

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

ORIGINAL

Application of Alamo Permian Resources, LLC for
Reinstatement of a Waterflood Project for its West
Artesia Grayburg Waterflood Unit Area and
Qualification of said Project for the Recovered Oil
Tax Rate Pursuant to the Enhanced Recovery Act, Eddy
County, New Mexico.

Case No. 14611

March 17, 2011
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Santa Fe, New Mexico

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HEARING EXAMINER: WILLIAM JONES

DAVID BROOKS, Esq.

For The Applicant:

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1 (Note: In session at 9:22.)

2 HEARING EXAMINER JONES: Let's continue
3 this morning and call Case 14611, Application of
4 Alamo Permian Resources, LLC, for Reinstatement of a
5 Waterflood Project for its West Artesia Grayburg
6 Waterflood Unit Area and Qualification of Said
7 Project for the Recovered Oil Tax Rate Pursuant to
8 the Enhanced Oil Recovery Act in Eddy County, New
9 Mexico. Call for appearances.

10 MS. MUNDS-DRY: Good morning, Mr.
11 Examiners, Ocean Munds-Dry with the law firm of
12 Holland & Hart, LLP representing Alamo, LLC, and I
13 have three witnesses this morning.

14 HEARING EXAMINER JONES: Any other
15 appearances? Stand and state your names.

16 (Note: Witnesses comply.)

17 MS. MUNDS-DRY: With that, I would call
18 Mr. Woodruff.

19 TYLER WOODRUFF
20 after having been first duly sworn under oath,
21 was questioned and testified as follows:

22 EXAMINATION

23 BY MS. MUNDS-DRY

24 Q. Would you please state your full name for
25 the record?

1 A. Tyler Woodruff.

2 Q. Where do you reside?

3 A. Katy, Texas.

4 Q. By whom are you employed?

5 A. Alamo Permian Resources.

6 Q. What's your position with Alamo?

7 A. I'm a senior landman.

8 Q. Have you previously testified before the
9 Oil Conservation Division?

10 A. I have not.

11 Q. Would you please review your education and
12 work history in the examiners?

13 A. I graduated from the University of
14 Oklahoma with a degree in energy management in 2004.
15 In the spring of 2004 I went to work for Cabot Oil
16 and Gas Corporation. I was employed with them until
17 the summer of 2010, at which point I went and
18 started work with Alamo Permian Resources.

19 Q. Mr. Woodruff, what do your duties include
20 as a senior landman with Alamo?

21 A. I am in charge of all land functions for
22 the company.

23 Q. As part of those duties and functions are
24 you responsible for the permian basin in southeast
25 New Mexico?

1 A. Yes.

2 Q. And including this waterflood project
3 area?

4 A. Yes.

5 Q. Are you familiar with the application
6 filed in this case?

7 A. Yes.

8 Q. And are you familiar with the status of
9 the lands in the subject area?

10 A. Yes.

11 MS. MUNDS-DRY: Mr. Examiner, we would
12 tender Mr. Woodruff as an expert witness in
13 petroleum land matters.

14 HEARING EXAMINER JONES: Is Cabot, was it
15 mostly Oklahoma?

16 THE WITNESS: Texas, Louisiana and
17 Mississippi.

18 HEARING EXAMINER JONES: So you have had a
19 lot of experience in different states in a hurry.

20 THE WITNESS: I did; yes, sir.

21 HEARING EXAMINER JONES: He is so
22 qualified.

23 Q. (By Ms. Munds-Dry) Mr. Woodruff, briefly
24 summarize what Alamo seeks with this application.

25 A. The reinstatement of a waterflood project

1 within the West Artesia Grayburg unit are and
2 qualification of the project for incentive tax rate
3 authorized by New Mexico Enhanced Oil Recovery Act.

4 Q. Thank you, Mr. Woodruff. If you turn to
5 what's marked as Alamo Exhibit 1, and give us all a
6 chance to get it open, and identify and review that
7 for the examiners.

8 HEARING EXAMINER JONES: You say that you
9 can tell whether someone a geologist or not whether
10 they can open a map and fold a map. Obviously, we
11 didn't make it.

12 Q. Now that Mr. Jones has that in front
13 of him, if you could review for him what's on the
14 map?

15 A. The dark black dashed outline in the
16 middle of the unit is the West Artesia Grayburg
17 unit. It's a 640-acre unit. Within that unit there
18 are black triangles which represent the locations
19 for the injection wells in the unit. There are
20 black circles representing the producing wells in
21 the unit and then black circles with dash lines
22 through them represent the plugged and abandoned
23 wells within the unit. The red circles represent
24 the half-mile radius around each one of the
25 injection wells.

1 Q. And Mr. Woodruff, before we move on from
2 this exhibit, if you could more particularly
3 identify the injection wells for the examiners.

4 A. The West Artesia Grayburg Unit No. 1 is in
5 the northeast quarter of the northwest quarter of
6 Section 8. The west Artesia Grayburg Unit No. 4 is
7 in the southwest quarter of the northwest quarter of
8 Section 8. The West Artesia Grayburg Unit No. 6
9 injection well is in the southwest quarter of the
10 northeast quarter of Section 8. The West Artesia
11 Grayburg unit No. 12 is in the northwest quarter of
12 the southwest quarter of Section 8. The No. 13 is
13 in the northeast quarter of the southeast quarter of
14 Section 7, and the No. 18 is in the northwest
15 quarter of the northwest quarter of Section 17.

16 Q. What is the character of the land in the
17 unit area?

18 A. It is made up of 81.25 percent state
19 minerals and the remainder is 18.75 percent fee.

20 Q. What is the working interest ownership in
21 the unit?

22 A. Alamo has 100 percent working interest.

23 Q. Thank you, Mr. Woodruff. If you would
24 turn to what's been marked as Alamo Exhibit No. 2.
25 Is this the notice packet including affidavits

1 signed by me indicating that proper notice was given
2 of this hearing, the affidavit of publication, the
3 notice letter that was sent to all affected parties
4 and the list of parties that were notified, and then
5 finally the green cards that were sent evidencing
6 notice to each of the parties?

7 A. Yes, ma'am.

8 Q. And Mr. Woodruff, if you could tell the
9 examiners who did we give notice to of this
10 application?

11 A. We gave notice to all leasehold operators
12 within a half-mile radius of each of the injection
13 wells as well as the surface owner where each of the
14 injection wells were located.

15 Q. Thank you. Were Exhibits 1 and 2 either
16 prepared by you or did you assist in the preparation
17 of each of the exhibits?

18 A. Yes, ma'am.

19 Q. And with that, Mr. Jones, we would move
20 the admission of Exhibits 1 and 2 into evidence.

21 HEARING EXAMINER JONES: Exhibits 1 and 2
22 will be admitted.

23 (Note: Exhibits 1 and 2 admitted.)

24 HEARING EXAMINER JONES: What formation
25 are we talking about?

1 THE WITNESS: Grayburg.

2 HEARING EXAMINER JONES: Is the Grayburg
3 leased, completely leased within these circles by
4 people -- you said you noticed all the offset --

5 THE WITNESS: We notified all the offset
6 leasehold operators regardless of whether or not it
7 was Grayburg.

8 HEARING EXAMINER JONES: Okay. When you
9 say leasehold operators, you mean that you noticed
10 everybody that had the lease in the Grayburg or was
11 an operator of a Grayburg well; is that correct?

12 THE WITNESS: Every one of every well.
13 Regardless of whether it was Grayburg, we notified
14 them.

15 HEARING EXAMINER JONES: Okay.

16 MS. MUNDS-DRY: Mr. Jones, that's the
17 funny language that's in the rule, leasehold
18 operators.

19 HEARING EXAMINER JONES: Yeah, it says
20 leasehold operator and, you know, if there's no
21 Grayburg well on a 40-acre tract, then you drill
22 down to where the lease -- whoever leased the
23 Grayburg.

