BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

October 17, 1955

Examiner Hearing

IN THE MATTER OF:

CASE NO. 966

TRANSCRIPT OF PROCEEDINGS

ADA DEARNLEY AND ASSOCIATES
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ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Hobbs, New Mexico
October 17, 1955

IN THE MATTER OF:

Application of Humble Oil and Refining Company for approval of a 320-acre non-standard gas proration unit in the Arrow Gas Pool, to consist of S/2 of Section 26, Township 21 South, Range 36 East, Lea County, New Mexico, and to be dedicated to applicant's New Mexico State "G" Well No. 2, located 660' from the East and South lines of said Section 26.

Case No. 966

BEFORE:

Mr. Warren W. Mankin, Examiner

R E G I S T E R

NAME	COMPANY	ADDRESS
W.G. Abbott	Amerada	Monument, New Mexico
G. H. Hinchfield	New Mexico Oil & Gas	Hobbs, New Mexico
Hugh A. Wallis	Western Oil Fields	Denver, Colorado.
K. C. Heald, Jr.	Humble	Hobbs, New Mexico
R. S. Dewey	Humble	Midland, Texas
S. B. Christy IV	Hervey, Dow & Hinkle	Roswell, New Mexico
J. B. Waid	Humble	Midland, Texas
R. E. Layhe	Samedan	Hobbs, New Mexico
R. D. McPeters	John M. Kelly	Hobbs, New Mexico
R. J. Francis	Continental	Hobbs, New Mexico
John A. Weideman	Continental Oil	Roswell, New Mexico
E. V. Boynton	Continental Oil	Hobbs, New Mexico
V. T. Lyon	Continental Oil	Ft. Worth, Texas
L. A. Hanson	O. C. C.	Artesia, New Mexico

A. L. Porter	O. C. C.	Hobbs, New Mexico
C. R. Smith	Continental Oil	Eunice, New Mexico
J. W. Adams	Mapenza Oil Co.	Hobbs, New Mexico
R. C. Lannen	Continental Oil	Eunice, New Mexico
C. M. Bumpass	Gulf Oil Corp.	Hobbs, New Mexico
R. E. Cook	Conoco	Hobbs, New Mexico
Carl Thornton	Conoco	Hobbs, New Mexico

TRANSCRIPT OF HEARING

HEARING EXAMINER MANKIN: The hearing will come to order. We have five cases today, 966, 967, 968, 969 and 970. I would like to swear all the witnesses in at once and dispense with that at this moment. Those that are going to testify today and be witnesses, will you please stand and raise your right hand, and I shall swear them in at this time, in all five cases.

(Witnesses sworn by Mr. Mankin.)

Let us proceed with Case 966.

MR. CHRISTY: Mr. Examiner, I am Mr. Christy of the firm of Hervey, Dow and Hinkle, representing Humble Oil and Refining Company in Case No. 966. This case covers the application made by Humble, through their letter of September 20, 1955, requesting the reclassification of Humble State "G" No. 2 Well, located in Section 26, Township 21 South, Range 36 East, Lea County, New Mexico, and to extend the boundaries of the Arrow Gas Pool to include the southwest quarter of said Section 26. The "G" No. 2 Well was completed and producing oil and gas on the proration of Arrow Head Pool prior to the creation of Arrow Gas Pool.

We will attempt to show that the well was completed and pro-

ducing within the horizontal and vertical limits of the Arrow Gas Pool as currently defined in Order R-120 of this Commission.

Production tests of rather short duration indicate that the well is capable of being classified as an oil well, with a gas-oil ratio as a gas well producing some oil. In their application of re-classification of the well, the request is made that it be classified as a gas well on a non-standard proration unit, consisting of 320 acres in the south half of the said Section 26. In the event the request is granted, it will be necessary to extend the horizontal pool limits of Arrow Head Pool to include the southwest quarter of said Section 26.

I have two witnesses, Mr. Waid, who will present the geological characteristics of the well and Mr. Dewey, who will present Humble's reasons for the allowance of the application.

Would you take the stand, please?

J. B. W A I D ,

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

DIRECT EXAMINATION

By MR. CHRISTY:

Q Will you state your name, please?

A J. B. Waid.

Q Mr. Waid, is this the first time you have testified before the Conservation Commission?

A Yes, sir.

Q What is your occupation, Mr. Waid?

A I am production geologist for Humble Oil and Refining Company.

Q How long have you been with Humble in that capacity?

A Ten years.

Q Do you hold a degree from the university in geology or mining engineer?

A I have a degree from the University of Kansas, Mining Engineer.

Q When was that degree --

A 1941.

Q How long have you been engaged in geological work in oil production?

A Past ten years.

Q Are you familiar with the geology of wells in the area of Southeastern New Mexico?

A Yes, sir.

MR. CHRISTY: Does the Commission have any --

HEARING EXAMINER MANKIN: His qualifications are acceptable.

Q Mr. Waid, would you please tell us who the offset operators are to the "G" Two State Well, within 1,500 feet?

A Sinclair and Gulf.

Q Are those the only two within the 320 acres involved in this application?

A Yes, sir.

(Marked Exhibits 1, 2 and 3, for identification.)

MR. CHRISTY: We would like to offer into evidence Exhibits 1, 2 and 3, which are the notices of this hearing with registered return receipts.

HEARING EXAMINER MANKIN: Is there any objection to the introduction of these exhibits? If not, they will be accepted.

Q Mr. Waid, will you please explain to the Commission the

geological characteristics of State "G" No. 2 Well and your recommendation thereon concerning this application?

A Yes, sir.

MR. CHRISTY: May I sit down?

HEARING EXAMINER MANKIN: Surely.

