BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
January 19, ~~1971~~ 1972

EXAMINER HEARING

IN THE MATTER OF:

Application of Fluid Power Pump Company for special rules and a pressure maintenance project, Sandoval County, New Mexico.

Case 4642

BEFORE:

Daniel S. Nutter, Alternate Examiner.

TRANSCRIPT OF HEARING

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date JANUARY 19, 1972 TIME: 9 A.M.

NAME	REPRESENTING	LOCATION
Val R. Reese	Fluid Power Pump Co.	Albuq.
Morris B. Jones	" " "	"
E. R. Manning	El Paso Natural Gas	El Paso, Tex.
Walter F. Lang	Wallen Production Co.	Midland Texas
Wm Durrett Jr	Manning Gas & Oil Co.	Albuquerque
Jason Kellahin	Kellahin & ~~Fox~~	Santa Fe
T. L. SPRINKLE	APACHE EXPLORATION	TULSA, OKLA.
Carroll Hinkle	" "	Roswell
Owen M. Lopez	Montgomery et al	S. Fe
Joe E. Starks	AZTEC Oil & Gas	DALLAS
Lyndon S Eaton	" " "	"
Nina H. Dubbami	R. W. Byram & Co.	Santa Fe
Bill Gressett	N. M. O. C. C.	Artesia
Everett N Walker	Manning Gas & Oil Co	Farmington
James E Kirk	James E Kirk	Albuquerque
Eddie Kendrick	O C C	Aztec
E. A. Schmidt	U. S. G. S.	Durango, Colo.

MR. NUTTER: Case 4642.

MR. HATCH: Case 4642: Application of Fluid Power Pump Company for special pool rules and a pressure maintenance project, Sandoval County, New Mexico.

MR. KELLIHAN: Jason Kellihan, Attorney at Law.

Are you ready, Mr. Examiner?

I would like to call as our first witness Mr. Val R. Reese.

VAL R. REESE

a witness, having been first duly sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR. KELLIHAN

Q Would you state your name, please?

A Val R. Reese.

Q What business are you engaged in, Mr. Reese?

A I am a consulting geologist in Albuquerque, New Mexico.

Q In connection with your work as a consulting geologist, have you handled work for Fluid Power Pump Company, the applicant in this case, in the Media-Entrada Pool?

A Yes.

Q Have you testified before the Oil Conservation Commission or one of its Examiners, and made your qualifications a matter of record?

A Yes, I have.

MR. KELLIHAN: Are the witness' qualifications

acceptable?

MR. NUTTER: Yes.

Q (By Mr. Kellihan) What is proposed by the applicant in Case 4642?

A Our proposal, as shown on the Entrada structure map of Media dome.

Q That has been marked as Exhibit No. 1?

A Yes.

Q I see.

A --is to form or to obtain for 160 acre tract as shown by the red outlines on the map.

Q What is the purpose of the four 160-acre tracts?

You are applying, first of all, for 160 acre spacing in this pool?

A That is correct.

Q You are also applying for a pressure maintenance project?

A That is right. The purpose here is we are finding that our production on the crest of this structure is easily producible, and the sands are in the form of a channel or a trend of a beach trend in the Entrada sand, and are irregular in their currents.

In other words, it is suffering from a direction, probably from northeast to north, curve.

We do feel that we can drain 160 acre tract adequately by producing from the crest of the structure or

close to it, as well as by injecting produced water down on the flanges of the structure.

These four 160 acre tracts are where we feel that initially we have our present known oil reserves, and they may be added to it later.

Q Do you anticipate further development in this pool?

A Yes, we do. The red dots on the structure map are tentative locations, and also the access trend goes south west from the crest of the structure axis, and may have additional locations on it.

MR. NUTTER: You would anticipate productive wells. Are you talking about injection wells?

THE WITNESS: These red dots represent both possible productivity and injection wells.

Q (By Mr. Kellihan) Now, in the four 160 acre units outlined, those two cross section lines, do they not?

A Yes, in the two south tracts they cross the section line into the northwest quarter of Section 23 and the northeast half of Section 22. That would be the north half of the northwest of Section 23.

Q Would you describe the other units, please?

A This unit to the--part of the north half of Section 23 in the northwest north half of the northwest of 23 has the south half of the southwest quarter of 14 included in it, and the southwest 160 acres has the south half of the

southeast of Section 15 and the north half of the northeast of Section 23.

The other, the northeast 160 has the northwest, has the north half of the southwest and the south half of the northwest.

The northwest 160 has the south half of the northeast of Section 15 and the north half of southeast of Section 15.

Q Now, has that area been substantially developed on 160 acre spacing? Do you have more than one?

A No, the present development pattern has been on 40 acre spacing.

Q I see.

A However, there has been presently the number 2 Fluid Power Pump located in the southeast of the northeast of Section 15 would be the first well on this projected 160 acres in the northwest.

Q Would you propose to dedicate each 160 acres to one well?

A Yes, we would.

Q Now, what proposed injection wells do you show on there, Mr. Reese?

A Our present proposed injection wells are outside of this recommended area.

However, if we find that these, that our position does not extend past these four 160 acre tracts, we are proposing

that the Fluid Power Pump No. 2 be converted into injection.

This well at the present time is still testing.

We are setting a pump check on it, and the well is 30 feet to 3 foot structurally to the crest of the structure, and we don't know yet what the well will do.

It is making some oil.

If it should be a marginal well, we propose to convert to an injection well.

If it is to three hundred barrels a day producing, we would no doubt produce it and drill another well to the north and west of it in the same 160 acre tract, or possibly go up to recommended location to the north of the 160.

Q For that reason, do you need an Administrative Procedure for your expansion of the proposed pressure maintenance project area?

A Yes, we would. If we continue to drill outside of this area, we would need Administrative approval on it.

Q How about down to the south now, what are your plans?

