

CASE 3555: Application of COASTAL
STATES for pressure maintenance
expansion, Lea County.

CASE No.
2555

Application,
TRANSCRIPTS,
SMALL Exhibits
ETC.

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

April 26, 1967

EXAMINER HEARING

IN THE MATTER OF:

Application of Coastal States Gas
Producing Company for a unit
agreement, Lea County, New Mexico.

Case No. 3554

Application of Coastal States Gas
Producing Company for a pressure
maintenance expansion, Lea County,
New Mexico.

Case No. 3555

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

REGISTER

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HEARING DATE

APRIL 26, 1967

TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
Joseph O. Wooten	Montgomery, Ward & Co.	St. Louis, Mo.
L. E. Thomas	Amerada	St. Louis, Mo.
Frank E. Thomas	Coastal States Gas Prod.	St. Louis, Mo.
Richard S. Thomas	Montgomery, Ward & Co.	St. Louis, Mo.
D. A. FRAWLEY	SHELL Oil Co.	Mt. Vernon, TEX
Ray E. Gray	SKELLY OIL Co.	Hosbourn, ILL.
E. FORBES GORDON	COASTAL STATES GAS PROD.	St. Louis, Mo. TEX
W. Z. McGraw	" " "	St. Louis, Mo. TEX
B. P. McCarley	" " "	St. Louis, Mo. TEX
W. D. ELLIOTT	" " "	St. Louis, Mo. TEX
W. H. Price	Maxwell Oil Co.	St. Louis, Mo. TEX
Don W. H. Berger	Phillips Petroleum Co.	St. Louis, Mo. TEX
C. W. Wotton	Phillips Petroleum Co.	St. Louis, Mo. TEX
W. H. Thomas	Phillips Petroleum Co.	St. Louis, Mo. TEX
Jason W. Kellahi	Kellahi & Fox	St. Louis, Mo. TEX
J. B. Grant	SKELLY OIL	Tulsa, Okla.
W. J. Henry	Union Oil	Roswell, N. M.
John A. Anderson Jr.	Phillips Petroleum Co.	St. Louis, Mo.

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARINGSANTA FE, NEW MEXICOREGISTERHEARING DATE APRIL 26, 1967 TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
John W. Ech J.	Domar Industries, Inc.	Dallas, Texas
Leo S. Cichowicz	Continental Oil Co.	Durango, Colo.
William B. Kern	BTA Oil Producers	Midland, Texas
NINA DuHAIME	RW Byram	Santa Fe
Ralph L. Gray	Hudson & Hudson	Artesia, N.M.

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MR. UTZ: Case 3554.

MR. HATCH: Application of Coastal States Gas Producing Company for a unit agreement, Lea County, New Mexico.

MR. HINKLE: Mr. Examiner, Clarence Hinkle, Hinkle, Bondurant and Christy, Roswell, appearing on behalf of Coastal States Gas Producing Company. We have three witnesses, and both of our witnesses, their testimony will relate to the first two Cases 3554 and 3555. The testimony is overlapping. Those cases are very closely associated and I would like to move, if there's no objection, that these two cases be consolidated for the purpose of taking the testimony.

MR. UTZ: As I understand the situation, 3554 is for a unit agreement and the Case 3555 is for a pressure maintenance project within the bounds of the Unit Agreement for 3554, is that correct?

MR. HINKLE: That is correct.

MR. UTZ: The cases will be consolidated for purposes of testimony; separate orders will be written on the cases.

MR. HINKLE: We have three witnesses. I would like to have them all sworn at this time.

(Witnesses sworn.)

MR. UTZ: Do we have other appearances in this case?

You may proceed.

MR. HINKLE: Before proceeding with the testimony, I would like to make a very brief statement for the record and bring you up-to-date on these proceedings here. The Flying "M" San Andres Pool was discovered by Coastal States in February 1964. After eight wells had been drilled, and in July 1964, Coastal States made application to the Commission for the adoption of special field rules, including 80-acre spacing, and these were adopted in July 1964, and a year later, in July 1965, under Order R-2746, these rules were made permanent.

In January 1966, Coastal States made application to the Commission to initiate a pilot pressure maintenance project which has been in operation under Order 3033.

Case 3555 is for an expansion of that pressure maintenance project. Of course, Case 3554 is to unitize the area to make it more effective. It has been the objective of Coastal States from the very beginning to put into effect a pressure maintenance project to prevent pressure declines, and we thought by inaugurating this at an early date they will obtain the greatest ultimate recovery from the pool.

W. D. ELLIOTT

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name.

A W. D. Ellictt.

Q By whom are you employed?

A By Coastal States Gas Producing Company.

Q In what capacity?

A I am Manager of Unitization Developing and Planning.

Q Have you previously testified before the Oil Conservation Commission of New Mexico?

A Yes.

Q You did it in connection with the previous cases which I referred to?

A Yes, sir.

Q Have you continued to make a study of the Flying "M" San Andres Pool?

A Yes, I have continued.

Q Have you made an examination of all the well logs, all of the core analyses and generally all the information available?

A Yes, sir.

Q Are you familiar with the applications of Coastal States in these two cases, 3554 and 3555?

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A Yes.

Q Have you prepared certain exhibits to be offered in evidence in this case?

A They have been prepared under my supervision.

(Whereupon, Coastal States' Exhibits 1 through 16 were marked for identification.)

Q Mr. Elliott, refer to Exhibit 1 and explain to the Commission what this is and what it shows.

A Exhibit 1 is the index map showing the surface location of the field in relationship to the other fields and to the towns in New Mexico.

Q It shows it's in the extreme Northwest Corner of Lea County?

A Lea County, correct.

Q Now, refer to Coastal States' Exhibit 2 and explain what it shows.

A Exhibit No. 2 is an ownership map and an outline of the unit area, proposed unit area. There are at least two miles on either side of the field showing the wells that have been drilled and the various wells surrounding the field that are dry holes. It should be noted that there are three present injection wells, they are marked with a triangle, with an arrow through them. There are four proposed injection wells, that are just marked with a triangle, and there are ten

wells around the periphery of the field that are either non-productive or nearly non-productive.

Q Does this exhibit also show the wells which have been completed in the San Andres and the Abo and the Bough "C" formation?

A Yes, all wells.

Q All wells in the area?

A Right.

Q The outline, as shown on this exhibit, conforms to the designation of the unit by the United States Geological Survey and as agreed upon with the Commissioner of Public Lands?

A That is correct.

Q Now refer to Coastal States' Exhibit No. 3 and explain what it shows.

A Exhibit No. 3 is a cross section through the field from the east portion of the field to the northwest portion of the field. If you'll note, there's a little map, insert map down in the bottom that shows this line of cross section.

Q That's A to A¹?

A Yes. LL&E No. 2 to FNB No. 3 Well. This exhibit shows the Slaughter zone of the San Andres formation is a continuous zone and the Flying "M" San Andres field is one reservoir.

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Q The logs shown on the plat are reproduced electric logs of the wells that are on the cross section?

A They are gamma ray neutron logs.

Q Is your correlation good as far as the pay section is concerned?

A The correlation is excellent.

Q Does this show a continuity of the pay section through the entire pool?

A Yes, there is continuity through the entire pool.

Q You conclude from this exhibit that all of the lands in the proposed unit area are in the same pool?

A Yes.

Q Now, refer to Coastal States' Exhibit 4 and explain what it shows.

A Exhibit 4 is a structure map on top of the Slaughter zone of the San Andres dolomite. It is actually the top line on the previous cross section.

Q On Exhibit 3?

A On Exhibit 3. This shows the structural top. As you can see, the structure is a monoclinal feature. This means in order to have a trap it must be stratigraphic in nature and there is --

Q What do you mean by stratigraphic?

A It has to pinch out updip.

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Q You mean the porosity and permeability pinches out?

A The porosity and permeability pinches out. The pore space is filled with anhydrite updip.

Q This also shows the same outlines of the proposed unit area as shown on Exhibit 2?

A That is correct. The outline of the unit area is shown in black on this exhibit.

Q Refer to Coastal States' Exhibit 5 and explain what it shows.

A Exhibit No. 5 is a cross section foot map or isopach map of the San Andres pay zone.

Q By foot map, you mean it shows the net thickness of the pay section?

A Net thickness of the pay section. This map was prepared mostly from cores in the field. We had cored over 50% of the wells and we chose a cutoff portion, cutoff porosity of 4% and oil footage above 4% was taken to prepare this map.

Q Was this plat or isopach map used in delineating the outlines of the proposed unit area?

A Yes. The outlines of this isopach map were used to find the productive acreage in the field and to delineate the unit area.

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Q When was this plat prepared?

A This plat was prepared approximately one month ago.

Q At the time this was prepared did you have all of the information in connection with the well which is shown to be in the Northwest Quarter of the Southeast Quarter of Section 28?

A No, I did not have that information at that time.

Q What well is that?

A That is the Southland Royalty McCoy No. 1.

Q Was it completed as a producer?

A It was completed as a producing oil well.

Q In the Flying "M" field?

A In the Flying "M" field, that is correct.

Q In the San Andres. Did you have all of the information on it at the time this plat was prepared?

A No, I received all information on it yesterday afternoon.

Q Since receiving that information, would that change the contours of this plat any?

A Very, very little. It would bend them out very little.

Q Well, you mean it would bend the outside contour to include that well slightly?

A That is correct.

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Q That's about the only difference it would make?

A That's the only difference it would make.

MR. UTZ: Let me be sure I understand where that well is. What section is that again?

MR. HINKLE: Section 28. It's in the Northwest of the Southwest of 28, Southeast rather, I said Southwest.

MR. UTZ: That would cause your -- Let's see, what is your outside contour?

A Fifteen foot gross outside line, which is really the productive limit of the field because, for instance, the Gonzales No. 4 down in Section 33 produced only a hundred barrels of oil before it was abandoned, so we used that as our cutoff feet.

MR. UTZ: That would cause the fifteen-foot contour to swing out?

A Swing out slightly around that well.

MR. UTZ: While we are discussing this, let me be sure I understand the meaning of this fifteen, or these contours, fifteen, thirty and so forth. Now, this is the gross pay above 4% porosity?

A Above 4% porosity, that is correct.

MR. UTZ: You may proceed.

Q (By Mr. Hinkle) Have the limits of the field, that is the Flying "M" San Andres field, been pretty well

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defined by dry holes and marginal wells?

A Yes, they have, as was shown on Exhibit No. 2. We have marked in green the non productive wells or the nearly non-productive wells around the periphery on the field.

Q That is on Exhibit No. 2?

A On Exhibit 2.

Q Would you point those out to the Examiner?

A Starting at the north side in Section 9, the Shell State 1 and 2 Abo Well in Section 15, the Southern Minerals 1-15 in Section 15, going clockwise, that is an injection well but it was non-productive. The Fee 2 in Section 22 was a marginal well and will become an injection well. Actually the Ainsworth No. 1 in Section 22 tested water in the San Andres zone.

MR. UTZ: That's the one in the Southeast Quarter?

A The one in the Southeast Quarter, that is correct. Going on further clockwise, the Gonzales No. 4, as mentioned before, made 100 barrels of oil before it was abandoned. That is a total of 100 barrels of oil. The Warren American well in Section 32 was a dry hole, the Sinclair State No. 2 in Section 20 produced some oil in the San Andres and was recompleted in the Santa Rosa as a water supply well.

MR. UTZ: The Sinclair 1?

A Sinclair 2.

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MR. UTZ: That was dry in the San Andres?

A It actually produced some oil for a time and has since been recompleted as a water supply well. The Pan American well in Section 18 was a dry hole in the San Andres. The Redfern No. 2 well in the Northwest of Section 16 is a very, very poor producer. It was a proposed water injection well.

MR. UTZ: The No. 2 well?

A Yes.

Q (By Mr. Hinkle) That's all the wells then.

A Yes.

Q You then used these dry holes and marginal wells and the isopach map, Exhibit 5, to determine the boundaries of the proposed unit?

A Yes.

Q Was the volumetric study made in connection with the isopach map?

A Yes, it was.

Q That was also the purpose of delineating the proposed unit area?

A Yes.

Q In fixing the boundaries of the unit area as we have here, could there be any exceptions or is the information so definite that there's not likely to be any exceptions or any

acreage added to the unit?

A Of course, a field can always be extended beyond its present boundaries, that happens every day. Normally, though, this field is pretty well controlled by dry holes and I would not expect them to, in most areas of the field, to be extended.

Q You could possibly have a well, a producing well, outside the outer boundaries of your isopach map here which might cause you to expand the unit to take in that acreage if that proved to be the case?

A That is correct.

Q In determining the boundaries of the unit you have used all available information to make the boundaries as definite as you could under the circumstances with the information available with the object of protecting correlative rights?

A That is correct. We used every information that was at our disposal to make these boundaries.

Q Do you have anything else to add with respect to these exhibits you referred to?

A No, I do not.

MR. HINKLE: That's all the direct testimony of this witness.

MR. UTZ: I have some questions in regard to

productivity of some wells. Would you rather I refer them to another witness?

A I would rather refer them to Jack McGraw.

MR. HINKLE: We will have an engineering witness on.

MR. UTZ: You are the unitization man?

A Yes.

MR. UTZ: Would you state what percentage of this you had committed?

A We have another witness that will state that.

MR. HINKLE: Mr. Morton will testify to that as to the percentage committed.

MR. UTZ: Are there questions of the witness?
He may be excused.

(Witness excused.)

EDGAR A. MORTON

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, place of residence and by whom you are employed.

A My name is Edgar A. Morton; 634 Philomena, Corpus Christi, Texas; Staff Land Manager with Coastal States.

Q As Land Manager of Coastal States, have you handled

the matter of getting up the unit agreement, the unit operating agreement for the Flying "M" San Andres area?

A Yes, sir, it was under my supervision.

Q You are familiar with the ownership of all of the lands in the Flying "M" Pool?

A Right, sir.

Q You are familiar with the application of Coastal States in these two cases?

A I am.

Q Has this proposed unit area been approved by the Director of the United States Geological Survey?

A Yes, sir, we have with us, I believe it is Exhibit 6, a letter back from the United States Geological Survey showing their approval.

Q Exhibit 6 is the letter dated April 18, 1967 to Coastal States?

A That is right.

Q The area which is designated by the Director of the United States Geological Survey is the same as delineated on Exhibit 2 of Coastal States which has already been referred to?

A Yes.

Q Has the form of unit agreement been approved by the Director of the United States Geological Survey?

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A It has.

Q And it's also referred to in this letter of April the 18th, or Exhibit 6?

A Right.

Q This letter also refers to certain changes in the form that was filed. Have those changes been made?

A Those changes have been made, yes, sir.

Q They were really minor changes and did not --

A Right.

Q -- and did not change the substance of the agreement?

A They did not.

Q Had this form also been approved by the Commissioner of Public Lands?

A The form has been approved, they have not as of yet approved the minor changes. It has been submitted to the State for their acceptance.

Q You anticipate no difficulty?

A I anticipate no difficulty. The changes were not material.

Q Is the form of unit agreement substantially the same as has heretofore been used where federal, state and fee lands are involved?

A Yes, sir.

Q And which has heretofore been approved by the

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Director of the United States Geological Survey and the Commissioner of Public Lands?

A It is.

Q And also by the Commission?

A By the Commission, yes, sir.

Q Is this a form which is gotten up for the purpose of waterflood or pressure maintenance project?

A Yes, sir, it is covering both cases.

MR. HINKLE: We have heretofore filed with the application three copies of the unit agreement which are a matter of record, and I would like, Mr. Morton, for you to refer to the unit agreement and to point out certain features here.

Q Is this unit agreement limited to any particular formation?

A Yes, sir, it is limited to one formation and that is the San Andres-Slaughter zone.

Q Where is that found in the unit agreement?

A Section 2 in the definition.

Q On page 2?

A On page 2, sub G.

Q Which defines the unitized formation?

A Right.

Q So that limits the unit agreement to this

particular formation?

A Yes, sir.

Q On page 3 you have definitions of Phase 1 and Phase 2; why are they in the unit agreement?

A To define why are they in the agreement?

Q Yes.

A To define total or to show what, how much oil it will be and how this will be apportioned to the different tracts during certain periods of time.

Q For the participating or the allocation of the production to the working interest owners of the different tracts?

A That's right.

Q Is Coastal States designated as the unit operator in the agreement?

A Yes, sir, it is under Section 5, page 6.

Q Now refer to Section 11 on page 9. Does that provide for tract participation?

A Yes, sir, it does.

Q In that connection are the percentages of participation of the different tracts shown by Exhibit B?

A That it is specifically set out for each tract.

Q The percentages of participation as shown on Exhibit B are on the basis if all tracts are committed to the unit agreement?

A That is right.

Q In case some of the tracts are not committed, Exhibit B will be revised and provision is made for that?

A Revised, in the agreement, yes, sir.

Q To reflect the actual commitment to the unit agreement?

A That is right.

Q Now, is provision made for filing an initial plan of operation?

A Yes, sir, Section 10, page 8.

Q And it's contemplated that a plan of operation will be filed when the unit agreement is filed for final approval?

A Yes, sir.

Q Does the unit agreement contain a provision for expansion of the unit area?

A Yes, sir.

Q And also for subsequent joinder?

A That's right. Section 3 for the expansion and Section 31 for subsequent joinder.

Q So in the event there are any producing wells outside the boundaries of the unit, they could be brought in?

A Yes.

Q Or anyone that fails to join originally can

subsequently join?

A Yes.

Q Have you contacted on behalf of Coastal States all of the owners of the working interest and extended to them an invitation to join in the unit?

A That we have.

Q That constitutes all of the lease owners within the proposed boundaries of the unit?

A That is right.

Q What percentage do you anticipate will be committed to the unit agreement, that is of the working interest owners?

A 94.2.

Q Those that have refused to join so far, can you point or refer to any of those?

A Yes, sir; Southland Royalty owners of Tracts No. 24 and 25.

MR. UTZ: Do you have a map on the unit somewhere?

A Yes, sir, Exhibit A. It is right after page 26, right before Exhibit B.

MR. UTZ: What was that again?

A Tracts 24 and 25 owned by Southland Royalty. The working interests there have elected not to join. Also under Tract No. 2, Mr. Gonzales has elected not to join as a working interest owner, and in Tract 22 to the west-southwest-

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Q That's in Section 29?

A In Section 29. -- Mr. Richardson with a small interest there. Those are the only working interests that have elected not to join.

Q And it so happens that all of those are on the edge of the unit?

A That is right.

Q In your opinion, will the failure of these parties to join actually interfere to any degree with the operation of the unit?

A No, sir.

MR. HINKLE: I believe that's all we have on direct of this witness.

CROSS EXAMINATION

BY MR. UTZ:

Q This unit agreement states a participation formula?

A Yes, it does.

Q Phase 1 and Phase 2, is there a difference in the participation formula in the two phases?

A Yes. I would prefer to leave that to the engineer to discuss in more detail.

MR. HINKLE: The next witness will discuss that better than this witness.

MR. UTZ: Are there any questions of the witness?

The witness may be excused.

(Witness excused.)

JACK MCGRAW

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, your residence and by whom you are employed.

A My name is Jack McGraw. I work for Coastal States Gas Producing Company in Midland, Texas, as the Division Engineer.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A Yes, sir, I have.

Q And your qualifications as an engineer are a matter of record with the Commission?

A Yes, sir.

Q You have previously testified on behalf of Coastal States in connection with Case 3366, which was the application for a pilot pressure maintenance project?

A Yes, sir.

Q Since that time have you continued to make a study of the Flying "M" San Andres Pool?

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A Yes, sir, I have. I have been in direct charge of operating the pilot project and gathering information for the full-scale project.

Q Have you prepared, or were there prepared under your direction, certain exhibits which you would like to refer to?

A Yes, sir.

Q Refer to Coastal States' Exhibit No. 7 and explain what that is and what it shows.

A Exhibit No. 7 is a plat of the field area showing our pilot project. It shows three injection wells starting in the upper right-hand corner. The injection well in Section 15 was commenced in July of 1965 as a salt water disposal well. At that time we asked for permission to inject this water into the oil column below the water-oil contact in this area. In January of 1966 we asked for permission to expand or to have a field-wide pilot project. When this was approved we converted the well in Section 33 in the south portion of the field to injection, in April of 1966.

The well in Section 17 was placed on injection in December 1966. We have injected to date 303,000 barrels of water in the well in Section 15, 154,000 barrels of water in the well in Section 33, and 48,000 barrels of water in the

well in Section 17.

MR. UTZ: How much was in Section 33 again?

A 33, 48,000 barrels. I am sorry, 154,000 barrels.

MR. UTZ: Okay.

Q (By Mr. Hinkle) Have you had any response from the injecting of the water in these wells?

