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:	)	CASE NO. 12,709
APPLICATION OF MELROSE OPERATING COMPANY TO EXPAND ITS ARTESIA UNIT WATERFLOOD PROJECT AND AMEND DIVISION ADMINISTRATIVE ORDER WFX-768, EDDY COUNTY, NEW MEXICO	)	ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

September 6th, 2001

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, September 6th, 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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I N D E X

September 6th, 2001
Examiner Hearing
CASE NO. 12,709

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E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	9	52
Map	9	52
Economics	29	52
Reserves	26	52
Green Tab	31	52
NMOCD - C 108	12	52
Past Orders	29	52
Exhibit 2	18	52
Exhibit 3	18	52

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A P P E A R A N C E S

FOR THE DIVISION:

DAVID BROOKS
Attorney at Law
Energy, Minerals and Natural Resources Department
Assistant General Counsel
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

FOR THE APPLICANT:

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

FOR BP AMOCO PRODUCTION:

HOLLAND & HART, L.L.P., and CAMPBELL & CARR
110 N. Guadalupe, Suite 1
P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: MICHAEL H. FELDEWERT

* * *

WHEREUPON, the following proceedings were had at 9:50 a.m.:

EXAMINER CATANACH: Call the hearing back to order, and at this time I'll call Case 12,709, which is the Application of Melrose Operating Company to expand its Artesia Unit Waterflood project and amend Division Administrative Order WFX-768, Eddy County, New Mexico.

Call for appearances in this case.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of the Applicant, and I have two witnesses to be sworn.

EXAMINER CATANACH: Additional appearances?

MR. FELDEWERT: Mr. Examiner, Michael Feldewert with the law firm of Holland and Hart and Campbell and Carr, appearing on behalf of BP Amoco Production, and I have no witnesses today.

EXAMINER CATANACH: Okay, will the two witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

MR. KELLAHIN: Mr. Examiner, we've organized the exhibit book in such a way that we've simply marked the book Exhibit 1. It will have subdivided tabs that will allow us to identify the individual portions of Exhibit 1 as we go through that.

I have two witnesses to present to you this morning. One is Mrs. Ann Ritchie. She specializes in handling processing of filings and applications on behalf of industry companies, with the Oil Conservation Division, and as a consultant to Melrose she has compiled the data that's submitted in the C-108.

She's done that in association with Mr. Tony Beilman who's the principal of Melrose, and in addition with the help of Mr. Robert Lee who's a petroleum engineer and a consultant to Melrose.

We're going to have her authenticate the documents, describe for you the details she's gone through in assimilating the data for the area of review.

And then we'll have Mr. Lee describe and identify for you the project area. And we're going to focus our attention this morning to looking at wells that may potentially be considered problem wells and have Mr. Lee's recommendations to you as to what, if any, remedial action is necessary.

You may recall that this case was filed in a piecemeal fashion at one time with various administrative applications, the last of which was processed by the Division some time ago. And in that processing Mr. Mark Ashley was responsible for looking at a certain portion of the unit. He had issued what we have described as

Administrative Order WFX-768. We're here to report to you on the status of that order and what Melrose has done concerning that order.

What we decided to do is to move back from the administrative processing and give you an entire presentation on these proposed additional injection wells and a comprehensive review of wells within the area of review so that you would have the chance to talk to Mr. Lee about this problem before you have to review it and make your decision.

So that's our proposed plan of presentation, Mr. Examiner, and with your permission we'll call Mrs. Ann Ritchie.

EXAMINER CATANACH: You may proceed.

MR. KELLAHIN: Mr. Examiner, there is a population of these wells that is in the Empire Abo Unit. That unit is operated by BP Amoco. Mrs. Ritchie examined all available public documents, was not satisfied that she had a comprehensive database, particularly to identified, measured and calculated cement tops for wells operated by BP Amoco.

We're here to express our gratitude to BP Amoco for assisting us, in providing us internal documents and to help us verify cement tops for those wells, and they have continued to cooperate and assist us in this effort.

ANN E. RITCHIE,

the witness herein, after having been first duly sworn upon her oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mrs. Ritchie, for the record would you please state your name and occupation?

A. My name is Ann Ritchie, and I am manager and owner of West Texas Oil Reports in Midland and have been in that capacity for the past 26 years in association with my father who is a registered petroleum engineer for over 40 years.

Q. You conduct your business principally in Midland?

A. Yes.

Q. That's your office? And that work includes examining documents at the Oil Conservation Division in Hobbs, is it?

A. Hobbs, Artesia --

Q. So all of southeastern New Mexico is within --

A. Yes.

Q. -- the area of your expertise and operation?

A. Yes.

Q. All right. Describe for us what your relationship is with Melrose Operating Company.

A. I was contracted by Melrose to prepare all

documents and data necessary to file the Form C-108 for the expansion of their waterflood project with the Artesia Unit.

Q. Is this a document, the Division Form C-108, with which you have had past experience and involvement in compiling and submitting that type of document?

A. Yes, it is.

Q. And have you done so in this case?

A. Yes, I have.

Q. Describe for us the efforts you've gone through to compile the information for submittal of the Division Form C-108.

A. We initially took the area of review for 18 wells, the half-mile radius, and got all of the scout tickets for each and every well that was drilled in that area. We obtained the plugging reports for any wells that have been plugged within that area and submitted that with the initial Application.

Q. Can you estimate the approximate time in which you began your work for Melrose examining the database for the wells in the area of review? How long has this taken

A. It's taken twelve months.

Q. The exhibit book, let's turn to that. Is this an exhibit book that you have organized?

A. Yes.

Q. Let's open the exhibit book, we've marked it as Exhibit 1. There is a foldout map. Do you see the foldout map in the divider, in the divider section? Would you take that and unfold it, please? Let's talk about it for a minute.

Is this a map that was prepared under your direction and supervision?

A. Yes, it is.

Q. Have you satisfied yourself to the best of your knowledge that it accurately depicts the information displayed?

A. Yes, I have.

Q. Let's talk about the information. What is portrayed on this display by the red dashed line? What is that?

A. This is the half-mile radius that comprises each of the half-mile radiuses for each of the wells that are applied for and designated with a red triangle.

Q. The red outline cloud, if you will --

A. Yes.

Q. -- is one that is generated by taking multiple half-mile-radius circles --

A. Right.

Q. -- around each of the proposed injection wells, and then you have covered all that area with this area of

review?

A. Yes, sir, better said.

Q. Okay. Within the area of review, what type of wells are shown on the plat?

A. Basically, it is all of the -- the majority of the Artesia Unit wells, which -- and then also the Amoco Empire Abo wells.

Q. Okay.

A. That is the vast majority of the wells, of the approximately 210 wells that are located.

Q. Set the map aside, turn to the exhibit book --

A. Okay.

Q. -- and go beyond the geologic reference document and look at the very next page.

A. Yes.

Q. Do you see the very next page?

A. Yes.

Q. What is this extracted from?

A. This is extracted from the unit agreement for the Artesia Unit.

Q. Within this page, then, there's identified the unitized formation; do you see that?

A. Yes.

Q. When we go back to the plat, have you, to the best of your ability, accurately identified and located any

wellbore that penetrates to or through the unitized formation?

A. Yes, sir.

Q. In addition, there's some well symbols I'd like you to identify.

A. Okay.

Q. There are some well symbols identified with blue circles, a blue dot and then a red triangle.

A. Uh-huh.

Q. What are those?

A. Currently -- There are numerous current injection wells. The blue dot signifies the wells that are contained within our current Application. There are four pilot areas. One pilot area that was approved by WFX-768 is in Section 3, and that is identified by the red triangle and the blue triangle and the blue dot.