A Our plans there on the projected location in the northwest northwest of Section 23 is to drill this well, and if it doesn't encounter production, that would be converted to an injection well.

However, if it became productive, we would then move further south to the southeast of the northwest of 23 and

drill an injection well.

This would need Administrative approval to include that.

Q How about to the east and west of the unit, do you plan to drill any injection wells?

A The well we are considering at present would be a close-in well between No. 2 Hutchinson Federal and the Federal Media No. 2 in the northeast of the southeast.

This well would be drilled primarily to obtain high production and to confirm a sand trend extending southeast from the crest of the dome.

If this sand trend were confirmed, we would then project the locations southwestward, and then outside of the proposed area we would be following the trend of the access.

Q There again you might need Administrative Procedure for expanding the project area?

A Right.

Q Now, referring to what has been marked as Exhibit No. 2, would you identify that exhibit, please?

A This exhibit is an acreage ownership map of the same area, and shows the ownership of Fluid Power Pump Company, the acreage ownership of Fluid Power Pump Company.

The acreage is located primarily in Township 19 North, Range 3 West, Sandoval County, New Mexico.

The same outline of the four 160 acre tracts is pencilled in in red on this map, and it shows that the acreage is owned one hundred percent by Fluid Power Pump Company.

The acreage is all Federal acreage.

The lease numbers are noted on the map, and the same wells are noted on the map as on the structure map.

There is one open KGS tract consisting of 40 acres in the southwest of the southeast of Section 14.

Q That KGS, that is Federal acreage?

A That is Federal acreage.

Q It is unleased?

A It is unleased.

Q The only difference between the proposed project area and the acreage off-setting would be in the overriding royalties; is that correct?

A That is correct.

Q Would all of the royalties be protected under the proposals you have made for development of this area?

A Yes, it would. We would propose to--

Q They would share in production?

A They would share in production under the 160 acre units.

Q As you propose to dedicate?

A Yes.

Q Do you also contemplate unitizing this area for the

development of your pressure maintenance project?

A Yes, we do. We are proposing to follow up this with a proposal for unitization of the approximate, almost the same area or the same area unless by drilling we add to it, which we would add to the area.

However, we do propose to follow this up.

MR. KELLAHIN: That is all.

MR. NUTTER: We will take a brief recess at this time.

(Whereupon, a brief recess was taken.)

MR. NUTTER: The hearing will come to order, please.

DIRECT EXAMINATION
(CONTINUED)

BY MR. KELLAHIN:

Q Mr. Reese, referring to what has been marked Applicant's Exhibit No. 3, would you identify that exhibit, please?

A This is a cross section of the northwest-southeast Cross Media Dome, Title B, Prime B, Double Prime.

It is composed of three wells, Fluid Power Pump Company No. 2, located 2,310' feet from the north line, 330' feet of the east line of Section 15.

Fluid Power Pump Company No. 1, located 330' feet from the west line, 1,980' feet of the south line of Section 14.

The Beard No. 1 Well, located 1,650 feet from the west line and 1,980 feet from the south line, the upper part of

the cross section is the indux electrical logs.

In the lower half is composed of formation density logs.

The distances between these wells is 1,130 feet and 1,320 feet.

Well depths are approximately 5,300 to 5,350 feet.

As shown on the cross section, the gray colored area is shale and then the middle blue colored area is limestone and gypsum.

The lower pattern is Entrada sandstone, and the limestone and gypsum are Todilto in form.

There is a complex interfingering of the limestone-gypsum and sandstone with the Todilto and Entrada.

The Fluid Power Pump Company No. 1 well is located on the crest of the structure and has 45 feet of saturated oil sand above the oil-water contact.

While the No. 2 Fluid Power Pump well off the northwest flange has approximately twelve feet of saturated sand on to the east, the Beard well, where the limestone and gypsum has thickened, there is approximately three feet of saturation.

The lower part Gamma Ray density logs show the porosity, which the porosity checks very well. The porosity is indicated on the right hand side of the logs. There is a porosity scale attached on the middle log showing the

porosity indices of approximately between 23, 24 percent in the sandstone porosity.

I might add, too, on the upper half of the log the perforation in the wells for completion are noted.

For example, the No. 1 Fluid Power Pump well was perforated for 48 feet to a distance of 5264 to 5254.

Q Now, referring to what has been marked as Exhibit No. 4, could you identify that exhibit, please?

A Exhibit No. 4 is the north-south cross section titled A Prime A, double prime, and consists of the same two wells.

Again, the Fluid Power Pump Company No. 2 on the north end of the cross section, of Fluid Power Pump Company No. 1, and then coming southward, the Federal Media No. 1, and further south, Federal Media No. 5, again, it is noted on these cross sections the thickening of the limestone and hydrate section in the No. 5, which completely cuts out the top of the sand in this well.

And through the sand down to a plus 1538, which is the datum for both cross sections.

Again, you can see the interfingering, and the Fluid Power Pump Company No. 1 well is the highest structural well, with the thickening of the limestone in both the Fluid Power Pump Company No. 1 and Federal Media No. 1, and the thickening in the No. 2. Part of the reason why the Fluid Power Pump Company No. 2 well is structurally low in

the sandstone is due to the thickening of the anhydrate limestone section.

The thickening increased from 18 feet in the Fluid Power Pump Company No. 1 to 28 feet in the Fluid Power Pump No. 2 well.

This cross section shows the drill stem test taken on the Federal Media No. 1, which it shows initial flow pressure in fifteen minutes of 634 pounds, and final flow pressure in two hours of 1,674 pounds, and an initial closed-in pressure in thirty minutes of 2,020 pounds, and a final closed-in pressure in one hour of 2,020 pounds.

The cross section also shows a core on the Gamma Ray part of the section in the lower half.

The core analysis showed 24 feet of oil saturated sand with an average of 23.3 percent porosity in the Entrada sandstone.

The upper part crossed eleven feet of the Todilto limestone and seven feet of this eleven feet was saturated with oil.

