A Proposed input wells, yes, sir.

Q I would like to offer into evidence Applicant's Exhibit 2A, B, C, D, and E, which the witness has testified are the logs of the five proposed input wells.

MR. NUTTER: Without objection, Exhibits 2A, through 2E, will be received in evidence.

Q (By Mr. Campbell) Mr. Krouskop, with regard to the wells that you have testified are to be th input wells for the pilot program, are there any of those wells on which any special work would be involved in order to render it satisfactory for this program insofar as formation protecting is concerned?

A Yes, there is. We, of course, propose to confine our water to the Grayburg-Jackson zone only, and the wells, the Burch A 23 and 24, proposed input wells, were drilled later in the stage of depletion. This pool pressure was good, and we encountered a few slight shows in the Grayburg Sand immediately overlying the San Andres Formation, and the casing was set high in those wells, so we

recovered all we could out of that, but the wells are in a condition that we can set Formation and Kerr type packers and isolate the lower zones in which we hope to confine our injections at this time.

Q And you do propose to set some sort of formation packer before using these wells as input wells, is that correct?

A That is correct, and we feel that they will be adequate in that we should be able to inject water on a vacuum here, and would not be bothered with any great differential pressure.

Q Referring you again to the application, I'll ask you to notice the diagrammatic sketch attached to that application marked Exhibit No. 3, will you state what that represents?

A That is a diagram of a Formation and Kerr type packer, on the order of which we propose to use to isolate the Grayburg-Jackson from the open hole formation above it. It would be run on the tubing, of course.

Q Would you, after the setting of that packer, consider it will be necessary to conduct any tests to make certain there are no leakages involved?

A We intend to check it, yes.

MR. CAMPBELL: I would like to offer in evidence Applicant's Exhibit No. 3.

MR. NUTTER: Without objection, Applicant's Exhibit No. 3 will be received.

Q (By Mr. Campbell) Mr. Krouskop, what will be the present source of water for the proposed water flood pilot program?

A We've reconditioned an old depot formerly known as the Gulf Grayburg Unit No. 1, located in the Southwest Quarter of the Southwest Quarter of Section 24, Township 17 South, Range 29 East, NMPM. A Pennsylvanian limestone aquifer was perforated from 9265 to 9299, and have tested this zone at the rate of about 1800 barrels a day, and in addition to this supply, we are currently producing about four to five hundred barrels a day from shallower zones in the area which we propose to use, giving us a total of 23 to 24 hundred barrels a day, which will be sufficient to start the flood.

Q Do you have any comments with reference to the amount of water that might be injected into the reservoir as a part of the pilot program?

A Yes, we do. Our pilot area, the five spot pilot area, embraces an area of about 50 acres, and to get any reasonable, to get a fill-up in any reasonable time, why we would like to inject all available water that we have now, and possibly in the future, any additional water that may become available. In other words, the five wells right now would amount to about 500 barrels per day.

Q I note that your application contains a statement that you do not expect the input volume to exceed 400 barrels of water per day into each intake well. Do you feel that may not give you the flexibility that you need?

A I would not want to say. If it is restricted to just 400 barrels a day per well, we may not even be able to get that in some of the wells, but to get a fillup, even in five hundred barrels a day,

theoretically, probably it would take us between a year and a half to two years to get any effect, and to cut it back to 400, why it is just that much longer. We would not like to be limited to that 400 barrels.

MR. CAMPBELL: If the Examiner please, when this application was prepared, I was of the impression that the available water would not exceed that amount, and put that restriction in there. I would like to request that the record show that I have asked to amend the application to delete the clause with reference to the statement "but would not ~~extend~~ exceed 400 barrels of water per day into each intake well," if there is no objection.

MR. COOLEY: Mr. Campbell, the case was advertised as the application appears, and you will note that in the body of the ad, it is identical to that appearing on the Docket, the portion there in the middle, that the input volume would not exceed 400 barrels of water per day, do you feel that is a jurisdiction of limitation?

MR. CAMPBELL: I respectfully disagree on the jurisdiction of limitation, I think the notice is ample notice, and that the question of whether it is 400 barrels of water per day is not a judicial matter. It would simply require, in the event that they had that available water and intended to inject it into the well, it would require coming before the Commission again and asking in a formal hearing that it be deleted. If anybody here has any objection to it, I could see your basis for it, but I don't think that affects the validity of the order in any degree.

MR. NUTTER: Is there a possibility that anyone that is not here might have objection to an unlimited amount of water, whereas they didn't have any objection to 400 barrels a day, who are not here?

Q (Interrupting) Well, if that is the Commission's position, we'll just have to make a new application. I didn't prepare the notices. I think that was entirely unnecessary to the notice of hearing. The Commission does the preparation of the notice, and publication of the notice is the Commission's responsibility.

MR. COOLEY: Does not that accurately reflect the application.

MR. CAMPBELL: No question about that, but I ask that it be amended in view of the testimony of the witness. There is a lot of things that might not be in the notice of evidentiary matters. It is your position then, that the Commission could not issue an order, Mr. Cooley? It is your position that the Commission could not issue an order based upon the testimony here that they not limit the amount of water that could be injected into the resevoir to 400 barrels per day?

MR. COOLEY: My position is that we would not be authorized to issue an order authorizing more than 400 barrels.

MR. NUTTER: I think that any order of the Commission would have to be limited to the amount that was advertised.

MR. CAMPBELL: If the order is issued, and the amount is available which needs to be injected and the amount is in excess of 400 barrels a day, we'll simply file a request for an amendment of the original order establishing that.

MR. [illegible]. Yes, sir.

Q (By Mr. Campbell) Mr. Krouskop, in your opinion, can this proposed pilot water flood program be effected without waste and with the protection of correlative rights of the owners in the area?

A Yes, it can.

Q Have you notified the owners of the property within one half a mile of the proposed input wells as required by the rules?

A Yes.

Q Do you believe that this proposed pilot program could result in recovery wells which might not otherwise be recovered from this reservoir? A Yes.

Q Mr. Krouskop, what will be the approximate cost of the initial pilot program here?

A The overall cost of the development of the water supply and conditioning the property to flood will fall between sixty and seventy thousand dollars.

Q What do you propose at this time with regard to allowable production insofar as this pilot water flood program is concerned?

A I believe that the existing proration order covering our Cooperative and Unit Area, Order No. 802, could be modified insofar as the Burch A Lease is concerned to allow us to take the restriction as to what any one well could produce, or would give us the flexibility we would need in an operation of this type. I probably haven't put that too clearly.

MR. CAMPBELL: If the Commission, please, if I may make a

statement about this allowable situation in this area. A number of years ago, as a matter of fact, 1948, the Commission, in connection with this particular area, set up proration units that contain acreage considerably in excess of the normal proration unit due to the approval and the installation of a five spot program of development of the area, that was Commission Order No. 802. The Commission Order, as I understand it, provided that the operator could produce not in excess of the total number of developed 40-acre tracts in any particular described unit, of which this area was one of those units, and designated as Proration Unit G-1 in the Order, and still carried as such in the proration schedule, and that no well in any of these units could produce in excess of a single top unit allowable. It is our request that for the purpose of this pilot water flood project, which will affect wells within the area referred to as the Unit G-1 under that Order 802, and in the proration schedule for Eddy County, be retained in effect, except that for the purpose of this water flood project, a small well will not be limited to a single top unit allowable, so that the cumulative allowable for the developed units would not be increased, but the limit for a single top unit allowable well for the purpose of the water flood project would be removed.

Q (By Mr. Campbell) Do you think, Mr. Krouskop, that such a proposition would give the flexibility that you say is required in connection with the investment for this pilot program that you are speaking of? A Yes, I believe so.

MR. CAMPBELL: Have I made myself clear, Mr. Examiner, or what

we're seeking?

MR. NUTTER: I think so.

MR. CAMPBELL: I just have a couple of more questions.

Q (By Mr. Campbell) Mr. Krouskop, is the United States of America the only basic royalty owner in this entire area?

A Yes, sir.

Q Has this plan been presented to the USGS for it's consideration?

A Yes, it has.

Q Referring again to the application, I direct your attention to what is attached thereto and marked Exhibit Four and ask you to state what that is?

A This was a request for approval of the proposed pilot project to the United States Geological Survey Office in Roswell, New Mexico.

Q Mr. Krouskop, I now hand you what has been identified as Applicant's Exhibit No. 5 and ask you to state what that is?

A This supersedes the previous request, Exhibit No. 4, and is a request for approval of the pilot project, and also requesting the USGS -- or the governments attitude as to whether the pattern for the expanded flood would be acceptable to them in case we expanded the flood, and it also goes into a little more detail as to just what our overall plans were.

Q Mr. Krouskop, you are not asking the New Mexico Oil Conservation Commission to take any position with regard to expansion of the program, but only as to the pilot water flood, are you not?

A That is correct, at this time, yes.

Q Have you formally discussed with the United States Geological Survey the proposal as to the pilot water flood program?

A Yes.

Q Have they expressed any objection to the proposed application or the installation of the pilot program? A No.

Q I would like to offer in evidence Applicant's Exhibits Nos. 4 and 5.

MR. NUTTER: Without objection, Exhibits 4 and 5 will be received.

Q Mr. Krouskop, do you have any present estimate as to the approximate length of time involved before any result of this water injection might be observed?

A On our limestone reservoir, such as this, it is a little difficult to predict when we might expect some results. However, based on withdrawls from the area and the rate of water available for injection, why, we might possibly expect some effects from the flood in from one and a half to two years.

Q If satisfactory results are observed insofar as the pilot program is concerned, I assume that you would then come before the Commission again to seek extension of the authority for water injections into the reservoir, is that correct?

A That is correct.

Q Do you have anything further you would like to add before the Commission with regard to this proposal? A No.

MR. CAMPBELL: That's all I have at this time.

MR. NUTTER: Anyone have any questions of the witness?

MR. RUNYAN: I have a question.

MR. NUTTER: Mr. Runyan.

CROSS EXAMINATION

BY MR. RUNYAN:

Q Mr. Krouskop, I believe you mentioned that you will obtain your water from the Pennsylvanian and Shallower Zones. Will you clarify which are the shallower zones?

A By the shallower zones, I meant to say water being produced with oil from smaller zones. We have a zone called the Grayburg-Keely on the west end of this area.

Q It wouldn't be a part of a water zone? In other words, it wouldn't be a pilot water zone.

A No, this are produced zones within the unit area here, the Grayburg-Kelly and Grayburg-Paddock.

MR. NUTTER: Do you have anything further, Mr. Runyan?

MR. RUNYAN: No, that is all.

MR. NUTTER: Anyone else have any questions? Mr. Fischer.

QUESTIONS BY MR. FISCHER:

Q Mr. Krouskop, could you tell us possibly where you intend to set this formation packer in these wells, two of these wells in the Bentonite zone?

A What log are you referring to?

Q There is a log here on Well No. 8, and Well No. 9, they both have Bentonite, showing there from 2800 feet.

A we intend to set the packer roughly about 100 feet below the Lovington Sands. I don't know whether your familiar with that general area, but the Lovington Sand comes in about, occurs about, oh, from 100 to 120 feet below the top of the San Andres, and --

Q (Interrupting) Well, I am not familiar with it, but what I want to know is will it be below that Bentonite zone?

A Well No. eight?

Q Or nine.

MR. CAMPBELL: I believe the witness testified that wells No. 23 and 24 were the only ones they intended to use a formation packer on.

MR. FISCHER: That will answer the question then if you have shown to be wells No. 23 and 24.

A I'll tell you, these are old drillers logs, which were drilled back in 1936.

Q (By Mr. Fischer) Do you have cement circulated on the surface pipe?

A No, but I think it is common practice to use a hundred to one hundred fifty sacks.

MR. FISCHER: That's all I have.

QUESTIONS BY MR. NUTTER:

Q Mr. Krouskop, I think you stated that the Lovington Sand occurs 2000 feet below the top of the San Andres or above?

A No, below the top of the San Andres, it's --

Q (Interrupting) I was thinking of the Grayburg-Jackson zone.

How far from the Grayburg-Jackson zone is the zone?

A We figured that our first standing in the Grayburg-Jackson zone is usually picked up about 120 below the Lovington Sand. It has been the practice to drill 120 feet below the Lovington Sand through a few Bentonite streaks, and most of the recent wells have been completed in that manner.

