STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION COMMISSION

| | | |
|---|---|---|
| IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION FOR THE PURPOSE OF CONSIDERING: | ) | |
| APPLICATION OF THE NEW MEXICO OIL CONSERVATION DIVISION FOR REPEAL OF EXISTING RULE 50 CONCERNING PITS AND BELOW GRADE TANKS AND ADOPTION OF A NEW RULE GOVERNING PITS, BELOW GRADE TANKS, CLOSED LOOP SYSTEMS AND OTHER ALTERNATIVE METHODS TO THE FOREGOING, AND AMENDING OTHER RULES TO MAKE CONFORMING CHANGES; STATEWIDE | ) | CASE NO. 14,015 |

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

COMMISSION HEARING

RECEIVED
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BEFORE: MARK E. FESMIRE, CHAIRMAN
JAMI BAILEY, COMMISSIONER
WILLIAM OLSON, COMMISSIONER

Volume XI - November 26th, 2007

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Commission, MARK E. FESMIRE, Chairman, on Monday, November 26th, 2007, 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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# C U M U L A T I V E  I N D E X

Monday, October 22nd, 2007 (Volume I)
Commission Hearing
CASE NO. 14,015



(Continued...)

PUBLIC COMMENTS (Continued):



DIVISION WITNESSES (Resumed):



(Continued...)

(Continued...)

(Continued...)

DIVISION WITNESSES (Continued):



* * *

(Continued...)

Thursday, November 8th, 2007 (Volume V)
Commission Hearing
CASE NO. 14,015



* * *

Friday, November 9th, 2007 (Volume VI)
Commission Hearing
CASE NO. 14,015



(Continued...)

(Continued...)

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Tuesday, November 13th, 2007 (Volume VII)
Commission Hearing
CASE NO. 14,015



(Continued...)

PUBLIC COMMENTS:



OGAP WITNESSES (Resumed):



DIVISION WITNESSES (Continued):



(Continued...)

PUBLIC COMMENTS:



* * *

Wednesday, November 14th, 2007 (Volume VIII)
Commission Hearing
CASE NO. 14,015



(Continued...)

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Thursday, November 15th, 2007 (Volume IX)
Commission Hearing
CASE NO. 14,015



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Friday, November 16th, 2007 (Volume X)
Commission Hearing
CASE NO. 14,015



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Monday, November 26th, 2007 (Volume XI)
Commission Hearing
CASE NO. 14,015



* * *

E X H I B I T S

| Applicant's | Identified | Admitted |
|---|---|---|
| Exhibit 1 | 163 | 163 |
| Exhibit 2 | 163 | 163 |
| Exhibit 3 | 2736 | - |
| Exhibit 4 | (58) | 205 |
| Exhibit 5 | (61) | 205 |
| Exhibit 6 | (94) | 205 |
| Exhibit 7 | - | - |
| Exhibit 8 | 421 | - |
| Exhibit 9 | (373) | 399 |
| Exhibit 10 | (383) | 399 |
| Exhibit 10A | (385) | 399 |
| Exhibit 11 | (176) | 205 |
| Exhibit 12 | 178 | 205 |
| Exhibit 13 | 427 | 511, 527 |
| Exhibit 13A | 430 | - |
| Exhibit 13B | 430, 432, 832 | 834 |
| Exhibit 13C | (345), 433 | 511 |
| Exhibit 14 | 428, 449, 511 | - |
| Exhibit 15 | 449 | 511 |
| Exhibit 16 | 457, 459 | 511 |
| Exhibit 17 | 450, 458, 484 | 511 |
| Exhibit 18 | 484 | 511 |
| Exhibit 19 | 676 | 764 |
| Exhibit 20 | 677, 764 | 764 |
| Exhibit 21 | 679 | 764 |
| Exhibit 22 | - | 1159 |
| Exhibit 23 | 842 | 1159 |
| Exhibit 24 | 844, 846, 1109, 1156 | 1159 |
| Exhibit 25 | 846, 1157 | 1159 |
| Exhibit 26 | 1158 | 1159 |

(Continued...)

E X H I B I T S (Continued)

| Applicant's (Continued) | Identified | Admitted |
|---|---|---|
| Exhibit 27 | 847, 1158 | 1159 |
| Exhibit 28 | (2551), 2628 | 2629 |
| Exhibit 29 | (2554), 2628 | 2629 |
| Exhibit 30 | 2626, 2627 | 2629 |
| Exhibit 31 | (admitted on behalf of OGAP) | |
| | - | 2574 |
| Exhibit 32 | 2095 | 2096 |
| Exhibit 33 | 2138 | 2160 |
| Exhibit 34 (identical with OGAP Exhibit 11) | 2827 | - |

* * *

| Industry | Identified | Admitted |
|---|---|---|
| Exhibit 1 | 1184, 1212 | 1216 |
| Exhibit 2 | 1187, 1212 | 1216 |
| Exhibit 3 | 1213 | 1216 |
| Exhibit 10 | 1213 | - |

* * *

| OGAP | Identified | Admitted |
|---|---|---|
| Exhibit 1 | 1417 | 1417 |
| Exhibit 2 | 1489 | 1490 |
| Exhibit 3 | 1418, 1420 | 1486 |
| Exhibit 4 | - | - |
| Exhibit 5 | 1491 | 1607 |
| Exhibit 6 | 1491 | 1607 |
| Exhibit 7 | 1491 | 1607 |
| Exhibit 8 | 1491 | 1607 |
| Exhibit 9 | 1492 | 1607 |

* * *

(Continued...)

E X H I B I T S (Continued)

| OGAP (Continued) | Identified | Admitted |
|---|---|---|
| Exhibit 10 | 1492 | 1607 |
| Exhibit 11 | 1492 | 1607 |
| Exhibit 12 | - | 1607 |

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| NMCCAW | Identified | Admitted |
|---|---|---|
| Exhibit 1 | 1757 | 1861 |
| Exhibit 2 | 1758 | 1861 |
| Exhibit 4 | 1861 | 1861 |

* * *

| IPANM | Identified | Admitted |
|---|---|---|
| Exhibit 1 | - | - |
| Exhibit 2 | - | - |
| Exhibit 3 | - | - |
| Exhibit 4 | - | - |
| Exhibit 5 | - | - |
| Exhibit 6 | - | - |
| Exhibit 7 | - | - |
| Exhibit 8 | - | - |
| Exhibit 9 | - | - |
| Exhibit 10 | - | - |
| Exhibit 11 | - | - |
| Exhibit 12 | - | - |
| Exhibit 13 | 2749 | - |
| Exhibit 14 | - | - |
| Exhibit 15 | - | - |
| Exhibit 16 | - | - |
| Exhibit 17 | - | - |
| Exhibit 18 | - | - |

(Continued...)

E X H I B I T S (Continued)

| IPANM (Continued) | Identified | Admitted |
|---|---|---|
| Exhibit 19 | - | - |
| Exhibit 20 | - | - |
| Exhibit 21 | - | - |
| Exhibit 22 | - | - |
| Exhibit 23 | - | - |
| Exhibit 24 | - | - |
| Exhibit 25 | - | - |
| Exhibit 26 | - | - |
| Exhibit 27 | - | - |
| Exhibit 28 | - | - |
| Exhibit 29 | - | - |
| Exhibit 30 | - | - |
| Exhibit 31 | - | - |
| Exhibit 32 | - | - |
| Exhibit 33 | - | - |
| Exhibit 34 | - | - |
| Exhibit 35 | - | - |
| Exhibit 36 | - | - |
| Exhibit 37 | - | - |

* * *

Additional submissions by the Division, not offered or admitted:

| | Identified |
|---|---|
| OCD's Requested Changes to 9/21/07 proposal, 11/7/07 | 558 |
| e-mail from David Brooks to Kelly O'Donnell, 10/22/07 | 559 |

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A P P E A R A N C E S

FOR THE COMMISSION:

CHERYL BADA
Assistant General Counsel
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

FOR THE DIVISION:

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

FOR NEW MEXICO OIL AND GAS ASSOCIATION; CONOCOPHILLIPS COMPANY; DUGAN PRODUCTION CORPORATION; and ENERGEN RESOURCES CORPORATION; and an INDUSTRY COMMITTEE comprised of BP America Production Company, Inc.; Benson-Montin-Greer Drilling Corporation; Boling Enterprises, Ltd.; Burlington Resources Oil and Gas Company; Chesapeake Energy Corporation; Chevron USA, Inc.; ConocoPhillips Company; Devon Production Company; Dugan Production Corporation; Energen Resources Corporation; Marathon Oil Company; Marbob Energy Corporation; Merrion Oil & Gas Corporation; Occidental Permian, which includes OXY USA, Inc., and OXY USA WTP Limited Partnership; Samson Resources Company; J.D. Simmons, Inc.; Williams Production Company, LLC; XTO Energy, Inc.; and Yates Petroleum Corporation:

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

(Continued...)

A P P E A R A N C E S (Continued)

FOR INDEPENDENT PETROLEUM ASSOCIATION OF NEW MEXICO:

KARIN V. FOSTER
Independent Petroleum Association of New Mexico
Director of Governmental Affairs
17 Misty Mesa Ct.
Placitas, NM 87043

FOR CONTROLLED RECOVERY, INC.:

HUFFAKER & MOFFETT, L.L.C.
155 Grant
Santa Fe, New Mexico 87501
P.O. Box 1868
Santa Fe, New Mexico 87504-1868
By: GREGORY D. HUFFAKER, Jr.

FOR NEW MEXICO OIL AND GAS ACCOUNTABILITY PROJECT:

New Mexico Environmental Law Center
1405 Luisa Street, Suite 5
Santa Fe, New Mexico 87505
BY: BRUCE BAIZEL

FOR NEW MEXICO CITIZENS FOR CLEAN AIR AND WATER:

BELIN & SUGARMAN
618 Paseo de Peralta
Santa Fe, New Mexico 87501
By: ALLETTA BELIN

* * *

WHEREUPON, the following proceedings were had at 10:04 a.m.:

CHAIRMAN FESMIRE: Let's go back on the record.

Let the record reflect that it is approximately 10 o'clock on Monday, November 26th.

This is the continuation of Case Number 14,015.

Let the record also reflect that Commissioners Olson, Bailey and Fesmire are all present, we therefore have a quorum.

I believe, Mr. Brooks, when we left off you were in your direct examination of Mr. Chavez?

MR. BROOKS: That is correct, Mr. Chairman.

CHAIRMAN FESMIRE: Would you like to proceed sir?

MR. BROOKS: May it please the Commission.

Mr. Chairman, in an effort to streamline this case and hopefully bring it to a conclusion a little bit sooner, we have decided to omit the actual presentation of Mr. Chavez's liner materials, which are Exhibit Number 31. We are -- I'm sorry, Exhibit Number 30.

We are going to offer them in evidence, however, but I will first ask Mr. Chavez the predicate questions.

CHAIRMAN FESMIRE: Okay.

CARL J. CHAVEZ,

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

DIRECT EXAMINATION

BY MR. BROOKS:

Q. Good morning, Mr. Chavez.

A. Good morning, Mr. Brooks.

Q. Mr. Chavez, have you reviewed Exhibits Numbers 28, 29 and 30? 28 being your résumé?

A. Yes.

Q. And Mr. Chavez, were Exhibits 28, 29 and 30 prepared by you or compiled by you from published materials?

A. I don't have the exhibits in front of me, but whatever I'm responsible for, yes, I would...

CHAIRMAN FESMIRE: Mr. Brooks, I don't think that's a sufficient predicate.

Maybe you ought to get a copy of the exhibits in front of him.

MR. BROOKS: Okay, may I approach the witness?

CHAIRMAN FESMIRE: You may, sir.

THE WITNESS: Thank you.

Q. (By Mr. Brooks) Would you then look at Exhibits 28, 29 and 30 and advise me when you have examined them

sufficiently?

A. Yes, sir, I prepared these.

Q. Okay. Were they -- were those exhibits prepared by you or assembled by you from published materials?

A. They were.

MR. BROOKS: Thank you. May I approach the witness?

CHAIRMAN FESMIRE: You may, sir.

MR. BROOKS: Thank you.

Mr. Chairman, we'll tender in evidence Exhibits 28, 29 and 30.

CHAIRMAN FESMIRE: Mr. Carr, any objection?

MR. CARR: Mr. Chairman, just so I'm clear on what we're offering -- what the Division is offering, 28 is Mr. Chavez's résumé, 29 is the presentation he made a week ago Friday on pollution prevention, P2, and then the last exhibit is the pit liner exhibit; is that correct?

MR. BROOKS: That is correct.

MR. CARR: I have no objection.

CHAIRMAN FESMIRE: Okay.

MR. BROOKS: And we will not be offering Exhibit Number 31 inasmuch as that has already been admitted as an exhibit on behalf of OGAP.

CHAIRMAN FESMIRE: Okay. Ms. Foster, any -- on short notice, any objection?

MS. FOSTER: Well, I believe that there are going to be some witnesses from Lovington that will be speaking on the basis of that exhibit, and -- I know you'll overrule me, but I will -- I'm going to sustain an objection [*sic*] as to that object.

MR. BROOKS: As to which exhibit?

MS. FOSTER: As to the pit-liner exhibit.

CHAIRMAN FESMIRE: Exhibit 30?

MS. FOSTER: Yes.

CHAIRMAN FESMIRE: And what is your objection?

MS. FOSTER: Well, my objection would be that I -- you know, I think that the witness should testify upon it, and if it is exhibit -- if it is offered in evidence, then it would not be for the truth of the matter asserted. I would rather have the witness testify on it, I guess, would be my objection.

CHAIRMAN FESMIRE: Okay. I'm going to overrule that objection --

MS. FOSTER: Okay.

CHAIRMAN FESMIRE: You're clairvoyant. -- and Exhibits Number 28, 29 and 30 will be admitted into evidence.

Mr. Brooks, you can proceed.

MR. BROOKS: Pass the witness, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Carr?

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Chavez, if I -- I'm going to kind of work through this. Some of it's getting kind of distant in my mind.

Exhibit Number 28 is your résumé. You graduated from college in 1986; is that correct?

A. Yes, sir.

Q. And since that time your résumé indicates you've worked for various regulatory agencies?

A. Yes.

Q. Have you had jobs for industry, or has your work been confined to working for regulatory agencies?

A. I think with the exception of the geotechnical engineering position with the Pacific Soils out in California and working for Unocal 76 during the summers as an assistant petroleum engineer and as a chemist in the refinery, I would say most of my career has been regulatory, yes.

Q. Have you ever been the engineer on a project responsible for drilling a well?

A. Yes.

Q. And who was that with?

A. That was with the Michigan Department of Natural Resources when I worked for the glacial and groundwater

geology unit, supervised the installation of monitor wells for pit contamination, installation of monitor wells at the Porter oilfield.

Q. Have you ever drilled a producing well?

A. No.

Q. I'm going to try, Mr. Chavez, to go through some of the exhibits that you presented the other day, and I think what we ought to do, perhaps, is go to your -- page 7 of your Exhibit Number 29. And when you were testifying to this exhibit, my recollection is that you testified that today New Mexico is about 30 years behind where it should be in regulating these wastes. Do you recall that testimony?

A. Yes, I recall indicating that 31 years after RCRA, we're still grappling with proper storage, disposal and waste handling.

Q. Now you are aware that during that 31-year period of time there have been significant improvements in New Mexico on how we manage waste, are you not?

A. Through the RCRA program, yes.

Q. And through Rule 50?

A. Correct.

Q. In your work here and with -- in the State of Michigan, were you called upon to work with and communicate with oil and gas operators?

A. Yes.

Q. And are you aware that over the last 30 years there have been substantial internal changes in the way the oil and gas companies are trying to manage environmental issues?

A. I think that's fair, yes.

Q. And in making these general statements that we are 30 or 31 years behind, you're not trying to discredit or disregard efforts that have been made over this period of time to better manage these wastes, are you?

A. What is the question?

Q. The question is, when you say we're 30 years behind, you're not ignoring, in making your comments, the efforts that have been made in the last 30 years, are you?

A. I am not.

Q. Now, if we go to your testimony about closed-loop systems -- and maybe we should go to page 23 in your presentation -- perhaps page 24 -- if I recall your testimony, it seems to me that one of the bases for your recommendation that closed-loop systems should be encouraged is that they're, in fact, less costly; is that correct?

A. Generally, yes.

Q. And in support of this statement, you cite a report from the Texas Railroad Commission addressing a

closed-loop system by a small independent operator?

A. Yes.

Q. Did you prepare this part of your presentation yourself?

A. Yes.

Q. Were you assisted in this effort by OGAP?

A. No.

Q. It's just coincidence that there's significant overlap in the things that you've cited in the --

A. In my research of closed-loop systems in this process, this is just how my presentation came together.

Q. And you found these on your -- and you located these on your own?

A. Yes.

Q. Okay. If we look at the example you have from the Texas Railroad Commission, this involved a small independent operator; is that correct?

A. Yes.

Q. Do you know who that might have been?

A. No.

Q. Did you look -- I went on the Texas Railroad Commission web page, and I found a web page that is very close in its text to what is in your exhibit book. Did you look behind the information from the Texas Railroad Commission to get any particulars on this well or operator?

A. I did not.

Q. This information that you've provided indicates that the initial cost of a turnkey operation was incrementally more expensive. That's on page 26. It's one of the benefits, and then --

A. That's correct --

Q. -- it goes on?

A. -- yes.

Q. You don't know the nature of this turnkey operation, then, do you?

A. It was basically an agreement between the oil company project manager and the drilling contractor.

Q. Do you know what costs were assumed by the drilling contractor and what would have been left for the operator?

A. Other than what's explained here, that -- you know, the general waste disposal and things of that nature would be handled by the contractor, not much more than that.

Q. You state on page 26 that even though it was more expensive, other things resulted in a savings of about $10,000 --

A. Yes.

Q. -- is that correct?

Do you know exactly how these -- what costs fall

into this $10,000 category that represents savings up here?

A. It was my understanding, based on what I was able to research, that the $10,000 savings was for waste disposal of the cuttings after drilling with closed-loop system. They were able to essentially cut their waste disposal costs by about half --

Q. Okay.

A. -- at $20 a cubic yard.

Q. Do you know -- You don't know where this well was drilled; is that correct?

A. That's correct.

Q. Do you know the --

A. Somewhere in Texas.

Q. Covers lots of ground.

(Laughter)

Do you know the depth of the well?

A. On that particular case, no.

Q. Do you know the number of target horizons in the well?

A. No.

Q. Would you know the size of the casing?

A. No.

Q. The depth of the well would affect the amount of waste that might be generated; isn't that fair to say?

A. It would, but with closed-loop systems you're

dealing with a finite volume of fluid, and therefore although the depth would increase the volume of the fluid, you're still dealing with a finite volume of fluid.

Q. And the deeper you drill, the more cuttings you might have; isn't that fair to say?

A. That's true, and if you're drilling, yes.

Q. And the larger the casing, the more cuttings and waste you might generate?

A. Yes, and that may be a little inefficient.

Q. Do you know if any of these wastes were allowed to be disposed of on site?

A. It's my understanding that no wastes were --

Q. And --

A. -- disposed of.

Q. And what do you base that understanding on?

A. Well, just based on this case study showing the savings with the closed-loop drilling system --

Q. But is there anything --

A. -- and --

Q. -- in this study that says where those wastes were disposed?

A. There is not.

Q. Do you know what sort of costs there might have been to transport any waste to a disposal facility?

A. I have some general estimates on a worst-case

scenario of 100 miles.

Q. And where did you get the 100 miles?

A. Well, I was -- for this particular rule, we were talking about a 100-mile radius, so I wanted to kind of look at the worst-case scenario for dig-and-haul.

Q. And did you assume 100 miles to be the worst case?

A. Yes.

Q. Do you know what the basis for -- Is it a 100-mile radius?

A. It's a 100-mile radius, yeah.

Q. Do you know how many miles you might have to drive within a 100-mile radius to get to a disposal facility?

A. Well, it's based on a 200-mile round trip, but just an estimate.

Q. Do you know what costs there might have been incurred by this operator to dispose of whatever wastes they had in a disposal facility?

A. I attempted to factor in certain costs and come up with a reasonable estimate based on a worst case, 100-mile, one-way.

