BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE 1897: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Cities Service Oil Company to appear and show cause why the use of the dual-zone pumping equipment should not be discontinued in the State "P" Well No. 3, located 990 feet from the South and West lines of Section 32, Township 22 South, Range 38 East, Blinebry Oil Pool and South Paddock Pool, Lea County, New Mexico.

BEFORE:

A. L. Porter
Murray Morgan

TRANSCRIPT OF HEARING

MR. PORTER: The hearing will come to order, please. We will proceed with Case 1897.

MR. PAYNE: Case 1897. In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Cities Service Oil Company to appear and show cause why the use of dual-zone pumping equipment should not be discontinued in the State "P" Well No. 3, located 990 feet from the South and West lines of Section 32, Township 22 South, Range 38 East, Blinebry Oil Pool and South Paddock Pool, Lea County, New Mexico.

MR. KELLAHIN: If the Commission please, Jason Kellahin, Kellahin and Fox, Santa Fe, New Mexico, representing, I wouldn't

call it the applicant in this case, representing Cities Service Oil Company. At this time I would like to make a brief statement. This is a rather unusual situation which has arisen, and apparently due to some degree of misunderstanding brought on the part of the Cities Service Oil Company and staff of the Oil Conservation Commission.

As the Commission knows, by the provisions of Order R-1298-A, the installation of dual-zone pumping equipment in the Cities Service Oil Company's State "P" Well No. 2 was approved on a one year trial basis. Among the provisions in the order were that tests be made; however, the order itself sets up no tests, and I believe that was done by memorandum from the Commission. Theses tests, of course, have been made on a monthly basis by Cities Service since the installation of this equipment.

As another provision in the order, however, there was a requirement that at the end of the year, the equipment be removed from the well and pressure tested while the lower polished rod was in motion through the seal assembly. In the month of December, toward the 28th, I believe the 28th of December, the Commission was notified by letter that it was going to be necessary to remove this equipment and suggested that a member of the Commission staff be present when this was done. On the date the assembly was removed from the well, the Commission's office in Hobbs was notified by telephone, however, they were, I believe, in Santa Fe on that date and were not present when the assembly was pulled.

Now, at that time the equipment was taken out of the well and some degree of corrision was found on the polished rod. As any normal prudent operator would do, Cities Service felt that they should replace that polished rod and did so. The polished rod was then taken into Hobbs and was at that time cut under circumstances with which I believe the Commission is familiar, and therefore, it has been impossible to make the type of test required by the order. The section of the polished rod which was cut out is here and will be displayed to the Commission.

The monthly tests which have been filed by Cities Service Oil Company on the operations of this installation are in the Commission files and indicate that no commingling has occurred in this well.

Subsequent to the removal of this rod, tests had been performed on it, the results which will be given to you today, and they also indicate that there has been no communication in the pump assembly as a result of the use of this type of equipment.

Now, this is something new in the State of New Mexico, it is true. It is an economical and efficient means of pumping two zones, and it is of tubing value where one of the zones or the other is low in productivity. It enables the company to recover a greater amount of oil ultimately than would otherwise be recovered because of the economic features of it. It has certainly proved to be efficient, and it is approved and in use in practically all the other oil producing states.

I feel that Cities Service is pioneering the thing in New Mexico and it is of benefit to the State and to the production of oil, and we will, of course, urge that the use of this equipment be continued.

We will have one witness, Mr. Gene Motter. We also have present here in the hearing room, in the event any questions are raised about the pumping equipment itself, Mr. Gallien, who testified in the previous hearing in this case and Mr. Watkins who has participated in this case.

In connection with this particular hearing, I would like to offer in evidence the record and its exhibits in Case 1557 which resulted in the Order R-1298-A.

MR. PORTER: If there is no objection to counsel's motion, the record of the previous hearing will be made a part of this one.

MR. KELLAHIN: I would like to call Mr. Motter.

MR. PAYNE: Perhaps we should swear all the witnesses in, in case there are any questions of the other witnesses.

(Witnesses sworn.)

D. F. MOTTER

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Will you state your name, please?

A D. F. Motter, M-O-T-T-E-R.

Q By whom are you employed and in what position, Mr. Motter?

A Cities Service Oil Company, division engineer for the Hobbs Division.

Q You have testified before the Oil Conservation Commission as a petroleum engineer and had your qualifications accepted?