The porosity was about 3 percent and the limestone anhydrate section was saturated with oil.

For this reason, an estimated two percent additional porosity was assigned in reserves to the Todilto-Entrada section because of fractures.

These are fractures both open and closed type

fracture. Some are very small and some are large, that you can see.

Q But, your main producing formation is the Todilto sandstone?

A The Entrada sandstone.

Q Entrada sandstone?

A Right. It contains the most reserves, the reserves in the Todilto section are minor.

Q But, you are producing from the Sandstone primarily?

A That is right.

Q Could you recognize this reservoir as a type of formation?

A This reservoir is both a combination structural dome type reservoir, where there is a large nose media dome extending northward on the South Blanco, there is a thickening of the Todilto section, which is helping to trap the oil on the outside of the structure against the regional dip upward toward the south.

So this is a combination structural and stratographic trap.

Q Are the wells you are presently producing being pumped?

A Yes, they are all. There is no gas produced from this oil.

There isn't even enough gas to run a pump-jack.

Q Well, what is the producing mechanism then in this reservoir?

A It is a water-dried reservoir. We do produce from approximately four, three barrels of water and one barrel

of oil.

Q On the basis of your experience, has there been any decline in the fluid level in these wells?

A No, there hasn't been. It has been very minor.

Our engineers take continuous fluid level surveys, and we find very little change in the fluid.

Q How much water are you producing?

A We are producing at this time approximately 750 barrels a day, better than 2,000 barrels of water a day.

Q Now, you consider this an active water-drive; is that right?

A Yes, I do, and it has excellent pressures, as shown by the drill stem test.

Q Have any of these wells been cored?

A Yes, there has been five of them cored.

Q Five of them cored?

A Yes.

Q That information is available if the Commission desires it?

A Yes.

Q What permeability does the cores reflect?

A An average of approximately very close to 300 milidarces per foot in the Entrada sandstone.

Q With that kind of a permeability and with an active water drive, in your opinion will one well adequately drain and develop 160 acres?

A I believe it will.

The effect of our heavier and increasing pumping here in the last two months hasn't affected the fluid levels, and I don't--the total milidarces in some of the cores is as much as 10,000 milidarces.

It doesn't seem to be anything that can hold back the fluid.

Q What is the gravity of the oil?

A The gravity of the oil is, as stated on the Permean Statement, thirty-two and a half gravity.

Q In your opinion, will this type of reservoir lend itself pressure maintenance by injecting water onto the flanges?

A I believe it will. We will get a better sweep of the oil from the flanges of this due to the high permeability.

Q Do you think there would be any loss of ultimate recovery due to not injecting water on the flanges?

A There could be, there could be some oil left.

Q Now, referring to what has been marked as Exhibit No. 5, would you identify it and discuss that exhibit, please?

A Exhibit No. 5 is a compilation of well histories. That shows the wells drilled in the Media dome area; when they were drilled; the formation type; and casing records, if any.

The first wells drilled in this area were drilled by Magnolia Petroleum Company, and they drilled three wells

and then left the area.

Then this was followed by drilling by Fluid Power Pump Company, and there were several wells drilled by one by two by Beacon Co., Incorporated.

I won't try and go into detail on this well history.

However, if there is any question on it, I will be glad to go back through.

Q Referring to what has been marked as Exhibit No. 6, would you identify that exhibit?

A Exhibit No. 6 is a statement for December of 1971.

Prior to December we asked the Commission for permission to produce our No. 1 Fluid Power Pump Company well over the allowable in order to try and determine the size of the well, and as a result of their giving us this allowable test, test allowable, why this statement shows a shipment of oil in December which totaled in gross value was $22,250.75 from the Fluid Power Pump Federal Media No. 1 well, and the No. 2 wells on the second page, the producing from the Fluid Power Pump Company No. 1 well, gross value of this is $34,967.65.

This production was obtained from 10,564 barrels of oil shipped during December.

Q Was this information indicated, that a well would be capable of producing the allowable that would be assigned to a 160 acres in this pool?

A Yes, this number one Fluid Power Pump Company well is capable of producing an allowable.

Q For a 160 acres?

A For 160 acres.

Q Referring to what has been marked Exhibit No. 7, would you identify that exhibit?

A Exhibit No. 7 is production information on the wells that have produced from the Entrada and the Media--they are listed No. 1 Media, 2 Media; the 4 Media, and then I don't see the new well, but our producers, the date of completion is noted, and some remarks.

The attached pages to the summary sheet show the detailed month by month production of the wells.

There has been quite a few months when we haven't produced, and this has been due to changes being made in the company, and financing.

At the present time the Fluid Power Pump Company is undertaking to bring these wells to a high rate of production.

Q Now, referring to what has been marked as Exhibit No. 8, would you identify that exhibit?

A Exhibit No. 8 is an estimate of oil reserves.

This reserve was made approximately in June of 1970, and I haven't made a new one because we were still testing on the Fluid Power Pump Company No. 2 well and the No. 4

Federal Media well, and due to the complex interfingering of this limestone and sandstone, at this time I don't know whether this present reserve estimate should be decreased or increased.

However, the reserve estimate is submitted so as to give you some idea of the reserves.

On the last page of this summary, the Entrada sandstone net sand thickness is 21 feet calculated stock tank barrels per acre.

Net sand thickness is 21 feet.

In the Entrada sandstone the calculated stock tank barrels per acre foot in place is 995 barrels, and the calculated stock tank barrels per acre is 20,895 barrels.

The overlying Todilto thickness is 25 feet, with a calculated stock tank barrels per acre foot in place of 222 barrels, and the calculated stock tank barrels per acre in place is 5,550 barrels.

The total reserves on the Entrada-Todilto formation under 469 acres is calculated at 11,001,120 barrels, and using a 33 percent recovery factor, this recoverable oil is estimated at 3,630,370 barrels.