Q. But that's a -- Isn't that a general number that you're applying? It's not specific to this well?

A. Well, I look at it from a $20-per-cubic-yard

disposal cost basis --

Q. And that's -- is that --

A. -- and I look at the -- the estimated volumes of the cuttings were anywhere from 1000 to 2000 cubic yards, and based on some calculations I had done on land disturbance and projected depth for burial, et cetera, I came up with some -- you know, some figures.

Q. But you came up with general parameters, did you not?

A. Based on size of the land disturbance, burial, et cetera.

Q. And you didn't have any particular or specific data to the well cited in this Railroad Commission report, did you?

A. It's not cited to this particular case that you're referencing.

Q. Would you agree with me that the amount of waste would affect the cost of operating a closed-loop system?

A. State that again, the amount of waste --

Q. The amount of waste. The more waste you have, the more costly it may become?

A. Yes.

Q. And that would vary well by well?

A. It's more so for the dig-and-haul scenario than it is for on-site disposal, or in-place disposal as

recommended by the industry.

Q. Would also -- The farther you have to take to dispose of it, that would affect the cost, would it not?

A. It would.

Q. And were any of these particular facts addressed as to this case you're citing as an example, or were you just accepting what the Railroad Commission reported?

A. It is as per the case number provided in that study.

Q. When you talk about -- when we talk about a closed-loop system, if this rule goes into effect -- It will become effective on a particular date. Have you given any consideration to the availability of the equipment that might be required on that date if operators at that time try to move to a closed-loop system?

A. Yes, but I would point out that this rule is flexible, it still allows wells to be drilled with pits. So during that transition time --

Q. And what is that transition period?

A. I can't recollect without citing -- or looking at the Rule 17.

Q. It's not the intention of the Division or the Comm- -- to recommend that a rule be adopted that would create a situation where there wouldn't be the equipment needed on the effective date to continue drilling

operations; is that fair to say?

A. I would say that equipment is available, and there's numerous drilling contractors in state and out of state that can show up to drill the closed-loop systems at any time --

Q. Do you think --

A. -- in this day and age.

Q. Do you think that all operators could immediately acquire the equipment necessary, say within the first year, to drill 1400 wells?

A. 1400?

Q. Yes, with a closed-loop system?

A. I haven't examined that in particular, whether that could be done. But this rule does provide options to drill with pits.

Q. And if it became an impossibility, would it be the Division's recommendation that the rule still go into effect?

A. Absolutely, we'll protect the environment if we do this.

Q. And when you're protecting the environment, did you consider the impact on New Mexico revenue?

A. I've seen some of the numbers thrown around.

Q. But -- So have all of us, Mr. Chavez, but my question was, did you consider the potential impact of this

kind of a rule change on its effective date and what that might be on New Mexico revenue?

A. I -- I think that's a moot issue, because as I've indicated, that drilling pits are -- would still be allowed.

Q. So the impact on revenue is a moot issue?

A. This industry can continue to move forward and drill with pits if it so chooses to do so. And it has the option of using closed-loop systems, which could potentially save it money.

Q. When you were looking at the benefits of closed-loop systems, did you consider any downside to moving to closed-loop systems? Did you find any?

A. Well, I think you pointed out one, equipment availability, and I think I've addressed that. There's several -- a long list of contractors that provide this new technology in this day and age, and it's been available for a long time.

Q. Did you look at safety issues?

A. Yes.

Q. And did you consider that a closed-loop system, if there was a blowout, was as safe as having reserve water in the pit?

A. Well, I think it's important to point out that we've had no blowouts with closed-loop systems in this

state thus far, and I would argue that when -- a closed-loop system, you're monitoring your tanks, your mud systems, and a trained drilling engineer would have knowledge of any potential subterranean kick that could occur and could prepare to handle that quite quickly with certain density fluids that this drilling contractor would have available on-site to quell any type of blowout.

Q. In your experience, do operators know about subterranean kicks before they hit them? Is that a typical situation?

A. It's my understanding in New Mexico, in the northwest and the southeast, that many of these formations are already depleted in pressure. However, some -- there are cases where you encounter a subterranean formation, a higher-pressure formation, and a trained drilling engineer should know when to begin acting on that to prevent a blowout with a closed-loop system, versus drilling with a reserve pit.

Q. We do know that blowouts happen?

A. They have.

Q. And wouldn't you anticipate that with closed-loop system, blowouts would happen again in the future?

A. It's certainly subject to occur, yes.

Q. And have you given any consideration to what would be required at the location to control a blowout with

a closed-loop system?

A. Yes, I think that a trained drilling engineer who's monitoring their mud system and looking for signs of kicks, subterranean formations, should be able to act in a timely manner to prevent that. And if it does happen, it's going to happen whether you drill with reserve pits or closed-loop systems.

Q. When it does happen, if you have a drilling supervisor or superintendent who doesn't catch it and you have a blowout, are you aware that it might be more difficult to control that blowout with a closed-loop system once it starts?

A. I think there would need to be more tanks on site to handle the fluid flow if that occurred. But also, the drilling engineer should know that they should have the proper density drilling chemicals to offset that.

Q. But you're not saying it won't happen with a closed-loop system?

A. It can happen with reserve pits or closed-loop systems.

Q. Now you also had what we called a tale of two wells, and a report apparently from a company called Swaco, S-w-a-c-o. Who are they? On the -- it's cited, Mr. Chavez, on the bottom of page 28.

A. Right. Mr. Carr, this is -- this was provided

just as a reference to closed-loop systems and their potential benefits, and so as far as who was the company, you know, I couldn't go into that.

Q. Isn't Swaco a company that manufactures, in fact, closed-loop systems and sells them to the industry?

A. It could be. I mean, it could be Cimarex. I mean -- yeah. A subsidiary of Cimarex, for all I know.

Q. When you prepared this exhibit showing a tale of two wells, what is the source of this summary on page 27? Where did you get that? Where it says, The Swaco closed-loop system is probably the surest way to ensure the best solids- --

A. I believe that I discovered this on the OGAP -- on an OGAP website that had case studies referenced within its website, and then I went out to the actual website to look at the Swaco case study, and I incorporated the information --

Q. Would it surprise you --

A. -- from this Swaco website.

Q. Would it surprise you to learn that page 27 of your exhibit is a direct and exact quote of a blurb from a Swaco sales brochure?

A. Could be.

Q. Could be? Would it surprise you that the person who sells this equipment would tell us it's good?

A. Well, I -- are you questioning the integrity of this person --

Q. No, I'm asking you --

A. -- that's providing this --

Q. I'm asking you -- you've accepted -- This slide is identical to a sales pitch made by Swaco, and --

A. Do you have the brochure?

Q. Yes, I do. I have one copy. Would you like to read it?

A. Sure, I could take a look at it.

MR. CARR: Mr. Chairman, may I approach the witness?

CHAIRMAN FESMIRE: You may, sir.

Q. (By Mr. Carr) Mr. Chavez, this is a brochure called What is Swaco? And the portion highlighted in yellow, would you like to read that into the record?

A. Do I have to read it in?

CHAIRMAN FESMIRE: He asked you if you'd like to.

THE WITNESS: Well, I don't want to have to read it in, but it looks very similar, and I -- I guess I would have to assume that this operator is a good-faith operator and that he's not lying.

Q. (By Mr. Carr) Well, isn't Swaco -- Is Swaco an operator or the person who sells this equipment?

A. They would appear to be a contractor that either

sells or subcontracts its drilling services out to the oil and gas industry.

Q. Thank you.

A. I can only assume that they're not lying to the public when they make these statements.

Q. And -- That's fine.

A. Yeah, they look similar, Mr. Carr.

Q. If we go to page 33 of your exhibits -- and I think you corrected this, I just want to be sure, Mr. Chavez, but when you testified to this, the third bullet point says, Drill cuttings may be put to beneficial use.

And I think Mr. Brooks asked you -- and correct me if I'm wrong -- but this would only be allowed under these rules if an exception is obtained; isn't that right?

A. I believe so.

MR. CARR: And one of the only benefits of the break was, I crossed out a lot of things.

CHAIRMAN FESMIRE: That wasn't the only benefit.

MR. CARR: Huh?

CHAIRMAN FESMIRE: I said, That wasn't the only benefit.

Q. (By Mr. Carr) If we go to page 44 of your exhibit, your exhibit says, OCD should require the oil and gas industry to follow best management practices for closed-loop drilling, pit evaporation pond, deep-trench

disposal guidance to prevent pollution. And when you were testifying to this exhibit, you referenced sophisticated oil and gas companies.

Is it your testimony that the oil and gas industry is not following best management practices?

A. I don't recall ever seeing any type of best management practices from the industry for closed-loop systems or pit -- pit construction --

Q. And --

A. -- or --

Q. -- even if the OCD is encouraging the industry to use things like deep-trench disposal guidance, if you're within a 100-mile radius, you're not to use that; you're to dig and haul. Isn't that correct?

A. Basically, yes.

Q. On page 45 you talk about moving to closed-loop systems making sense because it will reduce the cost of drilling.

Now Mr. Chavez, you've worked for this industry, you know that it's a cost-driven industry, do you not?

A. Yes.

Q. And that well managed companies try and reduce their costs?

A. Yes.

Q. Is that fair to say?

A. Yes.

Q. And do you -- is it your belief that for some reason the industry is not using closed-loop systems, even though it's cheaper?

A. Re- -- What was the question?

Q. I understand your testimony to be that it's economic, that you save money by using a closed-loop system.

A. I think -- Yeah.

Q. And in a cost-driven business, why would companies -- do you have any idea? -- not use this if it's cheaper?

A. Well, I did cite an example where I think that drillers in this day and age in New Mexico, at least, are so used to drilling pits that, you know, they really haven't entertained the thought and the advantages of using these closed-loop systems.

But once they're trained and up to speed, and new drillers get up to speed with this closed-loop system technology and you put this in the hands of highly intelligent drillers in this oil and gas industry, that great things can happen. And there can be significant cost savings, not only with closed-loop systems, changing their process, but the entire waste minimization process that I discussed through the Texas Railroad Commission where they

outline numerous cost savings to industries if they just would buy into re-examining the way they do business.

Q. You understand that each well is evaluated on cost factors that are unique to that well, do you not?

A. (Nods)

Q. I need an answer.

A. Yeah, yes, sir.

Q. And is it your position that all wells can be more economically drilled with closed-loop?

A. I think I did mention that there was cases in the literature where it was cited that there are some instances where closed-loop systems may actually cost more. But with liability considerations, in the long run I think this industry stands to save a lot of money.

Q. When you talk about drillers, a sophisticated, highly intelligent driller, who are you talking about? Are you talking about the people who physically drill the well or the operators themselves?

A. I'm talking about the people in the oil and gas industry in general. These are highly educated people. I like to refer to them as think-tanks. Many of these individuals have multiple PhD's. You give them a problem to solve, they can sit down and crank out 10 different solutions with price tags for each one.

Q. And these highly intelligent people, these think

tanks, it's your belief now that they are not seeking out the most cost-effective way to produce the resources; is that --

A. Based on my -- based on the entire basis for my P2 evaluation on what the oil and gas industry is doing to reuse, reduce the source, recycle, I would say absolutely not, you guys aren't doing any of that.

And I think we could encourage that by -- on our P2 website, perhaps we could start by putting Cimarex as a first case study for New Mexico to begin this P2 case study to help this industry move forward into the pollution-prevention age and save money.

Q. Beyond Cimarex, have you contacted any of these highly intelligent people to find out what their concerns are about closed-loop?

A. I did not contact each oil and gas company individually to discuss that. I think that was part of the task force which I was not a member of. I need to point that out.

Q. Were you aware that concerns about cost were raised at the task force, of closed-loop?

A. I'm sorry.

Q. Are you aware whether or not costs were raised at the task force meetings -- concerns were raised about the cost of closed-loop?

A. I'm sure it was, but I was not privy to the first-hand discussions of it.

Q. If we go to page 47 of your presentation, it reads, To correct the present crisis, the OCD should consider a massive enforcement campaign on drilling, workover, disposal and production pits across the state to enforce the problem of inadequate design and construction of pits.

A. Yes, sir, very strongly there.

Q. My question is, have you not been conducting a massive enforcement campaign under Rule 50?

A. I think due to staffing, when we put Rule 50 in place we were hoping that this industry would move forward in good faith to design and construct these pits, and what we found during our sampling in May of 2007 and through various photos from our district staff is that the construction of these pits was -- well, it was very poor quality.

And then to find out that a majority of our liners are going in with threads in them, and we know these things leak, you know, we're very -- And also as I think you saw from Mr. Price, he basically laid back and just said, I have so many cases we just can't keep up with this, and if we continue -- this industry continues in this direction that they're following, that -- you know, we're

just not going to be able to keep up with all the contamination that we're having to keep up with.

Q. Were you present for Mr. Price's testimony?

A. Yes, sir.

Q. And as I recall it, he stated that if you'd quit drafting rules you might have time to process some of those applications. Do you recall that?

A. Yeah, and that's why we --

Q. Do you recall that?

A. Yes, absolutely.

Q. And if I look at this exhibit, page 47, it says what's needed is a massive enforcement campaign. That suggests to me you haven't been undertaking one; is that right? For whatever reason?

A. I would say, based on our evaluation of pits and following up with the IOGCC and EPA recommendations to provide better guidance on pit construction, that in fact we -- I guess because of our workload, this is the major time for us to review the problem, and we've reviewed -- we've concluded that it is a crisis, that these pits are leaking, and we're going -- you guys are going in a direction that we're not going to ever have enough staff to clean up all these sites if you continue in this direction.

Q. Now, is it fair to say that what you're calling for is a massive enforcement campaign, correct?

A. It's a recommendation that we could go out and begin implementing fines and penalties for improper construction, lack of adequate berms, berms that aren't compacted, tears in liners with multi-actual stresses and chucking fenceposts into them to -- you know, just all these things are just -- we had our hands up, just -- we've got a problem here, and we want to try to fix it.

Q. Right now, under Rule 50, do you have authority to go after an operator for having a tear in the liner?

A. I think it's under the general provision of must contain --

Q. What about an inadequate --

A. -- in pit.

Q. -- an inadequate berm? Couldn't you go after an operator for having inadequate berms?

A. Yes, but can I cite a difference?

Q. Sure.

A. The difference in this Rule 19 is is that because of the prescriptive nature of it -- for example, if we were to show up to a pit with a tear on the side, an operator could simply just say, Well, it just happened this morning, and besides it's below the high water mark, so bye, bye.

And with this new rule, with the prescriptive nature of it, we can show up on site and, based on our prescriptive language we could basically issue a violation

or work on the violation right away.

So I think that's the fundamental difference between Rule 50 and Rule 17, as it's prescribed today.

Q. Now, if you don't go out under Rule 50 and discover a problem, and if it isn't reported, you don't know about it, do you?

A. And by and large we don't get contacted for rips or tears or releases. If somebody wants to say, Well, it's above the high water mark, and nothing ever happens, so -- and we're going to tear this pit down tomorrow.

Q. And you're requiring, for your system to work, that operators report problems to the OCD; isn't that right?

A. There is a Rule 116 that applies for releases from pits that has always been in effect for Rule 50 and will also be in place for Rule 17.

Q. And under the new rule that's being proposed, you're still going to require that operators report problems to the OCD; you're not going to go out and try and catch everything?

A. It will not be subject to the interpretation of an operator that on any given day from operator to operator they don't think it's worthy of reporting or not.

Q. The point of this is, some operators do manage their properties well; isn't that fair to say?

A. I would indicate that they attempt to follow Rule 50.

Q. And by changing these requirements now and imposing more rigorous standards on them, you're imposing more rigorous standards on good operators as well as poor operators, correct?

A. I believe that is true and that you have a wide assortment and range of operators out there. Not all of them are -- have the resources of, you know, major oil companies.

Q. Isn't it true that what you really need to do as an agency is go after the poor operators, go out, inspect and find them and bring them into line? Isn't that what you really needed here?

A. No, I think we need prescriptive guidance, especially for temporary pits, Mr. Carr, because we have to look at this rule, and we look at the supervision that goes into a temporary pit versus a permanent pit. And you clearly -- there's no professional engineer that supervises the construction of these temporary pits, and we try to provide prescriptive guidance to help the do-it-yourselfer on these temporary pits.

Q. Even when you get that guidance, though, my question is, isn't it incumbent on the agency to go out and go after the operators who are not complying with Rule 50

or the new rule, and bring them into compliance? You need an aggressive, massive enforcement campaign, do you not?

A. We go out and we look at any problem. We don't just discriminate based on poor versus rich operators, we look at each site individually and --

Q. Who are you going to catch with your massive enforcement campaign? The bad operator, right?

A. You may catch operators that thought they were doing things right that aren't doing things right, so it could be --

Q. And --

A. -- there could be bad operators and there could be good operators out there that are subject to this enforcement provision.

Q. You still have to go out, no matter what rule we're under, Rule 50 or a new rule, and enforce the rule; is that not right?

A. Due to the crisis that we see here, yes.

Q. And the crisis is because you haven't been able to conduct the -- partly because you haven't been able to conduct the massive enforcement campaign; isn't that right?

A. Because we've seen Rule 50 in place, and we've taken numerous observations and photos that we've looked at, and we've determined that there's a problem here, and we've got to fix it.

Q. A week ago Friday, you talked about the public's perception of the oil and gas industry; do you recall that?

A. Yes, sir.

Q. Have you given any thought to what the public's perception might be of an agency that has rules and writes new ones, instead of enforcing the existing ones?

A. Do you want to rephrase the question, Mr. Carr?

Q. I mean, you're worried about public perception of the oil and gas industry, or at least expressed concern about that.

A. Yes, I think --

Q. Are you not also concerned about the public's concern and its impression of this agency for not having a massive enforcement campaign? Isn't that a legitimate concern for the public as well?

A. I think they would consider that. But you know, you have to --

Q. Have you --

A. -- look at the staffing of the organization that's --

Q. Uh-huh.

A. -- that's overseeing this. And based on our staffing and based on what we think needs to be done, we think it's more efficient for us to implement this Rule 17 with more prescriptive language to help this industry

prevent pollution. The threaded liners, for example, that are going in, in the northwest and the southeast.

Q. Are those prohibited under your rules?

A. Under Rule 50 --

Q. Yes.

A. -- no, it's not.

Q. Will they --

A. Under Rule 17, we won't allow breaching of liners with thread anymore, so that would be very significant for us. We think that just because we don't see a liner leaking doesn't mean that it's not leaking and impacting soils or groundwater. And we know with great certainty, based on these threaded liners, that they in fact are leaking, and we heard testimony from numerous installers that are indicating this is what they install on an everyday basis in New Mexico.

Q. And when you have a tear in the liner that's allowed under Rule 50, or --

A. What's that? I'm sorry?

Q. If you have a tear in the liner that's currently permissible under Rule 50 --

A. If there is a tear and you're able to see it --

Q. If you do --

A. Yeah.

Q. -- or if you have one under a new liner, your

still going to need to enforce your rule; isn't that right?

A. That's -- that's true.

Q. Now, when we look at your exhibit on liners and liner material, I only have one question --

A. What page is that, Mr. Carr?

Q. Well, just generally, talking about deep-trench burials and liners. Would you agree with me that it is most important that the liner that is over the trench -- that its integrity be maintained, so that you don't have ponding within the trench?

A. Yes.

MR. CARR: Okay, and that's all I have.

CHAIRMAN FESMIRE: Ms. Foster?

*MS. FOSTER: Thank you.*

CROSS-EXAMINATION

BY MS. FOSTER:

Q. Mr. Chavez, part of our presentation concerned better waste management in the State of New Mexico, and I believe that you state -- there was a part of your exhibit that had levels of waste management, starting off with sustainable consumption and production?

A. Yes.

CHAIRMAN FESMIRE: Ms. Foster, are we looking at a specific exhibit?

MS. FOSTER: I can get you a page number if you'd

like.

Q. (By Ms. Foster) We're looking at 30.

A. Page 30?

Q. No, Exhibit 30, the slide that you had from the pollution prevention program --

A. Yes.

Q. -- in the state. I know you know which one it is. Here it is, page 9.

And part of -- I believe what you stated when you testified earlier was that part of this sustainable consumption and production, you believe that the closed-loop drilling system fits into that portion of better waste management program, correct? Or was it the source reduction?

CHAIRMAN FESMIRE: Ms. Foster, I believe the correct exhibit is 29, page 9.

THE WITNESS: Oh, 29?

MS. FOSTER: Yeah, it's this page here.

