BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 8, 1967

EXAMINER HEARING

IN THE MATTER OF: Application of Gulf Oil Corporation for a unit agreement, Lea County, New Mexico.	Case No. 3683
Application of Gulf Oil Corporation for a waterflood project, Lea County, New Mexico	Case No. 3684

BEFORE:

Daniel S. Nutter, Examiner

TRANSCRIPT OF PROCEEDINGS

MR. NUTTER: We will call Case 3683.

MR. HATCH: Case 3683, application of Gulf Oil Corporation for a unit agreement, Lea County, New Mexico.

MR. NUTTER: Do you want the two cases consolidated?

MR. KASTLER: Yes, I would like the two cases consolidated.

MR. NUTTER: We will also call Case Number 3684.

MR. HATCH: Case 3684, application of Gulf Oil Corporation for a waterflood project, Lea County, New Mexico.

MR. NUTTER: For purpose of testimony, we will consolidate Case 3683 with Case 3684.

MR. KASTLER: This is a composite Exhibit Number 1. It is a booklet that contains 1-A through 1-G and some other texts or just plain statements. It will be testified to as well, but I think if we just stamp this and have you label it there --

(Whereupon, Applicant's Exhibit Number 1 was marked for identification.)

MR. KASTLER: Our two witnesses in this case will be Mr. Lonnie C. Smith and Mr. Bates Boles, both of whom I would like to have sworn at this time.

(Witnesses sworn.)

LONNIE C. SMITH, called as a witness on behalf of the Applicant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KASTLER:

Q Mr. Smith, will you please state your name, your address, for whom you work and in what capacity.

A My name is Lonnie C. Smith, I live at Roswell, New Mexico, where I work as a Petroleum Engineer for Gulf Oil Corporation in the Reservoir Engineering Department.

Q Have you previously appeared as a witness for Gulf Oil Corporation and been qualified to testify before the Oil Conservation Commission Hearing Examiner?

A Yes, in 1960.

MR. KASTLER: Are the witness's qualifications satisfactory?

MR. NUTTER: They are.

Q (By Mr. Kastler) Would you briefly outline the purpose of this hearing?

A Gulf as the largest interest owner and the respective unit operator, seeks approval to install a waterflood project in a portion of the Langlie-Mattix field in Lea County, New Mexico in order to inject water into the Queen and lower

one hundred feet of the Seven Rivers formations for the purpose of recovering oil reserves which would otherwise be left in the reservoir.

Q Mr. Smith, will you more specifically describe the location of the proposed project and give the number of wells and total acreage involved?

A Referring to Exhibit Number 1, and specifically to 1-A in Exhibit Number 1, this is a lease plat showing the outlined unit area in Sections, portions of Sections 2, 3, 10, 11 of Township 25 South, Range 37 East in Lea County, New Mexico.

This location is approximately three miles northeast of Jal, New Mexico. The qualifying unit area, as shown in Exhibit 1-D, this is a larger plat showing the outlined unit area with a nonqualified, or an unqualifying tract, so I will be talking specifically about the qualified unit area. It contains 960.17 acres and twenty-four Langlie Mattix oil wells, of which nineteen wells are presently producing.

And you can see in, it is shown on Exhibit 1-A, the first plat, there are several other wells within the unit boundary along the east portion of the unit. These are all wells completed in deeper horizons, many of them are dual completions, but none of them are completed in the Langlie Mattix oil and we don't expect them to interfere with the

unit operations in any way.

Q In other words, they are just other operations in this unit area?

A Yes.

Q But they are not within the framework of the proposed unit?

A That is true.

Q Are there currently any other waterflood projects operating in this pool?

A Yes, there are several other projects in operation in this pool. The nearest project is the Woolworth-Langlie Mattix unit, operated by Amerada, which is approximately one mile to the northwest of this proposed unit. And there are two other projects on the north boundary of the Langlie Mattix-Woolworth Unit which are co-operative ventures by Shell and George L. Buckles, so there are several other projects under operation or planned farther to the north.

Q So, this is a proposed unitization of only a portion of the pool?

A That is true.

Q How about border, or lease line agreements? Have they been negotiated and entered into?

A Yes, lease line agreements are presently in process

of formulation, but they have not been consummated as yet. This is specifically with George L. Buckles to the west and to the south of our unit.

Q To the west and to the south you say?

A Yes.

Q Will there be need for lease line agreements on the west in Section 9 shown in Exhibit 1-D, or is that part of the Buckles area?

A No, sir, I don't believe there is any Langlie Mattix production offsetting in that area.

Q Do you know if these three nearest waterflood projects operating in the Langlie Mattix Pool have responded to water injection?

A Yes, all three of these projects have shown favorable response to water injection in the Langlie Mattix Pool.

Q You previously stated that the purpose of the Langlie Mattix Unit waterflood project would be to inject water into the Langlie Mattix Pool which consists of the Queen and the lower one hundred feet of the Seven Rivers formations. Will you tell us more about this reservoir?

A Referring to Exhibit 1-B, which is a typical well log and comes from a well within the unit area, I have noted on this log the top of the proposed unitized interval and the

bottom of the proposed unitized interval and we think this shows the characteristic productive sand string as it appears in the Queen formation.

The average depth of these producing sands in the proposed unit is about 3200 feet. The estimated avarage net pay is considered to be twenty-three feet. The reservoir rock consists of a dolomite in the lower portion of the Seven Rivers formation, having very fine crystaline anhydritic anhydride interbedded with very find grain sandstone.

The Queen formation sand members can be described as very fine grain sandstone, slightly anhydritic with some silty shale partings.

Q You mean anhydritic?

A Anhydritic, sorry about that. Exhibit 1-C is a subsurface structure map contoured on top of the Queen formation. The subsurface formations within the unit lie on the west flank of a northwest, southeast trending anticline, which is on the west flank of the central basin platform and there is a monoclinal dip of approximately two hundred feet per mile in a west, southwest direction within the unit area.

The estimated gas-oil contact is presently assumed to be at one hundred fifty feet Sub-sea; while the oil-water contact, the water-oil contact is believed to be at three hundred fifty feet Sub-sea.

Wells on the western edge of the unit have the lowest structural position and oil production has come from the lower Seven Rivers formation in this area.

Wells on the eastern edge of the unit have the highest structural position and produce from the lower portion of the Queen. These conditions exist due to the wedging out of the sands up-dip, varying development of porosity and permeability with the effect of the gas-oil and water-oil contact. The average porosity in the unit area has been estimated to be 15.51 per cent; while the average permeability of net pay is estimated at 3.02 millodarcies.

Q This data that you are testifying to can be further based upon original logs that are on file with the Oil Conservation Commission, is that correct?

A There are very few logs available in this area. It was developed in the early, late 30's and there are -- yes, we did submit with our application the three logs that we have available in the unit area.

