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BEFORE THE OIL AND GAS CONSERVATION COMMISSION

OF THE STATE OF COLORADO

****

IN THE MATTER OF THE INVESTIGATION TO TAKE MEASURES TO PREVENT WASTE OF GAS IN THE "D" AND "J" SANDS IN THE VALLERY FIELD, MORGAN COUNTY, COLORADO.	))))	CAUSE NO. 46

PURSUANT TO NOTICE the above-entitled matter came duly on for hearing at the Shirley Savoy Hotel, 17th Avenue and Broadway, Denver, Colorado, at the hour of 10:00 a.m., October 22, 1954.

BEFORE:

Mr. Warwick Downing, Chairman
Mr. H. C. Bretschneider, Commissioner
Mr. Russell H. Volk, Commissioner
Mr. F. M. Van Tuyl, Commissioner
Mr. A. J. Jersin, Deputy Director
Miss Annabel Hogsett, Assistant Secretary

APPEARANCES:

Mr Robert B Laughlin, Casper, Wyoming, for the Applicants;

Mr William S Livingston, Denver, Colorado, for The Carter Oil Company;

Mr Harry Culver and Mr Charles Love, for Rocky Mountain Standard;

Mr Frank Morrison, for the Petroleum Corporation;

Mr Raymond B Gengler, for Earl Siler and other operators;

Wilbur Rocchio, Esq., Assistant Attorney General, for the Oil & Gas Conservation Commission.

CHAIRMAN DOWNING: We have on the agenda Hearing No. 46, Vallery Field, application of the Stanolind Oil and Gas Company. Now, are we ready for that? Does your record show proper and due notice to everybody?

MISS HOGSETT: Yes.

CHAIRMAN DOWNING: All right. As I understand it there is some opposition?

MR MORRISON: Mr Chairman, could I ask that the notice given for this hearing be made a matter of record?

MR ROCCHIO: Mr Morrison, it is a matter of record.

CHAIRMAN DOWNING: All right. Well, I was going to call for the parties who were represented here, who want to be heard. Who represents the applicant?

MR LAUGHLIN: I make an appearance on behalf of Stanolind Oil and Gas Company, and also enter the appearance of Mr William S Livingston, representing Carter Oil Company.

CHAIRMAN DOWNING: Who else is present?

MR CULVER: Rocky Mountain Standard wishes to enter its appearance, Harry Culver and Charles Love.

MR MORRISON: Frank Morrison representing Petroleum Corporation.

MR GENGLER: Raymond B Gengler representing Earl Siler and other operators, operators of the two wells in Section 22 and 23.

CHAIRMAN DOWNING: Well now, you know there is a

meeting of Rocky Mountain Oil and I hope we will go through without unnecessary waste of time, so I guess maybe the first thing is for the petitioner to proceed. How many witnesses have you?

MR LAUGHLIN: Two.

CHAIRMAN DOWNING: Suppose we swear them both at the same time.

MR CULVER: Mr Chairman, I would like to ask your permission to present our motion to be excluded, so that as the evidence is presented you will be able to see why we want out of it. If we present the motion at this time I believe you will be more able to determine why we shouldn't be a part of this unit.

CHAIRMAN DOWNING: In other words as I understand it your motion to exclude is the reason why you are here? Otherwise you are not opposed?

MR CULVER: That's right. We are not opposed to the spacing. The property we have has oil on it.

CHAIRMAN DOWNING: All right.

MR LAUGHLIN: We have no objection to that.

CHAIRMAN DOWNING: Do you want to present your case now or just state it?

MR CULVER: I just want to state it. We own leases in Sections 11 and 12...

MR ROCCHIO: Mr Culver, would you mind illustrating

when they complete this (indicating chart)? While they are putting this up, Mr Reporter, I have a letter here that should go into the record. Is there anyone representing Amerada here this morning? This is a letter dated October 15, 1954, directed to the Commission: "Gentlemen: The Amerada Petroleum Corporation owns leases in the Vallery Field, Morgan County, Colorado, which lie within the area delineated under Cause No. 46 which comes up for public hearing 10:00 a.m. Tuesday, October 19, 1954. We have been advised and are familiar with the contents of the petitition and hereby recommend the Commission adopt 320-acre drilling and spacing units for "D" and "J" Sands in the Vallery Field, Morgan County, Colorado, as petitioned by Stanolind Oil and Gas Company in Cause No. 46." Signed by Charles Danchertsen. That is the only one.

CHAIRMAN DOWNING: Proceed, Mr Culver.

MR CULVER: The Rocky Mountain Standard are interested in these two half-sections, which would be the south half of 11 and the south half of 12. We have recently drilled an oil well just off of the edge of the unit which is the southeast southeast northwest of 12. Now, based upon the information they have here we are in a separate reservoir entirely because there is apparently a porosity block extending from these wells across here, and based upon that information we don't have any gas up here in the "D" Sand to speak of, hardly enough to measure, and none whatever in the "J". That is a

matter of record with all the folks who have wanted to observe it. Here is a dry hole, here is a dry hole, and here is a dry hole, and down here is a dry hole, which indicates a porosity block. Now, you will notice they have prepared a nosing across here and our ridge would all be up here in the low. Now, whether that works out exactly as this or not, at this time we don't believe this should be included until we have been able to procure more subsurface information.

CHAIRMAN DOWNING: The well you drilled, is that an oil well?

MR CULVER: Yes, sir.

COMMISSIONER BRETSCHNEIDER: How large a well is it?

MR CULVER: We don't have an accurate test but it looks like it might make 60 or 65.

COMMISSIONER VOLK: That is a "D" Sand well?

MR CULVER: That is a "D" Sand well.

COMMISSIONER VOLK: There is no free gas up there?

MR CULVER: There is a little free gas but hardly enough to measure. It burns a flare about so long.

MR JERSIN: When was it completed?

MR CULVER: The well was completed about the 4th or 5th of October.

MR JERSIN: How much net pay does it have?

MR CULVER: About three feet. We will introduce what-

ever information the Commission desires.

CHAIRMAN DOWNING: All right then, proceed, Mr Laughlin. In presenting your case will you bear in mind the statement just made and present any evidence you may have that you wish us to consider in connection with the application to be excluded?

MR LAUGHLIN: Yes, sir. I might say that I think the evidence we will present will present our position on the motion made by Mr Culver. I might say in opening that we do not believe there is a porosity block there. Without further ado I will call the witnesses. I have two witnesses, Mr Sharkey and Mr Heglund.

HENRY SHARKEY

called as a witness for the Stanolind Oil and Gas Company, being first duly sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR LAUGHLIN:

Q. Will you state your name, please?

A. My name is Henry Sharkey.

Q. And where do you live?

A. I live in Denver.

Q. And by whom are you employed?

A. I am employed as District Geologist by the Carter Oil Company.

Q. How long have you been...

CHAIRMAN DOWNING: If there is no objection he will be considered as qualified.

Q. Have you, Mr Sharkey, made a detailed study as to the geology of the Cretaceous sands in the area of the Vallery pool, Morgan County, Colorado?

A. Yes, sir.

Q. Do you have an exhibit - or I will refer to Exhibit A, which is the top exhibit on the board there. May I ask you, Mr Sharkey, if that exhibit, Exhibit A, was prepared under your supervision?

A. Yes, it was.

Q. And would you please explain Exhibit A to the Commission?

A. Exhibit A shows an outlined area within which there are four gas wells and one dry hole. The outline was drawn to exclude a series of dry holes surrounding the productive area.

Q. I am wondering if it would be easier for the Commission if you pointed that out as you give your testimony.

A. Sure. This is the outlined area around here. Here are four gas wells here, dry holes here and here and down here and over here.

COMMISSIONER VAN TUYL: Those dry holes tested both sands?

WITNESS: Yes, there are no wells shown here except those which checked both the "D" and the "J".

Q. During your studies of the Vallery Field did you

consider structural conditions in the "D" Sand and in the "J" Sand?

A. Yes.

Q. Will you elaborate a little on that, please?

A. We prepared Exhibit B - - Did you wish to take that up?

Q. Yes, we will go into Exhibit B.

A. These contour lines represent subsurface structure on the "D" Sand, which is the upper of the two sands, and it shows the rather prominent nosing, and we believe that nosing, this regional feature, is what concentrated the production in that particular area.

COMMISSIONER BRETSCHNEIDER: What is the contour line interval?

WITNESS: Twenty-five feet.

MR JERSIN: That is contoured on top of the "D"?