Q. (By Ms. Foster) Would you like --

A. I think it falls under source reduction, under pollution prevention --

Q. Okay --

A. -- as a process change. The company examines its current process and weighs it against the closed-loop system process and works to reduce cuttings, reduce

consumption of water and all of the variables that were discussed in my --

Q. Okay. So your testimony is, then, that a closed-loop drilling system would reduce the amount of consumption of water and reduce the amount of waste that comes out on the back end of the drilling operation, correct?

A. Yes.

Q. All right. Do you know what percentage the waste volume would actually be reduced by?

A. I guess I would -- in referencing the literature on the cost savings per well, you know, my estimate is about half the cost for disposal because of -- using a closed-loop system actually minimizes the volume of waste as well.

Q. Okay. And when we're talking about waste, we're talking not only about liquid waste, but we're also talking about solid waste, meaning the drill cuttings, correct?

A. Correct.

Q. And part of solid waste would also be liners and cement?

A. Yes.

Q. Correct? That would be -- your solid waste versus your liquid waste, right?

A. Yes.

Q. Now with a closed-loop system, you still have to

haul off liquid waste, correct?

A. What we try to do with that is recycle it and re-use it in another well --

Q. All right.

A. -- and that's the adv- -- that's the real plus of the closed-loop system, is, you use the finite volume of fluid they use on one well, you carry over to the next well and you use it on the next well.

Q. All right. Now to reuse the fluids on another well, does that fluid need to be reconditioned?

A. I'm sure it's a part of the standard mud process of the new well.

Q. But it would need to be -- if you're using fluids from one location and bringing it to a second location, you would need to at least make some kind of study that the fluids would be the correct weight; is that right?

A. Yes.

Q. Right? Okay. And what about operators that are only -- small operators, for example, that are only drilling one well at a time? They don't get those cost benefits, do they?

A. Well, I think they would still reduce their costs by approximately $10,000 under certain circumstances, from what I understand, the literature that I've researched.

Q. Okay, but if -- what I'm asking you, then, is, if

you're one operator -- if you are a small operator and you are drilling one well at a time -- in other words, you're not a big Cimarex that's in the field, that's drilling five or six wells at a time, okay? --

A. There would be a cost-per-well savings that would be less than for multiple wells, yeah.

Q. So I want to make sure that -- you know, part of your program is recycle and reuse. And the recycle and the reuse of water would be for a second well. Is there another option for recycle and reuse of drilling fluids, that you know of?

A. That's the only one that I'm aware of.

Q. Okay. Now what about drill cuttings? There was the discussion with Mr. Carr earlier that drill cuttings -- reuse of drill cuttings is possible for use in berms, correct?

A. Yes, especially in the northwest. However, based on our pit sampling and the chemicals that we've determined to be in these drilling fluids, it's somewhat questionable now, without some type of sampling of those cuttings before reuse.

Q. Okay. So an operator would need to go through sampling to determine the constituents in the drill cuttings before reusing it, and an operator, I believe you testified, would also need to go to Santa Fe for an

exception, correct?

A. I believe so.

Q. All right. Now as stated earlier, when a company decides to drill a well, obviously the cost and the economics of the well comes into play in deciding whether to drill a well, correct?

A. Yes.

Q. And it's my understanding that a petroleum engineer or a member of the company actually does what's called an AFE, right?

A. Application for expense.

Q. Okay. And would the disposal of the cuttings be an issue of cost in an AFE that would be of concern to a company?

A. I would think so, yes.

Q. And how long would it take to come to Santa Fe to get an exception?

A. I would have to defer to Mr. Jones on the details of all of our regulations on exceptions.

Q. Okay. But an operator would need to come to Santa Fe and ask for an exception, and if that is not granted then they would have the potential of having a hearing between -- before the OCC, correct?

A. Yes.

Q. Okay. So you could imagine --

A. Or a Hearing Examiner.

Q. Or a Hearing Examiner. So you're talking about a certain time frame, right, to go through an exception process and propose something that is just barely prescriptive in the rule that an operator could do automatically, right?

A. (No response)

Q. Did you have any discussions with your bureau chief concerning the reuse of cuttings as a potential change to this rule?

A. Yes.

Q. Okay, and it's my understanding under the surface waste management rule that operators have limited disposal abilities of cuttings as well; is that right?

A. Yes.

Q. Yes. So was there -- So there was a discussion with Mr. Price, or your department, concerning the use of cuttings?

A. Yes.

Q. And it's only possible under an exception?

A. Currently, yes.

Q. And only if you're outside the 100-mile rule?

A. Not particularly only if you're -- There can be exceptions to every case. I think that was -- I would defer to Mr. Jones on those questions --

Q. Okay.

A. -- on the exceptions. But I believe that regardless of the 100-mile radius, I think it was clear in Mr. Jones' testimony that an oil and gas company can request an exception for -- propose an exception for anything.

Q. Well, given the surface waste management rule, that there are certain landfarms that can't take drill cuttings and that you have to haul drill cuttings off the location, what do you think is the likelihood of the Division granting an exception to use drill cuttings as berms?

A. Just depends on the analytical data results.

Q. Okay, but under the surface waste management rule, the drill cuttings -- the rule was very clear and stated no drill cuttings may be left on location, they have to be hauled off. Correct?

A. You're confusing me a little bit with surface waste management rules. You're talking about part 36?

Q. Yes, I am.

A. I'm not sure whether that's the case for part 36 --

Q. Okay, well --

A. -- so I couldn't answer that.

Q. -- it would seem to me that there might be a

little bit of an inconsistency on the use of drill cuttings for a surface waste management facility versus a drilling location.

A. I think we try to comply with -- take a look at part 36 and try to make this new rule mesh with it, so I would maybe disagree with that.

Q. Okay, all right. You stated on your direct testimony, and I believe there was a slide concerning the IOGCC, the IOGCC/EPA state review, which was in June, 1994, on slide number 12?

A. Yes.

Q. The IOGCC is an intergovernmental agency?

A. Well, it's the Interstate Oil and Gas Compact Commission.

Q. Okay. Do they have any jurisdiction over oil and gas drilling in New Mexico?

A. They do not.

Q. Okay, so their recommendations are just that, they're recommendations?

A. I think they're a nationwide -- consistency-nationwide-type commission.

Q. To create regulations that are consistent across the nation, but they're basically recommendations, they're not mandates to the state?

A. Yes, I believe they're recommendations.

Q. Okay. Now you stated also that -- on page 15, that pit wastes were of special concern to the OCD because the most toxic ingredients are in workover pits and pit wastes; is that correct?

A. Workover pits seem to be the scenario with the most toxic substances.

Q. Okay, and do you have proof for that statement, or did you read it in literature there?

A. As cited by the API Environmental Guidance Document, as referenced down below --

Q. Okay, and --

A. -- and through discussions with our district staff, who also evaluate the type of toxicity in their -- in their pits.

Q. Okay, so your district staff evaluates toxicity in pits. Do they do testing?

A. They basically just corroborated in communications that the workover pits are the most likely scenario to have the most amount of toxins from chemical additives. That's not to say that reserve pits with saltwater aren't also of concern with chlorides, but from a toxicity standpoint it becomes clear that these closed-loop systems are very preferred for workover-type activities, based on the toxic nature that we would expect.

Q. All right. Now workover-type activities. You're

aware that workover is kind of a generalized term that's used in industry to talk about many different types of activities on location, correct?

A. Yes.

Q. And a workover could mean from cleaning rods to a dewatering thing or -- I mean, there's many different activities out there that could be considered workover.

Now, are you saying that for every single type of workover that's out there, you must use a closed-loop system?

A. There may be instances where, you know, toxic additives aren't added. That could be true.

Q. All right. Now when you -- So I guess what you're saying, then, is that the drill cuttings that come out if toxic additives are used are not of as great concern to you if they're put on a drying pad, as opposed to put in a reserve pit or a tank?

A. Restate that question.

Q. Okay, toxic additives -- I'm using your premise --

A. Uh-huh.

Q. -- are used in workover and frac'ing and different activities at the well locations, according to your testimony, correct?

A. (Nods)

Q. And if you have solids that come up in your drilling operation, they could very well have some of these toxins in it, correct? According to your testimony?

A. Depends on the workover activity. I mean, if they're replacing tubing probably not. But if they're -- you know -- yes, if they're -- you know.

Q. Okay. But the closed-loop system does allow for a drying pad, does it not?

A. Not in all cases. There was one scenario from Cimarex where they dry the cuttings, and we think that's a good idea, to dry those cuttings for -- you know, one of the main reasons from part 36 was that wet wastes with organics in them can vaporize, cause vapors. So we like to dry the cuttings before they're disposed.

Q. Okay, so you are okay with volatilization and bioremediation of drill cuttings on a drying pad, but the rule will not allow for evaporation in a pit any longer, that happens to have drill cuttings in the pit?

A. Rephrase your question?

Q. Well, I just want to make sure --

A. I don't understand it.

Q. Well, I just want to make sure that I understand what you're saying, and that is that drill cuttings that have toxins in it, that are put on a drying pad, are okay for volatilization and bioremediation on a drying pad, but

they're not okay to be left in water and let that water evaporate in a pit, even if that pit's going to be hauled off?

A. I think the main concern with the pit is, you have a head -- you have a head on the wastes that could be driving that -- those toxins down into the soil and the substrate.

Q. But don't operators dewater a pit, usually? They take the majority of the water off before they go through the evaporation process?

A. I believe it's part of the end process, yes.

Q. For closure?

A. (Nods)

Q. Right, okay. On page 28, again you stated that solid waste could be landfarmed, hauled off or injected. And there was a question about footprints as well, and I believe that you stated that a one-acre location is traditional if it's a flat site, and that you could lay tanks down on additional ground with minimal disturbance?

A. I think my point there is that the average -- the level drill site averages about an acre, and my point there was -- is that that footprint could be smaller with a closed-loop system. It wouldn't have to be an acre to accommodate a reserve pit the size of a half to three-quarter acre when it could facilitate tankage or tanks

instead.

Q. Okay, but the size of a reserve pit is not standard. It depends on the type of drill rig that's used, the company that's drilling, et cetera, et cetera, right?

A. And depth of well.

Q. And the depth of the well, right. And traditionally, reserve pits are smaller in the northwest than they are in the southeast; is that not correct?

A. That's what we observed, yes.

Q. All right. Now, however, to put tanks on a location, an operator still has to put it on a pad location, correct? Or a caliche location; you just can't put it on the ground?

A. Well, I think the standard practice was to level the ground and place the tanks on leveled ground.

And my only point there is, with this pollution prevention initiative, as we begin to think outside of the box and entertain other options for saving money and reducing expenses, if the relief at a site was flat, and you're using closed-loop systems, the wellpad area, the leveled wellpad area, could actually be smaller, and that the tanks that you bring in for a closed-loop system wouldn't necessarily have to go on a leveled, disturbed area.

You could simply -- depending on the scenario,

you could place the tanks on top of the ground, and then after you're done drilling, you could potentially restore the site.

And that was just offered to point out a point with pollution prevention. Not everything -- not all soils need to be disturbed and land needs to be disturbed. We may be able to place these systems down on top of the ground in proper circumstances and, when we remove them, work to restore any damage that's --

Q. Okay, so then if I hear you correctly --

A. So the footprint becomes smaller.

Q. The foot- -- okay, then -- then I guess we need to discuss what you're thinking of as a footprint, versus what I'm thinking of as a footprint.

A footprint, traditionally, is the caliched area or the wellpad, that you go to the OCD and put on your APD. Right?

A. (No response)

Q. Now using that definition of a footprint, are you saying that you will allow operators to put tanks for a closed-loop system that are -- for example, frac tanks or tankage that needs to be used for a closed-loop system, off of that caliched area?

A. My point there is that the standard size for these well clearings is about an acres. However, if you

were to use closed-loop systems, that level of land area could be reduced. You reduce the footprint of the disturbed area, and then you work to bring the closed-loop system inward toward the well. And in some instances, if the conditions are right, those tanks, et cetera, may be able to place right on -- be placed right on top of the ground.

Q. Okay, now --

A. I'm saying that's something that could be entertained to further reduce the footprint.

Q. On a closed-loop system, you have trucks coming on and off location to haul off your fluids and your cuttings, et cetera?

A. I think that's reduced, and the reason why the truck traffic is reduced, and as it's stated here in my presentation, is the fact that you're working with a finite volume of liquids, so you don't need to be trucking in a whole lot of volume of liquids for the well.

Q. All right, so you're -- Okay, you're working with a finite amount of liquids. That means that if you don't have a reserve pit, then you have to have your water in tanks, correct?

A. Yes.

Q. And a prudent operator would, in case of a kick, need additional backup water in additional tanks in a

closed-loop system, correct?

A. Could have additional tanks, yes.

Q. Right, instead of all the water that traditionally would be in a reserve pit --

A. I believe that's --

Q. -- right?

A. -- maybe the case.

Q. And a reserve pit in the southeast is usually 100 by 100, a horseshoe, it's filled with water that's used as a reserve, right?

A. (Nods)

Q. And the middle section of the horseshoe is usually fresh water that's used as backup, right?

A. I think -- Yeah.

Q. Now -- Right. Now, for a closed-loop system, conceptually, you have to replace all that water with water in tanks?

A. I think you have fresh water starting off in the inner horseshoe, for drilling through the freshwater zone, but that certainly is subject to change, and I think that's the flexibility of the horseshoe design, to use it to store fresh water and saltwater fluids.

Q. Okay, in the northwest you don't traditionally have the horseshoe design? You --

A. We did not see the horseshoe design up in the

northwest.

Q. All right. But you have liquids that are available as a backup in case something should happen on location, right?

A. In a reserve pit or a closed-loop system, yes.

Q. That's right. And in the closed-loop, all that needs to be in frac tanks?

A. Yes, smaller dimension frac tanks that take up less space, yes.

Q. But they still need to be on location?

A. Could be.

Q. Right? And when you're drilling, you're bringing up solids -- I mean fluid initially, and that goes through our closed-loop system and into a tank, and that needs to be hauled off-location? Are you saying the no --

A. I don't know what you -- What is your question?

Q. I'm trying to assess the number of tanks that need to come on and off location at a closed-loop system.

A. You mean at the beginning and the end stage, or --

Q. During drilling.

A. Oh, I wouldn't know the answer to that question.

Q. Okay. But are you aware that fluids go through a closed-loop system and that some comes out on the back and it needs to be tanked off?

A. I think that's the fluid -- the recycled fluids that we're talking about here that are trucked off, either to another drilling location or for disposal downhole or to be recycled.

Q. Right, so you have trucking to haul off your fluids, and then ultimately you will -- and you also have to have a bulldozer on site, correct, to move your drill cuttings around?

A. The Cimarex example basically exemplified that.

Q. Okay, and how large is the drying pad in the Cimarex example?

A. That's a good question. Based on being on site during the sampling, I think 60 square foot would be -- 60 to 80 square foot. It seemed to be smaller than a standard reserve pit.

Q. Sixty to 80 square foot, and the drill cuttings are going to be put on that location. And how high a lift are you going to allow the operators to put on their drying pad?

A. We don't specify the height of lifts on top of a lined drillpad, drying pad.

Q. Okay. But again, you're aware of the surface waste management rule, are you not? Rule 36?

A. Yeah, I was familiar with it --

Q. Okay, and rules --

A. I am.

Q. -- the rules that were allowed to put into a landfarm were, I believe, six-inch lifts, correct?

A. This isn't a landfarm, this is a storage area --

Q. Okay, it's a storage, but --

A. -- for --

Q. -- the purpose, I believe you testified earlier, was for volatilization and bioremediation of the soil?

A. I didn't indicate that, you did.

Q. Okay, but you stated volatilization, did you not?

A. No, I did not, not to my reference. You brought that up as air volatilization and so forth. I --

Q. Okay, so then what is the purpose of the drying pad, just to put the drill cuttings there and have them sit there?

A. Basically store the cuttings as they come out during the drilling process. You simply store them in the drying area, and at such time as you're ready to transport them for disposal or reuse, that's -- that's what the function serves.

Q. Okay, so you're -- it's not a drying -- it's not a landfarming function, you're saying now?

A. Absolutely not.

Q. Okay. And have you talked to, or has there been any discussion with surface owners concerning this concept

of putting tanks just on unprotected soils?

A. I think that's their option. I mean, if the drilling company wants to work with a landowner on that, then that's certainly something that could be negotiated. And all I'm indicating is that from a P2 standpoint, I think we would -- we would need to consider that. Do we want to disturb another half-acre of land, or because of the nature of this site, would it be good to just place the equipment on the top of the ground and restore it when the drilling is done? I mean, that's something that we would entertain --

Q. Okay.

A. -- under a pollution-prevention initiative.

Q. Okay. I believe you also stated in your testimony that air drilling would add an additional cost savings of about $1200 per location?

A. About $2000. Again, the depth of the wells weren't specified, but it just -- from the research, if companies are able to drill with air, they're able to also reduce the cuttings --

Q. Okay --

A. -- in some form or fashion.

Q. -- and do you know if you can use a closed-loop system with air drilling?

A. No, I believe that needs to be done with fluids,

but in the process of getting to the target zones, I think companies are using air drilling as part of these closed-loop systems to further reduce their costs.

Q. Okay. So what you're saying is, the companies are starting off with air-drilling and then moving to fluids?

A. Well, I don't think they're doing that through the freshwater zone, but I think there are certain points where they can, and I would just need to abstain from that question because I'm not a registered petroleum engineer.

Q. Okay. In your presentation you stated that while -- that -- in terms of P2 and waste management, that actually hauling to a landfill was the least preferable alternative, ultimately, that in your perception that landfills were better than deep-trench burial. Is that a fair statement?

A. I want you to repeat that again, because I'm hearing conflicting things here.

Q. I believe what you stated -- you know, the premise of your presentation was waste minimization and waste management, and that landfilling is the least preferable alternative, because you'd prefer to have industry recycle and reuse first and then move down the chain, and then wastes that cannot be recycled and reused ultimately have to go to a landfill --

A. Absolutely.

Q. -- correct?

And in your mind, landfilling the waste is better than deep-trench burial?

A. Yes, it is, based on all the presenters from the OCD that I was, you know, privy to listen to and be involved with, that disposal at a certified, permitted facility would be preferable to land disposal.

Q. Right. And now your background is -- I believe in Michigan you had some landfill design experience, if I remember correctly?

A. I was a project manager for Superfund, overseeing a couple of contamination sites, both being subtitle D solid waste landfills.

Q. Okay, subtitle D is under RCRA?

A. Yes.

Q. And RCRA is -- the subtitle D are specifically to handle special wastes?

A. Not necessarily special wastes. Refuse, trash, putrefied waste, things that aren't hazardous.

Q. Including oilfield waste?

A. They do have a provision for special wastes here in New Mexico that I'm aware of. I --

Q. Okay. And the special wastes can be taken to some of the landfills that were listed -- I believe it was

on Mr. van Gonten's exhibit, in New Mexico?

A. Yes.

Q. One of them being -- I think it was the northwest landfill?

A. I believe these are the Colorado landfills that you're alluding to, or the New Mexico landfills?

Q. The New Mexico landfills?

A. Yes, I see a northwest New Mexico regional landfill. Is that the landfill that you're --

Q. Okay, the New Mexico -- the northwest regional landfill, is that permitted by OCD or NMED?

A. NMED.

Q. NMED?

A. (Nods)

Q. Okay. And if I were to look on the NMED website, would I find information about the northwest regional landfill?

A. I could only expect that if you did a search of their website, the solid waste bureau, that you would find that.

Q. Okay. Now special wastes are -- in the State of New Mexico, includes PCS, which is petroleum-contaminated soil, correct?

A. Right, yes.

Q. And what exactly is petroleum-contaminated soil?

A. It would be any type of soils with hydrocarbons from -- for example, an emulsion that comes from subsurface in oil and gas drilling exploration would contain organics, would be subject to petroleum-contaminated hydrocarbons.

Q. Okay. And would that include drill cuttings?

A. Yes, I believe it could.

Q. Okay, so --

A. It comes from downhole, and they're in contact with the formation.

Q. All right. And are these NMED landfills allowed to reject some of this special waste?

A. I believe every facility has the right to reject incoming waste.

Q. All right. And would it surprise you to know that, for example, Lee Land requires -- Lee Land, which is in southeastern New Mexico, would require -- would require -- I'm sorry, could I speak today? -- require a TCLP test, which is for the 3103 metals?