MR. NUTTER: That is all.

MR. COOLEY: This maybe more properly answered by Mr. Campbell, since he explained it. Will you please tell me what the cumulative limit would be, as you understand it, as established by Order 802?

MR. CAMPBELL: My understanding is that -- we were unable to obtain a copy of Order 802 from either the office here or from the engineering office, and I didn't have one with me, but it is my understanding that Order 802 actually describes certain proration units within this five spot area by meets and bounds, and that the area encompassed in the blue lines, which is the area affected by the proposed project, it coextensive with proration unit No. G-1, under Order R-802. That proration unit has fifteen developed 40-acre tracts as shown on this months proration schedule in Eddy County. I would refer you -- so that this will be in the record -- to page 16 of the September Eddy County Allowable Schedule, which reflects that proration unit No. G-1, has fifteen forty acre allowables.

Now, the order further provides that will be the maximum oil that can be produced from the unit, and that no well in the unit will produce in excess of a single top unit allowable. The reason

for that, of course, was that there was five spots created in the wells in a 40-acre tract, and that was the formula that was worked out to permit the allocation of the allowables to that particular unit. There are other units in this area described otherwise in the schedule.

This project affects only proration unit G-1, and so far as the present application is concerned, all we seek is not an increase in that unit allowable, but a removal of the restriction on a single well producing in excess of one top unit allowable, because the effected producing well here, from these four water injection wells, obviously cannot operate this project on a limitation of a single top unit allowable, so the order here, if it were issued, would either have to make reference to Order 802 or set out the description of proration Unit G-1 as contained in that order and state the limitation on the allowable insofar as that unit is concerned, and leave the rest of them as they are.

MR. COOLEY: Now then, if I understand your proposal, the No. 4 well would be the producing well in the five spot, and the No. 7 well would be for channeling. Between the two of them, could they produce fifteen allowables?

MR. CAMPBELL: No, sir. Well, I suppose theoretically, if all the rest were shutin, this project will and could very well affect, as shown here, other wells, and these four, and this single well, and it is possibly the water may move in other directions, that is why the program covers the area. The net effect will be that

instead of fifteen producing wells, that will be cut down to nine, by virtue of the -- to ten, by virtue of the five input wells.

MR. NUTTER: Well, Mr. Campbell, as an example, we have a 37 normal unit allowable for the month of September and you have fifteen 40-acre tracts within that area --

MR. CAMPBELL: Developed tracts, yes.

MR. NUTTER: Fifteen times thirty-seven is 555, and you will assign the 555 barrels to the area outlined in blue here to be produced by any well or wells in that tract?

MR. CAMPBELL: Which is exactly what is being done at the present time, except that at the present time, no single well can produce in excess of the top unit allowable. What we want to do is remove that restriction in order that the wells that are affected by this water flood project, if they happened to produce in excess of the top unit allowable, will do so legally, but the total cumulative production from that unit will not be any greater than it is at the present time.

MR. NUTTER: Which will be the gas injection well under the old program?

MR. CAMPBELL: Perhaps the witness can answer that.

A Burch 8A is one, on the Burch lease and has been for years.

MR. NUTTER: Were there any other gas input wells?

A Yes, the Burch 14, of course, was one, and the Burch A and Keely 5-A, but of course, that's outside the pilot area.

MR. CAMPBELL: Mr. Krouskop, are any of these wells, are

there any transfer of allowables now as a result of that gas injection program? A No, no.

MR. CAMPBELL: We will be glad to offer in evidence the original of a letter from Mr. Miller, the District Engineer for General American Oil Company of Texas, with regard to that question which was raised by one of the members of the staff of the Commission, which explains the circumstances surrounding the discontinuance of transfer of allowables on any of these gas injection wells sometime ago. As a matter of fact, when order R-802 was issued, there was no basis for transfer of allowables, that was it, that was the total cumulative allowable of that well, irrespective of injection wells or anything else, and that method was instituted for transfer of allowables insofar as the gas program was concerned. I could see no bearing on this particular situation.

QUESTIONS BY MR. NUTTER:

Q Mr. Krouskop, how many wells is it your expert opinion will be actually influenced by this pilot water flood?

A Well, we certainly expect the five spot take point, and then I would say that any well either directly offsetting it or diagonally offsetting it.

Q What well number?

A 23, 13, 12, 5, and it is not unconceivable that the second row of wells could be affected, that has happened before.

Q How about 16? A 16, yes.

Q Well, now, 13 is shown as a future water input well, will

that be a producing well for the time being?

A Until we expand the flood, yes, it will, yes.

Q Do you believe that every 40-acre tract in G-1 will be affected by the water flood?

A I think it is possible that it would be, yes.

Q How many of the wells in Tract G-1 as outlined in blue, will be producing? A Under the pilot phase?

Q Under the pilot flood?

A Well, let's see, we have 20, about 15 under the pilot phase.

Q Which wells would those be?

A Well, it would be all except Burch 8, 9, 14, 23, and 24.

Q Every well on the plat, in that section in other words, would be producing except the input wells? A Yes.

MR. NUTTER: That is all.

QUESTIONS BY MR. COOLEY:

Q No. 15, we have information from some source that the No. 15 was also formerly a gas input well, is that correct?

A It was for a while, yes.

Q That well is presently producing?

A It presently producing very little. Now, the Burch 5-A is temporarily shut down, it should be excluded from that list of producing wells, it is temporarily shutin.

MR. COOLEY: This raises up another question I wanted to ask you, Mr. Campbell, what is the developed 40-acre proration unit?

MR. CAMPBELL: I don't have the Order in front of me, and I

don't know if it defined that at that time. I am sure it did at that time, at the time it was issued, which was November 19, 1948.

MR. NUTTER: Do you remove that from the shutin status?

A Your well No. 24 is the same as the 5.

QUESTIONS BY MR. COOLEY:

Q It will be an injection well?

A It is a developed 40.

Q I asked Mr. Campbell, and now I want to ask you, what is the definition of a developed 40-acre unit?

A Under water flood conditions, whether it has ever been defined in New Mexico or not, I don't know, but certainly an injection well will constitute a 40, for water purposes, I think.

MR. COOLEY: That is all.

MR. NUTTER: Anyone else have any questions of the witness. Mr. Runyan?

QUESTIONS BY MR. RUNYAN:

Q Do you happen to have the water analysis on the water which you intended to use?

A I do not have them with me. We've tested them there in Dallas, and apparently it is compatible, but I don't have them here, no. Incidentally, with respect to this Lovington Sand, I think that the Shaly zone -- we intended to radioactivity log it, and be sure that our pipe is below all that shale and sand.

MR. RUNYAN: That is all.

MR. FISCHER: May I ask a question?

MR. NUTTER: Mr. Fischer.

QUESTIONS BY MR. FISCHER:

Q You said that if you could not get enough water for injection from this one well from the Pennsylvanian zone, then you would go to some other source to add to that source, the first primarily source of water, Pennsylvanian water? A Yes.

Q Well, have you already tested this secondary source of water to see if it is compatible with the Pennsylvanian water?

A Yes.

Q You commingled them?

A From all the testing that we have done today, yes. We have one source of water, produced water here that we may have a little trouble with. However, I think we can adequately treat it.

Q The system, or the source of your injection water to the injection well, will that be a closed system? A Yes.

Q One other thing, is the oil from this oil zone, the Grayburg-Jackson, it is sweet or sour?

A I believe it is less than one per cent sulpher, I don't know where you draw the line.

Q I consider anything above three grains --

A This is sour, the gas is sour.

Q The holes where you put your formation packer you will not load or attempt to load?

A Not to start out with, we are going to have to feel our way along to get started.

Q Maybe I misunderstand this system of prorationing according to Order 802. Would it be correct to assume then, that if-- or would you ask that if Well No. 3 were affected by this water flood, if you noticed that it would be necessary to increase the allowable of your No. 3 say, then your No. 5 well, that would surely or most probably be affected by this water injection? A Yes.

Q Would you attempt to ask for more than a forty-acre allowable on that?

MR. CAMPBELL: I might be able to explain that better. I will go over it again, and this is my understanding, and I might say that applicant is willing to work out any feasible program which will give them the flexibility required to make investment of this program, but this is the simplist way, it seems to me, at the present time. Under the five spot drilling program that was approved a number of years ago, where there were more than one well on several developed 40s or several proration units, the Commission approved, in effect, a larger proration unit that the normal unit, and said that the operator would be permitted to produce cumulative amount of oil not in excess of say 15 times the 40-acre top unit allowable assuming 15 --

MR. FISCHER: Well, let me ask you one thing in that connection, then would you consider, just for simplicity, would you consider this area, this supposed 15 time 40-acres say, would you consider that, then, as one unit? I mean, would you consider it as one unit for allowable purposes?

MR. CAMPBELL: That is the way it has been considered for 15 years, almost. It is still carried that way in the proration schedule. Now, the only limitation in it is that no well under the present order will be permitted to produce in excess of a single top unit allowable. The fact is, of course, as the schedule shows, all these wells are marginal wells now, but that limitation in a water flood situation -- and it should certainly be limited to that situation -- would make it impossible for production of any output well in excess of one 40-acre top unit allowable, which would restrict the flexibility for water flood.

My reaction to it was that the simplist way, at least during the stages of this water flood project, or pilot project, would be to go right ahead with the same allocation method that they have used, except elimation of that restriction on the one top unit allowable. If that doesn't prove adequate, then we will have to take a look at something else by way of maximum production or whatever it may be, but this way it will not increase the cumulative allowable for that particular unit.

MR. FISCHER: All right. Then possibly I am right in saying that you would possibly ask for five allowables for the No. 4?

MR. CAMPBELL: If the water flood project made that much oil available, it would be permitted, under this proposal, to produce it, so long as cumulative production from that G-1 unit did not exceed the number of units times the top unit allocation in one well.

MR. FISCHER: All right, if No. 3, if it would be necessary,

to your engineering appraisal of this project, if it should be necessary that the No. 3 well should be allowed to produce more oil, would it be taken from the No. 4?

MR. CAMPBELL: It would be permitted, under that formula, to produce as much as it could, so long as the total production does not exceed the top unit allowable times the developed unit. Under the present order, you may have several wells producing in excess of the single top unit allowable; under the water flood project, that wouldn't be known for a year or two years, but it is possible it could be a year, depending on the effectiveness of the program.

I felt that was a simpler method of approach at this stage, rather than to change the method of transfer of allowables, or the maximum allowables in the pilot stage, that's the reason for this proposal.

MR. NUTTER: Mr. Campbell, in the event the Commission did not see fit to grant unrestricted allowables to any particular well within the limitation of the 15 times the normal unit allowable, would General American be willing to any sort of limitations on the wells?

MR. CAMPBELL: I think you should ask the witness that question.

A I think that depends on what your limitation is. We certainly need to put the thing in to see how the reservoir responds to water injection, we might want to test it at various rates or cut it back, we want a little flexibility in operation here to see what we can do.

QUESTIONS BY MR. NUTTER:

Q I appreciate that, but it is rather hard to conceive that some of these units that are far removed from the pilot project will be affected.

A I have seen them half a mile off, by golley, kick, with two wells in between. I have seen them affected. That might be an exception rather than the rule, but it could happen, especially in this type of reservoir. You have some very erratic permability distribution, and porosity varies quite suddenly from one lease to the other and from one well to the other. Anything can happen in this thing.

Q Would a limitation of five times the normal unit allowable be too restrictive to the operation of the flood?

A Well, not to start out with, but we would like to be able to see how it is going to respond, and do some work in checking to see what the most effective producing rate would be, we would like a little flexibility.

Q Actually, you don't expect any results until fillup?

A Fifty to sixty per cent of fillup should take about a year and a half with no more water than we have available now. Of course, you can do all the figuring you want, but if we have irregular distribution in permability and porosity, as we might have, we might get a response much quicker, you might have a thin stringer flood out right away, and you might have some effects within two or three months, but theoretically, it ought to be about a year and a half

injecting say between four and five hundred barrels per day per injection well.