Q And have you made core analyses to determine porosity and permeability?

A These porosities and permeabilities were determined from core analysis of a well that was cored in the Amerada's

Woolworth Unit to the northwest of us. There are no cores in the Langlie Mattix wells within this unit area.

Q What can you say about the primary operations in this area?

A Well, as I said, the first production from the unit was in the late 30's, in 1936, and by January of 1940, all twenty-four of the unit wells had been completed. The original reservoir pressure was 1450 PSIG at two hundred feet Sub-sea. Cumulative production from the twenty-four producing wells, through June of 1967, is 3,479,720 barrels. This is an average of 144,988 barrels per well.

The oil is being produced by solution gas drive and the reservoir is approximately 96 per cent depleted of its primary oil.

MR. NUTTER: On that cumulative production that you gave through June, is that from the qualified leases only in the unit?

THE WITNESS: That is from the qualified, the twenty-four producing wells.

MR. NUTTER: O.K. Thank you.

A The average daily oil production is approximately two barrels of oil per day per well. It is estimated a total of 3,612,468 barrels of oil will be produced through primary

operations.

Q (By Mr. Kastler) This later figure is again the qualified area --

A That is true.

Q -- is that correct? I would expect in connection with that that the unit agreement would actually name a different figure. Is that the case in this?

A The original unit agreements did name a larger figure based on the twenty-eight well unit, yes.

Q But to this extent, this is the total qualified cumulative primary oil production that you anticipate?

A True.

Q Please outline your plans to recover additional oil in place by waterflooding. Do you intend to pilot the area?

A No, we do not intend to pilot. If you will turn to Exhibit 1-D; since there has been favorable response in the Langlie Mattix Pool, we propose to put in the whole project, complete, from the start. Exhibit 1-D shows the twenty-four-well project using an eighty-acre five-spot pattern. There will be twelve injection wells in which we plan to put 500 barrels per day of water in each well. Initial injection pressure will be held to not over 1,000 PSI at the wellhead

on each injection well. The systems will be designed for 2,000 PSI, so at a later time, if we need additional pressure, we have it available.

Q Specifically, how do you plan to inject water into these twelve wells?

A If you will refer to Exhibit 1-F -- I am sorry, I have the wrong number there.

Q 1-F?

A Yes, 1-F. I turned to the wrong one myself. This 1-F is a diagrammatic sketch of a typical proposed injection well and it is a sketch also of a specific injection well, the Skelly Oil Company State L Number 1, and along with this we have Exhibit 1-G, which is a tabulation of the casing and tubing and packer settings for the additional -- for all twelve wells. All twelve wells, we propose to complete the injection equipment essentially as shown in Exhibit 1-F.

We will be injecting down two and three-eighths-inch "OD" internally plastic-coated tubing below a tension type packer, set approximately fifty feet above the casing shoe and into the Queen and lower Seven Rivers formations through open holes. The casing tubing annulus will be filled with corrosive resistant inhibited water.

Q Will there be in this manner a positive protection against any pollustion of a fresh water aquifer?

A True. All acquifers from the sufrace down to the total depth of the completion interval will be protected by the existing casing strings and by maintaining their condition and further, by the loading of the tubing casing annulus with inhibited water, which will immediately give us an indication of any problems.

Q Thank you. Has the State Engineer Office been notified of the injection plans of the proposed project?

A Yes, a copy of the letter of the application to the Oil Conservation Commission, containing the diagrammatic sketch, was sent to the State Engineer.

Q What will be the source of your injection water?

A The water will be produced from the San Andres formation at depths ranging from 3762 feet to 4943 feet from the surface. The injection water will come from a recompleted abandoned well within the unit area. If you will refer to Exhibit 1-D, 1-A, or 1-D, either one, this well is Gulf's J. A. Stuart Number 9 located in the northeast quarter, Unit A, Sections 10, 25, 37. The produced water will also be used, but the amounts will not become significant until the latter stages of the project.

MR. NUTTER: Is that the open circle with the slant line through it?

THE WITNESS: Yes, sir. It is now an abandoned well. It is plugged and abandoned, but we can easily re-enter this well. It was drilled to a deeper horizon originally and was unproductive.

Q (By Mr. Kastler) Has Gulf made the proper application and adhered under the laws as they now stand to appropriate the San Andres source water?

A Yes, Gulf's application to appropriate 400-acre feet per year of ground water from this source has been properly advertised and an affidavit of publication filed with the State Engineer.

Q And no protests or suits or notices of complaints have been known to exist, is that correct?

A Yes, that's true.

Q What is the quality of the San Andres water which you are proposing to use?

A The San Andres water is saline and we anticipate in this area that the chloride content will be approximately 5,000 parts per million.

Q Will this water be treated prior to injection?

A No, not initially since the injection equipment will be coated. However, if tests or performance later indicate

that it is necessary, we will take appropriate action.

Q How much additional oil do you think will be recovered from the project area because of waterflooding?

A We estimate that 2,610,000 barrels of additional oil will be recovered based on seventy-five per cent of the primary. Recovery of this additional oil will increase the productive life of wells in the unit area.

Q Do you believe that the waterflooding of these properties is in the best interest of conservation and prevention of waste?

A Yes. Under primary operations only a small portion, approximately twenty per cent of the oil in place will be recovered. We feel that secondary recovery operations will almost double the primary recovery and at the same time, increase the producing life of this area.

Q Was composite Exhibit Number 1 with all of its text materials and the Exhibit 1-A through 1-G all prepared by you or under your direction and supervision?

A That's right.

MR. KASTLER: I would like at this time to move that Composite Exhibit 1 be admitted into evidence.

MR. NUTTER: Gulf's Exhibit 1 will be admitted into evidence.

(Whereupon, Applicant's Exhibit 1 was admitted into evidence.)

Q (By Mr. Kastler) Did you testify at all concerning Exhibit 1-E?

A I referred to it in the text as an exhibit, but it is a -- I should have pointed out when I pointed out that the current per well production has an average of two barrels per day, that this exhibit is to substantiate that figure of two barrels per day or less.

MR. KASTLER: This concludes the questions I have on Direct Examination of this witness.

MR. NUTTER: Are there any questions of Mr. Smith?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Smith, I notice in your Exhibit 1-G that, it is probably an error, but the tubing and packer setting point for your Stuart Number 5 is below the depth of the casing. That should probably be corrected to be 3285 possibly, or is the depth of the casing, is that in error?

A I think the depth of the casing is correct there and the packer setting is probably in error. It probably should be 32, but I can double check.

Q Would you check that out and let us know about that?

A Yes, sir.

Q At any rate, your packer is going to be set inside the casing, somewhere in the lower portion of the casing, isn't it?

A Yes, sir. I figure approximately fifty feet.

Q Approximately fifty feet?

A Right.

Q Could we agree on this at this time? That in no event would the packer be set at more than a hundred feet above the shoe?

