BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE NO. 1587

TRANSCRIPT OF HEARING

DEARNLEY - MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE NEW MEXICO
Phone CHapel 3-6691

February 4, 1959

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

Application Cabot Carbon Company for an oil-oil dual completion. Applicant, in the above-styled cause, seeks an order authorizing it to dually complete its J. L. Reed Well No. 2 located 660 feet from the North and East lines of Section 35, Township 13 South, Range 37 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the King-Wolfcamp Pool and King-Devonian Pool through parallel strings of 1½ inch tubing. ) CASE NO. 1587

BEFORE:

Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: We will proceed to Case 1587.

MR. PAYNE: Case 1587. Application of Cabot Carbon Company for an oil-oil dual completion.

MR. CHRISTY: Sim Christy, of Hervey, Dow & Hinkle for the Applicant, Cabot Carbon Company. We have one witness, Mr. Daniel.

(Witness sworn.)

MR. UTZ: Are there other appearances to be made in this case? If not, you may proceed.

J O E M. D A N I E L, J. R., a witness called by and on behalf of the Applicant, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY: MR. CHRISTY:

Q Will you please state your name and address, please.

A Joe M. Daniel, Jr., of Pampa, Texas.

Q By whom are you employed and in what capacity?

A Cabot Carbon Company as their senior petroleum engineer.

Q Have you previously testified before the New Mexico Oil Conservation Commission as an engineer in matters similar to this application?

A Yes, sir.

MR. CHRISTY: Refer the Examiner to a prior hearing on a dual completion matter that Mr. Daniels testified to. Are his qualifications satisfactory?

MR. UTZ: If previously qualified, yes.

Q Are you familiar with the matter contained in the application in this Case, Case 1587?

A Yes, sir.

Q Now, will you please explain to the Commission the purpose of this application, what you seek by it?

A The application is to dually complete as an oil-oil well using two tubing strings the Cabot Carbon Company's J. L. Reed Well No. 2, which is located 660 feet from the North and

East lines of Section 35, Township 13 South, Range 37 East, Lea County New Mexico, in the King field. This well is currently producing from the Devonian formation.

We propse to perforate the 5-1/2 inch casing oppostie the Wolfcamp formation from 9247 feet to 9290 feet, from 9300 feet to 9309 feet, from 9315 feet to 9319 feet, and from 9373 feet to 9386 feet, and conduct a production test through straddle packers on each perforated zone.

If the Wolfcamp intervals are productive, we will have a temporary bridging plug at approximately 9400 feet which will separate the Devonian and Wolfcamp formations in the well bore. The Wolfcamp intervals will be produced until the equipment for the dual completion can be obtained.

After arrival of the dual completion equipment, we propose to set packers at approximately 9400 feet and 9200 feet and produce each zone through 1-1/2 in tubing.

Q Now, I notice that you mentioned an additional zone of 9373 feet to 9386 feet, and I don't believe that this is shown in your application, is that correct?

A That is correct.

Q Now, this additional zone is in the Wolfcamp Pool?

A Yes, sir, and we desire to test this interval for oil production.

MR. CHRISTY: With that statement in mind, that it is a part of the same King Wolfcamp Pool, we move to amend the

application to show the additional interval to be perforated and to amend Exhibit 2 of the application to that extent also. The revised Exhibit 2, Mr. Examiner, that you have in front of you to show the additional interval. The initial application did not do so.

MR. UTZ: Is there objection to the amendment of the application as stated? If not, it will be so amended.

Q (By Mr. Christy) Now, Mr. Daniel, have you conducted tests on this well?

A Yes, sir.

Q Now, will you please explain the manner of current completion of this well and the tests taken and the results thereof?

A The subject well has 5-1/2 inch casing set at 12,440 feet and cemented with 300 sacks. Top of the cement behind the pipe was found to be 10,000 feet by estimation of fillup. The well was then rat holed to a total depth of 12,590 feet. The open hole section in the Devonian formation was completed natural and on the initial potential test taken November 20th, 1956, the well produced 312 barrels of 47 degree API corrected gravity oil in 12 hours through a 23/64 inch choke.