A Yes.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. PORTER: Yes, sir, they are.

Q (By Mr. Kellahin) Mr. Motter, were you a witness in Case 1557 which resulted in the approval of the installation of a dual-zone pump on Cities Service Oil Company's State "P" Well No. 3?

A Yes, sir, I was.

Q Subsequent to the installation of this equipment, were tests made of the operation of this pumping equipment?

A Yes, sir. We installed this equipment in April of 1959 and since that time we have tested it every month.

Q Have you prepared an exhibit showing the results of those tests?

A Yes, sir, I have.

Q Will you have that marked as Exhibit No. 1, please. Referring to what has been marked as Exhibit No. 1, will you state

what that is?

A This is a copy of all the tests that have been run on the State "P" No. 3. We call them segregation tests. These were taken from letters which were filed with the Commission each month. All these figures are on file in the Hobbs Office. Before we go into it, I would like to point out that this is a method of testing which was arrived at after discussion with members of the staff and a memo which they sent down, and it is done in this method:

The pump that pumps on the bottom zone comes up to the cross-over assembly, crosses over to this second string of tubing, and we installed the valve as they prescribed in the flow line in position right here, and also made provisions to put a pressure gauge in the flow line up stream of the valve. This we have done, the same thing, for the upper zone flow line, installed a valve and a pressure gauge. The method of this test is to close the valve on the lower zone of production and keep pumping the well until approximately four hundred pounds of pressure has been built on the pressure gauge, and immediately the pumping unit is shut down and the valve on the upper zone is closed. Those pressures were then recorded instantaneouly and also for thirty minutes. At the end of the thirty minutes, the pressure was relieved and the pump was again put in operation, and the reverse procedure was followed with the upper zone valve being closed; a pressure of four hundred pounds was applied, the pumping unit shut down, and this valve

on the lower zone immediately closed. Pressures were recorded instantaneously, and for the next thirty minutes. Those are all listed here under both the Blinebry, which is the lower zone, and the Paddock, which is the upper zone. Along with those tests we ran gravities on the produced fluids. Now, these gravities were taken from the stock tanks, and we ran BS & W tests on the fluid taken from the flow line in each particular case.

I would like to call your attention to the fact that, for instance, we ran down the Blinebry, the pressure on the lower zone, and that in nearly all cases, in fact I think you'll find in all cases, we would pump this up to four hundred pounds and the pressure on that would increase, and also the pressure on the upper zone would increase indicating that we had some build up probably from gas breaking out of the fluid column in the tubing. When we tested the upper zone with a higher pressure, you'll notice that the pressures did not increase at any time probably because we had enough pressure on there, the gas was not breaking out of solution. However, the pressure on the lower zone did build up, sometimes as much as, I guess, 190 pounds.

In may 1959 another quick run down on the gravities showed that in most cases we had a minimum of two degrees difference, and in most cases ran around four degrees difference. Further check to indicate segregration is the fact that the Paddock zone in the second month, that the well was dualed, started making a considerable amount of water, thirteen percent, and from there on down until in December

it was making ninety-five percent water.

The water production on the Blinebry zone came up back in July and August, and in the latter part of November, the Blinebry started produing less amounts of water and started flowing, giving us a considerable amount of trouble. It kicked off and flowed filling the tanks up, overrunning it one time, and we had to be quite careful in producing this well making sure we had empty tanks so the thing wouldn't kick off and flow on us.

I think that was probably caused on account of this water decrease on the Blinebry zone. Now, at the same time when we had to stop producing the well every day, we were unable to keep the water completely pumped off of the Paddock Zone, and you'll see that the watter cut there in December was ninety-five percent.

On the 7th of December, we went down and ran a potential on the Blinebry and that zone flowed 60 barrels of oil in four hours. We knew it was then necessary to do something to the well so that we could continue to pump the Paddock, and also the Blinebry, and control that production. There is some equipment out called a traveling over-load value, which I think was discussed in the previous hearings, and we had made up our minds as soon as we could get this equipment, to pull the equipment out of the well and install this traveling over-load value on the bottom of the pump. About three days after this GOR test was ran, we made our monthly segregation test, and as you'll note, on the upper zone test of December 10th, the pressure bled from 25 pounds down to zero.