Q. For purposes of this Application, then, we are directing the Examiner's attention to the approval of injection wells, additional injection wells, for the Artesia Unit, that are shown with the red triangle?

A. Yes, we are.

Q. That's the focus or the topic of the presentation, correct?

A. That's correct.

Q. In addition, there are a number of smaller blue

triangles within the unit. What do those represent?

A. These are current injection wells that are already in the waterflood project.

Q. For example, in Section 35, if we look down in the southeast quarter --

A. Uh-huh.

Q. -- and then look in the northeast of the southeast, there's a Melrose 20 well?

A. Yes.

Q. That appears to have an injection well symbol associated with it?

A. That's correct.

Q. And it's a currently approved injection well?

A. That's correct.

Q. All right. So when the Examiner looks at all the blue triangles, he's looking at wells that are already approved for injection within the unitized interval?

A. That's correct.

Q. The additional injection wells are the conversion of existing wells, are they not?

A. Yes, and there is one well that's plugged, that we anticipate drilling out and converting to injection.

Q. Okay, let's go back to the exhibit book. If you'll turn to the yellow tab in the exhibit book that's marked "C-108", the compilation of information within this

portion of Exhibit 1 are documents prepared by you?

A. Yes, they are.

Q. Am I correct in understanding that this will substitute in its entirety for the C-108 that was filed originally with the Application?

A. Yes.

Q. So when the Examiner commences his review of the project, this is the revised C-108 that he should utilize?

A. That is correct. And we have deleted the wells that were permitted by Administrative Order WFX-768.

Q. Okay, let's --

A. We have not deleted that from our map, or any of the wells that have been reviewed.

Q. Beyond the C-108 there's another orange tab that says "Past Orders"?

A. Uh-huh.

Q. You included in this portion of the exhibit book what type of information, Mrs. Ritchie?

A. Particularly any order that had anything to do with the Artesia Pool, the Artesia Unit, prior operators that had operated in the Artesia-Queen-Grayburg-San Andres Waterflood area.

Q. Let's turn through those pages until you find the copy of Administrative Order WFX-768.

A. Okay.

Q. This was the order issued by the Division on November 28th. I referred in my opening comments that this was the administrative order processed by Mr. Ashley.

A. That is correct.

Q. That's your understanding?

What did Mr. Ashley require?

A. Initially, I submitted the entire Application, which involved four pilot areas. He -- In looking at the numerous wells that were involved to be reviewed in the process, he asked that we break it down into Pilot Area 1, 2, 3 and 4. And so this WFX-768 essentially deals only with the Pilot Area 1.

Q. Pilot area is just a matter of convenience in terms of how to process this originally under Mr. Ashley's suggestion?

A. Well, and it also ties into the reservoir engineer's proposed --

Q. -- sequence of development?

A. That's correct.

Q. Okay. What did Mr. Ashley require?

A. He required that -- Being that wells Number 22 and 28 were already permitted by prior permits, we had anticipated possibly adding to the perforated interval in the two wells. He suggested and we agreed that we would leave those wells with their existing permit. And so in

the process of permitting wells 23 and 29, he required that we do remedial work on the Melrose Artesia Unit 12, the Melrose Artesia Unit 13, and provide data on the BP Amoco Empire Abo G Well Number 38 in order to bring all those wells into compliance.

Q. All right. The two wells controlled by Melrose are the Artesia Unit wells?

A. Yes.

Q. And any problem existing in those wellbores has been remediated by the fact you've converted them to injection and, in doing so, have cured any flaw?

A. Yes, they have had squeeze jobs with cement circulated to surface on both wells.

Q. What's happened to his requirement for the BP Amoco-operated Empire Abo Unit G Well 38?

A. I submitted a sundry notice, which gave the calculations, and wellbore diagram, showing the cementing method that was used when the well was initially completed.

Q. That documentation immediately follows the administrative order?

A. Yes, it does.

Q. And that's documents you have filed with the District Office?

A. Yes, I have.

Q. What's your conclusion about the information you

have subsequently submitted on that well?

A. I believe we're in compliance with all of the orders that are contained in the Administrative Order 768.

Q. Let's turn back to the beginning portion of the C-108, Mrs. Ritchie. We've got the cover sheet which you have executed. Let's turn past that, and you have provided certain well data for the Examiner concerning the area of review?

A. Yes.

Q. You have done this with the assistance of certain technical individuals, have you?

A. Yes, I have.

Q. And who are those individuals?

A. Particularly Kay Maddox, Robert Lee and Tony Beilman.

Q. All right, and who are those individuals?

A. Kay Maddox is a geologist, who is a research -- she is a wellbore researcher. I need a better word than that. But anyway, she's very good at identifying wells, particularly through research of subsurface libraries and OCD.

Robert Lee is a reservoir engineer.

And Tony is a field engineer.

Q. All right. And with the assistance of all those experts, then, you have compiled the C-108.

A. Yes.

Q. Have you collectively agreed upon, on page 2, an identification of any potential fresh water?

A. Yes.

Q. And do you have an opinion, with the assistance of those experts, as to where that fresh water may be expected to be encountered?

A. Yes. It actually -- In applying for subsequent applications to drill, the recommendation has been for a depth to be protected to approximately 350 foot. Our latest -- We have submitted a documentation pertaining to a water well located, I believe, in Section 2, that the owner, the surface owner has indicated the depth to be approximately 180 feet.

Q. Okay. So when the Examiner is comparing the setting depths of surface casing and cementing, then your data research shows the production interval could be at 180 feet, and there's some indication that there's water present down to 350 to 400 feet?

A. Yes, which I presume would come from log data.

Q. Following that page, there is a tabulation of names and addresses. What does this represent?

A. These are all the people that are operators within our bubble area, our half-mile radius as designated on our map.

Q. Okay. I'm going to show you a certificate of mailing -- it's marked as Exhibit Number 2 --

A. Uh-huh.

Q. -- and the question is, does this list that I'm about to show you include, to the best of your knowledge, all the offset operators within the area of review and the owners of the surface for any injection well?

A. Yes, these are all the offsets to the best of my knowledge.

Q. Okay. Subsequent to sending out Exhibit Number 2, did you subsequently acquire additional information to let you know that there were operators omitted from the first list that now needed to be notified?

A. Yes.

Q. What is Exhibit Number 3, then?

A. We subsequently needed to notify Vintage Drilling, Louis Dreyfus and Devon Energy.

Q. With that supplemental notification, are you now satisfied, to the best of your knowledge, all appropriate parties have been notified pursuant to Rule 108?

A. Yes.

MR. KELLAHIN: Mr. Examiner, you'll note that these last three companies were not sent notice until August 30th. We would recommend that you continue this case following our presentation to the September 20th

docket, which would allow those three parties the appropriate 20-day period in which to file an objection, should they have any, and if they do so, we'll be back on the 20th to address that issue.

EXAMINER CATANACH: Okay.

Q. (By Mr. Kellahin) Following the notice list --

A. Okay.

Q. -- what is then shown in the filing under the C-108?

A. This is a listing of the wells that we are currently filing for permission to include in the expansion project.

Q. And the well numbers on this list correspond to the well identification numbers for those injectors shown on the plat?

A. Yes, they do.

Q. Okay. Lastly, Ms. Ritchie, after you've extracted the locator map from the pocket inside the front page, there is a tabular list of data that is some 19 pages long. What does this represent?

