BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

Case No. 1577

TRANSCRIPT OF HEARING

JANUARY 7, 1959

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BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

Case 1577 Application of Pure Oil Company for permission to install lease automatic custody transfer equipment. Applicant, in the above-styled cause, seeks an order authorizing it to install lease automatic custody transfer equipment to receive and measure the oil produced and marketed from the South Vacuum Unit located in Township 18 South, Range 35 East, Lea County, New Mexico. Applicant proposes to utilize positive displacement meters for measurement of the oil delivered to the pipeline.

Mabry Hall
Santa Fe, New Mexico
January 7, 1959

BEFORE:

Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: The next case on the docket will be Case 1577.

MR. PAYNE: Case 1577, "Application of Pure Oil Company for permission to install lease automatic custody transfer equipment."

MR. HINKLE: Clarence Hinkle of Hervey, Dow and Hinkle, Roswell, New Mexico, representing Pure Oil Company. We have one witness and four exhibits.

I would like to have Mr. Murphy sworn in.

(Witness sworn in).

(Whereupon, the documents were marked for identification

as Exhibits One to Four.)

JOHN R. MURPHY

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name?

A John R. Murphy.

Q Where do you live, Mr. Murphy?

A Fort Worth, Texas.

Q By whom are you employed?

A Pure Oil Company.

Q In what capacity?

A Production Engineer.

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

A No sir, I have not.

Q Are you a graduate of Petroleum Engineering?

A Yes sir, I am.

Q Of what school?

A Louisiana State University.

Q What year?

A 1952.

Q What degree?

A BS in Petroleum Engineering.

Q Have you practiced Petroleum Engineering since your graduation?

A I served two years in the Air Force as a Communication Electronics Officer and the past four and a half years I have worked for Pure Oil Company as a Production Engineer.

Q Have you been in the Fort Worth office during this four and a half years?

A I spent two and a half years in the Delahite District in San Andres County, Texas, and two and a half years in Fort Worth.

Q Does your Fort Worth office have jurisdiction over the Southeastern New Mexico area in their operations?

A Yes sir, we do.

Q Are you familiar with Pure's operations in Southeastern New Mexico?

A I am.

Q Generally?

A Yes sir, I am.

Q Are you familiar with the South Vacuum unit area?

A Yes sir, I am.

Q Are you familiar with the wells that have been drilled in that area?

A Yes, sir.

MR. HINKLE: Are the qualifications of the witness acceptable?

MR. UTZ: Yes sir, they are.

Q (By Mr. Hinkle) We might add this, too: Have you had any experience with automatic custody transfer equipment?

A Yes sir, I have. My work has been primarily concerned with this type of equipment work in the past two years.

Q Mr. Murphy, I wish you would refer to Exhibit One and explain to the Commission what this is and what it shows?

A Exhibit --

MR. UTZ: Just a moment. If you people can't hear back there, there's plenty of seats up here. We have to keep those things running or we'll have pneumonia when we get out of here.

A Exhibit One is a map showing the area around the South Vacuum unit, which is located in Township 18 South, Range 35 East, Lea County, New Mexico. The area enclosed inside the hatchered marks is the area as outlined by the Commission's order and set out as the South Vacuum unit. The area that is enclosed by this is the south half of Section 26, the southeast quarter of Section 27, the northeast quarter of Section 34, all of Section 35, the northwest and southeast quarters of Section 36 and the north half of the southwest quarter of Section 36.

Q When you refer to the South Vacuum unit, you mean the unit agreement, do you not?

A Yes sir, I do.

Q Has that unit agreement been approved by this Oil Conservation Commission?

A Yes sir, it has.

Q And also by the Commission of Public Land?

A Yes sir, it has. Both of them approved the unit agreement on September 9, 1957.

Q What is the character of the land included in the South Vacuum unit, are they State lands, Fee lands or Federal lands or what?

A Both State and Fee lands are contained inside of the unit, sir.

Q How much Fee land do you have in the unit?

A There's 160 acres of Fee land.

Q And what is the description of that?

A The Fee lands are in Section 26 and they consist of the west half of the southeast quarter and the east half of the southwest quarter.