A Our object here today is to recommend to the Commission to reclassify, for one thing, our State "G" No. 2 Well located here in the southeast quarter of Section 26, and also our State "G" No. 4 located in the northeast quarter of Section 26. We would like to reclassify those wells from the Arrowhead Pool, which produce from the Grayburg only, and reclassify them into the Arrow Pool, and, secondly, we would like to extend the horizontal limits of the Arrow Pool to include all of our State "G" Lease, which consists of Sections 23 and 26.

HEARING EXAMINER MANKIN: The Arrow Pool?

A Yes, Arrow Pool. Extension of this pool is necessary in the first place, in order for us to get a 320-acre allowable for "G" No. 2, and also fits in with the plan that Humble has for the proposed development of the "G" Lease, which we hope will prove successful, and which was commenced by work-over on our State "G" 2 Well. Now, I have an exhibit here I have numbered Number 1.

MR. CHRISTY: Excuse me. At this time I would like to have the reporter mark these four exhibits as Exhibits 4 to 8. I will offer them in evidence.

(Marked Humble's Exhibits No. 4 to 8, for identification.)

A This exhibit shows the location of our State "G" Lease, and the purple line here (indicating) shows the present limits of the

Arrowhead, Arrow Pool, and the green shows the horizontal limits of Jalmat, and the blue shows the limits of the Eumont Pool. The orange line here (indicating), shows our proposed 320-acres that we wish to assign to our "G" No. 2 Well, which consists of the south half of Section 26. Our proposed extension to the Arrow Pool is signified by a dashed purple line which includes all of Sections 23, 26 and the southwest quarter of Section 24. I also have another Exhibit --

HEARING EXAMINER MANKIN: (Interrupting) Excuse me, Mr. Waid, you have been testifying from Exhibit Number 4, is that correct, sir? If you will watch --

A I had it Number 1 and it should be Number 4, is that right?

Q Please refer to the numbers.

A All right, sir. Exhibit Number 5, which is a structural map contoured on top of the Queen sands, and it will be noticed by the structure map -- Well, before I start on that, also the -- if you will notice the structure on our "G" Lease is in an area which is also slightly lower than wells to the north, which is on the southern flanks of the old Monument, and is only slightly lower than the wells to the east and south, along the old Eunice High. And, the fact is, it can also be termed as a relatively flat area, It dips from the north to south, and from the east to the west, from the range of one degree dip.

This structure map was made by tops on all of the gamma neutron logs available. Where we didn't have logs, I used the best sample tops I could find to form the interpretation there. Now, I also have some cross-sections which are, they are directions, and so forth, indicated on this Exhibit Number 1, and --

Q Excuse me, Mr. Waid, that is Number 4?

A I mean Number 4 and Number 5, I am sorry.

Q That is all right.

A These cross-sections -- we will start with Section BB, which goes from the Continental State D-15 No. 8, located in the southeast quarter of Section 15, down to our State "G" No. 2 Well, which is located in the southeast quarter of Section 26, and by looking at this cross section, I have the top of the Yates and the top of Seven Rivers and top of the Queen. Possibly you can see there that there is a good distinct correlation on top of the Queen, and also, on Section AA you will notice I have Yates, Seven Rivers and Queen, which are --

HEARING EXAMINER MANKIN: That is Exhibit Number 7?

A On Exhibit Number 7. Now, what I would like to point out going back to Exhibit Number 6, Gulf's Ramsey State No. 17, which is this well (indicating). It is classified in the Jalmat Pool, and it has 480 acres dedicated to it. It produces gas from the Yates and Seven Rivers through open hole sections from a plus 335 to a minus 90. Also, this is above the top of the Queen Formation, but in drilling a well in the Queen, we ran two drillstem tests, and the first drillstem test is minus 100 to minus 212, flowed gas at the rate of 22 MCF a day, and on the second drillstem test, only 130 from minus 212 to minus 300 carried open 320 feet. This indicates that there is production in present day, with the present day well completion practices to the southwest of our "G" lease. Now, Gulf's Ramsey A No. 2, located in the southwest quarter of Section 27, which doesn't appear on this cross section, no log of it is classified in the Eunice Pool, and it produces oil from Queen through open hole from a minus 167 to a minus 320. July, 1955

production of this well was 578, oil, with gas-oil ratio of 139, which indicates that there is production from the Queen sand directly east of our "G" Lease, and since the Queen sand is correlated from said Ramsey 17 clear through to our "G" 2, why it is reasonably assumed that all of Section 26 will be productive.

On our lease there, now I have also some information on the Ramsey, Gulf Ramsey A No. 13, located in the northeast quarter of Section 35, here (indicating). That well is classified in the Arrowhead Pool. It is very doubtful that it will encounter the Grayburg, and probably should be prorated in the Arrow Pool. It produces oil from the Queen, to open hole from a minus 188 to a minus 292 feet. July production from that well was 1,130 barrels of oil, with gas-oil ratio of 939, which establishes that there is production south of our "G" Lease.

Now, Gulf's Ramsey A No. 11, this well is located in the northeast quarter of Section 35, and is also prorated in the Arrowhead Pool. It is very doubtful that it will encounter the Grayburg. It produces from the Queen in open hole from minus 195 to a minus 296. This July production was 1,237 barrels of oil, plus 3,109 barrels of water, with a gas-oil ratio of 3,057.

The next well on our cross section will be the Humble State "G" No. 2. This well was originally completed on 8-27-1942, and was completed from two sets of perforations. One set from 3,640 to 3,670, and one set from 3,724 to 3,786. It potential for an initial production after being acidized with pacs for 21.66 barrels of oil per day through an 18-64 choke, gas oil ratio 784. On workover in September of 1948, cumulated production totalled 20,785 barrels of oil. Its production decreased to 4.7 barrels per day.