A. This should contain each and every wellbore that is within the bubble area, the half-mile radius of review for the 14 wells that are contained in this current Application.

Q. It is this 19-page document that you had Mr.

Robert Lee examine to determine his engineering opinions about any potential problem wells?

A. That is correct.

MR. KELLAHIN: All right, that concludes my examination of Mrs. Ritchie, Mr. Examiner. I would like to withhold introduction of Exhibit 1 until I have the rest of the pages authenticated by Mr. Lee, but that concludes my presentation of Mrs. Ritchie's testimony.

EXAMINER CATANACH: Okay. Mr. Feldewert, do you have any questions of this witness?

MR. FELDEWERT: No, Mr. Examiner.

EXAMINER CATANACH: Just a couple.

EXAMINATION

BY EXAMINER CATANACH:

Q. Ms. Ritchie, the Artesia Unit is currently operated totally by Melrose?

A. Yes, sir.

Q. And you are currently actively waterflooding this unit?

A. Yes, sir.

Q. With regard to WFX-768, you did present a documentation on the -- the terms of that order were complied with --

A. Yes, sir.

Q. -- as far as the remedial work?

A. Yes. I have not -- I believe it's Well Number 12 I have not -- Let's see, on Wells Number 23 and 29 for the mechanical integrity test, they were witnessed by the District OCD field personnel. I have not received the stamped copy back from them. I may have it in my office.

Also on the data that was submitted for the Empire Abo G-38, I have not received the approved copy back on that. So I have submitted my copy.

Q. Okay. On the Number 12, on the Artesia Unit Number 12, on the sundry report --

A. Uh-huh.

Q. -- you show that the cement bond log was run and the cement was found to be at surface; is that correct?

A. Yes, sir, and that was submitted to the District Office, the bond log.

Q. So no remedial work was done on that well, except for the cement bond log?

A. The squeeze job was performed, and the cement job report should be behind it.

Q. Okay.

A. Yeah.

Q. And again, on the Empire Abo Unit G-38 --

A. Uh-huh.

Q. -- is it your testimony no work was done on that well?

A. No, sir, not by Melrose.

Q. Okay, but you believe it's in compliance with the terms of the order?

A. Yes, sir.

Q. Okay. Mr. Lee may go into more of that? Okay.

A. Yes.

Q. Now, as far as the pilot areas are concerned, is Melrose actually going to develop this waterflood in pilot areas, one area at a time?

A. It is my understanding it will be Pilot Area 1, then 2, then 3, then 4.

Q. Can you identify which is Pilot Area 1 and 2 and 3 and 4?

A. I'll have to go back to my submission to Mark Ashley.

Okay, Pilot Area 1 contained -- the usage for injection, the injection pattern, the injection wells to be utilized would be Wells Number 22, 23, 28 and 29.

Pilot Area 2 would be to convert or maintain Wells Numbers 10, 11, 12, 13, 2 and 3. The purpose is to inject and monitor production from Wells 70, 69 and 73.

Pilot Area 3 would be to convert or maintain Wells 34, 36, 54 and 57, to inject or monitor production from Well 55 and subsequent wells to be drilled.

Pilot Area 4 would be to maintain or convert

Wells Number 16, 17, 18 and 19, to monitor production from Well Number 83 and subsequent wells to be drilled.

Q. Okay. Ms. Ritchie, do you know how many producing wells you currently have in the unit?

A. I don't. Robert Lee does, I believe.

Q. Okay.

A. There is active drilling going on at this time. And during the year, from the time this Application was initially submitted, I believe there have been four wells, two wells subsequently drilled.

EXAMINER CATANACH: Okay. Mr. Kellahin, the way this Application is styled, you're seeking the amendment of Administrative Order WFX-768. Can you explain --

MR. KELLAHIN: Well, when it was originally filed, we believed that we were going to ask you for an amendment to delete the BP Amoco-operated well.

It now appears, from what Mrs. Ritchie has submitted to you, that all we need to have you do is to reflect in the order of this case that we have satisfied the requirements of that administrative order.

EXAMINER CATANACH: Okay.

Q. (By Examiner Catanach) Ms. Ritchie, did you say that there was a water well in this area?

A. Yes, sir.

Q. And is that --

A. Let me see if I can get you the right page. After all the wellbore diagrams should be, if you can flip over about 20 pages, the blue and green. Are you at the blue and green? There they are --

Q. Okay.

A. -- at the end of that. The next page is the water well, the BJ Services water analysis on that well.

Q. Okay, and where is that well located? Should I ask Mr. Lee?

A. Yes, I'm sorry.

MR. KELLAHIN: Okay, that's all I have of this witness. She may be excused.

MR. KELLAHIN: Mr. Examiner, we'll call Mr. Robert Lee.

ROBERT LEE,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Lee, would you please state your name and occupation?

A. Robert Lee, I'm a petroleum engineer consulting for Melrose, right now, Melrose Oil Company.

Q. And where do you reside, sir?

A. I live in Midland, Texas, now.

Q. On prior occasions, Mr. Lee, have you testified before the Division as a reservoir engineer?

A. Yes, I have.

Q. Have you as part of your duties as a consultant for Melrose Operating Company analyzed the wellbores within the area of review identified by Mrs. Ritchie in her filing of the Division Form C-108?

A. Yes, I have.

Q. And based upon that review, do you have certain recommendations, opinions and conclusions concerning those wellbores?

A. Yes, I do.

MR. KELLAHIN: We tender Mr. Robert Lee as an expert petroleum engineer.

EXAMINER CATANACH: Mr. Lee is so qualified.

Q. (By Mr. Kellahin) Mr. Lee, let's turn to the exhibit book and orient the Examiner as to the formations within the unitized interval --

A. Uh-huh.

Q. -- that are the topic of this project. And if you'll take the regional geologic display, help us understand the intervals that you have examined for purposes of waterflooding within the Artesia Unit.

A. The unit boundaries cover the Grayburg-San Andres, and in this localized area there are unique names

to some of the sands. If you look at the far left-hand column here, under the northwest shelf, under the Grayburg, we see that the Grayburg is broken up into three intervals, the Loco Hills, the Metex, the Premier, and then into the San Andres with the Lovington there at the top of the San Andres. And these are the primary zones of interest in this Application.

The primary zone that has been flooded to date out in this field is the Premier, with some scattered completions in the Loco Hills and Metex.

Q. Give us some general background on how the unit area was produced under the primary phase of production. What were they withdrawing?

A. Okay, if you turn to the "Reserves" section, I have a --

Q. It's the pink tab that says "Reserves"?

A. Yes, the pink tab that --

Q. Let's turn to that --

A. -- says "Reserves".

Q. -- and behind that tab let's talk about what's happened in the unit in terms of recoveries.

A. Yes. Actually, the initial well that was drilled in this unit was drilled back in 1926. This sheet of paper here breaks down the reserves by development, by primary operations, current operations, which is the existing

flood, and our proposed operations.

What I draw your attention to is that under the primary operations from 1926 to when the flood started in 7 of 1965, the unit had recovered 1.1 million barrels of oil and at that time had about a half million barrels left, for an ultimate recovery of 1.6 million barrels.

The waterflood was initiated in July of 1965. From that point in time until now, the unit has recovered almost 3 million barrels, 2.9 million barrels, and has remaining reserves of 180,000 barrels for an ultimate current recovery of 3.1 million barrels.

The waterflood has recovered an incremental 1.5 million barrels, which gives us a secondary-to-primary ratio of a little less than one to one.

