STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF APACHE CORPORATION FOR APPROVAL OF A WATERFLOOD PROJECT, LEA COUNTY, NEW MEXICO CASE NO. 12,785

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ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

January 10th, 2002

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, January 10th, 2001, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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A P P E A R A N C E S

FOR THE DIVISION:

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FOR THE APPLICANT:

KELLAHIN & KELLAHIN 117 N. Guadalupe P.O. Box 2265 Santa Fe, New Mexico 87504-2265 By: W. THOMAS KELLAHIN

* * *

1	WHEREUPON, the following proceedings were had at
2	9:00 a.m.:
3	EXAMINER CATANACH: At this time I'll call Case
4	12,785, the Application of Apache Corporation for approval
5	of a waterflood project, Lea County, New Mexico.
6	Call for appearances in this case.
7	MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of
8	the Santa Fe law firm of Kellahin and Kellahin, appearing
9	on behalf of the Applicant, and I have three witnesses to
10	be sworn.
11	EXAMINER CATANACH: Call for additional
12	appearances?
13	Okay, can I get the three witnesses to stand and
14	be sworn in, please?
15	(Thereupon, the witnesses were sworn.)
16	MR. KELLAHIN: Mr. Examiner, our first witness is
17	Mr. Bruce Uszynski. He's a petroleum geologist.
18	BRUCE USZYNSKI,
19	the witness herein, after having been first duly sworn upon
20	his oath, was examined and testified as follows:
21	DIRECT EXAMINATION
22	BY MR. KELLAHIN:
23	Q. For the record, sir, would you please state your
24	name and occupation?
25	A. Bruce Uszynski, senior staff geologist.

On prior occasions have you testified before the 1 0. Division? 2 Α. Yes, I have. 3 And pursuant to your employment by Apache Q. 4 Corporation, have you made a geologic study of the 5 particular area that's involved in this Application? 6 7 Yes, I have. Α. 8 MR. KELLAHIN: We tender Mr. Uszynski as an 9 expert geologist. EXAMINER CATANACH: He is so gualified, if I can 10 get you to spell your name. 11 12 THE WITNESS: U-s-z-y-n-s-k-i. 13 EXAMINER CATANACH: Thank you, sir. (By Mr. Kellahin) All right, sir, if you'll take 14 Q. the first exhibit, which we've marked as Exhibit 1, let's 15 take a moment and unfold that. What type of map are we 16 17 looking at, Mr. Uszynski? 18 Α. This is a structure map contoured on top of the 19 Grayburg. 20 And did you prepare this map? Q. Yes, I did. 21 Α. Can you show us on this map the area you're 22 Q. 23 asking for approval for a waterflood project? 24 Α. That would be the area in Section 8, southeast 25 quarter, highlighted in pale yellow.

1	Q. What is the formation that's targeted for
2	additional recovery on a waterflood project basis?
3	A. The Grayburg formation.
4	Q. When we look in the southeast quarter of Section
5	8, can you identify for us those wells that currently
6	produce from the Grayburg or have historically produced
7	from the Grayburg?
8	A. They would be the Number 1, the Number 2, I
9	believe it's the Number 177. Numbers are different here
10	The Number 176.
11	Q. What is the significance of the wells circled
12	with the red or the purple color?
13	A. The wells circled in red with the subsea tops are
14	the wells that we have logs available on. They are twin
15	wells to the wells that will be used as producers for this
16	project.
17	Q. All right. There are four wells, then,
18	identified as potential producers for the project?
19	A. Yes, sir.
20	Q. Show us which ones those are.
21	A. It would be the 182, 183, again the 176, the 177.
22	Q. And which one is to be the injector?
23	A. That would be the Apache Corporation Grizzell
24	Number 11.
25	Q. Okay. It's an inverted fivespot, if you will,

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1	planned for the injection of water into the Grayburg and
2	then production from these offsetting wells?
3	A. That's correct.
4	Q. Is there a geologic basis for doing this?
5	A. Yes, sir.
6	Q. What is that?
7	A. We have structural closure, high structure here.
8	We have proven production in the past. Exhibit 2 is a
9	cross-section that shows lateral continuity of the
10	reservoir as well as vertical continuity.
11	Q. From a geologic perspective, then, it is both
12	practical and feasible to attempt to increase the ultimate
13	recovery from the Grayburg by this manner of production?
14	A. Yes, sir.
15	Q. Is there sufficient reservoir continuity, in your
16	opinion, to provide a reasonable opportunity to improve
17	your recoveries?
18	A. Yes.
19	Q. Do you have an exhibit that will illustrate that
20	for us?
21	A. Exhibit 2.
22	Q. All right, let's take a moment and unfold the
23	cross-section, and let's talk about that.
24	How have you organized the cross-section?
25	A. Okay, this is a stratigraphic cross-section. The