24 MS. MUNDS-DRY: That's correct, Mr. Jones.
25 So what they did is they notified -- if there was an

1 operator, they notified the operator. If there was
2 not an operator, they notified the lessee.

3 HEARING EXAMINER JONES: That's the
4 language I understand.

5 MR. BROOKS: What about Chevron-operated
6 acreage?

7 HEARING EXAMINER JONES: This is Alamo.
8 You mean Chevron --

9 MR. BROOKS: Chevron is the applicant?

10 MS. MUNDS-DRY: No, that was the last
11 case, Mr. Brooks.

12 MR. BROOKS: I'm looking at the wrong
13 case. Okay. What about Alamo Permian-operated
14 acreage? Did you notify any working interest owners
15 within the operated acreage?

16 THE WITNESS: We notified everyone who had
17 a working interest within a half-mile radius of the
18 injection wells.

19 MR. BROOKS: Thank you.

20 HEARING EXAMINER JONES: This unit, is
21 it -- is this the waterflood outline or is this the
22 unit outline?

23 THE WITNESS: The unit outline is the
24 waterflood outline.

25 HEARING EXAMINER JONES: The same? Okay.

1 That was the way I should have asked the question.

2 Okay. This unit was originally created as an
3 exploratory unit; is that correct?

4 THE WITNESS: In 1967 it was created as a
5 waterflood unit.

6 HEARING EXAMINER JONES: It's a statutory
7 unit?

8 THE WITNESS: It was created by the
9 lessees and approved by the State.

10 HEARING EXAMINER JONES: Okay. Does it
11 consist of separate tracts that have participating
12 parameters?

13 THE WITNESS: It consists of eleven
14 different leases.

15 HEARING EXAMINER JONES: Okay. And Alamo
16 is 100 percent working interest?

17 THE WITNESS: Yes, sir.

18 HEARING EXAMINER JONES: And they obtained
19 it from someone else recently; is that correct?

20 THE WITNESS: Yes, sir.

21 HEARING EXAMINER JONES: Who was that?

22 THE WITNESS: Doral.

23 HEARING EXAMINER JONES: I have no more
24 questions.

25 MR. BROOKS: You said Alamo is the 100

1 percent working interest owner?

2 THE WITNESS: Yes, sir.

3 MR. BROOKS: All tracts within the unit
4 are committed to the unit?

5 THE WITNESS: Yes, sir.

6 MR. BROOKS: Now, when you are doing your
7 offsets, did you draw -- you drew your area of
8 review line around wells and did you notify the
9 owners within every tract, that is within the
10 circles of the area of review circles?

11 THE WITNESS: Yes, sir.

12 MR. BROOKS: Does Alamo operate any area
13 outside the unit within the area of review?

14 THE WITNESS: Yes, sir. We also
15 highlighted acreage that we have surrounding the
16 unit where we also have interest.

17 MR. BROOKS: Okay. And you notified any
18 other working interest owners in those tracts?

19 THE WITNESS: Yes, sir.

20 MR. BROOKS: Thank you.

21 HEARING EXAMINER JONES: In some cases we
22 have people, for a unit like this, in order to speed
23 it up in the future, they notify everybody within a
24 half-mile of the unit boundary and that way they can
25 convert other wells to injection without another

1 area review notice, I guess. But in other words,
 2 it's a little quicker that way. But in other words,
 3 if your engineers want to convert a well, let's say,
 4 up in the northwest of Section 8 or so, then we
 5 would have to draw another circle. That's fine, you
 6 know. What you did is great. Thank you very much.
 7 We have no more questions.

8 MS. MUNDS-DRY: That concludes my
 9 examination of Mr. Woodruff.

10 THOMAS EUGENE FEKETE
 11 after having been first duly sworn under oath,
 12 was questioned and testified as follows:

13 EXAMINATION

14 BY MS. MUNDS-DRY

15 Q. Good morning.

16 A. Good morning.

17 Q. Would you please state your full name for
 18 the record?

19 A. Thomas Eugene Fekete.

20 Q. Mr. Fekete, where do you reside?

21 A. Midland, Texas.

22 Q. And how are you employed?

23 A. I'm a partner in my own company called
 24 Jordan-Rubicon Resources.

25 Q. What is your relationship to Alamo?

1 A. I am a consulting geologist for Alamo on
2 their New Mexico properties.

3 Q. And have you previously testified before
4 the Oil Conservation Division?

5 A. No, I have not.

6 Q. If you would, please, for the examiners,
7 review your education and work history.

8 A. Okay. I received my bachelor of science
9 degree in geology in 1983 from State University of
10 New York at Stonybrook. I received my master of
11 science degree in geology from University of
12 Wisconsin at Madison. I worked at the Wisconsin
13 State Survey from about '86 to 1988.

14 In 1988 I joined Atlantic Richfield Arco
15 and worked in Midland with Arco from 1988 to 2000.
16 In 2000 BP bought Arco, offered us jobs in Houston.
17 Another geologist and I said no thank you, so we
18 started our own little shop in Midland that we call
19 Jordan-Rubicon Resources.

20 Q. Do you have any certifications or
21 registrations as a geoscientist?

22 A. Yes, I'm a certified petroleum
23 geoscientist in the states of Texas and Wyoming.

24 Q. Are you familiar with the application
25 filed by Alamo in this case?

1 A. Yes, I am.

2 Q. Have you made a geological study of the
3 subject lands for the unit?

4 A. Yes, I have.

5 MS. MUNDS-DRY: We tender Mr. Fekete as an
6 expert witness in petroleum geology matters.

7 HEARING EXAMINER JONES: You have the same
8 name as a commonly used software.

9 THE WITNESS: Right, Tibor. No relation,
10 unfortunately.

11 HEARING EXAMINER JONES: He is so
12 qualified.

13 Q. Have you prepared exhibits for
14 presentation in this case?

15 A. Yes, I have.

16 Q. Let's turn first then to what's been
17 marked as Alamo Exhibit 3. If you can identify and
18 review this for the examiners.

19 A. Okay. Gentlemen, may I approach your
20 table? It might be easier if I can point things
21 out, if that's all right. Easier for me.

22 Q. As long as the court reporter can hear
23 you.

24 A. This is our Exhibit 3. It's the one you
25 are looking at. It's a little bit more focused map.

1 It's easier to see than this one here. What we have
2 is the WAGU is outlined in the heavy dashed purple
3 line. The acreage is colored in yellow, 640 acres.
4 The wells producing out of the WAGU are colored in
5 red, the red circles here. There are 16 active
6 producing oil wells. The water injection wells
7 which are not currently active but they were
8 injection are shown by the red triangles. There are
9 six of those.

10 In addition, there are five plugged wells
11 shown by these slash marks. There were four plugged
12 oil producers, one plugged water injection well.

13 The question you asked earlier about the
14 other Alamo acreage in here, those are shown in
15 green. These are Alamo Permian-operated leases.
16 They are not part of the water flow.

17 These blue dashed lines here are one-half
18 mile radius circles that are centered upon the six
19 water injection wells.

20 The next map, which is our Exhibit 4 is a
21 stretcher map across the unit area. This is
22 contoured on top of the Grayburg formation. Contra
23 interval is 25 feet, so 100 feet between here and
24 here. What you see is that the Grayburg is really
25 just part of a monoclinal dip. It's high in the

1 northwest dipping down to the southeast. There's
2 about 190 feet of structural dip in this direction.

3 HEARING EXAMINER JONES: What member of
4 the Grayburg?

5 THE WITNESS: The very top.

6 HEARING EXAMINER JONES: Not the pin road?

7 THE WITNESS: No. It's the very top. I
8 will show that on the cross-section for you. Let's
9 see. What you notice or what strikes me is that the
10 Grayburg is not draped over a closure or any kind of
11 a structural node. It's really just more of a
12 monoclinal dip.

13 The other thing is I don't see any
14 bunching of contours or anything here that would
15 suggest that we really have any faulting that might
16 come in and complicate the waterflood injection.