A. That could be a part of their requirement, yes.

Q. Okay, and so they would have the right to reject --

A. -- hazardous --

Q. -- based on whatever standard for the 3103 metals?

A. I presume so, unless they have treatment on site

that they're able to offer.

Q. All right. Now if operators are not able to dispose at an OCD regional landfill because there isn't one, or an NMED landfill accepting special waste, say for example because they have high 3103 constituents, where would they take that waste?

A. What do you mean by high TC- -- what you mean -- If it's hazardous or --

Q. Well, if the TCLP demonstrates that there are 3103 constituents in it, and for whatever reason the NMED landfill will not accept it, where could an operator take those wastes then?

A. Well, if it's determined to be hazardous, they would need to -- well, or -- if one facility rejects it, they can -- you know, they have the option of applying for another facility.

But these solid waste landfills are lined, and unless these wastes are determined to be hazardous wastes there shouldn't be a problem with receiving waste at that facility, if they so desire to accept it.

Q. All right. So these landfills are lined, and I believe they're lined with 60-mil high-density polyethylene, HDPE?

A. That's the new requirements under subtitle D for those type of facilities.

Q. Right, and under the liner is two foot of low-permeability soil or red clay, right?

A. Yes, there could be, yeah.

Q. Okay. Well, are you familiar with the Rio Ranch landfill?

A. I'm not.

Q. Okay, are you familiar with the San Juan County regional landfill?

A. I'm familiar with their locations and their subtitle D designations, but --

Q. Okay, and they just renewed their permit, did they not?

A. I don't know.

Q. Okay. Would it surprise you to know that they had the 60-mil PVC -- the HDPE liner with the two foot of soil underneath?

MR. BROOKS: Mr. Chairman, I object to the "would it surprise you to know" when it's attempting to testify -- when counsel is attempting to testify -- use that form of question to testify to facts not in evidence. She can ask the witness to assume the facts, but I think that it's improper for counsel to make a question that states facts that have not been entered in evidence in this case.

CHAIRMAN FESMIRE: Mr. Brooks, I agree with you. But given the odd way that this hearing is evolving --

(Laughter)

CHAIRMAN FESMIRE: -- if Ms. Foster can tell us that she's going to present that evidence at some point in the future, I think I would allow the line of questioning.

MS. FOSTER: Well, I believe that Mr. Chavez stated that under the new rule, that the 60-mil HDPE and the two-foot soil underneath was of concern to the new requirements, I believe was the word that he used.

So I would assume that if the San Juan landfill is one, it is an appropriate landfill that he could probably make the assumption that they have adequate liner.

MR. BROOKS: Well, I have no objection to her asking the witness to assume facts, merely to her testifying to facts.

MS. FOSTER: Okay.

CHAIRMAN FESMIRE: I think that would be the proper way to handle it, Ms. Foster.

MS. FOSTER: Okay.

Q. (By Ms. Foster) Were you here for --

CHAIRMAN FESMIRE: Ms. Foster, this would probably be a good place to take a 10-minute break. Let's make it a 12-minute break. We'll reconvene at 35 to noon. I intend to go till about a quarter to one, break for lunch, and then come back after that.

(Thereupon, a recess was taken at 11:23 a.m.)

(The following proceedings had at 11:37 a.m.)

CHAIRMAN FESMIRE: Okay, let's go back on the record. For the record, this is a continuation of Case Number 14,015.

Let the record also reflect that Commissioners Bailey, Olson and Fesmire are all present, we therefore have a quorum.

I believe we were in the cross-examination of Mr. Chavez by Ms. Foster.

Ms. Foster, are you ready to proceed?

MS. FOSTER: Thank you, Mr. Chairman, yes.

Q. (By Ms. Foster) Mr. Chavez, were you present for the testimony of Mr. Brandon Powell and Mr. Michael Bratcher for the OCD?

A. Yes.

Q. And I believe that there quite a few pictures that they showed as part of their exhibits. Did you see those?

A. Yes.

Q. All right. And in the exhibits that they showed, did they fine the operators every time for the infractions that were shown in the picture?

A. From my recollection, not every time.

Q. All right. And I'd like to talk to you about the prescriptive nature, was the term that you used, that the

current Rule 50 was not prescriptive enough. Could you expound on that statement?

A. I think that Rule 17 has more prescriptive guidance for temporary pit construction that will assist the do-it-yourselfer.

Q. All right. And a lot of what's come into Rule 50 actually was in guidance -- in a guidance document previously, that was drafted by the OCD. Correct?

MR. BROOKS: Excuse me, does the witness mean Rule 50 or the proposed rule?

MS. FOSTER: Rule 50 is the old rule, and --

MR. BROOKS: Correct.

Q. (By Ms. Foster) Yes. Was there not a guidance document that was issued by the OCD?

A. I'm aware of a guidance document.

Q. All right. And the need to report and the need to communicate with your local district managers, was that not part of your guidance document previously?

A. I wasn't here for the development of that guidance document.

Q. So this new Rule 17, you would like to see that as -- or, you determined that to be more prescriptive in nature?

A. Yes.

Q. What do you mean by something that is more

prescriptive in nature? What does that mean?

A. That we're outlining -- we're outlining specific construction requirements so that that person who's constructing the pit is more aware of what's going to be required for its construction, maintenance, et cetera, and what the OCD would be looking at when we come out and do an inspection.

Q. All right. Now you used the term in some of your slides of best management practices. Does not the term best management practice give the operators the right to try and use the best technology that's available?

A. I think best management practices, as I've discussed them, are kind of outside the realm of the rule guidance. It's more like the industry developing best management practices for the industry on how to properly construct these items. Perhaps it would take into account Rule 17.

Q. Okay. But how is it that an operator can follow the very prescriptive mandates in your rule that say specifically how you're supposed to construct a pit, how you're supposed to do things and still use best management practices if there's a change in technologies?

A. Well, I think that the industry has to evaluate Rule 17 and factor that into its best management practices.

Q. Well, would it not be the case that if there is a

best management practice that an operator must use, they actually have to go and ask for an exception?

A. I don't particularly call that a best management practice. I wouldn't --

Q. Well, if there is a technology or a product is available to an operator that is not within the prescriptive mandates of Rule 17, do they not need to go ask for an exception?

A. I believe so.

Q. All right. Even if it's better than what might actually be in the prescriptive rule?

A. I think in some instances we defer to the district staff to make those calls, but -- and sometimes those need to go up to -- come up to Santa Fe.

Q. I believe that it came through your testimony and that of several other witnesses that the OCD staff is clearly overworked. And you're in the process of trying to work with operators and industry currently, correct?

A. That's what my understanding of the task force was, I don't --

Q. Right, but in terms of the 200 cases that are sitting on Mr. Wayne Price's floor and this foot and a half of paper that's sitting on Michael Bratcher's desk that he needs to get through, that is clearly an indication that you guys are very overworked, correct?

A. No, I think it's more of an indication of the contamination that's going on out there, that we only have a small fraction -- a small fraction of what we're seeing going on out there as regulators.

Q. Okay, but you're assuming that those 200 cases and all that paperwork is an indication of contamination?

A. I think it's a small fraction of potential contamination that's going on out there.

Q. Okay, and that's your assumption because they haven't gone through that paperwork yet, so they don't know, they don't even know?

A. I don't understand your question. Are you asking about based on paperwork, or are you -- What is your question?

Q. Well, my question to you is that your -- the reason that you stated that you don't do the additional enforcement, and the reason that you need a more prescriptive rule is because the OCD staff is overworked?

A. I think I was indicating that based on what we're seeing out there, even after implementing Rule 50, that there are significant problems out there, especially as I've highlighted, threading liners, the majority of these liners going in with these threads and leaking out there, and just because we don't see them leak doesn't mean that they're not leaking.

Q. Okay, but is it -- but it seems to me that your concern happens to be with the pits. And therefore if you remove the pits with closed-loop systems, in your mind there needs to be less enforcement by the OCD?

A. No, I think I indicated we give you options, industry options, to drill with pits or closed-loop systems.

Q. Okay, so you think that there actually will be less need for enforcement under the new Rule 17 as written?

A. As I indicated earlier, I think the prescriptive language in Rule 17 provides further guidance to the industry on how to construct these pits so that when the OCD arrives on site to conduct an inspection, we're hoping we won't see as many violations.

Q. So that you can fine automatically, I believe is what you stated before?

A. I -- what you indicated.

Q. Well, if you -- if -- under these new prescriptive rules, if you arrive on location as an opera-- as an inspector, I believe you stated that you can implement more fines than under Rule 50, as written?

A. I think that we would be better able to enforce our regulations with the prescriptive language, as opposed to the general statement, must contain liquids in a pit. I mean, that's pretty generic.

Q. Okay, so basically what you're saying is that you want to take away some of the subjectivity and communication skills that your district managers have and they demonstrated in their exhibit?

A. No, I think I mentioned that the type of quality and supervision that goes into a temporary pit versus a permanent pit, so you're kind of comparing apples to oranges, and that with temporary pits we don't require these pits to be constructed with the oversight of a certified quality assurance officer, for example, or a professional engineer who's knowledgeable in pit construction, design, et cetera --

Q. But --

A. -- and therefore, prescriptive language for the temporary pits makes sense to provide that type of guidance for these do-it-yourselfers.

Q. But in this new rule you're still requiring the additional things like, for example, a hydrogeological report, even for a temporary pit, yes?

A. You know, I'd have to defer to Mr. Jones on the language.

Q. But that's part of your new prescriptive requirements, that if that doesn't get done your operators can get fined?

A. They could potentially be fined, I suppose, yes.

Q. Okay. Now, you were also present, I would imagine, for Mr. Hansen's testimony or modeling. Are you familiar with it?

A. Yes.

Q. Okay. And did not his modeling make the final finding that it would actually take close to about 80 years' contamination to get to groundwater?

A. I seem to recall that for part of his presentation.

Q. All right. But in your testimony you keep saying that there is a crisis and that there is a problem, and -- but that statement is due to your observation or the reports on ripped liners and some spills on the ground; is that not correct?

A. I think the main impetus for that is soils, that just because things don't reach groundwater doesn't mean that they contaminate soil, sterilize soil, impact soil and surface water and possibly groundwater, yeah.

Q. Okay. But so the crisis that you have in your mind here is the impact to the soils and not to the groundwater?

A. I think they're all of the above. But you certainly can't discount soils. Part 36 kind of discussed the concerns with chlorides.

Q. Okay. But under the current Rule 116 and 19,

don't operators -- aren't they mandated to clean up their spills and clean up the soils?

A. If they become -- if they become aware of a spill, they're required to report.

Q. Okay. And so I want to make sure that I don't put words in your mouth, but are you saying that a spill is automatically, in your mind, a contamination event?

A. I would say spill to the soils, the substrate, could potentially be a contaminant event, and under Rule 116 we'd work to rectify it.

Q. Okay, so it could potentially be a contaminant event, but since operators are cleaning up spills on soils, there would be no contamination then?

A. If they report a release, if they're knowledgeable that there, in fact, is a release occurring, they would possibly report.

Q. Or they'd clean it up?

A. Depends on the release. They have to -- They may have to report.

MS. FOSTER: Okay, I have no further questions. Thank you.

CHAIRMAN FESMIRE: Mr. Baizel, do you have any questions of this witness?

MR. BAIZEL: No, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: Nothing, Mr. Chairman. Thank you.

CHAIRMAN FESMIRE: Ms. Belin?

MS. BELIN: No questions.

CHAIRMAN FESMIRE: Mr. Brooks, do you have a redirect of this wit- -- Oh.

(Laughter)

CHAIRMAN FESMIRE: Commissioner Bailey?

EXAMINATION

BY COMMISSIONER BAILEY:

Q. Yes. Let's look at page 46 of Exhibit 29, and in the middle of that frame it says, Habitat and wildlife will benefit. Landscape beauty and surface waters of the state will also be better protected --

A. What number? Excuse me?

Q. In the middle of that slide where it's labeled, Habitat and wildlife will benefit. And the next couple of words is landscape beauty.

How can landscape beauty be protected unless re-vegetation standards are clear and enforced?

A. Well, I think the premise for that is the fact that with closed-loop systems we have a smaller footprint. We don't have half-acre, three-quarter acre of pits and soil disturbance, and therefore the landscape is -- there's going to be less landscape that's going to be disturbed.

And that's that pollution prevention element that

I discussed earlier, that once we get going with these P2 concepts -- and one of the things we hope to realize is a smaller footprint at each and every drill site.

Q. But if there's no vegetation, which is absolutely essential for protection of groundwater, according to your staff -- if there's no vegetation, if the ground is ripped up, it's not even contoured according to your regulation, proposed regulation, how do you call that landscape beauty, is my point?

A. I think the land would only be affected where the equipment is laid down, and when the equipment is removed restoration can occur in that instance, as opposed to any instances where you're clearing the land in massive areas. The site is restored either way, but...

So in my opinion, if you lay down a tank, directly onto the ground, you drill, and when you're done drilling you pull it up and you evaluate the impacted areas and restore that site, I think you're ultimately getting a smaller footprint at the facility.

Q. Do you know why they lay down caliche on wellpads?

A. I'm not too familiar with the basis for the caliche. I know that it's highly fracturable --

Q. Right, when its formation --

A. -- calcium carbonate.

Q. -- the surface agent of choice in the southeastern part of the state. And there are many good reasons why caliche is used in the drill pads. One of them is to keep trucks and tanks from bogging down in mud, to prevent greater disturbance of the surface. It's a nice hard surface, which also prevents any kind of natural receding, unless that caliche is ripped.

You talk about protecting soils. You just made the comment you can't discount soils as part of the natural environment. Soils -- Do you agree that soils will erode from wind and water and everything else, unless there's vegetation that does hold it to the surface?

A. Commissioner Bailey, I would agree with that.

Q. Okay. When you were doing your research for best management practices, did you look at the BLM gold book that is enforced or used for all federal lands in New Mexico for best management practices?

A. Commissioner Bailey, no.

Q. According to your department's annual report, 43 percent of the state revenue from oil and gas sales come from federal mining leasing royalties, 42 percent of all the oil produced in the state comes from federal lands, 63 percent of all the natural gas produced in New Mexico comes from federal lands.

And the BLM has issued the gold book, which

official title is, the *Surface Operating Standards for Oil and Gas Exploration and Development*. And operators on federal lands have to comply with the gold book.

With such a huge land-management agency, why did you not look at those management plans used by the BLM?

A. Commissioner Bailey, I was aware that the BLM fully endorsed the closed-loop systems from the research that I had previewed. However, I regret that I had not reviewed the gold book that you're referencing there.

Q. In the gold book there's an entire chapter -- Chapter 6, Reclamation and Abandonment -- and while not prescriptive, it does have some very basic plans on what needs to be done for reclamation and at closure of any kind of well site.

And since most operators who operate in this state also have at least some federal leases and are aware of what those requirements are, is it logical to you that the OCD Rules should at least acknowledge the requirements for reclamation of the lands, when you talk about improving relationships with surface owners, like you do on page 33?

A. (No response)

Q. With the cumulative effects that we've heard so many times here, wouldn't cumulative effects of well sites that are left rough and bumpy and not re-seeded have some detrimental impact on surface owners and would, in fact,

not improve relationships unless the OCD takes into account some of the requirements?

A. Commissioner Bailey, if I implied that these closed-loop tanks were going to be removed from the surface and there was going to be no site restoration, I would concur with where you're going. However, I don't think I expressed in any way where we would not seek to fully restore the site to its original condition and -- with our regulations. Those tanks, when they're removed, there will be efforts to restore whatever it's disturbed.

And that was an example cited as a P2 example on where -- you know, where we can go with P2 in reducing costs and using reasonable approaches to drilling in this state.

Q. If one of your complaints with Rule 50 is that it's not prescriptive enough, then how can you say that four sentences are adequate for soil cover designs in the proposed rule, when it doesn't even talk about recontouring the land?

A. I think I would need to defer that to Mr. Jones or Mr. Price, to address that, since I was not involved with the land-restoration aspect of it. I was just involved with the P2 approach for my presentation.

Q. But the P2 approach does deal with best management practices, and there was a great resource that's

being used here in New Mexico already, that does talk about recontouring the land, restoring intermediate and final reclamation so that the footprint is reduced during the time that the well is in production.

I've been thinking very hard about the different scenarios, and let's talk about the scenario with the removal of the contents of the pit to a landfill.

According to the proposed rule, there's not even any recontouring that's required. So would you think that holes in the ground that are left rough, not required to be recontoured, left for re-seeding of manzanita and whatever else that's out there, is a good way to treat surface owner concerns or public concerns or the lands that we all look at in the southeast and the northwest?

A. Commissioner Bailey, if you're indicating that perhaps we could be more prescriptive in our land-restoration section of our regulations, I don't think we would have a problem with becoming more prescriptive, to try to address some of these best-management practice suggestions from BLM. I think we should consider those in this regulation. But we would be more prescriptive in that section if we do so.

COMMISSIONER BAILEY: Thank you. That's all I have.

CHAIRMAN FESMIRE: Commissioner Olson?

EXAMINATION

BY COMMISSIONER OLSON:

Q. Yeah, Mr. Chavez, I'd like to get into a couple questions on -- related to some of these disposal issues.

One of the options that's left if you're outside the 100-mile radius is deep-trench burial, and do you consider the deep-trench burial analogous to landfilling?

A. I think what I indicated is that it's not -- it doesn't meet the requirements of the landfill monitoring, leachate collection/removal systems from the waste by long-term monitoring over time. So I don't view them to be from a definition of landfills, but at the same time they could be potentially considered dumps if you're going to bury them and try to use some means of minimizing or preventing pollution for the long-term.

Q. But you are taking the waste, you're creating an excavation, you're burying it in the ground, the same as a landfill; isn't that correct?

A. That is similar, yes, Commissioner Olson.

Q. So if there's a concern over the contaminants that are in the deep-trench burial, why wouldn't the liner requirements be the same as for a line facility under Rule 36?

A. Commissioner Olson, it's my understanding that -- and from our Rule 17, we make sure that the waste meets

minimum concentration requirements before we allow the burial. So in that respect I don't think that we're as stringent in requiring, you know, double-lined systems with leak detection, leachate collection/removal systems and long-term monitoring.

Q. Well, I was thinking along the lines of liner requirements. The liner requirements for -- under Rule 36 are looking at, you know, essentially deep waste burial and looking at a minimum of a 30-mil liner.

Why wouldn't we be looking at a -- similar liner requirements for landfilling of essentially the same types of waste on a smaller scale, such as in deep-trench burial?

A. Commissioner Olson, excuse, I'm just trying to get over to my section on pit liner specification and requirements where I provide schematic diagrams of the on-site deep-trench system. And I'm just looking at page 37 of the -- I believe it's Exhibit 30. And I would need to listen to your question again.

Q. Well, I think what I'm asking is that the waste types could be very similar at a centralized facility and for deep-trench burial in terms of the chloride concentrations of the waste being landfilled, whether it's being landfilled on site or at a centralized facility.

So I guess what I'm asking is, why should the liner requirements be different for on-site deep-trench

burial than at a landfill -- centralized landfill facility?

A. Well, I think there's two answers to that question, Commissioner Olson.

The first is, the string-reinforced linear low density polyethylene 20-mil was a product of the task force. That was a task force recommendation.

And number two, as I've mentioned earlier, we do require a certain type of testing of the waste to ensure that it does not exceed certain limits before we allow it to be buried in place. And therefore, based on these recommendations and this design, we feel that this may be acceptable -- an acceptable means of disposal of the waste on site.

Q. Well, I guess what -- do you know what the -- since you're the ones that, I guess, was looking at the liner systems themselves, what is the life of a 20-mil string-reinforced liner versus a 30-mil liner required for the centralized facilities?

A. Mr. Olson, as part of my review of these regulations that -- again, I kind of was involved with the liner requirements under part 36, and that's why I kind of became involved with these pit liner -- I had the privilege of reviewing a couple of reports.

One was from the Geosynthetic Institute, the GRI white paper number 6, Geomembrane Lifetime Prediction,

Unexposed and Exposed Conditions, dated June 7th, 2005.

And another publication from a similar institute on Lifetime Prediction of Polymeric Geomembranes Used in New Dam Construction and Dam Rehabilitation.

And based on what I'm seeing is that the temperature plays a significant role in the longevity of a liner. The lifetime of a liner is measured based on its half-life. That means that the liner properties, as long as the ultimate stresses are within 50 percent of the new condition of the liner, not understressed, that, you know, that's a fully functional liner.