WITNESS: On top of the "D", yes.

CHAIRMAN DOWNING: There are no contour lines shown on the map.

WITNESS: Sir, we have two exhibits.

MR LAUGHLIN: On Exhibit B, sir. Do you have Exhibit B?

Q. Mr Sharkey, in your opinion, based on your studies, are the "D" and the "J" Sands so located structurally that they might reasonably be expected to be productive of gas throughout the area which is proposed to be spaced, which is the area outlined in the heavy line on Exhibit A?

A. Yes.

Q. And from your study of the structural position of these sands is there any condition within the area proposed to be spaced which might reasonably be expected to preclude the production of gas?

A. No, sir.

Q. Would you care to elaborate a little on your last answer?

A. We have production from the two different sands here. As you may know - those who are familiar with it - this was a "J" well and this was a "D" well over here, this was "J" and again this was "D". We get the production from both the sands across the structural nosing which we have shown there.

COMMISSIONER BRETSCHNEIDER: What is the thickness of the "D" Sand in the area that is contoured?

WITNESS: The productive part of it would run somewhere around 10 - 12 feet.

COMMISSIONER VAN TUYL: What about the porosity?

WITNESS: I am speaking of the productive part.

COMMISSIONER BRETSCHNEIDER: Do you know the porosity and permeability of the productive part?

WITNESS: I believe that is going to be introduced in some of the engineering testimony.

COMMISSIONER VAN TUYL: What about the possibility of

discovering oil to the west there?

WITNESS: Well, there is always that possibility, Mr Van Tuyl. So far, the way these wells have been coming across here, we have assumed that the strength of the productive evidence is predominantly for gas. There is that possibility.

COMMISSIONER VAN TUYL: Do you think they should draw heavily on that gas pool? Should they mark it for large amounts of gas without determining whether there is oil to the west or not?

WITNESS: I think if we proceed with our development here we will establish the gas reserves and then as we move toward the edge perhaps we could verify that. Right at present we couldn't say.

COMMISSIONER VOLK: Is there any market for that gas?

WITNESS: The field is presently shut in, awaiting connection.

COMMISSIONER VAN TUYL: With Fort Morgan or Brush or both?

WITNESS: I couldn't say, sir.

COMMISSIONER BRETSCHNEIDER: There are no wells out in here?

WITNESS: You mean off to the west?

COMMISSIONER BRETSCHNEIDER: Yes.

WITNESS: Well, there are two dry holes here to the south, and when you get over to about here there are some dry holes.

COMMISSIONER BRETSCHNEIDER: A couple of miles over?

WITNESS: Yes, one to the northwest, and to the southwest down here.

COMMISSIONER BRETSCHNEIDER: None directly west as your contours indicate?

WITNESS: No, sir, not right off of here.

COMMISSIONER BRETSCHNEIDER: Do you have an explanation for the difference in the thickness of this sand up here at 3 and this sand down here at...

WITNESS: The difference in thickness?

COMMISSIONER BRETSCHNEIDER: Yes.

WITNESS: Well, you get certain erratic developments in those sands, and it has been well established throughout the whole basin. For example, right here we have a producer, right here we have a dry hole. On your Schlumberger - on your electric log, that is - your sands are present but there is a great variation between the two of them right there. I think maybe that might explain that.

COMMISSIONER BRETSCHNEIDER: Are there some areas in here where the "D" Sand is 3 feet thick or thereabouts?

WITNESS: The sand usually holds up pretty well. The thing that changes seems to be the permeability and the porosity.

COMMISSIONER BRETSCHNEIDER: Well, when he talks about 3 feet of sand up here is he talking about the whole sand or just...

WITNESS: Well, I assume - I wouldn't want to answer for Mr Culver - but I assume that is the porous productive part.

MR LAUGHLIN: I have no further questions of this witness.

CHAIRMAN DOWNING: Do you wish, Mr Culver, to ask the witness any questions?

MR CULVER: I want to know if he has prepared an isopach of the pool?

WITNESS: I don't have one with me, Mr Culver.

MR CULVER: You have prepared one?

WITNESS: We made an isopach of the "D", we made an isopach of the "J", yes.

MR CULVER: Well, based upon the information then that you obtained from the isopach - - May I ask you when you prepared this map below, what date?

WITNESS: This one here?

MR CULVER: Yes.

WITNESS: Oh, it has been not too long ago; it was a month or so ago, I imagine.

MR CULVER: It was before we completed the...

WITNESS: It was before the well up here.

COMMISSIONER BRETSCHNEIDER: It says here October 6th.

WITNESS: Well, that is when we had it remade, but we did not have a point on this well here yet.

MR CULVER: Well, since that time have you observed

that the well up here is a few feet higher than this well here?

WITNESS: I hadn't noted that.

MR CULVER: You haven't noted it?

WITNESS: No, I haven't noted it.

MR CULVER: That is all.

CHAIRMAN DOWNING: Any other questions of this witness by anyone present?

MR LOVE: In your isopach do you consider this "D" and "J" sand a common reservoir and productive over that block?

WITNESS: Yes, sir, we do.

MR LOVE: Well, how is it that you have a "D" sand dry hole there between two "J" sand wells?

WITNESS: Because of the variations in the porosity or permeability. In other words the void space in there is rather erratic.

MR LOVE: Well, then you couldn't call it all a productive common reservoir if it has dry spots in it?

WITNESS: Well, the dry spots may not constitute - - The question is whether they constitute a barrier or whether they are a little isolated spot. For example, if you take many of the fields in the basin you can drill right in the production, you can drill a dry hole where porosity is lacking because there may be some local development. What I am getting at is whether it is a regional thing, a thing that extends across the pool, or

whether it is a small thing that you just happen to drill into.

MR LOVE: Well, have you any data to make you believe that it is not a regional thing, that these porosity blocks do not extend across the entire pool?

WITNESS: I think maybe one of the clues on that eventually would be production or pressure statistics, which of course we don't have any history on as yet, but I think that would show whether or not production in one area would influence another.

MR LOVE: Well, in this area is it customary if a well is drilled in the center of 160s, is it considered to prove the adjoining 160s?

WITNESS: The adjoining 160?

MR LOVE: Yes. Would you consider that as reasonably proven?

WITNESS: I think you would drain your gas, yes, sir.

MR LOVE: I say would you consider if you drilled the adjoining 160, would you consider that you were going to get a well? Is it considered questionable?

WITNESS: I think if you were going to drill - - For example, we are talking about 320 spacing on here. I think if you drilled the next 160, or the other half, you could probably expect to get a well, yes, within the area outlined here in this particular field.

MR LOVE: In Section 13 there I see two wells closer together than centers of 160, one of which is dry and one of

which is an oil well.

WITNESS: That is correct.

MR LOVE: I mean a gas well. Isn't that more or less the customary - - Is that the unusual or is that the more or less common thing?

WITNESS: I think it would be unusual, because over here we have got three producers in a row. Here we have that erratic development. We can't guarantee that that is sheet sand; we are not trying to guarantee that. It is a question of occasionally running into spots where you will not get permeability.

MR LOVE: Isn't it a fact that of those three wells in a row two are from one sand and the one between them is from another sand?

WITNESS: Yes, sir, these are "D" wells, that is a "J" well. This had a small amount of gas, from the "D", but it was better in the "J" so as I understand it it was completed in the "J".

COMMISSIONER VAN TUYL: What is the size of those gas wells?

WITNESS: The initial production, Mr Van Tuyl, has been around between three and five million, I guess. As you probably know, we are not producing any of these yet. The wells are all shut in.

COMMISSIONER VAN TUYL: Any wet constituents in the gas?

WITNESS: There has been some distillate in it, I

believe.

COMMISSIONER VAN TUYL: Any increase in the amount of that to the west?

WITNESS: Not to my knowledge.

CHAIRMAN DOWNING: Any other questions? All right, take the next witness.

(Witness excused)

MARTIN O HEGLUND

called as a witness for the Stanolind Oil and Gas Company, being first duly sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR LAUGHLIN:

Q. Will you state your name, please?

A. Martin O Heglund.

Q. And where do you live?

A. Casper, Wyoming.

Q. And by whom are you employed?

A. Stanolind Oil and Gas Company.

Q. In what capacity?

A. I am District Engineer for Stanolind.

Q. Mr Heglund, do you have your testimony in written statement form?

A. Yes, sir, I do.

Q. And you have it before you there?

A. Yes.

Q. Would you please give your testimony to the Commission?

A. In order to review the need for gas well spacing in the Vallery Field it is desirable to review well information and reservoir data. As of this date there are four completed commercial gas wells within the area proposed for spacing, with the discovery well for the field being Siler and Campbell's Ross No. 1 in the northwest northwest of Section 23, Township 3 North, Range 59 West, this location right there. Starting with Ross No. 1 I will provide a resume of each producing well and its related sand characteristics.