MR. CAMPBELL: I might make a statement in that regard. I don't think the Commission expects, or should expect any operator of a proposed secondary recovery project, water flood project, to make the investment that is required without some reasonable assurance of flexibility in production, which will justify the investment. We are perfectly willing, within the realm of reasonable limitation, to approach this thing with caution insofar as unrestricted allowables are concerned, but that has to be done in the light of the obvious fact that a 60 or 70 thousand dollars investment, coupled with the cost of lifting the oil, cannot be made without -- on the assumption that a year and a half or two years from now maybe they will get some allowable relief, I think it would be a serious restriction on water flood programs to take that fixed position. If there is a somewhere, an in between that can be reasonably worked out in gradual steps, we are certainly willing to consider that.

QUESTIONS BY MR. NUTTER:

Q Mr. Krouskop, do you feel that a water flood project like this will be very sensative? That is, could the allowable rate be changed in the middle of the flood program?

A That's quite a question. Of course, we don't know, that's what we are trying to find out, but I think -- lot of boys that are a lot smarter than I am have not been able to answer that and they are still trying to figure that out.

Q Do you think that this 400 barrels per day injection into each well would be considered a high rate of injection, low rate of injection, or medium rate of injection?

A I think for the area that we are trying to fill up, it is a rather low rate. In other words, we have a 50-acre pilot area, and that has produced cumulatively to date around 75 hundred, that particular area, and the No. 4 well has produced cumulatively 475,000 barrels, and you are looking at 10 or 12 thousand barrels per acre that has been voided already, and it is a low rate. A year and a half to two years, its quite a slow fillup period. Most of them try to inject at a rate sufficient to get a fillup. Most floods get a fillup within six to seven months on ten acre spaces, ten-acre five spot, instead of your 40-acre five spot as you have here. Actually it measures 15.

Q Do you think that the No. 4 well, once you have obtained fillup and obvious effective results of the water flood, that the rate of production on that No. 4 well could be changed in any well without affecting the ultimate recovery?

A That I can't say for this reservoir. I can show you examples where the ultimate recovery has been hurt by cutting back the rate, and I can also show you some where it hasn't. I think it depends on the individual reservoir, but on this one, I can't say, I don't know.

MR. NUTTER: That is all.

QUESTIONS BY MR. COOLEY:

Q If this flood is successful, what would you expect the production from No. 4 to be, do you have any idea?

A In the one zone you have very good permability in this immediate area, the well came in four, six hundred barrels a day naturally, and that well could conceivably, with water put in, could make 3 to 5 hundred barrels a day, and it wouldn't surprise me if it did, because you do have the best part of this reservoir right through the middle of that Burch A Lease. Of course, our intention was to try it out in the best part, and if it works, we will expand the thing, as the water is available. We don't want to jump out and develop the whole thing. We're going to have to fillup our well on it because you do run into some very tight zones down in the flanks.

MR. COOLEY: That is all.

QUESTIONS BY MR. NUTTER:

Q Do you have an estimate as to what the original recovery reserves on that 50-acre pilot area were?

A In that 50-acres, it's close to 12,000 barrels per acre, probably in that --

Q And what percentage of that has been produced?

A Well, it is probably 98 per cent depleted now, I imagine. I am just picking a figure out of the air. It is certainly in the latter stages of depletion.

MR. NUTTER: Anyone else have a question? Mr. Fischer.

QUESTIONS BY MR. FISCHER:

Q Are you going to inject in tubing? A Yes.

Q Swinging in the hole?

A Swinging in the hole. I'll tell, we will have this formation type packer.

Q This is just on two wells?

A On the two wells and we are going to run radioactive logs on the other two to decide that. Eventually, we will have packers in them. See, they have old pipe in them, and we will start out and see what kind of pressure we are going to have, we are going to feel our way along, and probably just inject down the casing until we see what we run into. We expect to run into a little pressure on the two north wells.

Q You are going to inject down the casing? A To start.

Q On all wells? A No.

Q Or just the ones that don't have formation packers?

A That's right.

Q Well, do you possibly know or have an idea what your injection rate might be at first?

A I think that at first those four wells in the pilot, the five spot area, will take about everything you can give it on a vacuum, we know that from going in an acidizing these holes. I almost be you that for time it would take water on a vacuum. We do expect the two north wells to pressure up, and I think that the two south wells will probably take everything you can give them on a vacuum.

Q Do you think the pipe in the hole now will hold up?

A On the newer wells, the two south wells, yes, there is good pipe in it. It has been drilled within the last eight or ten years, of course, that remains to be seen. We eventually expect to have to run packers in all of them, in some of the wells, at least just to protect the piping.

MR. FISCHER: Thank you.

QUESTIONS BY MR. NUTTER:

Q Mr. Krouskop, what method would you use for testing the formation packers upon setting them in the two wells that you will use them?

A Those are the two wells that we expect the water to go in on a vacuum. Actually there is nothing above the pipe that we are afraid of, just very tight streaks, and I don't imagine you could inject into them but several hundred pounds pressure. It is going to be a little difficult, unless we measure, to determine whether the packer is leaking, and it will be of no concern if we are on a vacuum, and if it does pressure up, we will be able to run an echometer and watch the fluid in the annulus, if it builds up. If you run in too much pressure, it will circulate, come to the surface, and we will watch it very close.

Q Not only upon the initial setting, but later on to determine if the packer is leaking?

A Yes. As I say, if we run into any pressure at all, you get your water in the annulus in the surface. We will know right

away if it seems reasonable, I imagine.

MR. NUTTER: Are there any other questions? If there are no other questions, and no statements, we will take the case under advisement.

MR. CHRISTY: Mr. Examiner, there is a statement. I am Sim Christy with Hervey, Dow and Hinkle representing Humble Oil Company. We have a statement in connection with this application.

Humble is not interested in acreage involved in case 1300, and is not opposed to the granting of an application to General American for permission to institute a pilot water flood program in the Grayburg-Jackson Pool, but we are opposed, as a matter of principle, to the Oil Conservation Commission establishing an allowable formula in this particular case, or in any case, based upon operation of the project at maximum efficiency, or increased allowables per well, and which will be a precedent for all other water flood or similar secondary recovery projects. Humble believes that any allowable formula which is a deviation from the State Wide allowable Rule should only be made upon proper motion for the promulgation of rules to be adopted by the Commission, which would only be adopted after a state wide hearing in which all operators are given an opportunity to express their views and submit evidence with respect thereto.

MR. NUTTER: Any other statements?

MR. COOLEY: Mr. Christy, you stand opposed to the allowable formula proposed by the applicant?

MR. CHRISTY: We are opposed, as a matter of principal, to adopting any allowable factors as a deviation from your State Rules without a full Commission hearing on a state wide basis, whether it be this case, this program, or other program in an isolated instance. We feel that your basic allowable, state wide rule should apply, unless you have a full Commission hearing and adopt rules for secondary recovery or for proration unit allowables.

MR. COOLEY: That would be, as well then, that you would be opposed to any unitization for the purpose of secondary recovery?

MR. CHRISTY: No.

MR. COOLEY: Doesn't this amount to the same thing?

MR. CHRISTY: The applicant seeks a change of the state wide allowable and that is the objection. It is not the secondary recovery project, as such, but the change in allowable from the state wide rules, that is the objection.

MR. COOLEY: Thank you Mr. Christy.

MR. NUTTER: Anything further in this case? If not, we will take Case No. 1300 under advisement, and proceed to Case No. 1301.

C E R T I F I C A T E

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILL)

I, J. A. TRUJILLO, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me in Stenotype at the time and place hereinbefore set forth; that same wes thereafter transcribed into typewritten transcript by me; and that same is a true and correct record to the best of my knowledge, skill, and ability.

WITNESS my Hand and Seal this, the 8th day of September, 1957, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

J. A. Trujillo
NOTARY PUBLIC

My Commission Expires:

October 5, 1960.

I do Hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1300, heard by me on 8-28, 1957.

..... Examiner
New Mexico Oil Conservation Commission

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

6-4-17

LAW OFFICES OF
CAMPBELL & RUSSELL
J. P. WHITE BUILDING
ROSWELL, NEW MEXICO

JACK M. CAMPBELL
JOHN F. RUSSELL

21 August 1957

MAIN OFFICE OCC
1957 AUG 22 PM 1:20

TELEPHONES
MAIN 2-4641
CAP 2-4642

Case # 1307
8/29/57

Mr. Warren Mankin
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Dear Warren:

I am enclosing herewith a copy of a letter from the General American Oil Company of Texas dated August 20th in response to my inquiry to them concerning transfer of allowables under the gas injection program within the Grayburg Cooperative and Unit Area.

If you have any further questions about this phase of the matter, I will be glad to attempt to obtain the answer for you.

Very truly yours,

CAMPBELL & RUSSELL

Jack M. Campbell

Jack M. Campbell

JMC:bb
Enclosure
cc: Mr. Jack Cooley

COPY

GENERAL AMERICAN OIL COMPANY OF TEXAS
Republic Bank Building
Dallas, Texas

Field Office: Box 416
Loco Hills, New Mexico

August 20, 1957

Mr. Jack M. Campbell
Attorney at Law
J. P. White Building
Roswell, New Mexico

Dear Mr. Campbell:

Reference is made to your letter of August 16, 1957 in regard to status of allowables which had been transferred in connection with a gas injection program within the limits of the Grayburg Cooperative and Unit Area.

The transfer of allowables, as authorized by Oil Conservation Commission Order No. 659, affected only two wells, namely Keely C No. 12 located 1980 feet from North and East lines of Section 25 and Keely B No. 9, located 1980 feet from South and East lines of Section 26, Township 17 South, Range 29 East, N.M.P.M.

Effective April 1, 1948 the discontinuance of transfer of allowable on Keely C No. 12 was approved by the Oil Conservation Commission.

Transfer of allowable on Keely B No. 9 was continued through November 19, 1948 at which time upon approval of Commission Order No. 802, no well within the limits of the Unit Area was allowed to produce in excess of top unit allowable, which provision precluded the transfer of allowables.

I trust the above information is sufficient to clarigy the present status of transferred allowables.

Very truly yours,

/s/ Raymond F. Miller
District Engineer

OIL CONSERVATION COMMISSION

SANTA FE, NEW MEXICO

November 5, 1957

COPY

Mr. Jack Campbell
P.O. Box 721
Roswell, New Mexico

Dear Sir:

On behalf of your client, General American Oil Company of Texas, we enclose two copies of Order R-1058-A issued November 4, 1957, by the Oil Conservation Commission in Case 1300.

Very truly yours,

A. L. Porter, Jr.
Secretary - Director

bp
Encls.

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. 1300
Order No. R-1058-A

APPLICATION OF GENERAL AMERICAN OIL
COMPANY OF TEXAS FOR AN ORDER AMENDING
ORDER NO. R-1058 CONCERNING ITS PILOT
WATER FLOOD PROJECT IN THE GRAYBURG-
JACKSON POOL, IN EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on October 24, 1957, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the New Mexico Oil Conservation Commission, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 4th day of November, 1957, the Commission, a quorum being present, having considered the application, the evidence adduced and the recommendations of the Examiner, Daniel S. Nutter, 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 paragraph (2) of Order No. R-1058 authorized five water injection wells for the General American Oil Company of Texas pilot water flood project in the Grayburg-Jackson Pool in Eddy County, New Mexico, but that said order limited the input volume into each of said wells to 400 barrels of water per day.

(3) That the applicant cannot effectively operate the pilot water flood project authorized by Order No. R-1058 within the 400 barrels of water per day per well limit due to the low injectivity of certain of the injection wells.

(4) That the limitation on the volume of water to be injected into the above described water injection wells should be removed.

IT IS THEREFORE ORDERED:

That the second paragraph of Section (2) of Order No. R-1058, i. e., "Provided however, that the input volume shall not

exceed 400 barrels of water per day into each injection well." be and the same is hereby deleted.

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

ir/

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

CASE 1300 Date 10-31-57

Hearing Date 10-24-57
ASW 9 am SE

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

Enter order R-1058-A in the subject reopened case amending R-1058 in that the second paragraph of Sec (2) of the order be stricken ("Provided however that the input volume shall not exceed 400 bbls of water per day into each injection well.)