A Yes, sir. The response has been very gratifying in the area near the well in Section 15 which has the most water injected to date. The two closest producing wells, the well Coastal States Redfern State No. 1 in the Southwest Quarter of the Northeast Quarter of Section 16 has increased from 870 barrels per month in January of '66 to 1380 barrels per month in June of '66. The producing well immediately south of that, the Coastal States Southern Minerals 16 No. 3 has increased from 1320 barrels a month in June '66 to 2650 barrels per month in October of '66.

Q These results have led Coastal States to believe that the pressure maintenance project for the entire area will be successful?

A That is right. We are very encouraged by the results received in this pilot project.

Q Now refer to Coastal States' Exhibit 8 and explain that to the Examiner.

A Exhibit 8 is a plat showing the location of all

of the proposed injection wells at this time. You will also note that the three present producing wells are shown, or present injection wells are shown on this plat and that we anticipate converting four additional wells to injection at this time. These four injection wells, starting in Section 22 on the east side of the field, are the Coastal States Gas Producing Company LL&E No. 2 located in the Northwest Quarter of the Southwest Quarter of Section 22; the Redfern State No. 2 well located in the Northwest Quarter of the Northwest Quarter of Section 16 in the north portion of the field; the Skelly State No. 5 well located in the Southeast Quarter of the Northwest Quarter of Section 20 and the Gonzales No. 1 located in the Northwest Quarter of the Northeast Quarter of Section 29.

Q In the original application I believe it was stated that there would be eight injection wells?

A Yes, sir, that's right.

Q You have only referred to seven of them.

A We had at that time expected Southland Royalty to commit their tracts to this unit and had anticipated having an injection well in the vicinity of Section 28, possibly in the Southeast of the Northeast.

Q Is that indicated by a little dotted circle which you have drawn?

A That is right.

Q So that well will be eliminated at least for the present?

A At this time, that is right.

Q Is there anything else that you wish to state in regard to this exhibit?

A I don't believe so.

Q Attached to the application were diagrammatic sketches of wells which you are going to convert into injection wells. Would you refer to these which have been marked as Exhibits 2 through 12 and explain those to the Commission?

A Yes. These are simply diagrammatic sketches of the method used to convert present producing wells to injection wells in this field. They are all very similar since a common practice was established in the field for drilling and completing the wells, they all have about the same amount of cement, same size casing string, same amount of surface pipe. The sketch does show that we intend to inject water through tubing with a packer set below the top of the cement. This tubing will be plastic-coated and the annular space will be filled with a non-corrosive fluid.

Q Do you think by completing these wells in the method you have explained will securely seal the water injection from other formations?

A Yes, sir, as well as can possibly be done.

MR. HINKLE: If the Examiner please, we received, or at least I received a copy of a letter of the State Engineer dated April 24, 1967 which is addressed to Mr. A. L. Porter, Secretary-Director of the Commission. In Paragraph 4 he says this, that "the diagrammatic sketch for the Redfern No. 2 well does not state what class of tubing will be used."

Q Mr. McGraw, will you explain to the Examiner what this is and what it means?

A Yes. That was inadvertently left off that sketch; the tubing to be used there will be 2-3/8ths-inch EUE plastic-coated 4.7 pounds per foot.

Q Have you noted that on Exhibit 9?

A Yes.

Q Is there anything else that you wish to refer to as far as the diagrammatic sketches are concerned, Exhibits 9 through 12?

A No, sir.

MR. UTZ: Did you explain all, away all of his objections there?

MR. HINKLE: We have another one that will come into the water analysis.

MR. UTZ: I see. Well, there were some others?

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A Yes, sir, we'll cover that in a moment.

MR. UTZ: You covered the tubing and you covered the one injection well he couldn't find?

A Yes, sir.

MR. HINKLE: The others are all taken care of except the water analysis which we're going to get to right now.

Q (By Mr. Hinkle) Where does Coastal States propose to get its water supply for the injection of water in the Flying "M" formation?

A We have contacted a property owner in the Lea County underground water basin for possibility of him furnishing water for this project and it looks favorable that we will be able to get this water.

Q Is this potable water?

A Yes.

Q And from what formation?

A From the Ogallala.

Q And that's in one of the declared areas on the caprock?

A Yes, sir, it's just inside the Lea County underground water basin.

Q Will you also inject some produced water?

A We will inject, of course, all the produced water

that is produced and gathered in the field.

Q Have you prepared an exhibit to show the fill-up of the pool, or estimated fill-up?

A Yes, we have. Exhibit 13 shows our calculated fill-up volume for the field as of 1-1-67. This, of course, is not exactly accurate since we're running some approximately six months behind the date that we had anticipated getting this kicked off.

Q But it does give some idea of the water which is going to be required?

A That is right. The first column there is estimated volume of makeup water required, and at that time we estimated it would take about 8,251,000 barrels of makeup water. We would also produce about 7,000,000 barrels of water in the field, which would be returned to the reservoir, for a total water that would be handled of 15,283,000 barrels. This would restore the reservoir pressure to 1125 pounds in a period of approximately two years and then would be maintained at that rate for the remaining life of the project.

Q You furnished with the application a water analysis and a copy of the application and all of the exhibits were sent to the State Engineer, is that right?

A Yes, sir, we did.

Q Now, the State Engineer, in the letter which I have

previously referred to of April 24th, says in paragraph 5, "The analysis of Ogallala water by Martin Laboratories, which is numbered 66133, does not clearly state the source of the water sample." Can you give that source?

A Yes. If you will refer back to Exhibit 7, which was our pilot project, that plat also shows the source of our water for this pilot project, the fresh water supply Well No. 1 that is in the East Half of Section 21 is the well that this sample was taken from and this will continue to be used; however, it will not be the complete source of our water.

Q Now, since filing the application, have you had any further water analysis made?

A Yes, we have.

Q Including the Ogallala formation from which you propose to obtain the bulk of the water?

A Exhibit 14 is an analysis from Martin Water Laboratories of all the possible sources of water in this area. It's an analysis of Ogallala water from the well that we intend to use as our primary source of outside water. It also shows an analysis of the produced San Andres water from the Southern Minerals State tank battery. It also shows an analysis of the Bough "C", Pennsylvanian water which is available in the area in small quantities. It also shows an analysis of Bough "C" water that is produced in a rather,

a well about fifteen miles from the field, in rather large quantities.

Q You anticipate that the water supply is going to be adequate to take care of all the needs?

A Yes. The primary reason for selecting the Ogallala water was that it does offer us a completely adequate source of water at all times and will be adequate for our needs.

Q Now, Mr. McGraw, Mr. Morton, in his testimony, pointed out that the unit agreement provides for the filing of a plan of development at the time the unit agreement is filed for final approval. Do you have a copy of the plan of development which has been prepared?

A Yes. Exhibit 15 is a plan of operation which will be filed with the Supervisor, the Commission, and the Commissioner concurrently with the filing of this unit agreement. This plan of operation just briefly summarizes that as soon as the unit becomes effective we will exercise all diligence to obtain an outside source of water to construct the necessary injection facilities, convert additional injection wells, and it names the wells that we plan to convert at this time, lay the necessary injection lines, consolidate production facilities where it is possible and economical.

It says that we will keep accurate records at all times on the progress of the project and also says that we anticipate that one additional injection well will be needed at a later date. This additional injection well will be drilled at a location to be selected later or a present producing well will be converted to injection. This is if it is determined that we need this at a later date.

The total number of injection wells that we plan to use in this project will, of course, depend on our ability to get the required amount of water into the reservoir in the time that we have expected to restore the reservoir pressure to above the bubble point pressure. If it is determined at a later date that we need more injection wells, we do plan to ask for this permission and we'd like to put on injection as many wells as is needed in order to restore the reservoir pressure to above the bubble point pressure.

Q Would you like to have provision made in the order so that administrative approval can be had of any injection wells that you deem necessary?

A Yes, sir, we certainly would.

Q Are you requesting the Commission by this application to establish a project allowable?

A Yes, we are.

Q Do you have any particular rules that you would

like to propose in connection with this project?

A Yes.

Q Including the allowable?

A Exhibit 16 shows the rules that we propose the Commission adopt for governing the allowable and future operation of this project. These rules are, I understand, very standard for this type operation in that they have been adopted by the Commission for pressure maintenance projects in other fields in New Mexico.

Q Do you know of any field specifically that these rules have been adopted for?

A I believe they have been adopted in the Horseshoe-Gallup area.

Q That's in northwest --

A That's in northwest New Mexico.

Q Do you have any particular comments to make with regard to the proposed rules?

A No, sir, I don't.

Q These are substantially the same as those which were adopted by the Commission in the Horseshoe-Gallup Pool pressure maintenance project?

A Yes, sir.

Q Some mention was made in connection with Mr. Morton's testimony of the participating formula. Will you

state to the Examiner how this formula was arrived at?

A Yes. In November 1966, Coastal States prepared a list of parameters to be used in order to determine a formula for this field. These parameters were discussed with the field operators at that time and the ones that were recommended to us in the formula were the current rate parameter which was the current production from May through October of 1966, and the ultimate primary parameter and the productive acreage parameter.

Q Why were these parameters selected?

A These parameters were selected because they were the ones that were the least amount interpretive. They represented actual production information from the field and were not determined by interpretive means.

Q After considering all of the possibilities and use of various factors as parameters, were these selected as being the ones which would be most equitable and most nearly protect correlative rights?

A Yes, sir, that is right. The formula that was arrived at from these parameters was a two-phase formula, the first phase being 75% current rate, 25% productive acres. This first phase formula was to be in effect from the time of unitization until the cumulative production from the field reached three million barrels, the three million barrels being

the ultimate primary recovery as determined by field decline curves and material balance calculations.

Q So that's the reason the three million was used in Phase 1?

A Yes, sir. Phase 2, then, consists of 75% ultimate primary and 25% productive acres and this will be in effect, of course, following Phase 1 and to the end of the project.

Q Have you made any calculations or estimates as to what the total recovery might be through this pressure maintenance and secondary recovery project?

A We have made some estimates. We have estimated that the secondary recovery will be one times primary or three million barrels. The total production, then, from the field would be six million barrels.

Q If this unit agreement is approved and the pressure maintenance project is put into effect, in your opinion will it be in the interest of conservation and the prevention of waste?

A Yes, sir.

Q And it would also be in the interest of obtaining the greatest ultimate recovery?

A Yes, sir.

Q In your opinion will the unit agreement and the pressure maintenance project protect correlative rights?

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A Yes, sir.

MR. HINKLE: We would like to offer in evidence all of our exhibits, 1 through 16.

MR. UTZ: Without objection the Exhibits 1 through 16 will be entered into the record of this case.

(Whereupon, Coastal States' Exhibits 1 through 16 were offered and admitted in evidence.)

MR. HINKLE: That's all the direct of this witness.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. McGraw, in regards to your participation formula, how did you determine current rate?

A Current rate was the production that was reported to the Oil Conservation Commission, C-115 production for each lease in the field from the period May through October of 1966.

Q So actually the potential of the well would have nothing to do with it, then, it was actual production?

A That's right.

Q Actual production limited by allowables, is that right?

A That is right. This period of time, though, was chosen largely because it was unaffected by allowables or by

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the effect of the pilot project in the area.

Q Now, in regard to ultimate recovery which was used only, as I understand, in Phase 2 --

A That is right.

Q -- and so current rate was not used at all in Phase 2?

A That is right.

Q Ultimate recovery would be considered what, reserves?

A Yes. And also would be indicative of the net feet of pay that each lease would contribute to the unit and, therefore, would be proportional to their amount of secondary oil that they would contribute. We think, therefore, that it is a very equitable parameter to use in a formula.

Q In your ultimate recovery figure would initial potential of the well or ability of the well to produce be involved in the ultimate recovery?

A On an individual lease basis it is somewhat in that it, as I stated before, the ultimate primary was determined by material balance calculations and field decline curves. The primary was also determined by individual lease decline curves and at that time it was noticed that the remaining primary for each lease was very close to their current rate percentage, and so in order to remove the interpretative nature,

then, of remaining primary by a lease decline basis, we presented to the operators their remaining primary based on their current rate parameter. In other words, their current rate percentage was multiplied times the field remaining primary and assigned to each lease and this was very acceptable to each operator. They felt that it was equitable to them in this case.

Q So this is really not a volumetric calculation?

A No, sir, it's a material balance calculation and also the field decline curves and lease decline curves show that it is within engineering accuracy.

Q I'm sure you know that we've had one objection to your formula which has promulgated some of my questions, and in all fairness to you, I will say that we have that objection at the present time and the subsequent questions will be in regard to that, and whatever fairness he might be deserving of just writing letters and not being here.

In regard to the Southwest Quarter of Section 24, I do note that you have a producing well in the Northwest Quarter, to the Southeast of the Northwest Quarter of Section 29. Now, what kind of a well is that?

A That well is a good producing well. It's a top allowable well. It makes its allowable. I might also point out the other wells south of it are not top allowable wells,

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nor are they, two of them at least are not even commercial wells.

Q You are speaking of the two wells in the North Half of Section 32?

A Yes, sir, that is right.

Q Do you have any figures as to what those wells are producing at this time?

A Yes, sir. The well in the Southeast Quarter of the Northwest Quarter of Section 32 is producing four barrels of oil and six barrels of water per day. The well in the Northwest Quarter of the Northeast Quarter of 32 is producing four barrels of oil and nineteen barrels of water per day.

Q And your Well No. 5-29 in the Northwest of the Southeast, what kind of a well is that?

A That is a fair well. It makes 32 barrels of oil and no water and that's as high as it has ever made. It never was any better than that.

Q Do you have a lease on the Southwest Quarter--

A Yes.

Q -- of 29? Why did you decide not to drill that lease?

A That lease has not been drilled at this time because we are watching the performance of this well in the Southeast of the Northwest. We have run some pressure or obtained some

pressure information on this well to see if there is sufficient justification to drill another well in this area, but the well in the Southeast of the Northwest is not a very old well. It has not been drilled very long.

Q When was it completed?

A I would just have to guess at it. It's about six months old; September of last year. That would make it about eight months old.

Q Now, if that well looks like it has pretty good reserves under it, what would be Coastal States' attitude as far as drilling?

A Well, we would certainly drill the tract.

Q If it pops out pretty fast, then you --

A We wouldn't.

Q You wouldn't feel like spending the money, particularly in view of the two sorry wells down--

A That is right. And that is the reason for watching this well. We might also point out that the well to the northeast of that well is a very poor well. It's proposed as an injection well, it makes eight barrels of oil and ten barrels of water.

Q That's the 1-29?

A Yes, sir. So we have one good well in an area of very, very sorry wells and we, of course, want to determine

that we do have sufficient justification to drill a well.

Q How about 2-29 in Section 29?

A 2-29 makes 30 barrels of oil and seven barrels of water. 3-29 makes 28 barrels of oil and no water.

Q It is true that a tract without a well on it doesn't have much participation in the formula?

A That is right. We did not attribute a lot to productive acres. We couldn't do that. We didn't anticipate anyone committing a tract to the unit if they felt sure that they should or had sufficient justification for drilling a well.

Q In other words, the way this leaves this individual here is that if he thinks he has enough reserves there to drill for it, he's free to drill for it?

A That is right, and this in no way limits or prevents him from doing this.

Q Even though you have the lease?

A That is right.

Q Now, in arriving at your gross contours here you used electric logs, did you?

A You are talking about the exhibit--

Q Yes, your gross pay.

A That was mostly from core analyses.

Q How many wells were cored?

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A Greater than 50%, 30 --

Q 30%?

A No, 30 wells.

Q Out of how many?

A Out of 46.

Q That's an unusually high percentage of coring in any field, is it not?

A Yes, sir, it is.

Q This is a solution drive field?

A Yes.

Q Otherwise you wouldn't be making this application?

A That's right.

Q I believe you stated it was your intention to reinject all produced water?

A Yes, sir.

Q Is it my understanding that you would inject even produced water from the Bough "C" formation?

A Yes, sir.

Q We anticipate taking some produced water from the Bough "C" in this area. There's some that is available to us and we're planning to use all that we can of that water.

Q In other words, all produced water in all three zones of this area you will use?

A We will use it and reinject it.

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Q That will save some fresh water, will it not?

A Yes, sir. It will save us from having to buy it.

Q In your proposed rules, in arriving at the Z factors here, was that from gas analysis or calculated?

A Yes, from gas analysis and correlations from this.

Q This is between the test points?

A Sir?

Q As between test points in your analysis?

A It was correlated from the gas gravity as determined by our gas analysis.

Q I see, so you just took the gravity?

A Yes, sir.

Q You didn't actually run a Z factor on it?

A No, sir.

Q I don't remember the name for it right now.

A No, it was from correlation curves using gas gravity.

MR. UTZ: Any other questions?

MR. HINKLE: If there are no other questions, I would like to make a very brief statement here in regard to the line of testimony concerning Mr. Richardson's protest. If there is any implication in his protest there that this lease hasn't been fully developed like it should have been by Coastal States, I think that's a matter of law to be

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determined by a court and not by the Commission.

The approval of the unit agreement and of this pressure maintenance project will not in any way affect those rights, so this has nothing to do with any rights he may have there as against Coastal States for the reasonable development of that lease. That's entirely another matter, as I see it. I would like to point that out to the Commission.

MR. UTZ: Have you received copies of these letters?

MR. HINKLE: Yes, we have copies. At least one of them.

MR. UTZ: We have a wire and a letter. I believe the letter was written to you, so I think you are aware of what is in it.

MR. HINKLE: The royalty owners under this tract, of course, have not committed their interest.

MR. UTZ: None of them?

MR. HINKLE: That's right. Of course, that tract is not going to be effectively committed to this unit.

MR. UTZ: I would gather from his objections here he would like to be in the unit but not with this participating formula. Do we have other statements?

MR. HINKLE: I might also add this, that the United States Geological Survey scrutinized this formula very carefully and approved it as indicated by their letter which

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has been introduced in evidence.

MR. HATCH: I would like to mention that the Commission has received a letter from the State Engineer's Office and that all of the points have been responded to, and that there is a telegram addressed to the Oil Conservation Commission dated April 25th, 1967 that I would like to read into the record.

"Reference Cases 3554 and 3555, Coastal States Flying "M" San Andres Unit. As a working interest owner under Tract 22 and on behalf of one-half of the fee royalty under Tract 21, I object to approval of the proposed unit and waterflood. The field not drilled and developed to the extent necessary to determine unit outline. Productive but under drilled acreage is severely penalized by the participation formula. Wells in West Half, Section 29, and in Section 32 lie outside peripheral of flood. The entire program based upon Coastal States' economics rather than equitable and sound geology and engineering. I do not feel that the rights of anyone except Coastal States will be protected. I urge the Commission to carefully examine and withhold the approval until the correlative rights of all parties are protected. R. M. Richardson."

That's all I have.

MR. UTZ: You did have a letter?

MR. HATCH: Yes, that's a copy of a letter that was sent to Mr. Hinkle. The Commission has received a copy of a letter sent to the Coastal States but I will not read that at this time.

MR. HINKLE: That's the same one that we received?

MR. HATCH: Yes.

MR. HINKLE: I might point out here that 88.86% of all of the royalty owners under the fee tracts have committed their interest to this unit. They have already signed the agreement.

MR. UTZ: Fee royalty interest?

MR. HINKLE: Fee royalty, 88.86%.

MR. UTZ: Are there other statements to be made in this case? The witness may be excused.

(Witness excused.)

MR. UTZ: If no further statements, the case will be taken under advisement.

I N D E X

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public 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.

