

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

May 21, 1969

EXAMINER HEARING

IN THE MATTER OF:

Application of Allied Chemical)  
Corporation for a waterflood )  
project, Roosevelt County, )  
New Mexico. )

Case 4140

Application of Allied Chemical)  
Corporation for a unit )  
agreement, Roosevelt County, )  
New Mexico. )

Case 4139

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. HINKLE: I'm going to move that these two Cases be consolidated, 4139 and 4140.

MR. UTZ: Case 4139.

MR. HATCH: Application of Allied Chemical Corporation for a unit agreement, Roosevelt County, New Mexico.

MR. UTZ: 4140.

MR. HATCH: Application of Allied Chemical Corporation for a waterflood project, Roosevelt County, New Mexico.

MR. HINKLE: I am Clarence Hinkle, appearing on behalf of Allied Chemical Corporation. I have one witness in this Case.

CLYDE D. FORD

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

DIRECT EXAMINATION

MR. UTZ: We had better put in the record that we are combining Case 4139 and Case 4140 for personal testimony only.

MR. HINKLE: Yes, sir.

BY MR. HINKLE:

Q Would you state your name, residence and by whom are you employed?

A My name is Clyde D. Ford. I live in Houston, Texas. I am employed as Superintendent of Unitization, Secondary Recovery, for Allied Chemical Corporation Division, Union Texas Petroleum.

Q Are you a graduate of petroleum engineering?

A Yes, sir, I am.

Q Have you testified previously before this Commission?

A No, sir, I have not.

Q Will you state briefly your education qualifications and your experience as Petroleum Engineer?

A I graduated with a B.S. in petroleum engineering from Louisiana State University in 1953. It was then, Stanlon Oil and Gas Company, now Pan American Petroleum Corporation; and I worked for them until 1960, doing engineering work, both reservoirs and production type engineering work. I went to work in 1960 with an independent oil company which properties were located mostly in west Texas and southeast New Mexico. And in 1964, I went to work for Union Texas Petroleum Division, Allied Chemical Corporation, and have been Superintendent of Unitization

Secondary Recovery, following projects in the entire United States, since 1966.

Q Are you familiar with the applications of Allied Chemical in these two cases?

A Yes, sir, I am.

Q What is Allied Chemical seeking to accomplish with these two applications?

A In Case 4130, we are applying for the agreement approval and --

Q That is Case 4139.

A Excuse me, that is 4139. We are applying for unit agreement approval, an approval of the unit area. In Case 4140, we are requesting a waterflood program, covering the identical unit area approved.

Q Have you made a study of the Milnesand (San Andres) area?

A Yes, sir, I have.

Q And of the various wells that have been drilled in the area? In the proposed area?

A Yes, sir.

Q Have you prepared, or have there been prepared under your direction, exhibits to be introduced in this Case?

A Yes, sir.

Q Refer to what has been marked as No. 1, which consists of a number of attachments which are referred to as Exhibit 1-A, B, and so forth; and refer to, first, Exhibit No. 1, and explain what this shows.

A Exhibit No. 1, shows the general area in which the unit is requested to be approved. The unit area, itself, is outlined in red. It also shows the wells which are drilled within the unit area; and all wells which have been drilled within two miles outside of the unit area.

Q Does this also show the character of the lands involved, whether they are Federal, State, or --

A Yes, sir, it does. The Federal lands are indicated on the bottom of each of the major tracts.

Q Are all the lands within the proposed unit area Federal lands or --

A No, sir. Approximately 48.17 percent of the lands within the unit area are Federal lands. The remaining 51.83 percent are fee lands.

Q Does Allied Chemical own a substantial part of the leases within the proposed unit area?

A Yes, sir, we own all of the interests in Section 18, the north half and southwest quarter of Section 19

in Township 8, Range 35, and we own the south half of Section 13 of Township 8, Range 34.

Q Does this proposed unit include all of the wells within the Milnesand space (San Andres) producing area?

