BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 18, 1974

EXAMINER HEARING

IN THE MATTER OF:

Application of Northern Minerals, Inc. for pool creation and special pool rules, McKinley County, New Mexico

Case No. 5521

BEFORE: Richard L. Stamets, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: William Carr, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant: Mr. Lloyd Davidson

I N D E X

E X H I B I T S

MR. STAMETS: Case 5321.

MR. CARR: Case 5321. Application of Northern Minerals, Inc. for pool creation and special pool rules, McKinley County, New Mexico.

MR. DAVIDSON: I am Lloyd Davidson, representing Northern Minerals. I have with us a geologist from Farmington, Mark Weidler.

First of all, we would like to suggest that this field be given the name of Miguel Creek. I found no conflict in the name in that regard.

We also are requesting in this Hearing that we be permitted to drill these wells at unorthodox locations without in each case having to get specific administrative approval, and in that connection, the topography plays an important part. We have a map here which shows the wells that we have drilled. It also shows, and Mr. Weidler will indicate, where the locations would fall if we followed the normal location procedure. We have a situation here where we have Chico Creek running right through the little field, and we have also a mountainous condition there.

MR. STAMETS: Mr. Davidson, you are an owner in Northern Minerals, Inc., is that right?

MR. DAVIDSON: Yes, sir.

MR. STAMETS: And Mr. Weidler probably should be sworn at this time if he will be testifying.

Are there any other appearances in this case?

(Witness sworn.)

MARK E. WEIDLER

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

BY MR. CARR:

Q Mr. Weidler, will you state your full name for the record, please?

A Mark E. Weidler. I am a consulting geologist in Farmington, New Mexico.

Q Mr. Weidler, have you ever testified before the Oil Commission and had your credentials made a matter of record?

A Yes, I have.

Q Are you familiar with the Application in this case?

A Yes, I am.

MR. CARR: Mr. Examiner, is Mr. Weidler qualified in this matter?

MR. STAMETS: Yes.

MR. CARR: At this point, Mr. Davidson, would you like to go into what the substance of your Application is with Mr. Weidler? Is that how you would like to do it, Mr. Examiner?

MR. STAMETS: Yes.

DIRECT EXAMINATION

BY MR. DAVIDSON:

Q You have drawn this map, have you not, Mr. Weidler?

A Yes.

Q What does this map indicate?

A The map is an enlarged plat of Section 29, Township 16 North, 6 West, McKinley County in which Northern Minerals has undertaken development of an oil field approximately one year ago for which Miguel Creek is being proposed. The purpose of the illistration or exhibit is to provide the Examiner with a reference plat which shows the location of the wells drilled to date by Northern Minerals in the southeast quarter of the northeast quarter of Section 29, and I will point out those wells. The original discovery well was the Santa Fe Pacific No. 6 which was plugged and abandoned because it was carried through the Gallup Zone and we didn't want to have

any problems with water, so we plugged it with cement and came back and drilled a 40-foot offset called the No. 6-Y. We produced a small amount of oil for a short period of time from the No. 6-Y and subsequently converted it to an injection well which was approved by the Commission at a hearing in October of '73.

Subsequent to that it was the Santa Fe Pacific No. 7 and No. 8 and No. 11 which were completed as producing wells from the Hospah-Gallup Zone at a depth of approximately 750 feet. An additional well was a water supply well drilled about 137 feet northwest of the No. 6-Y and it is completed in the massive Gallup Zone as a source well for water for injection in this shallow water project.

The most recent well drilled is the Santa Fe Pacific No. 15 which is located in the southeast southeast, northwest of Section 29 at an unorthodox location which was approved by the Commission.

I have indicated on the plat the proposed pattern of development that we are considering for this field which is a development on a 10-acre pattern, with the ultimate plan being to produce from alternate acre locations and inject in alternate 10-acre locations which

which would provide a five-spot pattern, and as a result of this plan, we are requesting approval of the Commission for the conversion of the Santa Fe Pacific No. 8 to an injection well as part of this proceeding today, and we ultimately expect to have alternate 10-acre locations being injection wells and the other alternates being producing wells which, if carried out on a systematic basis, would provide a five-spot pattern of flooding, providing for injection wells around each producing well which we feel would provide the most economic and efficient means of stimulating the production from this shallow, low pressure zone.