A That is true. It would probably be in the fifty, approximate fifty-foot range. That is what I intended in all cases. If that assurance will be adequate, then we could change this exhibit to show that.

Q Now, referring to your Exhibit Number 1-D, Mr. Smith, I notice two triangular wells which are identified in the legend as wells to be drilled for injection. Now, the one down here in the southwest, southwest of Section 10 apparently is on the Buckles and J. R. Stuart Lease, is that correct?

A Yes, sir.

Q So that won't be a part of your waterflood?

A No, sir.

Q Now, over in Section 11 in the southeast, northwest, is that well within your unit area?

A Yes, sir, we contemplate it may be. As I said, the unit, the lease line agreements haven't been consummated as yet. This is what has been proposed, that we would cooperate on this south boundary and they would drill one well and we would drill the other, either that or they will be drilled on the lines and shared, or something to that extent. It has to do with the lease line agreement.

Q Well, we can't very well drill them on the line because we have got to attribute the allowable for the wells to one-forty or the other.

A That is true. Well, this would -- one would be on the unit as shown and the other on the Buckles property.

Q Now, that was the next thing I was going to do, would be to get into this area of allowable on here. Now, as I count the wells, you have twelve existing proposed injection wells --

A Yes, sir.

Q -- and there would be twelve producers, is that correct?

A Yes, sir.

Q On the qualified leases? And, then up here on the east

half of the east half of Section 3, this is a non-qualifying lease and would not be part of the unit area, so it wouldn't share in the unit allowable, is this correct?

A That is true.

Q So in other words, we have twenty-four existing wells in the proposed unit and then one of the injection wells would be drilled and it would be the second well on a forty I presume?

A Yes, that's true.

Q So it would earn another third of an allowable. So, we would have twenty-four forty-acre tracts earning an allowable plus a third of an allowable for a second well on a forty.

A I think that is true. We would ask for the allowable on that of course when we made application for drilling that well, additional allowable for that well.

Q And it will be all right in our initial letter to restrict the allowable to the twenty-four wells that are existing?

A Yes, sir, that is what we had --

Q Now, there is a difference in the ownership of this unqualified tract. On Exhibit 1-C it is identified as Texaco and on Exhibit 1-D it is identified as Buckles. I presume

that Buckles is now the owner?

A Buckles is now the owner.

Q What will be the disposition of the produced water in this waterflood, Mr. Smith?

A The disposition of the produced water, I don't --

Q What will you do, recycle produced water?

A Yes, sir, at a later time whenever we have adequate volume of course. There is not very much water production from the unit area at this time. I think it is in the neighborhood of 1500 barrels per month, and of course we will, since we are putting in a complete project, we will probably go ahead and put in recycle lines to begin with, and so, we will be able to take care of any water, but we will keep injection -- produced water injection will be at a minumum of course, due to the nature that there isn't any yet.

Q You are aware that the Commission Order Number 3221 provides that produced water in waterflood projects will not be disposed of in pits after the 1st of 1968?

A Yes, sir.

Q So produced water here would be, either reinjected as part of the waterflood or disposed of in some other satisfactory means?

A Yes, sir.

MR. NUTTER: Are there any further questions of

Mr. Smith? He may be excused.

(Witness excused.)

MR. NUTTER: Your next witness, Mr. Kastler?

MR. KASTLER: Mr. Boles. Mr. Boles' exhibits will consist of three copies of the unit agreement and three copies of the unit operating agreement, which are not executed copies, but upon completion of signing up the instruments, we will furnish this.

(Whereupon, Applicant's Exhibits 2 and 3 were marked for identification)

BATES BOLES, called as a witness on behalf of the Applicant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KASTLER:

Q Please state your name and your title, by whom you are employed and in what capacity.

A Bates Boles, District Clerical Superviser, Gulf Oil Corporation, Roswell, New Mexico.

MR. NUTTER: How do you spell your last name, Mr. Boles?

THE WITNESS: B-o-l-e-s.

Q (By Mr. Kastler) Have you previously been qualified

as a witness in previous waterflood projects in unit cases?

A Yes, sir.

Q Are you familiar with the Stuart Langlie Mattix unit agreement, the exhibits and status of working interest owners and the royalty interest owners and the status of their ratifications and joinder of this agreement?

A Yes.

Q Will you give the status of the working interest owners' executions?

A Based on secondary phase participation, approximately eighty-eight per cent of the working interest owners have signed ratifications. Mark W. Whitted, administrator of the estate of Janice F. Fleming, deceased, in tract five and Texaco Incorporated, now Buckles, in tract three are the two unsigned working interests. Buckles has refused to sign and therefore tract three will not qualify for inclusion in the unit.

MR. NUTTER: Where is tract five, Mr. Boles?

THE WITNESS: Exhibit A of the unit agreement designates that it is in Section 2.

MR. NUTTER: Oh, it is in the Richmond drilling --

THE WITNESS: Yes, the Richmond drilling and programming

tract, yes, the southwest quarter of Section 2.

MR. NUTTER: Have they indicated that they won't join?

THE WITNESS: No, sir. I called them last week in Denver, this lawyer is in Denver and, of course, they have a legal firm representing them and the lawyer told me that if he could ever get the administrator in the office that they would sign, but he hasn't been able to get him in as of yet.

Q (By Mr. Kastler) There is no question about the propriety of the unit, the fairness of the participating formula or anything like that raised by the Whitted --

A No, sir.

Q -- Janice Fleming interest?

A I asked him if he had any questions and he said that at that time they did not have any. It was merely getting the executors into the office.

Q And I understand that the interest involved within tract five is still insufficient to cause that tract not to be committed to the unit, is that correct?

A That is true. It is twelve --

Q You are referring now to Exhibit B which is a schedule attached to the unit agreement, which is our, for this case, Exhibit Number 2?

A This is a twelve and a half per cent interest in tract five, which, in secondary phase, participation for the whole unit would amount to 1.1881 per cent.

MR. NUTTER: That is the only portion of tract five that hasn't executed the agreement, is that correct?

THE WITNESS: That's right.

Q (By Mr. Kastler) Will you please give the status of the royalty owners signed up?

A Based on secondary phase participation, approximately thirty per cent of the unit area is fee lands, forty per cent federal lands and thirty per cent state lands. Approximately ninety-eight per cent of the royalty ownership and fee lands have signed. If we consider the state and federal royalty as being signed, approximately ninety-eight per cent of the royalty ownership has ratified the agreement.

Q Has the Stuart Langlie Mattix unit agreement been drafted after various preliminary drafts and approvals of the working interest owners and leasees involved?

A Yes. The operators formed a committee and held a meeting and drafted the instruments to the satisfaction of all leasees.

Q Except for Texaco and that tract is now owned by Buckles, is that correct?

A That is correct.