A The wells to the south are operated by Pan American Petroleum Corporation, under the Horton Federal Lease; at the election of Pan American, will not be included in the unit area. They have indicated they will cooperate with us on a flood, and in fact, there is a pressure maintenance project which has been approved, and they are using -- injecting water into wells in this area, now.

Q This is immediately to the south in Section 29 and 30?

A Yes, and 31.

Q What are some of the reservoir characteristics of the Milnesand (San Andres) Pool?

A Well, it is a San Andres dolomite, approximately 4500 or 4600 feet, and it consists of three porosity zones, which lie 750 feet below the top of the formation. The average net pay is 46 feet. It's fine to medium, crystal and brown with pinpoint to vuggy porosity. The average

porosity is 6.13 percent and the permeability --

Q Refer to Exhibit 1-A, and explain what it shows.

A Exhibit 1-A is a map of the unit area which shows all wells that have been drilled in the unit area, and wells that have been drilled within two miles of the unit area. But it shows in addition, by indicated circles, colored in red, those wells which will be used as injection wells, and, in addition, it shows the tracts numbers which have been designated and defined in the unit agreement.

Q How many proposed injection wells are there?

A There are 28 currently proposed injection wells.

Q Now, in the notice of advertising, in Case 4140, it indicates there would be 33 injections wells?

A There are some wells that are edge wells that were located around a well, which we only recently learned was permanently abandoned. It's required that we make some minor modifications to the injection program that we had planned originally, so that this current plans consist of 28 rather than 33 injection wells.

Q Now, refer to Exhibit 1-B, which consist of a series of exhibits together, and explain what these are.

A Exhibit 1-B is logs covering the intervals of the 28. The Jacob's Federal No. 10, the log was not available on this well. I don't know whether there was an original log run. We purchased these properties from El Chorro, but we could not find a copy of the log on No. 10. The other --

Q These have not been included?

A That's right. Each one of the logs had been marked to show the three zones of the porosity that I mentioned earlier. They are called top zones, Zone 2 and Zone 3. It is apparent from each one of the logs that the zones are continuous throughout the reservoir.

Q I refer to Exhibit 1-C, and will you explain this exhibit?

A Exhibit 1-C is a plat showing the structure on the top of San Andres reservoir, which indicates that it is gently dipping anticline, which dip to the southeast.

Q Does this tend to show that continuity of the entire reservoir San Andres formation, that is the unit area?

A Yes, sir.

Q Now, refer to Exhibit 1-D, and explain to the Commission.



A Exhibit 1-D is the production curve showing the average monthly production of oils from wells within the unit area, plotted against time.

Q First production was the early of 1959?

A Actually, the first production, was July, 1958.

Q Now, refer to Exhibit -- do you have any further comments with respect to that exhibit?

A No, not with respect to that exhibit.

Q With reference to Exhibit 1-E, will you explain this?

A Exhibit 1-E is just a chart, showing the production which went into the draft on the previous page. It also shows the cumulative oil productive, which through February of 1969, amounted to 4,391,395 barrels of oil.

Q Now, refer to Exhibit 1-F, and explain this to the Commission.

A Exhibit 1-F is a diagrammatic sketch of a typical injection well to be in the proposed plan of waterflood.

Q That's the conversion of existing producing wells to injection wells, that you referred to?

A Yes, sir. All wells in the unit area are

completed singly. All of them will be wells that have casing entirely through. There is no variation as far as the type of wells, so we used a single diagrammatic sketch with a chart of Table 1, which is Exhibit 1-G, to show the various information corresponding to that shown on the diagrammatic sketch for the other wells which will be used as injection wells.

Q So, between these two exhibits, 1-H and 1-G, it does show all the information, with respect to the completion of the injection wells?

A Yes, sir.

Q It also shows how the casing has been cemented?

A Yes, sir.

Q How it was used, and so forth?

A Yes, sir.

Q Quantities of cement used?

A Yes, sir.

It also shows that we do plan to use plastic lined tubing for all of our injection wells, and we do plan to use inhibited fluid behind the tubing in the annulus.

Q Now, what is the character of the water which you intend to inject?