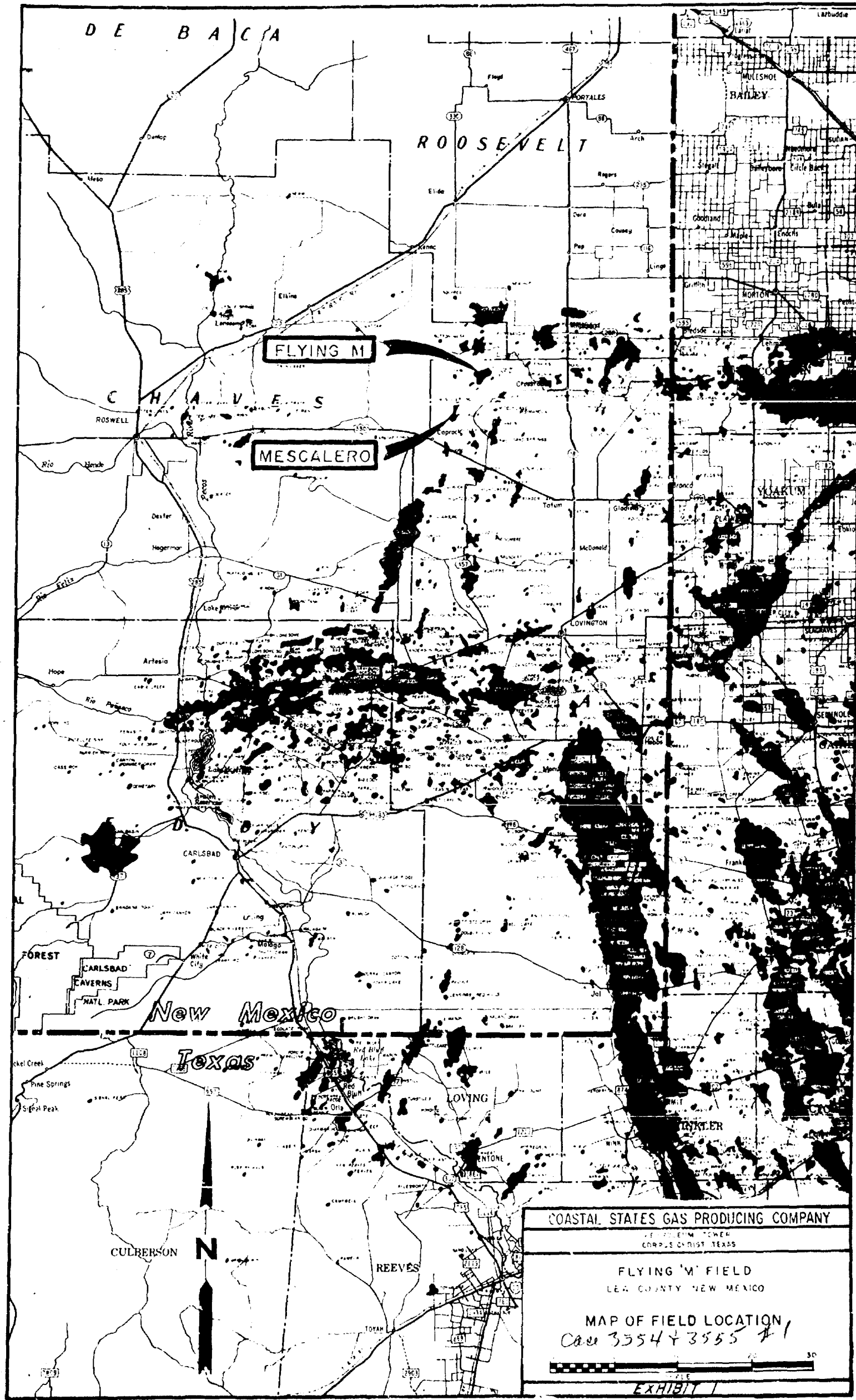
Witness my Hand and Seal this 9th day of May, 1967.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5554-55 heard by me on *April 26*, 1967.
Michael J. [Signature], Examiner
New Mexico Oil Conservation Commission



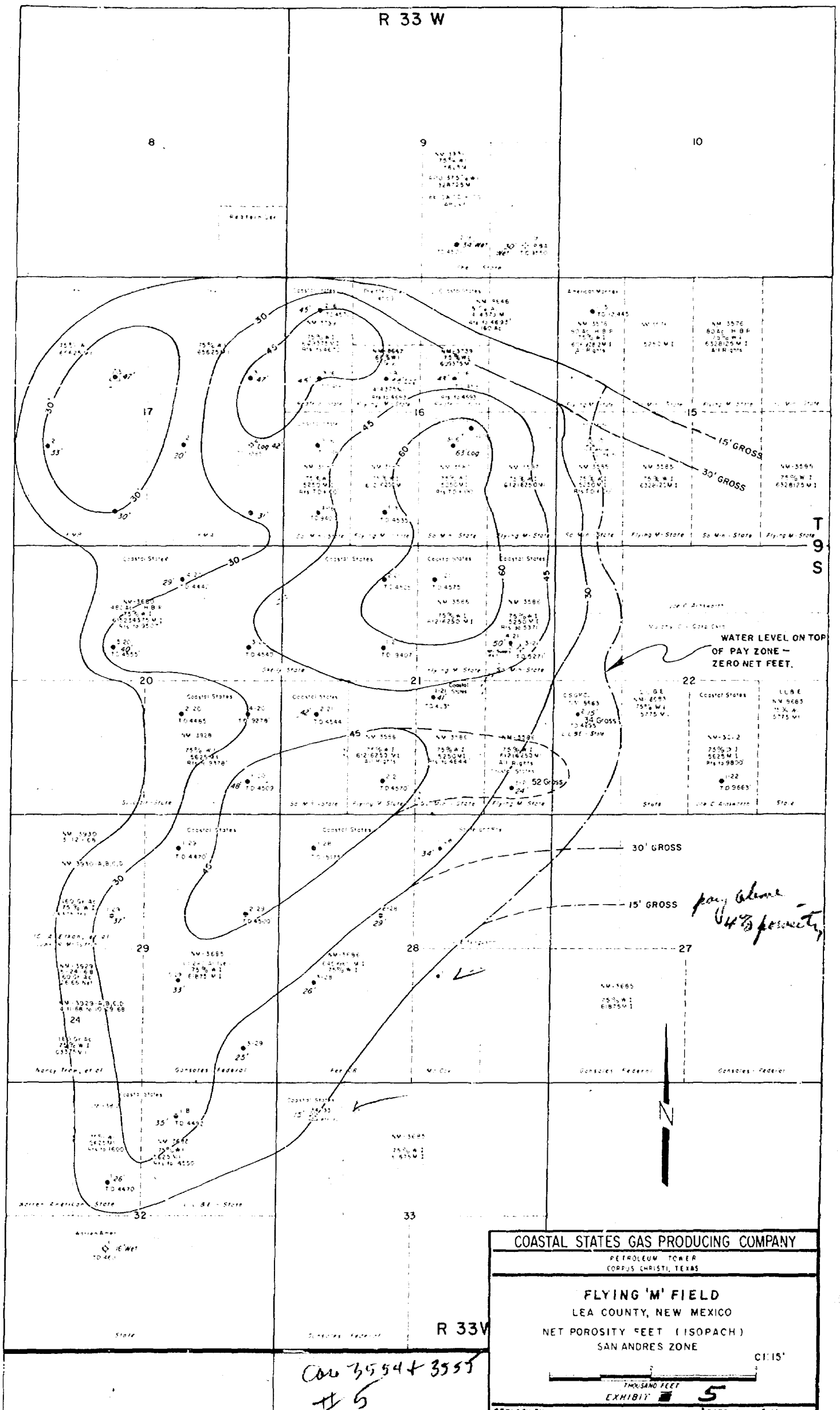
COASTAL STATES GAS PRODUCING COMPANY

LEA COUNTY, NEW MEXICO

FLYING M FIELD
LEA COUNTY, NEW MEXICO

MAP OF FIELD LOCATION
Case 3354 & 3555

EXHIBIT I



Cor 3554 + 3555
 #5

pay alone
 14 3/8 permeability

WATER LEVEL ON TOP
 OF PAY ZONE -
 ZERO NET FEET.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

IN REPLY REFER TO:

APR 18 1967

RECEIVED
APR 21 1967

Coastal States Gas Producing Company
c/o Hinkle, Bondurant & Christy
P. O. Box 10
Roswell, New Mexico 88201

HINKLE, BONDURANT & CHRISTY
ROSWELL, NEW MEXICO

Gentlemen:

Your application of January 31, filed with the Regional Oil and Gas Supervisor, Roswell, New Mexico, requests the designation of the Flying M-San Andres unit area, embracing 4,080 acres in Lea County, New Mexico, as logically subject to operation under the unitization provisions of the Mineral Leasing Act, as amended. The proposed unit area is comprised of 480 acres (11.76 percent) of Federal lands, 2,840 acres (69.61 percent) of State of New Mexico lands, and 760 acres (18.63 percent) of fee lands.

Unitization is for the purpose of conducting pressure maintenance and secondary recovery by water injection and will be limited to the San Andres formation as defined in Section 2(g) of the unit agreement. The area has been developed by 43 wells completed in the formation to be unitized. Phase I participation in unitized substances is based 75 percent upon production from May 1, 1966, to November 1, 1966, and 25 percent on productive acres. Phase II participation is based 75 percent on ultimate primary recovery and 25 percent on productive acres. You estimate the pressure maintenance and secondary recovery project will result in the recovery of 3 million barrels of oil over and above that recoverable by primary depletion.

The land outlined on your plat marked "Exhibit A, Flying M-San Andres Unit, Lea County, New Mexico," is acceptable as a logical unit area for pressure maintenance and secondary recovery operations. Your proposed form of unit agreement which modifies the standard form (1961 reprint) to the extent necessary to cover conditions incidental to pressure maintenance and secondary recovery operations in a producing unit will be acceptable if further modified as marked in colored pencil and by attached riders. One copy of the marked form is returned herewith and the remaining copies are retained for distribution to the appropriate offices of the Geological Survey.

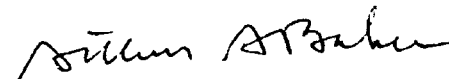
Exhibit #6

In the absence of any lands requiring special provisions or any objections not now apparent, a duly executed agreement conformed to the marked copies and approved by the appropriate officials of the State of New Mexico will be approved if submitted in approvable status within a reasonable period of time. However, the right is reserved to deny approval of any executed agreement that, in our opinion, does not have the full commitment of sufficient lands to afford effective control over pressure maintenance operations.

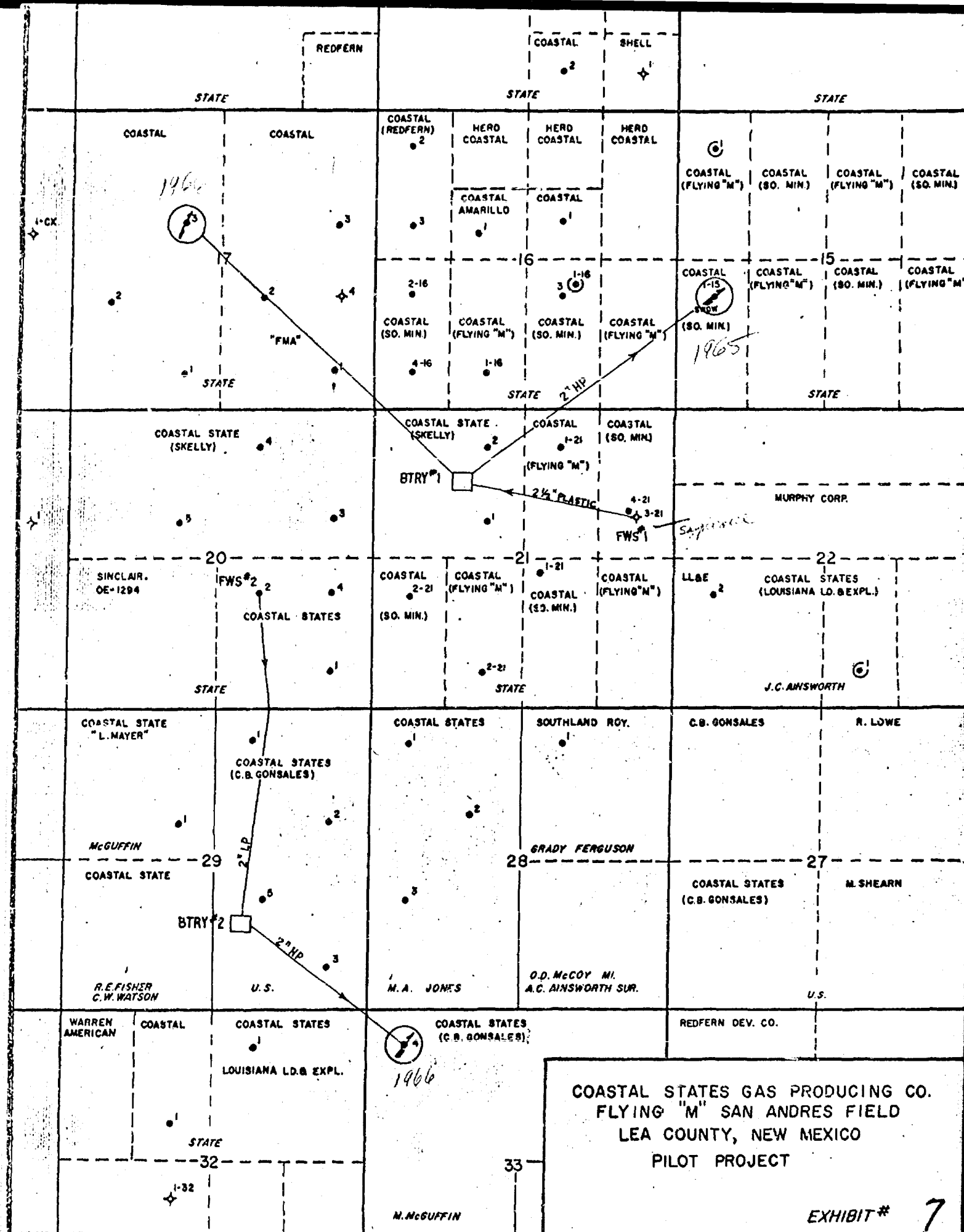
Please include the latest status of all acreage when the executed agreement is submitted for final approval. The format of the sample exhibits attached to the 1961 reprint of the standard form should be followed closely in preparation of Exhibits A and B.

Inasmuch as this area contains State of New Mexico lands, we are sending a copy of this letter to the Commissioner of Public Lands in Santa Fe. Please contact the State of New Mexico before soliciting joinders regardless of prior contacts with or clearances from the State.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "William A. Baker".

Acting Director



REDFERN #2

8 7/8" @ 262' CMT. CRK. CMTD. W/ 200 SX CL. "A"
W/ 2 1/2" GLL

GR. LEVEL EL. 4390'
KB. EL. 4400'

TOP CMT 3510'

2 3/8" EUE Plastic Coated
4.7 #/ft J-55

2 1/2" x 4 1/2"
TENS PKR
@ 4450'

4490'-4501' } PERFS - 2 JSPF

4513'-17' } PERFS -
4519'-22' } 1- 1/2" JSPF
4524'-29' }

PBD 4538

2 1/2" 9.5" J-55 CMT. @ 4459' CMTD. W/ 200 SX CL. "C"
DO-60 PERMAK PLUS 100 SX CL. "C" W/ 2 1/2" GLL

Exhibit # 9

SKELLY - STATE #5

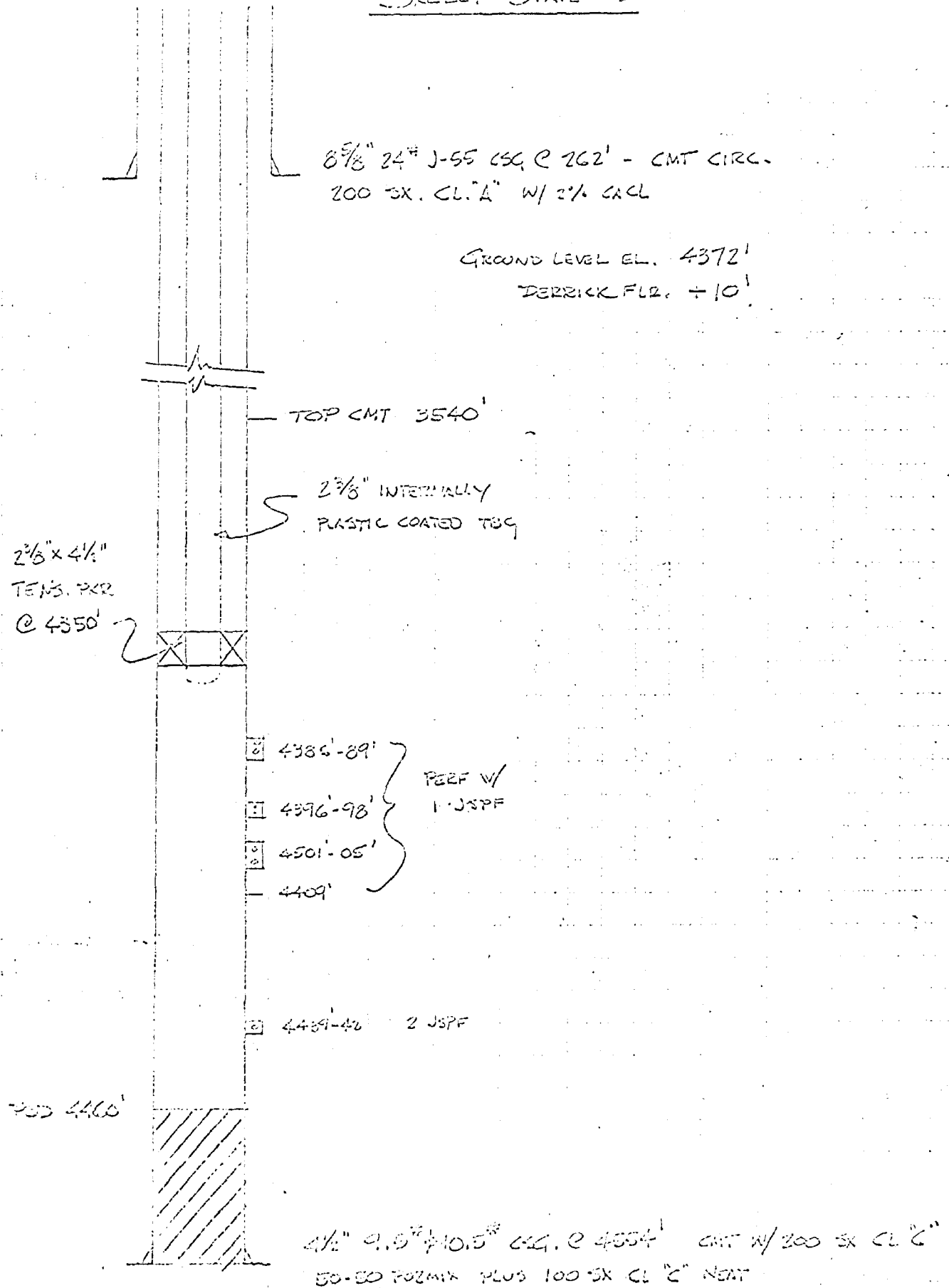


Exhibit #10

GONZALES - FEDERAL #1

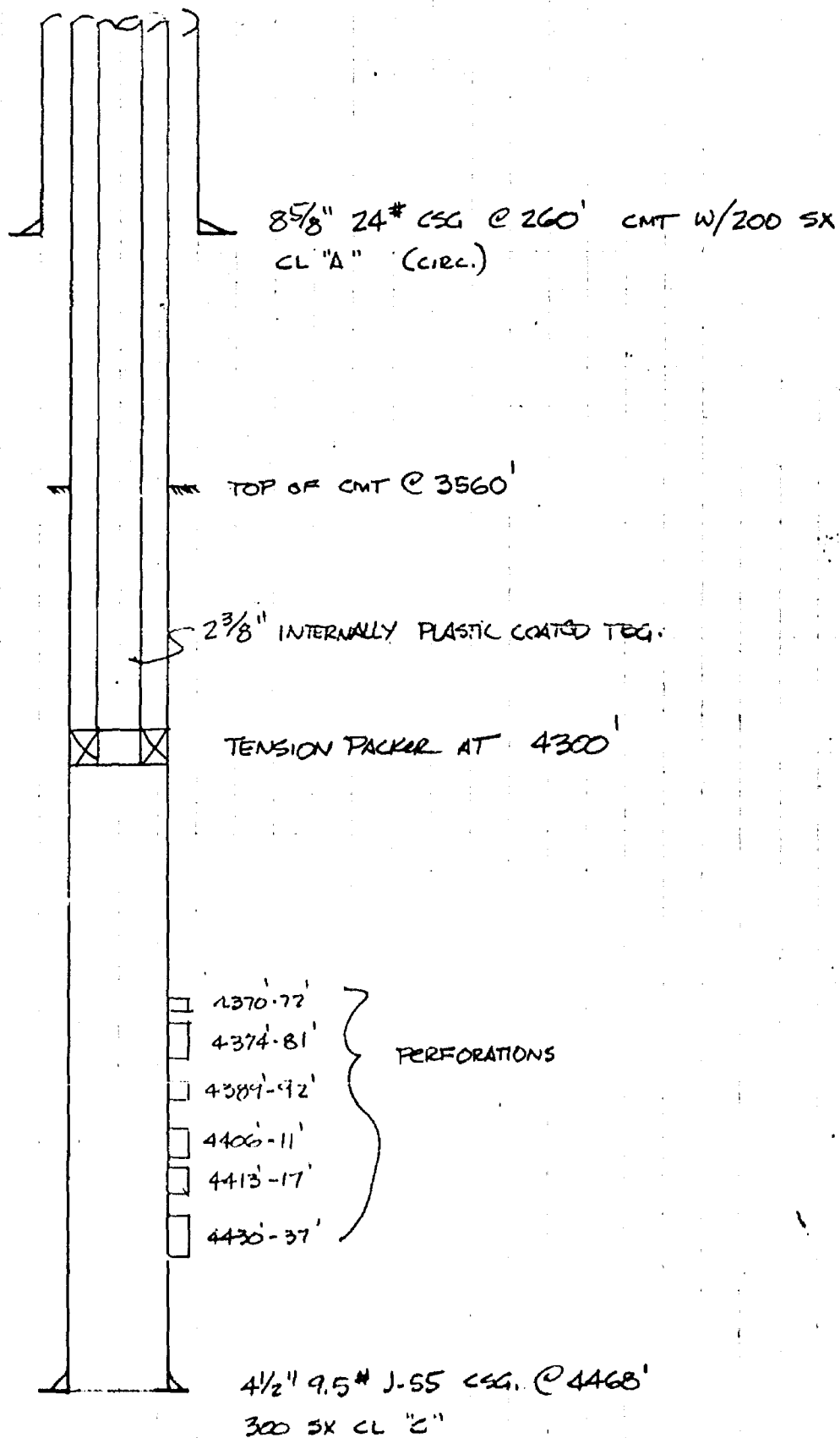


Exhibit #11

LL#E #2

8 5/8" 24# J-55 CCG @ 264' CMT CIRC.
150 3X CL "C" NEAT

GR. LEVEL EL. 4351'
K.B. EL. T 10.5'

TOP CMT 3550'

2 3/8" INTERNALLY
PLASTIC COATED
TUBING

2 3/8" x 4 1/2"
TENS. PER
@ 4500'

4567-69' }
4574-76' }
4580-84' } PERMS - 2 JSPF

4603' }
4620' } PERMS - ONE - 1/2" JSPF

POD 4640'

4 1/2" 9.5# J-55 CCG @ 4630' CMT W/ 150 3X
CLASS "C" NEAT

EXHIBIT #12

TABULATED WATER REQUIREMENTS AND FILL-UP VOLUMES
FLYING "M" SAN ANDRES FIELD
LEA COUNTY, NEW MEXICO
THOUSANDS OF BBLs

	<u>EST. VOL. OF MAKE-UP WATER REQUIRED</u>	<u>EST. VOL. OF PROD. WATER RETURNED TO RESERVOIR</u>	<u>TOTAL</u>	<u>RESERVOIR VOIDAGE</u>	<u>BALANCE FILL-UP</u>	<u>CUMULATIVE* BALANCE</u>
1967	1,370	300	1,670	1,610	60	60
8	1,830	328	2,158	1,048	1,110	1,170
9	1,310	356	1,666	886	780	1,950
70	530	380	910	910	0	1,950
1	530	403	933	933	0	1,950
2	530	424	954	954	0	1,950
3	530	444	974	974	0	1,950
4	530	474	1,004	1,004	0	1,950
5	464	510	974	974	0	1,950
6	281	555	836	836	0	1,950
7	169	630	799	799	0	1,950
8	102	768	870	870	0	1,950
9	61	1,020	1,081	1,081	0	1,950
80	<u>14</u>	<u>440</u>	<u>454</u>	<u>454</u>		1,950
	8,251	7,032	15,283	13,333		

* Calculated Fill-Up Volume required to re-pressure reservoir to 1125 psi is 1,950,000 Bbls.