Siler and Campbell Ross No. 1 was completed June 16, 1954, from perforations in the "D" Sand with initial potential estimated at five million cubic feet per day through a 3/4" choke.

COMMISSIONER VAN TUYL: How many feet were perforated?

WITNESS: I don't have those exact figures but I think on the order of 10 or 12 feet. That is about the productive entry...

UNIDENTIFIED SPEAKER: 14 feet.

WITNESS: 14 feet. A drill stem test of the "D" Sand indicated a reservoir pressure of 1,620 pounds per square inch. A drill stem test of the "J" Sand indicated no obtainable production.

Petroleum Incorporated Schwindt No. 1 was completed June 11, 1954, from perforations in the "J" Sand, with initial potential also five million cubic feet per day through a 3/4" choke.

Core analyses of this sand showed an average of 15.9% porosity and 80 millidarcies permeability. Prior to completion of the well, a drill stem test of the "J" Sand indicated a reservoir pressure of 1,700 psi. As for the "D" Sand, drill stem test recovery was 300 feet of oil cut water and 15 feet of oil cut muddy water.

The third well, Siler...

COMMISSIONER VAN TUYL: Would you give us the number of feet perforated in this w ell?

WITNESS: There were approximately 25 feet productive and the perforated interval, I presume, was most of that section.

The third well, Siler and Campbell Graham No. 1 in the northwest northeast Section 22, Township 3 North, Range 59 West, was completed August 9, 1954, from perforations in the "J" Sand with initial potential estimated at six million cubic feet per day. Porosity from the "J" Sand averaged 14.7% and permeability averaged 94.5 millidarcies. Reservoir pressure from drill stem test results was again indicated to be 1,700 psi. A drill stem test of the "D" Sand indicated a possibility for some gas production, but better formation characteristics in the "J" Sand resulted in the well being completed in the "J" Sand.

The fourth gas well, Stanolind Oil and Gas Company State of Colorado A No. 1 in the southeast southeast of Section 16, Township 3 North, Range 59 West, was completed 23 August 1954, from perforations in the "D" Sand with test open flow potential

2750 MCF/Day - that is, two and three-quarter million cubic feet. A drill stem test of the "D" Sand showed a shut-in pressure of 1,620 psi, and this is equal to that measured at Siler and Campbell's Ross No. 1. Core analyses of the "D" Sand averaged 15.6% porosity and 35 millidarcies permeability. The "J" Sand was wet as evidenced by a drill stem test which recovered 1,830 feet of water.

In referring to Exhibit C, we propose that future well locations be within a radius of 950 feet from the center of each 320-acre drilling unit, provided further that no well shall be located less than 660 feet from the boundary of the unit.

We have mentioned in our individual well discussions that the reservoir pressure for the "D" Sand, as measured in different wells, is in the order of 1,620 psi. Similarly, drill stem test pressures from both "J" Sand wells provides evidence to a reservoir pressure of 1700 psi. This information is indicative of continuity through the "D" Sand individually throughout the area outlined on Exhibit A and for the "J" Sand individually throughout this area.

As pressure data indicate continuity of each formation, as permeability is indicated adequate to permit drainage, as gas itself is highly mobile, and considering all aspects of drainage, we recommend that future spacing be established on the basis of 320-acre drilling units to each well.

In my opinion, spacing on 320-acre units will result in

efficient development and will prevent waste. Closer spacing will not permit adequate return on investment to justify development. Without development, gas will remain in the reservoir that might otherwise be recovered. Considering the aspects of this field, in my opinion 320-acres is no smaller than the maximum area that can be drained efficiently under circumstances indicated for the "D" and "J" Sand reservoirs in this field.

COMMISSIONER VAN TUYL: How would you lay off your 320 acre tracts, running north and south, east and west?

WITNESS: As outlined on this exhibit, they are predominantly on north and south. There are exceptions in Sections 11, 12 and 13. The exceptions in 11 and 12 are the result of a dry hole in the north half of 11. The exception in 13 is the result of a dry hole in the south half of 13.

COMMISSIONER VOLK: To follow that pattern you would have to get exceptions for every well that is drilled so far, wouldn't you?

WITNESS: That's right.

CHAIRMAN DOWNING: Any further questions?

MR LAUGHLIN: The Commission indicated some interest in the interval that was perforated and I think we have some notes here from which Mr Heglund can refresh his memory and give that information exactly if you care to have it.

CHAIRMAN DOWNING: All right.

WITNESS: I will start over here at the right with

Petroleum Incorporated Schwindt No. 1; it was perforated in the interval 5920 to 36 so that perforated interval in this well would be about 15 feet. I believe I stated approximately 25 feet so I beg to be corrected. Siler and Campbell Ross No. 1 is perforated in the interval 5901 to 5920 and from 5922 to 26; that would total 23 feet of perforations. Siler and Campbell Graham No. 1 is perforated in the interval 6014 to 6026 or 12 feet. The Stanolind Oil and Gas Company well had 11 feet of perforations.

MR LAUGHLIN: That is all.

CHAIRMAN DOWNING: Any further questions?

MR CULVER: May I ask you how much difference in pressure would be necessary to indicate a different reservoir?

WITNESS: The pressure information that I provided indicated an order of magnitude of similar pressures, which was from drill stem test information, and I believe is indicative of common reservoirs.

MR CULVER: What I am getting at, suppose the well in 13 had a pressure of 1700 pounds, I believe you said, and then our well up there in 12 has a pressure of 1400 pounds, what would be your opinion as an engineer? Would that be the same reservoir in that short distance?

WITNESS: My opinion on that would be based on if both wells were excellent wells, that is, you had good permeability and good sand in both, I would expect comparable pressures

if they were in the same reservoir. If one well had, say, very poor permeability I wouldn't expect to measure a complete pressure on my drill stem test, so I don't know whether I could use the information on an edge well or not. I don't think I could.

MR CULVER: In your opinion then an edge well might have a lower pressure and still be a part of the same reservoir?

WITNESS: You would measure a lower pressure.

MR CULVER: Well, don't you think based upon the information that the well in 13 is some ten feet lower than the well in 12 that you should have a higher pressure in 12 if it is a part of the same reservoir?

WITNESS: So few feet would make very little difference in your pressure measurement provided you had good sand in both wells whereby you could get a fairly quick build-up on your drill stem test pressure.

MR CULVER: That is all.

CHAIRMAN DOWNING: Any other questions?

MR JERSIN: I was just wondering how many operators were contacted that are interested in this area being spaced?

MR LAUGHLIN: I think I can answer that, Mr Jersin. I think all operators were contacted, am I correct? And the following operators in the area answered in the affirmative, favoring this spacing application: Carter and Stanolind, of course, R M Huff, Amerada, Dr E T Metz, Max Bickling, Ray Campbell

and F W Winegar. Now, those names represent 73% of the working interest ownership in the area proposed to be spaced. No response was received in opposition from any of the operators other than the motion presented today.

CHAIRMAN DOWNING: What effect does the fact that the well in 12 is an oil well and the others are gas wells have upon this question?

MR LAUGHLIN: I think there might be some question - - The only thing I think we know about the well is what is in the petition which was filed, which indicated 250 feet of oil on a drill stem test. I would like to refer your question to Mr Heglund.

COMMISSIONER VAN TUYL: Is that a "D" or "J" Sand well, that oil well there? I believe that was brought out here but it slipped my mind.

WITNESS: I understand the well just north of the center section of 12 is a "D" sand well.

CHAIRMAN DOWNING: Any further questions?

MR JERSIN: Mr Culver, you are objecting only to the amount of acreage being spaced, is that correct?

MR CULVER: We have no objection to the spacing of 320 acres and if subsequent drilling proves that the unit comprising the south half of 12 and the south half of 11 are gas productive then the Commission should space it into the units, but we believe based upon the information we now have that they

are not a part of the same reservoir and pending the time that we can prove our contention by drilling additional wells we would like for that to be excluded for the reason that we have plans now for drilling another well up there and we will be out of position of course if we proceed with it.

COMMISSIONER VAN TUYL: What would be the location of that well?