A In these wells, the water which we propose to

inject is salt water. It is produced water which comes from the Cross Roads Devonian Field, which is approximately 14 miles from the area that we are referring to here. This is salt water, and we have had it analyzed under, I think, Exhibit No. 4. The analysis is for both the San Andres produced water, which has a chloride content of one hundred and sixty-seven thousandth parts per million, and the second page of that exhibit is an analysis of the East Cross Roads water which has a chloride content of thirty-seven thousandth parts per million. You will also note, this analysis which was run by Dowell, on page 1, indicates there was no precipitant was noted when this water was mixed with East Cross Roads Devonian water, and allowed to stand for 72 hours; so we feel that we do have a compatible water system that we will be injecting here.

Q Has this area been designated by the United States Geological Survey in an area suitable and proper for utilization?

A Yes, sir, it has.

Q Refer to Exhibit 2, and explain what this is?

A Exhibit No. 2 is a letter from a United States

Department of Interior, Geological Survey; signed by the Acting Director which approved as an area for unitization, the 5,370 acres which we are requesting to be approved here today.

Q Does that letter also approve the proposed form of the unit agreement?

A Yes, sir, we submitted a form of unit agreement, which the letter approved, subject to certain modifications which have been made in the exhibits which we are presenting here today.

Q Is this form substantially the same form as heretofore been approved by the Director of the USGS and by the Commission where Federal and Fee lands are involved?

A Yes.

Q Refer to Exhibit 3, being the unit agreement. Is this the form of unit agreement which you filed with the USGS for approval?

A Yes, sir, including the modifications which they referred to in Exhibit 2.

Q Now, who is designated as Unit Operator under the terms of the unit?

A The Texas Petroleum and Division of Allied Chemical Corporation.

Q Does the unit plan to provide for participation

of formula?

A Yes, sir, it does.

Under Section 13 of the unit agreement, there is an established formula on which the unit will be based. It is a two-phase formula, with the primary phasing being 25 percent of production from January 1, 1966 to September 1, 1966, and 75 percent on remaining primary, subsequent to September 1, 1966. This portion of the formula will continue until 2,284,845 barrels have been produced subsequent to September 1, 1966; after which the secondary phase will come into effect. And this is based 75 percent on the ultimate primary production, 5 percent on the porosity acre fee, and 20 percent on cumulative production to September 1, 1966.

Q Has this formula been agreed to by all the working interest owners?

A This formula has been agreed to by -- yes, sir, the formula has been agreed to by all the working interest owners by earlier meetings.

Q What is the present status of the execution of the unit agreement by the working interest owners, and by the owners of overriding royalty, and --

A As of last Friday, the working interest signed up Phase One, was 87.204 percent and on Phase Two, by 83.6510

percent. The unit agreement provides, to be effective, that we have to have 75 percent sign-up, so we are well in excess of the required amount under the terms of the agreement.

Q What do you anticipate you will end up with, as far as working interest owners, being --

A In excess of 95 percent. We have some tracts in here where the title is under dispute. We don't know whether we will ever get it signed-up.

Q Is that edge acreage?

A Yes, it is edge acreage, and will not substantially affect the unit, even if we cannot get it signed-up.

Q Do you have any dead-line under the terms for approval?

A Yes, sir. This unit provides that we have to have it effective by July 1, 1969, or it will terminate as of that date, so we are short-fuse.

Q Are you requesting a project allowable in connection with the waterflood project?

A Yes, sir, we are.

Q In accordance with Rule 701 of the Commission?

A In accordance with Rule 701, yes sir.

You asked also about sign-up of royalty interest,

which I did not indicate at that time. We have signed 76.94 percent of Phase One, and 86.0825 percent of Phase Two, royalty interest. Subsequent to last Friday, we have received some additional ratifications, but I don't have the amounts here with me today; but they are still coming in, the reason we are here with this Hearing at this time is because of the short-fuse we have on getting the unit effective.

In addition, the unit provides that only 65 percent of the royalty owners need approve it, for the unit to be effective. And as I mentioned, we have over 75 percent of Phase One and 85 of Phase Two.