1	datum is the top of the Grayburg marker. The two wells on
2	the left of the cross-section are the two wells on the
3	western edge of the proposed project, the Grizzell Number
4	11 is in the center, and then the two wells on the right of
5	the cross-section are the two wells along the eastern edge,
6	adjacent to those that will be the producers in the
7	project.
8	Q. Let's look at the proposed injector, the one in
9	the center, the Number 11 well.
10	A. Yes, sir.
11	Q. What's the status of that well?
12	A. The status is currently inactive.
13	Q. All right. What is the top and the bottom of the
14	proposed interval that would be included in the waterflood
15	project area?
16	A. The proposed injection interval is highlighted
17	there in green.
18	Q. The current perforations in that wellbore are
19	less than the total project interval area, true?
20	A. That's correct.
21	Q. All right. You're not suggesting that you be
22	limited to the actual perforations, are you?
23	A. That's correct.
24	Q. The concept, then, would be to inject water in
25	the Number 11 well in the Grayburg and then produce it in

Yes, sir. 2 Α. Describe for us what you see geologically as the 3 ο. continuity that will allow that to happen. 4 As you can see from the cross-section, within the 5 Α. 6 interval of the proposed injection there's a good lateral continuity of these zones. We've seen this in this area, 7 as well as other areas in the Grayburg, offsetting these 8 So we don't see any restrictions as to lateral 9 leases. 10 water flow to any of these proposed producing wells from 11 the injector. Are you aware of any geologic factors that would 12 Q. preclude the opportunity to attempt to increase recovery 13 14 out of the Grayburg in this manner? 15 Α. Not to my knowledge, no. That concludes my examination of 16 MR. KELLAHIN: Mr. Uszynski. We move the introduction of his Exhibits 1 17 and 2. 18

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these offsetting wells?

19EXAMINER CATANACH:Exhibits 1 and 2 will be20admitted as evidence.

EXAMINATION EXAMINATION BY EXAMINER CATANACH: Q. The four wells that you plan to use as producing wells, are those currently producing? A. Three of those wells are currently inactive, I

1	believe one of them is producing.
2	Q. Do you know why they're inactive?
3	A. They just became uneconomic at the time.
4	Q. Now, this is just going to be limited to the
5	Grayburg?
6	A. Yes, sir.
7	Q. On your exhibit on your cross-section here
8	you've got a line marked "Grayburg porosity". What is the
9	distinction between that and the upper Grayburg?
10	A. Okay, the upper Grayburg through our work out
11	here we've determined that there are two zones out here in
12	the Grayburg that produce in various areas within Townships
13	21-37 and 22-37. For purposes of this project, these wells
14	that have originally produced in the upper portion of the
15	Grayburg. The lower portion of the Grayburg, to my
16	knowledge, has not been productive out here
17	Q. Okay, so
18	A which would be the Grayburg porosity, I'm
19	sorry.
20	Q. Okay, that would be the lower Grayburg?
21	A. Yes.
22	Q. Okay. Well, if I read your cross-section
23	correctly, are you planning on injecting into the lower
24	Grayburg in the 11 well?
25	A. No, sir. The planned The proposed injection

1	interval in the 11 well is the perforations highlighted in
2	pink.
3	Q. Not the interval in green?
4	A. Right, not at this time.
5	Q. And this interval is continuous in the southeast
6	quarter to where you think you can get some benefit from
7	water injection?
8	A. Most definitely.
9	Q. Penrose-Skelly is a pool that's fairly commonly
10	waterflooded; is that correct?
11	A. Yes, it is.
12	Q. Is it actively waterflooded in close proximity to
13	this section?
14	A. The Arrowhead-Grayburg is not too far from here.
15	It's one of the Grayburg units out here.
16	Q. What direction is that in, do you know?
17	A. West.
18	EXAMINER CATANACH: Okay, let me see. Okay, I
19	have no further questions.
20	FURTHER EXAMINATION
21	BY MR. KELLAHIN:
22	Q. One follow-up question. Geologically, is there
23	sufficient integrity above and below the Grayburg so that
24	water injected in the Grayburg is going to remain confined
25	to the Grayburg?