Include among findings that operator has been unable to inject appreciable volumes due to certain of the input wells even under considerable pressure while others of the input wells took large volumes under little or no pressure at the wellhead

Staff Member

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. 1300
Order No. R-1058

APPLICATION OF GENERAL AMERICAN OIL
COMPANY OF TEXAS FOR PERMISSION TO
INSTITUTE A PILOT WATER FLOOD PROJECT
IN THE GRAYBURG-JACKSON POOL IN EDDY
COUNTY, NEW MEXICO AND FOR THE ESTABLISH-
MENT OF AN ALLOWABLE FORMULA FOR ALL WELLS
INVOLVED IN SAID PROJECT.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 1 o'clock p.m. on August 28, 1957, at Hobbs, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 30th day of September, 1957, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, 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, General American Oil Company of Texas, proposes to institute a pilot water flood project in the Grayburg Jackson Pool in Eddy County, New Mexico, in a pilot area consisting of the S/2 SW/4 and SW/4 SE/4 of Section 18, and the N/2 and N/2 S/2 of Section 19, all in Township 17 South, Range 30 East, NMPM, Eddy County, New Mexico, with input volumes limited to 400 barrels of water per day into each injection well.

(3) That the applicant further requests that an allowable formula be established for the wells in the above-described pilot area.

(4) That the said pilot area comprises a portion of one of the unitized tracts in the Grayburg Cooperative and Unit Area established by Order 802 dated November 19, 1948, and identified therein as the Grayburg Oil Company of New Mexico Unit G-1.

(5) That the allowable formula established by Order 802 for the units created thereby provides that the applicants are hereby authorized to produce from each unitized tract, hereinabove described, the total allowable production, as fixed by the Commission for the total number of developed 40-acre proration units comprising such unitized tract...", provided however, "that no well located upon any unitized tract shall be permitted to produce at a rate in excess of the top allowable as fixed by the Commission."

(6) That the total allowable for Unit G-1 should continue to be calculated and assigned in accordance with the above quoted provisions of Order 802 but that all producing wells in the above-described pilot area should be excepted from that portion of the order which prohibits the production of said wells at a rate in excess of the top allowable as fixed by the Commission.

(7) That the proposed pilot water flood project will not adversely affect the interests of any other operator in the Grayburg Jackson Pool.

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

(9) That periodic reports should be submitted to the Commission by the applicant disclosing the progress of the secondary recovery program.

IT IS THEREFORE ORDERED:

(1) That the applicant, General American Oil Company of Texas, be and the same hereby is authorized to initiate a pilot water flood project in the Grayburg Jackson Pool on the S/2 SW/4 and SW/4 SE/4 of Section 18, and the N/2 and N/2 S/2 of Section 19, all in Township 17 South, Range 30 East, NMPM, Eddy County, New Mexico.

(2) That the following wells be and the same are hereby authorized as water injection wells for the above-described pilot water flood project:

			Sec.	Twp.	Rge.
Burch "A"	14	SW/4 SE/4	18	17	30
Burch "	8	NE/4 NW/4	19	17	30
Burch "	9	NW/4 NW/4	"	"	"
Burch "	23	SW/4 NW/4	"	"	"
Burch "	24	SW/4 NE/4	"	"	"

all in Eddy County, New Mexico.

Provided however, that the input volume shall not exceed 400 barrels of water per day into each injection well.

(3) That the total allowable for the Grayburg Oil Company of New Mexico Unit G-1 established by Order 802 dated November 19, 1948, shall continue to be calculated and assigned in accordance

with the provisions of said Order 802, provided however, that all producing wells in the above described pilot water flood area are hereby excepted from that portion of Order 802 which provides "that no well located upon any unitized tract shall be permitted to produce at a rate in excess of the top allowable as fixed by the Commission."

(4) That monthly progress reports on the 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

E. L. Mechem

EDWIN L. MECHEM, Chairman

Murray E. Morgan

MURRAY E. MORGAN, Member

A. L. Porter, Jr.

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

ir/

No. 32-57

SUPPLEMENTAL DOCKET: EXAMINER HEARING OCTOBER 24, 1957

Oil Conservation Commission 9:00 a.m. Mabry Hall, State Capitol, Santa Fe

The following case will be heard before Daniel S. Nutter, Examiner:

CASE 1300: Application of General American Oil Company of Texas for an order amending Order No. R-1058 concerning its pilot water flood project in the Grayburg-Jackson Pool in Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order amending Order No. R-1058 to permit the injection of unlimited amounts of water into the injection wells authorized by said order for the applicant's pilot water flood project in the Grayburg-Jackson Pool, Eddy County, New Mexico.

ir/

LAW OFFICES OF
CAMPBELL & RUSSELL
J. P. WHITE BUILDING
ROSWELL, NEW MEXICO

JACK M. CAMPBELL
JOHN F. RUSSELL

TELEPHONES
MAIN 2-4041
MAIN 2-4642

11 October 1957

File
Case - 1300

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

Enclosed please find the original and two copies of the application of General Americal Oil Company of Texas for an order amending Order No. R-1058 concerning its pilot water flood project in the Gray-burg-Jackson Pool, Eddy County, New Mexico.

Very truly yours,

CAMPBELL & RUSSELL

Jack M. Campbell

Jack M. Campbell

JMC:bb
Enclosures

10-11-57
Docket mailed to Jack Campbell & Sim Christy
BP

BEFORE THE NEW MEXICO
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF)
GENERAL AMERICAN OIL COMPANY OF TEXAS)
FOR AN ORDER AMENDING ORDER NO. R-1058)
CONCERNING ITS PILOT WATER FLOOD PROJ-) NO. 1500
ECT IN THE GRAYBURG-JACKSON POOL, EDDY)
COUNTY, NEW MEXICO, TO PERMIT THE IN-)
JECTION OF UNLIMITED AMOUNTS OF WATER)
INTO THE INJECTION WELLS AUTHORIZED BY)
SAID ORDER.)

APPLICATION

Comes now Applicant, General American Oil Company of Texas, by its attorneys, and states:

1. Under the provisions of Commission Order No. R-1058 dated September 30, 1957, Applicant was permitted to establish a pilot water flood project in the Grayburg-Jackson Pool, Eddy County, New Mexico, and as a part of said Order, the input volume of water was limited to an amount not to exceed 400 barrels of water into each intake well.

2. Due to reservoir conditions, said limitation restricts the effective and efficient operation of the said pilot water flood project.

WHEREFORE, Applicant respectfully requests the amendment of said Order No. R-1058 to permit the injection of unlimited amounts of water into the injection wells authorized by said Order for Applicant's pilot water flood project in the Grayburg-Jackson Pool, Eddy County, New Mexico.

APPLICANT FURTHER REQUESTS that this matter be set down before an Examiner for the Commission at an early date and that notice of said hearing be published as required by law.

Respectfully submitted,

GENERAL AMERICAN OIL COMPANY OF TEXAS

By: Jack M. Campbell
For: CAMPBELL & RUSSELL
Box 721, Roswell, New Mexico
Attorneys for Applicant

DATED: October 11, 1957

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

October 1, 1957

COPY

Mr. Jack Campbell
Campbell & Russell
Box 721
Roswell, New Mexico

Dear Sir:

On behalf of your client, General American Oil Company of Texas, we enclose two copies of Order R-1058 issued September 30, 1957, by the Oil Conservation Commission in Case 1300, which was heard before an Examiner on August 28th.

Very truly yours,

A. L. Porter, Jr.
Secretary - Director

bp
Encls.

DOCKET: EXAMINER HEARING AUGUST 28, 1957

New Mexico Oil Conservation Commission 1:00 p.m. Hobbs, New Mexico

Oil Conservation Commission Office, 1000 W. Broadway, Hobbs, New Mexico

The following cases will be heard before Daniel S. Nutter, Examiner:

CASE 1300: Application of General American Oil Company of Texas for permission to institute a pilot water flood program in the Grayburg-Jackson Pool in Eddy County, New Mexico, and for the establishment of an allowable formula for all wells involved in said project. Applicant, in the above-styled cause, seeks an order authorizing the injection of water into the Grayburg-Jackson Pool through five wells presently producing from said pool in Sections 18 and 19, Township 17 South, Range 30 East, Eddy County, New Mexico, the input volume not to exceed 400 barrels of water per day into each intake well. Applicant further requests the establishment of an allowable formula for all wells involved in the subject water flood project to permit the operation of the project at its maximum efficiency. The area covered by the subject application is presently included in the Grayburg Cooperative and Unit Area gas injection project authorized by Commission Orders No. 659 and No. 802.

CASE 1301: Application of Tidewater Oil Company for a non-standard gas proration unit in the Tubb Gas Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order granting a 120-acre non-standard gas proration unit in the Tubb Gas Pool consisting of the S/2 SE/4 and SE/4 SW/4 of Section 17, Township 21 South, Range 37 East, Lea County, New Mexico, said unit to be dedicated to applicant's Percy Hardy No. 2 Well located 660 feet from the South line and 1980 feet from the East line of said Section 17.

CASE 1302: Application of Continental Oil Company for permission to produce more than eight oil wells into a single common tank battery in the Eumont Gas Pool on its State "A-36" Lease in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the production into a common tank battery of eleven existing oil wells plus one additional proposed oil well in the Eumont Gas Pool within the boundaries of its State "A-36" Lease which comprises the S/2 and NE/4 of Section 36, Township 20 South, Range 37 East, Lea County, New Mexico.

CASE 1303: Application of Gulf Oil Corporation for a 468-acre non-standard gas proration unit in the Eumont Gas Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order creating a 468-acre non-standard gas proration unit in the Eumont Gas Pool consisting of SW/4 Section 30 and the N/2 Section 31, Township 21 South, Range 37 East, Lea County, New Mexico, said unit to be dedicated to the applicant's H. T. Mattern "B" No. 10 Well located in the NE/4 NW/4 of said Section 31.

EXAMINER HEARING AUGUST 30, 1957

Oil Conservation Commission 9:00 a.m. Mabry Hall, State Capitol, Santa Fe

The following case will be heard before Daniel S. Nutter, Examiner:

CASE 1304: Application of El Paso Natural Gas Products Company for the approval of an unorthodox oil well location in an undesignated Gallup Oil Pool in San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order approving the unorthodox location of its Sapp No. 1 Well in an undesignated Gallup Oil Pool at a point 1,450 feet from the South line and 965 feet from the East line of Section 30, Township 24 North, Range 8 West, San Juan County, New Mexico. Said well was projected as a wildcat gas well but was found to be productive of oil rather than gas.

ir/

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date 9-10-57

CASE 1300 Hearing Date 8-28-57 DSN @ Hobbs 1:00 PM

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

Enter an order authorizing General American Oil Company of Texas to initiate ~~water~~ a pilot water flood in the Grayburg Jackson Pool Eddy County, New Mexico. Pilot flood area is to cover S/2 SW/4 & SW/4 SE/4 18

Limit the rate of injection to 400 barrels per day into each of these 15 wells:

		Sec	T	R
Burch "A" 8	NE/4 NW/4	19	17	30
" 9	NW/4 NW/4	"	"	"
" 23	SW/4 NW/4	"	"	"
" 24	SW/4 NE/4	"	"	"
" 14	SW/4 SE/4	18	17	30

Fix the total allowable for the pilot flood for any month at 15 x the current normal unit allowable, which may be produced in any proportion from any of the following wells:

Burch A	15	SE SW	18	17	30
" "	16	SW SW	"	"	"
" "	10	NE NE	19	17	30
" "	7	N W NE	"	"	"
" "	3	SW NW	"	"	"
" "	4	SE NW	"	"	"

over

Daniel S. Nutter
~~Staff Member~~
Examiner

Burch	H	5	SW	NE	19	17	30
"	"	6	SE	NE	"	"	"
"	"	22	"	"	"	"	"
"	"	11	NE	SE	"	"	"
"	"	25	"	"	"	"	"
"	"	27	NW	SE	"	"	"
"	"	12	NW	SE	"	"	"
"	"	13	NE	SW	"	"	"
"	"	2	NW	SW	"	"	"

Require injection reports ~~etc~~ as per rules

BEFORE THE NEW MEXICO
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF GENERAL AMERICAN OIL COMPANY OF TEXAS FOR PERMISSION TO INJECT WATER INTO THE GRAYBURG - JACKSON ZONE IN THE GRAYBURG COOPERATIVE AND UNIT AREA IN SECTIONS 18 AND 19, TOWNSHIP 17 SOUTH, RANGE 30 EAST, EDDY COUNTY, NEW MEXICO, AND FOR THE ESTABLISHMENT OF AN ALLOWABLE FORMULA.