Q Have instruments been submitted to the Unit Division of the State Land Office for its preliminary approval?

A Yes, on March 31, 1966.

Q And has that preliminary approval been granted?

A I don't believe we have a --

MR. KASTLER: Off the record.

(Whereupon, an off-the-record discussion was held.)

MR. KASTLER: Back on the record. I don't think we have a very satisfactory answer to that.

Q To the best of your knowledge, has any disapproval or objections been rendered by the State Land Office?

A No, we have no disapproval.

Q Has the unit agreement been examined and approved by the U. S. Geological Survey, both through its Roswell and Washington offices?

A Yes, the acting director of the U.S.G.S. gave this unit area preliminary approval by a letter dated December 16, 1966.

Q Does the unit agreement provide for the expansion of the unit area?

A Yes, subject to approvals of the Director, of the Land Commissioner and the Commission.

Q Does the unit agreement provide for a selection of a successor unit operator in the event of the resignation or removal of the operator, so as to insure a continuous responsible operation?

A Yes, the successor operator shall be selected by three or more working interest owners having sixty per cent or more of the voting interest, subject to approval of the Land Commissioner and filed with the supervisor.

Q What is the basis of allocation of both the primary and the secondary oil as shown in the unit agreement of Exhibit 2?

A The unit agreement provides for a split formula, which resulted from negotiations in the operators committee and which has been approved by the commissioner and director. Specifically, the allocation of the remaining primary oil to both working interest owners and royalty owners is based upon the ratio of the total income inclusive of gas production from each such tract to the total income inclusive of gas production from all such tracts during the period July 1, 1964 to January 1, 1965. Secondary participation shall be equal to ninety per cent of the ratio of the total cumulative oil production from each such tract to the cumulative oil

production from all such tracts, both as of January 1, 1965, and ten per cent of the ratio of the surface acres contained in each such tract to the number of surface acres contained in all such tracts.

MR. NUTTER: Off the record a minute.

(Whereupon, an off-the-record discussion was held.)

MR. NUTTER: Back on the record.

Q (By Mr. Kastler) Well, you have testified as to what the formula for allocating the primary oil is. Have you also testified as to the formula for secondary allocation?

A Yes.

Q What does the unit agreement provide in regard to nonjoinders and subsequent joinders?

A For joinders after the effective date a working interest owner must obtain the approval of the other working interest owners, the director or commissioner. Subsequent commitment of a royalty owner is subject to the consent of the working interest owner, who is the leasee of the tract involved.

Q Does the unit operating agreement, as well, provide for fair and agreed-upon operating principles, to insure that the dependable operation of this as a waterflood unit?

A Yes.

Q In your opinion do the unit and unit operating agreements provide for the prevention of waste and the protection of correlative rights in all respects?

A Yes.

Q Is time an important factor involving the approval of this unit agreement and if so, why?

A Yes, the unit agreement calls for an effective date on or before January 1, 1968.

Q I understand that that time can be extended by agreement of eighty-five per cent of the working interest owners, but we hope to avoid that, is that the status?

A That is true. We hope to make it effective on January 1 and avoid the extra work involved in extending the unit.

Q Are Exhibits 2 and 3 compared and true and faithful representations of the agreed-upon unit and unit operating agreements here?

A Yes.

Q And when the instruments become effective, will Gulf furnish the Commission with either a true or executed photocopy?

A Yes.

MR. KASTLER: I would like at this time to move for admission of Exhibits 2 and 3 into evidence and this

concludes my questions of this witness.

MR. NUTTER: Gulf's Exhibits 2 and 3 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 2 and 3 were admitted in evidence.)

MR. NUTTER: Are there any questions of the witness?

CROSS EXAMINATION

BY MR. NUTTER:

Q Now, Mr. Boles, on subsequent joinder you mentioned it had to be approved by the working interest owners and by the director or the commissioner. Now, on page nineteen at the end of Section 31, doesn't it provide that the joinder would be more or less automatic unless the Land Commissioner or the Director would object to it?

A Well, that is true, but I believe, it says here that, "If state lands is involved --

Q Now, whereabouts are you?

A Let's see, just a second. Well, right -- just above Section 22 there.

Q 32?

MR. KASTLER: 32.

A Section 32, excuse me.

Q O.K. Now, that provides that if it is state land,

the joinder has to be approved by the State Land Commissioner?

A Yes.

Q What about now, in the event that Federal lands would join? Does the Director have to approve that --

A No, sir, we had --

Q -- and then the Land Commissioner could object?

A Well, no. On Federal lands, of course we file it and then if we get no objections from the Director or the Land Commissioner, it is automatic within sixty days.

Q But in the event of subsequent joinder by Federal lands, of Federal lands, the State Land Commissioner has the right to object within this sixty day period --

A That is right, within sixty days.

Q -- in accordance with the second to the last provision there in that paragraph?

A That is true.

Q But on State lands it must be approved by the Land Commissioner and also the sixty day waiting period for objection by the Director would apply?

A That is true.

MR. NUTTER: Are they any other questions? The witness may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further to offer in the case, Mr. Kastler, either on or off the record?

MR. KASTLER: No.

MR. NUTTER: If there is nothing further -- does anyone have anything they wish to offer in Case 3683 or 84?

MR. HATCH: I have a letter from George L. Buckles Company addressed to the New Mexico Oil Conservation Commission under date of October 31st, 1967.

"Gentlemen: It is our understanding that the Commission is holding a hearing on November 8th, 1967, to consider Gulf Oil Corporation's application to conduct a waterflood development on their Stuart Unit in the Langlie Mattix Field of Lea County, New Mexico.

As an offset operator, we have no objection to Gulf's application. We plan to cooperate with Gulf in this development and will request a hearing for our own waterflood application as soon as current engineering studies are completed. Signed George L. Buckles."

MR. NUTTER: Thank you. Is there anything else to be offered in Case 3683 or 84? If not, we will take the cases under advisement.

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

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

IN WITNESS WHEREOF I have affixed my hand an notarial seal this 5th day of December, 1967.