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Yes, sir, there is. Typically, the top of the 1 Α. 2 Grayburg has a hard cap on it, and formations above that tend to be restrictive to vertical flow as well as 3 mechanical fracturing, as we observed in other wells in the 4 area. 5 Below us is the San Andres, and again, the top of 6 7 the San Andres typically has a fairly thick, hard cap that 8 restricts downward fracturing. MR. KELLAHIN: Nothing further, Mr. Examiner. 9 Thank you. 10 11 Mr. Examiner, our next witness is Mr. Kevin Barnes. Mr. Barnes is a petroleum engineer. 12 13 KEEVIN BARNES, 14 the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows: 15 16 DIRECT EXAMINATION 17 BY MR. KELLAHIN: Mr. Barnes, for the record, sir, would you please 18 Q. 19 state your name and occupation? 20 Α. The name is Keevin Barnes, reservoir engineer. 21 Q. All right, you spell it K-e-e-v-i-n? Yes, sir. 22 Α. 23 Mr. Barnes, on prior occasions have you testified Q. before the Division? 24 25 Α. No, sir.

1	Q. Summarize for us your education.
2	A. I got my bachelor's degree in petroleum
3	engineering in May of 1995 from Texas A&M University.
4	Q. How long have you been employed by Apache?
5	A. Five years.
6	Q. And what is your current capacity?
7	A. Reservoir engineer for the southern region.
8	Q. As part of those responsibilities, have you made
9	a reservoir-engineering study of the feasibility of this
10	waterflood project?
11	A. Yes, sir, I have.
12	Q. And based upon that study, do you now have
13	engineering opinions and conclusions?
14	A. I do.
15	MR. KELLAHIN: We tender Mr. Barnes as an expert
16	witness.
17	EXAMINER CATANACH: He is so qualified.
18	Q. (By Mr. Kellahin) Let me ask you to turn to
19	Exhibit 3, Mr. Barnes. When we unfold this display what
20	are we looking at?
21	A. This is a cumulative production map from the
22	Grayburg. You can see our Grizzell lease there in the
23	center.
24	Q. Okay. Let's look at the southeast quarter of 8.
25	It's your understanding that this is a single lease?

1	A. Yes, sir.
2	Q. Within that southeast quarter, then, what are the
3	anticipated producing wells for the waterflood project?
4	A. That would be the 177, the 176, the 183 and the
5	182.
6	Q. Those now have a name change associated with
7	them, do they not?
8	A. They do. They're now known as the Grizzell
9	Number 1, 2, 3 and 4.
10	Q. The proposed injector is the Number 11?
11	A. Yes, sir.
12	Q. And so your task was to study and determine the
13	feasibility of the project?
14	A. Yes, sir.
15	Q. As part of that process, did you make an
16	engineering calculation of what you estimate to be the
17	original oil in place underlying the southeast quarter of
18	the section?
19	A. Yes, sir, I did.
20	Q. And how did you go about doing that?
21	A. We took average log calculations and plugged it
22	into the simple original-oil-in-place formula.
23	Q. Have you reduced that effort to a summarized
24	exhibit to show us your volumetrics?
25	A. I have, your Honor, Exhibit 4.

1	Q. All right, let's look at Exhibit 4. First of
2	all, tell us the parameters that you have selected, Mr.
3	Barnes.
4	A. We have here an area at 160 acres, which is that
5	southeast section, porosity at 10 1/2 percent, our
6	formation height at 33 feet, initial water saturation of 25
7	percent.
8	Q. Have you satisfied yourself that all those
9	parameters are fair and reasonable parameters to utilize
10	for purposes of your calculation?
11	A. Yes, sir.
12	Q. What did you calculate to be the oil in place?
13	A. You can see down there highlighted in bold, it's
14	about 2.4 million barrels.
15	Q. Okay. Now let's go back to the bubble map.
16	We've got the estimated original oil in place. How much of
17	that oil has been recovered on primary production from the
18	wells in the southeast quarter?
19	A. We've recovered to date on primary production
20	approximately 413.7 thousand barrels.
21	Q. Pictorially, then, the bubble map shows the
22	apportioned recovery among those wells within the area?
23	A. Yes, sir.
24	Q. In fact, you've shown it for lots of wells in the
25	area?