No. ____

APPLICATION

Comes now Applicant, General American Oil Company of Texas, by its attorneys, and pursuant to Rule 701 of the Rules and Regulations of the New Mexico Oil Conservation Commission, states:

1. Applicant is the owner and operator of wells situated within the Grayburg Cooperative and Unit Area in Sections 23, 24, 25 and 26, Township 17 South, Range 29 East, and Sections 18, 19 and 30, Township 17 South, Range 30 East, Eddy County, New Mexico.

2. Applicant desires to institute a pilot water flood project with injection wells situated in Sections 18 and 19, Township 17 South, Range 30 East.

3. The wells involved in this application are producing from the Grayburg - Jackson zone within the San Andres formation and productive zones of the San Andres formation will be affected by the water injection.

4. Water to be used for injection for the pilot flood program would be obtained from a zone in the Pennsylvanian formation from 9265 feet to 9299 feet, encountered in the Gulf-Grayburg Unit No. 1 located 660 feet from the south line and 560 feet from the west line of Section 24, Township 17 South, Range 29 East. The input volume would be established by experimentation, but would not exceed 400 barrels of water per day into each intake well. A supplementary water source has been developed from the Paddock Zone in Burch A #17 well located 560 feet

from the south and east lines of Section 18, Township 17 South, Range 30 East. This well is capable of producing water at the rate of 360 barrels per day while producing 43 barrels of oil.

5. General American Oil Company of Texas will be the operator of the project.

6. Pursuant to Rule 701, Applicant attaches to this application the following:

(a) Plat, designated as Exhibit 1, showing the location of five (5) intake wells and the location of all wells and the names of lessees within one-half mile of the intake wells. There are no offset operators other than Applicant.

(b) Logs of each proposed intake well, designated as Exhibit 2 (a) (b) (c) (d) and (e).

(c) Schematic diagram, designated Exhibit 3, indicating proposed method of installing formation packer in intake wells.

(d) Copy of letter to U.S.G.S., designated Exhibit 4, requesting approval of the proposed pilot flood program.

7. The granting of this application will prevent waste and avoid premature abandonment of oil wells.

8. Sinclair Oil and Gas Company is the only operator within one-half mile of the proposed intake wells and a complete copy of this application is being forwarded to Sinclair Oil and Gas Company.

WHEREFORE, Applicant requests the Commission to set this matter down before an Examiner at the earliest possible date and to publish notice as provided by law. Applicant further requests the Commission, after hearing, to approve the program and to establish an allowable formula permitting Applicant to operate the secondary recovery project to its maximum effeciency.

Respectfully submitted,

GENERAL AMERICAN OIL COMPANY OF TEXAS

By: Jack M. Campbell
For: CAMPBELL & RUSSELL
Box 721, Roswell, New Mexico
Attorneys for Applicant

Dated: 22 July 1957

Before Examiner [illegible]
Oil Conservation Commission
Exhibit Case No. [illegible]

Exhibit [illegible]

Form 9-330

MAIN OFFICE OCC
1957 JUL 24 PM 1:22

LOCATE WELL CORRECTLY

Budget Bureau No. 42-R355.4.
Approval expires 12-31-60.

U. S. LAND OFFICE Las Cruces
SERIAL NUMBER 025723-b
LEASE OR PERMIT TO PROSPECT Burch A

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Grayburg Oil Company of New Mex. Address Box 416, Loco Hills, New Mexico
Lessor or Tract Burch A Field Grayburg-Jackson State New Mexico
Well No. 24-A Sec. 19 T. 17S R. 30E Meridian NMPM County Eddy
Location 2310 ft. {N./S.} of N Line and 2615 ft. {E./W.} of E Line of S. c. 19 Elevation 3628'
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed R. J. Heard
Date Jun. 22, 1949 Title Vice President

The summary on this page is for the condition of the well at above date.

Commenced drilling Jan. 23, 19 49 Finished drilling June 12, 19 49

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 2984 to 3010 No. 4, from ... to ...
No. 2, from 3060 to 3085 No. 5, from ... to ...
No. 3, from 3130 to 3180 No. 6, from ... to ...

IMPORTANT WATER SANDS

No. 1, from 295 to 305 No. 3, from ... to ...
No. 2, from ... to ... No. 4, from ... to ...

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8-5/8"	24#	8V		482	Tex-Patrn				Salt String
7"	20#	8rd		2514	Float				Prod. String

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8-5/8"	482	75	Halliburton	Heavy	To surface
7"	2514	100	"	"	" "

MARK

FOLD

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length .....

Adapters—Material ..... Size .....

ACIDIZING / SHOOTING RECORD

Size	Shell used	Explosive or Chemical used	Quantity	Date	Depth shot or Treated	Depth cleaned out
		20% HCl	850	3-9-49	2560-2688	
		" "	1000	3-12-49	2952-3030	
		" "	4000	3-13-49	2952-3037	
		" "	1000	3-19-49	3047-3106	
		" "	1000	3-20-49	3047-3106	
		" "	850	6-14-49	3104-3183	

TOOLS USED

Rotary tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

Cable tools were used from 0 feet to 3183 feet, and from ..... feet to ..... feet

DATES

June 22, 1949, 19.... Put to producing June 17, 19 49

The production for the first 24 hours was 26 barrels of fluid of which 100% was oil; ....% emulsion; ....% water; and ....% sediment. Gravity, °Bé. .....

If gas well, cu. ft. per 24 hours ..... Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. .....

EMPLOYEES

Oscar Burch, Driller C. A. Pratt, Driller

Rell Johnson, Driller L. N. Ledbetter, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
0	50	50	Surface Sand and Caliche
50	130	80	Sand and Red Mud
130	200	70	Red Mud
200	250	50	Red Shale
250	255	5	Anhy
255	275	20	Sandy Shale
275	310	35	Sand
310	350	40	Red Bed
350	355	5	Anhy
355	430	75	Red Bed
430	447	17	Anhy and Potash
447	905	458	Salt
905	940	35	Anhy
940	960	20	Red Sandy Shale
960	1090	130	Anhy
1090	1195	105	Anhy and Red Shale
1195	1255	60	Anhy
1255	1280	25	Gray Lime
1280	1695	415	Anhy
1695	1730	35	Anhy and Red Shale
1730	1770	40	Anhy
1770	1810	40	Anhy and Red Shale
1810	1954	144	Anhy

[OVER]

FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION
1954	1957	3	SLM
1957	1985	28	Anhy
1985	2015	30	Red Sand
2015	2135	120	Anhy
2135	2155	20	Gray Lime
2155	2179	24	Red Rock and Lime
2179	2192	13	Anhy and Lime
2192	2205	13	Anhy
2205	2234	29	Anhy and Lime
2234	2261	27	Anhy and Red Rock
2261	2290	29	Red Sandy Shale and Red Rock
2290	2320	30	Anhy and Red Shale
2320	2342	22	Brown Lime and Shale
2342	2366	24	Brown Sandy Lime and Red Rock
2366	2451	85	Gray Lime
2451	2468	17	Gray Sandy Lime
2468	2504	36	Gray Lime
2504	2510	6	White Lime
2510	2514	4	SLM
2514	2555	41	Gray Lime
2555	2559	4	SLM
2559	2666	107	Gray Lime
2666	2700	34	White Lime
2700	2728	28	Gray Lime
2728	2854	126	White Lime
2854	2849	-5	SLM
2849	2858	9	Gray Lime
2858	2867	9	White Lime
2867	2880	13	Gray Lime
2880	2970	90	White Lime
2970	3109	139	Gray Lime
3109	3106	-3	SLM
3106	3183	77	Gray Lime

16—32094-2 U. S. GOVERNMENT PRINTING OFFICE

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

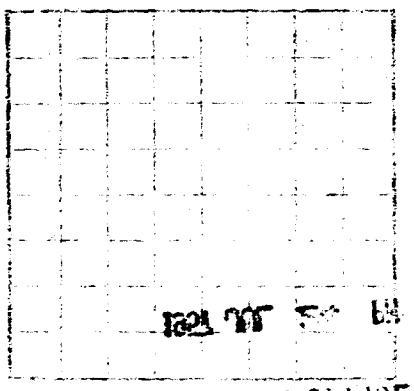


Exhibit 26

Budget Bureau No. 42-R355.4.
Approval expires 12-31-60.

Form 9-330

U. S. LAND OFFICE Las Cruces
SERIAL NUMBER 028793-A
LEASE OR PERMIT TO PROSPECT Burch

AIR OFFICE OCC
1957 JUL 24 PM 1:22

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOCATE WELL CORRECTLY

LOG OF OIL OR GAS WELL

Company Grayburg Oil Co. of N. M. Address Artesia, New Mexico

Lessor or Tract Burch A Field Grayburg-Jackson State New Mexico

Well No. 14-A Sec. 18 T. 17 R. 30 Meridian NMPM County Eddy

Location 660 ft. {N./S.} of S. Line and 1980 ft. {E./W.} of E. Line of Sec. 18 Elevation 3650
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed

Date December 7, 1943 Title Vice-President

The summary on this page is for the condition of the well at above date.

Commenced drilling Sept. 14, 19 43 Finished drilling November 29th, 19 43

OIL OR GAS SANDS OR ZONES

(*Denote gas by G*)

No. 1, from 3121 to 3129 No. 4, from to

No. 2, from 3135 to 3152 No. 5, from to

No. 3, from to No. 6, from to

IMPORTANT WATER SANDS

No. 1, from to No. 3, from to

No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8¼"	Casing			509 ft.	50 Sacks Cement and Mud				
7"	Casing			2900 ft.	100 Sacks Cement and Mud				

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8¼"	509 ft	50 sacks	International		Mud
7"	2900 ft	100 sacks	International		Mud

MARK

FOLD

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
Acidized well with 1500 gals acid from 3185 ft. to 3150 ft. (No Results)						
Shot well with 200 qts of Nitro-Glycerin using 5½" Shells from 3116 ft. to 3158ft.						

TOOLS USED

Rotary tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

Cable tools were used from 0 feet to 3185 feet, and from ..... feet to ..... feet

DATES

....., 19..... Put to producing November 30th, 19 43

The production for the first 24 hours was 20 barrels of fluid of which 100 % was oil; ..... % emulsion; ..... % water; and ..... % sediment. Gravity, °Bé. 38°

If gas well, cu. ft. per 24 hours ..... Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. .....

EMPLOYEES

J. T. Henry, Driller O. T. Hays, Driller

Leonard Kilburn, Driller ....., Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
0	5		Sand
5	15		Cyp
15	60		Sand
60	135		REd Rock and Sand
135	245		Red Rock
245	328		Anhydrite
328	370		Red Rocks
370	430		Anhydrite
430	450		Red Beds
450	460		Anhydrite
460	465		Red Rock
465	550		Salt
550	615		Salt and Potash
615	670		Salt Shells
670	740		Salt and Anhydrite
740	900		Salt and Anhydrite Shells
900	910		Salt
910	1110		Anhydrite
1110	1200		Anhydrite and Red Rock
1200	1735		Anhydrite
1735	1840		Anhydrite and Red Rock
1840	2145		Anhydrite
2145	2160		Gray Lime
2160	2190		Anhydrite
2190	2225		Anhydrite Broken

16—43094-4

FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION
2225	2250		Anhydrite and Shells
2250	2340		Anhydrite
2340	2383		Lime
2383	2400		Gray Lime
2400	2413		Lime
2413	2648		Gray Lime
2648	2662		Sandy Light Gray Lime
2662	2672		White Lime
2672	2690		Gray Lime
2690	2708		White and Pink Lime
2708	2713		Gray Lime
2713	2729		Lime
2729	2744		Light Gray Lime
2744	2759		White Lime
2759	2761		Gray Lime
2761	2770		Lime
2770	2820		Gray Lime
2820	2826		Lime
2826	2851		Dark Gray Lime and Slate
2851	2861		Lime
2861	2881		Gray Lime
2881	2972		White Lime
2972	2981		Gray Lime
2981	3000		Lime
3000	3046		Gray Lime
3046	3053		Gray Lime Sandy
3053	3185		Gray Lime
3185			TOTAL DEPTH

16—43094-2 U. S. GOVERNMENT PRINTING OFFICE

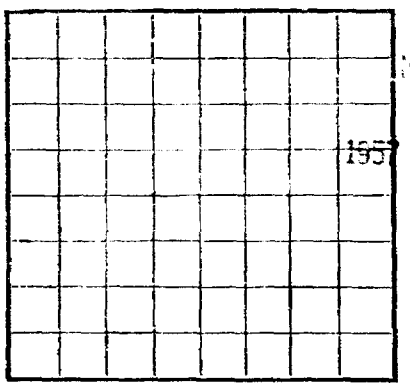
HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

Budget Bureau No. 42-R355.4
Approval expires 12-31-60.