The open hole Devonian section is currently producing water and oil. A recent production test indicated the well will make 189 barrels of oil and 61 barrels of water per day. We plan in the very near future to plug off the open hole section by setting a bridging plug at 12435 feet. The 5-1/2 inch casing will be

perforated from 12,068 feet to 12,084 feet and from 12,314 feet to 12,339 feet opposite the Devonian formation and thoroughly test. At least a portion of the Wolfcamp is believed productive by a DST taken while drilling from 9214 feet to 9220 feet. On this DST the tool was open 2 hours, gas to the surface in 90 minutes, recovering 292 feet heavy gas-cut mud, 90 feet free oil, and 1864 feet heavy mud-cut oil, estimated 75 per cent oil. The flowing pressures were 120 pounds to 800 pounds with the 20 minute shut in pressure being 3320 pounds.

Q Now, have these tests that you have taken indicate that the well is susceptible to production of oil in more than one zone?

A Yes, sir. The subject well was completed and is still producing from the Devonian horizon. A portion of the Wolfcamp horizon was indicated to be productive by the previously mentioned drill stem test. However, the Wolfcamp zones we propose to perforate have not been extensively tested in this well, nevertheless a study of the logs indicates these Wolfcamp intervals to be oil bearing. The procedure for the dual completion work over will permit thorough testing of the Wolfcamp prior to ordering our dual completion equipment. The work over proposed was set out in the application.

Q Now, will this proposed dual completion permit you to meet offset obligations and protect correlative rights?

A Yes, sir. The subject well is offset by two direct and two diagonal Wolfcamp producers on other leases.

Q Now, I refer you to Exhibit 1 and ask you if you will identify and explain it.

A Exhibit 1 is a plat of the King Pool showing the location of our J. L. Reed Well No. 2, and further shows all offset wells, their producing horizons, and offset property owners.

Q Now, I refer you to Exhibit 2 and ask you if you will please identify and explain it.

A Exhibit 2 is a diagrammatic sketch showing the proposed mechanical completion of the well in question. We propose to perforate and complete in the Wolfcamp horizon between the depths of 9247 feet and 9386 feet. A Baker Model D permanent type packer is to be set at approximately 9400 feet. This packer will separate the two pay zones in the casing. The 1-1/2 inch tubing through which to produce the Devonian will be run next. We will have some 2700 feet of 2-3/8 inch non-upset tubing as tail pipe below the Model D packer. Above the Model D packer seating element we will have 200 feet of 2-3/8 inch EUE tubing which will be externally wrapped with fiber glass and plastic to protect this interval from abrasion. The upper packer will be a Baker Model GB packer, to be set at approximately 9200 feet. This packer will be run on the first string of tubing. Above the upper packer we will run approximately 9200 feet of 1-1/2 inch tubing with Hydrill CS couplings. After the Devonian string of tubing is in place with the upper packer set, we will run the short tubing string to the Wolfcamp pay. The upper tubing string will also be 1-1/2 inch with Hydrill CS

couplings. The top 5000 feet of each tubing string will be internally coated with plastic for paraffin control.

Q Now, are these two reservoirs involved separated in the well behind the casing?

A Yes, sir, they are separated by some 3000 feet and 300 sacks of cement. However, we plan to perforate and squeeze below the Wolfcamp horizon as a safeguard.

Q Now, are all the fresh water zones and other producing horizons protected?

A Yes, sir. We used 2300 sacks of cement behind the intermediate 8-5/8 inch casing set at 4590 feet. The cement behind the 312 feet of 13-3/8 inch surface casing was circulated to the surface.

Q Now, in your opinion, do you feel that there is a possibility of communication or migration of fluids between the Wolfcamp and Devonian in the annulus between the casing and the well bore?

A No, sir.

Q In your opinion, is the proposed dual completion installation in accordance with good engineering practices and principles?

A Yes, sir.

Q Has this type of dual completion installation proven successful in actual field tests?

A Yes, sir.

Q Is this type of proposed dual completion customarily used

in Lea County, New Mexico?

A There are quite a few dual string installations using 2 inch tubing in Lea County. However, I understand there are very few installations using 1-1/2 inch tubing. Cabot Carbon Company has one 1-1/2 inch dual string installation in operation in New Mexico, which is a north offset to the subject well, and I understand that Humble has been granted permission for an inch and a half dual completion.