1	A. Yes, sir.
2	Q. What percentage, then, of the oil in place has
3	been recovered under primary production?
4	A. We're at 17.3 percent.
5	Q. Is there an additional opportunity, in your
6	opinion as an engineer, to improve that recovery number?
7	A. Yes, sir.
8	Q. And what number do you believe is reasonable to
9	assume?
10	A. Well, we've assumed 100,000 barrels of secondary
11	recovery, based on a reasonable secondary-to-primary
12	recovery factor of 25 percent.
13	Q. All right, let's turn to Exhibit Number 5 and see
14	how you have illustrated your forecast. What are we
15	looking at in Exhibit Number 5?
16	A. This is a production curve of the Grizzell lease,
17	which includes the 1, 2, 3 and 4, three of which are
18	currently inactive. It is solely the Number 1 that is
19	producing at a barrel of oil per day. The lower curve
20	there highlighted in green is the oil production. We show
21	our primary forecast or baseline at one barrel of oil per
22	day, and then the if you want to call it the pink, we
23	show our estimated waterflood response.
24	Q. Primary production was solution gas drive, I
25	assume?

	18
1	A. Yes, sir.
2	Q. And you have fully exhausted the opportunity to
3	produce oil in that manner?
4	A. Yes, we have.
5	Q. Describe for us how you forecast what is going to
6	be the period of time in which to sufficiently fill up the
7	reservoir that you can then start recovering additional
8	oil.
9	A. You can look at the response curve and see that
10	we've estimated it's going to take about three years to
11	reach our peak rate. That's based on a higher saturation
12	of about 20 percent within the reservoir, gas saturation,
13	excuse me. Forecasted flat for about four years, declining
14	at 14 percent thereafter.
15	Q. And you're assuming a certain injection rate with
16	your injector well?
17	A. Yes, about 500 barrels a day.
18	Q. Is the injection plan here one that would allow
19	you initially to stay within the Division guideline on
20	surface pressure limitation, which is 0.2 p.s.i. per foot
21	of depth?
22	A. Yes, it would.
23	Q. Okay. So once you make those assumptions and run
24	the calculation, what have you forecasted, then, as the
25	ultimate additional recovery?

It's about 100,000 barrels. 1 Α. ο. All right, let's go through the economics, then, 2 of how you consider this to be a feasible, economic and 3 practical plan. If you'll turn to Exhibit Number 6, 4 5 identify and describe for us what we're seeing here. We have three economic cases here. Α. 6 The first 7 case is the base case, which is reflective of the green 8 forecast line, showing the one barrel a day for four years. The next case is simply our waterflood case, 9 10 reflecting the three-year increased peak production, four 11 years flat at 1200 barrels a month, declining thereafter at 12 14 percent. The final case is an incremental case. 13 It's the difference between the two, which would show the total 14 benefit. 15 Q. In addition to pricing and other information 16 you've made assumptions about are all within your range of 17 18 reasonable engineering judgment? Α. Yes, sir. 19 20 Q. All right, sir. Summarize for us your conclusion, then. 21 I think it would be very beneficial for us to go 22 Α. 23 ahead and make this project a waterflood injection project. MR. KELLAHIN: All right, sir. 24 25 That concludes my examination of Mr. Barnes, Mr.

1	Catanach. We move the introduction of his Exhibits 3
2	through 6.
3	EXAMINER CATANACH: Exhibits 3 through 6 will be
4	admitted as evidence.
5	Mr. Kellahin, do you have a land witness?
6	MR. KELLAHIN: No, sir.
7	EXAMINER CATANACH: If I have any questions
8	regarding land, I mean, I'll just ask
9	MR. KELLAHIN: We do have a representative of the
10	company that could respond to land questions. He's not a
11	landman, but he's the project manager and he certainly
12	could tell you.
13	EXAMINER CATANACH: Well, these are fairly simple
14	about relating to the interest ownership of the
15	MR. KELLAHIN: Yes, sir.
16	THE WITNESS: We have a landman.
17	MR. KELLAHIN: The representation, Mr. Examiner,
18	is that it's all common ownership within a single lease.
19	There are no differences in the southeast quarter as to
20	royalties, overrides or working interest.
21	EXAMINER CATANACH: Okay, that's all I needed.
22	EXAMINATION
23	BY EXAMINER CATANACH:
24	Q. Mr. Barnes, can you please tell me which You
25	said these have new well numbers. Can you please tell me