17 My next map --

18 Q. (By Ms. Munds-Dry) Before you leave that,
19 if you could comment also on the number of well
20 controls that you have in that area.

21 THE WITNESS: Thank you, yes. The numbers
22 here associated with the wells indicate where we
23 have well control here as managed to procure laws.
24 What you can see is we really have very good well
25 control over the WAG unit. There's only three

1 wells, I believe -- this one here and maybe this one
2 here -- and there's a third.

3 HEARING EXAMINER JONES: Those are above
4 sea level?

5 THE WITNESS: Yes, they are. It's
6 confusing, isn't it? There are only three wells
7 where we don't have logs so we have very good log
8 coverage so I can go in there and look at porosity
9 and make better interpretation throughout the entire
10 unit. Okay. Thank you.

11 Q. Are you turning now to Exhibit 5?

12 A. Yes. It's the same structure but what we
13 have done here just for ease of looking at the
14 cross-sections is I have replaced the structural
15 contours with the well numbers so these would be WAG
16 unit well numbers. And then I posted on here
17 Cross-section B, which is a west to east
18 cross-section; A to A prime, north to south. Both
19 cross-sections what we see is that there's about 90
20 feet or 100 feet of structural change from one end
21 to the other, but I made stratigraphic
22 cross-sections so keep that in mind that there is
23 this 90 feet.

24 MR. BROOKS: In this case WAG stands for
25 west Artesia Grayburg.

1 THE WITNESS: Yes.

2 MS. MUNDS-DRY: Thank you for the
3 clarification, Mr. Brooks.

4 A. Okay. Anyway, so let's look at
5 cross-section A prime, which would be north/south.
6 What we did is we picked up every one of the
7 injector type wells so we could show where they were
8 perforated and the relationships with the offset
9 wells.

10 Q. Now are you turning to Alamo Exhibit 6?

11 A. Yes.

12 Q. This is really why I want to come up here
13 to point out some things. A north, A south,
14 structurally there's actually 90 feet of dip between
15 here and here. It's a stratigraphic cross-section.
16 This heavy dashed line here is the data that we made
17 the map on.

18 HEARING EXAMINER JONES: Why did you pick
19 that data?

20 THE WITNESS: Because it was the very top
21 of the Grayburg, very reliable pit.

22 HEARING EXAMINER JONES: So that is the
23 top of the Grayburg and it's around 2000 feet?

24 THE WITNESS: Around 2000 feet, yes, sir.

25 HEARING EXAMINER JONES: And the queen on

1 top?

2 THE WITNESS: Yes, the queen overlies
3 this.

4 HEARING EXAMINER JONES: Is it productive?

5 THE WITNESS: This part here, the lower
6 part, this sand right here is also, that's right.
7 What I have done is I've posted also -- this is the
8 West Artesia Grayburg Unit top and bottom
9 designation, and that's what this dashed line is
10 here. So this is the top of the unit, this is the
11 base of the unit. The base of the unit is actually
12 the base of Grayburg/San Andres dolomite boundary.

13 HEARING EXAMINER JONES: But it includes
14 the queen and --

15 THE WITNESS: Yes, it does. That's
16 correct. Up on top, the triangles are the injectors
17 and the round circles are the producers.

18 What I did is I went in here and the whole
19 point of this was to try to figure out what the
20 stratigraphy is between injectors and producers and
21 also look for opportunities. So what you see is
22 looking just at this curve, this gamma ray, you see
23 this coursing upward and then a hot streak.
24 Cleaning upward, hot; clean, hot; clean, hot. Very
25 cyclic.

1 What these represent are very shallow
2 marine dolomites that were deposited across the
3 whole northwest shelf during little periods of
4 flooding and then the shelf either built up to sea
5 level or sea level dropped five feet, ten feet. Not
6 much. And sandstones, radioactive sandstones
7 prorated out across the shelf in very thin layers on
8 their way to the Delaware basin. Those that made it
9 to the Delaware basin became the Cherry Canyon and
10 sandstones, so these are really kind of like lag
11 deposits almost, massive amounts of sands. So we
12 have shallow marine dolomite, sandstone, dolomite,
13 sandstone, dolomite, sandstone.

14 HEARING EXAMINER JONES: Originally
15 limestone, right?

16 THE WITNESS: That's exactly right. Now,
17 looking at the porosity curve, what we see is that
18 in general, and I mean like 95 plus percent, the
19 porosity development is associated with those hot
20 gamma rays. The reservoirs in this unit are
21 sandstone, the radioactive sandstone. Those are the
22 reservoirs.

23 HEARING EXAMINER JONES: Because these are
24 run on a -- they are all run on lime down in this --

25 THE WITNESS: The new logs are run on a

1 limestone matrix. These older neutron logs or open
2 hole neutron did not have a matrix. They were
3 logarithmic. They were matrix-independent. That's
4 right. A lot of these are from the late '50s and
5 early to mid '60s. In fact, there really aren't any
6 modern logs that capture this interval in this
7 entire section.

8 All right. So we did that. Now, having
9 identified those cycles, what we then did is I went
10 through, and this is our Alamo Permian internal
11 stratigraphy. It's not published anywhere. I
12 didn't take this off anybody's work. This is just
13 sort of what I came up with because it captured the
14 major cycles.

15 So we correlated them across and most of
16 the correlation is very easy, very straightforward.
17 There are a couple here and there, individual
18 correlations I could move it up five feet or down.
19 It gets a little tougher. But I would say in
20 general they are very reliable, in my opinion, very
21 easy and very reliable.

22 What it shows is a real layer cake looking
23 kind of unit. What it has is low porosity or no
24 porosity dolomites sandwiched with high porosity
25 sandstone above and below, and that repeats about 12

1 times. So no porosity, good porosity, no porosity,
2 just like that sandwiched in there.

3 Then what we did is we went through scout
4 ticket initial completion data. We went through
5 Alamo's well files that had any subsequent
6 perforations that were added. We searched the OCD
7 well records looking for perforations and posted
8 those on there. So these are our very best job at
9 deciding where these individual wells were
10 perforated and those were shown in the dark black.
11 The solid black are the original perforations.

12 What's interesting is when you start to
13 look at this, you see that there's, first of all, a
14 lot of porosity that was not perforated in most of
15 these wells. Here is a great example. This well is
16 the No. 12. Well, what's wrong with that porosity?
17 This one? That's a beautiful thick streak not
18 perforated. That one looks great. This looks good.
19 This one, that one. Maybe three out of a potential
20 eleven zones were perforated only.

21 We see this again and again. Almost any
22 log you look at you can see that.

23 Q. Which log are you referring to?

24 A. I beg your pardon?

25 Q. Just for the record, which log were you

1 just referring to?

2 A. The 12, the WAG 12.

3 Q. Thank you.

4 A. So we see that. We can pick any other
5 number of examples to show that. The injectors --
6 the other thing is you start looking at what was
7 perforated in the injectors relative to the
8 producers, the offset producers. You find that if
9 this is injecting to these zones, it's producing out
10 of these zones. A couple of zones might match, but
11 in general, it's not very good.

12 For instance, here, the WAG No. 18
13 injector is actually injecting into zones that the
14 offset WAGU 17 producer doesn't even reach. The
15 well TD'd 150 feet above that. Do you see that? So
16 all that water energy was not helping us over here,
17 helping the owner over there.

18 Now, these open perforations that you see
19 that are black outlined boxes there and here, right
20 here, those are perforations that were added from
21 2009 to 2010 as a result of this study. We came in,
22 looked at it and said, "Well, gee, we have got
23 production -- we have perforations in this offset
24 well here and here but we have no injection," so
25 those were added in the last couple years.

