

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

COPY

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

CONSOLIDATED CASES NO:
14637
14638
14639

APPLICATIONS OF OGX RESOURCES LLC
FOR APPROVAL OF A NON-STANDARD OIL
SPACING AND PRORATION UNIT AND COMPULSORY
POOLING, EDDY COUNTY, NEW MEXICO.

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING

BEFORE: TERRY WARNELL, Technical Examiner
DAVID K. BROOKS, Legal Examiner

April 28, 2011

Santa Fe, New Mexico

This matter came on for hearing before the New
Mexico Oil Conservation Division, TERRY WARNELL, Technical
Examiner, and DAVID K. BROOKS, Legal Examiner, on April 28,
2011, at the New Mexico Energy, Minerals and Natural
Resources Department, 1220 South St. Francis, Drive, Room
102, Santa Fe, New Mexico.

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1 A P P E A R A N C E S

2 FOR THE APPLICANT:
 3 JAMES BRUCE, ESQ
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5 I N D E X

6 WILLIAM HARDIE	
7 DIRECT EXAM BY MR. BRUCE	03
8 EXHIBITS	
9 EXHIBITS 8 AND 9 ADMITTED	11
10 EXHIBIT 10 (AS ADMITTED IN CONSOLIDATED RECORD)	11

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1 EXAMINER BROOKS: Very good. Now we will -- at this time we
2 will conclude the record, the separate record for 14639, and
we will begin the consolidated record for cases 14637, 14638
and 14639.

3 WILLIAM HARDIE

4 (Having been sworn, testified as follows:)

5 DIRECT EXAMINATION

6 BY MR. BRUCE:

7 Q. Will you please state your name and city of
8 residence for the record.

9 A. William Hardie, Midland, Texas.

10 Q. Who do you work for and in what capacity?

11 A. I work for OGX Resources. I'm an exploration
12 manager.

13 Q. Have you previously testified before the Division?

14 A. I have.

15 Q. And were your credentials as an expert petroleum
16 geologist accepted as a matter of record?

17 A. They were.

18 Q. Does your area of responsibility at OGX include this
19 portion of Southeast New Mexico?

20 A. It does.

21 Q. And are you familiar with the geology involved in
22 these applications?

23 A. I am.

24 MR. BRUCE: Mr. Examiner, I tender Mr. Hardie as an
25 expert in petroleum geology.

1 EXAMINER BROOKS: So qualified.

2 Q. Mr. Hardie, you have first two exhibits marked 8 and
3 9. I will let you introduce these exhibits and discuss the
4 target you seek in these wells.

5 THE WITNESS: Mr. Examiner, it would probably be
6 best if we opened up 8 and 9 both at the same time because I
7 will need to refer back and forth between. In fact, I would
8 like to start with -- with Exhibit 9, which is a -- it's a
9 cross-section that -- that runs through the immediate area of
10 the three forced poolings that OGX is seeking, and it is
11 drawn through five of the wells that -- that Concho or
12 previously Marbob have drilled and ultimately went horizontal
13 in the Bone Spring.

14 So it -- it exemplifies the way the section looks in
15 this area, and it also exemplifies the type of section that
16 we intend to encounter with the three forced poolings. The
17 entire cross-section is about 2,000 feet of vertical section.
18 And within that 2,000 feet, I have displayed the -- the unit
19 that we -- that we exploit horizontally. It's known as
20 Avalan Shale, its uppermost member of the Bone Spring, and
21 it's shown in the blue and brown colors in the middle of the
22 cross-section. The Avalan Shale is a -- a misnomer. It's
23 not a true shale. It's actually an organic rich siltstone.
24 We refer to it as a shale because of its high gamma ray in
25 the open hole logs that we see.

1 In this part of Southeast New Mexico there is
2 perhaps more organic rich shale in the Avalan Section than
3 there is anywhere else in New Mexico, so it is the center of
4 most of the horizontal drilling activity at this point. And
5 I depicted on the cross-section, the brown colors in the
6 Avalan depict organic rich siltstone. The blue colors depict
7 carbonate debris flows that occur between the shale zones.
8 And as you can see on the cross-section itself, about half of
9 the Avalan Shale Section is organic rich siltstone in this
10 part of the world. It's overlain above by the Brushy Canyon
11 shown in yellow, and below it rests upon the First Bone
12 Spring Sand again shown in yellow on this cross-section.