Q. What do you propose to do under this next phase of operations for the unit?

A. What we're going to do is to infill drill the well, the unit, from the current nearly 40-acre spacing down to 20-acre spacing, collapse our flood pattern down. We're going to drill 35 wells, we're going to convert 41 wells to injection. Melrose is going to spend a little over $13 million to do all this, and we hope to recover an incremental 4 million barrels from this unit, giving us a total ultimate recovery from the unit of about 7.2 million barrels.

Q. The proposed operation for these injection wells that are the subject of this hearing will include the opportunity for the operator to select any interval within the unitized formation for the injection of water?

A. Yes, that's correct. Like I said, the bulk of the development in the flooding of the unit up to this point in time has come out of the Premier interval. There's been some scattered completions, some limited injection into the Metex and the Loco Hills and the Lovington. It's our plan to open up all the intervals and flood all these intervals, increasing the vertical as well as the horizontal sweep efficiency of the reservoir.

Q. Would you unfold your area of review map for me so I can ask you some questions? Is there any structural component to the reservoir such that as you move through the reservoir you have to recalculate what is going to be the top and the bottom of the unitized interval?

A. Yes, there is. From the southern end of the unit, the formations dip to the north. And so the tops of the Loco Hills and all these would be moving updip as you move to the north.

Q. Have you taken that geologic event into consideration as you analyze the wells in the area of review so that as you measure and calculate tops of cement, you know where you are in relation to the top and the

bottom of the unitized interval?

A. Yes, I have.

Q. Let's turn to Exhibit Book 1, and if you go behind the first tab it says "Economics". Describe for us the costs associated with this proposed project.

A. This is a sheet where we break down what the $13 million will be spent upon. We anticipate drilling 35 wells at $230,000 apiece; recomplete quite a few zones out here, 72 zones in 44 different wells at $45,000 apiece; we're going to convert 40 wells, 41 wells, at $30,000 apiece; add to the existing facilities with additional pumps, tankage; we're going to have injection lines move the water to the wells; and a half a million dollars of miscellaneous costs, for a total of a little over $13.5 million.

Q. Let me direct your attention now, Mr. Lee, to the matters associated with the Administrative Order WFX-768. If you'll look behind the orange tab that has "Past Orders" in it --

A. Uh-huh.

Q. -- if you go about halfway back, you're going to find the administrative order.

A. Okay.

Q. Just ahead of the administrative order is a one-page summary sheet?

A. Yes.

Q. Would you look at that?

A. Uh-huh.

Q. Are you familiar with this information?

A. Yes, I am.

Q. Describe what Melrose has done in relationship to that administrative order.

A. One of the -- This is the page that shows the required what I will call stipulations and what was done to bring that compliance about.

One of the stipulations was to squeeze the Artesia Unit Well Number 12 that was performed, and we've got cement to surface on that well.

Same thing on the Artesia Unit Well Number 13, that well was also squeezed and had cement circulated to surface.

The other issue was to provide evidence that the BP Amoco Empire Abo Unit G 38 has a top of cement greater than 1700 feet. And in the list of wells, the 20-page document there, I have a calculated top of cement for that well to be 1545. I think that the wellbore diagram that was submitted was calculated showing cement to surface. That was because a different efficiency factor was used for the cement, and we will get into that in greater detail as we proceed with testimony.

Q. Let me direct your attention back to the C-108. There's the tabulation of wellbore data that Mrs. Ritchie identified as being in the front pocket. It's some 19 pages long. Are you familiar with that tabulation?

A. Yes, I am.

Q. In fact, you assisted to a substantial degree in the preparation of the data that's shown here, have you not?

A. Yes, I was.

Q. All right, I'm going to set that aside for a moment, and let's subdivide it in such a way that we can talk to Examiner Catanach about the various types of wells in the area of review and your conclusions and recommendations as to how to handle those various types of wells --

A. Uh-huh.

Q. -- in order to allow injection to take place in the proposed injection wells.

A. Okay.

Q. To start that conversation, if you'll go behind the green tab, let's look at the first display. And we are about to look at a whole bunch of displays that represent your work product, are we not, Mr. Lee?

A. That's correct.

Q. Let's start with the first spreadsheets. It says

"Half Mile Well Radius" --

A. Uh-huh.

Q. -- and they're numbered from page 1 down through page 20, correct?

A. Yes.

Q. How was this tabulation different from the one submitted in the front-pocket part of Exhibit 1?

A. Okay, it's basically almost a re- -- It's a regurgitation of this data, with some additional columns on it.

Q. Let's address yourself to the additional columns. Where do we find them on the spreadsheet?

A. If you look at the fifth column from the right, you'll see a 100-percent number. Next to that, to the right of it, there's 75 percent and 50 percent. To the left of the 100-percent column, you'll see a column that says Measured TOC.

What I did on the original 19-page document that was in the front of your folder, I went through and calculated the tops of cement for all these wells, and I utilized a 75-percent efficiency factor, except for wells that utilized a cement called HYS-400. That was a high-yield cement, and I handled that differently than I did wells where it just said well was cemented with X barrels of cement. And that is what is reflected on the original

19-page document.

What we show in these three columns will be the tops of cement if you use 100-percent efficiency, the 75-percent efficiency, which is on this sheet, or if you use a 50-percent efficiency for the cement volume generated from -- in cement in the wellbores. Other than that, the data is the same.

Q. The filing with the C-108 also provides the Examiner with the total depth of the well in the far-right column?

A. Yes, it does, the original has TD on it, and this well, we left the TD column off to give us a little more room so you can see it without a magnifying glass.

Q. So that would be the difference, then. If he wants to know the total depth he can go back to the pocket part. If he wants to see what happens with the calculation of the cement volumes using various percentages of efficiency, you've done that for him?

A. That's correct.

Q. All right. Let me ask you this, sir. The Division practice or custom is to generally apply a 50-percent reduction in the volume calculation --

A. -- uh-huh.

Q. -- for wells as a margin to satisfy themselves that they have reduced the volume enough to account for any

loss of volume or materials in wellbores in which you do not have the ability to measure the top.

A. Okay.

Q. What do you consider to be an appropriate percentage of reduction in the volume calculation that's suitable for these population of wells in the Artesia Unit?

A. For the wells in this area, I'd lean more towards the 75- to 80-percent efficiency factor. And we have some data to support that.

Q. All right, let's turn to the data that supports your conclusion that a 75-percent efficiency number is the appropriate one to use. How do we find that information?

A. If you go to the end of the -- after page 20 in the folder, flip that over, there's a table there that is called "Wells that pumped cement with a measured TOC which are not HYS 400 or using a DV tool..."

Q. All right, let's take a moment and make sure everybody's got that.

A. Okay.

Q. There are two displays back to back, very much like -- One deals with the HYS-400 cement --

A. Yes.

Q. -- the next one deals with those wellbores that didn't utilize the high-yield cement?

A. That's correct.

Q. You're looking at that one that doesn't deal with the high-yield cement?

A. That's correct, and there's nine wells on that list.

Q. All right, why have you selected these nine wells?

A. These are wells where we had a measured top cement, either with a bond log or through a temperature survey. Somehow the top of cement was known, and they did not utilize a DV tool, and they weren't utilizing the high-yield cement volumes. So by using these wells we're trying to come up with some sort of empirical efficiency factor for the wells in this area.

And what this table shows is, out of the whole population of wells, we had nine wells that had a top of cement that was cemented with just -- as the scout ticket would say, just cement.

