BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

Case No. 1542

TRANSCRIPT OF HEARING

November 6, 1958

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NEW MEXICO OIL CONSERVATION COMMISSION

Mabry Hall

Santa Fe, NEW MEXICO

REGISTER

HEARING DATE Examiner November 6, 1958 TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION:
T. O. DAVIS	The Atlantic Refining Co.	Casper, Wyoming
V. T. LYON	CONTINENTAL OIL CO	EUNICE, N. M.
[illegible]	Drilling Exploration Co Atty!	Hobbs N M
Karl W. Peterson	Drilling & Exploration Co.	Dallas Texas
Jason Kellahin	Kellahin & Fox Engineer	Santa Fe
H P Bratton	The Atlantic Rfg. Co.	[illegible]
Nancy Royal	N.M. Statehouse Reporting Service	Santa Fe

BEFORE THE
OIL CONSERVATION COMMISSION
November 6, 1958

IN THE MATTER OF:	
Application of Atlantic Refining Company for an exception to Rule 309 (a) of the Commission Rules and Regulations. Applicant, in the above-styled cause, seeks an order authorizing it to commingle the production from all wells now completed or hereafter drilled in the Horseshoe-Gallup Oil Pool on the following described lands in San Juan County, New Mexico:	Case 1542
TOWNSHIP 31 NORTH, RANGE 16 WEST All of Sections 29, 30, 31 and 32, and all of those portions of Sections 28 and 33 lying within the Navajo Indian Reservation.	

Mabry Hall
Santa Fe, New Mexico

BEFORE:

Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: We will take the next case, 1542.

MR. PAYNE: Case 1542, "Application of Atlantic Refining Company for an exception to Rule 309 (a) of the Commission Rules and Regulations."

MR. BRATTON: Howard Bratton, Hervey, Dow and Hinkle, appearing for the applicant, the Atlantic Refining Company. We have one witness. Have you been sworn in?

A No.

MR. BRATTON: Mr. T. O. Davis.

(Witness sworn in).

T. O. DAVIS

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

DIRECT EXAMINATION

BY MR. BRATTON:

Q Will you state your name, by whom you are employed and where, Mr. Davis?

A T. O. Davis, I am employed by the Atlantic Refining Company in Casper, Wyoming.

Q In what capacity, Mr. Davis?

A Regional Petroleum Engineer.

Q Have you ever testified before the New Mexico Oil Conservation Commission before?

A No, I haven't.

Q Will you give a brief summary of your educational and professional background, Mr. Davis?

A I graduated from the University of Texas in 1947, I received a BS in petroleum engineering. I was employed by Atlantic Refining Company that same year and I have been with Atlantic ever since. I have had various engineering assignments and my present position is Regional Petroleum Engineer of Atlantic's Rocky Mountain Region in Casper, Wyoming.

Q Does that region include the area involved in this

application?

A Yes sir, it does.

Q Are you familiar with the contents of the application in this case?

A Yes.

MR. BRATTON: Are the witness' qualifications acceptable?

MR. NUTTER: Yes, they are. Please proceed.

Q (By Mr. Bratton) Mr. Davis, do you have a map showing the location of the lease where you propose to install central storage facilities?

(Whereupon, the documents were marked as Exhibits A through D for identification).

A Yes, it's Exhibit A. This is a map of the Atlantic-Navajo lease and Horseshoe-Gallup Field. The lease is shown in red on this map. This is one lease, it covers Sections 29, 30, 31 and 32 and portions of Sections 28 and 33 which lie within the Navajo Indian Reservation. The lease is located in Township 31 North, Range 16 West, San Juan County, New Mexico.

Q It is in the Horseshoe-Gallup Field?

A Yes, sir.

Q And under this lease, there is one working interest owner, the Atlantic Refining Company?

A That is correct.

Q And there is one royalty owner, the Navajo tribe of Indians?

A Yes, sir.

Q How many acres are there in the lease?

A There are 2,684 acres on this lease.

Q And how many wells are now completed on this lease?

A Eight wells are completed on the lease. They are solid dots on the map and they run diagonally southeast, northwest. One well, Well Number Nine, is being drilled now and additional locations are staked and are shown as circles on the map.

Q You were drilling approximately one well a week on this lease?

A That is correct.

Q And all of the wells are producing from the Gallup formation at approximately 1200 feet?

A Yes sir, it varies from 1200 to 1600 feet depending on surface elevation.

Q Do you propose to produce all of the wells located on that lease on to one central tank battery?