At that time we shot the well with 2,000 gallons, and the potential test after workover was 31.5 barrels per day, gas oil ratio 7,692. Another workover was performed in July, 1955, after well had produced a total of 32,551 barrels of oil, and the production declined before workover to five barrels of oil per day. This section from 3716 to 3816 was sand fracked with 20,000 of refined oil and 30,000 pounds of sand, after which brings up our problem today.

The well is now capable of producing as a gas well or oil well, depending on the rate that it is produced at.

Going along to our cross section, Sinclair's Brownlee No. 4, located in the southwest quarter of Section 25, presently classified in the Arrow Pool, is a gas well and has 160 acres dedicated to it. It produces gas from the Queen Formation, their perforations from plus 112 to minus 92. Also in this same quarter section we have the Sinclair Brownlee Number 3, same location, in the southwest quarter of Section 25, same quarter section, classified in the Arrowhead Pool. This little casement--Brownlee No. 3 is right here (indicating).

HEARING EXAMINER MANKIN: That is southwest quarter?

A Southwest quarter. That produces oil from the Queen in open hole, from a minus 251 to minus 296. July production from that well was 222 barrels of oil, with a gas-oil ratio of 7,158. And, also in that same quarter section is ~~Number~~, the Brownlee No. 2 and No. 1, which are also oil wells with the same characteristics. I could go on, and I am skipping over. They are all oil wells producing out of the Queen, prorated in the Arrowhead, which is a necessity because you have a 160 acre allowable for gas from No. 4 and No. 3 oil wells, with an allowable producing on the same acreage.

Now, we can go on a little further to the Gulf Ramsey B No. 2, located in the northwest quarter of Section 25. It is presently classified in the Arrow Pool, has 160 acres dedicated to the well, produces gas from the Queen, the perforations from minus 75 to minus 165, and from plus 25 to minus 25. Also, Gulf Ramsey B No. 1, located in the northwest quarter of Section 25, same quarter section, classified in the Arrowhead Pool, and it produces oil from the Queen from a minus 222 to a minus 307. July production was 410 barrels of oil, gas-oil ratio to 2520. So, we have there, there we have a gas well with a 160 acre allowable and an oil well was in the same quarter section.

Now, if we can go on up to the Gulf's Mattern No. 1, located in the southeast quarter of Section 24, classified in the Arrow Pool, which has a 320-acre dedication and produces gas from the Seven Rivers and Queen, both. Produces between plus 320 to a minus 330, which includes both Seven Rivers and the Queen.

Then in the same quarter section, Gulf's Mattern Number 2, in the southeast quarter of Section 24, classified in the Arrowhead Pool, produces oil through the Queen and some of the Grayburg in the open hole. It produces from Minus 190 to minus 297.

Now, from this cross section, in the work that I have done here and the work that you will see later on, in the Exhibit No. 6, you can see that a gas-oil contact is very uncertain, that there is no oil produced above a minus 163, and gas is produced as low as minus 330 feet. Its low well is the Gulf Mattern. Also, from this data I have collected, water is being produced at 296 feet in Gulf's Ramsay No. 11, and there is one other well, producing well, it is Continental's D-15 Number 8 up here in the southeast quarter of

classified in the Eunice Pool. On this plat the Gulf Leonard A 3 is here, and No. 5 is here (indicating).

MR. MALONE: If the Examiner please, the witness, in referring to this well here, and this well here, it is impossible for us to follow his testimony. I would appreciate it if he would give a description of the well.

A The Gulf Leonard A No. 5, located in the northeast quarter of Section 22, is classified in the Eunice Pool, produces oil from a minus 156 to a minus 292. Its July production was 900 barrels of oil, gas-oil ratio to 4,678, plus 3,588 barrels of oil.

The next well I would like to talk about is Humble's State "G" No. 1, located in the northwest quarter of Section 23. Humble State "G" No. 1 was plugged and abandoned, however, it was plugged and abandoned in 1937. And we have, from cores in the well, there was definite gas sands from minus 222 to a minus 224; and from minus 251 to a minus 252; from minus 255 to a minus 256; and from minus 257 to minus 259; and from minus 276 to minus 278, which, I am sure, modern day completion practices will make a gas and oil well.

The next well on the cross section is Humble's State "G" No. 5, located in the northwest quarter of Section 23, which is also a plugged and abandoned well, but the "G" 5 was drillstem tested and from between plus 20 feet and minus 30 feet produced 29 MCF per day on a drillstem test of 60 minutes duration. Also, a drill stem test was taken from an interval of 130 to a minus 160, and gas received in 22 minutes duration was too slight, so I am sure with modern-day completion practices that that will probably make a gas well, too.

The next well on the cross section is Humble's State "G" No. 4. That is located in the northeast quarter of Section 26, presently classified in the Arrowhead Pool, which we are asking it to be reclassified to the Arrow Pool. It produces oil from the Queen from a minus 85 to a minus 199. Its July production was 124 barrels of oil, with an oil-gas ratio of 1,695. We feel that we can go in this well and probably make it a gas well by sand-frac.

HEARING EXAMINER MANKIN: Mr. Waid, I notice you keep referring to reclassifying "G" No. 4. Your application offered only your "G" No. 2 for a non-standard unit.

MR. CHRISTY: That is correct, I believe that there is another application.

HEARING EXAMINER MANKIN: I see.

MR. CHRISTY: I was going to clear that, only --

HEARING EXAMINER MANKIN: For the purpose of this hearing, we are only considering Humble's "G" No. 2 NSP, regarding this particular well.