Q So you have no problem with respect to required numbers?

A No, sir.

Q Now, are you requesting administrative approval for addition injection wells, in the event you see a need for them in the future?

A Yes, sir, this is a San Andres type reservoir, which has historically been known to have fractures in it, which may or may not give you a problem when you start waterflooding. To combat this, the plan is to start with an inverted nine spots. Once the fracturing pattern becomes

apparent, if it is apparent, we will be able to work with it and, we propose possibly to modify this to a higher injection rate program; and we would like to have approval to change the pattern if it becomes necessary.

Q Does the unit agreement provides for a plan of development to be filed at the time the unit is filed for final approval?

A Yes, sir.

Q Have you formulated a plan of development at the present time?

A Yes, sir, we have.

Q Can you state briefly what it is?

A Briefly, the plan of development will be to start out with the 28 injection wells without going into the pilot program, under the inverted nine spots program. Injecting approximately 700 barrels per day into each of those 28 wells, or a total of about 20,000 barrels per day of injected salt water. We propose to follow this for approximately one year, and look at the performance, and at that time, reevaluate our position.

Q In your opinion, in the event of the approval of this unit agreement, will it be in the interest of conservation and prevention of waste?

A Yes, sir.



Q Will it protect correlative rights?

A Yes, sir.

Q Will it also promote the greatest ultimate recovery of unitized substances?

A Yes, sir.

MR. HINKLE: We would like to introduce Exhibits 1 through 4, inclusive.

MR. UTZ: Exhibits 1 through 4, and including all parts, will be entered into the record of this Case.

(Thereupon, Applicant's Exhibits 1 through 4 were admitted in evidence.)

MR. HINKLE: I believe that is all of the direct.

#### CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Ford, does Table 1 and Exhibit 1 lift all the proposed 28 injection wells?

A Table 1 and Exhibit 1 -- 1-G?

Q Well, mine is just marked Table 1 --

A Oh, yes, yes, sir. That is Exhibit 1-G, and that is all of the 28.

Q Is that the only listing you have in your exhibits of injection wells?

A Yes, sir, other than as shown on the map.

MR. HINKLE: That's 1-A -- it shows the injection wells, too.

Q (By Mr. Utz) I mean, on the map?

A Yes, sir, on the map. But this is the only listing.

Q We need the exhibit location, or by units.

A Well, it will be on the map and also on the logs -- the heading of the logs. It shows the location.

Q You are missing one log?

A We are missing one log --

MR. HINKLE: Can you give them the location?

A I can give the location of that one. It's located -- well, let's see -- that would be 1,980 feet from the west line and 1,980 feet from the north line, Section 19.

Q And what was that well?

A That's Union Texas Jacob's Federal No. 1.

Q Does the map have the well numbers on them, in accordance with Exhibit 1-G?

A Yes, sir.

Q So, there will be no problem in correlating the map with the --

A We made no authorization of well names to units

names at this time.

Q Okay, because we will have to put the wells in the order by their unit number -- unit letter numbers -- so we have got to locate them. You recall, there were no exceptions to your completion practices on all your wells. All of them will be plastic coated tubing?

A Yes, sir.

Q Under a packer?

A Under a packer with inhibited fluid.

Q Any other questions?

MR. HINKLE: That's all I have.

MR. UTZ: You may be excused. Statements?

The Case will be taken under advisement.

I N D E XWITNESSPAGE

CLYDE D. FORD

Direct Examination by Mr. Hinkle

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Cross Examination by Mr. Utz

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EXHIBITSMARKEDADMITTED IN  
EVIDENCEApplicant's Exhibits  
1 through 4

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

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

Kurleen McCutchen

Notary Public

MY COMMISSION EXPIRES: May 22, 1973

I do hereby certify that the foregoing is a complete record of the proceedings at the Examiner hearing of 2:45 PM, April 29, 1969, heard by me at Albuquerque, New Mexico.  
*Thurman R. [Signature]*  
New Mexico Oil Conservation Commission