1

which is which? 1 The 177 is the Number 1, the 176 is the Number 2, 2 Α. the 183 is the Number 3 and the 182 is the Number 4. 3 The 182 -- I'm sorry, the new Number Q. All right. 4 4 is -- I'm sorry, on your Exhibit Number 3 you represented 5 that these green circles are cumulative production? 6 Yes, sir. 7 Α. Q. Okay. Can you tell me why the 182 has such a 8 small cumulative production? 9 10 We pulled this data from Dwight's. We believe Α. they have insufficient data within their program. They do 11 list the IP, initial production rate, at comparable rates 12 13 to the other wells. Our internal files also show that same IP rate, and it was producing as late as 1961. 14 15 So you do believe that the recovery is similar to Q. 16 the other wells; is that what you're saying? 17 Α. Yes, sir, but we just went with the data that we 18 had available. 19 Can you tell me how you arrived at your ο. Okav. 20 secondary-to-primary ratio? 25 percent? 21 Α. That's just based on reasonable numbers from the 22 Grayburg unit, from Grayburg production. From Grayburg production in this area? 23 0. 24 Yeah, the Arrowhead-Grayburg unit. It's about a Α. 25 mile to the southeast -- excuse me, southwest.

1	Q. Now, did you base that on what they projected out
2	there or what they actually have seen?
3	A. On what they've seen.
4	Q. Now, is this going to be the only injection well
5	that you propose on utilizing in this flood?
6	A. Yes, sir.
7	Q. And are there going to be any more producing
8	wells, or is this going to be it?
9	A. Just the four.
10	Q. Just the four, okay. Can you tell me about what
11	the project costs are going to be?
12	A. Actually, I'd like to defer that to our next
13	witness. He'll be able to answer much better.
14	Q. Okay. And you've estimated a response time
15	Well, you said three years for maximum response; is that
16	correct?
17	A. Yes, sir, we did some fill-up calculations, and I
18	actually do not have those available, but we can get that
19	to you.
20	Q. Do you know approximately what the response time
21	might be?
22	A. Probably about six months.
23	Q. Six months. In terms of the life of the project,
24	have you estimated what time frame that might be?
25	A. The life of the project is calculated to be about

1 14, 15 years. 2 EXAMINER CATANACH: Okay, I have nothing further of this witness, Mr. Kellahin. 3 MR. KELLAHIN: Thank you. Next witness is Mr. 4 Bruce West. 5 BRUCE WEST, 6 7 the witness herein, after having been first duly sworn upon 8 his oath, was examined and testified as follows: 9 DIRECT EXAMINATION BY MR. KELLAHIN: 10 Mr. West, would you please state your name and 11 0. 12 occupation? Bruce West, I'm a production engineer. 13 Α. Mr. West, on prior occasions have you testified Q. 14 before the Division? 15 No, I have not. 16 Α. Summarize for us your education. 17 Q. 18 Α. I received a bachelor of science in petroleum engineering in 1993 from the Colorado School of Mines and a 19 20 master's of business administration in 2000 from the University of Houston. 21 22 Q. What is your current responsibilities with 23 Apache? 24 Α. I'm a production engineer for the southern 25 region.

1	Q. As part of your responsibilities, have you
2	investigated the production in the southeast quarter of 8
3	that's to be the proposed waterflood project area?
4	A. Yes, I have.
5	Q. In addition, have you assumed the responsibility
6	for reviewing the Division Form C-108 and looking at the
7	wellbore integrity of the wells within the half-mile radius
8	area?
9	A. Yes, I have.
10	Q. In addition, are you also knowledgeable about the
11	costs associated with the investments necessary to make
12	this operation practical?
13	A. Yes, I am.
14	MR. KELLAHIN: We tender Mr. West as an expert
15	witness.
16	EXAMINER CATANACH: Mr. West is so qualified.
17	Q. (By Mr. Kellahin) Let's start with the C-108,
18	and if you'll set aside the schematics and data that's
19	shown on Exhibits 7 through 9, if you'll set those aside
20	for a moment, let's go to Exhibit 10. Do you have that,
21	sir?
22	A. Yes.
23	Q. All right. When we look at Exhibit 10, what are
24	we seeing?
25	A. We're seeing a map showing the Grizzell lease and