1 Q. Would that be for the No. 18 and the No.
2 4?

3 A. Yeah, the 21 producer, the 4 injector.

4 Q. Thank you.

5 A. So that was the intent was to try to perf
6 match or performance match this thing. That was --

7 HEARING EXAMINER JONES: So there's been a
8 lot of work done by Alamo or Doral in the last few
9 years on these?

10 THE WITNESS: Yes. They've added
11 perforations to, I believe, four injector wells.
12 And those are the 18 and the 4, and then the 1 and
13 one other, the 13.

14 HEARING EXAMINER JONES: Were those
15 conversions or new drills?

16 THE WITNESS: No, those were old historic
17 injectors that just more perforations were added to.
18 Anyway, so that's kind of the picture is you start
19 looking at this and boy, there's a lot of oil here
20 that has not been touched.

21 I will show you B quickly. It's the same
22 thing, but I want to get across to you that the
23 north/south picture is the same as the east/west
24 picture. There's no change to the section.

25 Q. Mr. Fekete, are you referring to Exhibit

1 No. 7 now?

2 A. Yes. Same story here. And here is a
3 really good example, I think, of what I was talking
4 about. The WAGU No. 1 historically was perforated
5 in Zones 1 and 2 down there. These were later added
6 by our group. But if you look at the offset well,
7 the WAGU No. 26, look at all these historical
8 perforations that come all the way up in Zones 2, 3,
9 6, 7, 8 and 9. There was no energy there to push.
10 That's the sort of thing we are running into out
11 here. Same thing here. So that's the point.

12 HEARING EXAMINER JONES: Do you have any
13 spectral gamma rays to confirm that the
14 radioactivity is not low permeability?

15 THE WITNESS: Not here. I have seen them
16 in other areas but not in this exact area, no.

17 HEARING EXAMINER JONES: But it's accepted
18 that that is --

19 THE WITNESS: Yes, that's right.

20 Q. (By Ms. Munds-Dry) Mr. Fekete, is it
21 easier for you to be up there or can you return to
22 your seat to explain the last exhibit? What's
23 easiest for you?

24 A. I think it's easier here.

25 Q. As long as that's okay with Mr. Brooks and

1 Mr. Jones.

2 A. I can sit down if you prefer.

3 HEARING EXAMINER JONES: That's okay. One
4 more.

5 THE WITNESS: This is complicated.

6 MR. BROOKS: If it's complicated maybe we
7 better go ahead and take our break. That clock is
8 about five minutes slow.

9 HEARING EXAMINER JONES: We have a very --
10 we are under orders to take a break.

11 (Note: The hearing stood in recess at
12 9:53 to 10:50.)

13 HEARING EXAMINER JONES: We're back on the
14 record in 14611. We will continue with the geology
15 testimony.

16 Q. I believe we were about to start
17 discussion of Alamo Exhibit No. 8.

18 A. Yes. I can try from here if you would
19 like.

20 HEARING EXAMINER JONES: Sure.

21 A. Now, we went through the cross-sections
22 and I think what they showed were clearly that we
23 had very layered reservoirs sandwiched through low
24 porosity dolomites. Twelve different zones, major
25 zones, that I could break out. We also saw there

1 were a lot of zones that had never been perforated,
2 a lot of porosity. To try to put our arms around
3 the opportunity out here we designed this map and
4 this Exhibit 8 map. And basically we have a type
5 log over on the right. That's the WAGU No. 9, the
6 designated unit type log for the West Artesia
7 Grayburg unit and we have, again, the top of the WAG
8 unit interval marked on the log and the base. The
9 base would be the top of the San Andres.

10 On the type log, you will see in red zone
11 numbers 1 through 12, off on the left side of the
12 log. And those zones correspond to 12 little pies
13 in that circle off to the left. What we have done
14 is we went through the cross-section, went through
15 the logs. Where the wells have historically been
16 perforated, we colored in the pie that corresponds
17 to that particular zone number. So Zone Number 1,
18 where that was perforated we colored in green at
19 about 11:00 o'clock position on all of the wells to
20 show that.

21 If I may, this WAGU 27 perforated it. It
22 was perforated in 21, not in No. 2. That's how that
23 works. So we can go back and look at almost from a
24 bird's eye view at what has been perforated. We did
25 the same thing with the water injection wells. We

1 designated it the same way.

2 Then what we did is we looked at the logs
3 and we found where we had porosity that in my
4 opinion was worthy of perforating. Porosity was
5 developed and those zones needed to be added. We
6 designate those by the little red dots that you see
7 all over the map. So, for instance, on WAGU No. 2
8 up here in the northwest, you see a lot of little
9 red dots. That means that all of the zones need to
10 be added, which is seven or eight different zones
11 need to be added to that well.

12 We did the same thing for the injectors.
13 So just looking at the red dots, it's basically an
14 opportunity map telling you up here we need to add
15 ten zones, over here only one or two, over here
16 three. It's a way to prioritize your work. But to
17 me, the message is there are a lot of zones to add.
18 There's a lot of oil that's been left behind, in my
19 opinion.

20 The only other thing to point out is on
21 some of these you will see colored pies with an open
22 black circle on them. For instance, in the WAGU No.
23 1, the water injector in the north there, you will
24 see most of the colored pies have black circles on
25 them. What those indicate are those are zones that

1 were perforated and added in 2009 and 2010 as a
2 result of this work. So those are recent
3 perforations, if you will, as opposed to the
4 historical perforations that are just the solid
5 colored pies.

6 Q. Also are you aware of whether Alamo has
7 any plans to drill additional wells within the unit?

8 A. Yes. I think we do. If you look at the
9 well spacing, you will see that in some of the
10 areas, for instance in the southwest of the
11 southwest, those wells have been drilled on
12 basically a ten-acre spacing. If you look at the
13 WAGU No. 1 in the north, that's a 40-acre -- the 27
14 and the 2 WAGU wells are on a 20-acre spacing. The
15 WAGU 6, 7 and 8 are drilled on a 40-acre spacing.

16 Looking at the porosity, looking at the
17 continuity of it and just how many zones are
18 developing, I believe that we have got -- I can
19 easily find 12 locations that need to be infilled
20 just on this map without really even trying hard.

21 Q. Thank you. And after you reviewed these
22 exhibits for the examiners and the studies that you
23 have made, what geological conclusions can you reach
24 from your study of this area?

25 A. I think the conclusions that I have

1 reached are that the producing reservoir are
2 radioactive sandstones. The sandstones are
3 sandwiched between nonporous marine dolomites that
4 are very continuous. They should provide good
5 compartmentalization for flooding. I think if you
6 inject water into Zone 3 over here, I think you
7 should be able to sleet whatever oil is in Zone 3
8 into this producer here without losing water up into
9 Zone 5 or down into 1. I guess there's going to be
10 good conformance.

11 I think it's very cyclic obviously. I
12 think that historically there's been not much of an
13 attempt to -- not much attention paid to
14 conformance. I think the perforations we saw in the
15 cross-sections clearly show that wells were not
16 really looked at in terms of a whole, they were
17 looked at individually, and with no thought given to
18 what's going on on the other side of you with other
19 wells. The perfs show that, and I think these pies
20 show that, too. If you look at them you can see
21 colors that are perforated in particular wells that
22 are not perforated in offset wells but yet have
23 porosity.

24 Clearly looking at the red dots, we have a
25 lot of zones to add, a lot of money to spend out

1 here, a lot of work to do. And there's a lot of
2 infill locations also. Like I said, at least a
3 dozen that just come to mind looking at it quickly.

4 Q. In your opinion has the reservoir in this
5 area been adequately defined?

6 A. Adequately defined? I think it's been
7 defined but I don't think it's been produced
8 adequately by any means or exploited or however you
9 want to say it.

10 Q. In your opinion will the entire unitized
11 area contribute reserves to the unit?

12 A. Yes, it will. Cross-sections A and B show
13 that with the continuance of porosity east/west
14 north/south.

15 Q. I assume with what you reviewed for us
16 today, is it your opinion that the area is well
17 suited for secondary recovery project?