A The next well I would like to talk about is Humble's "G" No. 3, which doesn't appear on the cross section, but is located in the southeast quarter of Section 26. I had no log available, I didn't-- It is also an abandoned well. However, on drillstem test from minus 87 to a minus 407, with tubing open 60 minutes, 1,830 feet of sulphur water was recovered, plus gas flowing at the rate of 50 MCF of gas per day, which indicates that definite gas is in our State "G" No. 3. The next well is State -- Humble State "G" No. 2, which has been thoroughly gone over in the cross section on Exhibit 6 a few minutes ago.

One other well which isn't on the cross section is the Gulf

Leonard C No. 4, located in the southwest quarter of Section 36, which is presently classified in the Arrowhead Pool, and is producing from openflow from minus 199 to a minus 204 feet. Their July production was 267 barrels with gas-oil ratio of 2267.

HEARING EXAMINER MANKIN: That particular well was in the northwest quarter, was it not?

A Yes.

HEARING EXAMINER MANKIN: I thought you said southwest.

A Northwest.

HEARING EXAMINER MANKIN: Northwest.

A One general statement in regard to the formations which have been picked on both of these cross sections, we used information obtained from the New Mexico Stratigraphic Nomenclature Committee cross sections. The well picked, top picked and the Gulf Ramsey State No. 17, located in Section 34 is on one of those cross sections, and it appears in this, both cross sections, and throughout the area there are only two wells which penetrated the Grayburg. They are the Gulf Mattern A No. 2 in Section 24, Township 21 South, Range 36 East, and Continental State D-15 No. 8, located in Section 15, Township 21 South, Range 36 East.

Q Mr. Waid, would you be kind enough to show by your marking on Exhibit 4, the location with reference to Exhibit 7, as to the area? I don't believe you covered that point.

A Okay, on that cross section --

Q Cross section on Exhibit 7 as related to Exhibit 4.

A That is cross section B-B Prime, which extends from Continental D-15 Well No. 8 southward to Humble State "G" 2, located in the southeast quarter of section 26. The other cross section in Exhibit No. 6 extends from the Gulf Ramsey A No. 17, located in the north -

west quarter of Section 34 to the Gulf Mattern A No. 2, located in the southeast quarter of Section 24.

Q Now, referring to the well in question in this application, State "G" 2, would you give us the number of feet from the southeast line, sir, of that well?

A Which one?

Q The "G" -2 involved in this application.

A It is 660 feet from the east line.

Q All right, sir. Now, I believe in your testimony you referred once or twice to some water in one or two of these wells, with particular reference, I believe, to a well, the first well discussed in Exhibit 7. Could that water be coming from the Grayburg formation?

A Yes, sir, I think it is probably likely it is.

Q It would not be coming from the Queen?

A Well, I don't think it is probable, I think it is more probable that it is coming out of the Grayburg.

Q Now, the information from which you have testified concerning these various wells, is that taken, from your personal knowledge, from Humble files, scout checks, things of that type?

A Yes, sir, that type of information that I gathered, it was strictly from our scouting reports, through a scoutcheck.

Q Would that be the best information available to you?

A That was the only information available.

Q Of course, if any of those facts are wrong you would like to amend your testimony to tell the truth?

A Yes.

Q I am sure of that. And in your testimony you mentioned an

application on "G" 4 Well, and I think we realized, as the Examiner mentioned, that is not involved in this application.

A No.

Q The application of the "G" 4 Well.

A We are sorry.

Q But this hearing covers only the "G" 2 Well?

A Yes.

Q Now, sir, I believe you testified the well involved in this application is the New Mexico State "G" Well No. 2, located 660 feet from the east and 660 feet from the south lines of Section 26, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico, is that right?

A Yes, sir.

Q Now, assuming the Commission Order R-520 was effective, or entered August 12, 1954, was the "G" 2 Well completed prior to such order or ruling?

A Yes, sir.

Q And the area in which you have asked for the proration, non-standard gas proration unit, as the south half of Section 26, is obviously contiguous area, is that correct?

A Yes, sir.

Q It would not cross the section line?

A Yes.

Q Based on your research of the wells in the area and your knowledge of the area, would you care to recommend to the Commission the acceptance or the rejection of an application to reclassify the NM "G" 2 Well as a gas well in the Arrow Pool, and the extension of the Arrow Pool to include the southwest quarter of 26, 21 South,

36 East, as a portion of the pool, is your recommendation for that or against that, sir?

A It is for that. I think I definitely proved from the cross section and well information, that the entire south half of 26 is productive of gas or oil, and it can be due to our development plans that we would like to extend the area on the pool, as I mentioned before, to include Section 26 and Section 23, and in the southwest quarter of Section 24. ← already in R-667A

Q From your research and work, would it appear from the characteristics as to oil and gas contact that productability would be the same throughout the entire south half of said Section 26?

A Yes, sir. It is one thing, since this area is flat, not many dips, and our "G" Lease actually is in an area, sand develops in an area, vertical limits where you would expect the normal gas oil contact to be. Our sand develops around minus 150, and it may be that the area is flat, that it is just hard to find the actual distinct gas-oil contact.

Q But it would appear to be the same throughout the whole south half?

A Yes, sir.

MR. CHRISTY: That is all.

HEARING EXAMINER MANKIN: Any questions of the witness?

MR. MALONE: May I, please. Ross Malone, appearing for Gulf Oil Corporation.

CROSS EXAMINATION

By MR. MALONE:

Q Mr. Waid, as I read the application, and I would like to direct this question to counsel as well, the application in Case

Number 966, which is under consideration, is limited to the approval of a proposed 320-acre non-standard gas proration unit. No reference is made in that publication to any redelination of any field. The questions which were directed to the witness, and substantially his testimony related to that proposition. I would like to inquire of the Examiner and of Counsel, whether the hearing is limited to the subject which was published, or whether it is being extended to include something which was not included in the publication?