MR CULVER: The location would be in Section 12. It would be the northeast ten acres of the west half of the southwest quarter. The application is on file with your commission now.

COMMISSIONER VOLK: May I ask a question here to try to cover this whole thing. Would there be any objection on the part of anybody if we give 320 acre spacing here but allowed the wells to be drilled not closer than 660 feet of another property line?

MR MORRISON: Petroleum Incorporated would object to such a ruling.

MR GENGLER: Seiler would object unless certain exceptions were granted.

COMMISSIONER VOLK: We would have to grant the exceptions on that, I mean the wells already drilled would have to be exceptions.

CHAIRMAN DOWNING: Any further questions? Any further evidence on behalf of the petitioner?

MR LAUGHLIN: I would like to offer in evidence

Exhibits A, B, and C.

CHAIRMAN DOWNING: If there is no objection they will be admitted.

(Witness excused)

MR LAUGHLIN: We have nothing further to present other than that I would like to make a response to Mr Culver if I could.

CHAIRMAN DOWNING: You may have that privilege.

MR LAUGHLIN: I think the evidence here before the Commission shows that this is a gas field and if these two half-sections are excluded from this order it might well upset the pattern, the spacing pattern, for the entire area if subsequent drilling in the south half of 11 and 12 result in gas wells, and I would suggest that the two half-sections be included but that an exception for his location be granted to Rocky Mountain Standard to drill the well that they have in mind. If it is a gas well the order need not be changed. If it is an oil well, if it develops that it is oil - which we don't think it will - then those appropriate acreages can be excluded from the order at that time. We do feel that the evidence all shows here that this is a gas field and that by excluding those two half-sections it can well disturb the entire pattern.

CHAIRMAN DOWNING: Any questions?

MR ROGERS: I would like to ask Mr Culver a question. You asked Mr Heglund here a question on which there wasn't a definite statement, it was evaded. What is the pressure in the

sand on your well?

MR CULVER: It is computed by the geologist from Midwest - I don't see him in the room - but based upon his report it was 1200 pounds.

MR ROGERS: 1200 pounds?

MR CULVER: I think perhaps there could be a difference of opinion but it isn't as great a pressure as the wells below us there to the south. Now, if the Commission will permit me I would like to call their attention to two things - we can present it in evidence with electric logs - but the position of this well here is structurally ten feet lower than the well in Section 12. Here they have a 1400 foot contour and here 1425, and the minus on our well is 1402. Now, we think that the only thing wrong with this map here is that he hasn't made his turns sharp enough and that we have got a porosity block between the two reservoirs. Now, we will introduce evidence to show why we think that.

CHAIRMAN DOWNING: All right, proceed.

MR LOVE: May I ask one question, please Mr Culver, of Mr Heglund. I will ask Mr Heglund what effect, if any, his build-up time on a drill stem test would have in comparing pressures between wells?

MR HEGLUND: If you had a very high permeability sand you would get a very good measure of your initial reservoir pressure on the drill stem test. If you have a very tight sand

wherein the oil or gas does not blow very readily through there - influenced maybe by a water block and that type of thing - you don't get a representative figure.

MR LOVE: On a drill stem test where you have a low permeability and do not get a good build-up pressure do you get a flat curve during the shutdown period or do you get a sloping curve on the chart? In other words, do you see a build-up during the shutin period on the low permeability or does it build up immediately and remain constant?

MR HEGLUND: It is a matter of relativity, I mean it depends upon the sand itself.

MR LOVE: Well, if you see a curve on a drill stem test where the first five minutes of the shutin pressure is approximately the same as the last five minutes do you consider that a fair bottom hole pressure? In other words a flat curve during the shutin period, does that indicate...

MR HEGLUND: The flatter the curve the more representative it is, yes.

COMMISSIONER BRETSCHNEIDER: Do you have any explanation why the minus datum figure here is 1402 against your contour line of 1425?

MR HEGLUND: All I know is that - - This contour map was not drawn by me but it was drawn, I believe, prior to the bore on this well and I believe it was based on reasonable contour intervals based upon what control was available. Now, this

top is minus 1402. That of course would tend to swing your contours possibly this way.

MR SHARKEY: We didn't have that point at the time we constructed this map.

MR JERSIN: Can you indicate where that line would go?

MR SHARKEY: Let's base this on Mr Culver's statement that this is 1402 at this point, and if we accept that figure this is the 1400 foot contour. It looks like you must have something setting this off over here. That is a fact that we were unaware of, but this would be too far east, this line here.

CHAIRMAN DOWNING: Mr Culver, let's proceed with your evidence.

MR CULVER: Mr Love will take the stand. He hasn't been sworn.

CHARLES L LOVE

called as a witness for Rocky Mountain Standard, being first culy sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR CULVER:

Q. Will you state your name, please?

A. Charles L Love.

Q. Mr Love, where do you live at this time?

A. I live at Boulder, Colorado.

Q. How long have you resided at Boulder?

A. Two and a half years.

Q. Where did you live prior to coming to Boulder?

A. Houston, Texas.

Q. What business were you in at Houston?

A. In drilling and production.

CHAIRMAN DOWNING: If there is no objection this witness will be considered qualified if that is the purpose of these questions.

Q. Thank you. First, I hand you here a copy of the electric log of the Rocky Mountain Standard and Midwest Oil Corporation well and ask you to give to the Commission the top of the "D" Section.

A. There is some question as to what all geologists do not agree on the top of the "D" Section but we consider the top of the "D" in the well as being 5826 or 5827.

Q. Give the elevation, please. It is on the top there.

A. The elevation, the ground level elevation, is 4413 and the Kelley bushing is 4422.

Q. Mr Love, have you made any study of the conditions of the sands in the area under consideration?

A. I have.

Q. Would you please state in your own way what your conclusions are as an engineer?

A. First I would like to say a little bit about the nature of the sand in this area, which appears to be typical of

the basin, that is, that they vary a great deal from well to well and it is very hard to outline the porosity zones, tell whether they are connected, where the porosity blocks lie, and how big they are. The development varies so much from well to well - by development I mean the permeability or porosity of the zone varies radically from well to well, so that common reservoirs are more the exception than the rule in the area and an oil or gas well does not by any means prove the offset acreage. It is often found that an oil well or a gas well will be surrounded with two or three dry holes, and then offset to the dry holes on the other side again oil or gas wells, so it is very hard to find common reservoirs. I think that is very true in this case. Here we have a gas well with two dry holes immediately offsetting it - you might say in the adjoining 160 acres - due to porosity blocks. In this area all three of these wells have no porosity in the "D" Sand. This well up here has only three feet porosity in the "D" Sand, or permeable sand maybe I should call it. This well here has a rather poor record but appears to have six or seven feet most likely of permeability, and again this well is marked as dry. As you can see here, it is much higher structurally than these wells are - or it is flat with this well I should say. Apparently there is porosity in the "D" Sand, yet it was a dry hole. So here we have a block consisting, we know, of two reservoirs, a "D" reservoir and a "J" reservoir, neither of which covers the

area - I should say neither of which covers all points in the area. Right above it we have a "D" Sand oil well as high structurally as this gas well here. Of course this gas well is in a "J" Sand but we have a "D" oil well here that is structurally in position with this well or a little above it. So the whole area is, by the greatest imagination, we would just say joining up maybe a group of 2 - 2 at least and maybe 4 or 5 - pools and calling itself a gas area. We have no objection to what happens in the gas area. We are interested only in our oil field.

Q. I would like to ask Mr Love one more question. In your observation of the core of the "D" Sand section would you care to state what you saw in that core, in your opinion what the indications...

A. In the "D"?

Q. In the "D" Section and in the "J" Section.

A. In well No. 1 in Section 12 the top of the "D" Section was hard, impermeable sand, the lower part of the "D" three feet of permeable sand with rather low permeability and high oil saturation and no indication of gas. The drill stem test on the well showed 275 feet of oil, gas on top in some 25 minutes - 23 minutes, shutin bottom hole pressure reported by the operator at 1200 pounds, reported by Johnson Testers as 1440 pounds. The Johnson Testers charge on that well on a drill stem test showed a low flowing pressure and a very flat curve on the shutin

pressure. In other words it was shut in 15 minutes, apparently attained the 1440 pounds within five minutes and remained that way until closed. Therefore we consider that although it is thin sand we nevertheless got a representative bottom hole pressure on the well, which is radically different from the "D" Sand bottom hole pressure as represented by testimony today, at least one hundred pounds.