PLAN OF OPERATION
FOR THE FLYING "M" (SAN ANDRES)
PRESSURE MAINTENANCE PROJECT

COASTAL STATES GAS PRODUCING COMPANY

April 24, 1967

EXHIBIT #15

PLAN OF OPERATION
FOR THE FLYING "M" (SAN ANDRES)
PRESSURE MAINTENANCE PROJECT

Section 10 of the Flying "M" (San Andres) Unit Agreement specified that an initial Plan of Operation be filed with the Supervisor, Commission, and the Commissioner concurrently with the filing of the Unit Agreement for final approval; therefore, immediately following the final approval of the Unit Agreement, the following Plan of Operation will be initiated in the subject field.

Disposition of on-hand crude and inventory adjustment.

At 7:00 a.m. on the morning following the final approval of the Unit Agreement, all stock tanks located on the committed tract in the Flying "M" (San Andres) Unit will be gauged and the production credited to the former operator. All production produced following this date will be considered to be Unit production. As soon as practical, a complete inventory of all equipment will be made and an inventory adjustment will be issued to each operator.

Obtain outside source of water.

Final contracts will be drawn up and necessary right-of-way obtained in order to secure a permanent outside source of water. Construction of facilities and pipeline will begin as soon as legally possible.

Construct injection station.

The present injection facilities will be expanded to a capacity of 5280 BPD. This will require two additional 80 HP triplex pumps and natural gas engines. Additional water storage facilities will be added in order to handle separately Flying "M" (San Andres) produced water, fresh Ogallala water and Bough "C" Pennsylvanian produced water.

Convert additional injection wells.

The following wells will be converted to injection immediately:

Coastal States Gas Producing Company
L.L. & E. State No. 2 - NW/4 of SW/4 of Section 22
Redfern State No. 2 - NW/4 of NW/4 of Section 16
Skelly State No. 5 - SE/4 of NW/4 of Section 20
Gonsales Federal No. 1 - NW/4 of NE/4 of Section 29

These wells will be equipped as shown on the attached diagrammatic sketches.

Lay injection lines.

Approximately 17,000' of 2" cement lined, doped and wrapped line pipe will be layed to the new injection wells. This injection line will also be ditched and buried.

Consolidate production facilities.

Tank batteries will be consolidated where possible and the Unit Production will be sold through ACT units, *where possible.*

Records.

Accurate well tests and water injection records will be kept at all times.

Additional injection wells.

It is anticipated that one additional injection well will be needed at a later date. This additional injection well will be drilled at a location to be selected later, or a present producing well will be converted to injection.

The total number of injection wells ultimately used will be determined by our ability to inject sufficient volumes of water at reasonable pressures in order to achieve fillup and restore the reservoir pressure to 1125 psi in a two-year period. If it is determined that higher injection rates are needed in order to achieve the desired results, application will be made to the New Mexico Oil Conservation Commission to convert the additional wells to injection that will be required.

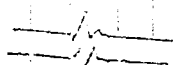
Larger pumping units.

As water break ^{through} occurs, larger pumping units will be installed in order to pump all fluids entering the wellbore. All produced water will be returned to the reservoir.

Trinity - State 75

2 7/8" 24" J-55 CCL @ 702' - CMT CIRC.
100 BX. CCL " W/ 1" CCL

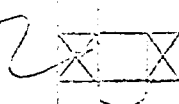
GROUND LEVEL EL. 4372'
DERRICK FL. +10'



TOP CMT 3540'

2 7/8" INTERNALLY
PLASTIC COATED TSC

2 7/8" x 4 1/2"
TENS. PKR
@ 4350'



4384'-89' } PERF W/
4396'-98' } 1.03PF
4501'-05' }
4400'

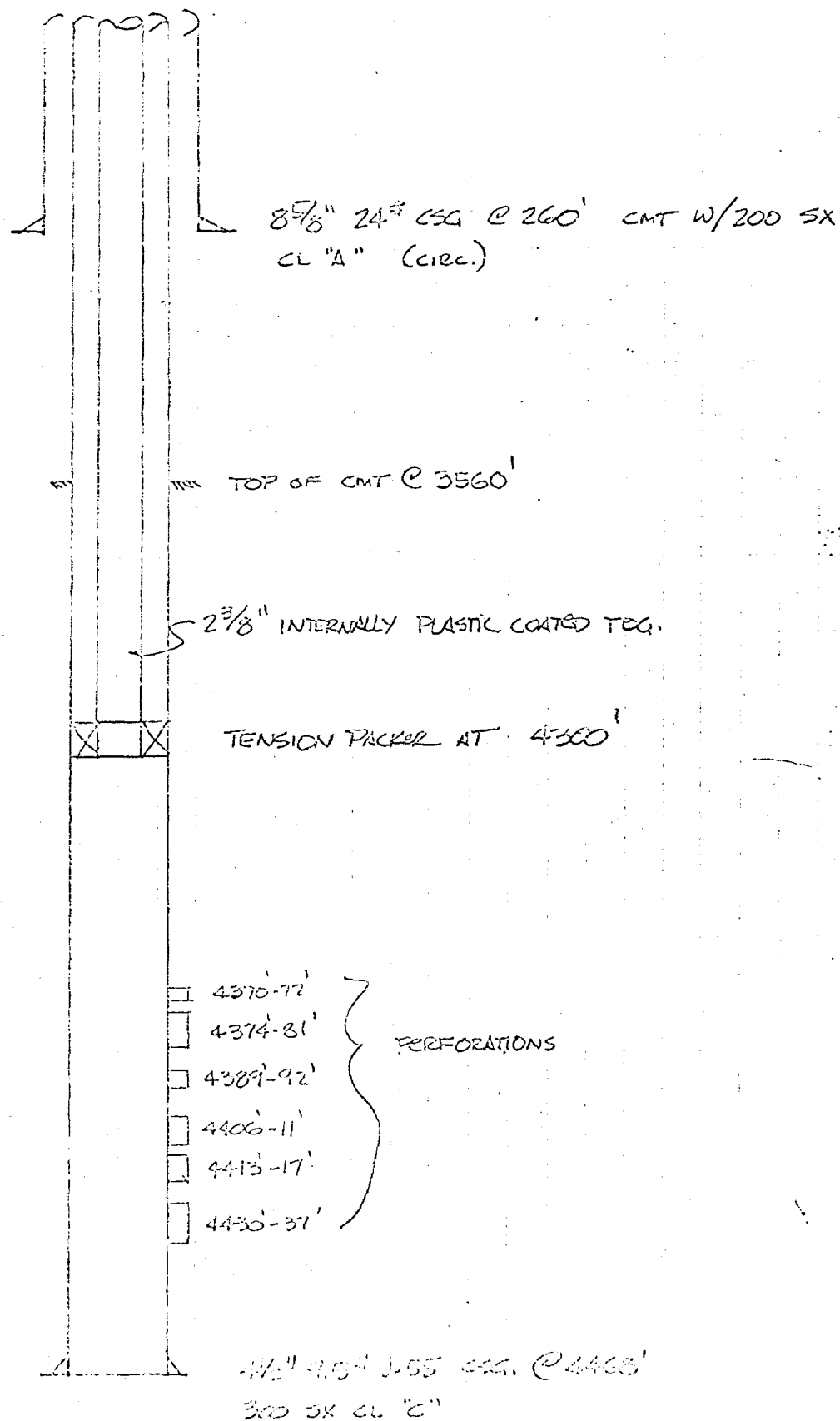
4439'-46' 2.03PF

POD 4416'



4 1/2" 4.0" 100' CCL @ 4004' - 4014' CCL of 100' CCL
50-50 WORKING PLUS 100' CCL @ 4000' N/A

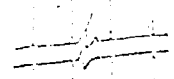
GONZALES - FEDERAL #1



LINE #2

8 7/8" 24" J-55 C&G C 164' CMT C&G.
150 BX C&G C. NEXT "

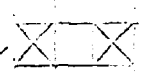
GR. LEVEL EL. 435'
K.B. EL. T.O.S.



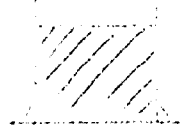
TOP CMT 3550'

2 3/8" INTERNALLY
PLASTIC COATED
TUBING

2 1/8" x 4 1/2"
TENS. Y&Z
C 4500'



4567-09' }
4574-72' } C&G DEEPS. - 2 J&SF
4580-04' }
4600' }
4610' } C&G DEEPS. - ONE - 1/2" J&SF

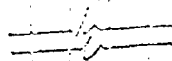


POD 4610'
4 1/2" S&B C&G DEEPS. - ONE - 1/2" J&SF
C&G DEEPS. - ONE - 1/2" J&SF

REDPLAN #2

8 7/8" @ 262' CMT. CMT. CMTS. N/200 SK CL. 7"
W/ 2 1/2" CALL

GR. LEVEL EL. 4390'
K.B. EL. 4400'



TOP CMT 3510'

2 7/8" x 4 1/2"
TENS PER
@ 4450'



4490'-4501' } END OF PERFS - 2 JOSE

4513'-17' }
4519'-22' } 1- 1/2" JOSE
4524'-29' }

PSD 4538



4 1/2" @ 262' CMT. CMT. CMTS. N/200 SK CL. 7"
W/ 2 1/2" CALL

EXHIBIT #16

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Ampl EXHIBIT NO. 16
CASE NO. 3554-3555

PROPOSED RULES TO DETERMINE UNIT ALLOWABLE AND FUTURE OPERATIONS
OF THE FLYING "M" (SAN ANDRES) PRESSURE MAINTENANCE PROJECT

RULE 1. The allowable for the Project shall be the sum of the allowables of the several wells within the project area, including those wells which are shut-in, curtailed, or used as injection wells. Allowables for all wells shall be determined in a manner hereinafter prescribed.

RULE 2. Allowables for injection wells may be transferred to producing wells within the project area, as may the allowables for producing wells which, in the interest of more efficient operation of the Project, are shut-in or curtailed because of high gas-oil ratio or are shut-in for any of the following reasons: pressure regulation, control of pattern or sweep efficiencies, or to observe changes in pressures or changes in characteristics of reservoir liquids or progress of sweep.

RULE 3. The allowable assigned to any well which is shut-in or which is curtailed in accordance with the provisions of Rule 2, which allowable is to be transferred to any well or wells in the project area for production, shall in no event be greater than its ability to produce during the test prescribed by Rule 5, below, or greater than the current top unit allowable for the pool during the month of transfer, whichever is less.

RULE 4. The allowable assigned to any injection well on an 80-acres proration unit shall be top unit allowable for the Flying "M" - San Andres Pool.

RULE 5. The allowable assigned to any well which is shut-in or curtailed in accordance with Rule 2, shall be determined by a 24-hour test at a stabilized rate of production, which shall be the final 24-hour period of a 72-hour test throughout which the well should be produced in the same manner and at a constant rate. The daily tolerance limitation set forth in Commission Rule 502 I (a) and the limiting gas-oil ratio (2,000 to 1) for the Flying "M" - San Andres Pool shall be waived during such tests. The project operator shall notify all operators offsetting the well, as well as the Commission, of the exact time such tests are to be conducted. Tests may be witnessed by representatives of the offsetting operators and the Commission, if they so desire.

RULE 6. The allowable assigned to each producing well in the Project shall be equal to the well's ability to produce or to top unit allowable for the Flying "M" - San Andres Pool, whichever is less, provided that any producing well in the project area which directly or diagonally offsets a well outside the project area producing from the same common source of supply shall not produce in excess of two times top unit allowable for the pool. Each producing well shall be subject to the limiting gas-oil ratio (2,000 to 1) for the Flying "M" - San Andres Pool, except that any well or wells within the project area producing with a gas-oil ratio in excess of 2,000 cubic feet of gas per barrel of oil may

be produced on a "net" gas-oil ratio basis, which net gas-oil ratio shall be determined by applying credit for daily average gas injected, if any, into the Flying "M" - San Andres Pool within the project area to such high gas-oil ratio well. The daily adjusted oil allowable for any well receiving gas injection credit shall be determined in accordance with the following formula:

$$A_{adj} = \frac{TUA \times F_a \times 2,000}{\frac{P_g - I_g}{P_o}}$$

where:

A_{adj} = the well's daily adjusted allowable

TUA = top unit allowable for the pool

F_a = the well's acreage factor

P_g = average daily volume of gas produced by the well during the preceding month, cubic feet

I_g = the well's allocated share of the daily average gas injected during the preceding month, cubic feet

P_o = average daily volume of oil produced by the well during the preceding month, barrels

In no event shall the amount of injected gas being credited to a well be such as to cause the net gas-oil ratio, $\frac{P_g - I_g}{P_o}$, to

be less than 2,000 cubic feet of gas per barrel of oil produced.

RULE 7. Credit for daily average net water injected into the Flying "M" - San Andres Pool through any injection well located within the project area may be converted to its gas equivalent and applied to any well producing with a gas-oil ratio in excess of two thousand cubic feet of gas per barrel of oil. Total credit for net water injected in the project area shall be the gas equivalent volume of the daily average net water injected during a one-month period. The daily average gas equivalent of net water injected shall be computed in accordance with the following formula:

$$E_g = (V_w \text{ inj} - V_w \text{ prod}) \times \frac{5.61 \times P_a}{15.025} \times \frac{520^\circ}{T_r} \times \frac{1}{Z}$$

where:

- E_g = Average daily gas equivalent of net water injected, cubic feet
- $V_w \text{ inj}$ = Average daily volume of water injected, barrels
- $V_w \text{ prod}$ = Average daily volume of water produced, barrels
- 5.61 = Cubic foot equivalent of one barrel of water
- P_a = Average reservoir pressure at mid-point of the pay-zones of Flying "M" - San Andres Pool in project area, psig + 14.0, as determined from most recent survey
- 15.025 = Pressure base, psi
- 520° = Temperature base of 60° F expressed as absolute temperature
- T_r = Reservoir temperature of 115° F expressed as absolute temperature (547°R)

460
115
575

460
87
547

Z = Compressibility factor from analysis of Flying "M" San Andres Pool gas at average reservoir pressure, P_a , interpolated from compressibility tabulation below:

Reservoir Pressure	Z	Reservoir Pressure	Z	Reservoir Pressure	Z
50	.986	500	.847	900	.724
100	.970	600	.816	1000	.694
200	.940	700	.786	1100	.663
300	.909	800	.755	1200	.633
400	.878				

RULE 8. Each month the project operator shall, within three days after the normal unit allowable for Southeast New Mexico has been established, submit to the Commission a Pressure Maintenance Project Operator's Report, on a form prescribed by the Commission, outlining thereon the data required, and requesting allowables for each of the several wells in the Project as well as the total Project allowable. The aforesaid Pressure Maintenance Project Operator's Report shall be filed in lieu of Form C-120 for the Project.

RULE 9. The Commission shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for each well in the Project for the next succeeding month in accordance with these rules. The sum of the allowable so calculated shall be assigned to the Project and may be produced from

the wells in the Project in any proportion except that no well in the Project which directly or diagonally offsets a well outside the Project producing from the same common source of supply shall produce in excess of two times top unit allowable for the Pool.

RULE 10. The conversion of producing wells to injection, the drilling of additional wells for injection, and expansion of the project area shall be accomplished only after approval of the same by the Secretary-Director of the Commission. To obtain such approval, the Project operator shall file proper application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional injection wells shall include the following:

- (1). A plat showing the location of proposed injection well, all wells within the project area, and offset operators, locating wells which offset the project area.
- (2). A schematic drawing of the proposed injection well which fully describes the casing, tubing, perforated interval, and depth showing that the injection of gas or water will be confined to the San Andres formation.

(3). A letter stating that all offset operators to the proposed injection well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection well if, within 20 days after receiving the application, no objection to the proposal is received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

Expansion of the project area may be approved by the Secretary-Director of the Commission administratively when good cause is shown therefor.

Junior Dickson, etc.

Martin Water Laboratories

BOX 1368 MONAHANS, TEXAS WIS-3234

RESULT OF WATER ANALYSES

LABORATORY NO. 4676
 TO: Mr. J. W. Sullivan
 SAMPLE RECEIVED 4-6-67
 RESULTS REPORTED 4-26-67
 COMPANY: Dallas, Texas
 FIELD OR POOL: Dallas, Texas
 SECTION: BLOCK: SURVEY: COUNTY: STATE: D. H.

SOURCE OF SAMPLE AND DATE TAKEN:

- NO. 1: Sample taken from water well in Section 3 Township 11S-Range 33E. 4-6-67
- NO. 2: Sample taken from water well in Section 3 Township 11S-Range 33E. 4-6-67
- NO. 3: Sample taken from water well in Section 3 Township 11S-Range 33E. 4-6-67
- NO. 4: Sample taken from water well in Section 3 Township 11S-Range 33E. 4-6-67

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES				
	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0000	1.0000	1.0000	1.0000
pH When Sampled				
pH When Received	7.3	7.3	7.3	7.3
Bicarbonate as HCO_3	207	201	201	201
Supersaturation as CaCO_3	3	202	10	15
Undersaturation as CaCO_3				
Total Hardness as CaCO_3	535	8,450	13,200	13,200
Calcium as Ca	100	2,174	4,068	4,520
Magnesium as Mg	33	757	374	900
Sodium & Potassium				
Sulfate as SO_4	372	2,060	373	573
Chloride as Cl	131	155,461	15,025	55,395
Iron as Fe	0.12	0.15	16.5	15.6
Barium as Ba	0.0	0.0	0.0	0.0
Turbidity, Electric	0.0	6.4	12.1	81.7
Color as Pt	0.75	0.75	12.0	111
Dissolved Solids at 100° C.				
Total Solids at 100° C.				
Total Solids, Calculated				
Temperature °F.				
Carbon Dioxide, Calculated	27	260	31	35
Dissolved Oxygen, Whetzel	4.0	0.0	0.0	0.0
Hydrogen Sulfide	0.0	0.0	0.0	0.0
Resistivity, ohm-in at 80° F.	6.75	0.005	2.130	0.120
Slime and Oil				

All results reported as parts per million except pH

EXHIBIT #14

100-33411-000

67 APR 13 PM 1 1

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF)
COASTAL STATES GAS PRODUCING COMPANY)
FOR APPROVAL OF THE EXPANSION OF THE)
PILOT PRESSURE MAINTENANCE PROJECT)
HERETOFORE INAUGURATED UNDER ORDER)
R-3033 OF THE COMMISSION TO INCLUDE)
ALL LANDS TO BE EMBRACED IN THE FLYING)
"M" - SAN ANDRES UNIT AREA WITHIN THE)
FLYING "M" - SAN ANDRES POOL, LEA COUNTY,)
NEW MEXICO. APPLICANT SEEKS AUTHORITY TO)
EXPAND THE PILOT PRESSURE MAINTENANCE)
PROJECT TO INCLUDE 8 INJECTION WELLS TO)
BE LOCATED IN SECTIONS 15, 16, 17, 20,)
22, 28, 29 and 33, Township 9 SOUTH,)
RANGE 33 EAST, N.M.P.M. APPLICANT ALSO)
SEEKS ESTABLISHMENT OF ADMINISTRATIVE)
PROCEDURE WHEREBY THE PROJECT AREA MAY)
BE EXPANDED AND FOR APPROVAL OF ADDITIONAL)
INJECTION WELLS.)