A Yes, sir.

Q Under State-wide rules, what is the maximum number of wells that you could produce on this lease under the central tank battery?

A Sixty-four wells would be the maximum. That's being optimistic, I don't think we will have that many, but that would be the maximum number.

Q Will you explain what facilities you propose to install

to produce all of the wells into a central tank battery?

A You will note on this map in the approximate center of Section 32, we show a circle and by the lettering, central storage, there is another little circle right by the test station number one, then in the northwest corner of Section 32, we show test station number two and in the approximate center of Section 30, we show test station number three.

It is our intention to bring flow lines from the wells into these three test stations and a test station will serve two purposes, it will allow us to make periodic tests on wells and it will allow us to separate gas from total fluids, then these total fluids will pass through the gathering line down to the central storage facility and all treating and storage will be accomplished at this point.

Q How many tests do you propose per day with the three test stations?

A We will make one twenty-four hour test per day at each station. That would be three tests per day or ninety tests per month.

Q So that that would exceed the number of wells that you could possibly have on the lease?

A Yes sir, that will allow each well to be tested once a month and an additional test made on twenty-six wells.

Q What have you determined if the Commission requested additional tests?

A We could always install an additional test vessel at each station, which would give six tests per day or a hundred and eighty per month.

Q Do you think it will be necessary to add a second test separator to any of these stations?

A No sir, I think ninety tests per month is more than adequate for this lease.

Q Turning now to Exhibit B, will you explain what that exhibit is and what it shows?

A Exhibit B is a flow diagram of a typical test station. The flow lines from the wells enter a well manifold over to the left of this drawing and this manifold has two legs, a production leg and a test leg. Normally, all of the wells except one will enter the production leg and will pass to a production separator where gas will be separated and fluid metered and sent down to the central storage facility. The one well to be tested will enter the test leg of the manifold, will pass to a test vessel, here gas will be separated and measured with a gas meter, fluids will be measured with liquid meters. These wells do not make any water now, so it is our proposal to install a test separator and an oil meter. However, later in their life, if they do make water, we will install a test treater and both water and oil meters. This fluid then, from the test of the well being tested, would pass down to the central facility. Also, you will note on this drawing that we show a test meter calibration loop. That is provided for

making periodic calibrations on the fluid meters.

Q What is --

A This is--excuse me--this is a manual operation, there are no automatic switching devices, it is manually controlled.

Q Now, you have a meter on the production separator?

A No sir, we do not have a meter on the production separator, but we do have one on the test separator.

Q I see.

A That will establish GOR tests on each well.

Q I see. What kind of a meter do you plan to use on your test vessel?

A We plan to use a dump-type meter.

Q Will you refer to Exhibit C and explain what it is and what it shows?

A Exhibit C is a drawing of a dump-type meter. This meter will be installed on the test vessel and it will replace the dump controls that are normally used on that vessel. In operation, the fluid will pass through the test vessel and to the dump meter and will fill the dump meter to the upper float portion. At that point, the full-up will close the intake valve and open the out-take valve and the fluid will run out to the other side and then the out-take valve will shut and the intake valve will open and this cycle will be repeated and each time will count as one dump and calibrations on the meter then will establish how many barrels or dumps are pumped. The calibration procedure will include a shrinkage

and a temperature correction, so that this meter will read as closely as will be necessary for our operation.

Q What degree of accuracy do you think is necessary for this meter and what degree of accuracy do you anticipate it would have, Mr. Davis?

A We feel that a plus or minus two per cent should be adequate for this meter. We should bear in mind that this meter is for testing only, we are not metering oil into a pipeline or off a lease. It is only for testing, and our current allowable in this field is running about fifty barrels a day. A two per cent error would be about one barrel and to me, that's not particularly significant because the well production can easily vary one barrel on successive daily tests, so I feel that a two per cent error should be satisfactory both to the operator and to the Commission.

Q What degree of accuracy do you believe this meter will have, Mr. Davis?

A We believe that this meter will be much more accurate than we need for testing. The Consulting Engineers, Ferrett, Parnell and White, tested a meter of identical design and published a report dated July 15, 1957 and on an average of 290 tests made, the meter showed an error of minus .07 per cent and plus .04 per cent. The maximum error from any one set of tests was minus .164 per cent and plus .098 per cent. These were laboratory tests and twelve sets of tests were made so in our opinion, we feel that the meter is much more accurate than we need for testing.

Q Do you think the meter would be as accurate as manual gauging?