This reserve figure is subject to either addition or deletion in our wells.

Q Were Exhibits 1 through 8 inclusive prepared by you or under your supervision?

A Yes, sir.

Q At this time I would like to offer in evidence Exhibits 1 through 8.

MR. NUTTER: Applicant's Exhibits 1 through 8 will be admitted in evidence. That completes the direct examination of this witness.

CROSS-EXAMINATION

BY MR. NUTTER

Q Mr. Reese, on this last exhibit you were talking about your reserves, actually the reserves are based on all of the wells that you show your average thickness in Table 2 on this exhibit?

A No, at the time the Beard well was not drilled. This reserve was at that time, and the Fluid Power Pump Company No. 1 well was not drilled, nor the No. 2 well.

Q The Beard well shows three feet of takes.

A That is, I believe we lost some reserves and gained some on the Fluid Power Pump Company No. 1.

Q One would increase the average and one would decrease, so they balance out?

A Yes.

Q What did you estimate your recovery factor at, 30 what percent?

A One-third, 33 percent.

This may be somewhat low for water-drive. However,

it seemed to be a reasonable figure.

Q Well, now the bulk of production to date, not counting the old production--well, first of all, we have the production from the old Hutchinson Well No. 1 and No. 2 that Magnolia drilled, and shows two wells together producing something less than 20,000 barrels.

A That is correct.

Q They were abandoned back around 1958?

A That is right.

Q Since then you have completed your Federal Media No. 1, and according to one of your exhibits, I believe, it indicates you produced about 64,000 barrels out of it?

A That is right, 63,947 barrels.

Q You have produced something like 33,000 barrels out of the Fluid Power Pump Company Well No. 1?

A Fluid Power Pump Company No. 1 well--no, let's see. We have produced, last month's production, December production was, or actually oil sold was 10,000.

Q I was going by your Exhibit No. 7, Mr. Reese, and it indicates about 13,000.

A Well, that is it. I don't seem to find that Fluid Power Pump No. 1, but I know that is about right.

Q Then the Federal Media No. 2 apparently has produced around 13,000 barrels; is that correct?

A Yes.

Q So not counting the old Magnolia production, the bulk of your production has come from the three wells, the No. 1 and No. 2 Media and the No. 1 Fluid; correct?

A That is correct.

Q But in determining your area, your triangular area for reserve calculations, it goes beyond those three wells.

Now, was it considered that the Hutchinson No. 1 and No. 2 were depleted prior to the time they were abandoned back in '58, or why were they abandoned?

A I don't know the cause for their being abandoned. I believe quite a lot of it had to do with the isolation of the area and the price of the oil, the distance they had to haul the oil. They would have to haul it clear over near Gallup through Albuquerque, and as far as their being depleted, they weren't depleted, or at least I didn't consider them depleted.

Q Certainly. Between the No. 1 and No. 2 is the location of your No. 1 well.

A That is correct, and the well came in 13 feet high to the old No. 1 Hutchinson well.

MR. PORTER: Mr. Examiner, it might be well to ask the witness what was the daily production of those old wells in '58, approximately.

THE WITNESS: I don't really know. I know that they were probably produced intermittently, especially during bad

weather, and due to the difficulty they had in transporting the oil by roads, there were no paved roads in there at that time.

MR. PORTER: Then low productivity probably was a factor in the determination to abandon the well?

THE WITNESS: I think it was.

MR. PORTER: As well as distance from the market?

THE WITNESS: That is right. I believe it had a great deal to do with it.

Q (By Mr. Nutter) Which well do you currently have on production?

A Fluid Power Pump Company No. 1 well, the Federal Media No. 1, the Federal Media No. 2.

Q So you do have these wells producing?

A Yes, we have the Federal Media No. 4, which we are contemplating working over, and will be covered later.

Q Do you think you have a well in the Beard No. 1?

A I think it is very questionable. We have produced some oil there.

The swabbing rates that we are able to obtain are not high enough to bring in any appreciable oil in the three feet of saturation, it is pretty thin in it.

Q Do your swab tests reveal quite a bit of water?

A Yes.

Q You are so close to the water-oil contact?

A Yes.

Q How about this Fluid Power Pump Company No. 2 up here?

A We have swabbed that well, and we are presently installing a large pump jack on it, and will pump it, the pump jack will be capable of lifting about, I believe, 4,000 barrels a day, and if we get 10 percent or better in the oil, we will consider it economic.

If not, it will make a good injection well.

Q Well, now, it actually has quite a bit--it has got 12 feet of sandstone?

A Yes.

Q But have you previous tests on it been mostly water?

A We have recovered a large percent of water, and we have not measured the oil.

We have been able to visually see it as it comes out on the pit, but we do need to test it at a high rate.

Q What you are doing now is installing the equipment so you can get some high capacity pumping on it?

A That is right.

Q Now, as I understood you, Mr. Reese, it is your proposal to drill the water injection well way up here at the top end of your Exhibit No. 1.

Up there at the top near your ten and eleven you have got two injection wells zoned; is this correct?

A Yes, our proposal at present is to concentrate on the four 160's, and then at a later date we will drill the closure

in the plus 1,600 contour.

Q Well, actually if we refer back to those four 160's, then you currently have a producing well in--first of all, the one in Section 14, being the south half of the northwest and the north half of the southwest. We will call that Tract No. 1, and then directly west of it in Section 15, we will call that one Tract No. 2, and then coming south, that unit would be Unit No. 3, and east of that would be Unit No. 4.

Now, Unit No. 1 there, Mr. Reese, already has a well on it; correct?

A That is correct, Fluid Power Pump Company No. 1.

Q You are experimenting with Beard No. 1, and still attempting to complete it?

A Yes.

Q That would be the second well on that unit? You would have a two-well unit?

A Well, we may convert that to an injection well in the Entrada because it is structurally low. Our hesitation there is that it is pretty close to the No. 1 well.