The map also shows the Chico Arroyo and there is a companion arroyo which comes in from the southeast and a rimrock to the northwest, and these topographic features will provide some problems in the systematic development. As you can see, several locations fall very close to the arroyo, and if the field is to extend to this distance, we will, of necessity, have to be modifying the normal locations to unorthodox locations to allow drilling equipment and operating equipment to have reasonable access.

Q All right, Mr. Weidler, I think that covers our

position with respect to the request for the drilling of the well at an unorthodox location with administrative approval.

Now, to the matter of the second point that is requested, and that is elimination of surface pipe. Have you had, in the drilling of these wells, any shallow water zones that you have encountered?

A No, the principal water aquifers in this area are the point lookout sandstone and the Gallup. The point lookout occurs as a rimrock around Miguel Creek dome and is not involved in the major portion of the field, and hence, is not a factor in the consideration of aquifer protection. The massive Gallup is below the producing zone, and hence, is not an essential issue. The other sands in the section are the Hospah sands which crossed out at the surface in the immediate area of development. The Hospah sandstone underlies immediately the surface in this area and extends to a depth varying from approximately 200 to 250 feet as a fairly massive sand. To date, we have encountered no flows of water, and to our knowledge, it is not used as a water supply for either domestic or commercial use in the immediate area. The only other intervening sand between the surface and the producing

zone is what we call the Dalton Sand, which I will show you on electric logs is a thin sand that is impermeable and to our knowledge has not been used.

MR. CARR: Mr. Weidler, for purposes of the record, the location map to which you have been referring is Applicant's Exhibit No. 1, is that correct?

THE WITNESS: Yes.

MR. CARR: Now, is it your intention to offer a copy of the log as an exhibit also?

THE WITNESS: Yes, we can.

MR. CARR: Then that should be marked as Exhibit No. 2.

(Whereupon, a discussion was held off the record.)

THE WITNESS: The surface area is underlined by the Hospah sand which I mentioned before, and extends to a depth of 200 to 250 feet, and it would be this unit here, and to our knowledge, there is no -- the sand does not carry an Artesian flow anywhere in the area and it is not used for domestic or commercial sources of water, to our knowledge in the immediate area.

The only other sand intervening between the surface and the producing horizon, the Hospah sand, is a

thin, relatively impermeable sand, the Dalton Sand, which we have cored at a couple of locations in the immediate area. It is a very shaley-type sand and we feel quite sure it does not represent a ground water aquifer.

It is our practice, in the completions of the wells in this area to run casing -- drill through the zone, the Hospah zone of interest -- run casing to the top of the zone using a cement basket as a cement retainer, and circulate the cement to the surface, thereby insuring cement-lined casing from the top of the pay zone to the ground surface. We have found that we have had -- experienced no problems thus far in the year of operation following this procedure. It has been our experience that the utilization of one or two joints of larger surface casing does not in any way help the operation or the protection of any other zones.

BY MR. DAVIDSON:

Q Now, Mr. Weidler, going to the third request made, I believe that the initial injection well was completed without the use of tubing. Can you give us some background and history on how that well has performed since it has been used as an injection well?

A Yes. The initial injection well was the Santa Fe

Pacific No. 6-Y which is shown at this location and it is shown as an injection well. We started injecting the water in that well after approval from the State, from the Commission last year, and since that time, we have injected approximately 60,000 barrels of water through that well at pressures ranging from 400 to 680 pounds and have experienced no difficulty in the injections and have had no indications of dramatic pressure changes which would suggest leakage. We have had no surface evidence, and we feel that with the procedure we followed of cementing on top of the zone and circulating the cement to surface, we minimize the chances of any casing failure or leaks developing. It has been our experience here that so far that the injection and down-casing is safe and effective means of so doing. We have minimum friction loss. We have not experienced any problems and we don't expect to experience any problems with injecting these.

Q Now, as respects the well known as the No. 8 Well, the Commission gave temporary approval for the completion of that well as an injection well. Has it been completed as such a well?

A Yes. Approximately a week ago, we made a conversion and laid an injection line from the injection pump

which is located adjacent to 6-Y. We laid a two-inch line pipe line to that well and commenced injection approximately a week ago, and we have introduced approximately 1500 barrels of water thus far with pressures averaging about 550 pounds, the minimum being approximately 450 and the maximum being 650. It has taken the water readily and, in fact, easier than the original 6-Y, and I think this will make a very good injection well. No problems thus far.

Q Now, then, to the next point, that is, as to the permission to drill additional injection wells and inject water into these wells. What, based upon your geological study of this area, do you now think will be the minimum or approximate outline in acreage of this field?