Jerry Potts
Notary Public - Court Reporter

My Commission Expires:

July 10, 1970

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3283-84 heard by me on 11/8, 1967

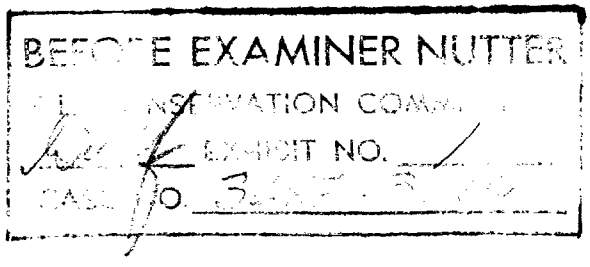
Examiner
New Mexico Oil Conservation Commission

EXHIBIT NO. 1

DATA FOR
PROPOSED STUART LANGLIE MATTIX UNIT
WATERFLOOD PROJECT

OIL CONSERVATION COMMISSION HEARING
CASE NO. 3684

NOVEMBER 8, 1967



GULF OIL CORPORATION

ROSWELL DISTRICT

Case Number 3684
Date: November 8, 1967

G E N E R A L

	Pertinent Exhibit(s)
OPERATOR Gulf Oil Corporation	
PROJECT Stuart Langlie Mattix Unit Waterflood	
POOL Langlie Mattix	
LOCATION OF PROJECT Portions of Sections 2, 3, 10 and 11, Township 25 South, Range 37 East, Lea County, New Mexico, approximately 3 miles northeast of Jal, New Mexico	1-A
NUMBER OF WELLS IN PROJECT 24 qualified producing wells	1-D
UNIT AND PROJECT AREA 960.17 acres	1-D
OTHER WATERFLOOD PROJECTS IN POOL The nearest flood project is the Amerada operated Langlie Mattix Woolworth Unit, approximately one mile to the northwest.	

G E O L O G I C A L A N D R E S E R V O I R D A T A

RESERVOIR The entire Queen formation and the lower 100' of the Seven Rivers formation	1-B
DEPTH 3,200 feet below the surface	1-B
PRODUCTIVE ZONES The main reservoir sands, found at an average depth of 3,200 feet in the proposed Unit, are in either the Seven Rivers or Queen formation, depending upon the structural position of the well.	1-B, C
NET PAY 23 feet is considered the average net pay thickness	1-B

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Pertinent Exhibit(s)

DESCRIPTION OF RESERVOIR ROCK The lower portion of the Seven Rivers formation is dolomite, having very fine crystalline anhydrite interbedded with very fine grained sandstone. The Queen formation sand members can be described as very fine grained sandstone slightly anhydritic with some silty shale partings.

STRUCTURE Western flank of a northwest-southeast trending anticline. The monoclinal dip to the west is approximately 200 feet per mile — 1-C

RESERVOIR LIMITS An oil-water contact at approximately 350 feet subsea defines the down-dip productive limit to the west and southwest. Deterioration of the porosity and permeability together with wedging out of the sands up-dip generally limits production to the east and northeast. A gas-oil contact is present at 150 feet subsea. — 1-B, C

AVERAGE POROSITY OF NET PAY Estimated at 15.51%

AVERAGE PERMEABILITY OF NET PAY Estimated at 3.02 millidarcies with a range from .1 to 25 millidarcies.

P R I M A R Y O P E R A T I O N S

DATE OF FIRST PRODUCTION June 25, 1936

TOTAL NUMBER OF WELLS DRILLED 24 wells in qualified project area — 1-D

CUMULATIVE PRODUCTION, 7-1-67 3,479,720 barrels (qualified leases) — 1-D, E

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	Pertinent Exhibit(s)
REMAINING PRIMARY RESERVES, 7-1-67 132,748 barrels (qualified leases)	1-D
AVERAGE DAILY OIL PRODUCTION PER WELL, JULY, 1967 2 barrels	1-E
ORIGINAL RESERVOIR PRESSURE 1450 PSIG @ -200 feet subsea	
OIL GRAVITY 37° API	
DRIVE MECHANISM Solution-gas-drive	
STAGE OF DEPLETION Late. The reservoir in the project area is approximately 96% depleted of primary oil reserves.	1-E
ESTIMATED OIL RECOVERY THROUGH PRIMARY OPERATIONS 3,612,468 barrels	

W A T E R F L O O D O P E R A T I O N S

PROPOSED PATTERN 80-acre 5-spot	1-D
NUMBER OF INPUT WELLS twelve	1-D
INITIAL INJECTION RATES Up to 500 barrels of water per day per input well.	
ESTIMATED INJECTION PRESSURES Maximum of 1000 psi at the well head. Injection plant will be designed for 2000 psi maximum pressure.	
PLAN OF INJECTION Inject into pay zone through plastic coated tubing and below a packer.	1-F, G
SOURCE OF INJECTION WATER From a recompleted abandoned well, Gulf's J. A. Stuart No. 9, located in the NE/4, Unit A, Section 10, T-25S, R-37E. Water will be produced from the San Andres formation at depths ranging from 3762' to 4943' below the surface. Gulf's application to appropriate ground	

Pertinent
Exhibit(s)

water from this source has been properly advertised and affidavit of publication filed with the State Engineer.

TYPE OF WATER Saline. It is anticipated that the San Andres water will contain approximately 5,000 ppm chloride.

TREATMENT OF WATER None is anticipated; however, if later in the life of the project treatment is deemed necessary, appropriate action will be taken.

ADDITIONAL OIL RECOVERY ANTICIPATED A minimum of 2,609,790 barrels, an amount equal to 75% of the estimated primary oil recovery (qualified leases). 1-D-E

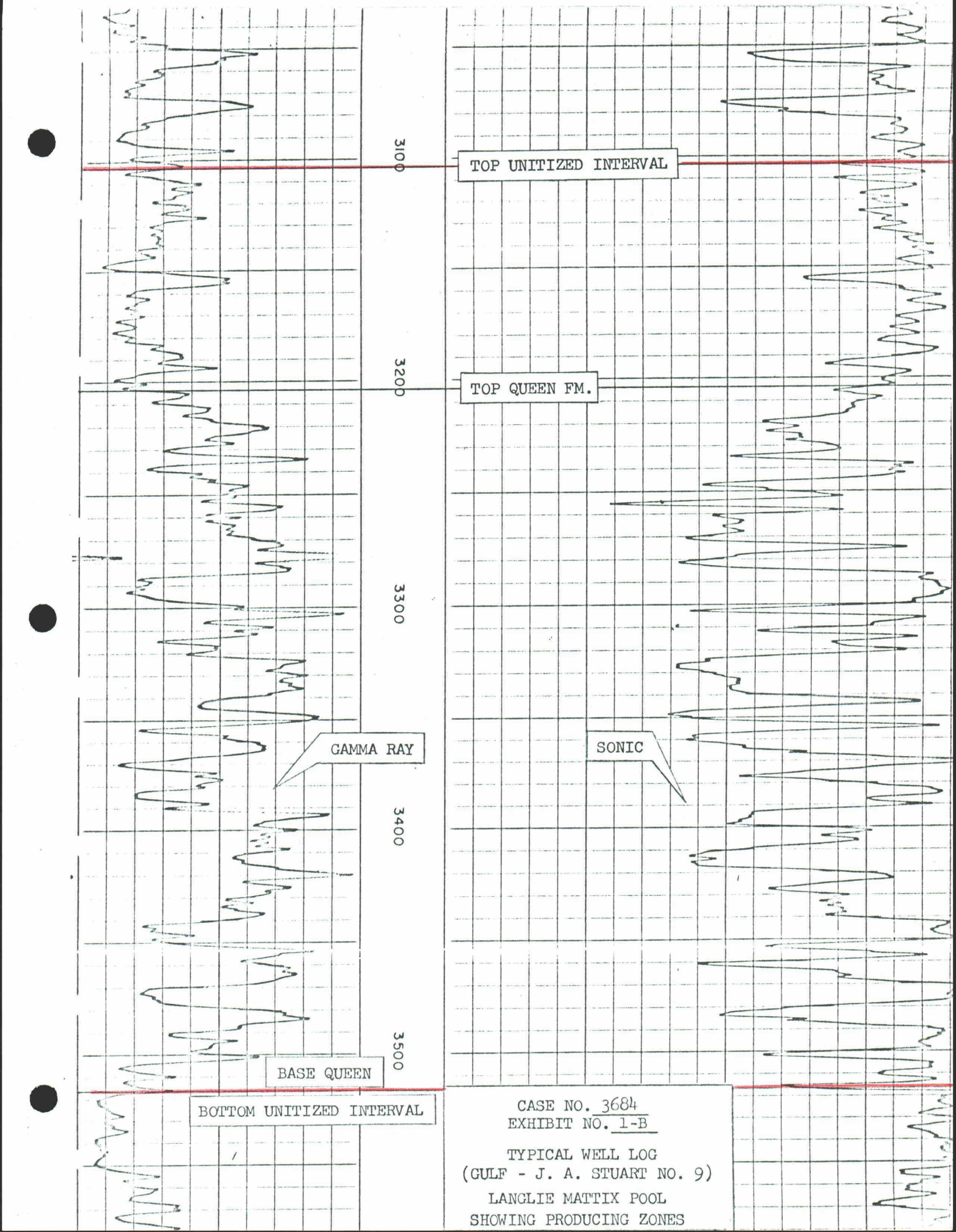
C O N C L U S I O N S A N D R E C O M M E N D A T I O N S