Normally it built up some, any where from one hundred pounds or greater usually. We went over and pressured up our upper zone to three hundred and fifty pounds, and it bled off to zero in thirty minutes. This is not really very alarming. We thought maybe we had sand in the standing valve and washed out, we really didn't give it much particular thought, but we filed a letter with the Commission, as Mr. Kellahin stated, I believe it was in December, latter part of December, giving all the figures on this test, around on the 10th, and also stated that we were going to pull this equipment to install this over-load valve. We retrived this equipment, I think it was around the 13th or 14th of January, and when we got it out, we found that the polished rod was badly pitted, and also the tubing on the upper string we found three holes. I think the upper most one was found at about four thousand feet, and two holes were in a joint immediately above the cross-over assembly. This equipment was out of the hole for approximately a week to ten days and finally we ran a new polished rod and new bushings in the cross-over assembly and also completely tested all of the tubing and replaced any that we thought was necessary, and ran the equipment back in the well.

Q Was the Commission notified at the time this operation was performed?

A Yes, the Hobbs office was called. It is my understanding that both Mr. Ramey and Mr. Engbrecht were in Santa Fe at the regular hearing. We installed the new equipment on January the 22nd and

did not pump the well to any extent. We did about three days later go down and pressure up on both zones just to make sure we had no leaks in the tubing and that is not a regular test, a prescribed test, that was merely to check on our tubing strings.

On February 9th we went back in and tested the new equipment as prescribed, and it showed, at least to my satisfaction, that we have absolutely no evidence of commingling.

Q Now, after the installation of the new equipment and the test as prescribed by the Commission of this equipment, do you find any significant difference between the results of those tests and the results of the tests of the equipment as it formerly was?

A No, sir, they are almost identical. I would like to point out one small feature. I believe the memo states that we are to pressure the zones to four hundred pounds. This traveling over-load valve that is placed in this bottom pump is controlled by shuting this valve at the surface, and if I recall the figures correctly, when two thousand pounds of pressure is exerted on the valve down here, that it opens up and the pump reciprocates without pumping. That means that we had to have approximately two hundred pounds of pressure at the surface to close the standing valve if the column was nearly full of fluid.

On our next test where we were able to build it up to three hundred fifty pounds before the over-load valve opened, apparently we had more gas in the column and we were able to get a little more pressure on it.

Q Now, in your opinion, these tests show that no commingling has occurred as a result of the dual zone pump?

A No, sir, there is absolutely no commingling on account of the dual zone pump.

Q The trouble encontered in the well was, had nothing to do with the pump, is that correct?

A That's correct.

Q It was due to a leak in the casing?

A Leak in the tubing.

Q Tubing, I mean.

A When we pulled the equipment to run this over-load valve.

Q Do you have any production history on the well, Mr. Motter?

A Yes, sir, I have an exhibit here that indicates the production from this well from the time it was completed both as a single and dual.

Again, these figures are the same, they are filed on our C-115's with the Commission. This indicates down here in December of 1959, at the time we were shut in that, actually, we didn't shut the Paddock zone, but yet the Blinebry went ahead and flowed nearly at top allowable.

Q You stated a while ago that the occurrence of water in the Blinebry had caused some problems. Have you anything to add to that statement?

A Yes, we were a little skeptical about the Blinebry. It may be watering out quite rapidly, and I think we will find within the next few months that what oil we get out of it would be more or less a salvage operation.

Q In your opinion, would that situation justify installation of what might be termed conventional pumping equipment for each horizon?

A No, sir, I believe that we probably would have to give it more careful consideration, but just a first-hand look, I think we probably would abandon it.

Q Under the provision of Order R-1298-A, Cities Service was required to notify the Commission any time that it was necessary to remove the dual zone pumping equipment. Was the pumping equipment removed at any time other than that which you testified about?

A No, sir.

Q Now, the operator is required to make such tests as the Secretary-Director of the Commission shall prescribe. Have those tests been made?

A No, it was almost impossible to make tests as prescribed in the order. However, we did apply some tests to the equipment that you see on the table.

Q I'm not referring to that, I'm referring to tests of the equipment in the well.

A Yes, sir, we have complied with all the tests required

in the memo.

Q Now, the order further required that at the end of one year's service this equipment would be pulled and tested in operation. Is it possible to make that test now?

A I would say no.

Q What was done with the equipment after it was removed from the well?