And based on discussions with Dr. Stephens, he had thrown out a 270-year time frame for a solid waste liner, and I believe that is in reference to a 60-mil HDPE liner. I think that that number is somewhat accurate, but that when we're dealing with covered liners versus uncovered liners, the temperature factor becomes more of an issue.

For example, and HDPE liner subjected to 100-degree temperature may only have a longevity of 107 years, according to some of these publications. And when we talk about 60-mil liners, you know, the thicker the mil thickness, the stronger the liner.

And so your question is, How long would we expect these liners to last? And based on these reports, they

indicate that linear low density polyethylene liners are very similar to HDPE liners, the liners that we know most about.

But the issue here is that the liner is thinner, it's a 20-mil liner. And so, you know, when we look at a 270-year lifetime for an HDPE liner, you now, it's anybody's interpolation guess between 107 and 270 years for this type of liner, buried underground, under certain stresses.

And I would also -- Again, this is with half-life. Again, the reports indicate that they've had liners installed in six months that leak because of seam problems. So there's a couple of -- You know, if you're asking about the half-life of these liners, I think, based on what I've read, you know, 100 years may not be too far off the mark.

Q. Well, I guess --

A. Covered, covered. Uncovered, subjected to the elements of sun, wind, less time.

Q. Right, but that's not what the Division is proposing. The Division is proposing the deep-trench burial, so you'd expect that the temperatures would be relatively constant at four feet under the ground. Correct?

A. The assumption with Dr. Stephens' model, as I understand it from the Geosynthetic Institute report, is

270 years for a half-life.

And linear low density was the only other liner type that came close but was not considered longer in longevity than HDPE, and currently research is being done on other liners, like EPDM and chlorosulfinated polyethylene reinforced liners, other types of liners. That research is ongoing, as we speak.

Q. Well, I guess what I'm trying to understand is if we have requirements for burial of wastes at centralized facilities that are comparable in waste quality to what would be buried in an on-site deep trench, why would our liner requirements be different?

A. Commissioner Olson, I thought I had addressed that previously when I discussed -- before we were allowing deep burial, it's my understanding that we will be testing the waste contents to determine whether they exceed certain limits. If they exceed limits that we think are unacceptable, then this may be an instance where we would not allow on-site trench burial to occur.

So I think that is the distinction that I'm trying to use to address your question of why we would allow a lower mil thickness liner and cover scenarios such as this in our regulations, part 17 proposed rule.

A lot of the central facilities receive very highly contaminated wastes. I think at solid waste

facilities that aren't considered hazardous can have highly concentrated contaminated concentrations of waste.

And I'm not saying that these wastes that we're allowing to be buried are not highly concentrated. However, they do have to meet our limits before they are allowed to be deep-trench disposed.

Q. But even those limits, as I understood from the OCD's testimony already, was that we're looking at up to 100,000 chlorides, which is quite high concentration; isn't that correct?

A. Mr. Olson, I would agree with that. And I think I also mentioned in my presentation that we're doing nothing in the way of EPA remediation to solidify or stabilize the wastes that we're burying in these deep-trench systems.

Q. Well, following along with the liners, were you here for the testimony from the gentleman from Raven Industries?

A. Yes.

Q. And in his testimony he was talking about a problem with the -- meeting the EPA SW-846 method 9090A. Do you agree with him that there's a problem with that method for complying with liner materials?

A. Commissioner Olson, I don't think there is any problem. I think that's a method -- EPA method that has

been accepted for more permanent type liner materials in their compatibility with chemicals and wastes in particular.

These liners when they're proposed, under 9090A, they undergo these chemical compatibility tests. And they take samples of the liner materials and they subject them to certain types of ASTM testing -- for example, tensile testing, multi-axial testing to see at what force that they will break or rupture -- and not only do they compare the new material, but they also subject the liner material to different types of waste that they're planning to dispose of.

And in that process, I think what Mr. Waltner was referring to is the fact that the ASTM method specified in 9090A could change. And to me that doesn't present much of a problem if we include an as-amended method to reflect changes in the ASTM methods that could be used when testing these liners.

And I believe the other issue he brought up is the fact that, well, what is the pass-fail for these? Well, there is no pass-fail. You simply evaluate the testing results on the new liner material versus the stress liner materials, and you determine, based on the -- you know, the testing, whether these are very similar. You know, if they're 30 percent off, 20 percent off, that may

be acceptable to a regulatory agency. If you're 50 percent off, or the half-life of the liner material, then that probably is not going to be acceptable to a regulatory agency.

So I don't foresee Mr. Waltner's concern about EPA method 9090A as being a factor at all. I think we can address that by adding "as amended" behind it, to include new ASTM methods that are accepted in the liner industry.

Q. Okay. And then there was a question on pad sizes. I thought you were saying that the average acreage of the pad is about one acre.

What was the -- I guess you had some experience with the Cimarex site. What was the size of the wellpad that they used on the closed-loop system for the Cimarex site?

A. I was estimating about 60 square foot, 60 to 100 square foot. It was just based on an estimate, because in Cimarex's presentation to us, they didn't provide the dimensions of the pad. However, when I was on site at a Cimarex site I was able view a drying area, and it was nowhere near the size of a reserve pit that I had seen, it was quite smaller. So it was just an estimate that I --

Q. But that's just the drying pad, correct, not the --

A. That's just the drying pad.

Q. -- not the room for other equipment that's used for --

A. Oh, no, just -- just the drying pad, just surface disturbance for the drying pad area.

Q. So was the overall pad size larger or smaller than a typical well drilled with a reserve pit?

A. Smaller, significantly smaller. And that's based on visual observations as well as -- In my liner-specifications presentation that I had, I was actually looking at estimated drill pit land disturbances. And based on the size of reserve pits, for example, a half-acre reserve pit would be on the order of 148 square foot, for example.

And what I'm saying is from my visual observations from being out at site -- at a Cimarex -- that drying pad was significantly smaller than a reserve pit. I mean, at least by a half the size. And that's just based on visual observations. And Cimarex didn't provide the dimensions of the drying area, the drying pad, so I did try to provide an estimate for you.

Q. Right. But again, that's just for the drying pad versus the reserve pit, not for the overall pad size?

A. Absolutely.

Q. That's what I was trying to get at, is the overall pad size larger or smaller in a closed-loop system?

A. Commissioner Olson, that's where I was trying to come back and tried to address the footprint. You know, in discussions with our district staff, they came up with average size of these cleared areas, land disturbances for the well drilling pad, and we all agreed that, you know, based on the size of the closed-loop systems, perhaps the footprint doesn't need to be an acre in size, it can be significantly reduced, and the closed-loop equipment can be brought further in to the wells, and we would have a reduced footprint.

We have a footnote from the cases that Mr. Carr was talking to me about, and it was from the Oil Conservation Division, and it was apparently a reference of .4-acre reduction. However that was, you know, before my time, and I was trying to use that just to exemplify, perhaps, the reduced footprint area and -- but that was one OCD estimate, the reduced footprint of .4 acres, if we were to use closed-loop systems.

Q. So I guess -- it's my understanding you weren't involved in the decisions for why the -- a 100-mile radius was selected for -- I mean, you used that, you said, in your calculations, but you weren't part of the discussions in selecting the 100-mile radius, or for digging and hauling --

A. Commissioner Olson, I was involved in the

discussion when it was formulated.

Q. And so what's your understanding of the basis of the 100-mile radius, the rationale for it?

A. Well, I seem to recall discussions on what other states and what solid waste management facilities in the state require in the way of any distance requirements, and I simply view it from a pollution-prevention standpoint in understanding where Mr. von Gonten was coming from about groundwater elevations in these watershed areas, that that 100-mile radius significantly protects those watersheds and the resources.

And to lessen the 100-mile radius to 50 miles would mean less protection to those watersheds, if you're able to leave waste disposed on site.

So from a P2 perspective, that 100 miles greatly conforms to the watersheds of those areas and significantly works to protect groundwater, surface water in those areas, with the shallow nature of the groundwater.

Q. But then it could be 200 miles. I still come down, I guess, to the rationale, why 100 miles versus 50 miles versus 200 miles versus -- I mean, it seems like if we're on a P2 basis, and based upon the testimony that you've presented on costs, that it costs -- overall costs less for a closed-loop system, why should we allow any on-site deep-trench burial then?

A. Mr. Olson, your question is well founded. In fact, as I was working on these presentations for P2, and in discussions with our other engineers who were modeling the scenarios that stand to take place if we allow this occur, it became evident to me that from a pollution-prevention standpoint we would simply be extending the impact time. We would be preserving the environment in the short term for present and future generations in the short term. However, from a P2 standpoint we wouldn't fully be protecting the environment from a long-term, future-generation standpoint.

So I do have some mixed feelings about coming up with the specifications for the on-site deep-trench disposal that we've alluded to, and especially in light of Mr. Hansen's modeling of those scenarios.

Q. Well, I guess, and isn't there some conflict with -- I look at page 43 of your Exhibit 29, and the last bullet talks about, Using deep-trench burial ensures more efficient designs and minimizes -- sounds like to me, minimizes or defers impacts.

So is there some conflict between hauling -- if -- if you're saying that if we do deep-trench burial correctly, it's not going to have any major impacts, why would there be a 100-mile radius for --

A. Mr. Olson, could you refer to the --

Q. -- digging and hauling?

A. -- could you refer to the section that you're talking? I'm on page 43.

Q. Yeah, I'm looking at the fourth bullet, and it talks about, Allowing industry to continue drilling with pits and disposing of oilfield waste using deep-trench will ensure that the industry applies more efficient designs, construction and emplacement techniques, to minimize or defer impacts.

So if the deep-trench -- There seems to be some conflict in what you're -- in your testimony, that in some cases you're saying we need to go and, if you're within a 100-mile radius, haul it all off. But if we do deep-trench burial correctly, we're also minimizing impacts. So I guess I'm seeing some conflicts in your -- some of your -- direct part of your testimony and your slides here.

A. Commissioner Olson, I'm sorry, I was trying to find the page. I see it's up there now, but you indicate the last bullet there.

So the last part there, And emplacement techniques, to minimize or defer impacts, is in conflict with previous language towards best-management practices? Is that -- I'm sorry, I was trying to find the page.

Q. Well, I guess what I see is that you seem to be implying here that deep-trench burial is going to minimize

impact, so we don't have potential environmental problems with groundwater, et cetera. But if that's the case, then why is it not acceptable within the 100-mile radius as well? It all comes back again to the rationale for the 100-mile radius.

A. Commissioner Olson, I guess -- you know, as I looked at the landfill facility layout in the state and that 100-mile radius, it seemed to provide a good -- a reasonable distance that operators could haul their wastes to if a facility were present.

I think that if we were to stick with the 100-mile radius and from the standpoint of facilities that were beyond that facility that needed to be dug and hauled off, I still think that that's more protective and a good basis for the 100-mile radius.

However, you know, my take on that is from a pollution prevention standpoint in that the longer the radius, the more distance you get from these oilfields and these sensitive watersheds like the Ogallala formation down in Lea County, the Pecos River, the San Juan watersheds. I mean, from a P2 perspective the 100-mile radius seems to fit quite well with facility, demographics locations, geographic locations, and serves to protect our water resources.

Anything less brings these on-site trench burial

systems closer in proximity to the watersheds, more likelihood for surface waters, surficial aquifers, et cetera, to be impacted. And ultimately surface waters of the watersheds themselves in the northwest, as you drill up near -- on the top of the terraces.

Q. Then you seem to be implying that the 100-mile radius is based on the protection of groundwater, when that's not my understanding of the prior testimony.

A. Commissioner Olson, I was just giving you my take from a pollution-prevention standpoint and being involved in the 100-mile radius. However, you know, my -- the P2 aspect of this 100-mile radius was more in the hands of the -- you know, Mr. Price and some of the other staff members.

Q. Well, I guess -- and in coming to the hauling -- issue of hauling a lot of these wastes, did you -- is there any estimate of the -- there's a lot of public comment from some of the industry members about increased truck traffic. Is there any estimate of the increased number of truck trips required for hauling wastes off site?

A. Mr. Olson, dig-and-haul seems to be the most protective of New Mexico's waters. And I know that this question had come up many times in Michigan when we implemented regulations and had similar-type arguments.

And the conclusion in Michigan -- and I'm just going to use that, because that's where most of my

experience comes from -- is that this is the cost of protecting the waters of the state. And these people who are driving on these roads are going to have to comply with all the laws of the road, state, federal regulations for transporting waste, and should not be used as an excuse not to further protect the environment for future generations.

So I acknowledge that there will be increased truck traffic. However, I would say that if every time there was a lightning and thunderstorm outside and we indicate we thought that we were going to get hit by lightning we stay indoors, I think that we would significantly be crippling our culture, our society.

So I -- I think that this will protect the waters of the state, and regardless of what person is driving on the state roadways, they will have to comply with all the regulations that would be required of anybody else driving on there.

Q. Well, I guess what I'm trying to get at, is there any estimate -- does the Division have any estimate, or do you have any estimate, of how much truck traffic has been increased?

A. Not so much the amount of the truck traffic. Excuse me a moment.

I think the estimates that I used in just coming up with price tags for dig-and-haul, in a worst-case

scenario, 100-mile radius, 200-miles round trip, at three dollars per mile, at 100 trips. So I mean, that kind of gives you, you know, a number there to go from. It would significantly increase traffic --

Q. How many --

A. -- and the estimates that I have for that 100-mile cost is $60,000 for worst case, 100-mile --

Q. And how many truckloads is that?

A. A hundred.

Q. A hundred truckloads?

A. A hundred trips.

Q. And do you have any -- Speaking of estimates, I guess, do you have any estimates of what the cost of deep-trench burial would be, under the proposed rule of the Division?

A. Mr. Olson, I did put together some figures on a per-well versus a 1200-well scenario, and for on-site trench burial per well -- and it -- again, it is a function of the yardage. I examined the 1000-cubic-yard, 2000-cubic-yard and 3630-cubic-yard scenario.

For on-site trench burial, per well, for 1000 yards, $31,534. For 2000 cubic yards, $38,068. For a 3630-cubic-yard, $51,353.80.

And then I have a dig-and-haul figure per well as well.

Q. And what's the estimate of your cost for dig-and haul?

A. For 1000 cubic yards, $105,167. For 2000 cubic yards, $125,333. For 3630 cubic yards, $157,600.

I also went a little step further and included a cost figure for in-place burial as proposed by the industry, if they were allowed to just bury in place, push over the liner and just bury it in place.

Q. So since the costs are significantly higher for dig-and-haul, the cost savings that you're mentioning for these -- in these other cases, are from reduced volumes that you're dealing with and other issues that are coming into an overall net savings. That's pretty -- in looking at a $70,000 difference, that's significant cost.

A. Mr. Olson, good question. One credit that I didn't include, if they were to use closed-loop systems and we were to assume a $10,000-per-well cost savings, under the dig-and-haul per well scenario that I gave you for 1200 wells, we could reduce the cost by about $12 million, or about $10,000 per well from the estimates I've given you.

Q. Right, and that's for other factors, other than just digging and hauling the waste?

A. That's if they change their process and reduce their waste volume at the end of their drilling.

And I would -- I would add that there is an

element in those cost differences, and that element that I was trying to put a handle on during my presentation was the liability factor. And I think we could very easily take that cost difference from the dig-and-haul per well versus the on-site trench burial. It's about a -- you know, $70,000. I think that if you evaluated liability and potential cost for contaminations and cleanups, that that figure could be anywhere from two to five times larger than that.

So although you're realizing an immediate cost savings by burying it or disposing of it on site, the liability issues associated with that could really come back to wreak havoc upon the New Mexico economy. And I think that's something that's neglected here, that I want to point out.

Q. Which is the cost of -- you're saying the cost of contamination, then, is greater than the cost of prevention?

A. Mr. Olson, yes.

Q. And I guess the question, some of the -- There was some testimony about waste going to out-of-state facilities. Are they constructed the same as New Mexico facilities? I don't know that I have a problem with them taking our waste to Texas or Colorado, but --

(Laughter)

A. Yes. Both of the facilities in Colorado -- I was the person that Mr. Price designated to contact these landfills. They are RCRA subtitle D landfills.

And I guess the transit waste Bondag landfill, that's located in Durango, Colorado, again it's a subtitle D constructed landfill with liners that would be commensurate with those requirements. The second one was the Montezuma County landfill in Cortez, Colorado.

Those are within 35 to 40 miles of the Farmington area, one way. And hearing discussions with Mr. Doug Goldsmith -- he's the manager of that facility -- he actually wanted to be here himself to tell the industry that he wants your business --

(Laughter)

-- that his liners are open, to please come.

And so I made sure that I told him that, you know, we would get that point across, that that landfill is especially privy to accept special type waste, petroleum-contaminated hydrocarbon waste, as well as highly contaminated chloride-type waste.

In Montezuma and Cortez I talked to Ms. Deborah Barden, and she also indicated that they can accept that oilfield waste. You know, they both have their requirements, they have forms that need to be submitted with testing to show that they can accept it, but that's

standard for any type of, you know, RCRA facility.

Q. Well, I guess, just trying to understand, my concern is, are the facilities constructed with similar protections as to what we have in New Mexico?

A. It's my understanding that they are both RCRA subtitle D facilities.

Q. Does that mean they're double-lined with leak detection?

A. I couldn't answer the details of their RCRA subtitle D construction.

COMMISSIONER OLSON: Okay. I think that's all I had.

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Mr. Chavez, Mr. Carr asked you about inadequate berms under the proposed rule, and you indicated that the OCD would be able to perform corrective action, or impose corrective action on an operator who didn't have inadequate [*sic*] berms on inspection under the proposed rule; is that correct?

A. Mr. Commissioner -- Mr. Chairman, yes.

Q. Under Rule 50, what provisions does the OCD have if a berm is identified as inadequate prior to the failure of the liner or a leak?

A. Mr. Chairman, under Rule 50 I think we just have

the generic statement that no waste shall be contained within the pit. Let's see.

Well, I'm having trouble locating it, but -- but essentially it's just a generic paragraph that indicates that wastes shall be contained within the pit.

Q. So even if OCD had a dozen inspectors out there and they noticed a fault, they would have to wait for a failure to do anything about it under the current rule?

A. Mr. Commissioner, they would probably have to prove that a release actually occurred there, which would be difficult to prove in the case of chlorides where visual evidence is usually absent.

Q. So under the proposed rule, though, they can -- if they see a problem that has the potential to create a failure, they can act before the failure, then, under the proposed rule?

A. Mr. Commissioner, that's correct.

Q. And under the old rule they'd have to wait for a failure?

A. Mr. Commissioner, not only would they have to wait for the failure, they'd have to prove that it actually occurred. And you know, with these temporary pits, these pits are usually closed out long before we can have a chance to prove that. And there's no sampling that's conducted under Rule 50 to show whether there's

contamination or no contamination.

Q. Okay. Now one of the technologies that's being used in the Rocky Mountains and in certain frontier areas overseas, instead of caliche and building the pad out of, you know, geologic materials, operators are using organic and composite mats that they lay down, drill the well on, put the rig on, and then when they move off, they pick up the mat with minimal disturbance to the surface.

Does the proposed rule prevent New Mexico operators from using a technology like that?

A. Mr. Commissioner, absolutely not. In fact, this new rule with its waste minimization and recycling, re-use language actually encourages it. And these companies would be practicing something very similar to the State of Texas in their housekeeping activities where they bring liners and put them under pumps and engines as part of their everyday work activities to prevent spills and releases from occurring so that they can quickly move on to different sites with minimal cleanup or soil segregation activities.

So this rule encourages the pollution-prevention age for this industry. And those mats would be excellent in the way of maintenance.

CHAIRMAN FESMIRE: I have no further questions.

Mr. Brooks, do you have any re- --

COMMISSIONER BAILEY: I would like to point out something. Rule 50.C.(2).(b).(iii), alternative liner media, says, in Rule 50 the Division may approve liners that are not constructed in accordance with Division guidelines, only if the operator demonstrates to the Division's satisfaction that the alternative liner protects freshwater, public health and the environment, as effectively as those prescribed in the Division guidelines.

CHAIRMAN FESMIRE: Mr. Brooks?

MR. BROOKS: Mr. Chairman, I have a few questions, very few.