Case 3555

Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Comes Coastal States Gas Producing Company, with offices at Midland, Texas, and hereby makes application for approval of the expansion of the pilot pressure maintenance project heretofore instituted under Order R-3033 of the Commission embracing lands to be included in the Flying "M" - San Andres Unit Agreement within the Flying "M" - San Andres Pool as defined by the New Mexico Oil Conservation Commission in accordance with Rule 701 of the rules of the Commission, and in support thereof shows:

1. That applicant is in the process of forming a unit agreement embracing the following described lands within the Flying "M"- San Andres Pool situated in Lea County, New Mexico, to-wit:

Township 9 South, Range 33 East, N.M.P.M.

Sec. 15 - $W\frac{1}{2}W\frac{1}{2}$	Sec. 27 - $W\frac{1}{2}NW\frac{1}{4}$
Sec. 16 - All	Sec. 28 - $N\frac{1}{2}$, $SW\frac{1}{4}$, $W\frac{1}{2}SE\frac{1}{4}$
Sec. 17 - All	Sec. 29 - $E\frac{1}{2}$, $E\frac{1}{2}W\frac{1}{2}$
Sec. 20 - $E\frac{1}{2}$, $E\frac{1}{2}NW\frac{1}{4}$	Sec. 32 - $NE\frac{1}{4}$, $E\frac{1}{2}NW\frac{1}{4}$
Sec. 21 - All	Sec. 33 - $W\frac{1}{2}NW\frac{1}{4}$
Sec. 22 - $W\frac{1}{2}W\frac{1}{2}$	

containing 4,080 acres, more or less

It is contemplated that applicant will be the unit operator under the terms of said unit agreement, the primary objective of which is to expand the present pilot pressure maintenance project to include the lands within the proposed Flying "M" - San Andres Unit Area and to maintain a pressure maintenance project for the purpose of obtaining the greatest ultimate recovery of oil, gas and other hydrocarbon substances from said pool.

2. That there is attached hereto, made a part hereof and for purposes of identification marked Exhibit "A", a plat showing the boundaries of the proposed unit area which would constitute the pressure maintenance project area and also the location of all wells producing from the Flying "M" - San Andres Pool, together with the location of the 8 proposed injection wells. Said exhibit also shows the location of all other wells within a radius of 2 miles from the project area as well as the formations from which said wells are producing or have produced and the ownership of the leasehold interests within said 2 mile radius.

3. There are also filed herewith electrical logs of each of the proposed injection wells.

4. There are also attached hereto diagrammatic sketches of the proposed injection wells showing the casing strings, including diameters and setting depths, perforation intervals, tubing strings, including diameters and setting depths and type and location of packers.

5. It is proposed to inject water into the Flying "M" - San Andres Pool in the injection wells shown on Exhibit "A".

6. It is proposed to purchase fresh water from existing water wells producing from the Ogallala formation in the immediate Caprock area for injection into the respective injection wells. There is attached hereto as Exhibit "B" a tabulation of the water requirements and fill-up volumes for the Flying "M" - San Andres field.

7. Applicant seeks the establishment of the project area and an equitable allowable formula for the project as provided by the rules of the Commission and the establishment of administrative procedure for expansion and approval of additional injection wells.

8. That a copy of this application with all exhibits has been mailed to the State Engineer of the State of New Mexico, Capitol Building, Santa Fe, New Mexico simultaneously with making this application to the Commission.

9. Applicant respectfully requests that this matter be set down for hearing at the examiner's hearing on April 26, 1967.

Respectfully submitted,

COASTAL STATES GAS PRODUCING COMPANY

By Jack R. McInnis

HINKLE, BONDURANT & CHRISTY

By [Signature]

Attorneys for Applicant

Box 10

Roswell, New Mexico

TABULATED WATER REQUIREMENTS AND FILL-UP VOLUMES
FLYING "M" SAN ANDRES FIELD
LEA COUNTY, NEW MEXICO
THOUSANDS OF BBLS

	<u>EST. VOL. OF MAKE-UP WATER REQUIRED</u>	<u>EST. VOL. OF PROD. WATER RETURNED TO RESERVOIR</u>	<u>TOTAL</u>	<u>RESERVOIR VOIDAGE</u>	<u>BALANCE FILL-UP</u>	<u>CUMULATIVE* BALANCE</u>
1967	1,370	300	1,670	1,610	60	60
8	1,830	328	2,158	1,048	1,110	1,170
9	1,310	356	1,666	886	780	1,950
70	530	380	910	910	0	1,950
1	530	403	933	933	0	1,950
2	530	424	954	954	0	1,950
3	530	444	974	974	0	1,950
4	530	474	1,004	1,004	0	1,950
5	464	510	974	974	0	1,950
6	281	555	836	836	0	1,950
7	169	630	799	799	0	1,950
8	102	768	870	870	0	1,950
9	61	1,020	1,081	1,081	0	1,950
80	<u>14</u> 8,251	<u>440</u> 7,032	<u>454</u> 15,283	<u>454</u> 13,333		1,950

* Calculated Fill-Up Volume required to re-pressure reservoir to 1125 psi is 1,950,000 Bbls.

EXHIBIT "B"

Case 3553

L. L. & E. State No. 2
Redfern-State No. 2
Skelly-State No. 5

PERTINENT INFORMATION

A. Formation into which water will be injected:

Slaughter zone of the San Andres, at 4386' to 4620'.

B. Kind of fluid to be injected:

Produced brine water and fresh water.

C. Anticipated volumes to be injected:

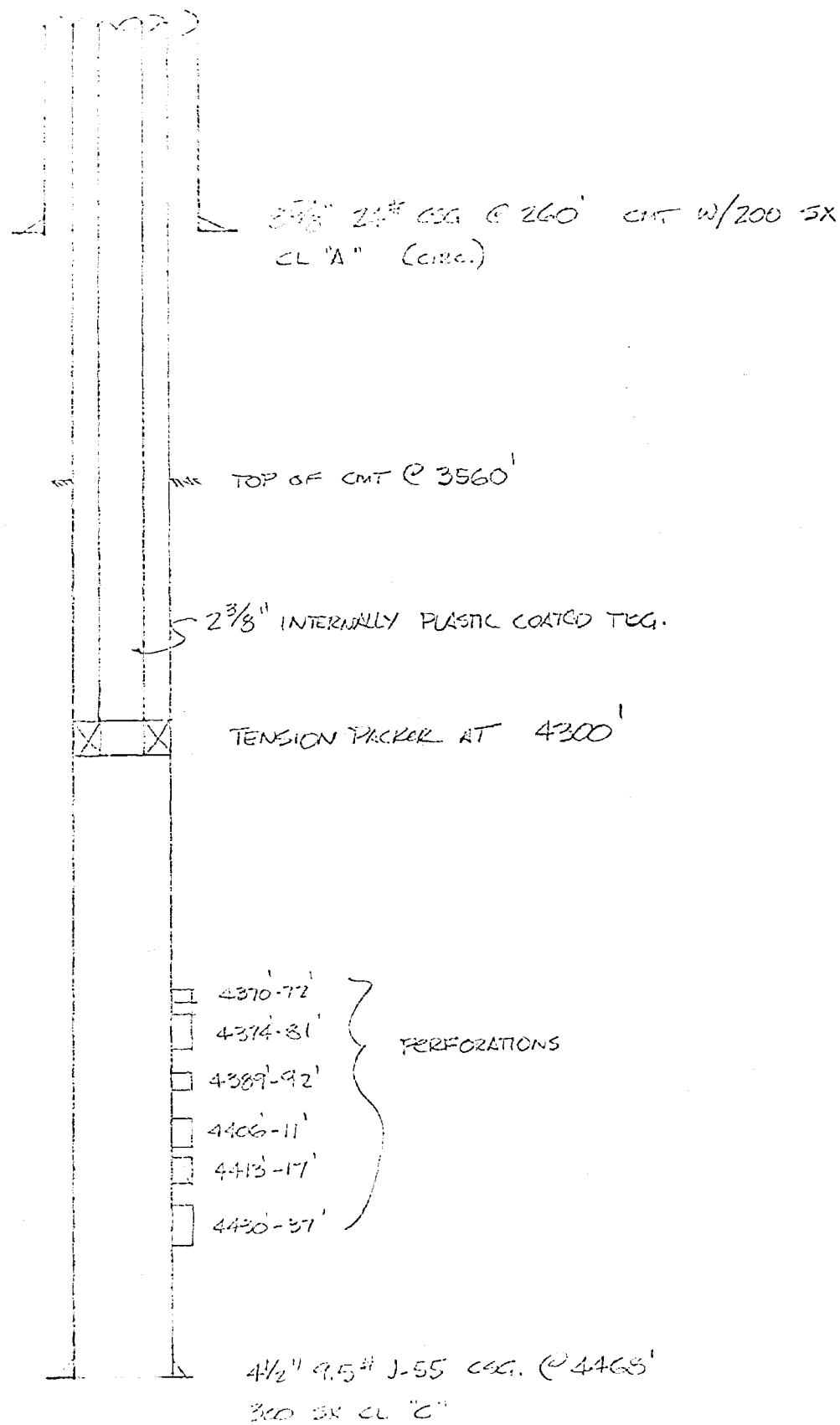
250 - 1000 Bbls/well/day.

D. Source of injected fluid:

1. Produced brine water from the San Andres formation, approximately 15%.
2. Produced brine water from the Bough "C" formation, approximately 35%.
3. Fresh water produced from the Ogallalla formation, approximately 50%.

Analyses of these waters are attached.

CONCRETE-FOUR #1



LL & E #2

8 5/8" 24# J-55 CSG @ 264' CMT CIRC.
150 SX CL "C" NEAT

GR. LEVEL EL. 4351'
K.B. EL. +10.5'

TOP CMT 3550'

2 3/8" INTERNALLY
PLASTIC COATED
TUBING

2 3/8" x 4 1/2"
TENS. PKR
@ 4500'

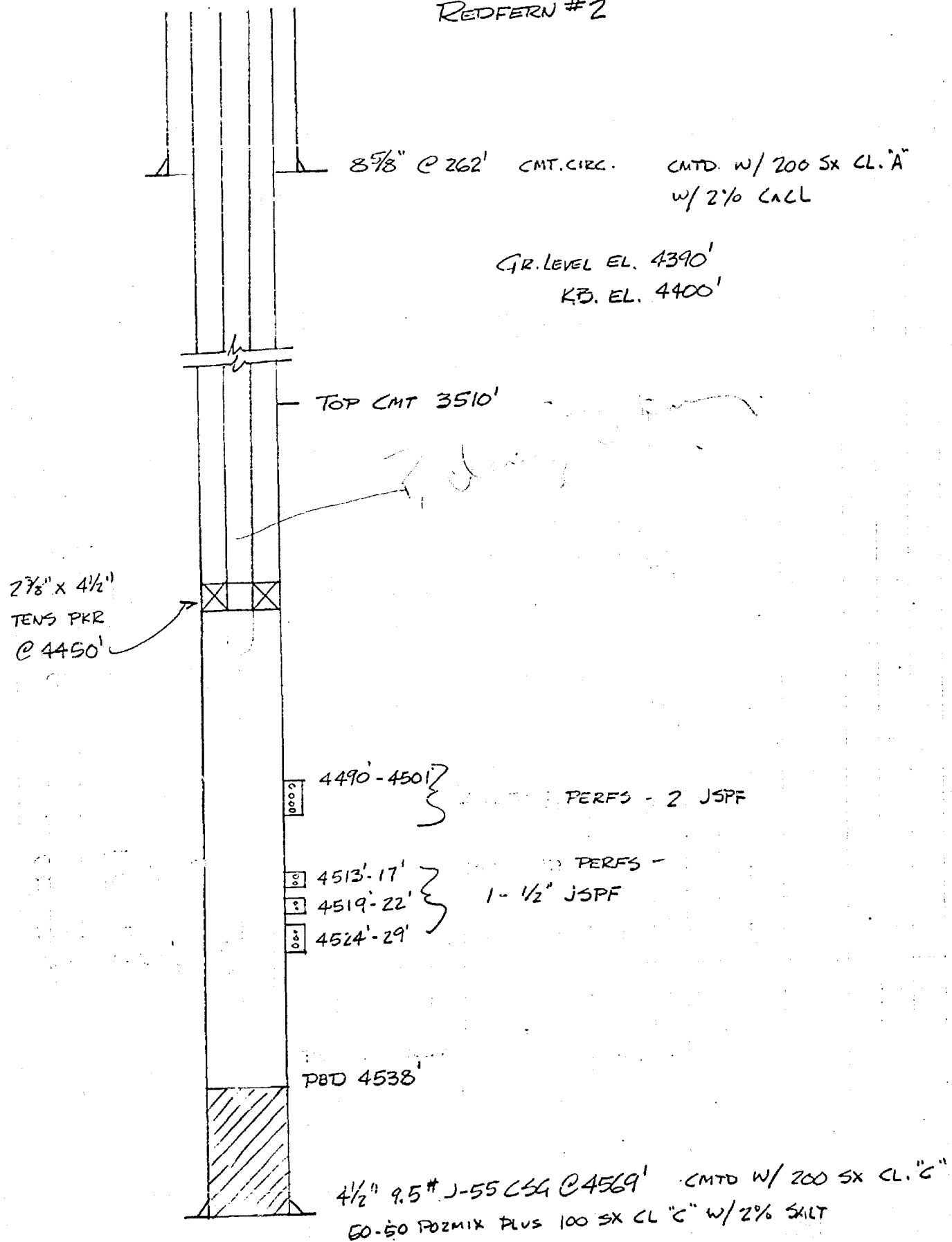
4567'-69' } PERFS - 2 JSPF
4574'-76' }
4580'-84' }

4603' } PERFS - ONE - 1/2" JSPF
4620' }

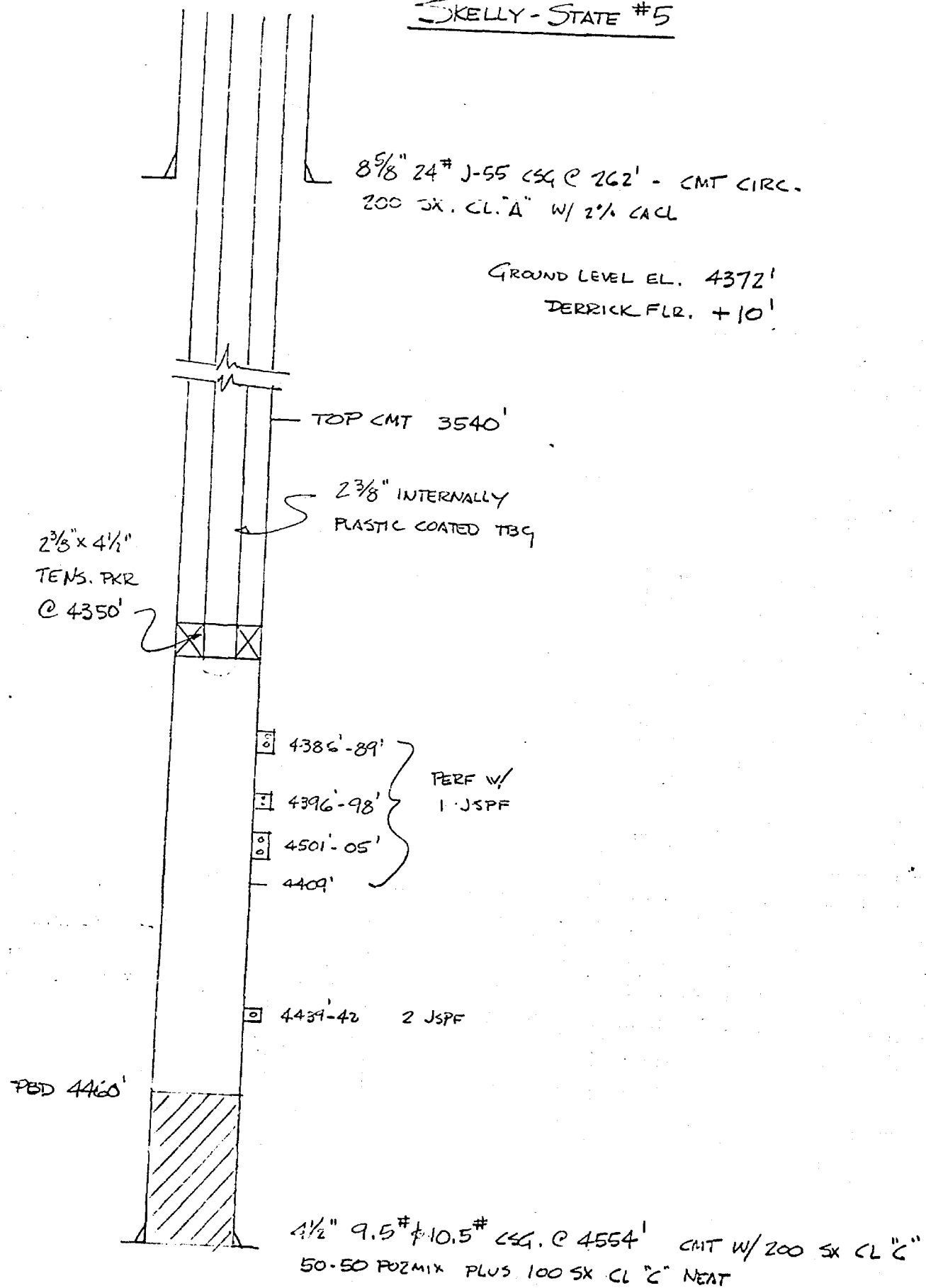
PDD 4640'

4 1/2" 9.5# J-55 CSG @ 4680' CMT W/ 250 SX
CLASS "C" NEAT

REDFERN #2



SKELLY - STATE #5



DWC-451-D



DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

WATER ANALYSIS

Coastal States Gas Producing
Company
Box 2498
Abilene, Texas

DATE 3-29-65

LAB NO. 4852

LABORATORY LOCATION

S. NO.

Hobbs, N.M.

SOURCE		TOTAL SOLIDS		PH		SPECIFIC GRAVITY	
Swab				5.9		1.062 @ 76 °F	
CONSTITUENTS		mg/L	meq/L	CONSTITUENTS		mg/L	meq/L
Sodium		11492	500	Chloride		48635	1532
Calcium		19820	989	Bicarbonate		915	15
Magnesium		1095	90	Sulfate		1550	32
Iron				Carbonate			

STIFF DIAGRAM
(meq/L)

	6	5	4	3	2	1	0	1	2	3	4	5	6	
Na/1000														Cl/1000
Ca/100														HCO ₃ /10
Mg/100														SO ₄ /10
Fe/10														CO ₃ /10

Remarks:

W.M. Harrell

LABORATORY DIVISION OF TEXAS OIL CHEMICAL COMPANY

WATER ANALYSIS

Mr. Joe Howard
Coastal States Gas Producing Company
P.O. Box 1501
Midland, Texas 79701

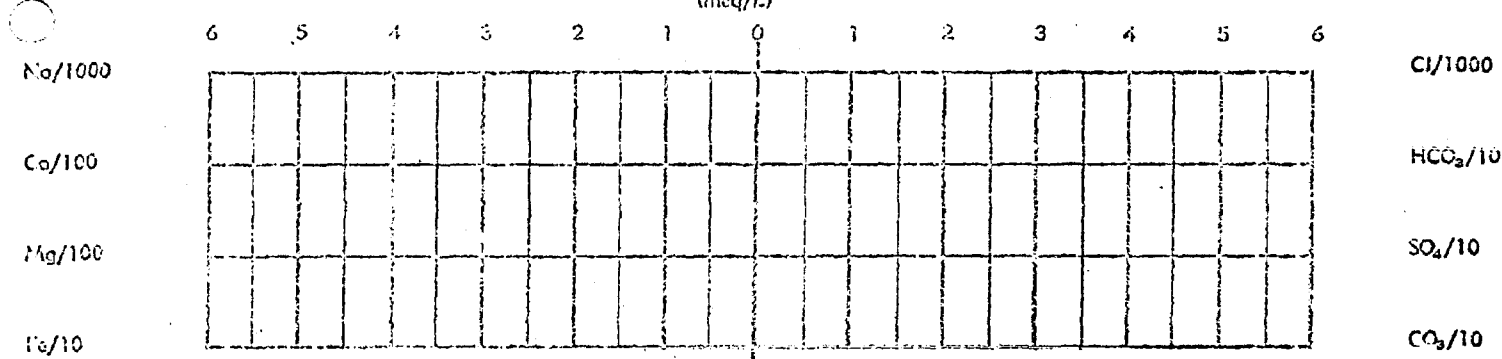
DATE
1-4-67
LABORATORY LOCATION
Hobbs, N.M.