Q Then going to Tract No. 2, you already have a well that you are experimenting with and going to put the high-lift equipment on that?

A Yes.

Q That would be your No. 2?

A Yes.

Q You mentioned you were going to drill a well, which is the one, I presume, shown by the red dot by the Southeast, southeast of that proration unit.

A That is correct. If we should find that the No. 2 well is a top allowable 160 acre well, we probably wouldn't drill that well.

Q I see.

A We don't know yet. We are at the point where we really don't know what the No. 2 will do.

Q But, if you don't make a good well out of it, then you would drill this one?

A Yes, we would drill that one.

Q The Southeast, east of that proration unit?

A Yes.

Q Then with respect to Tract No. 3, you have your Federal Media No. 2, which is a pretty good well. Was this well directly west of it?

A That would be the location that we would drill to bring that 160 acres up to the top allowable in there and extend our reserve in there.

Q Then with respect to No. 4 unit, you have got the Federal Media No. 1, which is the best well in the pool as far as past production is concerned. And then you mention that you are still trying to complete Federal Media No. 4

directly east of it, which has made a small amount of oil in the past?

A Yes.

Q Doesn't it actually look like one of your units has one well, you are proposing to drill--shouldn't you be speaking of 80 acres rather than 160 acres?

A One reason we are proposing to drill additional wells in the Field, Media No. 1, and the No. 2, the Federal No. 4, all have 4 1/2" casing in them.

We have changed these down.

We have changed the down-hole pumps in them, and we have increased the production from the wells, which time we have made a change, and we are almost at the maximum of what we can produce out of those wells with that size casing in it.

That is one reason why on those wells we were considering coming back and drilling an additional well on the No. 3, on the No. 4, the well log, the core analysis indicate eighteen feet of saturation, and we don't know at this time why it is not producing, except we can't lift the volume.

Q The No. 4?

A On the No. 4.

Q Is it on any of your cross-sections?

A No, it isn't. It is shown on the structure map.

Q Well, it is as low as the Beard, anyway, isn't it?

A Yes--well, it is six foot lower than the No. 1 Federal Media

right to the west.

Those three wells are almost level to Todilto, and the No. 2A produces 1,603; No. 1 Federal, plus 61602; the No. 4 is plus 1,596.

They are remarkably flat right across there.

Structurally the wells should be a producer.

Q Well, now, Mr. Reese, you are not seeking approval for these non-standard proration units at this Hearing, are you?

A You mean where they cross the section line?

Q If the Examiner please, I think it would probably be necessary, as far as they are concerned, to re-advertise the case.

MR. NUTTER: I don't believe they are included in the call to the Hearing.

Q They are not included in the call to Hearing, so I think it would probably be necessary to re-advertise it for that purpose.

However, we would like to submit the testimony on it at this Hearing.

MR. NUTTER: Then the remaining exhibits that you present to us will be presented by another witness.

Are there any further questions of Mr. Reese?

Q Mr. Reese, on the basis of your experience as a producer in this area have you found any reason for producing these wells at high rates on a continual basis?

A Yes, when we first started, like this No. 1 Federal Media, we'd set one 60 pump jack and 4 1/2" casing and we figured on calculated we would lift about 150 barrels of oil per day.

We found with the oil per cent of water that we were producing that we needed to increase that volume in order to make it commercial, and it has been a constant change of equipment too up to these higher rates.

With this type reservoir we don't seem to touch the reservoir capacity with the higher rate production, and we are bringing this into a commercial picture.

Q You found no evidence of water encroachment as a result of your high producing rates?

A No, we haven't. Our fluid levels are remaining approximately at 600 to 700 from the surface and our main problem has been getting big enough equipment.

Q That is all I have, Mr. Nutter.

MR. ARNOLD: I have one.

MR. NUTTER: Mr. Arnold.

CROSS-EXAMINATION

BY MR. ARNOLD

Q Do you have a structure contour map, Mr. Reese, on this area on the base of the Green Horn?

A No, I don't have one.

Q I was just wondering if this structure reflected in the

shallower formation, or do you think this is primarily a stratographic build up or a structural build up?

A One reason why I have all these plus datum on the various formations on the structure maps is to check that question, and I find in the shallower horizons, like the Gallup, that they are a large broad nose, and it does not reflect the underlying structure of the Entrada.

The data doesn't reflect it, nor any of these plus datums.

I find also that there is difference in total thicknesses of the formation, for instance, from the Entrada there is a thick area across the southern part of this, and the thin area up in this interval changes from a thousand feet to 1,110 feet, but overlying formation and--no doubt the green arrows would not reflect the underlying structure.

Q Do you think this primarily is a stratographic or a structural trap?

A It is primarily structural trap with a large upward arching of the Media Dome, and the stratographic trap conditions on it are right for concentrating the oil with a trap on the south side, with a thickening of the limestones as shown on the cross-section.

Q That was the reason I was asking the question.

There seems to be a relationship between limestone thickness, in a position on the structure, as if this

portion were high at the time of the deposition of this limestone.

A There could be, that could be an old structure, buried structure.

Again, it could be the deposition of the sandstone at the same time on the flanges, would be the deposition of gypsum and limestone, but the fact that sandstone was deposited would indicate that it might have been high during a Torisic or older times, and then buried by the younger sediment.

MR. ARNOLD: That is all I have.

MR. NUTTER: Are there any further questions of the witness?

MR. PORTER: I have a question, Mr. Nutter.

I believe you mentioned the figure of 2,000 barrels a day of water production.

THE WITNESS: Yes, that is approximately what we are producing.

MR. PORTER: That is for the whole pool, all of the wells in the pool?

THE WITNESS: No, it isn't. I probably stated that too low.

I was taking oil production at about 750 barrels a day. That would be 25 per cent, or one-fourth, and it is probably--

MR. PORTER: About 3,000?

THE WITNESS: About 3,000, yes, sir, correct.