A Yes sir, I think it will be equally as accurate or possibly even better.

Q How often would you plan to calibrate the meter?

A We would like to let experience dictate that. We would like to start off with a two-month calibration frequency and experience can tell us whether that should be lengthened or shortened. We don't have any meters of this type in operation in the Rocky Mountain Region and we don't have any experience with them ourselves.

Q Turning to Exhibit D, Mr. Davis, will you explain what Exhibit D is and what it shows?

A Exhibit D is a flow diagram of central treating and storage. This is where we will treat the incoming fluid from the test stations and store it. The incoming fluid will be treated and gas and water are removed and the clean oil goes to the tanks. We presently have two one-thousand barrel tanks installed, but we will install others as they are needed. Again, this is a manual operation, the pumper will be responsible for gauging and switching tanks.

Q At sometime in the future, though, you would hope to apply for an automatic custody transfer on this lease, would you not?

A Yes sir, that is our intention. We think this lease is

ideally situated for an automatic custody transfer installation and as soon as the pipeline connection is made to the central battery, we plan to propose to the Commission for an automatic custody transfer.

Q Currently, will you have high level shut-down devices in your design?

A No, we don't think they are needed now because we will have the same supervision on this manual operation as we would if we were producing sixteen wells to a battery in the conventional way. We do think when we propose automatic custody transfer that we will probably have installation of high level shut-down controls. So to answer your question, we don't think they are needed now, but we will propose them when we go to automatic custody transfer.

Q Mr. Davis, will you explain why you want to produce all of the wells in the one tank battery?

A We have several reasons for wanting to do this. These reasons are for economic purposes and for conservation purposes. One, we think we can reduce our operating cost if we go to this method. We think we can eliminate pumper labor which would otherwise be spent gauging tanks for testing operations. We think we can eliminate labor which would otherwise be spent maintaining several tank batteries in the field and for treating oil at several locations. Now, this is a direct benefit to the operator but also important for conservation reasons because it will lengthen the live of the lease. In other words, if we can operate more efficiently,

we can produce more oil before we reach the economic limit of this lease.

The second reason is oil gravity increase. We found from similar installations where we combined tank batteries that we did obtain an oil gravity increase. This is important for conservation reasons because it means that we will recover additional oil in our tanks that would otherwise be lost in vapors.

Third, we think testing, the manual operation of testing will be easier for our pumper with out proposed method and as a result, he will take more tests and we will get more accurate tests.

Fourth, we, as I mentioned before, we think automatic custody transfer will be a benefit for that lease and we do propose to install it when the pipeline--propose it when the pipeline connection is made, and it will save additional operating costs for the operator and the pipeline and it should provide a small gravity increase even over central storage.

Q Are there any disadvantages that you can see to this central storage proposal, Mr. Davis?

A In my opinion, there are no disadvantages to the method we are proposing. I have mentioned that testing will be easier and we should get more and more accurate tests. I think it will be a safe operation.

Q In your opinion, Mr. Davis, will this proposal, if approved, prevent waste and protect correlative rights?

A Yes, sir.

Q Were Exhibits A through D prepared by you or under your supervision?

A Yes sir, they were.

Q Do you have anything further you want to add in this case, Mr. Davis?

A No, I don't.

MR. BRATTON: We will offer Exhibits A through D in evidence.

MR. NUTTER: Without objection, Atlantic Exhibits A through D will be received in evidence.

MR. BRATTON: I have no further questions of the witness.

MR. NUTTER: Does anyone have any questions of Mr. Davis?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Davis, is the working interest ownership for that lease, which covers all of four sections and portions of two additional sections, common throughout?

A Yes sir, it is.

Q Is the royalty interest common throughout for the six sections?

A Yes sir, it is.

Q Is there any variation in any over-riding royalty interest at all?

A There is no over-riding royalty.

Q So all interests are identical throughout the entire acreage?

A Yes, sir.

Q You have proposed three test stations for that installation. Do you anticipate that the total number of wells which will eventually be drilled will be divided more or less uniformly among the three stations?

A That is correct, yes sir.

Q I notice, Mr. Davis, on your Exhibit D that you have a treater there to separate the fluid coming from the test station. There won't be any treating of the production at the test stations?

A No sir, we are trying to have all of our treating facilities at one place, at the central storage facility.

Q And the only treating that would be done would be on the test well at the various stations?

A If it doesn't make water, that will be the only treating, yes sir.

Q So that the fluid meter which is downstream from the production separator is measuring water and oil if water is present?