REDIRECT EXAMINATION

BY MR. BROOKS:

Q. Mr. Chavez, I believe Ms. Foster asked you a question with regard to -- the subject of the testimony was recycling drilling fluids. Do you remember that? Do you remember being asked some questions --

A. Mr. Brooks, yes.

Q. -- about that subject?

If my notes are correct, one of those questions had to do with an operator who is only drilling one well in an area, and you were asked if that operator could recycle drilling fluids.

Is there anything to prevent -- If there's one operator in an area that has some additional drilling

fluids and another operator in the area that needs some for another well, is there anything to prevent one operator from selling drilling fluids for recycling by another operator?

A. Mr. Brooks, there would be nothing preventing that. In fact, that's the element of pollution prevention, the spirit that is lost in the old Rule 50 that we're trying to capture in this new rule --

Q. Would that --

A. -- thinking outside the box and preventing --

Q. Would that --

A. -- recycling.

Q. -- save the second operator, probably, some hauling costs?

A. Yes, potentially.

Q. Okay. You were asked some questions about the Environment Department's -- or EPA's regulations concerning special wastes at solid waste landfills. Are you conversant with those regulations?

A. Mr. Brooks, in this again I was, but it's been some time since I've had to deal with solid-waste issues on a regulation line item by line item, so I would have to say no, I would defer those solid-waste type questions to Mr. Hansen or Mr. Jones.

MR. BROOKS: I want to call your attention to --

if I've got the right -- Yes. I want to call your attention to something in the proposed rule with regard to the next question.

May I approach the witness?

CHAIRMAN FESMIRE: You may, sir.

Q. (By Mr. Brooks) Let me -- I'm sorry, I'm not well organized here.

Be right there -- Oh, you had a copy, I'm sorry. I could have asked you without so much distraction.

The part I'm calling your attention to is section 13, subsection G, and it's coincidentally on page 13 of the draft that I have of the proposed rule.

Now that section starts out, The soil cover for closures where the operator has removed or remedied the contaminated soils shall consist of, and so forth. So...

Then it says in subsection (2) on the top of the next page, it reads, The operator shall construct to the site's existing grade and prevent ponding of water and erosion of the cover material.

Now based on those provisions, if an operator digs and hauls the waste, is he then required to restore the existing gradient of the site?

A. Mr. Brooks, yes.

Q. And then under subsection H is he also required to re-vegetate the site? Subsection H of the same section.

A. Mr. Brooks, under H.(1), Upon completion of closure, the operator shall substantially restore the impacted surface, et cetera, et cetera. Yes.

Q. Thank you. Now with regard to the 100-mile radius, Mr. Olson asked you a number of questions. What is it that you are allowed to do outside the 100-mile radius under the proposed rule that you cannot do within the 100-mile radius?

A. On-site burial is allowed.

Q. Okay.

A. Dig-and-haul is still allowed --

Q. Dig-and-haul --

A. -- at the discretion --

Q. -- is allowed anywhere, right?

A. At the discretion of the operator.

Q. Is on-site burial allowed within the 100-mile radius?

A. I believe that it can be allowed with an exception process.

Q. Well, let me change my question, because the term on-site burial is used by the industry committee, I believe, to refer to something other than deep-trench burial.

Is deep-trench burial allowed within the 100-mile radius?

A. It can be.

Q. Does that require an exception?

A. From my recollection, it does.

Q. Is it required -- is it allowed outside the 100-mile radius without an exception?

A. Yes.

Q. Now closed-loop systems -- are closed-loop systems allowed regardless of the 100-mile radius?

A. Absolutely.

Q. Are they required within the 100-mile radius -- Well, no, let me back -- Let me back up. That's not really a fair question.

When are closed-loop system -- When are pits prohibited under the rule? Where are pits prohibited under the rule?

A. I think they're prohibited nearby water bodies. You know, the siting requirements of the regulations --

Q. Okay.

A. -- define where they're not --

Q. Does that apply whether it's within the 100 miles or whether it's outside the 100 miles?

A. I believe it's within or beyond 100 miles.

Q. Thank you. I just have one other question.

Mr. -- Commissioner Olson intimated that he might not have an objection to our taking our wastes to Texas or

to Colorado. Wouldn't you have a different attitude to taking it to Colorado or to Texas because Colorado is upgradient, you might not want to --

(Laughter)

A. (No response)

MR. BROOKS: That concludes my examination, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Carr?

MR. CARR: No redirect [*sic*].

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: Yes.

RECROSS-EXAMINATION

BY MS. FOSTER:

Q. Directing your attention to the section of the rule, 13.F, which is the section just previous to the one you were just looking at --

CHAIRMAN FESMIRE: In the proposed rule?

Q. (By Ms. Foster) In the proposed rule.

Section F is on-site closure methods, and under the general requirements could you read the first sentence of subsection (a)?

A. (1).(a)?

Q. Yes, please.

A. The operator shall demonstrate, at the time of initial application for the permit, that the site where the

operator proposes to implement an on-site closure method is not located within a 100-mile radius of a Division-approved facility or an out-of-state waste management facility. If the operator demonstrates that neither a Division-approved facility nor an out-of-state waste management facility is available within the prescribed distance, then the operator may pursue the on-site closure method.

Q. Okay. And is not deep-trench burial an on-site closure method?

A. Yes.

Q. Okay, so a reading of this, does that not mean that if you're within the 100-mile radius, then you cannot have deep-trench burial unless you can demonstrate that the state -- the management facility is not available?

A. Could you restate the question?

Q. Well, reading what you just stated for the record, and a deep-trench burial is an on-site burial closure, does that not mean that the only reason you would be able to do an on-site deep-trench within the 100-mile rule is if you can prove to the Division that the facility is not available, as opposed to the qualifications of the deep-trench burial?

A. Ms. Foster, I would have to -- I would have to state that I don't know all the nuances exactly of this requirement in that, you know, I was not the architect of

the language, and I would defer this question to Mr. Price or Mr. Jones.

Q. Okay. How long have you been working on this rule?

A. About three months.

Q. About three months. And you're with the OCD, correct?

A. Yes.

Q. Are you employed with the OCD?

A. Yes.

Q. And you still don't understand this provision of the rule?

A. Well, the reason I'm not answering it is because I think there's other nuances of this regulation that may address your question, and for me to answer this as a stand-alone provision --

Q. Okay, but --

A. -- I would prefer to defer that to the architect of the regulations.

Q. Okay. Well, as somebody who's been working on this rule for three months, how is a small operator supposed to read this rule, then, this provision of the rule?

MR. BROOKS: Objection, argumentative.

CHAIRMAN FESMIRE: I'll overrule it.

Q. (By Ms. Foster) You stated on your redirect that recycling of drilling fluids is something --

CHAIRMAN FESMIRE: Ms. Foster, I overruled the objection.

MS. FOSTER: Well, I think I made my point. Thank you.

(Laughter)

THE WITNESS: Could you please -- could you --

MS. FOSTER: I -- you know --

THE WITNESS: Could you please re-state --

MS. FOSTER: -- I want to get to lunch, and --

(Laughter)

Q. (By Ms. Foster) Okay, you stated on your redirect that recycling of drilling fluid is something that you would encourage, that selling fluids to a secondary operator was something that would be within the recycling P2 mandates or --

A. Yes.

Q. -- for the OCD?

A. Yes.

Q. Is there anything under current Rule 50 that prevents resale of fluids right now?

A. Well, from my recollection of Rule 50 and subsection E, it only refers to recycling. And so based on that, I would say I think that Rule 50 specifies recycling.

It doesn't talk about, perhaps, selling it or in the spirit of reuse, it doesn't address what Rule 17 addresses.

MS. FOSTER: Okay, I have no further questions, thank you.

CHAIRMAN FESMIRE: Mr. Baizel?

MR. BAIZEL: No questions.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: Nothing, Mr. Chairman.

CHAIRMAN FESMIRE: Ms. Belin?

MS. BELIN: No questions.

CHAIRMAN FESMIRE: Any further questions from the Commission?

COMMISSIONER BAILEY: No.

COMMISSIONER OLSON: No.

CHAIRMAN FESMIRE: With that, I think Mr. Chavez can be excused.

I am planning to break for lunch and reconvene at two o'clock. Would that be acceptable to the attorneys?

(Off the record)

CHAIRMAN FESMIRE: Oh, yes, I'm sorry, I'm -- Since it's been a whole week since we've done this, I've gotten out of the habit.

Is there any public comment or testimony on the record?

Okay, let the record reflect that no one came

forward.

With that, we will break for lunch and reconvene at two o'clock.

(Thereupon, noon recess was taken at 12:57 p.m.)

(The following proceedings had at 2:06 p.m.)

CHAIRMAN FESMIRE: Okay, let's go ahead and go back on the record.

Let the record reflect that this is the continuation of Case Number 14,015.

Let the record also reflect that Commissioners Bailey, Olson and Fesmire are all present, we therefore have a quorum.

We had just finished up with Mr. Brooks' case and the cross-examination; is that correct?

MR. BROOKS: Mr. Chairman, we had finished the cross-examination -- or the examination of Mr. Chavez.

One other thing before the Division rests its case-in-chief.

The Division has supplied to the Commissioners in the notebooks and to everyone who has the notebooks Exhibit 3, which is a copy of Rule 17.

In addition, filed with the Application in this case, and therefore before the Commission in this case, are the revised definitions, which includes definitions to be used in -- that are used in other parts of the rule as well

-- and also, some conforming changes to some -- a few miscellaneous conforming changes to other rules that we are also recommending. We did not include those in Exhibit 3, and we do not have them here now today, but we would like the opportunity to provide them to the Commissioners for the books. They are -- as I say, they're already before the Commission in this proceeding, because they were attached to the Application filed to institute that proceeding.

CHAIRMAN FESMIRE: Mr. -- Oh, I'm sorry?

MR. BROOKS: That's all.

CHAIRMAN FESMIRE: Mr. Carr, do you have any objection to that?

MR. CARR: No, sir, I do not.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: No objection.

CHAIRMAN FESMIRE: Is there any objection to that from the other attorneys?

(No response)

CHAIRMAN FESMIRE: Okay, Mr. Brooks, if you'd do that at the break?

MR. BROOKS: Okay, we'll endeavor to have them by the first thing tomorrow morning. I think it will take us that long to get them --

CHAIRMAN FESMIRE: Okay.

MR. BROOKS: -- but we will have them at the beginning of tomorrow morning's session.

And subject, then, to rebuttal and to the right of the industry committee to further cross-examine Mr. Hansen on the limited subject of the substituted pages in his exhibit, the Division rests.

CHAIRMAN FESMIRE: Thank you, Mr. Brooks.

Ms. Foster, I believe that the agreement is that you'd go next?

MS. FOSTER: Yes.

CHAIRMAN FESMIRE: Are you ready?

MS. FOSTER: I am. I am.

CHAIRMAN FESMIRE: Who's your first witness?

MS. FOSTER: My first witness will be Sam Small.

Now, at the very beginning of the hearing I deferred my opening statement. If I could just make a very brief opening statement at this time?

CHAIRMAN FESMIRE: You may now.

MS. FOSTER: Okay, thank you.

Ladies and gentlemen of the Commission, my name is Karin Foster, I'm the director of government affairs for the Independent Petroleum Association of New Mexico, or IPANM.

IPANM represents 250 small companies in New Mexico. We are the producers for the State of New Mexico.

we are the companies who contributed a large part of the $2.3 billion in FY '06 to the New Mexico economy.

We're here today to talk about the changes in the proposed pit rule. I would remind the Commission that in 2003 we went through this very similar process, and here we are again with additional revisions to the pit rule.

I would remind the Commission of its statutory duties under the Oil and Gas Act. The prevention of waste. Will this rule increase regulatory cost which will result in shut-ins and abandonments of wells?

It is our position that the increased costs on operators will result in shut-ins and abandonment and therefore will cause waste.

We also remind the Commission that your duty is the protection of correlative rights, and that is the protection of human health and the environment. But we need to look at all effects on human health, on all New Mexican citizens and the total environment in the State of New Mexico, not just at a specific wellhead or a pad location.

The NMOCD is also a constituent agency of the Water Quality Commission.

The Water Quality Commission clearly states that it is the commission that is responsible for creating standards for groundwater, that it is the Commission that

creates the prescriptive standards for groundwater, and it is the OCD's job as a constituent agency of the WQCC to follow those mandates.

We contend that there is a clear negative economic impact on small businesses in the state. We would ask that you consider special considerations for small operators. Small operators have to deal with investors, we have to build special business relationships with disposal facilities, as well as with regulators, in order to stay in business.

We maintain that this rule is too complex as written. There are too many different standards for temporary pits versus below-grade tank pits -- below-grade tanks, versus the permanent pit standards.

We would agree with the industry committee's contention that permanent pits should be lined and that -- however, we do have problems with the below-grade tank statute and the changes in the definition and how it will clearly impact our industry.

There are conflicts with the existing rules. There's a conflict with the RCRA, which has been named a couple of times in the opening statement by the Commission, since oilfield waste is considered exempt under section D.

We believe this is also in conflict with the current spill rule, which will allow for abatement plans,

and small spills are cleaned up by operators. Therefore, there is no contamination to the environment.

We believe that the rule as written may conflict with the Governor's executive orders. Specifically, and the testimony will show, that the closed-loop system and the dig-and-haul provisions in the rule will increase trucking on the roads, which will specifically increase greenhouse gases in the state, which is contrary to the very clear mandates that the Governor has issued in his executive orders on climate change.

We would also contend that the scientific basis for the change in the rule is limited. There is a claim of groundwater contamination. However, is this groundwater subsurface groundwater, or actually groundwater on the surface? It is unclear.

As to the toxicity issue, we contend that -- and again, the testimony will show that the toxicity has to do with the dosage of the toxin and the timing to -- the timing of the dosage to the organism that is important. It is not just the fact that there is a toxin in a pit that should be of concern.

The science of hydrology will be addressed by the New Mexico industry committee. However, we contend that the rule ignores basic geology, that drill cuttings are the same minerals as on the surface and outcrops in most of the

State of New Mexico.

Mr. Sam Small will testify to the negative impacts on small businesses. He will discuss the many variable factors that come into issue when creating or looking at the economics of a well, the depth of the well, the width of the hole, and questions such as which facilities will accept the constituents and liners, and how much will they charge, and when will they close?

The other factors that need to be considered are how far will operators need to haul their wastes, and is the equipment for closed-loop systems available, and at what price?

We also believe that there's a disproportionate cost effect of increased regulations on small businesses.

Mr. Tyson Foutz, who is a small operator in the northwest, will specifically give us details and discuss the economics of drilling closed-loop systems in the northwest.

Mr. Al Springer will represent the southeast, and he will specifically give the Commission a primer on closed-loop systems. What equipment is needed for a closed-loop system? How much acreage does the closed-loop system really take? How often does a truck need to come onto location, for example, on a closed-loop system, so that the evidence is very clear on the record, as opposed

to a very nebulous closed-loop discussion that we've been having thus far.

Finally, Tom Mullins, who is a petroleum engineer and a small operator in the northwest, will discuss not only the economic impacts on his small business but will also, based on his expertise as a petroleum engineer, discuss several of the other factors that come into play on implementation of this rule and how it impacts small operators.

And John Byrom, who is the president -- the current president of the Independent Petroleum Association of New Mexico and also a small operator in the northwest, as well as a former task force member of this pit rule, will close up our testimony. And he will discuss not only the impacts, the economic impacts, on his small business, but also on other operators in the San Juan Basin.

And at this time we'd be calling Sam Small as our first witness.

CHAIRMAN FESMIRE: Mr. Small, would you take the stand, please?

Mr. Small, you haven't been sworn yet, have you?

MR. SMALL: No.

CHAIRMAN FESMIRE: Would you like to raise your right hand and be so.

(Thereupon, the witness was sworn.)

SAMUEL SMALL,

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

DIRECT EXAMINATION

BY MS. FOSTER:

Q. Good afternoon, Mr. Small.

A. Good afternoon.

Q. Would you state for the record your name?

A. My name is Samuel Small.

Q. And your employment, please?

A. I'm self-employed. I have a consulting firm in Hobbs, S.W. Small Consulting Engineers.

Q. All right, and for the record, would you please tell the Commission of your background as it relates to the pit rule that we're before the Commission here today?

A. I was contracted by IPANM to review the economics as they relate to the costs associated with the options that are available in the pit rule.

Q. Okay, and are you a professional engineer?

A. Yes, I am, registered in New Mexico and Texas.

Q. All right, and do you have any specializations as a professional engineer?

A. I registered as a petroleum engineer in New Mexico and then got a secondary specialty in environmental engineering, and I used both my environmental and petroleum

experience to register in Texas.

Q. All right. And how many years have you been involved in the petroleum business?

A. Thirty-eight.

Q. And the whole 38 years, have you been working in New Mexico?

A. No, I started working in Illinois for Texaco and worked up there for seven years, and then transferred to Hobbs with Texaco in '76.

Q. And while with Texaco, what type of experience did you gain there?

A. I was hired as a petroleum engineer. My first assignment was for designing workovers, acid jobs, frac jobs for the company. Then I went into a special projects position to help develop a tertiary recovery project, and I was district engineer supervising five other engineers.

Q. Okay, and after Texaco, where did you go?

A. I went with Amerada Hess Corp- -- Well, after Texaco in Illinois, I went to Texaco in New Mexico. And while I was in New Mexico I worked in the reservoir engineering department and drilling department a little bit, some equipment, and I was also assistant district engineer in Hobbs.

Q. All right, and with Amerada Hess?

A. Amerada Hess, I went to work for them in 1979 as

an operations engineer and handled completion projects and drilling completion workover projects, secondary recovery projects, and -- primarily in Texas, and a little bit in New Mexico, and then was transferred to Vernon, Texas, as an operations superintendent. My function was a little bit of foremanning, a little bit of superintendent, a little bit of engineering.

While I was working Vernon, I participated in drilling programs in Oklahoma, completion programs in Oklahoma and north Texas, a lot of workover activity in both states, and transferred back to Hobbs -- actually to Monument, New Mexico, as operations superintendent. And while there, I was in charge of a waterflood project that was being put in, handled some drilling operations for them there, workover operations.

And got involved in environmental activities for Hess in the early '90's, and we were very involved with pit closure activities in the Monument area, and then I got involved in it a little bit more in Texas and starting doing a lot of air-permitting work and pit cleanups in Texas.

Q. And in your capacity at Hess Corporation, did you ever do any regulatory work for them?

A. Yes, I was a liaison for the company with the OCD and ED in New Mexico, BLM. I'd been doing some work for

the Corps of Engineers in New Mexico, and in Texas I was involved with the TCQ and the Railroad Commission.

Q. And you mentioned that you had some -- that you did some regulatory work with the OCD. Were you involved in the prior pit rule?

A. No, not in the prior pit rule. I was involved with a spill rule rewrite. I really can't remember what the dates of that was, it was so long ago, but we were working on a spill rewrite. And we had the saltwater rule we were working on. I think that's been about five years ago.

Q. Okay.

A. And a little bit of work with the NORM regs.

Q. Okay. Now you mentioned in your experience that you would design and conduct workovers and well completions. What exactly does that mean?

A. Well, you know, as you discussed earlier with your workovers, you know, there's a multitude of different workovers. Designing frac job, acid jobs, drill-outs, you know, deepening wells, you know, and workover realm and the drilling realm.

But most of the activity I had was in the completions with both companies, Texaco and Hess. Generally, a drilling department would take the well down to the production casing setting depth and then turn it

over to the production department, and we'd complete the well from there. It might involve perforating a well and then doing some type of remedial treatment to bring a well in, or it might involve deepening.

I was up in Oklahoma, working some wells up there. We were using gas drilling to deepen the wells.

Q. All right. Now, did you ever -- in your background and experience, did you ever have to do what's been called an AFE?

A. Yes.

Q. And an AFE pertains to economic analysis?

A. Yes, it's a cost breakdown for the wells, and we look at it, you know, we'd put together the drilling AFE then turn them over to the department. But we'd look at, you know, the entire drilling program or the workover program to go step by step on what we'd be doing, and then we'd develop a cost, you know, for each of the steps to put into the AFE, and then we'd run economics to determine whether it was feasible to drill a well, particularly the risks involved.

MS. FOSTER: Mr. Chairman, at this time I would move Mr. Sam Small as an expert in the area of professional engineering and environmental engineering.

CHAIRMAN FESMIRE: Any objection?

MR. BROOKS: No objection, Mr. Chairman.

MR. BAIZEL: No objection.