LAB NO.
5224
S. NO.

Copyto: Mr. Carl Oden - Hobbs, N.M.

			POOL	FORMATION	
			Blying M	San Andres	
			LOCAL DESCRIPTION	DATE	DEPTH
			Flying M #3		
SOURCE			PH	SPECIFIC GRAVITY	
Swab after Acid Job.			5.6	1.149	95
TOTAL SOLIDS					
CONSTITUENTS	mg/L	meq/L	CONSTITUENTS	mg/L	meq/L
Sodium	75,700	3290	Chloride	135,900	3830
Calcium	7200	360	Bicarbonate	420	7
Magnesium	2800	230	Sulfate	2200	44
Iron	1	0	Carbonate	0	0

STIFF DIAGRAM
(meq/L)



Remarks:

C.M. Rosson

CSGP CO.
Drig. & Prod. Dept.
Midland Div.
JAN 10 1967

To	In	Out
File		

ANALYSIS BASED ON API RECOMMENDED PROCEDURE

Martin Water Laboratories
BOX 1468 MONAHANS, TEXAS W13-3234
RESULT OF WATER ANALYSES

TO: Mr. Jack McGraw LABORATORY NO. 666133
P. O. Box 235, Midland, Texas SAMPLE RECEIVED 6-30-66
 RESULTS REPORTED 7-8-66
 COMPANY Coastal States Gas Producing Co. LEASE Flying "M"
 FIELD OR POOL Flying "M"
 SECTION BLOCK SURVEY COUNTY Lea STATE N. M.
 SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Raw water - taken from water supply line at storage tank. 6-30-66

CHEMICAL AND PHYSICAL PROPERTIES		
	NO. 1	
Specific Gravity at 60° F.	1.0016	
pH When Sampled	7.3	
pH When Received	7.3	
Bicarbonate as HCO ₃	178	
Supersaturation as CaCO ₃	5	
Undersaturation as CaCO ₃	-	
Total Hardness as CaCO ₃	420	
Calcium as Ca	142	
Magnesium as Mg	16	
Sodium and/or Potassium		
Sulfate as SO ₄	298	
Chloride as Cl	114	
Iron as Fe	0.27	
Barium as Ba	0.0	
Turbidity, Electric	0.0	
Color as Pt	0.0	
Dissolved Solids at 103° C.		
Total Solids at 103° C.		
Total Solids, Calculated		
Temperature °F.	75	
Carbon Dioxide, Calculated	15	
Dissolved Oxygen, Winkler	8.0	
Hydrogen Sulfide	0.0	
Resistivity, ohm-cm at 60° F.	9.30	
Suspended Oil		
Filterable Solids, ppm	0.38	
Volume Filtered, ml	4,000	
All Results Reported As Parts Per Million (mg/l)		
Additional Determinations And Remarks	Theoretical Compatible	Actual
Equal Mixture of Waters	Turbidity, ppm	Turbidity, ppm
Supply water & produced water	3.5	5.1
Letter of recommendation attached		

cc: Mr. K. E. Oden
2900 N. Acres, Hobbs, N. M.

BY Waylan C. Martin, M. A.

List of Injection Wells
(All wells are located in T-9-S, R-33-E)

Wells already on injection under Pilot Project:

Coastal States Gas Producing Company
Flying "M" (San Andres) Unit, Tract 1B, Well No. 4,
Unit J, Section 15
Flying "M" (San Andres) Unit, Tract 3, Well No. 3,
Unit F, Section 17
Flying "M" (San Andres) Unit, Tract 11, Well No. 1,
Unit L, Section 15

Proposed injection wells:

Coastal States Gas Producing Company
Flying "M" (San Andres) Unit, Tract 1-A, Well No. 1,
Unit B, Section 29
Flying "M" (San Andres) Unit, Tract 5, Well No. 2,
Unit D, Section 16
Flying "M" (San Andres) Unit, Tract 12, Well No. 5,
Unit F, Section 20
Flying "M" (San Andres) Unit, Tract 17, Well No. 2,
Unit L, Section 22
One additional well to be drilled or converted to
injection at a later date.

Pertinent information concerning the total proposed project.

1. Water will be injected into the Slaughter zone of the San Andres formation.
2. The approximate depth is 4450' below the surface or at a subsea datum of approximately -100'.
3. The injection rate is expected to be 5250 BPD at 2000 psi injection pressure.
4. All produced water will be returned to the reservoir.
5. Make-up water will come from the Ogallala formation approximately nine miles south of the field.

Case 3534

FLYING "M" - SAN ANDRES UNIT AGREEMENT
LEA COUNTY, NEW MEXICO

THIS AGREEMENT entered into as of the 1st day of December 1966, by and between the parties subscribing, ratifying or consenting hereto, and herein referred to as "parties hereto".

W I T N E S S E T H:

WHEREAS, the parties hereto are the owners of working, royalty or other oil and gas interests in the unit area subject to this agreement, and

WHEREAS, the Mineral Leasing Act of February 25, 1920, 41 Stat. 437, as amended, 30 U.S.C. Sec. 181 et seq, authorizes Federal lessees and their representatives to unite with each other, or jointly or separately with others, in collectively adopting and operating a co-operative or unit plan of development or operation of any oil or gas pool, field, or like area, or any part thereof for the purpose of more properly conserving the natural resources thereof whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest, and

WHEREAS, the Commissioner of Public Lands of the State of New Mexico is authorized by an Act of the Legislature (Sec. 7-11-39 N. M. Statutes 1953 Annotated) to consent to or approve this agreement on behalf of the State of New Mexico insofar as it covers and includes lands and mineral interests of the State of New Mexico; and

WHEREAS, the Commissioner of Public Lands of the State of New Mexico is authorized by an Act of the Legislature (Sec. 7-11-41 N. M. Statutes 1953 Annotated) to amend, with the approval of the lessee, any oil and gas lease embracing State lands so that the length of the term of said lease may coincide with the terms of such unitized development and operation of State lands, and

WHEREAS, the Oil Conservation Commission of the State of New Mexico is authorized by an Act of the Legislature (Article 3, Chapter 65, Vol. 9, Part 2, 1953 Statutes) to approve this agreement and the conservation provisions hereof, and

WHEREAS, the parties hereto hold sufficient interests in the Flying "M" - San Andres Unit Area covering the land hereinafter described to give reasonably effective control of operations therein, and

WHEREAS, it is the purpose of the parties hereto to conserve natural resources, prevent waste, and secure other benefits obtainable through development

James H. San Andres Unit Agreement

and operation of the area subject to this agreement under the terms, conditions and limitations herein set forth;

NOW, THEREFORE, in consideration of the premises, and the promises herein contained, the parties hereto commit to this agreement their respective interests in the below-defined unit area, and agree severally among themselves as follows.

1. ENABLING ACT AND REGULATIONS The Mineral Leasing Act of February 25, 1920, as amended, supra, and all valid pertinent regulations, including operating and unit plan regulations, heretofore issued thereunder or valid, pertinent and reasonable regulations hereafter issued thereunder are accepted and made a part of this agreement as to Federal lands, provided such regulations are not inconsistent with the terms of this agreement, and as to State of New Mexico and privately owned lands, the oil and gas operating regulations in effect as of the effective date hereof governing drilling and producing operations, not inconsistent with the terms hereof or the laws of the State of New Mexico are hereby accepted and made a part of this agreement.

2. DEFINITIONS. For the purpose of this agreement, the following terms and expressions as used herein shall mean.

(a) "Commissioner" is defined as the Commissioner of Public Lands of the State of New Mexico.

(b) "Commission" is defined as the Oil Conservation Commission of the State of New Mexico.

(c) "Director" is defined as the Director of the United States Geological Survey.

(d) "Secretary" is defined as the Secretary of the Interior of the United States of America.

(e) "Department" is defined as the Department of the Interior of the United States of America.

(f) "Supervisor" is defined as the Oil and Gas Supervisor of the United States Geological Survey.

(g) "Unitized Formation" shall mean that subsurface portion of the unit area commonly known as the San Andres Slaughter zone and more specifically defined as that formation occurring between the depths below rotary drive bushing according to the well logs described below:

<u>Operator</u>	<u>Location, Lease and Well Number</u>	<u>Top of Unitized Formation</u>	<u>Base of Unitized Formation</u>	<u>Type Log</u>
CSGPC	Skelly State #1 1978 FNL & 1993 FNL Sec. 21, T9S-R33E	4456 ft.	4560 ft.	Schlumberger Gamma Ray-Neutron, dated 9/23/63
CSGPC	Southern Minerals State #4 1904 FNL & 845 FEL Sec. 21, T9S-R33E	4494 ft.	4600 ft.	Schlumberger Sonic Gamma Ray, dated 2/23/66

<u>Operator</u>	<u>Location, Lease and Well Number</u>	<u>Top of Unitized Formation</u>	<u>Base of Unitized Formation</u>	<u>Type Log</u>
Shell Oil	State "FMB" #3 1980 FN & WL Sec. 17, T9S-R33E	4406 ft.	4509 ft.	Schlumberger Sonic Gamma Ray, dated 12/13/64

(h) "Unitized Substances" is defined as and shall mean all oil, gas, gaseous substances, sulphur contained in gas, condensate, distillate and all associated and constituent liquids or liquefiable hydrocarbons within or produced from the Unitized Formation.

(i) "Working Interest" is defined as the right to search for, produce and acquire Unitized Substances whether held as an incident of ownership of mineral fee simple title, under an oil and gas lease, or otherwise held.

(j) "Working Interest Owner" is defined as and shall mean any party hereto owning a Working Interest, including a carried working interest owner, holding an interest in Unitized Substances by virtue of a lease, operating agreement, fee title or otherwise, which interest is chargeable with and obligated to pay or bear, either in cash or out of production, or otherwise, all or a portion of the cost of drilling, developing, operating and producing the Unitized Substances from the Unitized Formation.

(k) "Royalty Interest" or "Royalty" is defined as an interest other than a Working Interest in or right to receive a portion of the Unitized Substances or the proceeds thereof and includes the royalty interest reserved by the lessors in oil and gas leases and any overriding royalty interest, oil payment interest, net profit contract, or any other payment or burden which does not carry with it the right to search for and produce Unitized Substances.

(l) "Royalty Owner" is defined as and shall mean the owner of a Royalty Interest.

(m) "Unit Operating Agreement" is defined as and shall mean any agreement or agreements (whether one or more) entered into (separately or collectively) by and between the Unit Operator and the Working Interest Owners as provided in Section 8, infra, and shall be styled "Unit Operating Agreement, Flying "M" - San Andres Unit, Lea County, New Mexico."

(n) "Paying Quantities" is defined as production of Unitized Substances in quantities sufficient to pay for the cost of producing same from wells on the unitized land.

(o) "Phase I" is defined as that period of time that Unitized Substances are produced from the unit area from and after the effective date of this agreement until 7:00 a.m. the first day of the calendar month ensuing after 3,000,000 barrels of oil minus the gross oil production from February 24, 1964 to the effective date of this agreement have been produced from the Unitized Formation. For the purposes of this definition the Operator's Monthly Report, Form C-115, filed with the New Mexico Oil Conservation Commission shall be deemed the controlling evidence of the production of 3,000,000 barrels of oil after February 24, 1964.

(p) "Phase II" is defined as the remainder of the term of this agreement after the termination of Phase I.

(q) "Current Rate" is defined as the total amount of San Andres oil produced from any tract within the unit area during the period of May 1, 1966 through October 31, 1966; however, in the event any well did not produce for the full said six month period, the production for any full month or months within such period that the well actually produced multiplied by the ratio of six (6) divided by the number of full months of actual production shall be the current rate.

The current rate for any well completed after October 31, 1966 and prior to the effective date of this unit that has produced San Andres oil shall be calculated on the same basis as set out above; however, for such well the production shall be witnessed and reported by having the daily production gauged by a consultant Registered

Professional Engineer of the State of New Mexico and witnessed by a representative of the New Mexico Oil Conservation Commission.

(r) "Productive Acres" for each tract is shown on the schedule attached hereto as Exhibit "B"

(s) "Tract Ultimate Primary Reserves" is defined as the cumulative oil produced from each tract plus the remaining primary oil reserves from said tract.

(t) "Tract Remaining Primary Reserves" is defined as each tract's percentage of current rate multiplied by the number of barrels as defined in Section 2(o).

(u) "Tract Cumulative Production" is defined as the total amount of San Andres oil produced from February 24, 1966, as reported on the Operator's Monthly Production Reports, Form C-115, on file with the New Mexico Oil Conservation Commission through the effective date of the unit.

3. UNIT AREA. The following described land is hereby designated and recognized as constituting the unit area:

Township 9 South, Range 33 East, N.M.P.M.

Section 15 - W1/2W1/2	Section 27 - W1/2NW1/4
Section 16 - All	Section 28 - N1/2, SW1/4, W1/2SE1/4
Section 17 - All	Section 29 - E1/2, E1/2W1/2
Section 20 - E1/2, E1/2NW1/4	Section 32 - NE1/4, E1/2NW1/4
Section 21 - All	Section 33 - W1/2NW1/4
Section 22 - W1/2W1/2	

containing 4,080 acres, more or less.

Exhibit "A" attached hereto is a map showing, to the extent known to the Unit Operator, the unit area and the boundaries and identity of tracts and leases in said unit area. Exhibit "B" attached hereto is a schedule showing, to the extent known to the Unit Operator, the acreage comprising each tract, the acreage in each tract deemed productive, percentage of ownership of each Working Interest Owner in each tract and the percentage of participation each tract has in the unit area. However, nothing herein or in said schedule or map shall be construed as a representation by any party hereto as to the ownership of any interest other than such interest or interests as are shown in said map or schedule as owned by such party. Exhibits "A" and "B" shall be revised by the Unit Operator whenever changes render such revision necessary, and at least two copies of such revision shall be filed with the Commissioner, and not less than six copies thereof shall be filed with the Supervisor.

The above described unit area may, when practicable, be amended to include therein any additional tract or tracts regarded as reasonably necessary or advisable for the purposes of this agreement to conform with the purposes of this agreement. Such expansion shall be effected in the following manner:

(a) The Working Interest Owner or owners of a tract or tracts desiring to bring such tract or tracts into this unit, shall file an application therefor with Unit Operator requesting such admission.

(b) Unit Operator shall circulate a notice to each Working Interest Owner of the proposed expansion, setting out the basis for admission, the unit participation to be assigned to such tract or tracts, and other pertinent data. After negotiation (at Working Interest Owners' meeting or otherwise), if 90 per cent of the Working Interest Owners (on the basis of unit participation during Phase II) have agreed to such tract or tracts being brought into the unit, then Unit Operator shall:

(1) Prepare a notice of proposed expansion describing the contemplated changes in the boundaries of the unit area, the reason therefor, the basis for admission of the additional tract or tracts, the unit participation to be assigned thereto and the proposed effective date thereof, preferably the first day of a month subsequent to the date of notice; and

(2) Deliver copies of said notice to the Commissioner, the Director, each Working Interest Owner (mailing a copy of such notice to the last known address of each such Working Interest Owner) and to the lessee and lessor whose interests are proposed to be committed, advising such parties that thirty (30) days will be allowed for submission to the Unit Operator of any objection to such proposed expansion; and

(3) File, upon the expiration of said thirty (30) day period as set out in (2) immediately above and provided that objections of not more than 10 per cent of the Working Interest Owners have been filed thereto, with the Commissioner, Director and the Commission the following: (a) comprehensive statement as to mailing such notice of expansion; (b) an application for such expansion; and (c) an instrument containing the appropriate joinders in compliance with the participation requirements of Section 12, infra.

The expansion shall, after due consideration of all pertinent information and upon approval by the Commissioner, the Director and the Commission, become effective as of the date prescribed in the notice thereof or on such other date as set by the Commissioner, the Director and the Commission in the order or instrument approving such expansion.

4. UNITIZED LAND AND UNITIZED SUBSTANCES. All lands committed to this agreement as to the Flying "M" - San Andres formation as defined under "Unitized Formation" shall constitute land referred to herein as "Unitized Land" or "land subject to this agreement." All oil and gas in or produced from said Unitized Formation of the "Unitized Land" are unitized under the terms of this agreement and herein are called "Unitized Substances." Surface rights of ingress and egress shall be maintained for the benefit of the unit.

Nothing herein shall be construed to unitize, pool or in any way affect the oil, gas and other minerals contained in or that may be produced from any formation other than the Unitized Formation.

5. UNIT OPERATOR. Coastal States Gas Producing Company with offices at Corpus Christi, Texas, is hereby designated as Unit Operator, and by signing this instrument as Unit Operator it agrees and consents to accept the duties and obligations of Unit Operator for the operation, development and production of Unitized Substances as herein provided. Whenever reference is made herein to the Unit Operator, such reference means the Unit Operator acting in that capacity and not as an owner of interests in Unitized Substances, and the term "Working Interest Owner" when used herein shall include or refer to Unit Operator as the owner of a Working Interest when such an interest is owned by it.

6. RESIGNATION OR REMOVAL OF UNIT OPERATOR. Unit Operator shall have the right to resign at any time, but such resignation shall not become effective so as to release Unit Operator from the duties and obligations of Unit Operator and terminate Unit Operator's rights as such for a period of ninety (90) days after notice of intention to resign has been served by Unit Operator on all Working Interest Owners, the Commissioner and the Director, and until all wells then drilled hereunder are placed in a satisfactory condition for suspension or abandonment whichever is required by the Supervisor and Commissioner, unless a new Unit Operator shall have been selected and approved and shall have taken over and assumed the duties and obligations of Unit Operator prior to the expiration of said period.

The resignation of Unit Operator shall not release Unit Operator from any liability for any default by it hereunder occurring prior to the effective date of its resignation.

The Unit Operator may, upon default or failure in the performance of its duties or obligations hereunder, be subject to removal by the same percentage vote of the owners of working interests determined in like manner as herein provided for the selection of a new Unit Operator. Such removal shall be effective upon notice thereof to the Director.

In all instances of resignation or removal, until a successor Unit Operator is selected and approved as hereinafter provided, the Working Interest Owners shall be jointly responsible for performance of the duties of Unit Operator and shall, not later than 30 days before such resignation or removal becomes effective, appoint a common agent to represent them in any action to be taken hereunder.

The resignation or removal of Unit Operator under this agreement shall not terminate its right, title or interest as the owner of a working interest or other interest in Unitized Substances, but upon the resignation or removal of Unit Operator becoming effective, such Unit Operator shall deliver possession of all equipment, books and records, materials, appurtenances and any other assets used in conducting the unit operations and owned by the Working Interest Owners (including any and all data and information which it might have gained or assembled by reason of its operation of the unit area) to the new duly qualified successor Unit Operator or to the owners thereof if no such new Unit Operator is elected, to be used for the purpose of conducting unit operations hereunder. Nothing herein shall be construed as authorizing removal of any material, equipment and appurtenances needed for the preservation of any wells

7. SUCCESSOR UNIT OPERATOR. Whenever the Unit Operator shall tender its resignation as Unit Operator or shall be removed as hereinabove provided, or a change of Unit Operator is negotiated by Working Interest Owners, the owners of the working interests, voting according to their respective participating interests in all unitized land, shall by majority vote select a successor Unit Operator. Provided, That, if a majority or in excess thereof of the working interests qualified to vote are owned by one party to this agreement, a concurring vote of one or more additional Working Interest Owner shall be required to select a new Unit Operator. Such selection shall not become effective until:

(a) the Unit Operator so selected shall accept in writing the duties and responsibilities of Unit Operator, and

(b) the selection shall have been filed with the Supervisor and approved by the Commissioner. If no successor Unit Operator is selected and qualified as herein provided, the Director and Commissioner at their election may declare this unit agreement terminated.