MR. CHRISTY: Mr. Examiner, the Arrow Pool does not presently include the southwest quarter of Section 26. By necessity, to take in the 320 acres asked for in the south half, we must extend the limits of the pool.

HEARING EXAMINER MANKIN: I might add that the call of a hearing, as such, for an extension of the Arrow Pool, will be handled by a future nomenclature case.

MR. MALONE: In order to make the thing clear, I would like to state it for the record to be clear, that any application for the approval of a unit which includes acreage not presently in the common source of supply, or included in the designated field, is premature. And, for that reason, that the evidence relating to the redelineation of the Arrow Gas Pool is not pertinent to the issue presented. I would like to ask just a few additional questions.

Q (By MR. MALONE) Did I correctly understand you to conclude your testimony, Mr. Waid, with the statement that in your opinion, based upon the geological study that you have made, the entire south half of Section 26, which comprises the proposed unit can reasonably be assumed to be productive either of oil or gas?

A Well, I mentioned the south half of 26, however, I -- be just as well to say the whole Section 26 would be reasonably productive, yes, sir.

Q Of oil or gas?

A Yes, sir, both.

Q You have not testified that, in your opinion, the entire south half can reasonably be assumed to be productive of gas, is that correct?

MR. CHRISTY: Mr. Examiner, I believe the witness just answered that question "of both". Mr. Malone asked him that question himself.

Q Then, I will ask the question whether or not, in your opinion, based upon the study which you have made, the entire south half can reasonably be assumed to be productive of gas?

A Yes, sir.

Q That is your conclusion?

A Yes.

Q Whether or not that production is in association with oil, and the extent to which it would be in association with oil you are not testifying, is that correct?

A Well, I wouldn't go so far as to name the exact limits of where you could produce oil and where you could produce gas, but I believe you can produce gas alone, or I believe you can produce both gas and oil.

Q Depending upon what?

A The interval allowed to produce.

Q The gas which you are producing would be gas that is in association with oil though, would it not?

A Not necessarily. Anywhere, if you perforated any above a

minus 163 and anywhere around that, you probably would produce gas.

Q You would be producing gas then?

A Possibly.

Q In fact, probably, would it not, Mr. Waid?

A Not necessarily, but possibly.

Q Would you testify that, in your opinion, you would not be producing ascap gas?

A No, sir.

Q What is the present producing interval in Humble "G" No. 2?

A The present producing interval in "G" No. 2 is from 3716 to 3816, which is perforated four shots from the foot. The subsea interval of a minus 190 to a minus 296.

Q From what formation is it producing?

A The Queen formation.

Q Exclusively? A Yes, sir.

Q And what is the gas-oil ratio of the well at the present time?

A Mr. Dewey will testify later on about the productability of the well.

Q Have you taken into consideration in your testimony what the present gas-oil ratio is?

A No, sir.

Q You definitely believe --

A I know it will produce either gas or oil.

Q To what extent it has so produced, you are not prepared to testify?

A That is right.

Q You have, however, based your study of the other wells, as

to which you have testified, in part, on the relative production of gas and oil, have you not?

A Yes, sir.

Q But, you did not study Humble's own well on that basis?

A Well, it isn't my business to study our well. I was merely on the other wells. I was merely quoting information which was available and Mr. Dewey will later on tell you exactly how "G" No. 2 produces.

Q Did I correctly understand your testimony, that each of the wells to which you have testified specifically, in your opinion, is misclassified at the present time?

A Yes, sir, I think, the wells that I have testified -- My testimony included,the wells which were included in my testimony were correct.

Q Were incorrect?

A Correct, that is, very few wells in the area which are producing from the Grayburg.

Q And you did testify that all of the wells which you studied, and as to which you testified today were misclassified as to their, either as to being gas and oil wells, or as to the common source of supply from which it was producing?

A Well, from the information that I have, from our records, scouting records it appears that way.

Q How many of those wells were there, please, sir?

A God, I don't know how many wells. Let's see. I think roughly about 21. That may not be exactly correct.

Q Approximately 21, in any event, that are misclassified?

A Yes.

MR. MALONE: Off the record.

(Discussion off the record.)

MR. CHRISTY: I don't believe the witness testified there are 21 wells misclassified, he mentioned throughout his testimony certain wells that were misclassified. I don't believe there is any testimony--

A The one I know about is the fact that ours were misclassified.

Q In that connection, however, you managed to conclude that a large number of Gulf's were equally misclassified.

A Could be.

Q And, did I correctly understand you to say that there were 21 wells that you testified were misclassified?

A I didn't say misclassified, I said prorated a certain way.

Q They are classified for proration purposes?

A That is right.

Q That proration in your opinion is incorrect?

A All right, sir, that is right.

Q Now, with reference to the published scope of Humble's application in Case Number 966, do you have any information as to the normal allowable that would be assigned to this well if the application were granted, or would Mr. Dewey testify as to that?

A He will testify as to that.

Q And you don't have that information?

A No.

Q You would not be prepared to testify then that the Humble "G" No. 2 would be capable of producing the increased allowable of gas, if this application is granted?

A No, sir.

Q It is true, is it not, Mr. Waid, that based on your study, that there are oil wells located in the northeast quarter quarter of Section 35 which are producing Queen oil?

A Yes, sir.

Q Would you say as close as 1320 feet to the Humble "G" No. 2 Well, which you seek to have reclassified as a gas well?

A Yes, sir.