well completions in the area. 1 And inscribed on the map is a half-mile radius --2 Q. That is correct. 3 Α. -- circle with a half-mile radius? And that is 4 ο. the area of review that you and others with Apache have 5 6 investigated? 7 Α. That is correct. Okay. Let's look at the tabulation of the Q. 8 wellbore data associated with the C-108. Do you have that 9 10 in front of you? It's the spreadsheet. 11 Α. Yes, I do. When you as an engineer examine this spreadsheet, 12 Q. do you see any wellbores that may be potentially problem 13 14 wellbores insofar as they have a questionable volume of 15 cement or some plugging method that creates some concern 16 for you? 17 Yes, I did find one such well. Α. Which one is it? 18 Q. The Shell G Number 1. 19 Α. 20 0. All right. When we look at Exhibit 10, the area map, find that well for us. 21 22 Α. That well is in Unit Letter P in the southeast 23 section, southeast quarter of Section 8. 24 Q. All right, it's the most southeasterly well on the Grizzell lease within Section 8? 25

25

1	A. That is correct.
2	Q. Do you have a wellbore schematic of that well
3	that we can look at?
4	A. Yes, I do.
5	Q. And that's just beyond the tabulation of wellbore
6	data in my package. Do you have that, sir?
7	A. Yes, I do.
8	Q. When we look at that schematic, what is it about
9	the manner in which this well has been plugged and
10	abandoned that poses a potential risk?
11	A. The risk I see in this well is that there is no
12	isolation of the Grayburg formation and the lower producing
13	formations in the well. No plugs were set and the casing
14	was not perforated in those intervals.
15	Q. Okay, let's look at the lower plug. There's a
16	plug associated with the perforations down at 7319 to -27.
17	Do you see that plug?
18	A. Yes, I do.
19	Q. What is that plugging?
20	A. That is plugging the perforations that were
21	producing in the well, in the Fusselman.
22	Q. Okay. So immediately above that we would have
23	what, the Blinebry?
24	A. We would have actually the Drinkard section.
25	Q. The Drinkard section

1	A. Correct.
2	Q and then what happens?
3	A. We would have the Tubb, which is not productive
4	in the area, and above that we would have the Blinebry.
5	Q. Okay. And then above that you have the San
6	Andres, right?
7	A. The Yes, the San Andres, that's correct.
8	Q. And then above that the Grayburg?
9	A. Correct.
10	Q. So the Grayburg is the flood interval. And if
11	you're injecting water in the Grayburg in the Injector
12	Number 11, and water or pressure are migrating towards the
13	Shell G 1 well, what's the issue?
14	A. The issue there would be for water to exit the
15	Grayburg formation at the Shell G Number 1, and the water
16	will have no barrier traveling downhole in that well.
17	Q. Is there a sufficient engineering risk associated
18	with the manner in which this well is plugged that would
19	cause you to recommend to the Division Examiner that this
20	well be re-plugged? Is it going to be necessary to re-plug
21	this well, in your opinion?
22	A. No, I do not believe so.
23	Q. Why not?
24	A. I believe that there exists sufficient fluid
25	volumes behind the casing in the wellbore that will prevent

1	water from coming down from the Grayburg.
2	In addition, I believe that the Grizzell Number
3	3, which is a proposed producer, lies between the proposed
4	injector and the Shell G Number 1, and that will create a
5	pressure sink that will be reducing pressure. I do not
6	believe we shall see pressure from the Grayburg extend
7	beyond that wellbore.
8	Q. Okay. So if we're injecting into the 11, between
9	the potential problem well and the injector you've got the
10	Number 3 as a take point out of the Grayburg
11	A. That is correct.
12	Q as one of your producing wells?
13	A. That is correct.
14	Q. Is there any other way that you can monitor the
15	integrity of the Shell G 1 well?
16	A. Yes, there is. We also operate the Grizzell
17	Number 8, which is a Blinebry producer. And that would be
18	the same zone that would be of concern to us in the
19	Blinebry.
20	Q. So what would you see as an operational engineer,
21	under waterflood operations, that would cause you then to
22	want to re-plug the Shell G 1 well?
23	A. If at any time we did see an increase in water
24	production on the Grizzell Number 8.
25	Q. And absent that, you see no reason to spend the