A This equipment was removed from the well bore and as you see, the polished rod was cut in two and we can no longer make tests required by the Commission due to the fact that we cannot stick this polished rod its full length, which would be sixty inches maximum through the seal assembly. You see, we only have about three and a half feet of the polished rod available.

Q Were any tests made of that polished rod?

A Yes, sir, we made some tests on that polished rod. We were unable to reciprocate the rod, however, we did put this equipment in a new housing and pressure was applied to one end of it. I'll admit our tests were rather crude, made some rather hurried tests one morning at three hundred pounds, and at one thousand pounds with approximately thirty weight motor oil, and we found that with thirty pounds held on one end of this equipment, again it was stationary. It was not moving. We found leakage occurring in the mount of .998 gallons per day at three hundred pounds. At one thousand pounds we found that approximately 2.36 gallons per day would leak through the assembly. This equipment was then sent to

plant in Long Beach where it was manufactured, and they performed further tests at two thousand pounds, and they came up with a little bit greater volume than we did correspondingly, and I believe that the reason for this is that the higher temperature, and of course, the higher viscosity of the fluid, they found that at two thousand pounds that approximately .965 barrels per day would leak through the equipment. We subsequently went down and ran some tests after we had installed the new equipment, and actually dropped the bomb here where we have shown it, and recorded the pressures both while the well was pumping and static conditions. We further ran sonic fluid levels on the upper zone and we have arrived at some figure, that in the upper string, we believe there is approximately 810 pounds differential occurring across the pack-off assembly. On a down stroke, we arrived at 508 pounds differential. By applying those two differentials to a curve which we made from these pressure tests, we used twelve hours differential at 810 pounds, and twelve hours at 508, and we came up with approximately one and sixteenth gallons per day that probably is being commingled.

Q Would you consider that degree of commingling significant?

A No, I certainly do not.

Q Now, those calcuations are based upon the tests made in the equipment as it now is, is that correct?

A Yes. I would like to point out that that is made on new equipment. It was a chrome polished rod, and it is pitted, yet

it still has prevented commingling to some extent. I might add that the new equipment is stainless steel, which we feel will not be affected.

Q Are you using any inhibitor?

A I would not say it is being inhibited, we started to run some tests to determine which would be the best inhibitor to use, and I believe we have stopped inhibiting to this day.

Q In your opinion, Mr. Motter, would the tests be the same had pressure been applied to both ends of the rod, would that be the same situation under actual working conditions?

A Well, people who have performed these tests advised us that if we could have applied the pressure tests in the amounts which we arrived here, in other words, say 1750 pounds on one side and 1240 on the other, they feel that there is probably a fluid seal from both sides that way and there may be actually less commingling, could it be measured properly.

Q But that is impossible under the present circumstances?

A Yes, I would say so.

Q Now, in connection with the tests which have been made, Mr. Motter, have you any suggestions as to changes which should be made in the testing procedure?

A Well, in my opinion, I think that the equipment has proved itself to be quite satisfactory, and I would like to recommend that we go to a test procedure now that is set up in Commission Memorandum 30-58 ~~which prescribes tests for dual completions, and~~

packer leakage tests. I would like to refer to this as a segregation test and that the test should be scheduled during the annual gas-oil ratio test period for the lower most zone. I would, if the Commission feels that one year is not quite adequate, I think perhaps twice a year we could make these tests.

Q Have you anything further to add?

A I don't believe so.

Q Were Exhibits 1 and 2 prepared by you or under your direction and supervision?

A Yes, they were.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 1 and 2.

MR. PORTER: Without objection, Cities Service Exhibits 1 and 2 will be admitted in the record.

MR. KELLAHIN: That's all the questions I have, Mr. Porter.

CROSS EXAMINATION

BY MR. PORTER:

Q I believe on your Exhibit 2 it shows production from the two zones in December of '58 and '59. I notice you testified that you were concerned about your increasing water production in the Blinebry zone and it did show a considerable amount of water production in December, but it doesn't in January, it went down to nothing. How do you account for that?

A Well, Mr. Porter, if you will look at Exhibit No. 1,

our BS & W content was only two-tenths of one percent, and normally we do not report any water production for BS & W contents that low.

Q And actually you produced about fourteen barrels a day of oil?

A That's right.

Q During the month of January, but it wasn't in operation for a full month?