Q Is it your opinion that it is good proration practice to assign a 320-acre allowable to a well under those circumstances?

A Well, certainly I think it is possible to, yes, sir.

Q Well, that wasn't my question. Do you consider it to be good proration practice?

A No, sir.

MR. MALONE: That is all.

HEARING EXAMINER MANKIN: Any questions of the witness? Or, did you have something?

MR. CHRISTY: No, I don't have any more.

HEARING EXAMINER MANKIN: Any other questions of the witness? If not, the witness may be excused.

(Witness excused.)

MR. CHRISTY: Mr. Dewey.

HEARING EXAMINER MANKIN: Mr. Christy, do you wish to have these exhibits --

MR. CHRISTY: Yes, I was going to admit all eight of them.

R. S. DEWEY,

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

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Would you state your name, address and occupation?

A R. S. Dewey, Humble Oil Company, Petroleum -- Regional Petroleum Engineer, Midland, Texas.

Q Have you testified before the Commission before?

A Yes, sir.

MR. CHRISTY: Is the Hearing Examiner satisfied with his qualifications?

HEARING EXAMINER MANKIN: Yes, sir, his qualifications are accepted

Q Mr. Dewey, would you please explain to the Commission the factors and the matter which Humble desires the Commission to take under consideration concerning your "G" 2 Well in Section 26, 21 South, 36 East, Lea County, New Mexico, and the reasons why you believe the application should be allowed?

A Humble State "G" 2 Well fell off production to the point where it seemed advisable to try sand frac treatment to try to restore the well to production, and the lower set of perforations in this were sand-fracked, as Mr. Waid has testified to. The results of that sand-frac treatment apparently have opened up a reservoir and gotten this well into condition where it is possible to produce a great deal more oil and gas than it formerly did. Since the well has been sand-fracked, with the exception of some tests that were run on this well to determine its productive capabilities, the well has been shut-in. We have no information on the well relative to its ability to produce over a long period of time. We do have some tests that were taken on the well, and some of which are of relatively short duration, but which we feel that, as the informa-

tion is fairly consistent, to indicate that the well will be productive. The numbers that we have on these short tests, we think, are indicative of what we may anticipate the wells to do when placed on production.

MR. CHRISTY: At that point, Mr. Dewey, I would like to get these Exhibits marked where you can go ahead.

(Marked Humble's Exhibits Nos. 8 through 12 for identification.)

Q Go ahead.

A The test that was submitted to the Commission was obtained by our present topographical engineering personnel in the Hobbs District. In order to afford the Commission a little better chance to get this information, the tabulated information has been reproduced on these Exhibits, 9, 10, 11 and 12. Sheet 1 on Exhibit 9 indicates the test was made on August 12th and on August 13th. These tests were made during the daylight hours, so they are not continuous tests. The testing started out by placing the well on a large size choke, available choke, and not a positive choke, so it is not as exact, possibly, as a positive choke, which they sufficiently accounted for, for this purpose. On the lower line we have indicated the various size chokes that were used on these tests. We started in with a 40-60 choke and reduced that to 32-64, and subsequently reduced that to 28-64 and brought it on down to 24-64 on August the 12th, and as a result we tried to get as much stabilization in the well as possible while conducting these tests. But, as they are short time checks it is possible the well was not completely stabilized in any one of those tests. However, it indicates that for the larger size choke, that the well was capable of pro-

ducing at the rate of 105 barrels per day, and the production of the well was brought down to 70 barrels per day on a smaller size choke.

The gas volume was measured. These rates of production on barrels per day were obtained from tank guage. The gas that the well produced under these various size chokes were measured with the odometer and gas test. It indicated that the gas volume was reduced by production, of the size of the choke, fell from 5,178,000cubic feet per day to 3,307,000 cubic feet per day. At the same time, a pressure gauge on the tubing gave us an indicated pressure change from 530 pounds, increasing up to 750 pounds. These tests were of varying lengths of time, but theeffective time of stabilization varied from about 45 minutes to an hour and 15 minutes after the district personnel thought the well was stabilized. The next day we conducted a test on still a smaller size choke, reducing the choke size down to 12-64. The same relationship was obtained, that is that the average was decreased from choke size, gas volume also decreased, and the gas-oil ratio too went up. In consequence, because of the rate of which the oil production decreased, was not the same as the rate which the gas volume decreased.

I might mention that on the first day we got the gas-oil ratio. Well, on the 14th a longer test was conducted, this being a 13-hours test, at 10-64 inch choke, which was subsequently reduced to a 8-64 choke in the latter part of the test. The same relationship of declining all production and gas volume, with a increase in the gas-oil ratio, with very little pressure change was noticed on that day.

Now, the next day we made the -- that is on the 15th, the tests

were made to indicate an average of 24.7 barrels of oil per day combined with the fact that it could be obtained by combining choke sizes at a very short interval of time, and noting the tubing pressure and the gas volume. These indicated that, referring for instance to the tubing pressure as plotted against the choke size, that there was a rather consistent uniform change in tubing pressures when the choke sizes were changed, irrespective of the fact that the time intervals were not consistently the same. Also, in the gas volume used with the choke size as the other course, that when the choke sizes reduced, the gas volume decreased and consistent measurement is represented by interpretation of the straight line. When we came to plot the tubing pressure and the gas volume was on the other coordinate, there was found some divergence between the test taken. That is, we weren't able to have it fall quite so close to the same interpretive line.