13 This is really designed just to show you in a
14 cross-sectional view the targets that we encounter in the
15 Avalan Shale. I have shown in white text in the middle of
16 the cross-section the very particular shale that we intend to
17 drill with each of these three forced poolings.

18 I would note that there is no -- there is far too
19 much shale in this vertical section to exploit with a single
20 horizontal lateral. One lateral is not capable of draining
21 the entire vertical section. Ultimately this will be done
22 with multiple laterals. It hasn't been attempted yet by any
23 of the operators, but I think that's an important note,
24 especially when we consider the equivalence of the various
25 proration units or units that may be involved in the lateral.

1 They equally share amongst a very large shale section. No
2 one unit is any more valuable than the next one beside it
3 because there is simply too much shale for one wellbore to
4 drain.

5 The Exhibit 8 is a combination of two -- two
6 different maps. On the right is a structural contour map,
7 and it's -- it is a map on the top of the First Bone Spring
8 Sand or the base of the Avalan Shale, if you will, and it
9 just depicts typical regional dip for this part of the world.
10 It's 100 feet per mile to the east. There are no structures
11 or any other unusual structural configurations in this area.
12 This is simply regional dip.

13 Also shown on that map are -- is OGX's acreage
14 position, and the three -- the three wells that we intend to
15 drill are shown with -- with red wellbores, and the
16 cross-section we just looked at, Exhibit 9, is also depicted
17 with the red line on -- on that map.

18 The map on the left is -- is a net shale map of the
19 entire Avalan Section. It utilizes a hundred API unit cutoff
20 on the gamma ray, so it's a pretty severe cutoff. And this
21 map is really useful only to determine the boundaries of the
22 play, not necessarily to determine whether one area is going
23 to be better than the other.

24 It ranges in thickness with net shales from 200 feet
25 to over 550 feet, and -- and even the thinnest part of this

1 map is more shale than you can drain with a single lateral,
2 so there is ample thickness of the shale across this entire
3 map. This simply depicts where it is at its thickest and
4 where you may have the opportunity to drill multiple laterals
5 in the same section stacked in a vertical sense.

6 Q. Mr. Hardie, in looking at -- you just testified that
7 in this area you are looking at, at least in the immediate
8 area, of what, 400 to 550 feet thickness, correct?

9 A. Net thickness using 100 API unit cutoff.

10 Q. When you are looking at whether a well should be
11 drilled, what is the minimum that you would want to see for
12 the shale thickness?

13 A. The net shale thickness approaches thicknesses less
14 than 100 feet in Lea County, and they have been drilled
15 successfully with very similar wells to the wells in Eddy
16 County where we have all this much more shale to work with.
17 We don't know what the limit is yet. It's at -- it's less
18 than 100 feet of net shale thickness.

19 Q. And does that pertain to your statement -- certainly
20 each of the -- each of the quarter sections in these well
21 units should be more or less equally capable of contributing
22 to the production in the well units?

23 A. Yes, that is correct.

24 Q. As you said, at least two horizontal wells may be
25 required in each of the well units to adequately drain the

1 shale?

2 A. I truly believe that to be the case. I think it
3 will be only a matter of time until one of the operators has
4 attempted that.

5 Q. And were Exhibits 8 and 9 prepared by you?

6 A. They were.

7 Q. Mr. Hardie, I have handed you three Exhibits 10, one
8 for each case, which are simply portions of the APD for these
9 wells. I don't think you need to go over them in great
10 detail, but could you explain for the Examiner how you -- and
11 they each contain the directional drilling plans for these
12 wells. Could you explain to the Examiner how OGX drills and
13 completes these wells?

14 A. OGX typically does not utilize a pilot hole because
15 of the additional expenses involved in plugging back from
16 that pilot hole after it's been logged. We typically drill a
17 vertical hole to a position of about 500 feet above our
18 target, our horizontal target. And at that point we run open
19 hole logs in order to determine the viabilities of pays
20 within the vertical section, particularly in the Delaware
21 Sands -- Delaware Mountain Sands Group.