18 A. Absolutely. I think that cyclic stacking
19 nature makes this an ideal waterflood candidate.

20 Q. Were Alamo Exhibits 3 through 8 either
21 prepared by you or compiled under your direct
22 supervision?

23 A. Yes.

24 MS. MUNDS-DRY: Move the admission of
25 Alamos Exhibits 3 through 8.

1 HEARING EXAMINER JONES: Exhibits 3
2 through 8 will be admitted.

3 (Note: Exhibits 3 through 8 admitted.)

4 MS. MUNDS-DRY: That concludes my direct
5 examination.

6 MR. BROOKS: Just a couple more questions.
7 Even though you are seeing these in a gross sense,
8 you are seeing this porosity, the total porosity,
9 what kind of effective porosity do you think you
10 really have here?

11 THE WITNESS: We have had some wells
12 analyzed by New Tech. Now, these are not modern
13 logs, so we have picked some modern logs a couple
14 miles away that was on trend with this sort of thing
15 that we had analyzed. What we were seeing was the
16 average porosity of the Grayburg sands was about 11
17 to 12 percent porosity in the sandstones. So I
18 would say on modern electric logs, I have seen
19 porosities as high as 18 or maybe even 20 percent
20 occasionally.

21 HEARING EXAMINER JONES: So you are seeing
22 the high porosity and the finds that are in the
23 sands, what kind -- are they amenable to -- you have
24 to be real careful and not swell anything? In other
25 words --

1 THE WITNESS: No, sir. There's not much
2 clay in this. These are feldspathic.

3 HEARING EXAMINER JONES: Say that again.

4 THE WITNESS: Felspar. They have a lot of
5 potassium in them and that's why they are
6 radioactive. They are not quarts, they are felspar.

7 HEARING EXAMINER JONES: They came from
8 granite.

9 THE WITNESS: That's right. A very
10 felspar rich granite. So there's really -- they are
11 not hot because they have clay, they are hot because
12 of the felspar. So swelling is not really an issue
13 here.

14 HEARING EXAMINER JONES: Okay. Even
15 though I know in some of the clean waterfloods
16 there's a lot of iron carryover, and I don't know if
17 they get this out here. And also they have real
18 high injection pressures, and I don't know if this
19 flood does. We can ask the engineer.

20 THE WITNESS: I'm afraid you will have to.
21 I don't know.

22 HEARING EXAMINER JONES: Do you think one
23 reason they skip some of these zones that you have
24 identified is because they ran mud logs on the wells
25 that were drilled?

1 THE WITNESS: It's possible they did. A
2 lot of the wells were drilled in 1957 and '58 and
3 that's really -- to my understanding that's really
4 before fluorescence was used. What people would do
5 is they would take samples in a tray and kind of
6 shake them around, and the way they behaved
7 indicated if they were coated with oil or not. Talk
8 about an art.

9 And so I would say yes, the ones that even
10 had mud logs possibly they missed a lot of zones
11 because a lot of these are very thin zones. They
12 are not 50 foot thick, they are four foot thick and
13 five. So I think it's easy to miss that and
14 distribute it while the samples are coming up.

15 HEARING EXAMINER JONES: Would they have
16 been rotary drilled or --

17 THE WITNESS: Rotary. These were rotary
18 drilled.

19 HEARING EXAMINER JONES: And with these
20 laminated reservoirs, the fractures or the
21 stimulation would be contained in the reservoir
22 pretty adequately, in your opinion?

23 THE WITNESS: I think the ones that are
24 completed with just acid, probably. As the fracs,
25 the sand fracs get larger and larger, then I think

1 we are probably breaking those boundaries and maybe
2 lumping two or three zones together.

3 HEARING EXAMINER JONES: Okay.

4 THE WITNESS: But I have to say also that
5 the treatments in the older wells, the late '50s,
6 those were very small sand treatments compared to
7 what we do today, the big -- the Wolfberry kind of
8 frac. There's no comparison at all. Those
9 treatments, in my understanding, those are really to
10 get beyond damage from drilling the fluids.

11 HEARING EXAMINER JONES: But it's
12 continuous and it's adequate for waterflooding?

13 THE WITNESS: I believe so, yes.

14 HEARING EXAMINER JONES: There has been
15 underwater flooding so you probably looked at that,
16 and compared to your geologic analysis, kind of
17 worked with the actual waterflooding to see if your
18 geology analysis coincides with that?

19 THE WITNESS: Uh-huh. Yes, sir.

20 HEARING EXAMINER JONES: Okay. Well,
21 thank you very much.

22 MR. BROOKS: I have no questions.

23 H. PATRICK SEALE

24 after having been first duly sworn under oath,
25 was questioned and testified as follows:

EXAMINATION

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BY MS. MUNDS-DRY

Q. Good morning.

A. Good morning.

Q. Would you please state your full name for the record?

A. Horris Patrick Seale.

Q. Where do you reside?

A. Houston, Texas.

Q. By whom are you employed?

A. Alamo Permian Resources, LLC.

Q. What is your position with Alamo?

A. Senior vice president.

Q. And have you previously testified before the Oil Conservation Division?

A. No, I have not.

Q. Would you please -- and I'm not sure, Mr. Seale, with your experience, how you have ever escaped testifying before the Division before but let's review your education and experience and background for the examiners.

A. I graduated with a bachelor of science and petroleum engineering from the University of Texas at Austin in 1976. I began my career with Exxon Company U.S.A. and from 1976 through 1989 I held

1 various positions of increasing responsibility with
2 Exxon, the Louisiana Land and Exploration Company,
3 Marlin Petroleum Corporation, Union Texas Petroleum
4 and Fina Oil and Chemical.

5 In 1990 I was named vice president of
6 engineering for Kabot Oil and Gas Corporation, and
7 then in 1993 I joined National West Minister Bank
8 out of London but I was based in Houston as vice
9 president of engineering and head of the engineering
10 for the North American Energy Unit. I continued
11 that until 1997.

12 In November I joined Frontera Resources
13 Corporation. It was a startup independent oil and
14 gas exploration and production company in the former
15 Soviet Union, and I started up our operations in the
16 Republic of Georgia and the Azerbaijani Republic. I
17 left Frontera in October of 2000 to join Concept
18 Energy Corporation and start up a small E & P
19 company in Bogota, Columbia.

20 Then in 2001 in May I was co-founder of
21 SPI Operations, LLC, a private company based in
22 Midland, Texas and served as president of the
23 company until January of 2008. In February of 2008
24 I helped co-found Doral Energy Corporation, a public
25 company based in Midland, Texas and served as

1 Doral's president, chief operating officer and
2 director.

3 In June 2010 when Alamo permian purchased
4 the assets of Doral Energy Corporation, I came over
5 and joined Alamo Permian Resources as senior vice
6 president.

7 Q. And what do your duties as senior vice
8 president include?

9 A. I am responsible for our engineering,
10 evaluations, reservoir engineering and planning and
11 reserves.

12 Q. As far as those duties, does it include
13 overseeing engineering projects in Southeast New
14 Mexico?

15 A. Yes.

16 Q. And for the west Artesia Grayburg Unit?

17 A. Yes.

18 Q. Are you familiar with the application
19 that's been filed by Alamo in this case?

20 A. Yes, I am.

21 Q. Have you made an engineering study of the
22 area?

23 A. Yes.

24 MS. MUNDS-DRY: We would tender Mr. Seale
25 as an expert witness in petroleum engineering.

1 HEARING EXAMINER JONES: He is so
2 qualified. Thanks for going over that. That was
3 interesting.

4 Q. Mr. Seale, did Alamo prepare an
5 application for authorization to inject the Form
6 C-108?

7 A. Yes, they did.

8 Q. Were you involved in the preparation?

9 A. Yes, I was.

10 Q. And is the C-108 prepared by Alamo
11 identified as Exhibit No. 9?

12 A. Yes, it is.

13 Q. Let's go through this packet. First of
14 all, is this the expansion of an existing project?

15 A. Alamo is requesting the reinstatement of
16 the WAGU west Artesia Grayburg Unit waterflood
17 project.

18 Q. You don't need to go through the whole
19 history of the waterflood since we know it's been in
20 existence for a while. But if you could give a
21 brief snapshot of how the waterflood came in place?