In order to check the validity of these short tests, the 13-hour test that was run on the 14th, we used the data that we had obtained that day and spotted it on this map and it is identified here as a 13-hour test, 13-hour and 45 minute test on Exhibit 11. It appears that there the short period of testing that we had done on Exhibit 11, and that I just previously discussed, gave us very substantial agreement with the others insofar as the tubing pressure and the gas volume referred to choke size. But, there was the same discrepancy between -- the same relation obtained when the tubing pressure was plotted against the daily gas line. I think that the discrepancy in the tubing pressure and the gas volume is not too signigicant.

Coming to Exhibit 12, the summarization of the information that

we have tabulated and also presented in graphical form, using the barrels of oil per day, and gas volume in thousands of cubic feet per day as the other coordinate. I have taken the information that was obtained in all the tests and plotted it up. Because I felt that the 13 hour and 45 minute test was probably more significant than the other tests, due to the fact that the well had been produced longer, and there was probably better opportunity for accurate measurement, and the well probably better stabilized, I chose that point as appearing on this chart, and identified by the 13 hour and 45 minutes that is on Exhibit 12 as being the best point on the chart. And, then I drew a straight line through the other points

This line on this Exhibit 12, I have also indicated 40 barrels deviation, 40 barrels per day might be anticipated gas volume produced in a day, would amount to 2,175,00 cubic feet. Also I have indicated that at a producing rate of 100 barrels per day, that the anticipated gas volume would be 4,500,00 cubic feet of gas per day. If the relationship between the barrels of oil per day, and the gas produced per day, 40 barrels of oil production rate, and give the gas-oil ratio 53,750, at a hundred barrels per day, the gas-oil relationship would be 45,000.

You see this information on the right hand side of this chart in relationship between gas and oil production established by this interpretive line to indicate the average of gas-oil ratio from near the zero point to a hundred barrels per day. The line is not a straight line, due to the fact that the well was shut-in.

The oil production is reported with the gas production, and got a curved relationship. The upper part of the gas-oil ratio curve, that is from around a hundred barrels to around 40 barrels per day

production rate, it does not show too much variation. There is some increase in gas-oil ratio from 45,000 to 50 -- about 54,000. The curve then begins to be more accentuated and the change is gas-oil ratio from 45 barrels, say, to 10 barrels per day is at a much faster rate. So in order to reach the ten barrels production rate, I anticipated the gas-oil ratio would be a hundred thousand lower than the ten barrel production rate. The gas-oil ratio increased very rapidly and goes out to over 200,000.

From this set of data, which I have attempted to interpret, you can draw the conclusion that essentially the sand frac job has op opened us part of the formation. That is, it either has several pay stringers in it, some of which might be entirely gas, or some of which may be entirely oil, or else they are so closely associated together that they, with the perforations in there, that they pro duce essentially as one formation, and that it will be very difficult, if not impossible, to economically go in there and attempt to divide the formation into two parts, such as the lower part, for instance, would be essentially oil productive and the upper part essentially gas productive.

It seems as though the condition of the well is such that we are obliged to take the well, either as a high ratio oil well, or as a gas well making some oil. They will need to be depleted in that manner. The gas-oil ratio limit in the Highway Field is 3,500 at the present time; in the Eumont it is 10,000. We assume that 40-barrel topping with allowable assigned to this well, and admissible gas allowable from the Arrowhead Pool would be 140,000 cubic feet per day, the Eumont 4,000 cubic feet per day.

The high producing ratio of this well has such factors applied to it that will reduce the production of oil practically to zero if they are imposed upon it. As I mentioned before, at 40 barrels a day, the indicated gas-oil ratio is around 54,000, which gives a gas production, indicated gas production of 2,150,000 cubic feet per day.

In the Arrow Pool, they calculated that the average gas production from August, 1954, through July, 1955, was 541.07 MCF per day. That is for 160-acre unit, with the allowable from October, 1954, through September, 1955, 654.9 per day for 160-acre unit.

We used an indicated capacity of this well at a rate of 40 barrels of oil per day, as I mentioned before is 2,150,000. That is in excess of the capacity, that either on the actual average production or the allowable for 160 acre unit, or along a 320 acre unit, it would seem that it would be preferable to produce this oil that that is somewhere in the neighborhood of unit top allowable.

If the well is choked back too far, the chance that if the oil is coming out of one stringer in the formation and gas is coming out from an entirely separate stringer, that there is an opportunity that it perhaps will reduce the gas stringer faster than the oil stringer and when the well is shut in, could be a migration of the gas stringer and oil stringer.

On the other hand, if that is not the case and it is oil coming out of the same formation where the gas is on top and the oil is on the bottom, for instance, that by shutting the well in too drastically, all we are doing is leading as from the oil that is still in the formation. We know that such a practice would be wasteful.

The only reservoir narrowing that we could visualize from the Queen Formation is one that is due to the expansion of the solution of the gas. While there has been some water reported in the area, at lesser amounts, we think that the chances of water drive are relatively remote. We think it is less wasteful to give this well an allowable that is somewhere near top unit allowable. In order to do that, it is making this much gas, it is necessary to classify this well as a gas well in the Arrow Pool, and give it 320 acres -- dedicated 320 acres to it.

As it has been brought out here today, the application has requested the expansion of the field boundaries of the Arrowhead Pool. That is presently correct, that until those boundaries are expanded, why, we have to take a lesser allowable.

Now, this well has been shut in since August, waiting on how it should be classified, and how we might be able to produce it. We, therefore, urge the Commission to take this case under advisement as soon as possible, and tell us, give us an order on that.

I believe this well is capable of producing efficiently, and to drain the area of 320 acres in a relative efficient manner. As has been stated before, Humble now has had a policy relative to all of the fields to which they are interested in southeast New Mexico, that is that we do not favor a policy of granting two allowables to the same acreage. That is, the field, the same acreage of not more than one allowable. For instance, if this well were awarded the allowable of 40 barrels, or top unit allowable, whatever it is, why, one 40 of this 320 acres would be dedicated to that, and the

balance of 320 acres, or 280 would be granted to gas allowable, in favor of the position of trying to obtain two allowables from the same area dedicated.