MR. HUFFAKER: (Shakes head)

CHAIRMAN FESMIRE: Mr. Small will be so admitted.

MS. FOSTER: Thank you.

Q. (By Ms. Foster) Okay, Mr. Small, have you read the proposed new pit rule, Rule 17, for this hearing?

A. Yes, I have.

Q. And are you familiar with it?

A. Yes, I am.

Q. Okay. And as a result of this proposed pit rule, were you contracted by IPANM?

A. Yes, I did.

Q. And what did you do for IPANM?

A. I developed a cost scenario for the impact of the costs and each of the possible options you have for drilling a well and for disposing of the pit contents --

Q. Okay, I would remind you that you need to keep your voice up, because there's quite a few --

A. Okay, but I'm --

Q. -- people coming in and out of the room.

A. -- I'm losing it.

Q. Okay. Okay, and is that Exhibit 13 as part of the IPANM exhibits?

A. Is that my report?

Q. Yes.

A. Yes, uh-huh.

Q. Okay, and do you recognize that?

A. Yes, I do.

Q. And that was prepared by you?

A. Yes, It was.

Q. Okay. Now in the very first portion of your report you state -- you give us the purpose for the report. Could you state for the record what the purpose of the report was?

A. The purpose of the report was to develop cost scenarios for each of the completion -- or excuse me, each of the options for drilling and disposing of the wastes.

Q. Okay, and I believe you stated there were options that operators could take under your report?

A. Yes.

Q. Okay, and what are those four options that an operator could have?

A. The four options that I was able to identify are, you could use a closed-loop drilling system and dispose of the wastes on site, or you could used a closed-loop system and dispose of them off site, you could use a reserve pit and dispose on site, or a reserve pit with disposal off site.

Q. And does -- do the operators always have those four options, depending on where they're located in New

Mexico?

A. No, if you're within 50 feet of groundwater you have no option because pits aren't allowed, so you would have to use a closed-loop system. If you're within 100 miles of a disposal -- a commercial disposal site, then you would have to haul your material to that site.

Q. All right. Now could you please define a closed-loop system as it's defined in the rule?

A. Okay, closed-loop as defined in the rule is basically using steel tanks to contain the liquids and solids that you generate while drilling the well.

Q. And is there a different industry -- or commonly used terminology within the industry for a closed-loop system?

A. Yes, when closed-loop systems first came into being it was basically for solids control, and that's why the centrifuges and everything, where they put in the fine-mesh shale shakers. It was to control solids, and that was the primary reason for it. So a system, as industry would look at it, would be the solids control equipment, plus the tankage.

Q. And is there a use in New Mexico for closed-loop systems, currently?

A. Yeah, I think so. Yes, I think there's applications for closed-loop systems.

Q. And that would be under what circumstances?

A. Some of them that I've come across in my experience is where, you know, we have a very thin layer of soil, say on top of a dense caliche rock or even a basaltic rock, where excavating, you know, is not practical, you know, a closed-loop system as opposed to building something with berms above ground makes a lot of sense in those applications and applications, I think, where you're in very close proximity to groundwater, would be a good application for that.

Q. Now in your report you mention that there are some factors of cost concern for all operators. Could you list those for the Commission?

A. Yeah, the cost concerns you're going to have for any of the operations, you know, you're going to have to, you know, look at the size of the hole you're going to drill, you'll look at the depth of the well you're going to drill. Those all impact the cost. And then, as I just mentioned, you'll want to look at the surface conditions and the immediate subsurface conditions to decide, you know, whether a pit is a practical application there, or whether you'd look at something else.

Q. Okay, any other factors? Disposal factors?

A. Yes, disposal would be an issue too. You know, we're going to deal with the wastes generated -- or the pit

contents generated -- you're either going to deal with them on site or off site, and that's going to impact the cost.

Q. Okay. Now, getting -- moving on to your report, how is it you obtained the information for your study?

A. Primarily through discussions with representatives of industry and representatives of service companies that supply the equipment --

Q. All right --

A. -- that's being used.

Q. -- and did you do any research for the numbers?

A. Yes, I did. I did some Googol searches, you know, for -- you know, for surface company addresses to get cost breakdowns, and actually drove out and visited with the contractors to discuss with them how they come up with the cost numbers they come up with.

Q. Okay. Now are you familiar with the company Cimarex?

A. Yes, I am.

Q. All right. Did you review any of their literature?

A. Yes, I did.

Q. And did you review any other company literature?

A. There's a -- in the references there, there's a paper on waste disposal that was put together by Chevron and Piper Consulting, and it was on waste disposal.

Q. Okay. Now if you could please relate to the Commission what your main conclusions are of your report?

A. Main conclusions I had is that the cost of disposing of material offsite is probably the biggest contributor to the increased costs in drilling a well -- or using a temporary pit, excuse me, using a temporary pit. That would be the primary factor.

But there's also some costs involved with the closed-loop systems. You know, they come about in large part because of the availability of the equipment, and they're just higher cost.

Q. Okay, and is there a cost differential between the southeast and northwest?

A. Yes, there is.

Q. And on your main conclusions, what's that cost differential?

A. Same conclusions, generally, that the cost of disposing of your material off site is considerably more. They currently use a -- you know, a little different method up in the northwest than what's being used generally in the southeast, so their costs are impacted even more than they are in the southeast.

Q. Okay, please keep your voice up. Okay?

A. Okay.

Q. All right. Let's look at the actual factors that

you considered in your modeling. Let's start off with your waste volume.

And I would direct the Commission to table 5 on page 8 of Mr. Small's Exhibit 13.

If you could please relate to the Commission what this table discusses.

A. Okay, when I went to put this table together what I did is, as I said, I looked at the paper -- the Chevron paper and the Cimarex paper to get some concept of how they were relating their waste to the hole volume. And I wanted to do that to keep everything consistent as I could, you know, so that I wasn't getting off on a tangent and have something different from what they were looking at.

I had access to 15 wells that were drilled that I personally was involved in, in cleanup on. And so we had some good information pertaining to the amount of solid material that was hauled off site on each of those wells.

And I had two different scenarios.

One was a well that, you know, was in the range of 4000 feet, and the other one was in the range of 7200 feet. And so I grouped those together.

Calculated the hole volume which is, you know, basically the volume of the cylinder. And there's two different -- if you look, there's two different columns for that, and that's because of the different casing sizes.

The first column, E, is based on the diameter of the surface casing -- or excuse me, the hole -- diameter of the surface cas- -- or surface hole.

In the four-inch, it was pretty consistent at 11 inches. In the 7200 it was 11 inches, and then there was three of them at a little larger, 12 1/4 inches. So I calculated that volume.

And then from that depth down to total depth of the well is the H column, which is based again on the same thing, the diameter of the hole as being bit or, if you'd like, the bit diameter. And calculated that. That gave me a hole volume.

The sum of those is the total -- is in column I, which is the total hole volume for the well.

Then I just went ahead and took the volumes of material that we hauled to disposal, solid materials that we did keep records on. I looked at the tickets on it and just related those, and I came up with a ratio which was the waste volume to the hole volume. And you know, if you look at those, they move around, you know, significantly.

There's a good range there, so I just went ahead and averaged those for the purpose of my calculations. It's just a straight average, there's nothing -- no mean average or anything like that. It's just a straight average. And the average ratio for the 4200-foot well is

16, and the ratio -- average ratio for the 7200 was 10.

Q. Okay. So this table 5 is actual numbers from actual wells drilled?

A. Those are actual wells drilled, yes.

Q. Okay, and the volume of waste was actually tabulated?

A. Yes.

Q. Okay. Now in terms of another factor that you considered in your modeling, did you consider any surface disturbance or -- besides the pits?

A. Yes, I did, the volumes that we're showing there for the solids actually include material that would have been excavated beneath the pit, as well as the pit contents. When you're taking up the pit with a liner, that -- you know, there's a potential for a little bit of sloppage and maybe getting some contamination of the soils underneath.

And so generally, you know, we'd go ahead and scrape off an additional, you know, six to 10 inches of material and ship it off, just to make sure we picked up anything that might have leaked before we did our test, to -- you know, our composite test.

Q. Okay. And for your modeling, what were the general dimensions that you used for your pits?

A. The pits in the north -- or excuse me, in the

southeast, we used for the deeper well was 150 by 150, and for the shallower well it was 100 by 100. And I got those from talking to contractors, that that was kind of a typical pit size. You know, you need to understand, they do vary off of those exact numbers, but those are kind of a typical number you can use.

The pit size in the northwest, I'll have to look that up. I don't remember exactly what the dimensions were, but they were smaller because they were using a rectangular pit in the northwest. Let's see, the pit for the -- for the 7500-foot well was 100 foot by 30 foot, and the pit for the 4000-foot was 75 by 25.

Q. Okay, so substantially smaller in size. And what --

CHAIRMAN FESMIRE: Could I get those numbers again, please?

THE WITNESS: The pit -- the northwest, or all of them?

CHAIRMAN FESMIRE: Just the northwest.

THE WITNESS: The northwest pit size for the 7500-foot well was 100 foot by 30 foot, and the pit size for the 4000 was 75 feet by 25 feet.

CHAIRMAN FESMIRE: Mr. Commissioner, that's on page 10 of the exhibit if you'd like to look at it.

CHAIRMAN FESMIRE: Okay.

Q. (By Ms. Foster) Okay. And these pit dimensions are not exact to the foot. They vary by location, correct?

A. Yes, they'll vary by location, and by operators. You know, some -- not all operators will do a 150-by-150-foot pit, they may do a 120-by-120.

But you know, like I said, these are numbers that the contractors -- dirt contractors and the liner people told me were pretty typical numbers for those areas.

Q. Okay. And looking at the well location distance from the Division, was that a factor you also considered?

A. I'm sorry?

Q. The well distance from the commercial disposal facility, was that also factored into your model?

A. Yes, that was factored in, and I just -- you know, as Mr. Chavez did, I just used the 100-mile radius as a point to start.

One of the things that, you know, you need to recognize, that the 100-mile radius doesn't mean that's as far as you're going to drive, because if you're coming off the lease roads, you know, you could drive considerably more than 100 miles in order to get to the site. But that would put you within the radius --

Q. All right. And did you make any assumptions as to the cost of your disposal amount or your loads?

A. The disposal amounts -- you're talking dollar

amounts?

Q. The cost and the loads, yes.

A. Okay, the cost for disposal was based on the actual cost that you pay to dispose of the item in the facility, and the facilities I talked to were generally around $18 a yard. That was a good even number, somewhere -- a dollar or so less, I mean a dollar or so more, but $18 seemed to settle out in everybody's mind per yard.

The determination of the cost to haul, I called the trucking companies to see what they charge by the hour to run a 20-yard dump and a 12-yard dump. I opted for the 20-yard dump, because that moved a little more material off of the location in a load, which I felt, you know -- you know, if they can get a 20-yard dump, they'll get a 20-yard dump.

And then I just determined if you were hauling it 100 miles, roughly that would be five hours worth of hauling time, because it'll take you two hours driving at highway speeds, and that doesn't count how much time you might be on a lease road but, you know, just ballparking it.

Two hours to the site, you're going to have to unload at the site, and then two hours back to the drilling site -- or to the waste facility and then back. Five hours and 100-mile radius is probably a little light, but it was,

you know, a number I could put out there.

Q. All right. And what about your vehicle load restrictions in terms of weight and size?

A. I ended up looking at 14 yards in a 20-yard dump. There's a couple reasons for that. One is, there's load restrictions on the highways. County roads have an 80,000-pound load restriction. A 20-yard dump -- the tare weight of a 20-yard dump is 33,500 pounds, so you've got 16 tons off of it right there.

And I actually did a little Mr. Science project. I went out and I got some drill cuttings, and I put -- got two gallons' worth of drill cuttings, I measured them, dry drill cuttings. And then I started adding some 10-pound brine just to see, you know, at what point the material would be -- you wouldn't be able to handle it in a dump truck, it would be too liquidy, and it came to about a half a gallon was what it came to, per gallon.

So the weight of the material came out to be almost 13 pounds per gallon. And then taking a half a gallon, there's five gallons of water that would be entrained in the pore volume of that rock material. And so that gave me a weight that I could use to calculate, you know, the weight on a truck. And it comes out right around 14 --

Q. Okay --

A. -- yards that you could get within the weight limits on a county road.

And I also called the county road departments to see if they had any areas that might be restricted. In San Juan County they have a bridge over the Animas River on 550 that has a 25-ton total limit, according to the road department. So that only gives you nine tons to play with in the truck.

Q. Now, why is that bridge important in Animas County?

A. Because you cross that bridge, if you're -- particularly if you're going to Bondag disposal, you'll end up crossing that bridge. If you're coming in from the north, you're going to cross that bridge to get to the San Juan disposal.

And they also indicated there's a couple bridges out there that are 10-ton-limited bridges, so you wouldn't even be able to use a 20-ton truck on that.

Q. All right. And how is it that you came to your cost estimates for the closed-loop systems?

A. For the closed-loop system, I called vendors and discussed with them the -- I looked at the cost of the solids-removal equipment, you know, what it cost to rent it on a daily basis, what it costs to install it on location, what it costs to transport it to the location.

And then I looked at the tanks -- looked at the tankage needed. And I used -- I used, you know, four tanks, you know, three water tanks and one solids tank, just because there was a picture in the Cimarex paper that showed that particular configuration for the well that they were drilling.

Q. All right. And the numbers that you used, was this for a multiple well drilling program or otherwise?

A. It's a single well program. I did that on purpose because we were looking -- you know, you asked me to look at the small operator that isn't on a large drilling program, they're not drilling five or six wells in the same location, they may be drilling one or two wells over the course of a year, spread at remote locations.

And because of that, you know, they wouldn't get any particular discount. You couldn't move the closed-loop system from one well to the next. You move the well -- or the system to that well, and then you'd release it upon completion of the well. And it also impacts the material that you generate on location, whether you can use that somewhere else or not.

Q. All right. Now is it -- Did you account any factors for rehabilitating used water, for example, if you bought it from another operator?

A. I looked at that. Most of the companies I've

talked to would not buy someone else's water off of their rigs because -- you know, here we're calling it a waste, and you're going to ask me to buy somebody else's waste to put in my well. I'd be very uncomfortable doing that.

And I haven't -- I'm not a lawyer, so I couldn't research the implications of taking someone else's waste and putting it in my well to drill. If I lose waste, does that well now become an SWD well? You know, what's the implication here on what's happening in that well?

Q. Okay, and why would that be a concern? Because you need to have a special discharge permit?

A. You're going to have to -- Yes, you'd have to go through a permitting process to be an SWD facility. And again, you know, like I said, I -- you know, I'd be very concerned about taking someone else's fluids and putting them in my well.

Q. All right. Now moving on to table 1 in your report, which is on page 4 for the Commissioners, I'd like you to first start off with how it is that you're going to get to -- got to your calculations on your -- what you highlighted as your current method used.

A. Okay, the current method used, I talked to a number of operators in the southeast and in the northwest to just find out how they're currently handling their drilling programs and waste.

And in the southeast the deep burial seems to be a method that a lot of companies employ, so you have the construction of your reserve pit and the closure of a reserve pit, and that entailed the cost of the dozer time to dig the pit, the cost to line a pit, and then the cost to close it when you're completed.

And then I figured a cost for the deep burial, what it cost to dig a deep-burial trench. Normally, your deep-burial trench -- the long side of the trench will run the length of your pit. And then the -- they're about 20 feet wide and about 20 feet deep.

And then -- they're currently lining -- or the operators I talked to are using liner in their deep burial pits.

Q. Okay. Directing the Commissioners, the actual numbers for the cost calculations are on page 9 in your report, for cost of current methods employed.

And for the current method for the 7500-foot well in the southeast, what type of liner are operators currently using?

A. They're using 12-inch -- or -- "12-inch" -- 12-mil liners primarily.

Q. All right. And I see that you also have a sampling cost here.

A. Yes, there's a cost associated with the -- When

you clean up the pit you're going to be looking at the chlorides and the BTEX and TPH concentrations after you clean up the pit. And most of the operators I talked to were doing a pre-sampling in the area of the pit, just to make sure they had something to compare those numbers to.

Q. All right. And in order to move to closure, what was removed from the pit?

A. The free liquids were pulled off the pit and hauled to disposal, and then the contents of the pits are allowed to dry out, and then the solid material that's in the pit, which is primarily cuttings and mud residue, and then there will probably be some cement residue, is pushed into the deep-burial pits --

Q. All right, and how is it that you got to your 45 truckloads of liquids for the 75-foot -- 7500-foot well?

A. Okay, that's -- I took the 75 -- you know, we haven't discussed the type well as yet, but the type wells I put together were based on a 7200 foot, and the 4000 came off of that table 5. I used those because I had the data, so I used those as my type well.

And then I went ahead and I calculated the pit volume, and I used that multiplier, that average multiplier I told you all about on table 5, I just used that and multiplied it times that to get the solid volumes.

And then I used -- this sounds kind of

convoluted, if you can follow me here. The papers I looked at, all three papers indicated that a good number for a reserve pit drilling system for total waste volume generated was 20 times your hole volume. They all seemed to agree that that was a good number to work with.

So I used that 20 and multiplied it times the hole volume to get a total volume. And then by taking the total volume and subtracting the solids volume I could get a water volume. I could not find good records for the amount of water that was hauled off the pits, but -- you know, that was the best way I could come up with that number.

Q. Okay. And just so the record is clear, the pits -- your type wells are for your 7500-foot depth and your 4000-foot depth, correct.

A. Yes.

Q. Okay, just so the record is clear.

All right, and how is it again that you got to your 45 truckloads of water?

A. If you take the volume of material -- you can convert between yards and barrels, any way you want to go. But you know, like I told you, I had a number that I generated using that total volume, subtracting the solids volume, and that gave me my liquid volume.

A trans- -- or a vac truck can haul about 120

barrels of liquids, so just divide it, and that gives you the number of truckloads of liquids that you're going to haul off the location.

Q. Okay, moving on to your second option here on your southeast New Mexico 7500-foot well, the earthen reserve pit on-site disposal, can you explain those numbers for us, please?

A. Where are we again? The 4000-foot well?

Q. Table 1 --

A. Uh-huh --

Q. -- 7500 --

A. Okay, you're going over to -- Okay, the earthen reserve pit on-site disposal, under the current rule, you know, it's going to go up, you know, what I showed you.

Q. Under the proposed rule?

A. Proposed rule, excuse me, proposed Rule 17, is going to increase. Most of that cost is going to be due to going to a 20-mil liner, but there's also going to be a little additional sampling costs that are going to be thrown in there too, so that increases the actual pit construction closure costs.

Your deep-burial costs, you've got the same issue. You're going to go over to a thicker liner, and there's testing of the material you're going to have to put into that. You'll have to TCLP-test the material that

you're going to put in the --

Q. All right --

A. -- the deep trench.

Q. -- so your total for the earthen reserve pit, leaving it on site, is $51,000?

A. That's correct.

Q. On a -- Okay, and move on to your next option, please?

A. Earthen reserve pit with off-site disposal, the cost of constructing and closing the pit is going to be the same as in the first, in the earthen pit with on-site disposal. But now you're going to have the cost of hauling your material off-site to disposal, which will entail, you know, shipping your solids to a disposal -- commercial disposal site, and hauling liquids out.

Q. All right, and you -- for the off-site disposal, you estimated 80 truckloads?

A. Yes.

Q. And how is it that you got to that?

A. Using that calculation of the volume -- you know, the average -- excuse me, the calculation using the hole volume for the 7200-foot well -- the 7500-foot well, and then multiplying it times the 10, and that gave me roughly 1100 cubic yards of material.

Q. Okay, so for the off-site disposal, you're

hauling solids as well as liquids?

A. Yes.

Q. Okay. And for the 80 loads, can you estimate the number of miles for that?

A. I used -- Like I said, I used the 100-mile, so that would be 8000 miles.

Q. One way?

A. One way, so 16,000 miles two ways.

Q. 16,000 miles just for your solids?

A. Right.

Q. Okay. And about -- What about your liquids? Are you disposing at the same 100-mile radius?

A. Not in the southeast. I really couldn't get a good handle on that in the northwest. In the southeast there's a lot of -- you know, I'm familiar with a lot of the SWD locations, and they're -- they're in an area where you don't need to drive nearly as far, so I believe I used 30 -- 30 mile out and back on those.