22 A. The West Artesia Grayburg Unit has been
23 shown today as a 640-acre waterflood project. It
24 was established on April 25, 1967 by NMOCD Order
25 R-3357 which was later amended by Order R-3357A and

1 R-3357B. It was originally -- the West Artesia
2 Grayburg unit originally contained seven water
3 injection wells that were drilled as producers by
4 four different operators between September of 1957
5 and January of 1964.

6 All these wells were purchased by H & S
7 Oil Company of Artesia, New Mexico, the original
8 operator of the West Artesia Grayburg Unit, on May
9 10, 1968 and converted to water injection wells for
10 the unit.

11 The seventh water injection well, not part
12 of this application, was the West Artesia Grayburg
13 Unit No. 11, which was plugged and abandoned by
14 Alamo Permian in June of 2010. Water injection was
15 initiated in this unit on November 9, 1968 and
16 through September of this past year, and when we
17 were ordered to shut in our injection 5.4 million
18 barrels of water had been injected into the unit.

19 Q. Thank you. Mr. Seale, how many wells,
20 just to be clear, are part the of the application?

21 A. Six at the present time.

22 Q. Those are identified in the C-108?

23 A. Yes.

24 Q. Who will be the operator of the
25 waterflood?

1 A. Alamo Permian Resources.

2 Q. If you could, and this is in the
3 application -- let's find the page number -- on Page
4 7 of the application, what is the plan for
5 stimulating the injection wells?

6 A. We plan to perforate the porous intervals
7 that Mr. Fekete was testifying about and identify as
8 two shots per foot. We will then acid-stimulate the
9 individual zones using 15 percent NEFE, hydrochloric
10 acid, at an average volume of 75 gallons a foot.

11 Q. Also on Page 7 of the application, have
12 you attached appropriate logging and well test data
13 on each injector or has that data already been filed
14 with the Division?

15 A. All logs and data have been previously
16 submitted to the Division.

17 Q. I did notice that part of your application
18 included some recent mechanical integrity tests?

19 A. Yes, they were included.

20 Q. Okay. And that's -- these don't have page
21 numbers but I think it's the first set of
22 information after the application; is that correct?

23 A. I believe that's correct, yes.

24 Q. Mr. Bruce and I are usually used to
25 referring to the page number of the packet.

1 A. It's the first attachment, yes.

2 Q. And after you thumb past those MITs, has
3 Alamo also included injection well data sheets for
4 each of the injection wells?

5 A. Yes, we have, and in general I can say
6 that for all of the injection wells in the package,
7 the construction was done to ensure injection that's
8 into the permitted unit interval only, and each
9 injection well is equipped with 2 and 3/8 inch
10 internally coated tubing on a packer. That is used,
11 of course, to protect the interior of the tubing
12 from corrosion and wear.

13 And the annulus, the casing tubing annulus
14 is filled with an inhibited packer fluid in each
15 case with corrosion inhibitors to prevent damage to
16 the exterior of the tubing and the interior of the
17 production casing.

18 Q. Thank you. Does Alamo seek authority to
19 commit additional wells to injection through the
20 Division's administrative procedures?

21 A. Yes, pursuant to 19.15.26 NMAC.

22 Q. And Mr. Woodruff reviewed this earlier.
23 Does Alamo Exhibit 1, which is the Midland map, show
24 the area of review around each injector?

25 A. Yes.

1 Q. That was included in the C-108, was it
2 not?

3 A. Yes.

4 Q. Are there plugged and abandoned wells
5 within the areas of review?

6 A. Yes, there are.

7 Q. And I believe here as we go past the
8 injection well data sheets, Alamo has included a
9 table of all of the wells that are in the public
10 record within the areas of review?

11 A. Yes, we have.

12 Q. And if you could summarize for the
13 examiners what's included in that table.

14 A. In the area of review we looked at all of
15 the wells that we could find records on either from
16 the NMOCD database and records, our own internal
17 files and amass a table of wells within the six
18 half-mile circles around our injection wells and
19 found 69 wells within this area of review.
20 Twenty-seven of those wells are actually located on
21 the West Artesia Grayburg Unit and ten are located
22 on additional Alamo-operated leases. Thirteen of
23 the 69 wells have been plugged and abandoned. Six
24 of those wells are on Alamo Permian leases and seven
25 of the P & A wells are on offset leases.

1 Q. Mr. Seale, have you included wellbore
2 schematics for the 13 wells that you mentioned that
3 were plugged and abandoned in the areas of review?

4 A. Yes, we have, and they are attached to the
5 C-108.

6 Q. Mr. Jones can look through these in more
7 detail, but I did notice if you go to these wellbore
8 schematics on the second page within the schematic
9 itself for the WAGU No. 25 --

10 A. Okay.

11 Q. There's a notation on there that
12 says "mud, question mark." Can you explain what
13 that means?

14 A. At the time the sketch was prepared it was
15 unclear. We have since discerned it was filled with
16 mud.

17 Q. So you are confident now after additional
18 review there's mud in there?

19 A. Yes, I am.

20 Q. And have you reviewed the data available
21 on the wells within the area of review for the
22 waterflood project?

23 A. Yes, I have.

24 Q. Have you satisfied yourself there's no
25 remedial work that needs to be done on the wells to

1 enable Alamo to safely operate these wells?

2 A. The data we have of record shows that each
3 well was properly plugged per the NMOCD regulations
4 at the time of abandonment, and I believe that no
5 injected fluid would be allowed to escape from the
6 proposed zone of injection.

7 Q. And have you looked at the fresh water
8 zones, particularly in the plugged wells, to
9 determine whether they will be protected as well?

10 A. Yes, all of the fresh water zones that we
11 have been able to determine are protected in each
12 and every plugged well.

13 Q. Let's turn back to the main part of the
14 application. What injection volumes does Alamo
15 propose?

16 A. We were proposing injection of 600 barrels
17 per day, average rate at that, and a maximum rate of
18 1,000 barrels per day per well.

19 Q. I believe, Mr. Seale, that can be found on
20 Page 5 of the C-108 which has been marked as Alamo
21 Exhibit 9?

22 A. That's correct, yes.

23 Q. What injection pressure is Alamo
24 proposing?

25 A. Average of 500 PSI and a maximum of 1200.

1 Q. What is the source of the injection water?

2 A. It's produced water from the West Artesia
3 Grayburg Unit wells. It's also produced water from
4 other Alamo wells in the same area, and it's
5 produced water from outside operated leases in the
6 area and any water that comes on to the unit for
7 injection from outside operated wells and other
8 leases should always check for compatibility prior
9 to any inclusion into our system.

10 Q. Did Alamo include samples of some of the
11 water that comes off the unit in the application?

12 A. Yes, we did.

13 Q. And will the system be open or closed?

14 A. It is a closed system.

15 Q. Going back to the pressure that you are
16 currently seeking in the application, if a higher
17 pressure is needed by Alamo, will Alamo justify the
18 higher pressure with an OCD-witness separate test?

19 A. Yes, we would.

20 Q. If you could, explain for the examiners
21 how will Alamo monitor the wells to ensure the
22 integrity of the wellbores in the unit?

23 A. Alamo will continually monitor the casing
24 pressure on the injection wells and also the
25 wellhead injection pressures. We will then, of

1 course, perform our annual mechanical integrity
2 tests or MIT that's required by the OCD on these
3 wells and our Bradenhead test every five years as
4 required.

5 Q. Thank you. If we could turn to section --
6 I believe it's marked Section 8 of the application,
7 which is about half-way through the packet which
8 discusses the fresh water data. I'm sorry, I don't
9 have page numbers to get you there any easier.