Form 9-330

U. S. LAND OFFICE Las Cruces
SERIAL NUMBER 028793-A
LEASE OR PERMIT TO PROSPECT Burch



LOCATE WELL CORRECTLY

MAIN OFFICE OCC
1937 JUL 2 PM 1:22

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Grayburg Oil Company of N. M. Address Artesia, New Mexico
Lessor or Tract Burch Field Grayburg State New Mexico
Well No. 9 Sec. 19 T. 17 R. 30 Meridian N.M.P.M. County Eddy
Location 990 ft. {N./S.} of N. Line and 990 ft. {E./W.} of W. Line of Sec. 19 Elevation
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed

Date Dec. 18, 1937 Title Secretary

The summary on this page is for the condition of the well at above date.

Commenced drilling Sept. 21, 1937 Finished drilling Dec. 6, 1937

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 1475 to 1480 G. S. No. 4, from 3001 to 3010 O. S.
No. 2, from ~~2516~~ 1540 to ~~2515~~ 1546 G. S. No. 5, from 3034 to 3040 O. S.
No. 3, from 2660 to 2665 O. S. No. 6, from 3109 to 3105 O. S.

IMPORTANT WATER SANDS

No. 1, from to No. 3, from to
No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
10"				325'		325'			
8¼"	30#	8	Nat'l.	430'	Regular				
7"OD	24#	8	Youngston	2784'	Float				

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8¼"	430'	50	Halliburton	Heavy	Top to Bottom
7"OD	2784'	100	Halliburton	Heavy	Top to Bottom

MARK

FOLD

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
		Acid	1000	11-29	3000-30	3030
		"	2000	12-8	3000-3157	3157

TOOLS USED

Rotary tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

Cable tools were used from 0 feet to 3157 feet, and from ..... feet to ..... feet

DATES

....., 19..... Put to producing Dec. 30, 19 37

The production for the first 24 hours was 25 barrels of fluid of which 100 % was oil; ..... % emulsion; ..... % water; and ..... % sediment. Gravity, °Bé. .....

If gas well, cu. ft. per 24 hours ..... Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. .....

EMPLOYEES

Harold Hancox, Driller ....., Driller

L. E. Neely, Driller C. C. Connor, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
0	30	30	Sand & Gyp
30	50	20	Gyp & Red Shale
50	260	210	Red Sandy Shale
260	265	5	Red Sand Set 10" pipe @ 325'
265	325	60	Red Bed
325	350	25	Red Bed
350	360	10	Gyp
360	375	15	Red Bed
375	425	50	Red Bed and gyp
425	842	417	Salt Set 8" pipe, pulled 10", 430'.
842	862	10	Anhydrite
862	867	5	Red Shale
867	898	31	Anhydrite
898	938	40	Anhydrite, Brown Shale, & Salt
938	1018	80	Anhydrite
1018	1058	40	Anhydrite, Blue & Brown Shale
1058	1098	40	Brown Shale & Anhydrite
1098	1648	547	Anhydrite - Gas show 1475, and 1540-45
1645	1670	25	Anhydrite & Shale
1670	1800	130	Anhydrite & Brown Shale
1800	1935	135	Anhydrite
1935	1965	30	Anhydrite and Red Sand
1965	2005	40	Anhydrite
2005	2025	20	Anhydrite and Red Shale
2025	2325	300	Anhydrite

(OVER)

15—43024-4

FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION
2325	2340	15	Gray Lime
2340	2370	30	Lime
2370	2445	75	Gray Lime
2445	2460	15	Lime
2460	2490	30	Gray Lime
2490	2505	15	Gray and Brown Lime O. S. 2510-15
2505	2589	84	Gray Lime
2589	2616	27	White Lime
2616	2624	8	Light Gray Lime
2624	2632	8	White Lime
2632	2640	8	Hard White Lime
2640	2660	20	Dark Sandy Lime
2660	2670	10	Light Lime O. S. 2660 to 65
2670	2775	105	White Lime
2775	2784	9	Brown Lime
2784	2793	9	Brown Sandy Lime Set 7" pipe 2784'
2793	2801	8	Dark Gray Lime
2801	2828	27	Gray Lime
2828	2835	7	Gray Lime and Bentonite
2835	2842	7	Gray Lime
2842	2962	120	White Lime
2962	3001	39	Gray Lime
3001	3034	33	Gray Lime - OLS. 3001-3010
3034	3040	6	Brown Lime O. S. 3034-40
3040	3110	70	Gray Lime O. & G.S. 3102-05
3110	3122	12	Brown Lime
3122	3134	12	Gray Lime
3134	3140	6	Borwn Lime
3140	3157	17	Gray Lime

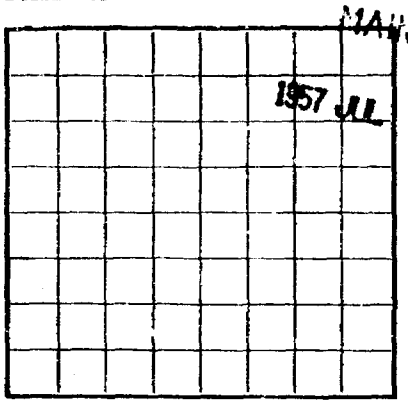
16—43094-2 U. S. GOVERNMENT PRINTING OFFICE

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

Budget Bureau No. 42-R355.4.
Approval expires 12-31-60.

Form 9-330



LOCATE WELL CORRECTLY

MAIN OFFICE OCC
1937 JUL 24 PM 1:23

U. S. LAND OFFICE Las Cruces
SERIAL NUMBER 028793-A
LEASE OR PERMIT TO PROSPECT Burch

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Grayburg Oil Co. Of New Mex. Address Artesia, New Mexico

Lessor or Tract Burch Field Grayburg State New Mexico

Well No. 8 Sec. 19 T. 17 R. 30 Meridian NMPM County Eddy

Location 990 ft. {N.} of N Line and 2310 ft. {E.} of W Line of Sec. 19 Elevation
{S.} {W.} (Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed

Date November 8, 1937 Title Secretary

The summary on this page is for the condition of the well at above date.

Commenced drilling ~~May~~ August 20, 1937 Finished drilling October 30, 1937

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 1500 to 1505 G.S. No. 4, from 2815 to 2825 O. S.

No. 2, from 2440 to 2445 O.S / 2560 to 2562 O.S. No. 5, from 2965 to 2970 O. S.

No. 3, from 2763 to 2767 O.S. No. 6, from 3130 to 3135 O.S. & G.S.

IMPORTANT WATER SANDS

No. 1, from 315 to 320 No. 3, from to

No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8¼"	32#	8	Nat'l	445	Regular				
7"OD	20#	8	Youngston	2825	Float				

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8¼"	445	50	Halliburton	Heavy	Top to Bottom
7"OD	2825	100	Halliburton	Heavy	Top to Bottom

MARK

FOLD

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
		Acid	2,000	11/2	3130-3225	3325

TOOLS USED

Rotary tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

Cable tools were used from 0 feet to 3225 feet, and from ..... feet to ..... feet

DATES

....., 19.... Put to producing Nov. 4, 19 37

The production for the first 24 hours was 20 barrels of fluid of which 100 % was oil; ....% emulsion; ....% water; and ....% sediment. Gravity, °Bé. .....

If gas well, cu. ft. per 24 hours ..... Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. .....

EMPLOYEES

H. G. Rideout, Driller ....., Driller

Oscar Burch, Driller S. M. McCool, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
0	15	15	Sand
15	85	70	Sand and Red Bed
85	110	25	Red Rock
110	135	25	Red Bed
135	205	80	Red Bed and Sand
205	305	100	Sand, Red Rock, & Gyp
305	315	10	Gyp
315	320	5	Sand & Gravel - Water
320	330	10	Red Bed
330	390	60	Red Rock & Gyp
390	440	50	Red Rock
440	445	5	Red Bed
445	900	455	Salt Set 8¼" Casing 445 feet
900	940	40	Anhydrite & Red Rock
940	945	5	Blue Shale
945	965	20	Anhydrite & Brown shale
965	970	5	Salt
970	1080	110	Anhydrite
1080	1090	10	Anhydrite & Brown shale
1090	1140	40	Anhydrite, Red Rock & Gyp
1140	1150	10	Red Rock & Anhydrite
1150	1160	10	Red Rock
1160	1170	10	Anhydrite
1170	1180	10	Anhydrite & Red Rock
1180	1210	30	Anhydrite
1210	1255	45	Anhydrite, Gyp & Red Rock

[OVER]

16—43091-4

FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION
1255	1279	24	Anhydrite
1279	2315	36	Anhydrite, Gyp & Red Rock
1315	1685	370	Anhydrite - Light Show Oil 1440 to 45 " Gas Show 1500-1505
1685	1695	10	Conglomeration, Sharp
1695	1720	25	Anhydrite
1720	1795	75	Red Rock & Anhydrite
1795	1825	30	Anhydrite
1825	1860	35	Anhydrite & Shale Breaks
1860	1885	25	Anhydrite & Red Rock
1885	1905	20	Anhydrite and Borwn Shale
1905	1915	10	Gray Lime
1915	1950	35	Anhydrite
1950	1955	5	Conglomeration
1955	1960	5	Blue Shale & Anhydrite
1960	1985	25	Anhydrite & Red Sand
1985	1995	10	Red Sand
1995	2020	25	Anhydrite
2020	2025	5	Gray Lime
2025	2030	5	Gray Lime & Anhydrite
2030	2055	25	Anhydrite & Brown Shale
2055	2130	75	Anhydrite
2130	2140	10	Lime
2140	2155	15	Anhydrite & Shale
2155	2180	25	Anhydrite & Red Rock
2180	2205	25	Anhydrite and Borwn Shale
2205	2240	35	Gyp, Shale & Lime Shells
2240	2250	10	Red Rock & Anhydrite
2250	2255	5	Red Sand
2255	2280	25	Red Sand & Anhydrite
2280	2315	35	Gyp & Shale Breaks
2315	2325	10	Gray Lime
2325	2330	5	Red Rock & Gray Lime
2330	2350	20	Gray and Borwn Lime
2330	2408	78	Gray Lime
2408	2420	12	Hard Lime
2420	2429	9	Gray Lime
2429	2441	12	Gray & Brown Lime
2441	2490	49	Gray Lime
2490	2503	13	White & Gray Lime
2503	2605	102	Gray Lime - Oil Show 2440-45 and from 2560-2562
2605	2613	8	Borwn Lime
2613	2624	11	Gray Lime
2624	2635	11	White Lime
2635	2646	11	Gray Lime
2646	2686	40	White Lime
2686	2694	8	Gray Lime
2694	2701	7	Brown Lime
2701	2721	20	White Lime
2721	2728	7	Gray Lime
2728	2774	46	White Lime - Oil Show 2763-2767
2774	2781	7	Gray Lime
2781	2797	16	Pink Lime
2797	2806	9	White Lime
2806	2815	9	Gray Lime

2815	2825	10	Gray Sandy Lime - Oil Show 2815-25 Set 7" OD Casing 2825
2825	2834	9	White Lime
2834	2859	25	Gray Lime
2859	2863	4	Gray Lime & Bentonite
2863	2881	18	Gray Lime
2881	2898	17	Gray Lime & Bentonite

16—42004-2 U. S. GOVERNMENT PRINTING OFFICE

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

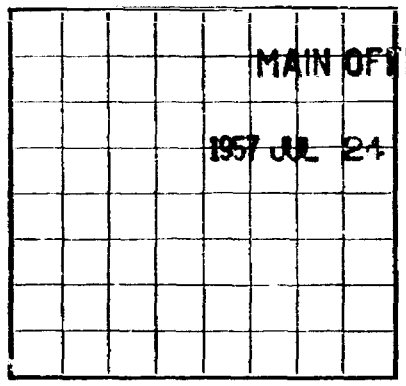
2898	2903	5	Gray Lime
2903	2960	57	White Lime
2960	3166	206	Gray Lime Oil Show 2965-2970, 3070, 3130-3135
3166	3173	7	Borwn Lime
3173	3198	5	Gray Lime
3198	3225	27	BrownLime T.D.