A It is very difficult to establish at this time. The drilling that has been conducted by Northern Minerals has been in the immediate area of the exhibit, and I feel that the field will develop laterally and to the north primarily. We are located on the anticlinal feature plunging to the north which was illistrated in the exhibit that we had at our last hearing.

Do we need to re-introduce that, Mr. Stamets?

MR. CARR: I think you can just express an

opinion on it.

MR. STAMETS: I think that would be adequate.

THE WITNESS: I believe the field will encompass parts of Section 29, illustrated before you, portions of the adjacent section to the east, Section 28, and the section to the north, which is Section 20, and could encompass, when ultimately developed, 1200 to 2000 acres. That is just a judgement figure because the critical limits of the field have not been defined by the drilling done to date.

BY MR. DAVIDSON:

Q If I understand it correctly, your plan of development of this field is to drill two injection wells on each 40-acre tract?

A Yes. As mentioned previously, we propose to develop the flood on a systematic basis, utilizing 10-acre locations, two of which, the diagonals will be producing wells, diagonals with the injection wells which will provide on a completely developed basis, a five-spot pattern of injection around each producing well which we feel will provide the most efficient flood and probably the most economic flood in terms of density of wells.

Q So, if the field covers 1200 acres, that is

30 40-acre tracts or meaning that you would have 60 injection wells?

A Yes.

Q Meaning that you would have 60 hearings if we did not have some sort of administrative approval for the injection wells?

A Yes, sir.

Q Now, then, I would like to pass this map to you and you may mark it Exhibit 3, if you will.

What does this plat show, Mr. Weiler? The yellow is the Northern Minerals acreage, and it shows that there are no other offsetting lease owners?

A That is correct, to the presently developed area and the area in which we expect the primary field to develop, which would be this area through here. All of the leasehold interest through the producing zone is under lease to Northern Minerals, Incorporated.

MR. DAVIDSON: I think that covers our case.

MR. STAMETS: Are there questions of this witness?

CROSS EXAMINATION

BY MR. KENDRICK:

Q Mr. Weidler, on Exhibit 2, you referred to the Dalton Sand. Would you please identify the depth of the

Dalton Sand on the log you are referring to?

A The Dalton Sand, in Exhibit 2, which is the electric log for the Santa Fe Pacific No. 8 Well, curves at a depth of 483 feet and is approximately 20 feet thick, and within the area that we have drilled thus far, we have found that thickness to be very consistent, and where we have quoted it, we have found it to be a very fine grade of shaley sand, which does not appear to me to be an aquifer.

Q Now, in your request for wells to be drilled at non-standard locations, have you considered the current Rule 104 allows drilling wells at locations as close as 330 feet to the boundaries of 40-acre tracts at its closest point and 30 feet to each other 40-acre tract?

A Yes, and on Exhibit 1, I have illistrated those locations as being 330 feet from each of the corners of the respective 40's, the point being that there appears that there may be as many as 6 wells, or perhaps more in the enlarged area that the location of wells could be affected by surface draining conditions that might go beyond the normal limits of locations.

Q The location of wells in the 40-acre tracts on this Exhibit 1, from well to well, is that --

A (Interrupting) 660 feet.

Q Rule 104 will now allow you to drill as close as 330 feet to another well within that 40?

A Yes.

Q Would that allow you enough flexibility, or do you need closer or further latitude than that for drilling within these tracts?

MR. DAVIDSON: Well, I haven't been sworn to testify, but I will ask you this: Mr. Weidler, is the location of the No. 15 well 2805 feet from the east line and 2405 feet from the north line?

THE WITNESS: Yes, it is.

MR. DAVIDSON: Did you find it necessary to put the location of that well at that point in order to adequately drain or attempt to drain that 40-acre unit inasmuch as Chico Creek occupies most of the rest of the 40 acres?

THE WITNESS: Yes, sir.

MR. DAVIDSON: I think that comes out to about 165 feet from the east line of that 40, Mr. Kendrick, and about 100 feet from the south line.

MR. KENDRICK: It is closer to the east line on the 40 than the south line, according to the plot?

MR. DAVIDSON: Yes.

BY MR. KENDRICK:

Q Could you live with footage spaces such as some of the other pools like the Chaco Wash Pool where the locations are allowed to be as close as 165 feet to the outer boundary of the 40-acre tracts and as close as 330 feet to another producing well?