And the way the table works, I've got the TD of the well listed, the number of sacks of cement utilized and where the measured top of cement located. From that, by subtracting the top of cement from the TD, I can tell you how many actual feet of cement was created from that volume of cement pumped.

The cubic foot is just the volume that was utilized between the hole size and the casing size.

Q. So in the first row for the EAU 35 --

A. Uh-huh.

Q. -- the actual volume created by this process is fifty-five hundred --

A. -- and fifty-nine feet, yes, sir.

Q. All right. Then what did you do?

A. Okay, then in the next column over I took an average cement yield -- and the yield that I used in these calculations was 1.32 -- took that yield times the hole size, you know, the cubic-foot difference in annular volume, by how many sacks were pumped, and came up with a number of how many feet you would calculate that cement to generate.

And then in the next column over I calculated a percentage of those two volumes, the number actually created and what you would calculate to create.

And in this first well the well actually created 5559 feet. I calculated that it should have generated 4923 feet.

Q. In addition, you have not applied any kind of efficiency percentage to the 4900 feet?

A. That's correct.

Q. If you use the Division practice of dividing that in half, by calculation, then, you'd only had about 2500 feet?

A. That's correct.

Q. And the known volume in this wellbore as actually measured is twice that?

A. That's correct.

Q. All right.

A. I followed that procedure down for all of these wells, and you can see over there that the range of efficiency varies from 47 percent to 124. But I averaged all of the wells that we had here and came up with an average efficiency of 88 percent.

But for the use of the -- calculating our top of cement for a C-108, instead of using the 88 I backed it on off to the 75 percent. So that's why we feel like maybe the 50-percent number may be a little harsh in this area where we do have some data on some of these wells.

Q. Let me direct your attention now, Mr. Lee, to the topic of those wells that utilize the high-yield cement. Do you have a table to illustrate those?

A. Yes, I do, that's the next table over. Some of these wells utilized a product -- it was a BJ product called HYS-400. It was a cement that was used in the mid-1960s -- maybe even the early 1970s, because it was still in some of the BJ handbook manuals -- that had a very high yield. It had a yield of 7.3 cubic feet per sack, whereas the yield that I used on the other wells was 1.32.

Generally, according to the completion reports here, the cement was pumped and then followed with generally what they called 4-percent Incor., where they're mixing some gel in with it. And according to the -- I believe it was the Halliburton book, 4-percent Incor. generates a yield of 1.88 cubic feet per sack.

I was able to find five wells out of the 200 wells that utilized HYS cement where I had a known measured top of cement. And by taking those five wells I do the same thing where I calculate a percent efficiency. I actually know how many feet was generated, how much feet was generated. Then I calculate how much I say should have been generated.

What's the difference? I kind of came up with a range of 64 percent to 57 percent, and then I used actually, on my tables, I would use generally a 55-percent efficiency on any well that had the HYS-400 cement.

Q. Is the 20 pages of data for the area-of-review wells coded in such a way that Examiner Catanach can find the wells associated with the high-yield cement?

A. Yes. On those wells that utilize the high-yield cement, I made a notation by the well, and if you just look at even the first page, the second well down, you can see where I say, you know, 5 1/2 cemented with 170 sacks HYS-400 -- or actually I just said HYS -- and 150 sacks of

4-percent Incor. And then over in my calculated TOC column, you can see on that particular well, the Amoco D 42, I calculated a top of cement of 1550 feet, using the 55-percent efficiency.

Q. All right, let's go through and categorize the various wells in the area of review. Approximately how many total wells are contained within the area of review? Do you remember?

A. I believe Ann said about 210.

Q. Okay.

A. It's a bunch.

Q. Let's go to the various spreadsheets that you've constructed so we can subdivide these into categories and address the various categories and talk about what are identified as potential wells that you need to comment on.

Let's start -- My next display is captioned at the top. It says "BP Wells". Is that your next display?

A. Actually, my next one is HYS wells, but we can go --

Q. All right, let's do it in whatever order that you've analyzed this. I'm not sure the exhibit books are exactly the same.

EXAMINER CATANACH: Where are you at, Mr. Kellahin?

MR. KELLAHIN: I'm following Mr. Lee's 20 pages

of summary where he's broken out with the efficiencies. My next display is captioned "BP Wells".

EXAMINER CATANACH: I'm there.

MR. KELLAHIN: Okay.

THE WITNESS: Okay? There too.

Q. (By Mr. Kellahin) What have you intended to direct our attention to, Mr. Lee, by this one page that says "BP Wells"? What's this?

A. This is a list of wells that, as I was going through the data available from the scout tickets from the OCD office in Artesia, the data that Kay had gathered -- these are the wells that even after knowing what type of cement was ran and any other particulars available on the completion reports still did not appear to have enough cement in the wellbore to cover the zone of the injection interval.

We contacted BP, and they had a contract engineer go to the Hobbs office and pull up some additional data and was able to demonstrate that all of these wells have cement sufficient to cover the injection intervals now. Generally what had happened is, either they had a bond log that wasn't available to the Commission or they may have subsequently squeezed a well that was not reported in the scout ticket information or that we didn't pick up at the Commission.

Q. This one-page sheet, then, is the compilation of data with the assistance of the BP Amoco engineer, utilizing their own internal records to then calculate what is either the measure or the calculated top of cement?

A. That's correct.

Q. Are you satisfied that based upon that data the wells on this sheet are adequately cemented in such a way as to isolate the unitized interval from any hydrocarbon-producing formation or from any shallow freshwater source?

A. Yes, I am.

Q. Let's turn to the next display, and the next display I have deals with HYS-400 cement.

A. Okay.

Q. Do you have that sheet?

A. Yes, I do.

Q. All right. Identify and describe where this came from and what it tells you.

A. Okay, this is a copy of the data from the BJ handbook on the HYS-400 cement, and what I want to point out here -- I think I should have highlighted it in your book, Mr. Examiner -- what the yield is, this is where I get my 7.3 yield number for the HYS-400. And it just gives some of the properties of the well and mixing properties.

Q. Who's BJ?

A. BJ Hughes Service Company that cemented several

of these wells out here in the 1960s.

Q. This is out of their technical manual that tells you how to do the calculation?

A. Exactly, this is out of their technical handbook.

Q. All right, sir. Let's turn past that, and the next display I have is two pages, at the top of which it's identified as the "HYSWELLS".

A. That's correct.

Q. What does this represent?

A. This is where I've gone through the 20-page document and pulled out all the wells that we know pumped HYS-400, putting it on one sheet so that you can see the calculations of where the tops of cement are, wells where we know that we've circulated or have measured tops on them.

And right now my recommendation is that there's no action necessary on these wells, because the tops of cement appear sufficient to cover the injection interval.

Q. Okay, let's set those two pages aside, Mr. Lee, and then we get to three pages that are captioned "Old wells".

A. Yes.

Q. What are you intending to convey to us by this category of wells?

A. These are wells -- As I said earlier, the first

well out here was drilled in 1926. These are all wells that were drilled in the 1920s. And somehow over the past 75 years, Mr. Gum has let some of this information not be found down there in the Division Office. There's nothing in the files on these wells. We've searched the Melrose files, they don't have anything on the wells that they operate.

And this is just a list of wells where, in some cases we don't even know what casing was ran, sacks of cement pumped or anything like this. And what we would propose -- But several of these wells have been plugged, and you can see that under the "Type" or "Status", they've been P-and-A'.