A Yes sir, the purpose of that meter is for trouble-shooting only. In the event we should have a production decline at our central storage, the pumper, by making daily readings on this production separator fluid meter, could easily determine which test station was responsible.

Q And he could eliminate two-thirds of the wells, maybe --

A Yes, sir.

Q By that means?

A Yes, sir.

Q How much gas are the wells in this area making at the present time, Mr. Davis?

A They are making approximately 160 cubic feet per well.

Q And the average ratio --

A Yes sir, that's about average.

Q What is the highest?

A I think about 100 is the lowest and about 300 is the highest.

Q Is it anticipated that the GOR's will go up in this pool?

A Yes, I would say that they would increase.

Q Do you have any idea what the ultimate GOR's may be?

A No sir, I would hesitate to make a guess.

Q Mr. Davis, you stated that you would like to start off with a two-month test frequency. Are you aware that the Commission has in the past authorized several of these installations utilizing dump-tpye meters and positive displacement meters?

A Yes, sir.

Q Were you aware that the Commission, in authorizing those, specified a test frequency of not to exceed thirty days?

A No, I didn't know that.

Q Would you be willing to start with a one-month test rather than two months at the beginning?

Q We would prefer the two-month test by calibration frequency because if we have to calibrate too often, it will increase our operating costs.

Q The Commission has always felt that the experience of the particular meter or the experience that the operator has with the particular meter should be the gauge by which to determine the frequency of the tests on that meter and until such time as enough history has been available on any meter, we feel that tests should be taken at a rather frequent interval. There is a possibility that one month or two months or even six months is too frequent in some cases, whereas in other meters that particular calibration test is more often than one month and it may be required.

A We would not object to starting off with a one month frequency provided it could be changed if it was found that that was too often.

Q All of these frequencies that the Commission has specified are of a temporary nature with a view of extending that time if it is feasible.

A We wouldn't object to that.

Q Have you had any experience at all with dump-type meters?

A No sir, I haven't.

Q I see. So you haven't taken any tests as yet to determine how frequently the test period should be run?

A No, sir.

Q Those figures that you gave which the consulting

engineering firm found to be the per cent of error in the tests is very interesting. I don't know if I got it correct. The average error on 290 tests on dump-type meters was plus four hundredths per cent and minus seven hundredths per cent?

A That is correct.

Q And the range was .98 per cent to a minus 1.64 per cent?

A No, the range varied from plus .098 per cent --

Q .098?

A Yes sir, to minus .164 per cent.

Q Plus .098 to a minus .164?

A Yes, sir.

Q Mr. Davis, you stated that the use of this system would increase the value of the oil by preventing the vaporization of gasses and increasing the gravity. You didn't intend to convey the idea that the test station facilities that you are proposing today would do that, but the LACT system that you have in mind would do that, is that correct?

A No, I feel that the test stations and the one central storage facility will actually increase the gravity over having four separate tank batteries.

Q I see. The advantage then would be of having production going into one tank instead of three or four tanks?

A Right.

MR. NUTTER: Does anyone have any further questions of Mr. Davis?

It not, he may be excused.

MR. STAMETS: Mr. Davis, are all these wells top allowable wells?

A Yes sir, they are.

MR. STAMETS: What provision would be made for keeping these wells within the 125 per cent of the daily tolerance?

A The pumper will be responsible for keeping them within 125 per cent of the daily tolerance.

MR. STAMETS: Will that be a time shut-off or a gauging valve?

A It will be a time shut-off. These are pumping wells and he can determine from tests how much a well is making per day. We can adjust the strokes per minute, the length of the stroke, so that a twenty-four hour producing period will be within the 125 per cent.

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

MR. NUTTER: Any further questions of Mr. Davis?

MR. BRATTON: One further question, Mr. Examiner. The entire royalty interest under this lease is held by the Navajo tribe of Indians?

A Yes, sir.

MR. BRATTON: Have you advised the U. S. Geological Survey of your proposal?

A Yes, we have, and they approved of our proposal.

MR. NUTTER: Are there any further questions of Mr. Davis?

If not, he may be excused.

(Witness excused).

MR. NUTTER: Does anyone have anything further they wish to offer in Case 1542?

If not, we will take the case under advisement and the hearing is adjourned.

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, JERRY MARTINEZ, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript by me, and that the same is a true and correct record, to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 8th day of November, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1542, heard by me on 11-6, 1958.

, Examiner
New Mexico Oil Conservation Commission

Notary Public

My Commission Expires:
January 24, 1962