The Langlie Mattix Pool produces by solution-gas-drive and this portion of the Pool is 96% depleted of primary oil and daily oil production averages only 2 barrels per well.

Engineering-geological studies and performance of other nearby Langlie Mattix waterfloods indicate the Langlie Mattix reservoir under the unit and project area can be successfully waterflooded, thereby increasing the life and ultimate oil recovery of wells in the Langlie Mattix Unit. The increased recovery due to waterflooding should be about 2,610,000 barrels of oil.

Gulf Oil Corporation, in association with other working interest owners, concludes that unitization of the 24 producing wells and 960.17 acres outlined in Exhibit No. 1-D for the purpose of waterflooding the Queen and lower portion of the Seven Rivers formations is in the best interest of conservation and prevention of waste.

Gulf, as Operator of the Stuart Langlie Mattix Unit, respectfully requests that the Oil Conservation Commission approve the proposed waterflood project and grant a unit oil allowable for the 24 qualifying producing wells in the waterflood area as provided under Rule 701 of the Commission Rules and Regulations.



CASE NO. 3684
EXHIBIT NO. 1-B

TYPICAL WELL LOG
(GULF - J. A. STUART NO. 9)
LANGLIE MATTIX POOL
SHOWING PRODUCING ZONES

FIGURE NO. II-A

STRUCTURE MAP

PROPOSED STUART LANGLIE MATTIX UNIT
LEA COUNTY, NEW MEXICO

CONTOURS ON TOP OF QUEEN FORMATION
Contour Interval 50 Feet

- LEGEND -

- Proposed Unit Boundary
- Langlie Mattix Pool Well
- Jalmat Pool Gas Well
- Langlie Mattix-Jalmat Gas Dual
- Justis Pool Gas Well

Wells producing deeper than Langlie Mattix Pool and Wells not relevant to the proposed Unit are not shown.

GULF OIL CORP. ROSWELL DISTRICT

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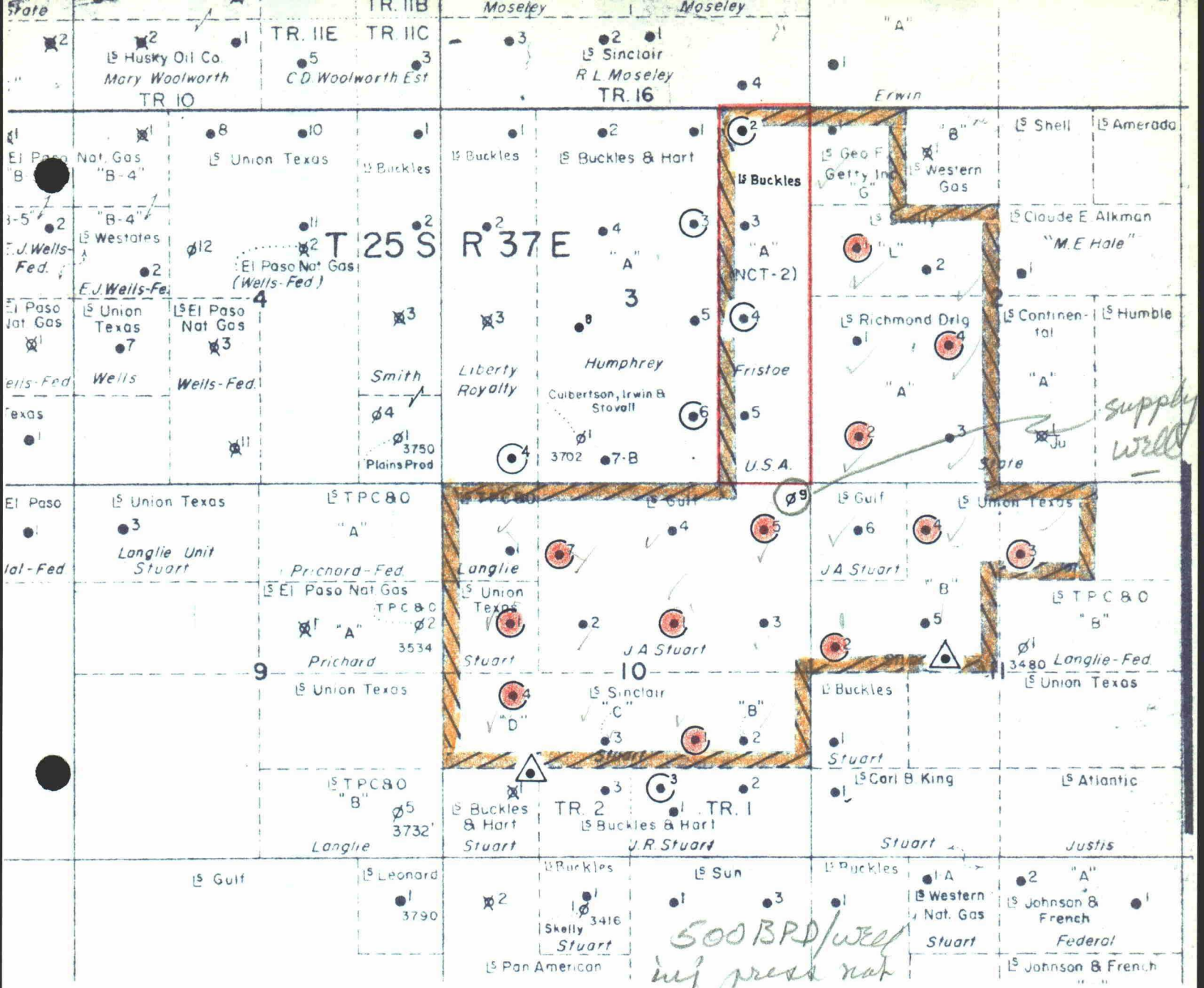
EXHIBIT NO. 1-C