Q Would you explain Cabot Carbon's experience with this 1-1/2 tubing in the dually completed well you spoke of a moment ago?

A On April the 28th, 1958, Cabot Carbon Company received permission from the New Mexico Oil Conservation Commission to dually complete their H. L. Lowe B Well No. 1, King Field. This was in Case No. 1365, Order No. R-1126-A. On July 22, 1958, the work over to produce the Wolfcamp formation was completed. The Devonian was temporarily plugged off. The Wolfcamp potentialled for 207 barrels of pipeline oil in 24 hours on a 14/64 inch choke. The Wolfcamp produced its allowable of oil with no water until the dual completion work over was started on September 10, 1958. At completion of the dual installation, the Wolfcamp was swabbed for two weeks without flowing due to excessive water production. The Devonian was then swabbed in and placed on production. Gas lift valves were installed on the Wolfcamp tubing string and production restored on November 6, 1958. The water and oil production gradually decreased. The first day on gas lift operations, the well produced

119 barrels of oil. By December 8, 1958, the production had reached 10 barrels per day. On December 9, 1958, a swabbing test recovered 50 barrels of fluid, 50 per cent water, and the fluid level remained at 6000 feet during swabbing test. The valve settings were redesigned and the valves relocated as a result of the swabbing test. The new valves were placed in operation on January 6, 1959. Since January 8th we have been varying the gas injection volume and time cycle. The daily oil production has varied from 27 to 90 barrels per day and will average 45 barrels of oil and 30 barrels of water per day.

Q Now, I refer you to Exhibit 3 and 3-A and ask you if you will please identify those and explain them.

A These exhibits are graphic presentations of production and pressure history for the H. L. Lowe B well No. 1 using 2 inch tubing and 1/1/2 inch tubing.

Q Now, what have been the producing characteristics of the well using 1-1/2 inch tubing for the Devonian pay in the H. L Lowe B Well No. 1?

A I can best answer this by referring to Exhibits No. 3 and 3-A. Exhibit No. 3 is a graphic presentation of the four production tests taken while 2 inch tubing was in the well. This well, while producing 250 to 300 barrels per day, required a 12/64 or 13/64 inch choke and the tubing pressure was 600 to 650 pounds. The gas-oil ration varied from 800 to 1400 cubic feet per barrel. Exhibit No. 3-A is a plot of the same data using

1-1/2 inch tubing. It can be noted that while producting 250 to 300 barrels per day, the tubing pressure has been 725 to 950 pounds and the choke size has averaged 11/64 inch. The gas-oil ratio has varied from 522 to 2727 cubic feet per barrel, but in November averaged 1050, in December averaged 976, and in January, 1959, averaged 965. A study of these graphs has indicated to us that 1-1/2 inch tubing is more efficient than 2 inch tubing for our conditions; that is, for wells with a gas-oil ratio of around 1000 cubic feet per barrel and producing 200 to 300 barrels of oil per day from 12,000 feet. We explain this by the fact that we have several hundred pounds greater tubing pressure while producing at approximately the same production rate and GOR and using a smaller size choke. We believe this is the result of less friction loss in the small tubing because we have less slippage of gas through the oil while being lifted vertically. This means we can sustain flowing conditions longer with small tubing because a lower bottom hole flowing pressure will be required to lift the fluid.

In the last 17 months, our shut in bottom hole pressure has declined 110 pounds, which probably reflects a similar decline in our flowing bottom hole pressure, and yet we have observed greater surface flowing pressures.

Q Why has Cabot Carbon Company proposed using two strings of 1-1/2 inch tubing when other operators use 2 inch tubing?

A It is a matter of clearance. In wells with 7 inch

casing, it is possible to use two strings of 2 inch tubing. Our well was originally completed with 5-1/2 inch casing, and it is a physical impossibility to get two strings of 2 inch tubing in 5-1/2 inch casing.

Q Now, I refer you to Exhibit 4 and ask you if you will please identify and explain it.