A I believe we could. Yes, we could, sir.

Q When you request for injection down the casing only with only one string of tubular goods for injection wells, is the injected water from your source well corrosive fluid?

A To our knowledge, no. We have experienced no problem with corrosion. The water from the Gallup is very fairly soft water and fairly low in solids and an analysis of that water was provided to the Commission at our last hearing, and there are no ions there that indicate a high degree of corrosiveness.

MR. KENDRICK: I believe that is all the questions I have.

MR. STAMETS: Mr. Arnold?

CROSS EXAMINATION

BY MR. ARNOLD:

Q Mr. Weidler, the pumper out on that lease was actually drinking that water, wasn't he?

A Yes. We use the same water that is injected as a domestic water supply.

Q So you wouldn't class that as a particularly hard water?

A No, it is very soft water, very soft.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Weidler, which well, again, is the source well?

A The source well is this well located over here on my exhibit.

Q What is the depth of that well?

A That well went to the massive Gallup to a depth of 905 feet.

Q How about the produced water, what is the quality of it?

A The produced water is very close in chemical constituent to the water injected. The producing zone is the next sand superjacent to the massive Gallup which is a water supply zone and I suspect that, geologically, if you take it back to the in-take area that it is very

closely related water zones.

Q Are you currently returning the produced water to the injection wells?

A No, we are not at present, but we are trying to lay a plan by which we can return the produced water to injection wells. We find them both compatible.

MR. DAVIDSON: What is your plan on that?

THE WITNESS: What we expect to do is take the separator water directly from the tank we are producing in from, and take it back to a separate tank through a minimum of filtering, and with no planned chemical treatment, feed it to the suction side of the injection pump again.

BY MR. STAMETS:

Q Do you have any objection to running an annual analysis on that produced water?

A No, none at all. We would be more than pleased to.

Q Would you propose on these non-standard locations to stay at least 330 feet away from a lease owned by any other operator?

A Yes, I believe we can abide by that.

Q Are these wells drilled with cable or rotary?

A Rotary tools. They are all drilled with rotary

tools.

Q It makes it a little more difficult to pick up a stray water sand?

A Yes, but we -- our experience here has been -- we usually drill with essentially clear water. We don't add -- really mud up until we get up close to the zone of interest for coring purposes, and were there significant aquifers, I think we would have encountered a water flow or some indication of volume gain in that.

Q You would report any such aquifer found to the District Office of the Commission?

A Yes, we will.

MR. STAMETS: Are there any other questions of this witness?

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Weidler, will the granting of this Application, in your opinion, be in the interest of the prevention of waste and protection of correlative rights?

A Yes, I believe it would.

Q Were Exhibits 1, 2 and 3 prepared by you or under your direction and supervision?

A Yes, they were.

MR. CARR: Mr. Davidson, is it your intention that these exhibits be made a part of the permanent record of this case?

MR. DAVIDSON: Yes.

MR. STAMETS: These exhibits will be admitted into evidence.

(Whereupon, Applicant's Exhibits Nos. 1, 2 and 3 were marked for identification, and were admitted into evidence.)

MR. STAMETS: Are there any other questions of the witness, or is there anything further in this case? Mr. Kendrick?

MR. KENDRICK: I have advertised a case coming up on October 2nd, the Mangus Pool and Arroyo Chico Pool. I have no objection to the name being Miguel Creek Pool, but I would prefer that the formation be referred to as Gallup rather than Hospah because Hospah is a geographic location rather than a formation location as far as we have been operating in the San Juan Basin.

MR. DAVIDSON: May I say something? I don't care what we call it and I don't care what we call the producing sand, Mr. Kendrick, but I've got a farmer out in Tenneco that specifies that this is the Hospah Sand,

and I would prefer to call it Gallup-Hospah or Hospah Sand or Hospah-Gallup, but I would very much like to keep that Hospah in there.

MR. KENDRICK: In the interest of brevity, we would prefer one name. If the Examiner will rule it Hospah, that is fine with us. The Miguel Creek, we have no objection to that. Between the time I put my advertisement out and the docket came in, they crossed in the mail.

MR. STAMETS: Is there anything further in this case? We will take the case under advisement.

STATE OF NEW MEXICO)
) SS.
COUNTY OF SANTA FE)

I, RICHARD L. NYE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

COURT REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5321, heard by me on 9-18, 1974.

Examiner
New Mexico Oil Conservation Commission

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