Permit
2-e

Form 9-330

Budget Bureau No. 42-R355.4
Approval expires 12-31-60.

U. S. LAND OFFICE Las Cruces
SERIAL NUMBER 028793-A
LEASE OR PERMIT TO PROSPECT Burch A



LOCATE WELL CORRECTLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Grayburg Oil Co. of New Mexico Address Box 416, Loco Hills, New Mexico
Lessor or Tract Burch "A" Field Gray-Jack State New Mexico
Well No. 23 Sec. 19 T. 17S R30E Meridian N.M.P.M. County Eddy
Location 2565 ft. {S.} of N. Line and 955 ft. {E.} of W. Line of Sec. 19 Elevation 3627
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed R. J. Heard
Date June 10, 149 Title Vice-President

The summary on this page is for the condition of the well at above date.

Commenced drilling March 31, 19 49 Finished drilling June 4, 19 49

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

Oil & GAs Pays

No. 1, from 2978' to 2995' No. 4, from ... to ...
No. 2, from 3060' to 3074' No. 5, from ... to ...
No. 3, from 3115' to 3144' No. 6, from ... to ...

IMPORTANT WATER SANDS

No. 1, from 293' to 303' No. 3, from ... to ...
No. 2, from 359' to 364' No. 4, from ... to ...

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8-5/8"	24#	8V	New	451	Guide				Salt String
7"	20#	10W2	"	2492	Float				Oil String

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8-5/8"	455	75	Halliburton	Heavy	To Surface
7"	2497	100	"	"	" "

MARK

FOLD

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
See below for Acidizing Record.						

TOOLS USED

Rotary tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

Cable tools were used from 0 feet to 3150 feet, and from ..... feet to ..... feet

DATES

June 10, 1949 Put to producing June 8, 1949

The production for the first 24 hours was 42 barrels of fluid of which 100 % was oil; ..... % emulsion; ..... % water; and ..... % sediment. Gravity, °Bé. .....

If gas well, cu. ft. per 24 hours ..... Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. .....

EMPLOYEES

Oscar Burch, Driller Albert Williams, Driller

R. 11 Johnson, Driller H. L. Bryant, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
ACIDIZING RECORD			
DATE	NO. GALS.	INTERVAL TREATED	
5/15&16/49	500	2497' - 3014' (Wash)	
5/17/49	1000	2509' - 63' (1 Stage)	
5/19&20/49	2630	2814' - 3014' (2 Stages)	
5/27&28/49	5000	3023' - 88' (Wash & 2 stages)	
6/1&2/49	1000	2497' - 3140' (Wash while fishing)	
6/6/49	1000	3105' - 49' (1 Stage)	

(OVER FOR LOG)

FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION
0	15	15	Caliche
15	215	200	Red Beds & Red Sand
215	300	85	Gyp. Water 290'-300'
300	355	55	Red Bed
355	370	15	Gyp Water 355'-60'
370	405	35	Red Bed
405	420	15	Pogash & Gyp.
420	430	10	Red Shale
430	450	20	Salt
450	455	5	SLM
455	875	420	Salt
875	1065	190	Anhydrite
1065	1210	145	Anhydrite and Red Shale
1210	1595	385	Anhydrite SG 1481'-91' Inc G 1555'-67'
1595	1610	15	Gray Lime
1610	1888	278	Anhydrite
1888	1906	18	SLM
1906	1970	64	Anhydrite
1970	1995	25	Red Sand
1995	2012	17	Anhydrite
2012	2020	8	Gray Lime
2020	2034	14	Anhydrite
2034	2045	11	Gray Lime
2045	2063	18	Anhydrite
2063	2070	7	Gray Lime
2070	2110	40	Anhydrite
2110	2135	25	Gray lime
2135	2155	20	Anhydrite
2155	2215	60	Anhydrite & Lime
2215	2295	80	Anhydrite & Red Shale SSO 2246'-57'
2295'	2300	5	Anhydrite
2300	2310	10	Lime
2310	2320	10	Anhydrite & Red Rock
2320	2340	20	Lime & Red Rock
2340	2444	104	Gray Lime
2444	2452	8	SLM
2452	2484	32	Gray Lime
2484	2499	15	Brown Lime
2499	2497	-2	SLM
2497	2517	20	Gray Lime
2517	2531	14	Gray & Brown Lime SO&G 2525'-31'
2531	2610	79	Gray Lime
2610	2610	—	SLM
2610	2650	40	Gray Lime
2650	2662	12	White Lime
2662	2686	24	Gray Lime
2686	2709	23	White Lime
2709	2749	40	White & Brown Lime SO&G 2716'-23'
2749	2795	46	Gray Lime
2795	2798	3	Gray Sand
2798	2811	13	Gray Sandy Lime
2811	2841	30	Gray Lime
2841	2903	62	White Lime
2903	2960	57	Gray Lime

2960	2964	4	SLM	
2964	3033	69	Gray Lime	OIL PAY 2[illegible]-[illegible]

16—43094-2 U. S. GOVERNMENT PRINTING OFFICE

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

3013	3014	1	SLM	
3014	3095	81	Gray Lime	OIL PAY 3060'-74'
3095	3088	-7	SLM	
3088	3150	62	Gray Lime	OIL PAY 3115'-44'
3150	3149	-1	SLM - TOTAL DEPTH	

GENERAL AMERICAN OIL CO. OF TEXAS

GRAYBURG-JACKSON PILOT WATER FLOOD

WELL NO:	NET PAY THICKNESS:
Burch A-8	55'
Burch A-9	22'
Burch A-23	72'
Burch A-24	61'
Average	52.5'

Total Productive Acres = 50.6
Total Productive Acre ft. = 2657

RESERVOIR SPACE VOIDED

Cum. Production thru 7-31-57	514,072	Bbls.
Per Acre	10,160	Bbls.
Per Acre/Ft.	193	Bbls.
Formation Volume Factor	1.235	
Reservoir Space Voided	634,879	Bbls.
Per Acre	12,547	Bbls.
Per Acre Ft.	239	Bbls.

Estimated Input Water Volumes

Effective Percent of Total	25.0%	
Total Input Volume to obtain 100% Fillup	2,539,516	Bbls.
Est. % Fillup Required to obtain 1st results 60%	1,523,710	Bbls.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No 1-A
CASE 1300

GENERAL AMERICAN OIL COMPANY OF TEXAS

GRAYBURG-JACKSON PILOT WATER FLOOD

Estimated Time Required for Fillup at Various Rates.

Daily Input Rate Barrels	Eff. Water Inj. per Acre/ft. Barrels	Fillup time in Months to obtain	
		60%	100%
1600	.15	31	52
2000	.19	25	42
2400	.23	21	35
2800	.26	18	30
3200	.30	16	26
3600	.34	14	23
4000	.38	12.5	21
6000	.56	8	14
8000	.75	6	10
10600	1.00	5	8

MAIN OFFICE OCC

1957 JUL 24 PM 1:23

Before Examiner
Oil Conservation Commission
Exhibit Case No.

Mr. John A. Anderson
Regional Oil & Gas Supervisor
U. S. Geological Survey
Box 6721
Roswell, New Mexico

Loco Hills, New Mexico
July 19, 1957

Dear Sir:

The General American Oil Company of Texas, Unit Operator for the Grayburg Cooperative and Unit Agreement, I - Sec. No. 370, Eddy County, New Mexico, hereby proposes to commence a water flood program with a pilot flood of the Grayburg Zone under the above Agreement. Set out below are data concerning this proposed pilot flood.

1. Zone to be Flooded: The Unit Operator proposes to inject water into the productive zones of the San Andres formation.

2. Input Wells: Wells to be converted from production to water input wells are as follows:

Burch A #8, 990 feet from North line and 2510 feet from West line of Section 19, Township 17 South, Range 30 East, N. M. P. M.

Burch A #9, 990 feet from North and West lines of Section 19, Township 17 South, Range 30 East, N. M. P. M.

Burch A #23, 2565 feet from North line and 955 feet from West line of Section 19, Township 17 South, Range 30 East, N. M. P. M.

Burch A #24, 2310 feet from North line and 2615 feet from East line of Section 19, Township 17 South, Range 30 East, N. M. P. M.

Burch A #14, 660 feet from South line and 1980 feet from East line of Section 18, Township 17 South, Range 30 East, N. M. P. M.

3. Take Points: The well most probably affected by the injection of water in Burch A Nos. 8, 9, 23 and 24 will be Burch A #4, located 1980 feet from North and West lines of Section 19, Township 17 South, Range 30 East, N. M. P. M. Burch A #14 was formerly used as a gas injection well and it was reconverted to production when channeling of gas direct to Burch A #7, located 660 feet from

Exhibit #

North line and 1980 feet from East line of Section 19, Township 17 South, Range 30 East, N. M. P. M., was noted. In view of this channeling, it is believed that the quickest results in the pilot flood will be noted in Burch A #7.

4. Source of water. The Unit Operator has developed a water supply by perforating casing and acidizing a zone in the Pennsylvanian formation from 9265 feet to 9299 feet, encountered in the Gulf-Grayburg Unit No. 1, located 660 feet from South line and 560 feet from West line of Section 24, Township 17 South, Range 29 East, N. M. P. M. This well, completed on gas lift, flowed water for 120 hours and then flowed 83 barrels water per hour for 2 1/2 hours. A sonic device indicated the working fluid level to be 2400 feet from the surface. While input volumes have not been determined as yet, it appears that this water well should furnish approximately 400 barrels water per day for each injection well. A supplementary water source has been developed from the Paddock Zone in Burch A #17, located 660 feet from South and East lines of Section 18, Township 17 South, Range 30 East. This well is capable of producing water at the rate of 360 barrels per day while producing 43 barrels of oil. This water could be injected directly into Burch A #14 with a minimum of distribution line.

Enclosed is a plat which delineates the boundaries of the pilot flood and the possible limits of an expanded flood. This plat depicts the pilot stage water input wells and the possible future input wells.

The Unit Operator proposes to undertake this pilot flood program in a workmanlike manner, making all tests and analyses of waters that are necessary, and construct and maintain the required gathering and distribution systems as well as any treating equipment necessary. A careful measurement will be made of all fluids injected and produced. Records of this project will be maintained in this office and will be open to your inspection at all times.

Respectfully submitted

GENERAL AMERICAN OIL COMPANY OF TEXAS

R. F. Miller

R. F. Miller
District Engineer.

Approved this____day of_____, 1957.

_____

Mr. John A. Anderson
Regional Oil & Gas Supervisor
U. S. Geological Survey
Box 6721
Roswell, New Mexico

Before Examiner /
Oil Conservation Commission
___ Exhibit Case No. ___

Re: Proposed Pilot Waterflood
Burch "A" Lease, LC 028793(a)
Grayburg Cooperative & Unit Area (I-Sec. No. 370)
Grayburg-Jackson Pool
Eddy County, New Mexico

Dear Mr. Anderson:

The General American Oil Company of Texas, as Unit Operator, proposes to install and operate a pilot waterflood on the subject Lease for the purpose of determining the susceptibility of the Grayburg-Jackson Zone of the Sand Andres Lime Formation to water injection. Pending the results of the original pilot operation, it is our intention to ultimately expand the waterflood to cover all portions of the Grayburg Cooperative and Unit Area that are indicated to be economically feasible to flood.

The purpose of this letter is to request your approval of our proposed pilot waterflood and to determine if our tentative pattern for ultimately expanding the flood would be acceptable to your office. We feel that the pattern proposed for the area-wide flood adequately protects the correlative rights of the varied interests concerned (U. S. Government Royalties, Overriding Royalties and General American Working Interests) without the necessity of drilling additional wells which might not be economically justified.