8. ACCOUNTING PROVISIONS AND UNIT OPERATING AGREEMENT. Costs and expenses incurred by Unit Operator in conducting unit operations hereunder shall be paid, apportioned among and borne by the Working Interest Owners in accordance with the Unit Operating Agreement. Such Unit Operating Agreement shall also provide the manner in which the Working Interest Owners shall be entitled to receive their respective proportionate and allocated share of the benefits accruing hereto in conformity with

their underlying operating agreements, leases or other independent contracts and such other rights and obligations as between Unit Operator and the Working Interest Owners as may be agreed upon by the Unit Operator and the Working Interest Owners; however, no such Unit Operating Agreement shall be deemed either to modify any of the terms and conditions of this Unit Agreement or to relieve the Unit Operator of any right or obligation established under this Unit Agreement, and in case of any inconsistency or conflict between the Unit Agreement and the Unit Operating Agreement this Unit Agreement shall prevail. Two true copies of any Unit Operating Agreement executed pursuant to this section shall be filed with the Commissioner and three true copies thereof shall be filed with the Supervisor prior to approval of this agreement.

9. RIGHTS AND OBLIGATIONS OF UNIT OPERATOR. Except as otherwise specifically provided herein, the exclusive right, privilege and duty of exercising any and all rights of the parties hereto which are necessary or convenient for prospecting for, producing, storing, allocating and distributing the Unitized Substances are hereby delegated to and shall be exercised by the Unit Operator as herein provided. Acceptable evidence of title to said rights shall be deposited with said Unit Operator, and together with this agreement, shall constitute and define the rights, privileges and obligations of Unit Operator. Nothing herein, however, shall be construed to transfer title to any land or to any lease or operating agreement, it being understood that under this agreement the Unit Operator, in his capacity as Unit Operator, shall exercise the rights of possession and use vested in the parties hereto only for the purposes herein specified.

10. PLAN OF OPERATIONS. It is recognized and agreed by the parties hereto that a large percentage of the land subject to this agreement is reasonably proved to be productive of Unitized Substances in paying quantities and that the object and purpose of this agreement is to formulate and to put into effect a pressure maintenance and secondary recovery project in order to effect additional recovery of Unitized Substances, prevent waste and conserve natural resources. The parties hereto agree that the Unit Operator may, subject to the consent and approval of a plan of operation by the Working Interest Owners, the Supervisor, the Commission and the Commissioner, inject into the Unitized Formation, through any well or wells completed therein, brine, water, air, gas, oil, liquefied petroleum gas, and any

other substance or a combination of any of said substances, whether produced from the Unit Area or not, and that the location of input wells and the rate of injection therein and the rate of production shall be governed by standards of good geologic and petroleum engineering practices and conservation methods. After commencement of pressure maintenance and secondary recovery operations, Unit Operator shall furnish the Commission, the Commissioner, and the Supervisor monthly injection and production reports for each well in the unit. The Working Interest Owners, the Supervisor, the Commission, and the Commissioner shall be furnished periodical reports on the progress of the plan of operation and any revisions or changes thereto; provided, however, that any major revisions of the plan of operation involving a basic deviation from the initial plan of operation shall be subject to the consent and approval of the Working Interest Owners, the Supervisor, the Commission and the Commissioner.

The initial plan of operation shall be filed with the Supervisor, the Commission and the Commissioner concurrently with the filing of this Unit Agreement for final approval. Said initial plan of operation and all revisions thereof shall be as complete and adequate as the Supervisor, the Commission and the Commissioner may determine to be necessary for timely operation consistent herewith. Reasonable diligence shall be exercised in complying with the obligations of the approval plan of operation.

Notwithstanding anything to the contrary herein contained, the Unit Operator shall commence pressure maintenance and secondary recovery operations on the unit area within six (6) months after the effective date of this agreement, or any extension thereof approved by the Commission, the Commissioners and the Director, or this agreement shall terminate automatically, in which latter event Unit Operator shall notify all interested parties. After such operations are commenced, Unit Operator shall carry on such operations as would a reasonably prudent operator under the same or similar circumstances.

11. TRACT PARTICIPATION. The last page of Exhibit "B" attached hereto shows the percentage of participation allocated to each tract in the unit area during Phase I and during Phase II, as defined in subsections (o) and (p) specifically of Section 2 hereof. The formula as used for the calculations of such percentages of participation are as follows:

(a) Phase I participation of each tract, beginning at 7:00 a.m. on the effective date hereof and until 7:00 a.m. on the first day of the month next following the date when cumulative oil production from all of the tracts described in Exhibit "B" from the Unitized Formation subsequent to 7:00 a.m. February 24, 1964 equals 3,000,000 barrels, shall be equal to seventy-five per cent (75%) of the ratio of the current rate of production of Unitized Substances from each tract to the total current rate of production of Unitized Substances from all such tracts plus twenty-five per cent (25%) of the ratio of the productive acreage of each tract to the total productive acreage of all such tracts.

(b) Phase II participation of each tract beginning at 7:00 a.m. on the first day of the month following the date when the 3,000,000 barrels referred to above shall have been produced, shall be equal to seventy-five per cent (75%) of the ratio of the ultimate primary production from each of such tracts, to the total ultimate primary production of all such tracts plus twenty-five per cent (25%) of the ratio of the productive acreage of each tract to the total productive acreage of all such tracts.

The percentages of participation set forth opposite each tract on the last page of Exhibit "B" were calculated on the basis of 100% tract commitment. If the Unit Agreement is approved with less than 100% tract commitment, said percentages of participation shall be revised to reflect the commitment status as of the effective date hereof, and thereafter, as needed, pursuant to Section 13 (Allocation of Unitized Substances).

12. TRACTS QUALIFIED FOR UNIT PARTICIPATION. On and after the effective date hereof the tracts within the unit area which shall be entitled to participation (as provided in Section 11 hereof) in the production of Unitized Substances therefrom shall be those tracts within the unit area and more particularly described in said Exhibit "B" that are qualified as follows:

(a) Each and all of those tracts as to which Working Interest Owners owning 100% of the working interest in said tract and royalty owners owning 100% of the royalty interest in said tract have subscribed, ratified or consented to this agreement; and

(b) Each and all of those tracts as to which Working Interest Owners owning not less than 95% of the working interest therein and royalty owners owning not less than 75% of the royalty interest therein have executed this agreement, and in which the Working Interest Owners in said tract who have executed this agreement have agreed to indemnify and hold harmless all other parties hereto, in a manner satisfactory to 85% of the Working Interest Owners qualified under (a) against any and all claims and demands that may be made by the nonjoining Working Interest Owners or royalty owners, or both, on account of the commitment and joinder of such tract to the unit agreement, and operation thereof under such conditions on the basis herein provided, and as to which 85% of the Working Interest Owners qualified under (a) exclusive of the Working Interest Owner submitting such tract, have approved the commitment of such tract to this unit agreement.

If, on the effective date of this agreement, there is any tract or tracts which have not been effectively committed to or made subject to this agreement by qualifying as above provided, then such tract or tracts shall not be entitled to

participate hereunder. Unit Operator shall, when submitting this agreement for final approval by the Commissioner and the Director, file therewith a schedule of those tracts which have been committed and made subject to this agreement and are entitled to participate in the production from the unit area hereunder. Said schedule shall set forth opposite each such committed tract the lease number and assignment number, the owner of record of the lease, and the percentage of participation of such tract which shall be computed according to the participation formula set out in Section 11 (Tract Participation) above. This schedule of participation shall be a part of Exhibit "B" and upon approval thereof by the Commissioner and the Director shall become a part of this agreement and shall govern the allocation of production of Unitized Substances until a new schedule is filed and approved by the Commissioner and the Director.

13. ALLOCATION OF UNITIZED SUBSTANCES. All Unitized Substances produced and saved (less, save and except any part of such Unitized Substances used in conformity with good operating practices on unitized land for drilling, operating, camp and other production or development purposes and for pressure maintenance or unavoidable loss) shall be apportioned among and allocated to the committed tracts within the unit area in accordance with the respective tract participations then effective hereunder during the respective periods such Unitized Substances were produced, as set forth in the schedule of participation in Exhibit "B". The amount of Unitized Substances so allocated to each tract, and only that amount, (regardless of whether it be more or less than the amount of the actual production of Unitized Substances from the well or wells, if any, on such tract) shall, for all intents, uses and purposes be deemed to have been produced from such tract.

The Unitized Substances allocated to each tract shall be distributed among, or accounted for, to the parties executing, consenting to or ratifying this agreement entitled to share in the production from such tract in the same manner, in the same proportions, and upon the same conditions, as they would have participated and shared in the production from such tracts, or in the proceeds thereof, had this agreement not been entered into; and with the same legal force and effect.

No tract committed to this agreement and qualified for participation as above provided shall be subsequently excluded from participation hereunder on account of depletion of Unitized Substances, and nothing herein contained shall be construed

as requiring any retroactive adjustment for production obtained prior to the effective date of the joinder of any tract

If the working interest and the royalty interest in any tract are divided with respect to separate parcels or portions of such tract and owned severally by different persons, the percentage participation assigned to such tract shall, in the absence of a recordable instrument executed by all owners and furnished to Unit Operator fixing the division of ownership, be divided among such parcels or portions in proportion to the number of surface acres in each.

The Unitized Substances allocated to each tract shall be delivered in kind to the respective Working Interest Owners and parties entitled thereto by virtue of the ownership of oil and gas rights therein or by purchase from such owners. Each Working Interest Owner and the parties entitled thereto shall have the continuing right to receive such production in kind at a common point within the unit area and to sell or dispose of the same as it sees fit. Each such party shall have the right to construct, maintain and operate all necessary facilities for that purpose on unitized land, provided the same are so constructed, maintained and operated as not to interfere with operations carried on pursuant hereto. Subject to Section 14 hereof, any extra expenditure incurred by Unit Operator by reason of the delivery in kind of any portion of the Unitized Substances shall be borne by the party receiving the same in kind. In the event any party hereto shall fail to take or otherwise adequately dispose of its proportionate share of the production from the unit area currently as and when produced, then so long as such conditions continue, Unit Operator, for the account and at the expense of such party and in order to avoid curtailing the operation of the unit area, may sell or otherwise dispose of such production to itself or others on a day-to-day basis at not less than the prevailing market price in the area for like production, and the account of such party shall be charged therewith as having received such production. The net proceeds, if any, of the unitized substances so disposed of by Unit Operator shall be paid to the party entitled thereto.

Any party receiving in kind or separately disposing of all or any part of the Unitized Substances allocated to any tract, or receiving the proceeds therefrom if the same is sold or purchased by Unit Operator, shall be responsible for the payment of all royalty on the lease or leases and tracts contributed by it and

received into the unit, and each such party shall hold each other party hereto harmless against all claims, demands and causes of action for such royalty on the lease or leases and tracts contributed by it and received into the unitized land.

If, after the effective date of this agreement there is any tract or tracts that are subsequently committed hereto as provided in Section 3 (Unit Area) hereof, or any tract or tracts within the unit area not committed hereto as of the effective date hereof but which are subsequently committed hereto under the provisions of Section 31 (Nonjoinder and Subsequent Joinder), or if any tract is excluded from the unit area as provided for in Section 28 (Loss of Title), the schedule of participation as shown in Exhibit "B", subject to Section 11 (Tract Participation) or Section 31 (Nonjoinder and Subsequent Joinder), whichever is appropriate, shall be revised by the Unit Operator and distributed to the Working Interest Owners, the Commissioner and the Director to show the new percentages of participation of all the then effectively committed tracts; and the revised schedule, upon approval by the Commissioner and the Director, shall govern all the allocation of production from and after the effective date thereof until a new schedule is filed and approved by the Commissioner and the Director.

Unit Operator may use as much of the Unitized Substances as it may reasonably deem necessary for the operation and development of the unit area, including but not limited to the injection of Unitized Substances into the formation.

No royalty shall be payable upon or with respect to Unitized Substances used or consumed in the operation or development of the unit area or which may be otherwise lost or consumed in the production, handling, treating, transportation or storing of Unitized Substances.

14. ROYALTY SETTLEMENT. The State of New Mexico and the United States of America and all royalty owners who, under an existing contract, are entitled to take in kind a share of the substances produced from any tract unitized hereunder, shall continue to be entitled to such right to take in kind their share of the Unitized Substances allocated to such tract, and Unit Operator shall make deliveries of such royalty share taken in kind in conformity with the applicable contracts, laws and regulations. Settlement for royalty interests not taken in kind shall be made by Working Interest Owners responsible therefor under existing contracts, laws and regulations, on or before the last day of each month for Unitized Substances

produced during the preceding calendar month, provided, however, that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any royalty due under their leases, except that such royalty shall be computed in accordance with the terms of this unit agreement.

If gas, or any other substance, obtained from lands not subject to this agreement, is introduced into the Unitized Formation for use in repressuring, stimulation of production or increasing ultimate recovery in conformity with a plan approved pursuant to Section 10 (Plan of Operations), a like amount of gas or such other substance, less appropriate deductions for loss from any cause, may be withdrawn from the Unitized Formation, royalty free as to dry gas or such other substance but not as to the products extracted therefrom; provided such withdrawal shall be pursuant to such conditions and formulas as may be prescribed or approved by the Supervisor and the Commissioner; and provided further that such right of withdrawal shall terminate as of the effective date of termination of the unit agreement.

All royalty due the State of New Mexico and the United States of America and the other royalty owners hereunder shall be computed and paid on the basis of all Unitized Substances allocated to the respective tract or tracts committed hereto, in lieu of actual production from such tract or tracts.

Each royalty owner (other than the State of New Mexico and the United States of America) that executes this agreement represents and warrants that it is the owner of a royalty interest in a tract or tracts within the unit area as its interest appears in Exhibit "B" attached hereto. If any royalty interest in a tract or tracts should be lost by title failure or otherwise in whole or in part, during the term of this agreement, then the royalty interest of the party representing himself to be the owner thereof shall be reduced proportionately and the interest of all parties shall be adjusted accordingly.

15. RENTAL SETTLEMENT. Rentals or minimum royalties due on leases committed hereto shall be paid by Working Interest Owners responsible therefor under existing contracts, laws and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any rental or minimum royalty in lieu thereof, due under their leases. Rental for lands of the State of New Mexico subject to this agreement shall be paid

at the rate specified in the respective leases from the State of New Mexico. Rental or minimum royalty for lands of the United States of America subject to this agreement shall be paid at the rate specified in the respective leases from the United States of America, unless rental or minimum royalty is waived, suspended, or reduced by law or by approval of the Secretary or his duly authorized representative.

16. CONSERVATION Operations hereunder and production of United Substances shall be conducted to provide for the most economical and efficient recovery of said substances without waste, as defined by or pursuant to Federal and State laws and regulations.

17. DRAINAGE. The Unit Operator shall take appropriate and adequate measures to prevent drainage of Unitized Substances from unitized land by wells on land not subject to this agreement.

18. LEASES AND CONTRACTS CONFORMED AND EXTENDED. The terms, conditions and provisions of all leases, subleases and other contracts relating to exploration, drilling, development or operations for oil or gas on lands committed to this agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect, and the parties hereto hereby consent that the Secretary and the Commissioner, respectively, shall and by their approval hereof, do hereby establish, alter, change or revoke the drilling, producing, rental, minimum royalty and royalty requirements of Federal and State leases committed hereto and the regulations in respect thereto to conform said requirements to the provisions of this agreement.

Without limiting the generality of the foregoing, all leases, subleases and contracts are particularly modified in accordance with the following:

(a) The development and operation of lands subject to this agreement under the terms hereof shall be deemed full performance of all obligations for development and operation with respect to each and every part or separately owned tract subject to this agreement, regardless of whether there is any development of any particular part or tract of the unit area, notwithstanding anything to the contrary in any lease, operating agreement or other contract by and between the parties hereto, or their respective predecessors in interest, or any of them.

(b) Drilling, producing or secondary recovery operations performed hereunder upon any tract of unitized lands shall be accepted and deemed to be performed upon and for the benefit of each and every tract of unitized land, and no lease shall be deemed to expire by reason of failure to drill or produce wells situated on land therein embraced.

(c) Suspension of drilling or producing operations on all unitized lands pursuant to direction or consent of the Commissioner and the Supervisor or their duly authorized representatives, shall be deemed to constitute such suspension pursuant to such direction or consent as to each and every tract of unitized land.

(d) Each lease, sublease, or contract relating to the exploration, drilling, development or operation for oil and gas which by its terms might expire prior to the termination of this agreement, is hereby extended beyond any such term so provided therein, so that it shall be continued in full force and effect for so long as such land remains committed hereto.

(e) The segregation of any Federal lease committed to this agreement is governed by the following provisions in the fourth paragraph of Section 17(j) of said Act of February 25, 1920, as amended by the Act of September 2, 1960 (74 Stat. 781-784): "Any (Federal) lease hereafter committed to any such plan (unit) embracing lands that are in part within and in part outside of the area covered by any such plan shall be segregated into separate leases as to the lands committed and the lands not committed as of the effective date of unitization; provided, however, that any such lease as to the nonunitized portion shall continue in force and effect for the term thereof but for not less than two years from the date of such segregation and so long thereafter as oil or gas is produced in paying quantities."

(f) Any lease embracing lands of the State of New Mexico having only a portion of its land committed hereto shall be segregated as to that portion committed and that not committed, and the term of such lease shall apply separately to such segregated portions commencing as of the effective date thereof. Provided, however, that notwithstanding any of the provisions of this agreement to the contrary, such lease shall continue in full force and effect beyond the term provided therein as to all lands embraced in such lease if oil or gas is, or has heretofore been, discovered in paying quantities on some part of the lands embraced in such lease committed to this agreement or, so long as a portion of the Unitized Substances produced from the unit area is, under the terms of this agreement, allocated to the portion of the lands covered by such lease committed to this agreement, or, at any time during the term hereof, as to any lease that is then valid and subsisting and upon which the lessee or the Unit Operator is then engaged in bona fide drilling, reworking, or secondary recovery operations on any part of the lands embraced in such lease, then the same as to all lands embraced therein shall remain in full force and effect so long as such operations are diligently prosecuted, and if they result in the production of oil or gas, said lease shall continue in full force and effect as to all of the lands embraced therein, so long thereafter as oil or gas in paying quantities is being produced from any portion of said lands.

19. MATHEMATICAL ERRORS. It is hereby agreed by all parties to this agreement that Unit Operator is empowered to correct any mathematical errors which might exist in the pertinent exhibits to this agreement upon approval of the Commissioner, the Supervisor and the Working Interest Owners.

20. COVENANTS RUN WITH LAND. The covenants herein shall be construed to be covenants running with the land with respect to the interest of the parties hereto and their successors in interest until this agreement terminates, and any grant, transfer or conveyance of interest in land or leases subject hereto shall be and hereby is conditioned upon the assumption of all privileges and obligations hereunder by the grantee, transferee or other successor in interest. No assignment or transfer of any working interest subject hereto shall be binding upon Unit Operator until the first day of the calendar month after Unit Operator is furnished with the original or acceptable photostatic or certified copy of the recorded instrument of transfer; and no assignment or transfer of any royalty interest subject

hereto shall be binding upon the Working Interest Owner responsible therefor until the first day of the calendar month after said Working Interest Owner is furnished with the original or acceptable photostatic or certified copy of the recorded instrument of transfer.

21. EFFECTIVE DATE AND TERM. This agreement shall become effective upon approval by the Director and the Commissioner or their duly authorized representatives and by the Commission as of the date of approval by the Director, provided:

This agreement and the unit operating agreement have been executed or ratified by Working Interest Owners owning a combined unit participation during Phase I of at least 90% and the execution and ratification of this agreement by royalty owners owning a combined interest of at least 75% of the royalty interest in said unit area.

If the foregoing is not accomplished on or before July 1, 1967 this agreement shall ipso facto terminate on said date (hereinafter called "termination date") and thereafter be of no further force or effect, unless prior thereto this agreement has been executed or ratified by Working Interest Owners owning a combined unit participation during Phase I of at least ninety per cent (90%), and the Working Interest Owners owning a combined unit participation during Phase I of at least ninety per cent (90%) committed to this agreement have decided to extend said termination date for a period not to exceed six (6) months (hereinafter called "extended termination date"). If said termination date is so extended and execution, ratification and approval are not accomplished on or before said extended termination date, this agreement shall ipso facto terminate on said extended termination date and thereafter be of no further force or effect. For the purpose of this section, ownership shall be computed on the basis of unit participation as determined from Exhibit "B" attached hereto.

Unit Operator shall, within thirty (30) days after the effective date of this agreement, file for record a certificate to the effect that this agreement has become effective according to its terms and stating further the effective date and the location of the governmental agency offices where copies of this agreement are filed.

The term of this agreement shall be for and during the time that Unitized Substances are produced in paying quantities from the unit area and as long thereafter as drilling, reworking or other operations (including secondary recovery operations) are prosecuted thereon without cessation of more than ninety (90) consecutive days,

unless sooner terminated by Working Interest Owners in the manner hereinafter provided.

This agreement may be terminated with the approval of the Commissioner and the Director by Working Interest Owners owning ninety per cent (90%) unit participation during Phase II whenever such Working Interest Owners determine that unit operations are no longer profitable, feasible or in the interest of conservation. Notice of any such termination shall be given by Unit Operator to all parties hereto.