A Exhibit 4 is a tabulation of the clearances between 5-1/2 inch and 23 pound casing and various combinations of tubing sizes. The 5-1/2 inch 23 per foot casing is used in this tabulation because it is the heaviest casing in our well, and is located in the top 1012 feet of our long casing string. All tubing run into this casing must pass through this heavy casing. The outside diameter of all 5-1/2 inch casing is the same, and the heavier weight casings have greater wall thickness, and therefore, the heavier casings have a reduction in inside diameter. The API has required all manufacturers of casing to guarantee a certain minimum inside diameter, called drift diameter. In other words, all casing of a certain size and weight has an inside diameter that can be no less than a prescribed minimum. For 5-1/2 inch 23 pound per foot casing, this inside drift diameter is 4.545 inches. Various combinations of tubing are used to give the clearance available when running the second string of tubing into the hole after the first string is already in place. It must be pointed out that the collars on the second string of tubing must pass the collars on the first string already in the well when running the second string into the

hole. This is when you have a minimum clearance between the two collars and the casing.

Q Well now, could you use one string of 2-1/16 inch OD tubing which, I believe, has an inside diameter of 1.75 inches, and one string of 1-1/2 inch tubing, instead of using two strings of 1-1/2 inch tubing, which has, I believe, an inside diameter of 1.61 inches?

A We could run a string of 2-1/16 inch tubing, internal diameter of 1.75 inches, to the Devonian and a string of 1-1/2 inch tubing, internal diameter of 1.61 inches, to the Wolfcamp. This installation would be satisfactory as long as both zones were flowing and would give a clearance of .102 inches. This is reflected in Case 1 and 5 on Exhibit 5. When it becomes necessary to artificially left the fluid from the Wolfcamp, we would have to remove both the strings and replace them with 1-1/2 inch tubing in order to run gas lift valves. It is our opinion that the Wolfcamp will require artifical lift in the reasonable near future. Exhibit No. 4 shows five various possibilities, and we believe it, together with the performance of the 1-1/2 inch tubing in the Lowe B Well No. 1, will show that the most effective and efficient tubing combination under the existing physical possibilities is as outlined in this application.

Q Now, how do you propose to lift the fluid from either or both pays when artifical lift is required?

A We propose to gas lift the oil. Gas lift valves are

available for 1-1/2 inch tubing. Therefore, we will be able to artificially lift the oil from either pay or both pays with gas lift. We will obtain our gas from our King field gasoline plant. We have obtained assurance from gas lift manufactures that we can lift large volumes of fluid from these pay depths when and if necessary.

Q Have you ever considered using rod pumps as a method of artificially lifting the fluid when it becomes necessary?

A Yes, we have, but that will require 2-1/2 inch tubing to lift the required volume from our pay depth. The 2-1/2 inch tubing would mean that only one zone could be produced at a time.

Q Will the surface equipment be so designed and installed that the reservoirs will be separately produced and their fluids separately tanked and gauged for absolutely no commingling?

A Yes, sir, each producing zone will have its own separator and storage facilities.

Q Now, do you feel that the dual completion technique requested in this application, is it recognized and accepted in general by the oil industry and other state regulatory bodies?

A Yes, sir.

Q Well now, do you feel that corrosion would be a possible objection to your proposed manner of dual completion?

A No, sir, we have observed no corrosion in the King Pool.

Q Does this dual completion technique possess any more possibility for leakage or communication of the reservoirs than

any other accepted method?

A No, sir.

Q Will Cabot Carbon Company be willing to make packer leakage tests, separation tests, and other tests which might be required by the Commission to determine if there is any commingling or leakage?

A Yes, sir.

Q Under the proposed method of dualing, is it possible to take bottom hole pressures on each separate zone, and if so, please explain how?

A Yes, it is possible. A bottom hole pressure bomb can be run to the bottom of the long string of tubing, within 50 feet of the Devonian formation. A bomb can be run to the top of the upper packer in the short string of tubing, or within some 100 feet of the Wolfcamp formation.

Q Well now, will it be possible to check at frequent intervals for leakage across the packer separating the two pays?

A Yes, sir. As stated before, we will have separate facilities for each pay. The Wolfcamp pay will possibly have an oil gravity of 38 degree to 42 degree API and the Devonian pay has an oil gravity of 47 degree API. This difference in gravity will provide a daily check for leakage, because any change in gravity will be noted by operating personnel and/or pipeline gaugers.