For your information, data relative to our proposed pilot flood are set out below:

1. ZONE TO BE FLOODED: That portion of the San Andres Formation locally referred to as the Grayburg-Jackson Zone and which occurs throughout an interval from 120' to 375' below the top of the Lovington Sand marker. This entire interval is not productive, the oil bearing portions occurring as thin breaks from a few inches to several feet in thickness scattered throughout, with an aggregate thickness estimated at 15'-16' average for the 3222 productive acres within the Cooperative and Unit Area. In wells selected for input water service in which casing has been set high (in the Grayburg Formation), it is our intention to confine the injection of water to the Grayburg-Jackson Zone by isolating this Zone with a packer assembly.

2. FLOOD PLAN: Enclosed herewith is a plat of the Grayburg Cooperative and Unit Area on which the proposed pilot flood pattern is delineated. The pattern employed in the pilot area could readily be utilized as shown in the event that the flood was expanded to cover the entire Unit and Cooperative Area. In selecting this area and pattern, the following factors were considered:

   (a) Minimum use of wells equipped with used casing as input wells.

   (b) Use of all lease line wells as input wells.

   (c) Although no core analysis data is available, completion and subsequent performance history indicates permeability of the Grayburg-Jackson Zone to be quite low in the West and South portions of the Cooperative and Unit Area. Accordingly, a nine-spot pattern providing three effective input wells for each producing well is tentatively scheduled for these areas. In the event that future operations so dictated, this pattern could easily be adapted to a conventional five-spot or some sort of line-drive pattern.

   (d) If flooding operations are successful within the Cooperative and Unit Area, it is possible that a field-wide flood would be feasible. This pattern easily lends itself to such an expansion in that the correlative rights of all operators involved would be protected by the staggering of input wells adjacent to common lease line boundaries.

3. INPUT WELLS: Wells currently producing which we propose to convert to water input service are as follows:

   Burch A #8, 990 feet from North line and 2310 feet from West line of Sec. 19, Twp. 17 South, Rge. 30 East, NMPM.

   Burch A #9, 990 feet from North and West lines of Sec. 19, Twp. 17 South, Rge. 30 East, NMPM.

   Burch A #23, 2565 feet from North line and 955 feet from West line of Sec. 19, Twp. 17 South, Rge. 30 East, NMPM.

   Burch A #24, 2310 feet from North line and 2615 feet from East line of Sec. 19, Twp. 17 South, Rge. 30 East, NMPM.

   Burch A #14, 660 feet from South line and 1980 feet from East line of Sec. 18, Twp. 17 South, Rge. 30 East, NMPM.

The conversion of the above listed wells will entail an immediate reduction in current production of approximately 16 to 18 gross bbls. of oil daily from the Burch "A" Lease as indicated by our most recent individual well checks listed as follows:

WELL NO.	DATE	OIL	WATER	GAS
BURCH "A" 8	6-30-57	0.2 BBLS.	-	-
BURCH "A" 9	6-30-57	2.5 BBLS.	-	23 MCF
BURCH "A" 14	6-30-57	0.1 BBLS.	-	-
BURCH "A" 23	6-30-57	8.0 BBLS.	-	72 MCF
BURCH "A" 24	6-30-57	7.9 BBLS.	-	37 MCF
TOTAL		18.5 BBLS.	-	132 MCF

4. TAKE POINTS:

(a) Burch "A" Input Well Nos. 8, 9, 23 and 24 together with Burch "A" No. 4 as a take point will constitute our original five-spot pilot flood area embracing an area of some 50 acres. Burch "A" No. 4 is located 1980 feet from the North and West lines of Sec. 19, Twp. 17 South, Rge. 30 East, NMPM.

(b) By injecting water into Burch "A" No. 14 and closely observing the performance of Well No. 7, located 660 feet from the North line and 1980 feet from the East line of Sec. 19, Twp. 17 South, Rge. 30 East, NMPM, we hope to determine the tendency of injected water to channel in the reservoir. If such channeling occurs, we should have sufficient time to evaluate the effects and to possibly work out a way and means of controlling it prior to the time that we would want to expand this flood. Proposed Water Input Well Burch "A" No. 14 was formerly used as a gas injection well in connection with the gas repressuring of the Grayburg-Jackson Zone, and a direct channeling of gas was noted to occur from Well No. 14 to Well No. 7. Burch "A" No. 14 Well is currently being deepened to the Paddock Zone, and if a completion is effected in this lower horizon, it is our intention to equip this well so that water could be injected into the Grayburg-Jackson Zone through the annular space between the 7" OD casing string now in the hole and the 5" OD or 5-1/2" OD casing it would be necessary to run.

5. SOURCE OF INPUT WATER: The Unit Operator has developed a water supply adequate for commencing the pilot flood operation by recompleting the old Gulf-Grayburg Unit No. 1 Well, located 660 feet from the South line and 560 feet from the West line of Sec. 24, Twp. 17 South, Rge. 29 East, NMPM. A Pennsylvanian limestone aquifer was perforated and acidized from 9265 feet to 9299 feet. This well, completed on gas lift, flowed water for 120 hours and then was tested at 83 bbls. of water per hour for 2-1/2 hours (or at a rate of 1992 bbls. per day). Some 450 to 500 bbls. of water per day is currently being produced from the Grayburg-Keely and Grayburg-Paddock Zones within the Grayburg Cooperative and Unit Area and is readily available for injection purposes, giving us a total supply of approximately 2500 bbls. per day. Actual injectivity rates cannot be estimated at this time; however, in order to effect a fill-up of the pilot area within a reasonable length of time, we feel that an injection rate of 500 bbls. per day per well should be obtained. The water supply now available should be adequate to effect these rates.

6. CURRENT WELL STATUS, JUNE 30, 1957:

	BURCH "A"	BURCH "B"	BURCH "C"	DEXTER	KEELY "A"	KEELY "B"	KEELY "C"	COOP. & UNIT AREA TOTAL
OIL WELLS								
PRODUCING - FLOWING	-	-	2	-	-	6	8	16
- PUMPING	15	9	2	1	9	15	25	76
- SWABBED	3	-	-	-	-	-	1	4
TOTAL ACTIVE	18	9	4	1	9	21	34	96
TEMPORARILY ABANDONED	1	1	-	-	-	-	1	3
RECOMPLETED IN GRAYBURG-KEELY ZONE*	-	7	7	-	-	-	4	18
GAS INJECTION WELLS (CONVERTED FROM OIL WELLS)								
ACTIVE	-	-	-	-	1	-	-	1
INACTIVE	1	-	-	-	-	-	-	1
TOTAL WELLS WHICH HAVE PRODUCED FROM GRAYBURG-JACKSON ZONE	20	17	11	1	10	21	39	119

*NOTE: These wells now have liners or casing set through the Grayburg-Jackson Zone; however, cement was not pumped over this Zone, and it could easily be reopened at a later date.

7. PRODUCTION STATISTICS:

(a) CURRENT PRODUCTION - MONTH OF JUNE 1957

LEASE	NO. ACTIVE WELLS	NO. PRODUCTIVE ACRES	OIL PRODUCTION - GROSS BBLS. FOR MONTH	AVERAGE PER DAY TOTAL	PER WELL	PER ACRE
BURCH "A"	18	590	2,438	81.3	4.5	.138
BURCH "B"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BURCH "C"	4	360	724	24.1	6.0	.067
DEXTER	1	40	173	5.8	5.8	.145
KEELY "A"	9	320	939	31.3	3.5	.098
KEELY "B"	21	480	1,643	54.8	2.6	.114
KEELY "C"	34	960	5,078	169.2	5.0	.176
TOTAL	96	3,222	12,229	407.6	4.2	.127

(b) CUMULATIVE PRODUCTION TO JUNE 30, 1957 (UNDER PRIMARY DEPLETION AND LIMITED GAS INJECTION)

LEASE	LOCATION S-T-R SUB-DIVISION	GRAYBURG-JACKSON POOL ONLY PROD. ACRES	NO. WELLS	CUMULATIVE PRODUCTION 6-30-57 GROSS BBLS. TOTAL	PER ACRE	PER WELL
BURCH "A"	18-17S-30E S/2 S/2	117.43	3	55,026	469	18,342
	19-17S-30E N/2, N/2 S/2	472.27	17	2,713,998*	5,747	159,647
SUB-TOTAL		589.70	20	2,769,024*	4,696	138,451
BURCH "B"	19-17S-30E S/2 SW/4	77.41	3	232,625*	3,005	77.534
	30-17S-30E NW/4	154.94	7	391,153*	2,525	55,879
	23-17S-29E S/2 NE/4	80.00	2	150,805	1,885	75,403
	23-17S-29E SW/4	160.00	5	252,595	1,579	50,519
SUB-TOTAL		472.35	17	1,027,178*	2,175	60,422
BURCH "C"	19-17S-30E S/2 SE/4	80.00	2	118,048*	1,476	59,024
	30-17S-30E NW/4 NE/4	40.00	1	38,083	952	38,083
	23-17S-29E S/2 NW/4	80.00	2	120,008	1,500	60,004
	23-17S-29E SE/4	160.00	6	201,298	1,258	33,550
SUB-TOTAL		360.00	11	477,437*	1,326	43,034
DEXTER	24-17S-29E SE/4 NW/4	40.00	1	78,159	1,954	78,159
KEELY "A"	24-17S-29E NE/4 NE/4	40.00	1	116,303	2,908	116,303
	S/2 NE/4	80.00	3	462,755	5,784	154,236
	N/2 S/2	160.00	5	345,609	2,160	69,122
	SW/4 NW/4	40.00	1	78,768	1,969	78,768
SUB-TOTAL		320.00	10	1,003,435	3,136	100,344
KEELY "B"	24-17S-29E S/2 SW/4)	160.00	7	441,062	2,757	63,009
	25-17S-29E N/2 NW/4)					
	26-17S-29E E/2	320.00	14	1,028,606*	3,214	73,472
SUB-TOTAL		480.00	21	1,469,668*	3,062	69,984
KEELY "C"	24-17S-29E S/2 SE/4)					
	25-17S-29E All except)	640.00	26	2,156,986*	3,370	82,961
	N/2 NW/4)					
	26-17S-29E W/2	320.00	13	1,021,289*	3,192	78,561
SUB-TOTAL		960.00	39	3,178,275*	3,311	81,494
COOPERATIVE & UNIT AREA TOTAL		3,222.05	119	10,003,176*	3,105	84,060

*NOTE: These cumulative production figures include a small amount of oil recovered from sand stringers in the Grayburg section which have been perforated and fracture treated recently. Total recovery to date from these Grayburg Sands is estimated to be from 65,000 to 75,000 gross bbls. for the entire Grayburg Cooperative and Unit Area.

The Unit Operator intends to conduct this pilot flood program in a workmanlike manner, undertaking all steps necessary to confine injected water to the Grayburg-Jackson Zone. Adequate facilities will be constructed and maintained to gather, treat and distribute injected water. Careful records will be kept of all injected and produced fluids. Complete records of this project will be maintained in the District Office of the Operator located at Loco Hills, New Mexico, and will be open to your inspection at all times.

Respectfully submitted

GENERAL AMERICAN OIL COMPANY OF TEXAS

R. J. Heard, District Superintendent

RJH:NWK:gk
Enclosure (1)

SF

GENERAL AMERICAN OIL COMPANY OF TEXAS

DISTRICT OFFICE
BOX 416
LOCO HILLS, NEW MEXICO

October 27, 1966

New Mexico Oil Conservation Commission
P. O. Drawer DD
Artesia, New Mexico

RECEIVED
NOV 2 1966
O. C. C.
ARTESIA, OFFICE

Attention: R. L. Stamets

Dear Dick:

Form C-120 has been filed on General American's Grayburg Jackson Pilot Flood No. 1 each month since the flood started. Last water injection was in February 1961. This form will not be filed in the future but General American wishes to retain the right to restart this project later if it so desires.

If additional information is needed please advise.

Very truly yours,

GENERAL AMERICAN OIL COMPANY OF TEXAS

Roy Crow

Roy Crow
District Engineer

RC/gl