CHAIRMAN DOWNING: Any further questions?

MR EPPERSON (Geo Epperson, Fort Morgan): Mr Love, is it your opinion that there has not been enough exploration now in this area to go forward with this spacing pattern at this time?

MR LOVE: I am sure that future exploration will bring out new data. Of course in the area that is primarily gas some pattern or some plan is applicable at this time. I feel sure that any pattern or any application or any acreage that they may put together will probably be changed radically with subsequent drilling because I think there is very, very little data to go on at the present time.

MR CULVER: As to the south half of 12 and the south half of 11, is there sufficient data available in your opinion to classify that as a gas area?

MR LOVE: No, there is practically no data available to indicate it to be a gas area.

MR CULVER: As an engineer in your opinion how do you

explain the difference in the minuses on the well in Section 13 that is a gas well and the one in Section 13 that is a dry hole?

MR LOVE: Well, apparently there is a considerable nosing right immediately around this well in 13 and I don't know why the radical dip, it is rather hard to explain. It means there is away too much difference in the subsea datum on the two wells. It doesn't appear - - If the subsea datum I have is correct on the two wells they don't compare at all as shown on this map. One is quite a bit lower than the other.

MR CULVER: All right. Now, on the core of the "J" Sand in Section 12, the Rocky Mountain Standard well, what was the nature of that core? I would like for you to explain it.

MR LOVE: We cut some 48 feet of the "J" Sand in that well. It was all reworked shaly sand with some lignite in it and no porosity or permeability recognizable at any point from the top to the bottom of the sand. Even the part of the so-called "massive sand" was of a clay-filled, impermeable nature.

MR ROCCHIO: Mr Love, you heard the proposal by Mr Laughlin with respect to the inclusion of the area and continued development to see what does occur. Do you have any objection to that procedure?

MR LOVE: It would not alter our plans in any way. I cannot see why they care to include the area because there is quite a bit more evidence of it being in an oil field up here than in a gas field in here.

MR ROCCHIO: But the next well would show that, wouldn't it?

MR LOVE: The next well would show that and it would not alter our plans or anything to give us - if we had an exception to prove or disprove it. We are not against any oil or gas spacing. We are not here to argue against any well spacing. We just think we have an oil field and we would like to have the privilege of developing for oil in our way. If we find gas, why, we of course want to join the spacing.

COMMISSIONER BRETSCHNEIDER: Is it a south offset, are you going to...

MR LOVE: No, the southwest offset in the northeast corner of this "J" Sand.

CHAIRMAN DOWNING: Would that be in violation of the plan proposed here?

MR LOVE: Yes, sir. You see, the plan would call for a well situated - if you would turn this over this way and place it in 12 - you see it would have to be way down in here.

MR CULVER: I have nothing further.

CHAIRMAN DOWNING: Any other questions on cross-examination?

COMMISSIONER VOLK: I am just trying to get this whole thing so everything would be agreeable with everybody. Would there be any objections at all to granting the 320-acre spacing for the entire area, making exceptions where we have the two

10-acre locations, where they could offset on 10-acre spaces, but make all the rest of it on the basis of not closer than 660 feet from a property line. I think that would be equitable all the way through.

MR CULVER: Under the terms of our agreement on the west half of the southwest of 12 we must drill the well in the northeast ten acres of that 80 to comply with that contract.

COMMISSIONER VOLK: The northeast ten acres?

MR MORRISON: We would object to your suggested spacing order and we will introduce evidence to show why we object to such an order.

MR GENGLER: You include the two exceptions for Mr Siler's wells? I just wanted to be sure.

COMMISSIONER VOLK: Yes, that's right.

MR CULVER: We would have no objection so long as an exception is allowed for drilling this well, providing that if we get an oil well there then we could continue to develop it in an orderly way as the indications would show on that well.

COMMISSIONER VOLK: Our order would only apply to the gas. If you have an oil well the rule wouldn't apply.

MR CULVER: The thing I was getting at, I didn't want to come back and ask for an exception to drill an offset to that well.

MR ROCCHIO: Under the proposed spacing all wells are now exceptions, isn't that correct? The way they are set right

now every well that has been drilled is an exception?

MR CULVER: That's right.

MR ROCCHIO: And your proposal would also be an exception?

MR CULVER: That's right.

MR EPPERSON: I would like to ask a question. I represent a group of land owners. On these exceptions what would happen? They drilled on 23 on 160 acres. What would happen to that particular one? Would it be tied in to some other area?

MR ROCCHIO: The well located in 23 is the Siler well, is it not? That would be the west half of 23, correct, according to the units here.

MR EPPERSON: And no other well...

MR ROCCHIO: No other well would be permitted in that unit. That would be the gas well for that unit, and I refer you to the - you have the green bible? - page 34, the pooling provisions for the people who own the land in the area.

MR EPPERSON: In other words everybody in the west half would share that...

MR ROCCHIO: Either voluntarily or involuntarily according to the statute.

MR MORRISON: I call to your attention that the statute provides "each pooling order shall provide for the drilling of the well." This order does not make provision for drilling.

MR JERSIN: Drilling and production.

MR MORRISON: That's right, provision for the drilling and production. The well in this instance has already been drilled.

MR ROCCHIO: We can't go back. I won't argue the legal point with you but I don't think it is necessarily up to the Commission to try to determine it. That is between the people who own the property and if you can't get together then court is your place.

CHAIRMAN DOWNING: All our orders, you know, are subject to revision at any time changes are necessary.

MR MORRISON: Well, I wonder about Mr Volk's suggestion. If you grant exceptions for all the wells drilled would your exception be on the 320-acre basis and pooling the 320?

COMMISSIONER VOLK: You would have to for gas production, yes. The gas production would be on the 320 acre basis. Now, on the 320 acre basis you would be allowed to drill a gas well anywhere you wanted to in the 320 acres provided it was not closer than 660 feet to those wells that have already been based on the 660 feet. But you would have the exceptions, you would have the right to drill it within 330 feet where the wells have been drilled within 330 feet, in making your offsets.

MR MORRISON: In 13 would there be an exception granted to drill in the south portion of that as an offset to the west half of 22?

COMMISSIONER VOLK: Well, wait a minute. You are

talking about the west half of 13. That is split north and south; there is no west half of 13.

MR MORRISON: I mean 15.

COMMISSIONER VOLK: West half of 15? You could drill anyplace you wanted, you could come down within 330 feet in your southeast southeast if you wanted to, or you could drill halfway between those wells as long as you would stay 660 feet back from your line if you move over to your other well there, see?

MR MORRISON: You would allow an exception then in the west half of 15?

COMMISSIONER VOLK: The west half of 15, yes, you could come down to 330 feet if you wanted to drill in the southeast corner.

MR MORRISON: There would be two wells in the west half of 15?

COMMISSIONER VOLK: No, only one well.

CHAIRMAN DOWNING: Is there any more testimony?

MR GENGLER: In connection with the Graham well and the Ross well, notwithstanding the legal principles involved I maintain that Mr Siler is entitled to an exception on the northwest quarter of Section 23 and is entitled to an exception on the west half of the northeast quarter of 22, and they must be excluded from your 320-acre drilling units.

MR ROCCHIO: Let me get that clear. You mean to say

those wells in 22 and 23 would not be the wells for the units in which they are located?

MR GENGLER: Absolutely.

MR JERSIN: They would not?

MR GENGLER: They would not be. We say the area is diminished by the ownership of the particular tracts, the 80 acre tract and the 160 acre tract. The wells have already been drilled and located on those tracts, therefore they must be limited to those tracts. What other people have perhaps may be an exception too but Mr Siler is entitled to an exception on those two tracts.

COMMISSIONER BRETSCHNEIDER: He has one well on 80 acres?

MR GENGLER: Yes, the north...

COMMISSIONER VOLK: What you are saying in effect is you can't make a satisfactory arrangement with the balance of the 320 acres?

MR GENGLER: That may be something else, but at the present time the exception must be granted.

MR ROCCHIO: The exception to the location of the well or as to the spacing unit or both?

MR GENGLER: You may call it both, but the exception must be that Mr Siler is granted an exception on the northwest corner of 23 and also an exception on the west half of the northeast quarter of 22.

MR ROCCHIO: Well, that's right as far as the location of the well is concerned.

MR GENGLER: As an exception from the drilling pattern of the 320 acres.

MR ROCCHIO: Yes, from the drilling pattern.

COMMISSIONER VAN TUYL: You mean you would like to produce as much gas from each of those tracts as the others would produce from 320 acre tracts?