Upon termination of this agreement, the further development and operation of the unit area as a unit shall be abandoned, unit operations shall cease, and thereafter the parties hereto shall be governed by the terms and provisions of the leases and contracts affecting the separate tracts.

If not otherwise covered by the leases unitized under this agreement, Royalty Owners hereby grant Working Interest Owners a period of six (6) months after termination of this agreement in which to salvage, sell, distribute or otherwise dispose of the personal property and facilities used in connection with unit operations.

22. RATE OF PROSPECTING, DEVELOPMENT AND PRODUCTION. All production and the disposal thereof shall be in conformity with allocations and quotas made or fixed by any duly authorized person or regulatory body under any Federal or State statute. The Director and the Commissioner are hereby vested with authority to alter or modify from time to time, at their discretion, the rate of prospecting and development and within the limits made or fixed by the Commission to alter or modify the quantity and rate of production under this agreement, such authority being hereby limited to alteration or modification in the public interest, the purpose thereof and the public interest to be served thereby to be stated in the order of alteration or modification.

Powers in this section vested in the Director and the Commissioner shall only be exercised after notice to Unit Operator and opportunity for hearing to be held not less than fifteen days from notice.

23. NONDISCRIMINATION. In connection with the performance of work under this agreement, the Unit Operator agrees to comply with all of the provisions of Section 202 (1) to (7) inclusive, of Executive Order 11246, as amended, (30 F.R. 12319),

which are hereby incorporated by reference in this agreement.

24. APPEARANCES. Unit Operator shall, after notice to the other parties affected, have the right to appear for or on behalf of any and all interests affected hereby before the Commissioner, the Department, and the Commission, and to appeal from any order issued under the rules and regulations of the Commissioner, the Department or the Commission, or to apply for relief from any of said rules and regulations or in any proceedings relative to operations before the Commissioner, the Department, or the Commission, or any other legally constituted authority; provided, however, that any other interested party shall also have the right at his or its own expense to be heard in any such proceeding.

25. NOTICES. All notices, demands, objections or statements required hereunder to be given or rendered to the parties hereto shall be deemed fully given if made in writing and personally delivered to the party or parties or sent by postpaid certified mail, addressed to such party or parties at their respective addresses set forth in connection with the signatures hereto or to the ratification or consent hereof or to such other address as any such party or parties may have furnished in writing to the party sending the notice, demand or statement.

26. NO WAIVER OF CERTAIN RIGHTS. Nothing in this agreement contained shall be construed as a waiver by any party hereto of the right to assert any legal or constitutional right or defense as to the validity or invalidity of any law of the United States or of the State of New Mexico or rules or regulations issued thereunder in any way affecting such party, or as a waiver by any such party of any right beyond his or its authority to waive.

27. UNAVOIDABLE DELAY. All obligations under this agreement requiring the Unit Operator to commence or continue secondary recovery operations or to operate on or produce Unitized Substances from any of the lands covered by this agreement shall be suspended while, but only so long as the Unit Operator, despite the exercise of due care and diligence, is prevented from complying with such obligations, in whole or in part, by strikes, acts of God, Federal, State or municipal law or agency, unavoidable accident, uncontrollable delays in transportation, inability to obtain necessary materials in open market, or other matters beyond the reasonable control of the Unit Operator whether similar to matters herein enumerated or not.

28. LOSS OF TITLE. In the event title to any tract of unitized land shall fail so as to render the tract inoperable under this agreement and the true owner cannot be induced to join this unit agreement, such tract shall be automatically regarded as not committed hereto and there shall be such readjustment of future costs and benefits as may be required on account of the loss of such title. In the event of a dispute as to title as to any royalty, working interest or other interest subject hereto, payment or delivery on account thereof may be withheld without liability or interest until the dispute is finally settled; provided, that as to State or Federal land or leases, no payments of funds due the State of New Mexico or the United States of America shall be withheld, but such funds shall be deposited as directed by the Commissioner or the Supervisor (as the case may be), to be held as unearned money pending final settlement of the title dispute, and then applied as earned or returned in accordance with such final settlement.

Unit Operator as such is relieved from any responsibility for any defect or failure of any title hereunder.

29. CONFLICT OF SUPERVISION. Neither the Unit Operator nor the Working Interest Owners, nor any of them, shall be subject to any forfeiture, termination or expiration of any rights hereunder or under any leases or contracts subject hereto, or to any penalty or liability on account of delay or failure in whole or in part to comply with any applicable provisions thereof to the extent that the said Unit Operator or the Working Interest Owners, or any of them, are hindered, delayed or prevented from complying therewith by reason of failure of the Unit Operator to obtain, in the exercise of due diligence, the concurrence of proper representatives of the United States and proper representatives of the State of New Mexico in and about any matters or things concerning which it is required herein that such concurrence be obtained. The parties hereto and the Commission agree that all powers and authority vested in the Commission in and by any provisions of this agreement are vested in the Commission and shall be exercised by it pursuant to the provisions of the laws of the State of New Mexico and subject in any case to appeal or judicial review as may now or hereafter be provided by the laws of the State of New Mexico.

30. BORDER AGREEMENTS. Subject to the approval of the Director and the Commissioner, the Unit Operator, with concurrence of sixty-five per cent (65%) of

the Working Interest Owners, based upon the percentages of participation during Phase II, may enter into a border protection agreement or agreements with the Working Interest Owners of adjacent lands along the boundaries of the unit area with respect to the operations in the border area for the maximum ultimate recovery, conservation purposes and proper protection of the parties and interests.

31. NONJOINDER AND SUBSEQUENT JOINDER. If the owner of any substantial interest in a tract within the unit area fails or refuses to subscribe, ratify or consent in writing to this agreement, the Working Interest Owner in that tract who has executed or ratified this agreement may withdraw said tract from this agreement by written notice to the Director, the Commissioner and Unit Operator prior to the effective date of this agreement. Joinder by any Royalty Owner, at any time, must be accompanied by appropriate joinder of the corresponding Working Interest Owner in order for the interest of such Royalty Owner to be regarded as effectively committed. Joinder to the Unit Agreement by a Working Interest Owner, at any time, must be accompanied by appropriate joinder to the Unit Operating Agreement in order for such interest to be regarded as effectively committed to this unit agreement.

Any oil or gas interest in the lands in the unit area not committed hereto prior to submission of this agreement to the Commissioner and the Director for final approval may thereafter be committed hereto upon compliance with the applicable provisions of this section and of Section 12 (Tracts Qualified for Unit Participation) hereof, at any time up to the effective date hereof and for a period to and including three (3) months thereafter, on the same basis of participation as provided in said Section 12 by the owner or owners thereof subscribing, ratifying, or consenting in writing to this agreement and, if the interest is a working interest, by the owner of such interest subscribing also to the Unit Operating Agreement; provided, however, that the current rate for any well on any tract committed within the said three month period shall be determined as though such well were completed during the period after October 31, 1966 and prior to the effective date of the unit as defined in Section 2(q).

It is understood and agreed, however, that from and after three (3) months from the effective date hereof the right of subsequent joinder as provided in this section shall be subject to such requirements or approval and on such basis as may be agreed upon by ninety per cent (90%) of the Working Interest Owners (based upon

the percentage of participation during Phase II) Such subsequent joinder by a Working Interest Owner must be evidenced by his execution or ratification of this agreement and the Unit Operating Agreement. Such subsequent joinder by a royalty owner must be evidenced by his execution, ratification or consent of this agreement and must be consented to in writing by the Working Interest Owner responsible for the payment of any benefits that may accrue hereunder in behalf of such royalty owner. Except as may be otherwise herein provided, subsequent joinder to this agreement shall be effective at 7:00 o'clock a.m. as of the first day of the month following the filing with the Commissioner and the Supervisor of duly executed counterparts of any and all documents necessary to establish effective commitment of any tract or interest to this agreement, unless objection to such joinder by the Commissioner or the Director is duly made within sixty (60) days after such filing.

32. NO PARTNERSHIP. It is expressly agreed that the relation of the parties hereto is that of independent contractors and nothing in this agreement contained, expressed or implied, or any operations conducted hereunder shall create or be deemed to create a partnership or association between the parties hereto or any of them.

33. COUNTERPARTS. This agreement may be executed in any number of counterparts, no one of which needs to be executed by all parties and may be ratified or consented to by separate instrument in writing specifically referring hereto, and shall be binding upon all those parties who have executed such a counterpart, ratification or consent hereto with the same force and effect as if all parties had signed the same document, and regardless of whether or not it is executed by all other parties owning or claiming an interest in the lands within the above described unit area.

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed and have set opposite their respective names the date of execution.

ATTEST:

Assistant Secretary

COASTAL STATES GAS PRODUCING COMPANY

By _____
Vice President

Address: _____

UNIT OPERATOR AND WORKING INTEREST OWNER

WORKING INTEREST OWNERS

ATTEST:

AMARILLO OIL COMPANY

Secretary

By: _____

Date: _____

Address: _____

ATTEST:

SCOTHLAND ROYALTY COMPANY

Secretary

By: _____

Date: _____

Address: _____

ATTEST:

SIPANAM, INC.

Secretary

By: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Dr. Gerhard Wagner

J. H. Herd

Mr. R. M. Richardson

ROYALTY OWNERS

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

Date: _____

Address: _____

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of

_____, 1967 by _____,

_____ of Amarillo Oil Company, a _____

_____ corporation, on behalf of said corporation.

Notary Public

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of

_____, 1967 by _____,

_____ of Southland Royalty Company, a _____

_____ corporation, on behalf of said
corporation.

Notary Public

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of

_____, 1967 by _____,

_____ of Sipanam, Inc., a _____

_____ corporation, on behalf of said corporation.

Notary Public

STATE OF _____

COUNTY OF _____

On this the ____ day of _____, 1967, before me, appeared
Dr. Gerhard Wagner, known to me to be the person whose name is subscribed to
the foregoing instrument and acknowledged that he executed the same for the
purpose therein contained.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Notary Public

STATE OF _____
COUNTY OF _____

On this the _____ day of _____, 1967, before me, appeared J. H. Herd, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged that he executed the same for the purpose therein contained.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Notary Public

STATE OF _____
COUNTY OF _____

On this the _____ day of _____, 1967, before me, appeared R. M. Richardson, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged that he executed the same for the purpose therein contained.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Notary Public

STATE OF _____
COUNTY OF _____

On this the _____ day of _____, 1967, before me, appeared C. H. Atchison, known to me to be the person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that the same was the act of the said Coastal States Gas Producing Company, a corporation, and that he executed the same as the act of such corporation for the purposes and consideration therein expressed, and in the capacity therein stated.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Notary Public

EXHIBIT "B"
FLYING "M" SAN ANDRES
LEA COUNTY, NEW MEXICO

Tract No.	Description of Land	No. of Acres	No. of Wells	Serial No. & Expiration Date	Basic Royalty	Lessee of Record	Overriding Royalty		Working Interest Owner and Amount	Productive Acres	Percent of Participation of Tract in Unit		
							Owner	Amount			Phase I	Phase II	
FEDERAL ACREAGE													
1a	E/2 of Sec. 29, T9S, R33E	320	4	NM-058102 HBP	USA 12.5	Coastal States Gas Prod. Co.	Isabel Q. Gonzales	.02500000	Coastal States Sipanem, Inc.	75.00% 25.00%	320.000	8.0837	7.3996
1b	W/2, NW/4 of Sec. 33, T9S, R33E	80	0	NM-058102 HBP	USA 12.5	Coastal States Gas Prod. Co.	Elizabeth Villa Garrett R. Quintana	.02500000	Coastal States Sipanem, Inc.	75.00% 25.00%	24.007	.1751	.1751
2	W/2 NW/4 Sec. 27, T9S, R33E	80	0	NM-058102 HBP	USA 12.5	Chas. B. Consales	None	None	Chas. B. Consales	100%	7.381	.0538	.0538
(Three Federal tracts containing 480 acres or 11.765% of the Unit Area)													
STATE ACREAGE													
3	W/2 of Sec. 17, T9S, R33E	320	3	OG-581-2 HBP	State 12.5	Coastal States Gas Prod. Co.	None	None	Coastal States G. Wagner	75.00% 25.00%	224.498	5.6359	6.1345
4	E/2 of Sec. 17, T9S, R33E	320	3	OG-670-1 HBP	State 12.5	Coastal States Gas Prod. Co.	None	None	Coastal States G. Wagner	75.00% 25.00%	316.273	5.8884	7.0818
5	W/2 of NW/4, SW/4 of NE/4 Sec. 16, T9S, R33E	120	3	K-2129-1 HBP	State 12.5	Redfern Dev. Corp.	J. H. Herd Wm. B. Johnston Rosalind Redfern Redfern Dev. Corp. Jack Thornton	.02000000 .00125000 .03000000 .01000000 .00125000	Coastal States Sipanem, Inc.	75.00% 25.00%	113.604	3.6617	3.9806
6	SE/4 of NW/4 Sec. 16, T9S, R33E	40	1	K-2129-1 HBP	State 12.5	Redfern Dev. Corp.	John J. Redfern Redfern Dev. Corp. Jack D. Thornton Wm. B. Johnston J. H. Herd	.03000000 .01000000 .00125000 .00125000 .04000000	Coastal States Sipanem, Inc. Amarillo Oil	51.00% 17.00% 32.00%	40.000	.7395	.7249

EXHIBIT "B"
FLYING "M" SAN ANDRES
LEA COUNTY, NEW MEXICO

Tract No.	Description of Land	No. of Acres	No. of Wells	Serial No. & Expiration Date	Basic Royalty	Lessee of Record	Overriding Royalty		Working Interest		Productive Acres	Percent of Participation of Tract in Unit	
							Owner	Amount	Owner	Amount		Phase I	Phase II
7	NE 1/4 of NW 1/4 NW 1/4 of NE 1/4 E 1/2 of NE 1/4 Sec. 16, T9S, R33E	160	0	K-2129-1 HBP	State 12.5	Redfern Dev. Corp.	Rosalind Redfern Wm. B. Johnston Jack D. Thornton Redfern Dev. Corp.	.03000000 .00125000 .00125000 .01000000	Coastal States Sipanam, Inc. J. H. Herd	51.00% 17.00% 32.00%	81.457	.5939	.5939
8	E 1/2 of SE 1/4 E 1/2 of SW 1/4 Sec. 16, T9S, R33E	160	1	CG-494-3 HBP	State 12.5	Coastal States Gas Prod. Co.	James P. Exum Neil A. McConnell *Franklin Bauldwin Bernard Peyton John C. Ryan Trice Production Suspense Arthur W. Dana, Jr.	.00023438 .00031250 .00031250 .00062500 .01562500 .02945312 .01451250 .00031250	Coastal States G. Wagner	75.00% 25.00%	160.000	3.2672	3.8359
9a	W 1/2 of SE 1/4 Sec. 16, T9S, R33E	80	1	OG-494-1 HBP	State 12.5	Coastal States Gas Prod. Co.	Southern Minerals Corp.	.17500000	Coastal States Sipanam, Inc.	75.00% 25.00%	80.000	4.0082	3.6535
9b	W 1/2 of SW 1/4 Sec. 16, T9S, R33E	80	2	OG-494-4	State 12.5	Coastal States Gas Prod. Co.	Southern Minerals Corp.	.17500000	Coastal States Sipanam, Inc.	75.00% 25.00%	80.000	4.9031	4.8048
10	W 1/2 of NW 1/4 Sec. 15, T9S, R33E	80	0	CG-1981-3 HBP	State 12.5	Coastal States Gas Prod. Co.	John C. Ryan Disputed Owner- ship Suspense	.01562500 .01451250	Coastal States Sipanam, Inc.	73.50% 24.50%	9.571	.0698	.0698
11	W 1/2 of SW 1/4 Sec. 15, T9S, R33E	80	0	OG-3798-3 5-20-68	State 12.5	Coastal States Gas Prod. Co.	Southern Minerals Corp.	.17500000	Coastal States Sipanam, Inc.	75.00% 25.00%	42.986	.3134	.3134

*Elisabeth G. Bauldwin,
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LEA COUNTY, NEW MEXICO

Tract No.	Description of Land	No. of Acres	No. of Wells	Serial No. & Expiration Date	Basic Royalty	Lessee of Record	Overriding Royalty		Working Interest	Productive Acres	Percent of Participation	
							Owner	Amount			Phase I	Phase II
12	NW/4, Sec. 21, E/3/4 of W/2 of Sec. 20, T9S, R33E	400	5	E-7392-1 HBP	State 12.5	Coastal States Gas Prod. Co.	Skelly Oil Co.	.05468751	Coastal States G. Wagner	393.970	14.6750	16.7428
13	SE/4 of Sec. 20, T9S, R33E	160	3	OG-1294 HBP	State 12.5	Sinclair Oil & Gas Co.	Sinclair Oil & Gas	.12500000	Coastal States Sipanam, Inc.	160.000	3.5556	3.5450
14	E/2 of SE/4 W/2 of NE/4 E/2 of SW/4 Sec. 21, T9S, R33E	240	3	OG-5083-2 HBP	State 12.5	Coastal States Gas Prod. Co.	James P. Exum Neil A. McConnell *Franklin Bauldwin Bernard Peyton John C. Ryan Trice Production Cuspense Arthur D. Dana, Jr.	.00023438 .00031250 .00031250 .00062500 .01562500 .02945312 .01451250 .00031250	Coastal States G. Wagner	240.000	7.0226	7.6444
15	E/2 of NE/4 W/2 of SW/4 W/2 of SE/4 Sec. 21, T9S, R33E	240	3	OG-5083-4 HRP	State 12.5	Coastal States Gas Prod. Co.	Southern Minerals Corp.	.17500000	Coastal States Sipanam, Inc.	240.000	8.9219	9.0550
16	SW/4 NW/4 Sec. 22, T9S, R33E	40	0	OG-5789 8-18-69	State 12.5	Murphy Oil Corp.	None		Murphy Corp.	30.942	.2255	.2255
17	W/2 SW/4 Sec. 22, T9S, R33E	80	1	E-7481-3 HBP	State 12.5	Louisiana Land & Exploration Co.	Louisiana Land & Exploration Co.	.09500000	Coastal States Sipanam, Inc.	66.872	2.2625	1.6626

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EXHIBIT "B"
FLYING "M" SAN ANDRES
LEA COUNTY, NEW MEXICO

Tract No.	Description of Land	No of Acres	No. of Wells	Serial No. & Expiration Date	Basic Royalty	Lessee of Record	Overriding Royalty Owner and Amount	Working Interest Owner and Amount	Productive Acres	Percent of Participation of Tract in Unit	
										Phase I	Phase II
18	E/2 NW/4 Sec. 32 T9S, R33E	80	1	OG-1826-2 HBP	State 12.5	Coastal States Gas Prod. Co.	Warren American Oil Co.	Coastal States 75.00% Sipanam, Inc. 25.00%	76.199	.9234	1.0156
19	NE/4 of Sec. 32, T9S, R33E	160	1	E-7481-2 HBP	State 12.5	Coastal States Gas & Exploration Co. Prod. Co.	Louisiana Land	Coastal States 75.00% Sipanam, Inc. 25.00%	125.917	1.2484	1.3105
(Eighteen State tracts containing 2,840 acres of 69.608% of the Unit Area)											
FEE ACREAGE											
20	NW/4 NW/4 of Sec. 22, T9S, R33E	40	0	Joe C. Ainsworth	Fee 12.5	Unleased	None	Joe C. Ainsworth	27.657	.2017	.2017
21	E/2 of NW/4 Sec. 29, T9S, R33E	80	1	J. R. McGuiffin HBP	Fee 12.5	Coastal States Gas Prod. Co.	Len Mayer	Coastal States 75.00% G. Wagner 25.00%	66.345	4.7731	3.3246
22	E/2 of SW/4 Sec. 29, T9S, R33E	80	0	Nancy Trow 5-24-68	Fee 12.5	Coastal States Gas Prod. Co.	Len Meyer	Coastal States 73.06% Sipanam, Inc. 24.36% R.M. Richardson 2.58%	80.000	.5834	.5834
23	W/2 of Sec. 28, T9S, R33E	320	3	F. A. Schultz HBP	Fee 12.5	Coastal States Gas Prod. Co.	Midwest Oil	Coastal States 75.00% Sipanam, Inc. 25.00%	291.374	12.4724	11.4811
24	NE/4 Sec. 28, T9S, R33E	160	1	Grady Ferguson HBP	Fee 12.5	Southland Royalty	None	Southland Royalty 100%	115.1405	5.6338	4.2842
25	W/2 SE/4 of Sec. 28, T9S, R33E	80	0	O.D. McCoy 8-9-67	Fee 12.5	Southland Royalty	None	Southland Royalty 100%	14.000	.1020	.1020
(Six Fee tracts containing 760 acres or 18.627% of the Unit Area)											
GRAND TOTAL 4,080 acres in entire Unit Area.											
									3,428.458		