Q Have the Fee lands been fully committed to the unit?

A No sir, they are not fully committed, the royalty interests under these lands have not signed the unit agreement.

Q Have all of the other lands, which I believe you said are State lands, been fully committed?

A Yes sir, they have.

Q Does that include all of the wells which have been drilled in the South Vacuum unit?

A Yes sir, it does.

Q Explain briefly to the Commission the wells which have

been drilled?

A The 135 was the discovery well of the South Vacuum-Devonian field and was drilled to the Devonian formation; it is a single completion well. The 235 was the second well drilled on the unit and was drilled to the McKee formation and is a dual completion completed in both the McKee formation, which is a gas-distillate zone, and the Devonian, which is an oil zone. At the present time, Number 335 is drilling.

Q Is the Pure Oil Company the operator of the South Vacuum unit?

A Yes sir, we are.

Q Originally, I believe the Union Company was the operator?

A Yes sir, that's true.

Q And that has been the change, that the Pure Oil Company is now the designated unit operator?

A Yes, sir.

Q How many acres does the South Vacuum unit cover?

A 1640.

Q Are you familiar with the application which has been filed in this case by the Pure Oil Company?

A I am.

Q What is the purpose of the application as it appears in this case?

A The purpose is to obtain permission to install and

operate an automatic custody transfer system for the South Vacuum Devonian production.

Q Have you made schematic drawings of the proposed installation?

A I have.

Q Will you refer to Exhibits Two and Three and explain them to the Commission?

A Exhibit Two is an overall lease flow diagram showing the complete flow pattern as accomplished by the Devonian formation. Exhibit Three is a more detailed schematic diagram showing only the automatic custody transfer metering skid.

In order to best describe the operations of the system, I will trace the flow pattern completely through from the wellhead through the delivery point to the pipeline. The oil flows from the wells to a centralized header and on each well's flow line at the centralized header is a gas-operated diaphram valve which has the gas controlled by a solenoid valve. In this manner we are able to obtain an electrical control over the opening and closing of this valve and have an electrical control as an emergency system shut-down. From this point, the well stream is then routed through the manifold and from there to the header treater to separate the oil, gas and water, or it may be routed through a metering separator in order to perform well tests. After the oil has passed through the metering separator and is metered and sampled, it is then put back into the well stream, the

composite well stream, with the rest of the produced fluid and into the treater.

All of the oil from the lease will be produced through the heater treater to insure that nothing but clean oil is put into the system surge tank. The surge tank in this case functions primarily as an accumulation chamber to the metering system so that a quantity of oil will be gathered before it is delivered to the pipeline and it will be delivered in batches. The surge tank is equipped with a ground level reading tank gauge that has a five-point electric liquid level programmer as an integral part of the equipment. Using this electrical control feature, control signals can be obtained from three points in our surge tank. The bottom point, which is a point approximately one foot above the pump suction outlet on the tank, or the pipeline outlet, is the "pump-off" signal point. The next control point in the tank is the "pump-on" signal, which is at a point nine to ten feet above the "pump-off" signal and it is in the upper part of the tank. The top signal point is the emergency high level shut-off point, which is approximately one foot below the top of the tank. This serves the function that should the oil rise in the surge tank to this point, a signal will be sent to the solenoid valves on the flow line diaphram valves and close them in and prevent the waste of oil by overflow of the surge tank.

To deliver oil to the pipeline, the oil has to rise in the surge tank to the "pump-on" float position. When this signal

is received in the control box, the electric motor of pump "H" is started and at the same time a signal is sent to the solenoid of the diaphram of the system, shut-in valve "P", to allow this valve to open. The oil is pumped from pump "H" through a BS & W monitor "I" to insure that it is a pipeline quality.

Next in the flow system is a strainer --

Q Let me interrupt you there. What is the function of this monitor, what does it do?

A The monitor serves to insure that only pipeline quality oil is delivered to the pipeline. That is, that no excessive amounts of water will be delivered.

Q What happens if a bad grade of oil is going through?