MR GENGLER: Yes, if we can't get together with the other owners, absolutely.

MR JERSIN: I think getting together with the other owners is a separate hearing.

MR MORRISON: I think the two wells under discussion and the well in the north half of 13 should be considered as discovery wells and not considered as field wells.

CHAIRMAN DOWNING: Is there anything further?

MR CULVER: May the witness be excused if no one else wants to ask him any questions?

MR HUFF (R M Huff, Fort Morgan): I would like to ask him one question. Now, there was gas in this well right here, not enough to case, but there was "J" gas in this Ross well, there was two feet of "J" gas here, there was "J" gas there and here is "J" gas. Wouldn't that indicate that this is a "J" gas section in here?

MR LOVE: In the lack of other evidence...

MR HUFF: Well, yes, but let me clear it up. This fellow asked me a question. This had two feet of "J" gas in it, and the core analyses will show that.

UNIDENTIFIED SPEAKER: It wouldn't produce.

MR HUFF: It wouldn't produce but I say it had two feet, and this one didn't produce, but there was two feet of "J" sand in this Ross well.

UNIDENTIFIED SPEAKER: If they wouldn't produce they should be considered dry holes.

MR HUFF: I just asked the question. I was wondering what indication that would make. There is a "J" gas well in 13 and the Graham well proves to be a gas well, and you go back north and if you have an electric log, why, it would show almost as good a gas kick as this well right here, from the log, but I just wanted to know what that would indicate. "J" Gas here and "J" Gas here, what does that mean?

MR LOVE: The data you present, in the absence of any other data, I think it would be only reasonable to assume that this is a common "J" gas or it could be a common "J" gas reservoir.

MR CULVER: May I offer an observation on this exception as far as Rocky Mountain Standard is concerned, which affects the south half of 12 and the south half of 11. If they give us a permit to drill the well in Section 12, in the northeast ten acres of the west half southwest of 12, and we

get an oil well, would we have to come back then each time and get an exception for an addition or can we make application to conduct our further drilling exploration? If we get gas, of course, we must report to this commission about the gas reservoir but as long as it is oil can we continue our orderly development?

COMMISSIONER VOLK: In drilling an oil well - - You can drill an oil well anyplace on there. There is nothing to prevent you from drilling a well anyplace on this entire pattern in any location. The only thing we control, you can produce gas only in a well that is on pattern. That applies to gas production only.

MR CULVER: Well, thank you very much, but suppose we should be wrong? I don't think we will be, but suppose this well in Section 12 turns out to be a gas well. Then is that going to take in all of the south half of 12?

COMMISSIONER VOLK: The thing you should do is make an exception for that well so if it is a gas well that is the gas well for that 320 acres.

MR CULVER: That would take in the south half of 12?

COMMISSIONER VOLK: That is correct.

MR CULVER: Then an exception on this well would be as to its location in the unit?

COMMISSIONER VOLK: That's right.

MR CULVER: Well, if there is no objection by others we won't object to that. We don't have any idea of producing

gas on a smaller sized unit than 320 acres.

MR GIBSON (Bob Gibson, Wichita Falls): I am an interested party in this area. I have got this 40 acres right here and we have filed a permit to drill a well in the center of that 40. Now, I am of the same opinion as Mr Culver and Mr Love that this is a separate area in here and there is possibly a small oil field there. We intend to drill that location and I think that this area should be excluded from the area involved in here.

COMMISSIONER VOLK: If you get an oil well you can go ahead and produce it. If you get an oil well. The only conflict would be if you would both get gas wells. If you both get gas wells you could only produce out of one of them.

MR GIBSON: Well, what happens if they drill the second well there and it is a gas well?

COMMISSIONER VOLK: You mean both of them gas wells?

MR GIBSON: No, the next well there of Rocky Mountain Standard.

COMMISSIONER VOLK: If that is a gas well and you all get together you could derive an income from their 320 acre gas well, and if you get an oil well over here you could go ahead and produce your oil well, no exception whatever. Does that answer your question?

MR GIBSON: Well, if he gets a gas well in there of course we wouldn't want to drill that 40 acres, you see?

COMMISSIONER VOLK: Well, then you better wait until he drills first.

MR CULVER: May I make this observation, which might help us as well as all of the operators. Why don't you set that area of the south half of 12 and the south half of 11 out for 90 days so we can complete that well and then let us bring in the information so you will have that side of the structure defined?

MR MORRISON: Mr Chairman, we would like to present our evidence with respect to the application. I believe it has some bearing on his suggestion and if you would allow us to do that I think we can maybe discuss it more fully.

CHAIRMAN DOWNING: All right.

MR MORRISON: Mr Robert Cowdery has not been sworn in but he is our witness.

ROBERT COWDERY

called as a witness for Petroleum Incorporated, being first duly sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR MORRISON:

Q. Mr Cowdery, would you please state your name?

A. Robert Cowdery.

Q. Address and occupation?

A. Denver, Colorado, District Geologist, Petroleum Incorporated.

Q. What training and experience have you had...

CHAIRMAN DOWNING: Do you wish to qualify him? If there is no objection he will be considered qualified.

Q. Mr Cowdery, are you familiar with the area outlined on this exhibit as the Vallery Field?

A. I am.

Q. In your opinion is the area outlined on Exhibit A, does this area cover one pool, one gas pool, one source of common supply from both the "D" and "J" Sands?

A. No.

Q. Would you please state your reasons and the basis for your opinion?

A. I would like to talk about the relationship of some of these wells starting with the "D" reservoir. Now, I have different figures than Mr Culver. I have this at 1389 on the "D", this at 1404...

Q. Will you please state what wells you mean each time?

A. This is Petroleum Inc No. 1 Schwindt, and Rocky Mountain Standard No. 1 Poe I believe...

CHAIRMAN DOWNING: What do you represent?

MR COWDERY: Petroleum Inc, we are.

CHAIRMAN DOWNING: What section?

MR COWDERY: Section 13, this 80 and this 80 acres. This well is 15 feet higher than this well on the "D", yet it tested 300 feet of water with a few specks of oil. According to your geologist this tested 270 feet of oil down dead. Then

in respect to this, we have a 1435 "D" producing gas, a 1404 "D" producing oil. This well is the Earl Siler and Ray Campbell No. 1 Ross. In other words we have a well 31 feet lower producing gas than an oil well. Then something that wasn't brought out, this well right here, they indicated it would make some gas from the "D" but that it had a better "J" zone so they perforated it in the "J". Well, the story on it is it had gas, in 40 minutes it made 270 feet of oil, mud cut oil, so primarily it would be considered an oil well. So we have this situation, this well, the No. 1 Ross, at 1435 produces gas, at 1465 producing oil, then we come down here to 1477 in the State, again in the "D", and produce gas. Now, I don't think that shows homogeneity of the reservoir...

MR JERSIN: Was there anything shown on the well in Section 16?

MR COWDERY: I have 412 feet of gas cut water. Stanolind may have a different or better recovery than that. It was their well. Now, I would like to consider the "J" reservoir, and I want to point out that after all this thing must be considered a dry hole in the "J". It had no production, it was tested, it wouldn't produce from the "J", so it must be considered a dry hole. It is separated from our hole, the No. 1 Schwinat, it is separated by this well from this other "J" producer. Then too, the situation around our Schwindt here, the northeast corner of 13 and our Fletcher Miller in the southeast corner of 13, this

well had 26 feet, we figure, of effective pay gas and of sand, "J". This well tested seven hundred thousand cubic feet a day, actually only had two isolated feet. So in this short distance we had gone from 26 productive feet to two short feet, which indicates to me that it isn't a very homogeneous reservoir. Then too, I would like to bring up the fact that these perms, although it doesn't take many perms to produce gas, only are in the neighborhood of 80 millidarcies permeability, and 95 over here in the "J". A few months back we considered the Adena reservoir and felt it required one well to 160 acres to drain that reservoir. We considered it to be a homogeneous reservoir and the evidence has proven it to be. Well, at that time we were considering wells that had 2000 millidarcies permeability, and here we are considering one at 80 and we say it will drain 320.

MR JERSIN: What recommendations do you have?

MR COWDERY: My recommendation is that I don't think you can effectively space this because it is not a common reservoir. I think that the relationship of the wells bears out that neither in the "D" nor the "J" is there a common reservoir. We agree with the structural picture as presented by Carter and Stanolind but we feel the sand development and the homogeneity, the lack thereof, is the controlling factor in this case and we don't feel it can be spaced.