A No, sir, from about the 25thof January on.

Q Now, I notice you have quite a fluxuation there in November. You had 407 barrels ,in December you had 821.

A Well, again, that, I think can be explained by the fact that the Blinebry zone was flowing on us and giving us considerable amount of trouble. It took almost constant attention, and rather than have to waste man power, we shut the well in and did not pump it at all. Now, the well will not flow, it needs to be agitated. It will not flow on its own except kick off and maybe flow for several hours.

Q Although it made 821 barrelsduring the month of December, in accordance with company policy, you plugged that off rather than install proper equipment?

A You are referring to the Blinebry?

Q Yes.

A No, I would not plug the Blinebry or the Paddock. To be real frank about this, the Paddock does not reflect the water cut that we had on our test. We got a 95 percent water cut and

yet only reported six barrels. We, of course, in reporting these production figures, this is, I guess, a matter of break down of communication from our engineering to our clerical department, and they apparently used a production figure of the previous month there for water. I might say that water percentage has come down since we started pumping this unit in January, the latter part of January, and I believe the reason for that is that we have been able to lift, keep that water moving and we are getting some oil now.

Q Mr. Motter, do you feel that you stainless steel polished rod will be more corrosive resistant than this which you have used?

A Yes, sir, I most certainly do.

Q Now, how long did you say that this polished rod had been in use?

A It was installed in April of 1959 and we pulled it in January of 1960.

Q About eight months?

A Approximately eight months.

Q You noted the condition of the polished rod?

A Yes, sir.

Q Would you have recommended to your company that this polished rod be reinserted or continued in use and do you, therefore, think that the Commission's requirement in the order of pulling equipment at the end of a year was justified?

A I think the Commission was justified. I most certainly

would not recommend equipment such as this be run back in the well. I will say this, that had we known that this was a corrosive fluid, or I should say this, extremely corrosive, we would have run the stainless steel equipment to start. Now, we did run the packing that you see around this and it is stainless steel. It has been replaced with new stainless steel and also the polished rod is new. Had we known the corrosive condition, we would have run that to start with.

Q Now, this was the same corrosive action which caused the holes in your tubing?

A That's quite true, and I would like to point out one thing. I think we were quite fortunate in the fact that this corrosion occurred in the tubing internally. Had we had external corrosion, we could have readily have had commingling through this upper zone if any holes occurred in that string of tubing. That could have happened to any dual completed well.

Q But you are satisfied with the performance of the pumping equipment down to the time that you had the difficulty and had to have it removed?

A Most certainly are.

MR. PORTER: Any questions of Mr. Motter?

Mr. PAYNE: Yes.

MR. PORTER: Mr. Payne.

EXAMINATION BY MR. PAYNE:

Q Mr. Motter, do you recall testifying in Case 1557 that

the polished rod which was to travel through the packing would be corrosion resistant?

A Yes, sir, to a certain extent the chrome plated rod is considered corrosion resistant.

Q It appears, however, does it not, that it was not corrosive resistant?

A Well, I would say we have an abnormal condition down there. I don't believe you'll find that extereme corrosion condition in very many wells.

Q Now, Mr. Motter, how do you know that the stainless steel rod will prove to be corrosion resistant?

A Well, it has proven its use in other wells in other fields that it is more resistant to corrosion than the chromeelment.

Q Of course this chrome had proven corrosion resistant in other areas in which you tried it, had it not?

A Well, yes, where it was mildly corrosive. We had no evidence at the time this equipment was run in there that this well was going to be that corrosive. In fact, the Paddock zone was produced for four months prior to the running of this equipment and we had no evidence at that time that there was any corrosiveness of the fluid.

Q In fact you testified that the oil was not corrosive?

A Yes, I probably did.

Q Did you not? Now, Mr. Motter, what is the viscosity of the thirty weight oil that you used in your test?

A Oh, I don't think I can tell you that to be frank about it. We didn't even record the temperature that particular day.

Q Well now, do you feel that it is similar to the crude that is produced from this well?

A Until I check the viscosity I would not care to say. I think it is fairly close. I think it can be used for test purposes such as we had to work with. We just had curde conditions with which to work, and it was just a matter of what we had available to use. We could have gone down, I guess, and gotten some of the actual fluid, curde oil, and used it. However, we didn't.