A If the amount of water is in excess of that set on the monitor, it will shut the valve "P" in so that no oil will be delivered to the pipeline. This will cause the oil to rise in the surge tank to the point that the emergency high level shut-in will shut the well in.

Downstream of our monitor "I" is a strainer which is noted by the letter "J." This strainer serves to remove any extraneous material which may be in the fluid which would be harmful to the meter. The next thing in the flow stream is a deareator marked by the letter "K." The function of the deareator is to remove any possible entrained gas which may be in the flow stream so that the most accurate measure may be obtained by the meter.

The meter, positive displacement meter, is marked by the letter "L." The meter has been equipped with certain auxiliary equipment. It has an automatic temperature compensator and a horizontal non-reset counter and a set stop counter, a motor control switch and an electrical impulse counter. The functions of these various equipments are: The temperature compensator is to correct the volume of oil as measured by the meter going at a 60-degree reading. The horizontal non-reset counter is to record the volume of oil that has passed through the meter. This meter has--or this counter has no device which may be re-set, so that it is essentially tamper-proof. The set stop counter has the function of allowing a certain quantity or volume of oil to be set on the meter and when this quantity has passed through the meter, it will then, by mechanical means, close the motor control switch. The motor control switch is tied in parallel electrically with the control circuit on electric motor "H" and the solenoid to the diaphram on valve "P." When this switch closes, it shuts valve "P" and also shuts off the motor "H," the motor to pump "H," thereby assuring that no further oil will pass. This allows us to have a control as to the amount of oil that will be passed by the system and give an allowable control in this manner. Downstream--or there is one other feature to the meter and that's the electrical impulser; this is tied as a safety feature wherein this is connected to the metering or the recording mechanism of our meter and every time that one barrel of oil is passed through

the meter, it will cause the electrical impulse transmitter to pulse once which will reset a time delay relay in the power circuit of pump "H." Should the time set on this time delay relay in the meter fail to deliver a barrel of oil to the pipeline, it will break the power circuit on pump "H" and it will be closed and it is also tied in parallel with the diaphram control colenoid on valve "P." The function of this is so that should the counter mechanism on the meter be broken or fails to operate or should the pipeline not be receiving oil, that the system would be shut down.

Q What is the type or kind of meter that you propose to use?

A The meter we propose to use is an AO Unit 212.

Q But is it a positive displacement meter?

A Yes sir, it is a positive displacement meter.

Downstream of the meter is the vertical riser in our system, which is inserted at the sampling nipple of our sampler, a Texsteam Type 3700 samplepump. This is a gas-operated type of pump and will be a continuous type of a sampler. The gas to the sampler is controlled by a solenoid valve and will be open only with motor "H," or pump "H" is running, thereby sampling continuously during the time that the oil is being delivered to the pipeline. By use of a centrifugal pump, it is felt that a continuous rate or an equal rate of oil is being delivered at all times, and in this manner, a continuous safety test that the

oil that is being delivered will be a composite and true sample of the oil that is passed through the meter. The sample is stored in a shop-made, vapor-proof container which has a volume of approximately twenty gallons. This sample container will be equipped with a sample centrifugal pump and a circulating line so that everything will show out on the sample. The whole sample contained inside of the container will be circulated to insure that an evenly mixed sample is obtained from the sample container for the shake-out. The Texsteam type sampler has two possible adjustments as to the quantity of oil which may be taken by it, both a volume control and a speed control, both of whichare adjustable.

The next thing in our flow stream is our proving manifold "N." It is proposed in this system to use the master meter type of proving for our system and it will be accomplished through this proving manifold. The last piece of equipment in the system is "K," an automatic shut-off and back pressure valve which is equipped with a diaphram head. This valve will serve three purposes in our system. Number one, by use of the diaphram head, which exerts pressure of seventy pounds on the valve, it is a positive shut-off for the system. Two, the valve serves as a back pressure valve and will hold a regulated amount of back pressure on the system to assure that the surge tank oil level does not drop below a point so that air could be pumped through the meter, and three, it serves as a check valve between the

producer's equipment and the pipeline equipment. The pipeline equipment is to be equipped with automatic starting devices so the transfer of oil will be completely automatic.