10 A. Okay.

11 Q. Alamo conducted a study of fresh water
12 data for the unit?

13 A. Yes, we did.

14 Q. And did you find any fresh water zones in
15 the area?

16 A. Of all of the fresh water available in
17 Southeastern New Mexico, the only zone that we found
18 in this area is the quaternary alluvial formation.

19 Q. And at what depth does that range?

20 A. Usually from about 140 to 160 feet below
21 the surface.

22 Q. And I believe also that Alamo has a fresh
23 water well within the unit?

24 A. Yes. If you look in Section 18, Unit
25 letter A on our Jennings lease there is a fresh

1 water window.

2 Q. And does Alamo propose to inject in any of
3 fresh water zones?

4 A. No.

5 Q. In your opinion, will the proposed
6 injection of these wells pose a threat to the
7 underground source of drinking water?

8 A. No.

9 Q. And besides the well in Section 18, are
10 there fresh water wells within one mile of any of
11 the proposed injection wells?

12 A. Yes. We looked at access, the New Mexico
13 water and infrastructure water system, the Wade
14 system, and we found seven fresh water wells in our
15 area of review. Three of those were in Section 4,
16 three were in Section 7 and one was in Section 17.
17 So they kind of bracket on both sides of our
18 waterflood unit.

19 Q. Did you include that data from the State
20 Engineer's system in the application?

21 A. Yes, we did.

22 Q. And also did you include the fresh water
23 well information for the well in Section 18?

24 A. Yes, we did. For the fresh water in
25 Section 18 we did also, yes.

1 Q. Do you have that sample, that analysis for
2 the fresh water well?

3 A. The fresh water sample from the windmill
4 in Section 18 showed a chloride content of 47 parts
5 per million. It's very, very fresh.

6 Q. Are the wells in the project area properly
7 completed and cased so as to prevent any
8 secondary recovery operations from damaging fresh
9 water in the area?

10 A. Yes, they are.

11 Q. And also in this packet did Alamo include
12 appropriate geological data per the requirements of
13 the C-108?

14 A. Yes, the geological data was provided as
15 reviewed by Mr. Fekete.

16 Q. That's included after the fresh water
17 analysis?

18 A. It is, yes.

19 Q. Did Alamo examine the available geologic
20 and engineering data for this reservoir?

21 A. Yes.

22 Q. As a result of that examination, have you
23 found any evidence of open faults?

24 A. No, we found no evidence of open faults or
25 connections or anything.

1 Q. No other hydrologic connections between
2 the injection interval or any other source of
3 drinking water?

4 A. No, we found none.

5 Q. Let's turn to what's marked as Alamo
6 Exhibit 10.

7 A. Okay.

8 Q. If you could identify and review this
9 exhibit, what is the exhibit for the examiners?

10 A. This exhibit is our application for
11 enhanced oil recovery project qualification for the
12 recovered oil tax rate at the West Artesia Grayburg
13 Unit in Eddy County, New Mexico.

14 Q. Does this meet all the requirements of the
15 division rules?

16 A. I believe it does.

17 Q. I don't want to go through everything in
18 here, but if we could, turn to Page 3 of this letter
19 application. If you could review the capital cost
20 estimate for the project.

21 A. The capital cost as we currently see them
22 includes about \$500,000 of field installations and
23 upgrades, development drilling costs of 3.45 million
24 dollars for the drilling and completion of 12
25 additional wells, well remediation and other costs

1 of about 1.5 million dollars, and work on our
2 injection system of \$500,000 for a total capital
3 cost projection of \$5,950,000.

4 Q. How much additional production does Alamo
5 expect to obtain from the project?

6 A. At the current time we are looking at
7 approximately \$300,000.

8 Q. What do you estimate the additional value
9 of the total production?

10 A. Average price of \$75 a barrel it would be
11 \$22,500,000.

12 Q. And without this waterflood project in the
13 unit area, will there be reserves wasted and left in
14 the ground?

15 A. Yes, there will be.

16 Q. Will approval of this application and the
17 implementation of the reinstatement of the
18 waterflood project be in the best interest of
19 conservation, the prevention of waste and protection
20 of correlative rights?

21 A. Yes.

22 Q. How soon does Alamo anticipate commencing
23 enhanced recovery operations in this unit?

24 A. We will be able to begin immediately upon
25 reinstatement of the water injection authority by

1 the NMOCD.

2 Q. Mr. Seale, does Alamo then request an
3 expedited approval of this reinstatement of the
4 project?

5 A. Yes, we do.

6 Q. Were Exhibits 9 through 11 either prepared
7 by you or compiled under your direct supervision?

8 A. Yes, they were.

9 MS. MUNDS-DRY: We move the admission of
10 Exhibits 9 through 10 into evidence. There's no 11.

11 HEARING EXAMINER JONES: They will be
12 admitted.

13 (Note: Exhibits 9 and 10 admitted.)

14 MS. MUNDS-DRY: That concludes my direct
15 examination.

16 HEARING EXAMINER JONES: You request a
17 uniform pressure limit over the whole project for
18 all the wells?

19 THE WITNESS: Yes, we would.

20 HEARING EXAMINER JONES: Or individual
21 pressure limits for each well?

22 THE WITNESS: Our application is assuming
23 an individual limit for each well within the uniform
24 --

25 HEARING EXAMINER JONES: Uniform?

1 THE WITNESS: Yes, sir.

2 HEARING EXAMINER JONES: And the 1275 is
3 more than .2 PSI per foot, but those were probably
4 approved in previous years; is that correct, from
5 step rate tests?

6 THE WITNESS: I'm not really -- I don't
7 know if any step rate tests were ever run. It's
8 just what our operations folks told me they would
9 like to have as a maximum pressure.

10 HEARING EXAMINER JONES: Now, is that the
11 pressure that the waterflood has been operating on
12 in the past?

13 THE WITNESS: No, because we didn't have
14 the volumes of water. A thousand barrels of day,
15 our maximum pressures would be much higher than we
16 have experienced in the past.

17 HEARING EXAMINER JONES: Do you know what
18 pressure limit you had -- I mean what -- so now you
19 have got more water to inject because you put more
20 producers on line; is that correct?

21 THE WITNESS: We would be putting more
22 water in either from our own work. We plan to do a
23 stimulation and re-perforating all the producing
24 wells you were shown by Mr. Fekete. That will add
25 to our produced water but also bring in water from

1 offset leases and non-operated leases in the area
2 that is compatible with the water in this unit.

3 HEARING EXAMINER JONES: Okay. So do you
4 have the pumps already out there?

5 THE WITNESS: We have a pump capable of
6 putting that up, yes, we do. And we have recently
7 upgraded our battery, producing battery and it's all
8 ready to go.

9 HEARING EXAMINER JONES: The pressure
10 limit, I would have to -- we may need you to run
11 some step rate tests but I will look at the data we
12 have got and we will see.

13 THE WITNESS: Okay.

14 HEARING EXAMINER JONES: I understand that
15 you need this pressure to achieve your goal of
16 getting this oil out of the ground.

17 THE WITNESS: Yes. Until we have the
18 actual volume going down these wells, we are all
19 faced with having to do our best at estimating what
20 the impact would be either in geology or
21 engineering. And what I was able to do, I have done
22 some work using breakdown pressures from the five
23 recent wells. We added those extra perforations as
24 shown by the geological study, and then we were able
25 to measure the breakdown pressure and the average

1 injection rate at the end of those during flush.

2 But what we found using the breakdown
3 pressures would tend to show a current frac gradient
4 in this unit of approximately a 1.52 gradient.

5 I know that sounds high, but the
6 literature -- there's been a lot of work in the
7 petroleum engineering literature about the frac
8 gradients and waterfloods rising over time. And Ben
9 Eaton, in a paper in October of 1969 even showed in
10 a California oil field where after just a year of
11 injection the frac gradient actually increased,
12 measured frac gradient by 33 percent.