22 After that we project where the new horizontal
23 lateral should lie based on our initial target and how it may
24 have changed with the additional tops that we recovered from
25 the open hole logs. That new revised plan is then

1 implemented, and we -- we begin building a curve about a
2 400-foot radius curve, and because each of these wells is
3 north south, they run along the stripe plain of the
4 formation, so they are true horizontals. They should be
5 within the shale bed that lies about 200 feet above the first
6 Bone Spring Sand.

7 We refer to it at OGX as the Tuscan Shale, and it is
8 the primary target for most of the horizontals that have been
9 drilled to date by -- by not only OGX, but other operators as
10 well.

11 Then the horizontal drilling will commence at that
12 point, and we will extend that lateral in -- in two of the
13 cases, the entire length of the section and pull up short of
14 the -- the 330-foot boundary at the end of the lateral. And
15 in the case of -- of the Copperhead, it's going to be an
16 extended lateral of about 5,000 feet in length, so it will be
17 a little bit longer, and the AFE cost on that is reflected in
18 the higher cost.

19 Typically the -- the wells are completed one of two
20 ways, either with a cemented liner, a perf and frac
21 technology. More often nowadays, I think most operators are
22 getting -- are going to a non-cemented liner using swell
23 packers or mechanical packers and a sliding sleeve completion
24 technology. This allows more stages for the frac work and --
25 and less time on location for the frac companies.

1 The frac jobs, every time I have come up here, they
2 get bigger, and so I'm telling you they've gotten bigger
3 again. The typical amount of sand being pumped in the wells
4 is between 4 to 6 million pounds of sand. I think last time
5 I was here I told you 3 million. The amount of fluid used to
6 carry that is between 40 and 60,000 barrels of water, and --
7 and the number of stages that are being applied is now
8 approaching 20 stages. In the past it was -- the average
9 number of stages was six to seven. And the -- the 20-stage
10 fracs are only possible with the sliding sleeve technology,
11 which is what OGX is now using.

12 Q. And were Exhibits 10 in each case compiled from
13 company business records?

14 A. They were.

15 Q. In your opinion, is the granting of these
16 applications in the interest of conservation and the
17 prevention of waste?

18 A. They are.

19 MR. BRUCE: Mr. Examiner, I would move the admission
20 of Exhibits 8 and 9, and then Exhibits 10 for each case.

21 EXAMINER BROOKS: Okay. 8 and 9 for the collective
22 record, and a separate Exhibit 10 for each case. Very good.
23 Exhibits 8 and 9 are admitted in the collective record.
24 Exhibits 10 -- the Exhibits 10 are three separate exhibits,
25 and each one identifies on the exhibit the Case Number, and

1 consequently Exhibit 10 pertinent to each case is admitted in
2 that individual case.

3 (Exhibits 8 and 9 admitted in collective case.)

4 (Exhibits 10 admitted in individual cases.)

5 MR. BRUCE: I would ask that cases 14638 and 14639
6 be taken under advisement, and 14637 be continued to May 26.

7 EXAMINER BROOKS: Okay. Question here, since these,
8 from what I -- from your testimony, I understood that you
9 expect to -- you think it's probable that you will be
10 drilling additional horizontal laterals within the same unit.
11 Is that an accurate -- or within the same project area -- is
12 that an accurate --

13 THE WITNESS: That is an accurate statement. I
14 think ultimately it will be done out of the same vertical
15 wellbore, as well, as is being done all over the world. It
16 has been tried in the Permian basin for the first time by --
17 by Bass, Bebcos, not in this formation, but it has been
18 attempted and it was successful.

19 EXAMINER BROOKS: Okay. That raises the question of
20 how we deal with the costs of any subsequent development. If
21 you have people who remain uncommitted and who elect to be
22 non-consent, because it will be the way OCD treats things now
23 the same well, I'm not sure if the rule we adopted a couple
24 of years on that subject, four or five years ago on that
25 subject is actually applicable. Do you have any suggestions

1 as to how we --

2 MR. BRUCE: I would suggest that we, rather than
3 speculate, and I could ask Mr. Hardie one question.

4 Q. At this point, you don't know when and if a second
5 zone completion will be attempted, do you?

6 A. I do not know. I suspect that if it were done by
7 OGX, it would be proposed at the beginning of the project as
8 the intent from the beginning.