Q Have you made an estimate of oil reserves that will be recovered from the Wolfcamp formation in this well?

A Yes, sir, I believe the recoverable oil reserves to be in the order of some 85,000 barrels.

Q What will it cost to drill a twin well to the J. L. Reed No. 2 to the Wolfcamp?

A Approximately $175.000.

Q All right, what would it cost to dually complete the subject well?

A Approximately $67,000.

Q Now, what are theeconomics involved when comparing the expected recoverable oil reserves with the cost of obtaining this oil from the Wolfcamp?

A The value of one barrel of oil to us after our royalty and tax is $2.20 per barrel. If we assume 40 cents per barrel for lifting cost, which is reasonable, the revenue to be received from our expected oil reserves in the Wolfcamp is $153.000. If we drill a twin well, we would not get our money back. If we are permitted to dual the subject well, a reasonable profit may be expected.

Q In your opinion, do you think that the ultimate oil recovery from the Devonian formation will be reduced as a result of this dual completion?

A No, sir, the ultimate oil recovery from the Devonian will not be affected as a result of this dual completion. I base this on two facts: One, the producing efficiency using small tubing will improve flowing life of both pays, and when necessary,

we can artifically produce either or both zones to depletion, and two, it is expected that the Wolfcamp will have a shorter producing life than the Devonian. Therefore, when necessary, we will plug off the Wolfcamp, and produce the Devonian by any approved method.

Q All right. Now, if this application were not approved, how could correlative rights in this instance be protected?

A Only by drilling a twin well on the same 40-acre tract, which would not be economical.

Q Were exhibits one, two, three, and four prepared by you?

A Yes, sir.

Q Or under your direct supervision?

A Yes, sir, and they are identified as Exhibits 1, 2, 3, and four.

Q Do you have a log on this well?

A Yes, sir, and they are identified as Exhibit 5 and 5-A. Exhibit 5 is a microlog on Well 2, Exhibit 5-A is an electric log on Reed 2.

MR. CHRISTY: We offer in evidence Applicant's Exhibits 1, 2, 3, 3-A, 4, 5, and 5-A.

MR. UTZ: Are there objections to the entrance of Cabot Carbon Company's Exhibits 1 through 5-A? If not, they will be received in the record.

MR. CHRISTY: We have no further question from this

witness, Mr. Examiner.

CROSS EXAMINATION

BY: MR. UTZ:

Q Mr. Daniel, what did you say the gravity was in the Wolfcamp?

A 38 to 42, and the Devonian, 47.

Q Did you state the pressure for the Wolfcamp?

A No, sir, I didn't. The drill stem test indicated 3320, but that's the upper portion of that interval.

Q What is your pressure in the Devonian?

A Currently, from the test taken in November -- October rather, of '58, it was 4588, I believe. Approximately 4588.

Q And both of these crudes are sweet?

A Yes, sir, both are sweet.

Q Will you tell me what the top of the cement is on your 8-5/8?

A I believe that was circulated to the surface.

Q Twenty-three hundred sacks?

A I believe it was circulated to the surface, sir. Let me check it. 8-5/8?

Q Yes.

A I don't have the top on that. I just have twenty-three sacks.

Q It was not circulated?

A Evidently not, but it was circulated to the surface.

Q I believe you stated the top of the cement on your 5-1/2 --

A On our 5-1/2 we calculate it by fillup, and it was 10,000 feet, but we did not run a temperature survey.

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

MR. PAYNE: Yes, sir.

EXAMINATION BY MR. PAYNE:

Q Mr. Daniel, you will attempt to gas lift either or both in the event it becomes necessary?

A Yes, sir.

Q Now, in this H. L. Lowe B No. 1 well in which you have the twin strings of 1-1/2 tubing--

A Yes, sir.

Q --are you artifically lifting --

A Yes, sir, we are gas lifting the Wolfcamp.

Q You don't contemplate having to gas lift the Devonian within a relative short period of time, are you?

A No, sir, not with the pressure we have, unless water breaks through sooner than we expect.

Q And this H. L. Lowe Well also has 5-1/2 inch casing?