And what we would suggest on these wells is to run a bond log and determine the actual top of cement. And if the cement does not cover the injection zone, Melrose then would go in -- and the bulk of the wells that are still active or inactive are Melrose wells, most of them are going to be utilized in the flood in some capacity. But --

Q. For those wellbores that Melrose has control, you have a course of recommended action for those wells?

A. That's correct.

Q. What are you going to do about wells that you don't operate or control?

A. There's not much we can do.

Q. But they're as listed as wells where we don't have data?

A. Let me look here.

Q. For example, on the bottom of page 2, the second one up from the bottom, this Maloney-Chambers well, says it's P-and-A'd. We don't have any data on it, right?

A. That's correct.

Q. All right.

A. That's correct.

Q. Well, we'll just have to defer to the Examiner to decide how he wants to recommend we handle those wellbores, I guess.

And what else can you do, Mr. Lee?

A. We would -- Well, like I said, on the wells that they control, we want to see where the top of cement is and take care of that situation. But on the other wells, particularly these P-and-A'd wells, we're going to have some evidence showing, you know, data that we believe that the -- even though that we don't know where the casing is or the cement used -- data that we believe that it does protect the fresh water and prevents migration of fluids within that wellbore.

And there's one of those wells that creates a problem too, but we'll discuss that once we get there.

Q. So at this point, Melrose as operator would have a substantial burden and perhaps the inability to achieve compliance if it's required to take action --

A. Absolutely.

Q. -- on wells that are beyond its control?

A. That's correct.

Q. Let's turn to another topic. Let's turn to whether or not you have examined in the population of wells to identify any well that potentially does not have adequate surface casing or cement to isolate that wellbore so that fresh water is protected. Do you have a table that shows those types of wells?

A. Well, we did late last night.

Q. It didn't get in your book. How about those two sheets?

A. Okay.

Q. All right, sir, I've handed you a two-sheet table that's identified as what, sir?

A. This identified as wells without surface pipe.

Q. And that's your work product, is it not?

A. Yes.

Q. You've gone through all these wells, and these are the ones that pop up to have potential concerns about surface pipe?

A. That's correct.

Q. All right.

A. And on this -- to help you locate them, we put what page the were on and a little bit of information on the various wells. These wells don't appear to have had surface pipe ran, and we have recommended action for each of these wells, these eight wells on this list.

And the first well, the N.G. Phillips, we feel like no action is necessary. That well has been plugged. We feel like it's adequate to protect the fresh water.

The Marbob Walker 2 well has cement to surface. We feel like there's no action to be taken there.

The Melrose Number 11, the calculated top of cement is at 900 feet, protects the fresh water, it's above the injection interval, so no actions there.

The Well Number 44, I think it also had a calculated top of cement, didn't have it on the comment.

But there's still three wells that are shown to be inactive that we don't have any information on. The very last well is plugged. On those three wells, what we would propose -- once again, these are Melrose wells so the operator is able to deal with them -- we would go out and dig out the wellhead and see if there is any surface pipe present. If there is surface pipe there, then we make the assumption that the fresh water will be protected.

The second page of that section on wells without

surface pipe, you know, if we find out that there is no surface pipe there when you dig down around the wellhead and no surface pipe, then what we would propose is to run a bond log and see where the top of cement is and see if it protects the injection interval, make sure it covers our injection interval. And if it does, we feel like, then, the fresh water is protected. And if it doesn't, then we would treat it as a well that didn't have the injection interval covered, we'd squeeze cement across there to cover that injection interval.

Okay, on Well Number 44, looking back at my handy-dandy list of wells, the calculated top -- or actually the measured top of cement in that well was 1512. the well had been squeezed with cement and a temperature survey was run showing the top at 1510. I think it's 1512, but it's 1510.

Q. All right, we've got 1510, and that's the measured top --

A. Yes.

Q. -- and the Melrose 44 well is going to be on page 16, I believe, instead of 17, so that's the only correction I see.

All right, let's turn your attention, Mr. Lee, to a different topic. Let's deal with the population of wells in the area of review that have been plugged and abandoned.

A. Okay.

Q. When we look through that population, do you see any wellbores that have not been plugged in such a way as to isolate the unitized interval from any potentially productive hydrocarbons in other formations?

A. What we see is that these wells -- all except for one that we could not find a plugging report on -- all these wells have been plugged, and we believe the plug to be sufficient to protect any migration of injection fluid into fresh water or any other productive zones.

Out in this particular area where we are with our unit there doesn't appear to be any higher productive zones in our unit area there, once you get out of our Loco Hills or once you get out of our unitized interval, up the hole.

Q. You currently conduct injection operations in the unitized interval in proximity to plugged and abandoned wells?

A. That's correct.

Q. That's been going on for how many years now?

A. Almost 40 years.

Q. And have any of those wells been problem wells up to now?

A. No, they have not.

Q. Let's direct your attention to the one well for which there was no plugging report. You've got an

individual spreadsheet --

A. Uh-huh.

Q. -- and it's captioned "Plugged wells with issues", and it shows the Maloney-Chambers well.

A. Yes, it does.

Q. What are you showing and what are you recommending?

A. This is a well that was -- it looks like it was drilled and probably plugged back in the 1920s.

Q. Let's find it on the locator map --

A. Yes.

Q. -- the area-of-review map. Show us where that well is.

A. It's going to be over here in Section 4, in Unit Letter H. There in the southwest portion of that quarter section it says Maloney-Chambers on the well. As you can see, it's almost out of my area of review. It's 400 feet away from the edge of my half-mile radius.

On this particular well we would submit that no action is required on this well because, one, we are almost outside of the area of review. This is an area, as you can see, where there's no other producing wells, so it's a tight, nonproductive area of the reservoir and not a part of this current phase of the project. But eventually there will be producing wells that would be drilled between the

proposed injection well, which would be 44 and 57, and the Maloney-Chambers Number 1.

Q. Those wells aren't shown on this display, are they?

A. No, they're not. Yeah, this is just, you know, knowing what the future of the grand scheme of the project will be.

Q. Let me make sure I understand.

A. Okay.

Q. The closest injection well to the Maloney-Chambers would be the Melrose 44 --

A. That is correct.

Q. -- and the Melrose 57?

A. That's correct.

Q. All right.

A. And the 44 is an active injection well now, and has been since 1967, and it's been injecting for, like I say, nearly 40 years, and there has not been any problem there at this time.

Q. Is the timing of the Melrose 57 to the south such that you'll have additional producers between that injector and the Maloney-Chambers well at the time you commence injection into the Melrose 57?

A. Probably not, no. The additional producers would be drilled, once these pilot areas prove up the success of

the infill drilling of the project. And once that occurs, then further development would take place, but eventually in the long-term plan there would be a producer between those two injectors and that plugged well.

But still, like I said, the Number 44 is an active injector now, and we have no problems there.

Q. Let me direct your attention, Mr. Lee, to the last category.

A. Uh-huh.

Q. To provide the Examiner an opportunity to not to look at all 200 wells individually --

A. Uh-huh.

Q. -- have you given him a spreadsheet that shows the wells that are affected, should he disagree with your opinion about the appropriate efficiency --

A. Yes.

Q. -- of the calculation?

So if he chooses to reject your conclusion and go with a 50-percent cutoff, what wells then become problem wells?

A. The list where at the top of the page it says "50% risked". There's seven wells that would drop out where the top of cement wouldn't cover the injection interval if we use a 50-percent efficiency factor instead of the 75.