Q Is all of this equipment standard equipment and equipment recognized by the industry as acceptable for this purpose?

A Yes, sir, it is.

Q Is there anything unusual about this type of installation?

A No, sir.

Q Is this the same type of installation that has been used in other cases, or similar?

A Basically, it is the same, sir.

Q Has this same type of installation been approved by the New Mexico Oil Conservation Commission in any cases that you know of?

A Yes, sir.

Q Do you know what those cases are?

A Yes sir, it was approved by Order Number 11-10, which authorized the Shell Oil Company to use positive displacement metering on custody transfer in the Pearl-Queen Field, Lea County, New Mexico. It was also approved in Order Number 10-29, which authorized the Shell Oil Company to use positive displacement meters for automatic transfer of oil in the Carson unit area, San Juan County, New Mexico.

Q Both of those orders were entered in 1957?

A Yes, sir.

Q Now, are you asking that this installation apply to any other oil production other than the Devonian?

A No sir, we are not.

Q Are you requesting that this installation apply to the whole unit area?

A No sir, we are requesting that it apply to the unit area with the exception of those Fee lands contained in Section 26 which have not executed the unit agreement. We would like to request, however, that should these interests execute the unit agreement, that the area covered under this order may be extended administratively to include the total unit area.

Q Who is running the oil from the unit wells at the present time?

A The Texas-New Mexico Pipe Line.

Q Have you taken this matter up with the Texas-New Mexico Pipe Line to see whether they thought this installation would be satisfactory?

A I have.

Q Have you received any reply from them?

A Yes sir, I have, by letter dated December 31.

Q Refer to Exhibit Four and tell the Commission what it is?

A Exhibit Four is a reply from the Texas-New Mexico Pipe Line to the request of the Pure Oil Company for a letter stating that they approved the system or would accept the system that we have

proposed for automatic custody transfer for the South Vacuum-Devonian oil.

Q In your opinion, will the proposed installation of automatic custody transfer equipment effectively and accurately measure the production from the Devonian formation from the unit wells?

A Yes sir, it will.

Q Have you any recommendations to make to the Commission as to the frequency and manner in which tests of the metering system should be made?

A Yes sir, I do. It is recommended that due to the experience of the Pure Oil Company and of other operators who have used this type of equipment, that the meters be proved monthly for the first three months, and if there is no appreciable amount of drift in the calibration factor, that it be proved semi-annually thereafter.

Q Have Exhibits One, Two and Three been prepared by you or under your direction?

A Yes sir, they have.

MR. HINKLE: We would like to offer in evidence Exhibits One through Four.

MR. UTZ: Without objection, Exhibits One through Four will be accepted.

MR. HINKLE: I believe that's all.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Murphy, it is my understanding that when your BS & W monitor closes valve "P," which in turn causes your wells to be shut in by the surge tank filling up, that it actually shuts in the whole system of the well, is that correct?

A Yes sir, it will close the diaphram valve, motor valve on the wells' flow lines and shut in the production.

Q Are all of these wells flowing wells?

A Yes sir, they are.

Q So that there will be pressure from your header to the wellhead?

A Yes sir, there will be.

Q Is there any plan to protect your system from possible breakage, line breakage, between the header and the wellhead?

A The initial flow line on the 135 is a tubing flow line and it is in considerable excess of anything that is expected to be encountered. We do not have any type of protective device on the wellhead itself, however.

Q Will it be possible to install such a device?

A Yes sir, it would.

Q Would it be practical?

A Yes, sir.

Q In the instance that I have just stated regarding to the shutting in of the valves at the wellhead, or at the header,

rather, the system has to be put back into operation manually?

A Yes sir, it does.

Q You would do that by cleaning the surge tank and --

A Yes, sir.

MR. UTZ: Are there any other questions of the witness?

MR. FISCHER: Yes.

MR. UTZ: Mr. Fischer?

CROSS EXAMINATION

BY MR. FISCHER:

Q On this surge tank, that closes that top control point from your end there, closes in the header directly, it by-passes the header, it has nothing to do with the separator or the treater, it goes directly to the motor valve on the header?

A That is correct.

Q Each motor valve?