MR. PORTER: What are you doing with that water at the present time?

THE WITNESS: We are pumping it into the No. 5 Federal Media well to the south, into the horizon.

MR. PORTER: It is not going back into the same producing formation, but it is being injected?

THE WITNESS: It is being injected. We are producing it into the--we plug the No. 5 back to 3,380 feet and fractured the Gallup with a large fracture treatment and tried to produce it.

We made some oil, and since it had this discharge fracture treatment, it looked like it would be an excellent zone to inject into, and we applied for approval on that.

MR. PORTER: I see. Now, I missed some of your testimony earlier about the characteristics of the oil here. Are you producing this oil directly into storage today?

THE WITNESS: Yes, we are, to 300 barrel tanks.

MR. PORTER: And--

THE WITNESS: And 400 barrel tanks.

MR. PORTER: Is it necessary to move this oil in a hurry, I mean, get it out of storage?

THE WITNESS: Yes. That is a good question, because this oil does have a high pour point. It is about 90°, and prior to our insulating the tanks all of the lines, while we had

to heat the tanks with steam generators, and using butane, which is very expensive.

We have now cut our costs of heating the tanks, and since we have insulated the lines in the tanks, the temperature in the tanks is about 138°, and on the logs, the bottom hole temperature recorded on the logs is around 135°, so we are actually getting formation temperature and serving that heat through the insulation right into the tanks, and it is saving us a lot of fuel, and it is making it much easier to transport the oil.

We transported 80 truck loads last month with no trouble on the oil consolidating in the tanks.

MR. PORTER: So, your insulation has worked?

THE WITNESS: It has worked, beautifully. It is about two inches thick.

MR. PORTER: Have you had difficulty transporting the oil out as far as road conditions are concerned?

THE WITNESS: Yes, we have some, as per usual, cloud bursts, and our roads become very muddy, and we have constructed a new road into the area that has stood up in this bad weather.

MR. PORTER: But the volumes that you were producing there, could there be a possibility on account of the road conditions sometimes you might have to shut the well down?

THE WITNESS: We were faced with that, and we did lose some production because of transportation. We couldn't get the trucks out and in without having a bull dozer there.

MR. PORTER: I see. And whereis this oil being trucked to?

THE WITNESS: It is being trucked by Permean, part of it is going to the Vistee Field, where it is being mixed with the migrating Gallup oil.

Part of it is going into Bloomfield, right into the Shell station there.

MR. PORTER: Where is the Vistee Oil Company?

THE WITNESS: It is at the north end of the Vistee Field. I think it is near the plant. Permean has a station there.

MR. PORTER: Eventually, does it go into the Shell, the Fourt Corners pipeline?

THE WITNESS: Yes.

MR. PORTER: Thank you.

MR. NUTTER: Any other questions of the witness?

You may be excused.

MORRIS B. JONES

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Morris B. Jones.

Q What business are you engaged in?

A Consulting petroleum engineer in Albuquerque.

Q In connection with your work as a consulting petroleum engineer have you done any work for Fluid Power Pump Company in regard to Case 4642?

A Yes.

Q Have you ever testified before the Oil Conservation Commission or one of its Examiners and made your qualifications a matter of record?

A Yes.

Q Are the witness' qualifications acceptable?

MR. NUTTER: Yes.

Q (By Mr. Kellahin) Mr. Jones, referring to what has been marked as Applicant's Exhibit No. 9, would you identify that exhibit?

A That is a summary of the drill stem tests taken on the Entrada Formation on four separate wells in the Entrada area, and the main reason for this is to show the consistency of the shut-in pressures which the +2,000 or 2,010 seems to be a consistent pressure on the Entrada Formation through this area.

Q That is consistent with an active water drive reservoir, is it?

A Yes.

Q Referring to what has been marked as Exhibit No. 10, would you identify that exhibit?

A After we completed these wells we ran fluid level surveys to see how our reservoir pressures held up, and the rate of production indicated there had been no appreciable drop in the fluid level since we started producing the No. 1 well, Fluid Power Pump No. 1, at the bottom of the sheet shows a lower fluid level, but I think this is because of the high rate of producing in this well.

We have seven casings set in No. 1, and three and 3/4" down-hole pump. We are capable of lifting approximately three to four times the amount of fluid that we are from Media 1 and 2.

However, Media 1 and 2 are probably capable of this same fluid, but mechanically because of the casing size we are not able to do it.

Q In your opinion, if the Fluid No. 1 well were shut in, would that fluid level stabilize at the same level as the other well?

A Yes, we are sure it is a consistent level because we have a rod and tubing pack in this well. We have shut down the fluid within about 100 feet of the surface, and it seems to be at a constant level.

Q Referring to what has been marked as Exhibit No. 11, would you identify that exhibit?

A That is the water analysis. This is produced into the Gallup and the analysis is made by the New Mexico State

University, and their comment here is that it is not water that is usable for any other purpose, such as irrigation.

Q Now, that water would be re-injected into the Entrada Formation if this Application was approved; is that correct?

A That is produced Entrada water and would be re-introduced into the Formation.

Q That would be compatible, of course, with the Formation?

A Yes.

Q Referring to what has been marked as Exhibit No. 12, would you identify that exhibit?

A This is an analysis of the produced Entrada well. This is a faulty base crude oil with a pour point of nine, or 90, or 92°, absolutely no gas with it, none produced at all.

We have 100 per cent water drive reservoir.

Pour point asphaltic base oil.

Q What is the gravity?

A Corrected to 60°. It is 32.5 API gravity.

Q Now, Mr. Jones, you are familiar with the operation in this pool, are you not?

A Yes.

Q You have been out there and examined these wells?

A Yes.

Q Is there a difference in the casing in the various wells?

A Yes, the original wells of the three producing wells, Media 1 and 2, have 4 1/2" casing in it, and the most recent

completion, which is Fluid Power Pump No. 1, has 7" casing; and the reason for this is mechanically we need to be capable of lifting a large volume, and in order to economically dispose of the water.