13 So as I look at the field right now or
14 this unit, we have been injecting water for over 40
15 years, and have injected 5.4 million or our
16 predecessors have, let's say. So to me it seems --
17 I would say from that perspective it would be
18 reasonable and conceivable that our current frac
19 gradient could be much higher, as would our
20 reservoir pressures.

21 HEARING EXAMINER JONES: That's probably a
22 down hole frac gradient as opposed to a surface
23 gradient?

24 THE WITNESS: Yes.

25 HEARING EXAMINER JONES: So it wouldn't be

1 quite that severe at the surface. If you backed it
2 out to .433 up to the surface.

3 THE WITNESS: Yes. I'm talking about the
4 effective frac gradient to go into the formation at
5 a mid point of 2125 feet, which is approximately the
6 midpoint of the interval.

7 HEARING EXAMINER JONES: What's right
8 above your formation? You got a little bit of Queen
9 and Grayburg here, so you have the Yates and then
10 you have the Solt; is that correct? Above it?

11 THE WITNESS: I believe that's true but I
12 would have to defer those questions probably. We
13 have a standard lithology.

14 HEARING EXAMINER JONES: Okay. Well, we
15 will get all we can do on that. But who was the
16 operator during that shut-in period a few years ago?

17 THE WITNESS: B & W oil Company of
18 Artesia, New Mexico.

19 HEARING EXAMINER JONES: Oil pressures
20 were pretty low at the time.

21 THE WITNESS: Yes.

22 HEARING EXAMINER JONES: So the new --
23 your completion program now going in and approving
24 your conformance with the initial perms and you are
25 only doing a .2 shots per foot? That's interesting.

1 But are you putting a frac job over the whole
2 interval?

3 THE WITNESS: Right now all we are
4 proposing is acid jobs. It's 75 gallons per foot,
5 because of the response we have seen in our
6 breakdowns of the injection wells to date. That's
7 not to rule out the possibility that frac work could
8 be done at a later date. When you are perforating
9 such large intervals as this, you have to be very
10 careful of your number of holes to determine
11 fracking a large interval. So if we put much more
12 holes than that, we would have a hard time going
13 back and fracking. We are looking --

14 HEARING EXAMINER JONES: At the future?

15 THE WITNESS: Yes. But we have seen we
16 are able to break down the wells we have already
17 perforated and acidized and had wells that we could
18 not pump into approaching 2,000 PSI that would take
19 water rates after the frac job at five to seven
20 barrels a minute at less than 2,000 PSI.

21 HEARING EXAMINER JONES: Pretty good.

22 THE WITNESS: That's the proof of what Mr.
23 Fekete was testifying to earlier in our mind, that
24 we are opening up and effectively opening up new
25 reservoir, and also during these acid jobs we are

1 using rock salt as a diverting agent, a thousand
2 pounds in each stage and we pumped in six stages.
3 We see discrete breakdowns between each stage. So
4 it gives us the impression right now that we are
5 seeing a very good breakdown and we are able to get
6 into this new formation, and we would like to take
7 the time to see how that goes before we try to frac
8 it. Because, you know, you can never unfrac a rock
9 like that. You always want to see what it does
10 first.

11 HEARING EXAMINER JONES: Well, those old
12 wells with the existing perms, do you think they are
13 still open?

14 THE WITNESS: No, we will mechanically
15 clean those off and then run -- we are running
16 casing integrity logs and all this before we work.
17 We are running a 40-arm caliper we have had a lot of
18 success with in New Mexico and also over in Texas.
19 It will adequately define -- it's not only
20 mechanical but has electronic measuring of casing
21 thickness. We have been very successful in doing
22 that.

23 So if we see something in any of the wells
24 and we go in the first time and the integrity is not
25 there in the casing, we realize it's much better for

1 us in many cases -- that's a large interval -- to
2 plug the well and redrill and start over. We don't
3 want to go in there and do the work without good
4 casing integrity.

5 HEARING EXAMINER JONES: Have you stuck
6 any packers out there?

7 THE WITNESS: We have not.

8 HEARING EXAMINER JONES: Are you asking
9 for any relief on the 100-foot packer setting depth
10 because of the old wells? In other words, are you
11 asking for some --

12 THE WITNESS: You mean above the zone?

13 HEARING EXAMINER JONES: Above the zone.

14 THE WITNESS: No, we have been able to
15 unseat and seat the packers back. We haven't had a
16 problem on the wells we pulled on the four injectors
17 so far, no, sir.

18 HEARING EXAMINER JONES: You are asking
19 for the EUR tax credit and I guess this last exhibit
20 was the --

21 THE WITNESS: No. 10.

22 HEARING EXAMINER JONES: To cover that.
23 That should be okay. See if oil ever gets to that
24 level again.

25 THE WITNESS: Well, this actually, this

1 graph and that valuation comes from our most recent
2 third party engineering report prepared by Russell
3 Hall & Associates, so you are actually looking at
4 the graph prepared from their report.

5 HEARING EXAMINER JONES: So your reserves
6 are done by a third party?

7 THE WITNESS: Russell Hall & Associates in
8 Midland Texas, yes, sir.

9 HEARING EXAMINER JONES: If you don't
10 mind, could you give me a spreadsheet with those
11 area review wells with your spreadsheet that you
12 have already done? Can you send that to me
13 electronically through your attorney?

14 THE WITNESS: Yes, I will. I will
15 definitely do that, yes.

16 MR. BROOKS: I really don't have any
17 questions for the witness. I just want to make an
18 observation that two of the firms that regularly
19 represent clients before us are involved here
20 because the question came up requesting an expedited
21 order, and at the last hearing I presided over all
22 but one of the cases that I had took under
23 advisement there was a request for expedited order.

24 We try to honor those requests, but of
25 course if we get a request for expedited order in

1 every case, the result will be that our workload
2 will be managed in exactly the same way it would be
3 if we didn't get any request. We are not offended
4 by them and we try to honor them, but it will be a
5 more effective tactic if it's selectively used.
6 That's all I have to say.

7 HEARING EXAMINER JONES: And we understand
8 that the drilling season is here. And in your case,
9 we also understand that this has been shut in.

10 THE WITNESS: Yes.

11 MS. MUNDS-DRY: Mr. Jones, I think you
12 appreciate this has been shut in since September.
13 They would like to see something come out of it.
14 That's the only reason we ask. We appreciate
15 Mr. Brooks' comments.

16 MR. BROOKS: I'm not saying don't make
17 requests for the expedited orders. I am saying make
18 them selectively so we really know which are the
19 most important cases and we can give them priority.
20 Of course, we would like to get things out as soon
21 as possible. Unfortunately, the condition of the
22 state budget, which is how they publicized, we have
23 been instructed not to work overtime.

24 HEARING EXAMINER JONES: Even if we want
25 to.

1 MS. MUNDS-DRY: I understand that. Could
2 you tell my boss that I can't work overtime?

3 HEARING EXAMINER JONES: He probably has
4 you on salary.

5 MR. BROOKS: I never heard of a law firm
6 where overtime was otherwise than mandatory.

7 MS. MUNDS-DRY: That's right. We
8 appreciate that. You have big piles to deal with,
9 and if it wasn't really truly a request for
10 expedited order we wouldn't make it. So we really
11 mean it, Mr. Brooks.

12 MR. BROOKS: Very good.

13 HEARING EXAMINER JONES: Thank you very
14 much.

15 MS. MUNDS-DRY: Nothing further.

16 HEARING EXAMINER JONES: We will take
17 14611 under advisement.

18 (Note: The hearing was concluded.)
19
20

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. _____
heard by me on _____

_____, Examiner
Oil Conservation Division

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REPORTER'S CERTIFICATE

I, JAN GIBSON, Certified Court Reporter for the State of New Mexico, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings and was reduced to printed form under my direct supervision.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this case.



JAN GIBSON, CCR-RPR-CRR
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