Q. And it's your recommendation not to use the 50-percent reduction in the volumetric calculation?

A. That's correct.

Q. And based upon your analysis, the appropriate reduction percentage to use in the volumetric calculation is again what, sir?

A. Seventy-five.

MR. KELLAHIN: That concludes my examination of Mr. Lee. At this point, Mr. Examiner, we would ask you permission to admit Melrose Operating Company's Exhibits 1, 2 and 3.

EXAMINER CATANACH: Exhibits 1, 2 and 3 will be admitted as evidence.

Mr. Feldewert?

MR. FELDEWERT: I just have one question, or maybe two.

EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Lee, that last exhibit, I don't have that in front of me, but of the seven wells that dropped out if you use a 50-percent --

A. Yes.

Q. -- were any of -- it appears that none of those wells are any of Amoco's Empire Abo Unit wells?

A. That's correct.

Q. Okay. So it's your testimony today that all of the Amoco Empire Abo Unit wells within your bubble area pose no risk to fresh water or other hydrocarbon-producing zones by virtue of your project?

A. Based on my examination and calculations, yes.

MR. FELDEWERT: Okay, thank you.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Lee --

A. Yes.

Q. -- the seven wells that you discussed that do not have top of cement, did you actually use as the -- if the cement covered the top of the injection zone, or was that the top of the injection zone for those thrown out, or did you use some footage above the injection zone?

A. I looked at the top of the injection zone.

Q. Okay, so if the cement was at the top of the injection zone, then they did not appear on this list? If it was at or above?

A. That's correct. That's correct, that's correct. These are the wells where the top of cement would be below the top injection interval, would be below the Loco Hills.

Q. Would you recommend that we do not use any kind of safety factor above the top of the injection zone to have cement in these wells, or would you recommend that if

you have cement right at the top of the injection zone it's adequate?

A. I see. There needs to be some coverage of some sort, and generally if my calculations showed 10 to 15, 20 feet of coverage, I called that good, that's a well I'm not going to have to go in and stimulate or anything, as far as containing the fluids within that zone. And one of my reasons for that gets back to the issue that that top of cement, whatever it is today it's been that way for the last 40 years, and we're in the midst of an injection project that's been going on for the last 40 years. That's a fact.

And it's also a fact that we have a freshwater well out there -- you'd asked Ann where it was; I'll tell you. It wasn't on this map. Actually, when I go out to the State Engineer's website they show no freshwater wells within the area, but we did a visual field inspection and found one lone windmill out there. It's over here by Well Number 89 in Unit Letter J, Section 35, kind of down in the southwest southwest corner, pretty much right next to the Well Number 89 that Melrose has, or that wellspot Number 89.

And as we look at the water analysis that we've got from that well -- and there's no other freshwater wells out there -- and as we look at the water analysis, it has

fluorides about 4800. The man uses it to water his cattle with. The thing's been going on for 40 years, so if there has been a problem out there, we should have seen it.

And so like I said, if I'm calculating my top of cement and I'm showing the zone to be covered, even though minimally or marginally, based upon the evidence I have here, I have to say that we're protecting the fresh water.

Also, you're going to have surface pipe in these wells. Except for the few on our list here where we show that we don't have surface pipe, all those were protected. There's about three that are unknown quantities out there right now. But still, we feel like we're protecting the surface, the fresh water, based upon the facts.

Q. Okay, let's talk about what your knowledge is regarding past problems out there. Do you know if we have seen any waterflows in any of these wells?

A. No, I don't. I -- No, I don't, and I don't know the history of casing leaks or things of that nature either.

Q. So when you say you haven't seen any evidence, you just don't know if there's any evidence of problems out there?

A. That's correct. But I do know my freshwater well is still 4800.

Q. Have you been involved in any recent drilling

operations out there?

A. I have not.

Q. Okay, so you don't know if any of these potential zones that water may migrate into is charged up at all?

A. No, I don't. In talking with Mr. Beilman, Tony has not indicated that he's experienced any problems, at least he hasn't told me, but I don't know that for a fact.

Q. Okay. Now, you say this has been going on for 40 years, but you're actually going to change things up, you're going to add new injection wells, you're going to perforate, I assume, injection wells in zones that may have not been perforated before, so you're going to change an awful lot of things out there; is that correct?

A. Well, we'll change some things. All the zones that we will be perforating have been perforated to some degree in scattered areas, not as much of a blanket as what we're going to propose. But with some of that original work from those scattered recompletions, that really kind of opens this thing up to the potential of having a lot more reserves out of those upper zones, Loco Hills and Metex.

Q. Now, is it the Metex that's the most prolific or the Premier?

A. The Premier --

Q. The Premier.

A. -- was the main interval, and that's what everything is completed in out there, is the Premier.

Q. Okay, and the Premier is the --

A. It's at the bottom of the Grayburg.

Q. Okay, it's at the bottom.

A. Yeah.

Q. So in some of these injection wells that you plan to convert or work on, you're going to add perforations above the Premier?

A. That's correct, in the Metex and Loco Hills.

Q. Okay, so -- What's the footage difference between those intervals, Mr. Lee? Between, say, the Loco Hills and the Premier? Is that very much or --

A. Well, I think it's a couple hundred feet. I have a -- let's see here, I have a log to look at. This particular well, the Loco Hills, came in at about 1900 feet, and the Premier is about 2420, so it's about 500 feet from my top of the Loco Hills down to the top of the Premier.

Q. Now, when you determined whether or not the cement was above the injection zone, you did use the Loco Hills --

A. Absolutely.

Q. -- the top of the Loco Hills?

A. That's correct, I used the Loco Hills.

Q. Let's talk about the fresh water out here. Now, you say there's only one freshwater well.

A. That's correct.

Q. And do you know what depth that is?

A. Not exactly. In talking to the rancher, he believes it's about 180 feet. Like I said, the State Engineer had no information on this well, and the State Engineer on their website show no fresh water anywhere in this area.

Q. So you don't know whether or not the fresh water that's present in this area -- is it continuous over the whole unit or is it scattered? You don't know?

A. I don't know.

Q. Tell me about potential producing zones above the Grayburg and the Queen. Is the Seven Rivers, Yates, are those zone productive in this area?

A. The Yates is not. There is some Seven Rivers production, I think it's in 27-34. I'm not exactly sure where those wells are located at. I believe that there are some shallower horizons producing over there. There's not anything here that we're producing out of.

Q. Is that Seven Rivers gas production or oil production?

A. It's oil, thick oil. I think it's around 700 or 800 feet.

Q. What is your assessment of any risk involved in this water getting into a Seven Rivers zone or a Yates zone and causing any harm to those producing formations?

A. Well, like I said, I believe the cement will contain the water into the injection interval, so water shouldn't be able to get up into the Seven Rivers.

And you know, that's also -- sometimes we look at this as though -- and you have to look at where the water may potentially go, but these zones are historically very tight, and they won't even produce unless you frac them. So if you have a well that did have water get back in there, I guess I'd really question how much would even -- without a lot of pressure, would even go into an unfrac'd, unstimulated interval in these type Permian sands.

Q. Okay, on the P-and-A'd wells, you're recommending that no action be taken on the Chambers well?

A. Yes, sir.

Q. And that's based on the fact that -- Go ahead.

A. I'm sorry, it's almost -- It's 400 feet short of being outside of my radius of investigation. It's in a very tight, nonproductive part of the reservoir, and it just hasn't presented a problem at this point in time. We don't believe that additional injection into the upper zones or conversion of the 57 would adversely affect it.

Q. Do you know at this point where the producing

well is going to be located?