Q Now, what volumes of water are you producing?

A At this time 2,500 and 3,000 barrels a day from three wells.

Q You would anticipate this might increase, would you not?

A Over a period of time so far, we don't show any increase. If we had additional wells, of course, we will have additional water.

Q You have no increase in water production in the present wells?

A Not that we can tell.

Q Which would indicate there has been no water encroachment on the high on account of the high production rate?

A That is correct.

Q The main reason for the high production rate is economic, as I understand your testimony?

A Yes, two reasons: One, in order to dispose of the water, the water disposal cost is pretty much in fixed amount. The more we dispose of, of course, the less price per barrel; second, on the point that Mr. Porter brought up earlier, if we produce at low rates and this oil stays in the tanks for two or three days before it moves, before we would have a load, and it tends to jell on us and we can't

get the oil from the tanks, so we need to keep the GA rate of hot oil going into the tanks to keep them so it would be fluid and can be moved.

Q You heard Mr. Reese' testimony in regard to the porosities and permeability and the active water drive.

Are you in agreement with his conclusions there?

A Yes.

Q In your opinion, in a reservoir such as this, will one well adequately drain and develop 160 acres?

A Yes.

Q Will this reservoir be suitable for pressure maintenance projection as outlined by Mr. Reese?

A Yes, I believe so.

Q Do you think that will enhance the production from the reservoir?

A Yes, I think it will give us a better sweep of the area.

Q If there is not, do you believe that there would be oil left in the reservoir that could be recovered?

A Yes, it is possible with a reduction of pressure that we could leave the trapped oil.

Q Now, you have examined the date on Exhibits No. 10, 9, 11, 12; have you not?

A Yes.

Q In your opinion, do they reflect the information they purport to show?

A Yes, they do.

MR. DURRET: I would like to offer Exhibits 9, 10, 11 and 12.

MR. NUTTER: Exhibits 9 through 12 will be admitted in evidence.

CROSS-EXAMINATION

BY MR. NUTTER

Q Mr. Jones, Exhibit No. 10 is a sheath of tests on the various wells to determine fluid level, etc. There is no volume given.

Could you give me a recent test on each of the wells and the volume of oil and water that has been produced on those tests?

A I can give an approximation.

Q Well, as long as you can.

A On No. 1 and 2, producing into a common tank battery, and all of these I can give you the oil production and water production, as approximately three times that amount.

No. 1 and 2 together produced between 240 and 280 barrels.

I believe the No. 1 well would be responsible for 140, and No. 2 would be 100 barrels on the Fluid Power Pump No. 1.

Q How much water?

Don't you have any actual tests on these wells, Mr.

Jones?

A I have just been there the last three or four months when the wells were shut down. This 140.

The tests on the individual wells, which have an approximation on the water of a 3 to 1.

We put meters on our water, but it is from the two combined wells.

Q But, all of these tests that have been made to determine these Fluid wells, they didn't measure up to your production coming out of the wells while they were doing it?

A No, we shot these fluid levels in the annulus with the wells shut-in or just shut-in, and then showed to the Fluid well.

Q You didn't know the rate that the well actually was producing other than this 140 barrels, and this 100 barrels, just approximately?

A Between 1, 2, that approximation is within, well, just a smaller percentage of them, because if one well is down, the No. 1 well, it is hard to establish a rate, because we have been trying to have larger and larger equipment.

At the present time it is producing 20 to 22 barrels of oil per hour, with 60 to 70 barrels of water per hour.

That is with the latest pumping equipment we have.

We have reduced it because we got to the point our pump equipment was so large it wouldn't fall. We were

producing 600 barrels of oil and 1,800 barrels of water.
Q How Fluid Power Pump Company No. 4?
A No. 4 hasn't been produced.
Q That is the one that sits over to the east there, and it is not producing, right?
A Right.
Q Now, this water-oil ratio that you mentioned three times as much?
A It applies to all the wells. It is a consistent ratio. We put meters on the 1 and 2 water outlets and on the Fluid Power Pump No. 1, and adjusted for small variations during the day, it comes out to a consistent 3 to 1 on all wells.
Q Are there any other questions of Mr. Jones? You may be excused.

Do you have anything further, Mr. Kellahin?

MR. KELLAHIN: Just a moment, please, sir. One other question.

Q (By Mr. Kellahin) Mr. Jones, have you had any problems with sand in connection with these high rate pumps?
A Yes, we have. That is one reason we have had to remove the pump from the Fluid Power Pump No. 1.

We are pulling in sand into the well stream, and it is cutting our pumps.

Q What do you plan to do about that?
A We now have sand pumps or a Barton Ring Plunger pump. We

have just run back into No. 1, that should, if not remedy the problem, at least slow it down.

MR. KELLAHIN: That is all.

MR. NUTTER: Does anyone have anything they wish to offer in Case 4642?

I do have a letter I would like to read in its entirety into the record.

It is from Richard S. Morris of Santa Fe, with the law firm of Montgomery, Federici, & Morris. I will let you copy it.

January 17, 1972

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Honorable Elvis A. Utz, Hearing Examiner

Re: Case No. 4642, Application of Fluid Power Pump Company for Special Pool Rules and a Pressure Maintenance Project, Sandoval County, New Mexico; Examiner Hearing of January 19

Gentlemen:

This firm represents Mrs. Billie Robinson and Mr. L. Claude Roark, who are the owners of overriding royalty interests in the NW/4 of Section 23, Township 19 North, Range 3 West, Sandoval County, New Mexico, which lands lie within the pressure maintenance project proposed by Fluid Power Pump Company in the subject case. Mrs. Robinson and Mr. Roark also own overriding royalty interests in the NE/4 of said Section 23, and in the E/2 NW/4 of Section 22, and in other lands in the vicinity of the proposed pressure maintenance project.