9 MR. BRUCE: I would suggest that these well costs
10 and non-consent be related to this one particular horizontal
11 at this point.

12 EXAMINER BROOKS: Okay. And then would it be
13 appropriate to add simply that any additional developments
14 would be -- would require an amendment to this order as to
15 the forced pool interest?

16 MR. BRUCE: Correct.

17 EXAMINER BROOKS: Okay. Very good.

18 EXAMINER WARNELL: If we amend the order down the
19 road, would that require another hearing?

20 EXAMINER BROOKS: I think that would require
21 another hearing, yes. The rule I was speaking of was drawn
22 to the requirement for another hearing, but the language we
23 have used in that rule, I'm not sure that it would apply to
24 this case the way OCD now treats multiple laterals. Of
25 course that could change. Did you have any questions,

1 Mr. Warnell?

2 EXAMINER WARNELL: I had a question, too, for
3 Mr. Hardie. If you are doing 20-stage fracs, how many days
4 are you actually fraccing?

5 THE WITNESS: If everything goes well, which never
6 happens --

7 EXAMINER WARNELL: Never happens.

8 THE WITNESS: -- it would take two and a half to
9 three days.

10 EXAMINER WARNELL: Okay.

11 THE WITNESS: And the reason is because the pump
12 trucks never shut down. They pump a series of scaled balls
13 to begin each of those subsequent stages and -- and if all
14 goes well, then that can be accomplished usually within a
15 couple of days, and that includes taking breaks in the
16 evenings and such, but so far we haven't had a frac job go
17 like that.

18 EXAMINER WARNELL: Do you have to go out on those
19 frac jobs?

20 THE WITNESS: I don't. I have an engineer that
21 goes. And with -- with problems, I would say the average
22 time on those locations is probably four to five days.

23 EXAMINER WARNELL: Let's go back to the
24 cross-section just for a second for my own clarification. At
25 the top of the Avalan Shale, what is that depth? I can't

1 really read the depth.

2 THE WITNESS: I should --

3 EXAMINER WARNELL: Is that about 6,000 feet?

4 THE WITNESS: It is about 6500 feet. This
5 cross-section is hung stratigraphically on the top of the
6 Bone Spring Sand, so it throws all the depths off a little
7 bit when you do that, but it makes it easier to get it all
8 within one horizontal piece of paper.

9 EXAMINER WARNELL: So from the top of the Avalan
10 Shale down to the bottom of that Shale --

11 THE WITNESS: Is 900 feet, and that's a very uniform
12 gross thickness for that unit across Southeast New Mexico.

13 EXAMINER WARNELL: So we are looking at 900 feet
14 there. Where -- and you said, I think you testified, coming
15 up from the bottom about 200 feet, that's basically where
16 your lateral is going to be?

17 THE WITNESS: That is approximately where that
18 Tuscan Shale zone is that we like to go horizontal in.

19 EXAMINER WARNELL: All right. Thank you. No
20 questions.

21 EXAMINER BROOKS: Very good. Then Case Number 14637

22 will be continued to the May 26 docket. Case Number 14638

23 and 14639 will be taken under advisement. At this time we
24 will take a ten minute recess. Examiner hearing of Case No. 14637, 14638 & 14639

25 (Concluded.)
heard by me on 4-28-11

David K. Brooks
Oil Conservation Division

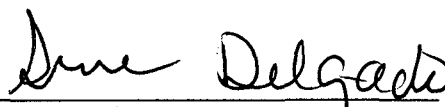
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REPORTER'S CERTIFICATE

I, IRENE DELGADO, New Mexico CCR 253, DO HEREBY
CERTIFY THAT ON April 28, 2011, proceedings in the
above-captioned case were taken before me and that I did
report in stenographic shorthand the proceedings set forth
herein, and the foregoing pages are a true and correct
transcription to the best of my ability.

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

WITNESS MY HAND this 28th day of April 2011.


Irene Delgado, CCR 253
Expires: 12-31-2011