MR ROCCHIO: Not even in 160s?

MR COWDERY: I feel in an erratic reservoir that 160 would come nearer to draining. Because of the nature of the reservoir the smaller the unit the more effective your drainage will be, because it is such an erratic condition. I think we have separated these wells off from each other.

Q. In addition to not having one pool under the total area being discussed, would it be your opinion that the land in Section 13 and the northeast portion of that area would have a different structure production-wise than the remainder of the area?

A. I think it is certainly different. We have just the two "J" Sand gas wells. We have this well in between which doesn't produce out of the "J". We have this very rapid change indicated here in the "J", an essentially dry hole, and up here we have a dry hole in the "J". To me it is a very erratic condition, and particularly in this case where this well lies between these two wells and separates them. I don't think you could say it is related to this well.

Q. In the Rocky Mountain Standard's reply this statement is made, "There is a reasonable conclusion the gas well in Section 13 in all probability is an isolated gas well." Would you agree with that statement?

A. I would feel that it was, yes.

CHAIRMAN DOWNING: Any further questions? Anyone else want to question this witness?

(Witness excused)

MR LAUGHLIN: I would like to recall Mr Heglund for a few questions.

MARTIN O HEGLUND

recalled as a witness for the Stanolind Oil and Gas Company, having been duly sworn according to law, upon his oath testified further as follows:

REDIRECT EXAMINATION

BY MR LAUGHLIN:

Q. Referring to this cross-section which has been marked Exhibit D, was that prepared by you or under your superivision, Mr Heglund?

A. This cross-section was prepared under my supervision by my draftsman.

MR LAUGHLIN: I would like to offer Exhibit D into evidence.

CHAIRMAN DOWNING: If there is no objection it will be admitted.

Q. Will you explain what Exhibit D is and what it represents and what you conclude from Exhibit D?

A. Exhibit D is merely a reproduction of the features of the "D" and "J" sands as indicated by the electric log, laid down here to a vertical depth scale. On this cross-section I show the features of the "D" and "J" sand for the Stanolind well in Section 16, I show the features for the Ross well in

Section 23, and for the Schwindt well in Section 13. You will note that the features of your sand, your "D" and "J" individually, are directly correlatable across the structure. That is indicative in my opinion of continuity and the only reason that you don't get commercial production locally are localized conditions perhaps within the vicinity of a well whereby some features of this sand do not contain as high permeability as it does in other wells. The correlation here is obvious.

MR CAMPBELL (Ray Campbell, Greeley): Wouldn't that more or less just represent your regional dip of the basin and not necessarily of the sand, because you don't have enough wells in between the points that you have there to indicate whether you would have a rise or a fall in that structure, in that sand?

MR HEGLUND: The logs in themselves indicate some qualitative...

MR CAMPBELL: Between your Schwindt well and your Ross well you have what? Two miles, two and a half miles?

MR HEGLUND: That is about a mile and a half roughly.

MR CAMPBELL: In that mile and a half couldn't that structure change but your cross-section would show you just a regional dip?

MR HEGLUND: There is a probability that it would change, but I would expect it to very, very closely follow this.

CHAIRMAN DOWNING: Proceed.

Q. You conclude then, Mr Heglund, that the "D" Sand consti-

tutes a common source of supply in this area proposed to be spaced?

A. Yes, I do.

Q. And do you conclude the "J" sand is a common source of supply in the area to be spaced?

A. Yes.

MR LAUGHLIN: No further questions.

MR COWDERY: I just wonder, if I would take a log from just anywhere in the basin and put it against this I would probably find I would have a "D" sand and in many cases I would have a top bench "J" development. I am wondering just what you proved other than you do have "D" sand present and you do have "J" sand present, and as far as the characteristics, they don't look alike to me. The "J" sand top bench, particularly in the center well, which is the Ross No. 1, you find your resistivity curve developed a little nearer to the top of the bench than you do in the other wells. They aren't particularly similar other than the fact they are top bench "J" wells - I mean top bench "J" kicks.

MR HEGLUND: Well, it is pretty difficult to get two logs that will match exactly. I will agree with you there.

MR COWDERY: What I say though is, I can take a well of the Adena and the air hole is fairly constant with this interval and I would insert it in there and I would have a "D" development and I would have a top bench "J" development,

and in some cases that top "J" development would look a lot like the gas well, our No. 1 Schwindt.

MR HEGLUND: The point I was trying to get across was the fact that your sands are readily correlatable across here. There are variations in permeability, I will grant you that. You find them in most "D" and "J" sand pools. But I was trying to use this exhibit as a means of explaining that locally you do get a variation in permeability which gives you different quality wells.

MR COWDERY: Then if you have different quality wells and you have dry holes within a field and apparently you have permeability barriers, would you say it is a common source of supply?

MR HEGLUND: If I had a dry hole at this point right here and...

MR COWDERY: Which you do have in the "J" sand.

MR HEGLUND: And I had a productive well here, and out here somewhere, I would say it is more probably that I had a localized effect here.

MR COWDERY: Well, wouldn't that localized effect probably cut this well off from that one up there, particularly when you have a low perm well....

MR HEGLUND: I would have to have a definite block clear across the structure. If I had permeability linking this well, even though it goes around this way to a point over here, I would get the drainage.

MR COWDERY: Well then, wouldn't you say we don't know enough about the reservoir right now to call it a common source of supply?

MR HEGLUND: In my opinion, like I stated, I think it is very probable that we have a common source of supply.

CHAIRMAN DOWNING: Any further questions?

MR COWDERY: I would like to ask one more question. Would you say the accumulation of gas in each one of these wells is common to each well, similar well? That the Stanolind well in 16 and the Siler well in 22 have an accumulation of gas common to each of those wells?

MR HEGLUND: The commercial gas found in Stanolind was from the "D" sand and this well was completed in the "J" sand, but there was evidence of gas in the "D" sand and therefore I would say there was evidence of a common source as between the "D" sand from this well to that well.

MR COWDERY: And the well in 23 as well? This is a common accumulation of gas under each of these wells?

MR HEGLUND: The well in 23 is completed in the "D" sand - "J" sand, correction - and my interpretation would be the reason it didn't produce in the "D" was the sand was not...

COMMISSIONER VOLK: It is a "D" sand well?

COMMISSIONER BRETSCHNEIDER: Dry in the "J"?

MR HEGLUND: That's right. My thinking is this, that the reason it is dry in the "J" is just lack of permeability.

MR EPPERSON: I don't know whether this is a proper question or not but does that map show the ownership of the leases? Or is the Commission interested in that?

COMMISSIONER BRETSCHNEIDER: Yes, we are interested.

MR EPPERSON: How many acres does Stanolind have in that area?

WITNESS: We have under lease one section and a half, Section 16 and the north half of Section 21.

MR EPPERSON: Do you have drilling commitments on either of those now?

MR HEGLUND: We have a drilling commitment - we have a farm-out arrangement which calls for a drilling commitment.

MR EPPERSON: You just have the section and a half on the west side of the area?

MR HEGLUND: That's right.

MR EPPERSON: And you have a drilling commitment on part of it?

MR HEGLUND: That's right.

CHAIRMAN DOWNING: Any further questions?

MR LOVE: I would like to ask if, in a common reservoir, you would expect to find a common water level?

MR HEGLUND: No, in the Denver-Julesberg basin I would not necessarily. It depends a lot on the individual field itself.

MR LOVE: Why not?

MR HEGLUND: Quite often in the Denver-Julesberg basin you will find that locally your sand tends to shale up and your natural water saturation becomes higher and therefore you can't always bank on a common water level in a field here in the Denver-Julesberg basin.

MR LOVE: Well, that is due to variation in development of the sand, isn't it?

MR HEGLUND: That's right.

MR LOVE: It shows the erratic nature of the sand in the Julesberg basin. Inasmuch as the well up there in Section 12 was dry in the "D" Sand and apparently had permeability and these wells in Sections 22 and 16 are much lower structurally and have gas - or 23 and 16 have gas in the "D" Sand - would that look like a common reservoir to you?

MR HEGLUND: I wouldn't attach too much significance to the dry hole in the "D" here and the production in the "D" here when you do have those permeability variations.

MR LOVE: Permeability varies so radically that you wouldn't pay much attention to that?

MR HEGLUND: Well, I don't think of it as a barrier as much as I do some gradations...

CHAIRMAN DOWNING: We are getting into argument. We want evidence.