Q Did you change the temperature of the thirty weight oil so it would reflect the same temperatures encountered in the well?

A No, sir, we didn't.

Q Do you feel that you would have had a more adequate test had you done so?

A I would say that if the temperatures were warmer, we may have had more leakage through the equipment, slighlty more leakage.

Q Now, what is the differential pressure, Mr. Motter, in the two zones encountered in this well, the actual working differential pressure?

A Well, I think I told you just a short time ago that the differential -- I believe you mean across the cross-over assembly?

Q Yes.

A That will change from the up stroke to the down stroke. If you will allow me, I'll point out why that is true. On the up stroke the traveling valves in both pumps are holding and the fluid in this column is then against the bottom of the pack-off assembly. The fluid that is on the top of the pack-off assembly is whatever amount of gradient and pressure that is occurring in the actual pumping conditions, or fluid level of the upper zone, I should say. Now, on a down stroke, the standing valves are holding and this column would remain nearly full. There will be some gas in it. The same thing occurs over on the upper zone. This standing valve holds this column almost entirely full of fluid so you have lesser amounts of differential on the down stroke than you do on the up stroke. If these two columns were exactly the same gravity, same amount of gas in solution, you should have, the only differential you should have across this pack-off assembly is actually the length of it, whatever the gradient may be. It could be as small as maybe two or three pounds.

Q Mr. Motter, I believe you testified you had certain difficulties with tanks running over and so forth. Does this lead you to believe that the Commission staff may have been right in the previous hearing when they indicated it might be difficult to regulate the production from each of the two zones?

A I think they might have been, but I think we have corrected that situation now.

Q Now, do you look at your new installation as being a new

type?

A Well, I can't say that it is a new type. I think we put in a new seal and new assembly; everything was the same as it was previously.

Q As I understand, the original installation didn't serve for one full year. Do you feel that the equipment has proved itself on a one year trial basis?

A Well, I can't say that it has proved itself on a one year basis when it only was in service eight months, but to be real frank about it, I think we will find a duplication of these tests for the next year, if you so require these tests.

Q At the previous hearing you had no objection to removing the pump, as a matter of fact, at the end of six months, to pressure test it in motion.

A I was probably talking out of turn without approval of management, but after we discussed this several months ago, it was our feeling at that time that if this equipment were to be removed from the well, that we possibly would lose not only the cost of removing the equipment, but we could lose as much as two weeks loss in production from the well while it was being tested. I think we could possibly have made up the production from the Blinebry zone, but I'm quite sure we could not have made up the production from the Paddock zone, and as you know, I applied for hearing to delete Paragraph 5 of the order to prevent having to pull that equipment. That was entirely our reason for it. We felt that these

tests here were adequate and had proven the equipment to be successful.

Q Of course you found it necessary to pull the equipment anyway, didn't you?

A We had to pull it to run the over-load valve, that's true.

Q Now, do you feel that this equipment is actually economical assuming you found it necessary to pull it every eight months?

A I would say it is, yes.

Q More so than standard duals on pumping equipment?

A Well yes, we have not spent very much money on this well. I'm trying to think. I believe the only expenses we have been out on this well as far as actual expense was some hot oiling we had to do because of paraffin up in the rods and tubing.

Q Do you feel that such commingling as has occurred as was indicated by your test has been due to the pitting in the polished rod caused by the corrosion?

A Well, I certainly think to some extent, if the pitting was on the rod that we would not have had as great amount of fluid pass through it.

Q Is it your opinion then that if you install the stainless steel polished rod, you have even less indication than has been evidenced by your test.

A That's correct.

Q Mr. Motter, do you have the hydrostatic head for both

columns, do you have those figures?

A I testified previously we ran a bomb here both under static and pumping conditions and that was recorded as 140 pounds at 5400 feet. Our fluid level in this upper zone was found to be, by the acostic well sounder, to be 35½ joints of tubing, which I calculated at 1,116 feet, I believe. If you would like the figures I used in determining the differential type pump, I used 36 degree API gravity oil with 40 percent water, and used four-tenths pound per foot gradient.

Q Now, assuming your tests are accurate and the amount of commingling is relatively small as your tests indicate, do you feel that that amount of communication between the two zones would constitute any hazards to either zone?