A That is correct.

Q Is there any chance for pressure build-up between the motor valve, each motor valve in your header and the surge tank in your system?

A No sir, there is not.

Q You don't have a pressure pop-off of any sort between that and your surge tank, do you?

A No, sir.

Q As I understand it, your system is electrically controlled and also controlled by gas?

A It is electrically controlled and controlled and controlled by gas and electrically operated.

Q Where do you derive your gas?

A The gas will be taken either from the treater on the Devonian side or from the McKee gas, whichever proves more practical.

Q Do you have a gas flow in the flow treater?

A Yes, we do.

Q In any one of these valves here between "H" and "P," if certain conditions are true, they will shut off "P," is that correct?

A There actually is only one valve in there and that's "P," the rest of them are auxiliary and protection devices for either non-merchantable oil or protection to the meter.

Q Well, that's what I mean, if each condition of each piece of equipment there as you set in the equipment initially, if each condition is not met, it will shut off "P"?

A That's true.

Q Thank you very much. Oh, one other question. Has the Texas-New Mexico Pipe Line stated to you the minimum amount of oil that they will take?

A No, they have not. It is our desire, however, to deliver in the larger quantity so that we will not have such an intermittent surge on our pumps.

Q Well, then the minimum amount of oil then, as I understand

from your diagram, would be from the one-foot shut-off to the level of the nine or ten-foot intermediate in the surge tank?

A True.

Q How many barrels would that be?

A That's a five hundred barrel total, so it would be approximately three hundred and fifty.

MR. FISCHER: Thank you very much.

MR. UTZ: Mr. Murphy, do you have intentions of drilling a 3-35 well?

A I do not know on that, sir.

Q You do have one McKee-Devonian now, a 2-35, however?

A Yes, sir.

MR. UTZ: Have you previously had authorization to commingle the McKee with the Devonian?

A No sir, it is not our intention to commingle fluid, we still plan to deliver manually to the pipeline the concentrate from the McKee well.

MR. UTZ: I see. And it is your request in this application to commingle the entire South Vacuum unit and the Devonian section?

A Yes, sir.

MR. UTZ: With the exception of the Reeves interests?

A Yes, sir.

MR. UTZ: Are there other questions?

MR. STAMETS: Mr. Murphy, in the event that the non-merchantable oil was to develop, would that oil be re-cycled through

the treater?

A Not automatically, we may do it manually. It is our feeling that any time you get non-merchantable oil in the surge tank that you have a treater malfunction, and to automatically re-cycle that, all it would do is to create a more unbalanced condition than already exists in your treater.

MR. STAMETS: However, are there any lines there or just how would that oil be recirculated?

A At the present time there are none because the system is not installed yet, but there will be either a line laid back to the treater for a recirculating line or arrangements made to treat the oil out by a truck or some various other means that are available. There will be a drain line off the bottom, however.

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

MR. UTZ: Mr. Murphy, will it be possible to drill more than sixteen Devonian wells in this unit?

A It is not anticipated, sir, that there will be that many in the unit.

MR. UTZ: So you are not asking for any exception to Rule 309?

A No, sir.

MR. UTZ: Are there other questions?

MR. FISCHER: Do you have any idea of the amount of water that's produced totally so far?

A Approximately eight to eleven barrels a day from the 235.

MR. FISCHER: Do you plan to get in the Sinclair disposal well in that area?

A I am not prepared to answer that because I don't know.

MR. FISCHER: That's all.

MR. UTZ: Any other questions?

If there are no further questions, the witness may be excused.

(Witness excused).

MR. UTZ: You offered your exhibits, I believe?

MR. HINKLE: Yes, I offered them.

MR. UTZ: Are there other statements to be made in this case?

If not, the case will be taken under advisement.

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 was reported by me in Stenotype and that the same was reduced to typewritten transcript by me and contains a true and correct record of said hearing, to the best of my knowledge, skill and ability.

DATED this 21st day of January, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Notary Public

My Commission Expires:
January 24, 1962

ILLEGIBLE

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1577, heard by me on Jan. 7, 1959.

....., Examiner
New Mexico Oil Conservation Commission