A. What I had proposed to Melrose in my development plan would be that the producing well be about halfway in between the 44 and 57, and halfway between those wells and the Unit Letter I -- I mean in the section line. So it would be kind of in the east -- kind of in the northwest quarter of this quarter section, which would be Unit Letter L, so it would be kind of like a triangle there, because the well is here and then the producer over here.

Q. Okay, now you say you've proposed that. There's no definite plans to drill that well at this point?

A. That's correct, it hasn't been staked.

Q. Wells without surface pipe, you've identified three wells that you propose to dig up the wellhead, check for surface casing and if surface casing is present you would assume that the water is protected?

A. Yes.

Q. Is it your experience out here that generally -- or what percentage of the surface casing was cemented on these wells?

A. Based on our sheet here, almost -- probably 99, 98 percent. There were -- I think I found one well where they had the surface pipe set, and it was included on this list. I think that well may have been subsequently P-and-A'd.

Q. So that would be a fairly safe assumption, to assume that it was cemented?

A. Yes.

Q. Okay. On the old wells that you've identified, now, did you identify -- how many of those wells?

A. There were 21 of those wells. Nine of those have been P-and-A'd, and 12 are either listed as inactive or active.

Q. Okay, and you did identify some that you would run a bond log on?

A. Yes, and the reason for that is, some of them showed where they had casing set, at what depth, but none of them showed the sacks of cement pumped. I take that back. There was one well that showed the -- had sacks of cement, and there was another well that was squeezed and has a temperature survey on it. But the bulk of them didn't report the sacks of cement used. So on those wells what we would propose is to run a bond log, determine where that top of cement is, and squeeze enough cement to cover the injection interval adequately.

Q. Which of these wells are we talking about, Mr. Lee, on these --

A. I'm sorry.

Q. -- there are --

A. Okay, the wells that you'd probably want to do

something with are listed as inactive. If they're P-and-A'd, we feel like they're taken care of. If they're listed there as the status being active or inactive, these are the wells that we need to check out and have a bond log ran on them.

Q. So I've got about ten of those?

A. Yes, sir.

Q. Okay. The other category, the BP wells --

A. Yes.

Q. -- now, you've got some additional data that you got from BP Amoco?

A. Yes, we did. And this is a table that was really kind of more for my own education here. It's where I was keeping track of wells where I had concerns with -- and for your purposes it may not adequately -- it doesn't adequately express why I was concerned, because I had calculated tops of cement over there which were very low, and as I got additional data from BP and saw that they either had a top or they circulated cement, I deleted out my number of my calculated top and input the actual measured top or the current top.

Q. So you're confident with the additional information you got from Amoco that these wells are not a problem?

A. That's correct.

Q. When I go through this and I find a cement top that is -- What is the range of the injection zone? Is it -- What's generally the top and bottom of the injection zone?

A. Yeah, let's see if we have anything above 1900 feet. It looks like about -- Mr. Examiner, I don't -- it looks like about 1900 feet is the highest point of the Loco Hills, and most of them are down below that.

Q. Okay.

A. And it, like I say, varies across the field.

Q. One of the problems I can see when I go through this is, if I look at a top of the cement on a particular injection well, I'm not going to be able to identify where the top of the injection zone is.

A. Okay, I can help you with that. I've got a stick diagram that I created of all the Artesia Unit wells where I've marked the top of the Loco Hills, the Metex, the Premier, where I have it by depth and how that varies across the field. Let me make you a copy of this, and --

Q. That would be very helpful.

A. -- that way you don't have to rely upon your extraordinary powers to discern.

Q. Great. Let me ask you about the -- The WFX Order 768 had a reference to a -- on the G 38 well --

A. Yeah.

Q. -- Mr. Ashley had put a reference in there to 1700 feet. Do you know why he put 1700 feet in there?

A. No, I do not. I was really kind of brought in after Ann had been dealing with Mark on that, and I'm not sure exactly where the 1700-foot number came from with Mark.

Q. Okay.

A. And Ann may know that.

MS. RITCHIE: I never knew why. I think he was --

MR. KELLAHIN: Hang on, wait.

Q. (By Examiner Catanach) Okay, let me ask you about the HYS-400 cement that you talked about.

A. Yes.

Q. Do you know how the compressive strength compares to conventional Class C or anything else, or do you know what the properties of this cement are?

A. Nothing other than what is shown on the BJ handbook, and I tried to get some manuals, additional brochures. I tried to get ahold of the -- I got ahold of the petroleum museum. They keep a lot of older records and, you know, stuff that's donated to them, and they did not have anything. I found this -- You know, actually it was an old BJ hand that I was talking with. He looked back in one of his old handbooks and found this.

I don't know what the -- how the compressive strength ultimately gets to. If -- You know, according to this table the compressive strength, you know, is probably not as much as the other cements that are used, but I don't know what its ultimate compressive strength is.

Q. Do you know why it was used out here?

A. To cover the injection interval out here. Whenever BP Amoco was -- or ARCO at that time or the various operators were drilling these wells back in the 1960s, they were aware that this shallow horizon was there and producing, and they knew they had to cover it with cement. And so that was the product that was used at that point in time to do so.

Nowadays they're using DV tools set at about 3000 feet, moving cement across the injection interval. But that wasn't done in the 1960s.

Q. Mr. Lee, do you have an opinion as to whether this HYS-400 cement has sufficient properties to adequately protect these wells from fluid migration?

A. Well, I -- Once again, I believe that it does. Otherwise over the last 40 years we would have seen problems with water flows at the surface and things of that nature. It's probably not what you and I would like to use today, but it looks like that it is adequate from that standpoint, that their project's been going on for a long

time and there doesn't seem to be a lot of problems that have occurred because of it.

EXAMINER CATANACH: Okay, I have nothing further of this witness.

MR. KELLAHIN: With your permission, we would like to continue the case to September 20th, and we'll have Mr. Lee duplicate the stick cross-section so that you can see where the top is as it moves from the reservoir. If there is some other way we can display his data off of his database to save you the effort of trying to find a calculation, we'd be happy to do that.

If in your judgment there needs to be a minimum overlap of the Grayburg despite the absence of production above the Grayburg, let us know and we will generate that list for you, so we want to accommodate or minimize the efforts you have to devote to this project. So if there's questions, we will try to answer them for you.

EXAMINER CATANACH: Okay, we might want to let Ms. Ritchie answer the question that she -- that was posed earlier.

MR. KELLAHIN: Would you stand so you can be heard, Mrs. Ritchie?

MRS. RITCHIE: This is from correspondence in the process of providing data to Mark Ashley and his subsequent reply to me. He did fax to me a proposal, a proposed

permit, and within it he did state that it would be necessary to determine the top of cement when the 5-1/2-inch casing string is above approximately 1700 feet, and I do not know where he came up -- or where he determined that benchmark at 1700 feet.

EXAMINER CATANACH: Okay, thank you, Ms. Ritchie.

Mr. Kellahin, in the meantime you might be working on a draft order that would focus on what Melrose has proposed today in terms of which wellbore they propose to work on and what they propose to do with that, just so that's clear on the record, that would probably be helpful to me.

MR. KELLAHIN: All right, we'll certainly do that.

EXAMINER CATANACH: Okay, with that we'll continue this case, 12,709, to the September 20th hearing.

(Thereupon, these proceedings were concluded at 11:30 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 12709, heard by me on September 6 2001.

David R. Catanach, Examiner
Oil Conservation Division

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 September 9th, 2001.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002