money to replug this well? 1 Α. No, I do not. 2 All right, sir. Let's turn to the other matters 3 0. of the C-108. What do you believe to be the deepest known 4 fresh water in this general area? 5 Α. The deepest known fresh water is at several 6 hundred feet. 7 Is there adequate surface casing and cement in 8 Q. this area to protect the fresh water? 9 10 Α. Yes, sir. And you're going to start off with the initial 11 Q. surface pressure limitation that the Division issues? 12 That is correct. 13 Α. 14 Let's talk about the economics of your project. ο. If you'll go back, Exhibit 7 is the rest of the P-and-A 15 16 schematics, is it not? And then we get to 8, and it shows the Grizzell battery. You're just showing the surface 17 facilities, are you not? 18 19 Α. That is correct. 20 ο. All right, let's look at 9 and talk about the 21 costs associated with the project. What are they? 22 Α. The costs primarily encompass work on the five wells, the four producers and the one injector, as well as 23 some additional facilities costs. Those costs total 24 25 approximately \$240,000.

1	Q. Okay. Those costs, in association with Mr.
2	Barnes' calculation of additional recovery, have all been
3	processed by Apache, and you've come to a conclusion that
4	this is an economically feasible project?
5	A. Yes, we have.
6	Q. In terms of notification, let me ask you, Mr.
7	West, to look at what has been provided in the exhibit
8	package as Exhibit Number 11. What does this represent?
9	A. This represents all of the offset operators to
10	the Grizzell lease that were notified of our proposal.
11	Q. Are you aware of any opposition from any of the
12	parties to whom notice was sent?
13	A. No, I am not.
14	MR. KELLAHIN: Mr. Examiner, that concludes my
15	examination of Mr. West. We move the introduction of his
16	Exhibits 7 through 10.
17	EXAMINER CATANACH: Exhibits 7 through 10 will be
18	admitted as evidence.
19	EXAMINATION
20	BY EXAMINER CATANACH:
21	Q. Mr. West, looking at your P-and-A schematics,
22	particularly on the Greenwood Number 3, it appears to me
23	I don't recall that I've ever seen a well that only has a
24	surface plug and a bottom plug. That's what your research
25	indicates on that well?

We that a what is shown thoma
A. Yes, that's what is shown there.
Q. And that was plugged in 1970, which is pretty
surprising. You don't believe that poses any problem
because of the bottom plug?
A. No, I do not.
Q. What type of fluid are you going to be injecting,
Mr. West?
A. We'll be injecting produced water from the
Grizzell lease. That includes water produced primarily
from the San Andres.
Q. Did you provide an analysis of that water in your
Application?
A. Yes.
Q. Is that compatible with the Grayburg?
A. Yes, it is.
Q. Now, the 11 well, it does have 5-1/2-inch casing
down to 3900 feet?
A. That is correct.
Q. And top of cement at 2090. And the tubing you're
going to use is what size?
A. We'll probably use 2-3/8-inch.
Q. The Number 8 well that you discussed, the
Blinebry well
A. Yes.

1	A. Let's see, I believe it produces from the
2	Blinebry Oil Pool.
3	Q. Blinebry Oil.
4	Q. The various other wells that are in that quarter
5	section, what type of wells are those?
6	A. They also include San Andres wells.
7	Q. Okay. And those are all cased and cemented
8	adequately?
9	A. Yes.
10	EXAMINER CATANACH: Okay. Mr. Kellahin, in terms
11	of notice
12	MR. KELLAHIN: Yes, sir, we sent them notice of
13	hearing, and the mailing list that you have here was the
14	original mailing list when it was filed administratively.
15	We simply sent my standard notice letter of hearing, and
16	Apache re-sent notice of hearing to that list that you're
17	looking at. And what you see now, then, is the notice for
18	this hearing today.
19	EXAMINER CATANACH: And these are all the
20	operators within half a mile radius?
21	MR. KELLAHIN: Yes, sir. In fact, I think they
22	went farther than the half mile. They may have gone
23	outside of that area.
24	EXAMINER CATANACH: Okay. Is there a surface
25	owner, do you know?

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1	MR. KELLAHIN: Yes, there is, and I'll have to
2	find out for you because I don't remember from
3	recollection.
4	EXAMINER CATANACH: Okay, I have nothing further.
5	If there's nothing further in this case, Case
6	12,785 will be taken under advisement.
7	(Thereupon, these proceedings were concluded at
8	9:39 a.m.)
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CERTIFICATE OF REPORTER

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

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL January 13th, 2002.

STEVEN T. BRENNER CCR No. 7

My commission expires: October 14, 2002