It is our understanding from the application in this case that Fluid Power Pump Company intends to drill a water injection well in the SE/4 NW/4 of Section 23 to be used in connection with its proposed pressure maintenance project covering portions of Sections 10, 11, 14, 15, 22 and 23, Township 19 North, Range 3 West, Sandoval County, New Mexico. Our clients do not own any interest in the lands covered by the proposed pressure maintenance project other than the overriding royalty interest in the NW/4 of said Section 23. At the present time, there is no producing well located in the NW/4

of Section 23, and under the proposed pressure maintenance project a water injection well, but no producing well, would be located on that quarter section.

On behalf of Mrs. Robinson and Mr. Roark, we object to the proposed pressure maintenance project unless the applicant is willing to unitize the project or dedicate proration units across the section line common to Sections 14 and 23 in such a manner as to protect the correlative rights of our clients.

As part of its application, Fluid Power Pump Company seeks the establishment of 160-acre oil proration units for this area; however, the SW/4 of Section 14 already has been developed on 40-acre spacings. In view of the wells that already have been drilled in the SW/4 of Section 14 and the absence of producing wells in the NW/4 of Section 23, we would suggest that a 160-acre proration unit be established consisting of the W/2 SW/4 of Section 14 and the W/2 NW/4 of Section 23. Of course, another alternative for protecting my clients' correlative rights would be for the applicant to drill one or more producing wells in the N/2 NW/4 of Section 23 as direct offsets to the wells in the S/2 SW/4 of Section 14, depending upon what spacing is adopted for this pool.

If necessary for the protection of my clients' correlative rights, we request that the decision on the subject application be postponed until such time as the additional or supplemental applications are filed and heard pertaining to unitization of the pressure maintenance project or the establishment of non-standard proration units covering the SW/4 of Section 14 and the NW/4 of Section 23.

Very truly yours,

/s/ Richard S. Morris

RSM:F

cc: Mr. Jason W. Kellahin
Attorney at Law
P. O. Box 1769
Santa Fe, N. M. 87501

MR. NUTTER: Now, with respect to that last request, Mr. Kellahin, he is asking a decision on the subject Application be postponed until such time as additional or supplemental Applications are filed and heard pertaining to unitization.

Do you know of any Applications that are pending pertaining to this?

MR. KELLAHIN: There are no Applications pending.

We propose to limit the area. We hadn't progressed to the point of having a unit agreement as yet.

The other problem, I think, the acreage involved here as shown by our exhibit will be included in producing 160 acre tracts, as requested by the writer of the letter, Mr. Morris.

Wasn't he saying that they owned the acreage, that they would be dedicating an injection well, but not to any producing well.

MR. NUTTER: That would be true if the injection well were drilled in the south. What would it be in, 23, southeast of northwest quarter. But there will be a producing well in the north half.

MR. KELLAHIN: This is the well that was proposed to be drilled in which Mr. Reese testified to if it was productive, then the injection well would be drilled out of that?

THE WITNESS: That is correct.

Q But, if it wasn't producing, it would be an injection well, it would be an injection well.

A It would be an injection well. I think we would have to go forward with the unitization of the projection in order for everybody to share from the production.

MR. KELLAHIN: Well, they have requested that a decision on the sub-application be delayed until we have got the application or unitization.

We object to the delay in approval of our projection as presented here today for the reason, as we have testified, their interests will be taken care of if that well is drilled and it is not a producer, if it is not a producer, they are not entitled to any production from the point of view there is no oil underlying that tract anyway.

Now, of course, as I stated, I think we will have to re-advertise this case for the approval of these non-standard 160 acre units.

MR. NUTTER: They also request that that--what is the first part of the request--a delay in the order in this sub-application or the subject of non-standard proration units northwest quarter of 23.

I presume that they mean the establishment of the proration units as they are outlined up above in their letter.

MR. KELLAHIN: I would assume.

MR. NUTTER: Which would be contrary to the way you have delineated the proration units.

MR. KELLAHIN: That is correct. However, if they have

something to offer in that, I feel they should have appeared and offered testimony for the record rather than submitting this by letter.

MR. NUTTER: Of course, the non-standard proration units you have proposed here, they are not advertised and not part of this Hearing.

MR. KELLAHIN: They will be part of the next Hearing after we have re-advertised this case, at which time they can propose their proration units also, or object to our proration units.

MR. NUTTER: Does anybody have anything they wish to offer in Case 4642?

We will take the case under advisement and recess the Hearing until 1:15.

(Recess.)

(After recess 1:15.)

MR. NUTTER: The Hearing will come to order, please.

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, RICHARD STURGES, a Certified Shorthand Reporter, 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; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Richard Sturges
CERTIFIED SHORTHAND REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4642 heard by me on 1/19 1972.

_____, Examiner
New Mexico Oil Conservation Commission

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EXHIBITS

APPLICANT'S	MARKED	OFFERED AND ADMITTED
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Exhibit No. 7 & 8	18	20
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Exhibit No. 12	37	40

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
January 5, 1972

EXAMINER HEARING

IN THE MATTER OF:

Application of Fluid Power Pump Company for special pool rules and pressure maintenance project, Sandoval County, New Mexico.

Case 4642

BEFORE: Daniel S. Nutter,
Alternate Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: Case 4642.

MR. HATCH: Case 4642, Application of Fluid Power Pump Company for special pool rules and pressure maintenance project, Sandoval County, New Mexico.

The Commission has received a request the case be continued to January 19th.

MR. NUTTER: Case 4642 will be continued.

The examination to be held at this same place, 9:00 o'clock, January 19.

STATE OF NEW MEXICO)
)SS
COUNTY OF BERNALILLO)

I, RICHARD STURGES, a Certified Shorthand Reporter, 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; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

CERTIFIED SHORTHAND REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4642 heard by me on 1/5, 1972.

Examiner
New Mexico Oil Conservation Commission