supply well

500 BPD/well
inj press not
over 1000 psi
at wellhead
initially.

12
12
24
could go to 2000

FIGURE NO. III

RECOMMENDED WATERFLOOD PATTERN
PROPOSED STUART LANGLIE MATTIX UNIT
LEA COUNTY, NEW MEXICO

- LEGEND -

- Proposed Unit Boundary
- Unqualifying Tract
- Langlie Mattix Pool Well
- Jalmat Pool Gas Well
- Langlie Mattix - Jalmat Gas Dual
- Justis Pool Gas Well
- Injection Well
- Well to be drilled for Injection

GULF OIL CORPORATION ROSWELL DISTRICT
(REVISED SEPTEMBER, 1967)

CASE NO. 3684
EXHIBIT NO. 1-D

FIGURE II

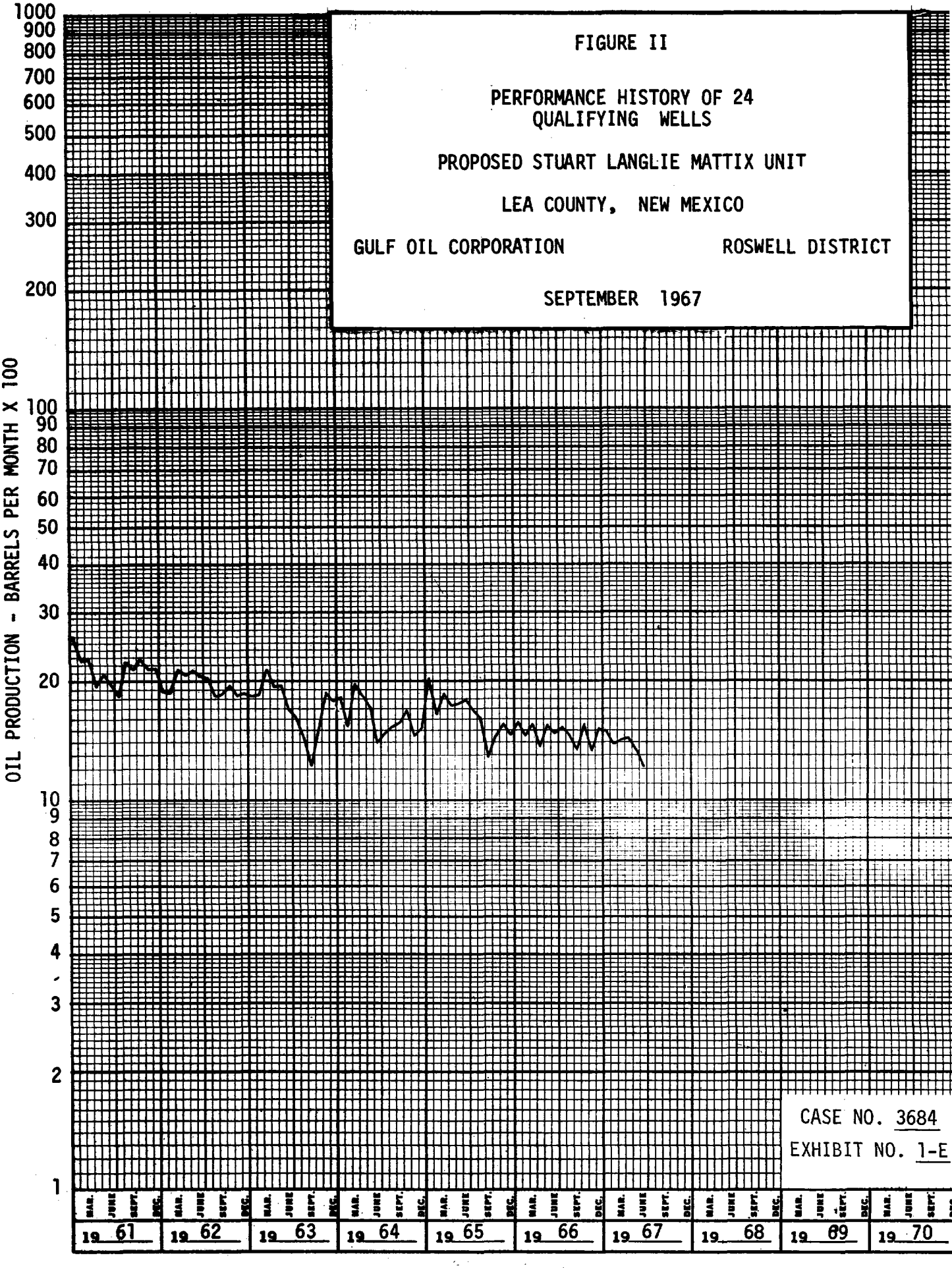
PERFORMANCE HISTORY OF 24
QUALIFYING WELLS