MR LOVE: I would like to ask one more question.

CHAIRMAN DOWNING: One more question, all right.

MR LOVE: In the Denver-Julesberg basin is it common practice to more or less expect the permeability barrier to play a part in creating the reservoir causing accumulations, or is it structural, reverses in the structure?

MR HEGLUND: My observations of the basin are that your oil accumulations are probably due in general to two reasons: One, so-called stratigraphic pinch-outs, that is, permeability decreasing going up; and the other is a terrace effect or some nosing effect of the structure or some change in dip of your structure.

MR LOVE: Now, which way, what direction, is prevailing in these pinch-outs? In other words is it north-south, east-west? Pinch-outs or permeability barriers, are they north-south, east-west?

MR HEGLUND: Your most predominant - - Well, that varies, I believe, with the pool. I think I have seen them both ways.

CHAIRMAN DOWNING: Any further evidence? You are excused.

(Witness excused)

CHAIRMAN DOWNING: I think it would be helpful if each of you would tell in a very few words what you think the order ought to be. Don't make an argument, just make a statement.

MR LAUGHLIN: The applicant, if the Commission pleases,

is requesting and suggests 320 acre spacing for this entire area, the 320 acres appearing on Exhibit A, with appropriate exceptions for four gas wells - location exceptions for the four gas wells now in the area. I believe there is only necessity for three exceptions; I believe the well up - I don't remember the name of it, the one in Section 13 - would comply with our suggestion, which is that any future well be located within 950 feet of the center of each of the drilling units on which it is located, provided that it shall not be located less than 660 feet from the boundary of any such drilling unit. In view of the motion and application of Mr Culver, Rocky Mountain Standard, it is suggested further that an exception be granted to them for the well they propose to drill. If it is a gas well then it will constitute the permitted well on that unit, and if it is an oil well of course it will not be subject to this order in any event. That is the proposal of the applicant, and I think the Carter Oil Company has one statement to make.

MR LIVINGSTON: Carter Oil Company feels the order should be in the form as proposed by Stanolind. The Commission will note that Carter, according to Exhibit A, has approximately 2,000 acres within the area to be spaced, and we feel that under the circumstances the exceptions as mentioned could be properly made a part of the order but otherwise we believe the order should be promulgated as asked in the petition.

CHAIRMAN DOWNING: Mr Culver, what is your position?

MR CULVER: Rocky Mountain Standard, of course, is put in the position that it can't raise much objection to following the exception outlined by Stanolind, except that we think it would better serve the Commission and the people who live in the area and the possible revenue from the oil which the State gets through its taxation and so forth to exclude the south half of 11 and 12. We do not think that there is sufficient evidence to show that it has any possibility of gas.

CHAIRMAN DOWNING: Do you object to the exclusion of the south half of 11 and 12?

MR LAUGHLIN: Yes, we do.

COMMISSIONER BRETSCHNEIDER: May I ask you a question, Mr Laughlin? There is no gas being sold in the area now, is there?

MR LAUGHLIN: That is my understanding.

COMMISSIONER BRETSCHNEIDER: In view of that fact, is there a drilling obligation which is confronting your company now?

MR ROCCHIO: You mean time-wise?

COMMISSIONER BRETSCHNEIDER: Yes, what are the drilling obligations on the lease offsetting a producing well, a producing gas well, which has no market?

MR LAUGHLIN: If there is no drainage I don't believe there is any offset obligation - if there is no drainage, and there couldn't be drainage if the well wasn't being produced.

COMMISSIONER BRETSCHNEIDER: As I see this there is only one well obligation in the situation and that is the well up here in Section 12, the oil well, if they have a market - and I suppose they would have a market and that is the reason they want to drill a well in the northeast of the west half of the southwest, and that is the only drilling obligation there, isn't it? Or is it?

MR LAUGHLIN: Up in 12?

COMMISSIONER BRETSCHNEIDER: In the area.

MR LAUGHLIN: I am unable to answer that, Mr Bretschneider. I don't know about the drilling obligations, including that of my own company.

COMMISSIONER VOLK: You don't know whether you have any obligations or not?

MR LAUGHLIN: I can't answer offhand. I don't know.

COMMISSIONER BRETSCHNEIDER: What I am trying to develop here, is there any urgency regarding a decision by this Commission at this time due to drilling obligations excepting...

MR CULVER: We do have a starting time on the location in Section 12...

COMMISSIONER BRETSCHNEIDER: We understand that, but does anyone here know of any other immediate drilling obligations in this proposed area?

MR METZ: Yes. I am E T Metz of Brush; I am with

Raleigh Huff. I didn't want to mention it because I had made arrangements to get it drilled before this meeting but we do have a drilling commitment in the west half of 14 and that has to be drilled within the next darn near 60 days or else we lose the lease.

MR ROCCHIO: Within 60 days? Nothing within a week's or two weeks' time?

MR METZ: No, sir, but within 60 days.

CHAIRMAN DOWNING: Anyone else have a statement they want to make?

MR LIVINGSTON: I just wanted to answer, perhaps indirectly, the Commissioner's question as far as the Carter Oil Company is concerned. We have no contractual commitments to drill a well within any specified length of time. We, however, do wish to join with the last operator in developing the area and we feel whether or not we drill depends upon the area to be spaced. If we know the spacing we can feel free to develop in connection with the previous operator's commitment. We already have tentative contracts along that basis. We do not feel cutting down the spacing will allow orderly development to proceed as far as the time element is concerned.

COMMISSIONER BRETSCHNEIDER: You would propose then to make the west half of 14 one of the units?

MR LIVINGSTON: I think one half of 14 is one of the units. To that extent there is a time element involved because

the whole scheme can progress if the Commission finds under the evidence that the area is a reasonable area to be spaced. It will allow an orderly development of the area as a whole. Speaking as one of the large working interest holders, we do not feel free to develop in an orderly basis as planned if this area is cut out as proposed. That I think relates somewhat to the time element.

MR MORRISON: Petroleum Inc recommends that the Commission deny the application for the spacing order. This recommendation is based on the fact that the evidence has not shown this to be a uniform pool. As you know, the Commission's own definition of a pool is an underground reservoir containing a common accumulation of oil and gas. Without that finding of course the Commission can not make the ruling. Moreover, in the alternative if the Commission would determine there is a portion of the area covered by one pool we recommend that the Commission deny the inclusion of the north half of Section 13 since evidence has been introduced to the effect that that is an isolated gas well and a separate area of production. Thirdly, Petroleum Inc would recommend that the Commission not force the existing wells in the area to be exception wells on a 320 acre basis. This recommendation is based on the idea that the statute seemingly...

CHAIRMAN DOWNING: Just state your position. No argument.

COMMISSIONER BRETSCHNEIDER: I would like to ask you

a question. Should we make an order to include the order as requested for 320 acre well spacing, how would that interfere with your development on your property?

MR MORRISON: In which area?

COMMISSIONER BRETSCHNEIDER: As I see the map you have two 80 acre tracts.

MR MORRISON: That's right. This order as you will notice - the application - in paragraph 9 is indirectly forcing the pooling of the north half of Section 13. The basis for an existing well pooling is not clearly known, we do not know exactly what the interpretation of that will be. We are being forced into a blind position, one. Two, the area has not been proven as one pool, one gas pool. The north 80 in Section 13 might prospectively be a location for an oil well, but you are going to prohibit the drilling in the area or more than one well for every 320 acres and the exploration may never determine that fact.

MR GENGLER: I might restate the conclusions I reached in connection with the Graham No. 1 well and the Ross No. 1 well as to the spacing units. Even though the Commission may grant the variation or the exception as to the location of those two wells, it must also go one step further, and that is grant an exception as to the Graham No. 1 well as being a unit in itself as to the west half of the northeast quarter of Section 22, and grant an exception as a unit to the entire northwest

quarter of Section 23 for the Ross No. 1 well in that. And to conclude, I don't believe Section 6 - or sub-paragraph of Section 6 - of the law contemplates a situation where wells have been drilled before the units have been established.

COMMISSIONER BRETSCHNEIDER: The reason I wanted to ask the question about any urgency in connection with the drilling of wells was to give us time to consider the matter.

MR LAUGHLIN: I find on inquiry here, Mr Bretschneider, that we do have one contractual commitment.

CHAIRMAN DOWNING: If there is no objection the hearing will be closed.

(Whereupon at 12:00 o'clock noon, 22 October 1954, the hearing in Cause No. 46 adjourned.)