I believe that is all I have.

Q Mr. Dewey, would these tests indicate that on a small size choke that the "G" 2 Well produces an oil-gas ratio, or is capable of producing an oil-gas ratio in excess of a hundred thousand cubic feet per day?

It, oh, these tests are short, and the well was placed on production for several months, why it figures that the interpretation to use here might be slightly different. These are relative and would not be too far off.

Q Do you feel that you could open up more pay sections by recovering more gas?

A We were successful in opening this particular pay section with sand frac. We have a perforation above this in an area of its own, that was interpreted one time as being productive. However, we haven't any test on relative productivity on these areas, yet I feel that we will have a very good opportunity, sand fracking the upper part of the hole to establish more gas.

Q These tests that you testified that took place in August, that was in 1955, was it not?

A Yes.

Q Do you feel that the granting of Humble's application under 966 would or would not result in the conservation of oil and gas, and the prevention of waste, without violating the correlative rights

of adjoining or offsetting royalty owners.

A I think so, yes.

Q You think it would not violate correlative rights?

A I don't think so.

Q Is there anything that I did not ask you that you feel is pertinent and relevant to this application?

A Not that I am aware of.

MR. CHRISTY: That is all.

HEARING EXAMINER MANKIN: Mr. Dewey, you made on statement there in regard to a possible extension of the Aragon, do you mean Arrow?

A I don't remember what you mean --

HEARING EXAMINER MANKIN: You spoke there that your possible extension to Aragon --

A Mr. Poole raised the question, that relative to our original application, that in the original application there was no mention of changing the field boundaries of the Arrow Pool. And, in order to obtain a 320 acre unit, that it would be necessary to do that, and I just wanted to confirm the fact that the original application did not request the extension of the boundaries, and your statement that it go to the nomenclature committee to do it.

MR. CHRISTY: It is the extension of the Arrow Pool as distingusihed--

HEARING EXAMINER MANKIN: I think you meant the Arrow, but you said Aragon.

A I am sorry.

HEARING EXAMINER MANKIN: I notice that you are basing your request for non-standard unit here, and for allowable, on the basis of top unit allowable of 40 barrels or whatever it might be?

A Whatever the Commission sees fit to grant.

HEARING EXAMINER MANKIN: Rather than as a normal gas unit?

A That 40 barrels is more or less a conversational number. We know that gas is prorated on the basis of nominations, and that it, irrespective of when a gas well makes oil, irrespective of anything else along with the gas, and it would be on the basis of whatever the gas unit is, and whatever the nominations are for a 160 acre unit or 320 acre unit.

HEARING EXAMINER MANKIN: I just wanted to make that clear, because if it was on the basis of 40 barrels you based your gas-oil ratio, it would be a far greater extension than the normal 320 unit because on the present allowable it would be about 80 MCF per day, whereas on your basis it would be 140. In other words, then it would be considerably greater, rather than on the nomination for 320 acres. I wanted to be sure what you are requesting.

A We are requesting for a gas well on 320, take whatever oil comes with it.

HEARING EXAMINER MANKIN: Any other questions of the witness?

A We are not asking for two allowables.

MR. MALONE: Ross Malone, with Gulf. I would like to ask Mr. Dewey just one question.

CROSS EXAMINATION

BY MR. MALONE:

Q Have you made an attempt to compute, Mr. Dewey, how much oil

you would produce with a 320 acre gas allowable if the application is granted?

A That involves the assumption that we either have to take the past average MCF per day or the average allowable, whichever you afford to have.

Q I think the past average MCF would be --

A Our information is that it was approximately five hundred and -- Well, it was figured out 514.07 MCF per day. Now, if we double that, just in round figures that would be about a million one hundred thousand. A million one hundred thousand, that would be twice 550, from this interpretation it seems as though that would be on the order of 13 barrels of oil per day. We are allowed to produce seven million, one hundred cubic feet of gas per day, and could be taken at a uniform rate, other than other gas companies do, they take a lot and shut down for awhile. It allows your average oil at the rate of 107,000 cubic feet per day, we have an oil allowable, oil production of 13 barrels, in that order, of 13 barrels.

MR. MALONE: That is all.

HEARING EXAMINER MANKIN: Any other questions of the witness?

A If that was reduced to 160-acre unit, we would have less, you understand, Mr. Malone.

HEARING EXAMINER MANKIN: If no other questions of the witness the witness may be excused.

(Witness excused.)

HEARING EXAMINER MANKIN: Would you like to say something?

MR. CHRISTY: Yes, sir, I would like to offer in evidence Exhibits 4 to 12, inclusive of the Humble applicant.

HEARING EXAMINER MANKIN: Is there any objection to the offering in evidence of these exhibits, if not they will be so entered in the record.

MR. CHRISTY: That concludes the testimony of the applicant. I would like to withdraw Exhibits 1, 2 and 3, and will offer photostatic copies within five days.

HEARING EXAMINER MANKIN: That is satisfactory.

MR. CHRISTY: We would like to keep the originals. Would you like to have those drawn up in better style, sir?

HEARING EXAMINER MANKIN: No, just leave them like that.

If there is nothing else we will take the case under advisement and take a five to ten minute recess.

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I, AMADO TRUJILLO, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Hobbs, New Mexico on October 17, 1955, is a true and correct record to the best of my knowledge, skill and ability.

Dated at Albuquerque, New Mexico, this 28th day of October, 1955.

Amado Trujillo
Court Reporter