A No, sir. In fact, I would say that if you went to the extreme and used this pressure of 2,000 pounds where we had .96 barrels per day, of course that's going to have to be cut some due to the fact of the differential change, but I wouldn't even consider that to be a hazard to the zone.

Q It would seem reasonable to assume, would it not, that if the polished rod had been reciprocating when the pressure test was taken, that the amount of communication would have been somewhat greater than shown within a static condition?

A I believe it may have been with this particular rod due to the fact that it is pitted. I believe the pits may have carried some fluid back and forth, but it it had been a stainless

rod and had not been pitted, I do not feel that the leak would have been quite as great.

Q You feel relatively sure that the stainless steel rod will withstand corrosion?

A I certainly do. On top of that, we are inhibiting, or will be inhibiting the zone for corrosion now.

Q Do you consider either or both of these zones relatively marginal?

A I think that we may find this upper zone will be going to water quite soon. I don't think the Blinebry would be considered marginal.

Q Mr. Motter, have you had any problems in this well?

A When we first pulled the rods out of this zone, we ran a swab in joints of tubing and we found a little sand, that was one thing we thought at first may have caused the pressure test to be like it was, thought it might have had some sand in the standing valve which may occur on any pumping well, and normally will flush itself out in due time, and your standing valve will operate again.

Q Of course, if you have a sand problem, even your stainless steel wouldn't withstand that, would it?

A I don't believe that I know of any place where the Blinebry zone carries sand to any extent that it would cause any, I think you call it errosion on the polished rod. To my knowledge I know of no place where there is any amount of sand produced with either of those zones.

MR. PAYNE: I believe that's all, thank you.

MR. PORTER: Anyone else have a question of Mr. Motter?

MR. KELLAHIN: Yes.

MR. PORTER: Mr.Kellahin.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Motter, are you familiar with the laboratory test which was made on this rod, do you have the report on it?

A Yes, sir, I do have.

Q Do you know what gravity oil they used in conducting that test?

A Yes, they used 30 gravity fluid at 80 degrees.

Q And what is the gravity of the fluid in this well, do you know?

A Yes, it runs, the Blinebry runs about 38 and the Paddock runs around 34.

Q Now, the same equipment is in the well today as was originally placed in the well with the exception of the polished rod and packer, is that correct?

A That's correct.

Q Otherwise, the installation is identical?

A Identical, the same.

Q The only difference -- did you install an over-load valve?

A Well, yes.

Q That's the only change that was made?

A Yes.

Q Now, was the removal of the pump in any way occasioned by failure of the pumping equipment?

A No.

MR. KELLAHIN: That's all.

MR. PORTER: Anyone else have a question of the witness? The witness may be excused.

(Witness excused.)

MR. PORTER: Mr. Kellahin, I would like to ask one question of Mr. Watkins.

E. WATKINS

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

DIRECT EXAMINATION

BY MR. PORTER:

Q Mr. Watkins, I assume that you have supervised the installation and watched the performance of such equipment as this?

A That's right.

Q Disregarding this item of corrosion, in your opinion, has this pumping equipment performed satisfactorily in instances, that is, as compared to other instances that you have observed?

A I think it has, Mr. Porter. A lot of installations we have ran in Texas where they sand frac, and pulled a well in three hours after we installed it because of sand, we round-trip the

equipment, clean up the pump, and run it back, and maybe it will run six months or a year before it is pulled again, this well has never been touched otherthan this one pulling job.

Q And that was not because of a failure of the pumping equipment?

A No, sir.

Q Now, have you had other instances wherein you found it necessary or desirable to substitute the stainless steel polished rod for the one originally installed?

A Yes, in the Prentice Pool between Plains and Sundown we used chrome, and it would flake off and stick on your pack-off and then we went to stainless steel with nickel lines and it stopped all of that. It stopped the flaking. In other words, chrome is a good corrosion resistant material, but it is real porous and your hydrosulfide on your sour crude works through that and works out metal and flakes it out.

Q This wouldn't happen to your stainless steel, you think?

A No, sir, it sure wouldn't.

MR. PORTER: Anyone else have a question? The witness may be excused. Thank you sir.

(Witness excused.)

MR. PORTER: Anyone else have anything further to offer in this case? Take the case under advisement and take up next Case 1898.

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, J. 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, the 15th day of March 1960, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Joseph A. Trujillo
NOTARY PUBLIC

My Commission Expires:

October 5, 1960