PROPOSED STUART LANGLIE MATTIX UNIT

LEA COUNTY, NEW MEXICO

GULF OIL CORPORATION ROSWELL DISTRICT

SEPTEMBER 1967



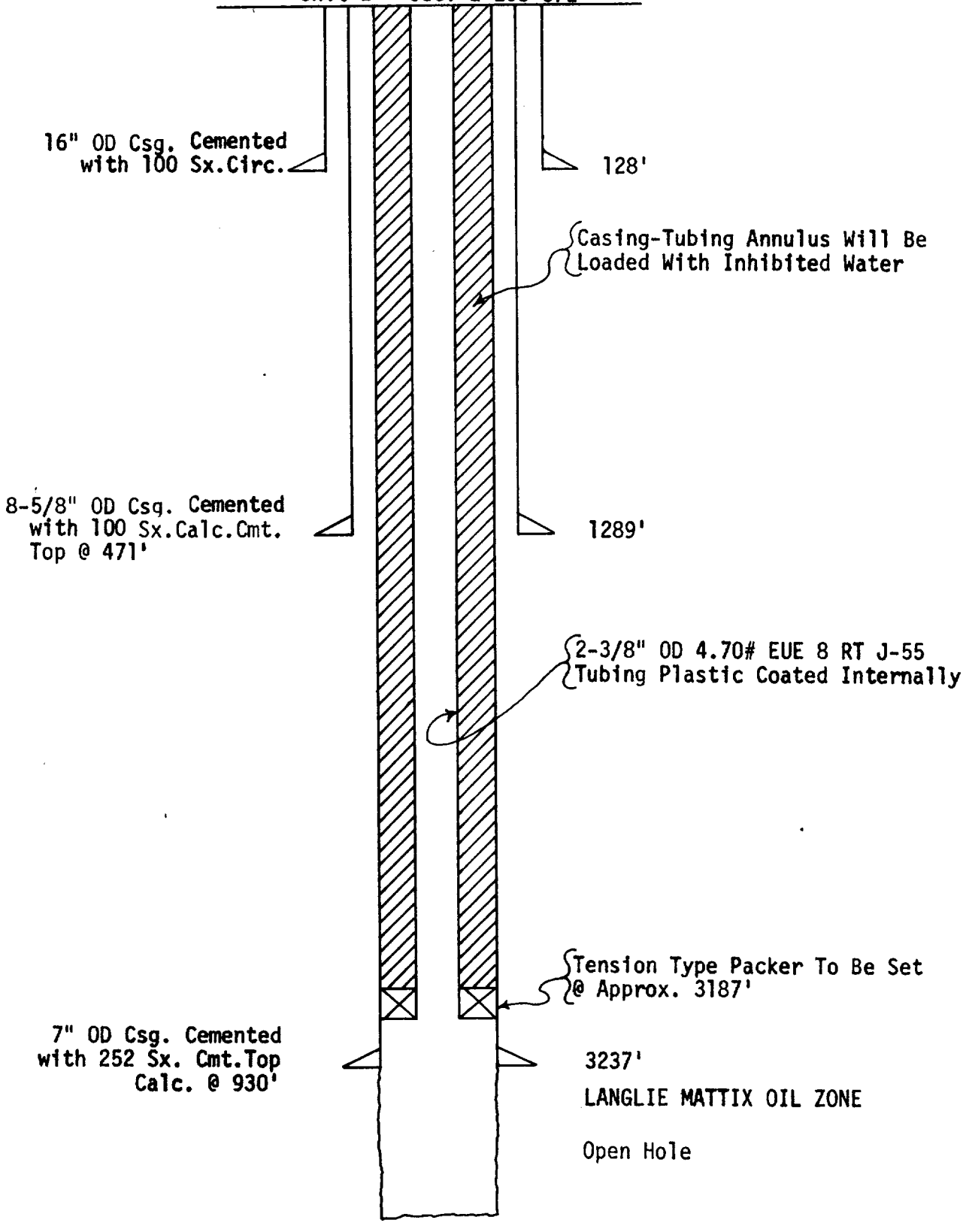
CASE NO. 3684
EXHIBIT NO. 1-E

FIGURE IV

DIAGRAMMATIC SKETCH
Typical Proposed Injection Well

Proposed Stuart Langlie Mattix Unit
Lea County, New Mexico

Skelly Oil Company State "L" No. 1
Unit E Sec. 2-25S-37E



CASE NO. 3684

EXHIBIT NO. 1-F

TABLE I

INJECTION WELL DETAIL
PROPOSED STUART LANGLIE MATTIX UNIT
LEA COUNTY, NEW MEXICO

	Injection Well	SURFACE CASING				INTERMEDIATE CASING				PRODUCTION CASING				INJ. INTERVALS Gross Perf And/Or OH		#Tubing & Packer Set @
		Size	Depth	Cement	Cmt. Top	Size	Depth	Cement	Cmt. Top	Size	Depth	Cement	Cmt. Top	Top	Btm	
Gulf	Stuart No. 1	12-1/2"	272'	300 sx	Unknown	9-5/8"	2473'	600 sx	*	7"	3264'	200 sx	1665'**	3264'	3431'	3214'
	Stuart No. 5	10-3/4"	255'	250 sx	Surface	--	--	--	--	7"	3324	350 sx	524'**	3324'	3435'	3385'
	Stuart No. 7	10-3/4"	271'	250 sx	Surface	--	--	--	--	5-1/2"	3220'	350 sx	Surface**	3220'	3420'	3180'
Richmond Drlg. Co.	State "A" No. 2	12-1/2"	186'	50 sx	Unknown	8-1/4"	1348'	100 sx	Unknown	7"	3315'	125 sx	Unknown	3315'	3414'	3265'
	State "A" No. 4	13"	164'	50 sx	Unknown	8-5/8"	1202'	100 sx	Unknown	7"	3291'	125 sx	Unknown	3291'	3424'	3240'
Sinclair Oil & Gas	Francis Stuart No. 1	10"	731'	300 sx	Unknown	8-1/4"	1295'	75 sx	730'	7"	2850	215 sx	Unknown	--	--	--
								Liner (Top @ 2794')		5"	3404'	75 sx	Unknown	3318'	3378'	3268'
	Francis Stuart No. 4	13"	316'	250 sx	Unknown	8-5/8"	1308'	200 sx	Unknown	7"	3142'	200 sx	Unknown	3142'	3461'	3092'
Skelly	State "L" No. 1	16"	128'	100 sx	Surface	8-5/8"	1289'	100 sx	471'**	7"	3237'	252 sx	930'**	3237'	3423'	3187'
Union Texas	Stuart No. 1	--	--	--	--	9-5/8"	1130'	500 sx	Surface	7"	3267'	300 sx	Surface	3267'	3444'	3217'
	Stuart No. 2	--	--	--	--	9-5/8"	1128'	500 sx	Unknown	7"	3286'	300 sx	Unknown	3286'	3430'	3236'
	Jal No. 3	--	--	--	--	9-5/8"	538'	260 sx	Unknown	7"	3274'	615 sx	Unknown	3274'	3432'	3224'
	Stuart No. 4	--	--	--	--	9-5/8"	445'	250 sx	Unknown	7"	3328'	600 sx	Unknown	3328'	3447'	3278'

* Recemented w/450 sx @ 147'
** Estimated by Operator
# 2-3/8" O.D. Internally Plastic Coated Tubing and Baker Model "A" (or equivalent) Tension Type Packers

CASE NO. 3684

EXHIBIT NO. 1-A

FIGURE NO. I

PROPOSED STUART LANGLIE MATTIX UNIT
LEA COUNTY, NEW MEXICO

- LEGEND -

- Proposed Unit Boundary
- Langlie Mattix Pool Well
- Jalmat Pool Gas Well
- Langlie Mattix-Jalmat Gas Dual
- Justis Pool Gas Well

GULF OIL CORPORATION ROSWELL DIST.
(REVISED SEPTEMBER, 1967)