A Yes, sir.

Q Do you think it is mechanically feasible to gas lift from both zones simultaneously?

A It would be efficient, but not possibly as efficent as if you had one string, but we could probably get -- Well, I wouldn'

say exactly what we could recover, but we could lift probably a hundred to a hundred and fifty barrels of fluid, two hundred barrels of fluid from each zone.

Q Do you contemplate that during the life of this well you will have to gas lift both zones simultaneously?

A No, sir, we think that the Wolfcamp will be depleted before we will ever have to consider artifical lift for the Devonian.

MR. PAYNE: That you, that's all.

EXAMINATION BY MR. FISCHER:

Q Mr. Daniel, if the top of your cement is at ten thousand feet, your perforations are going to be in the nine thousand foot --

A As I stated, we plan on perforating and squeezing below the Wolfcamp formation before we start perforating the pay in the Wolfcamp.

Q And the only day to day packer leakage check you will have is the gravity check?

A That's true.

Q But you will perform normal packer leakage tests so far --

A Initially, and then when we put in the new string of gas lift valves in, in January, we have to run another packer leakage test.

Q Could you explain how you would perform your packer leakage test with your gravity valve in there please, on the

presently dually completed well?

A I do not know the exact mechanics, I have the charts that they took on the well at the time of the tests, but I do not know the exact procedure that they used.

Q As I understand it, will you perforate your pipe for Wolfcamp production after, I mean, prior to setting your lower Baker packer?

A Well, we plan on setting our packer and testing it to make sure that it is sealed and then that will probably be after we do our squeeze job.

Q Yes, sir.

A And then we will set a packer and then we will perforate each one of the four intervals and test them separately, but it will be after the bridging plug is set.

Q When you perform this squeezing --

A Set our bridging plug.

Q --and set your bridging plug, will you pressure test your perforations before you squeeze.

A Yes, sir.

Q Then go back in and set your Baker packer?

A That's right.

Q Pressure test it for leaks?

A That's true, and then we will start our testing of the Wolfcamp.

Q It is not shown on the diagram, but both of the strings of tubing will be pulled, plugged,or have a spring collar of some sort.

A I am sure the bottom one will. The upper one has a restriction on it due to the sealing element that nothing could fall through but the bottom will have a bull plug.

MR. FISCHER: Thank you.

EXAMINATION BY MR. UTZ:

Q Mr. Daniel, is there any difference between the mechanics of this dual completion and the one on the Lowe One B?

A To my knowledge it is almost identical, except for the depth variation.

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

MR. CHRISTY: For the record, Mr. Daniel, in response to a question a moment ago, I believe you stated two separate leakage tests were taken on the Reed No. 2.

A I mean on the Lowe B,excuse me.

EXAMINATION BY MR. PAYNE:

Q Mr. Daniel, which well is deeper, this one or the Lowe B. No. 1?

A Total depthwise?

Q Yes.

A Let me check on that. Plugged back total depth.

Q Oh, plugged back total depth?

A Yes.

Q All right.

A The Lowe B 1 has casing set at 12,320 feet, and then was drilled out open hole to 12,307 feet.

Q So actually it is very similar to this?

A Yes, sir.

MR. PAYNE: Thank you.

EXAMINATION BY MR. FISCHER:

Q Mr. Daniel, in your Lowe 2 then, your Lowe 1 B rather, your Devonian is produced from the open hole?

A Yes, sir.

MR. FISCHER: Thank you.

MR. UTZ: Any other questions? If not the witness may be excused.

(Witness excused.)

MR. CHRISTY: That is all for the applicant?

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

MR. CHRISTY: I have registered return receipts of service on all of the offset operators. I don't believe it is requested under the Rules, but it was suggested by the attorney for the Commission.

MR. UTZ: All right. No further statements in this case, the case will be taken under advisement and the hearing is adjourned.

STATE OF NEW MEXICO )
) ss
COUNTY OF BERNALILLO )



I, Joseph A. Trujillo, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings 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 12th day of February, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

NOTARY PUBLIC

My Commission Expires:

October 5, 1960

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1577, heard by me on 2-4, 1959.

, Examiner
New Mexico Oil Conservation Commission