Q. On the water?

A. Yes.

Q. Okay.

A. So it's -- there's just more sites available for disposal.

Q. All right. And moving on to your last option, your closed-loop on-site disposal.

A. Closed-loop on-site disposal, a closed-loop system, again, as I said, that includes the solids-handling or separation equipment plus the tankage and the operator's time on location, you know, I came up with $57,000 in, basically, conversations with the vendors.

And then the deep burial would be the same as it would be for earthen pits. You have a trench that you'd line with a 20-mil liner and put the material in it.

Q. Okay. Now your closed-loop system, you said that there's solids-control equipment?

A. Yes.

Q. What does that entail?

A. Generally it's two shale shakers, the fine-screen shale shakers to get your fines out, and then you'll go to a centrifuge. You know, depending on the depth of the well you may have one or two centrifuges out there. Centrifuges are used to try to separate the solids as much from the liquids as possible.

Q. And you have an operator's cost?

A. I'm sorry?

Q. Do you have an operator cost?

A. Yes, that's all -- the operator cost, I believe, was $1200. Let me look -- that -- I think the operator's -- excuse me, it was -- for a 7500-foot well, the operator's was around $16,800.

Q. And why is that so expensive?

A. You're paying for them to be out there on a 12-hour shift, and depending on where you're located you're probably paying expense for them also. And then they're getting paid by their company to be out there to handle their equipment.

Q. Okay, why is it that you need to have separate operators for a closed-loop system?

A. Because they're not going to trust you, essentially, with their equipment. I mean, if I had money tied up in those things, I wouldn't trust just anybody to operate them.

Q. All right. And for the closed-loop system on the 7500-foot well you estimated how many days of drilling?

A. I estimated 14 days.

Q. And in the cost of your closed-loop system did you figure in what's been discussed as a drying pad?

A. Yes, I used a drying pad.

Q. All right, and what size is that drying pad? What size is that drying pad you estimated?

A. The drying pad, when I estimated it, I came out with a pad that would be 150 by 150, if you can believe that. It just -- that's the way it worked out, the numbers.

To get to that number what I did is, I went back

to those numbers that I generated out of table 5 and said, Okay, you know, we have 1120 yards of material being hauled off the location. If I were to take six inches of dirt from beneath that entire pit, the walls and the bottom of the pit, and add them into that, I'd come up with that 1100.

So I went ahead and did a calculation of the surface area with a six-inch pull-off and said, Okay, that's material that's not pit contents. It's -- I take it out of the equation, and I'm left with nothing but the pit contents.

So then I take the pit contents and I say, If I'm going to put a 12 -- or a two-foot lift -- and I came to a two-foot lift because I think anything more than two foot isn't going to allow that material to dry, you're defeating the purpose of the drying pad. So using a two-foot lift, you can back-calculate the volume and come out with 150 feet by 150 feet.

And the way I looked at that, in the design, the recommendation -- there was a number of recommendations, but from one in the -- oil paper cited there, the Cimarex or -- whatever, paper, recommended that you use a 20-mil liner for a liner underneath the six inches of clay, compacted clay, and put your material on top of that so you don't compromise the liner.

So now you've added that six inches of compacted clay to the amount of material you're going to haul off that location, plus you've got the same concerns with digging up a drilling pad, the drying pad as you're going to have with a pit, that there's a potential for contamination between -- beneath that, while you're taking the pit -- the liner up. And if you get any material there and it comes out, you know, in excess of the thresholds in the regulation, then you're going to end up digging a lot more.

So if I were operating it, I would put off an additional six inches beneath there. So now I have a foot of additional waste associated with that drying pad, plus I would also berm my drying pad. You know, as a prudent operator, if you get a rainfall out there you don't want the material washing off the pad onto the surrounding ground, so you're going to berm it.

And because this is all above ground, that berm is going to be taken off. If you're going to try to bring your pad back to contour, you're going to have to take that all off. So I figure in the volume of the berm you're going to put around there, is going to be hauled off also.

Q. Okay. And I notice that in your closed-loop off site for disposal costs are the same as your earthen pit reserve costs?

A. Yes.

Q. Is that because the volume is about the same?

A. Yes, volume comes -- it's -- I think -- I ran through the calculations, and the difference was 480 versus 440 yards of material that you'd be hauling off.

Q. Okay. All right, so what was your end result for your closed-loop off-site disposal cost?

A. The off-site, it was $132,500 in the southeast.

Q. Okay. Moving on to the northwest, which is table 3, at a depth of 7500 feet, I would just ask you if there was any significant differences in cost for disposal in the northwest versus the southeast?

A. The significance there was -- I'm trying to think of what the -- I'm sorry, I just went blank. What was the question again? I'm sorry.

Q. Do you need another piece of cake?

A. No, I just -- I had too much lunch, I think, you know.

Q. I was just asking, so we don't have to go through all the calculations again, because I know how you arrived at your volumes for disposal, if there was any significant difference in cost for disposal of the liquids or solids in the northwest.

A. Yes, the -- one of the biggest costs came in the cost for trucking in the southwest -- or northwest, is

quite a bit higher than it is in the southeast. The northwest, conservatively, a vac truck costs about $180 an hour. A vac truck in the southeast runs about $85 to $95 an hour.

Q. Okay, and what's the difference per load for that 120-barrel vacuum truck?

A. Let's see, if you're -- Look at that curve. Okay, if you just take the curves that are on page 13 and you look -- if you use a liquid for -- you know, one hour would be roughly -- the cost of a load, you know, just for one hour, is going to run you about $200, transport the liquids in the northwest. And it's going to cost you less than $100.

Q. Okay. Looking at -- I would direct you to page --

A. If you're looking -- were you looking at an hourly cost, or -- you know, when you're -- you're asking for a load. If you look at the curves, the curves are relative to the amount of time, so it would be your distance. If you use the 100-mile radius, you know, then you're going to look at a five-hour difference. So your five-hour costs would be in excess of $900 to haul a load, if you're hauling it a hundred miles. Is that what -- the number you were looking for?

Q. Right --

A. Yeah, so --

Q. -- and just to make sure that we're not comparing --

A. Okay, yeah, I -- down below, if you'll look at the -- you know, beneath each one of those curves, I tell you how many miles are being -- is being hauled and what the cost per hour is and the number of hours.

Q. Right. The 45 loads on your southeast demonstration for the 7500-foot well was a per-load price, correct? It was $212.50 a load --

A. Right.

Q. -- for 45 loads?

A. Right.

Q. Now for the northeast you have it at $905 a load?

A. That's right.

Q. Right?

A. Right.

Q. And is there a difference in your disposal charge per barrel in the southeast versus the northwest?

A. Yes, there is.

Q. And what's that?

A. That's the difference between a dollar and -- let's see what I have -- 65 cents.

Q. Okay, per barrel?

A. Yes.

Q. Okay. Now I notice that your current method used for the northeast is only $11,000. Why is that?

A. In the northeast, my understanding again, talking to operators, is that they currently bury the material in the reserve pit. The don't deep-bury, that the pits there -- you know, they let the pits de-water naturally through evaporative processes. If they need to haul off some of the fluid, they'll haul off the fluid to speed it up.

But they basically let them dry out and then close them *in situ*, in place. So you're not digging a trench on...

Q. Okay. And just so the record is clear, we are talking about the northwest now --

A. Yes, yes --

Q. -- versus --

A. -- yes.

Q. -- the southeast?

A. Okay, I -- northwest, yes --

Q. Okay --

A. -- 11,000 --

Q. -- northwest, San Juan County?

A. I'm in the right place, even if you all aren't.

(Laughter)

Q. Okay, I think we all know what you're talking

about --

A. Yeah.

Q. -- but I want to make sure the record is clear.

Okay, and I notice a $114,000 charge for commercial disposal facility costs in the northwest. How did we arrive at that number?

A. That will be the hauling cost plus the cost -- they run about $18 a yard up there for disposal also, and that just picks up the cost of your trucking, primarily hauling the solids and the liquid wastes off.

Q. Okay. All right, so the record is clear, what is the difference for a closed-loop off-site disposal versus your current method used in the northwest for a 7500-foot well?

A. The difference would be -- what, $160,000, $159,500, $160,000.

Q. Okay. Moving to the 4000-foot well for the southeast and the northwest, the costs for trucking and everything are different. The only difference is your volume, correct?

A. Correct.

Q. All right. And what is the difference in volumes between your 7500-foot well and your 4000-foot well?

A. The volumes -- Okay, primarily the reason for the difference is that they're different pit sizes. You know,

you're dealing with a smaller pit. But I came up -- get the right numbers here, make sure I'm in the right part of the state.

Okay, to the solids -- trying to remember that number. I had 1260 barrels -- excuse me, that's liquids. I had 11 loads. 11 times 14, that would be your solids --

Q. Okay, so for a --

A. -- and that's for -- in the southeast --

Q. -- a 4000-foot well, you have 11 loads of water, and you --

A. And you'd have -- you'd have 11 -- yeah, 11 loads of water.

Q. And how many truckloads of solids?

A. Okay, let's see. Okay, I would have an offsite disposal in the southeast for seventy- -- or for a 4000-foot, right? I had 1024 yards; is that --

Q. That makes 73 truckloads?

A. Yes.

Q. Right. Okay, and then for -- again, for a 4000-foot well, the difference in the total cost? Difference? Current method used is $26,000?

A. Okay, and you're -- you're looking at the closed-loop?

Q. Closed-loop, offsite disposal, the highest --

A. Okay, the highest will be $93,500, so it would be

the difference between $93,500 and twenty-six --

Q. Okay.

A. -- thousand.

Q. Now in terms of your disposal costs, these are based on conversations you had with the operators, or disposal facilities?

A. Both.

Q. Okay. And did you receive any indication at all that those disposal rates might change?

A. Yes, I did --

Q. All right.

A. -- that there's a good chance. Part of the reason being, is that in some of those sites are concerned with reaching capacity in a short period of time, and if they do they need to make the money up front.

So, you know, they're going to be handling a large influx of materials from drilling wells that's going to shorten their life, so they're -- they'll probably look at increasing rates to try to pick that up before they have to close the facility down.

Q. Now for a 7500-foot well, you said it was 80 truckloads of solids. Would there be an instance where an operator might have to dispose of more than the 80?

A. Sure.

Q. When would that be?

A. You know, if you looked at the numbers on table 5, you know, the --

Q. Right, depth -- depth to volume. But is there an instance where they might have to dilute what they're disposing at the location?

A. Oh, yeah, if you're going to get it to meet the, you know, requirements, you know, depending on your chloride load in the waste material, you may have to bring in some fresh dirt and blend it. And that just increases the amount of material you're hauling to the disposal site.

Q. And when you're bringing in fresh dirt, is that just topsoil from wherever?

A. If you're on private land, you're going to buy it from the landowner. And depending on the landowner, he may have a specific area he wants to get it from, or they may just tell you to go pick it up in a pasture and bring it over.

State lands, I think, you know, the state would probably like you to use theirs, but I don't think they want to disrupt the surface as much, so they'd be more inclined to let you buy the dirt from someone off site.

Q. All right. Now, did you have the opportunity to look at Ms. Denomy's information --

A. Yes, I did.

Q. Okay, and do you have that in front of you by any

chance?

A. No, I don't. I can get it --

Q. Okay, can you get it?

CHAIRMAN FESMIRE: She'll bring it to you, Mr. Small -- he'll bring it to you.

Yes, you may approach.

MS. FOSTER: Yes, I thought that was implied in the...

THE WITNESS: Okay.

Q. (By Ms. Foster) Okay, looking at the last page of Ms. Denomy's information where she did the detailed analysis of the closed-loop costs --

A. Yes.

Q. -- would you please discuss those costs as they were different from yours?

A. The two things that really stood out to me on her costs -- you know, I didn't look too much at the total drilling cost, but the savings for drilling mud and then the additional costs for closed-loop system, she came up with $2500 a day, and that's -- and the numbers I have are going to be more in the range of $4000 to $4500 a day, and that number is actually a little bit light compared to what some of the operators told me that it was running them, you know, both southeast and northwest, as much as $5000 or more per day, you know, on an average.

So I -- you know, she's got 16, I -- you know, I used 14 days, you know, that's -- however you want to work it. But that's -- you know, the $2500 is not a number I can come up with on her case.

And then the drilling mud, as we've talked about, you know, if you're an independent and you have to haul your muds off or your solids and liquids, you're not going to save any $17,000. So when I re-ran the numbers, the closed-loop cost comes closer to $65,000, you know, using -- you know, my number. And then, you know, the mud drilling, you'd add the $17,000 back into it as a cost and not a savings --

Q. Okay, and --

A. -- and that would be maybe even higher than that, but --

Q. Did she have any disposal of solids amount in her calculations?

A. Disposal of solids? I don't remember seeing those. Is this an order?

Q. Well, did you review the OGAP cases that were presented?

A. Yes, I looked at the OGAP, you know, papers and read through them.

Q. Okay, and do you -- are you aware of what they stated they did with the solids, the drill cuttings?

A. No. They -- in one -- in one of their examples, the material was actually used on site, and -- the last one where they were drilling on the Army Corps of Engineer land, and they had indicated that their solids -- you know, they reduced toxicity, but they didn't indicate they'd eliminated it, they'd just reduced it. But they were using it for whatever use on land, berms, roads, whatever. But that took care of their solids issue for them on that lease.

The others, you get into -- they were talking about recycling and, you know, reusing it. But then the first example they didn't say anything that I saw about how they were handling solids.

Q. Okay. Now looking at the transportation costs and disposal issue, under the proposed rule, what -- well, what exactly will have to be disposed of?

A. You're going to have, obviously, the cuttings from the wellbore.

They'll probably -- most drilling operations will have a certain degree of sloughing of the formation, so it will still be naturally occurring stuff, but it creates a little bigger wellbore. You'll have some sloughing material in there.

You may have some materials from the mud, particularly weighting agents, that may be a constituent of

the mud.

There's other solids, materials that they put in the muds for various reasons, lost-circulation issues and that type of thing, that would probably circulate through the system also.

And you might have some -- a little bit of cement. You know, we're required to circulate cement to the surface on surface pipe and try to tie it back in, so you might have a little bit of cement residue from the circulation process. And then when you're drilling out -- you'll have cement when you drill out your casing shoe that you'll have to contend with.

Q. Okay, and what about the liners?

A. And the liners, they're going to have to go to the disposal site also.

Q. Okay, now what has to go where, out of all those things that need to be disposed of?

A. Depending on what you have there, you know, the majority of it, you know, in the southeast is probably going to go to a commercial disposal landfill, primarily because of the chloride restrictions on landfarms, unless again you want to do a lot of blending out there. You know, they'll go with landfills.

The landfarm issue, they are allowed to take but they've got limitations to a permitted facility. You can

take no more than 1000 parts per million chlorides in there. And if you have a registered facility, they can't take any drill cuttings, so...

Q. Okay, so a permitted landfarm can take some chlorides to a certain level?

A. Yes, and drill cuttings, yes.

Q. And landfills, can they take anything to any level?

A. What the landfill is going to do, they can at their discretion, you know, when you bring in your waste, because it is technically a class D waste, which is exempt, but what they've been doing here recently is, they're requiring TCLPs to be run, you know, for the 3103 -- am I correct? -- chemicals to make sure that there's nothing in there that they don't want in concentrations, because they're going to have to clean that facility up at the end of their life, and they've got to account for that if there's a problem.

So it depends on the facility. Some are willing to accept, some aren't.

I couldn't tell you about the northwest, I honestly don't know, you know, where that --

I know I tried to dispose of some material, oilfield material, once in Lea County landfill, and they told me I'd have to TCLP it, and if anything came over the

limits specified, they wouldn't accept it. So you know, I ran into that down there. Whether that's a policy of all landfarms, I couldn't tell you. But I did run that into the Lea County landfill.

Q. Okay, and if the Lea County landfill would not accept your waste, where do you take it?

A. There's a hazardous waste disposal site in Texas. It's close to the southeast, that you can carry across the border to put it in if you can't get any other facility to take it.

Q. Okay. Now are you familiar with the exhibit from Mr. Wayne van Gonten that was the map with the red circles around it?

A. Yes.

Q. Hundred miles of the landfill?

A. Uh-huh.

Q. Looking at that map -- Do you have it in front of you?

A. I can -- I didn't know how much I was allowed to have on cross.

CHAIRMAN FESMIRE: Mr. Wayne van Gonten is right behind you. He's willing to help if you need --

THE WITNESS: Okay, yes, I'm looking at it.

Q. (By Ms. Foster) Okay -- Sorry. Okay, do you have it in front of you?

A. Yes, I do.

Q. Okay. There are a couple circles, red circles on that map indicating the 100-mile radius to a landfill, correct?

A. Right.

Q. And could you for the record -- put on the record what those landfills are, according to that map?

A. According to this map there's the Rio Rancho landfill -- Are you talking all of them, or just northwe- -- all -- all of them?

Q. All of them.

A. Okay, yeah, Rio Rancho landfill just north of Albuquerque. There's a northwest New Mexico regional landfill. You have the San Juan County regional landfill. There's a transit waste landfill up in Colorado. The Montezuma County landfill up in Colorado.

In the southeast there's the Gandy Marley landfill, there's the Lea landfill, Controlled Recovery landfill and the Sundance landfill.

Q. Okay. And out of the ones that you just mentioned, how many of those are OCD facilities, or permitted facilities?

A. OCD permitted? I believe that the CRI, the Controlled Recovery is, Sundance is, and Gandy Marley is.

Q. All right.

A. Those three.

Q. And so the other ones would be under what agency's control?

A. The ED, Environmental Department.

Q. All right. And did you actually make phone calls to some of these landfills?

A. Yes, I did.

Q. And let's start with the northwest landfills. Did you call them?

A. No, I didn't.

Q. And why not?

A. I just never got around to it.

Q. Huh?

A. I just didn't get around to that. The only one that anybody told me that I could probably contact would be the San Juan County landfill, and I did not contact them, no.

Q. Okay. Did you -- How is it that you contacted these landfills, then? How did you get their numbers?

A. I -- well, you know, I basically went to the ED website and called up their -- a sheet they had for landfills accepting special waste in New Mexico.

Q. Okay, special wastes. What is defined as special wastes?

A. Well, they've got a number of different

definitions here. Asbestos, ash, chemical spill residue, industrial process waste, municipal sludge, other sludges, PS -- PCS, which is petroleum contaminated soils, and then treated formally hazardous wastes.

Q. Okay. And is the northwest New Mexico regional landfill on that list?

A. No, it isn't.

Q. Okay, did you try and call them?

A. I don't have a phone number for them.

Q. Okay. Were you able to find them on line?

A. No.

Q. Did you call the San Juan County regional landfill?

A. No, I didn't.

Q. All right. Are you aware of the San Juan County regional landfill?

A. I'm aware of it, yes.

Q. And can they accept oilfield waste?

A. My understanding is, they can on some type of temporary MOU with the OCD, I believe. I've not seen the MOU, so I'm not sure what kind of agreement it is, but I understand it's kind of a year-to-year deal that they accept.

Q. Okay, and do you know when that MOU is set to expire?

A. I've been told in six months, is what I've been told.

Q. Okay. Now --

MR. BROOKS: Mr. Chairman, if this is -- we don't really disagree with the dates on these MOU, but I don't want to waive an objection to hearsay, and he's just saying, I've been told this. So I would object to the hearsay.

CHAIRMAN FESMIRE: I believe it's part of the earlier record, so I'll go ahead and sustain the objection, although it wasn't very timely.

Q. (By Ms. Foster) On the issue of landfills, you stated that there was a concern, based on conversations you had, that they would close because they would fill, right?

A. Yes.

Q. Now is -- somebody that's doing an AFE for a company, is that a cost concern that would be of issue to you?

A. Yes, it would.

Q. Why?

A. When you're putting together an AFE, it's not like I'm going to do the AFE today and drill the well tomorrow. Usually our AFEs, when I was working for Hess and Texaco, might be prepared as much as a year in advance. And so knowing how you're going to handle that waste and

where you're going to have to truck it to could become, you know, a very critical component of that AFE.

Q. Okay, so when you're doing the AFE you need to know whether the disposal facility will be open?

A. Yes.

Q. Now let's talk about this safety issue. On a 7500-foot well, how many truckloads was that again?

A. You're making me work here.

(Laughter)

CHAIRMAN FESMIRE: Ms. Foster, I'm going to object to that one.

(Laughter)

CHAIRMAN FESMIRE: Although that too is part of the record.

THE WITNESS: You're talking total loads, or just liquids, solids?

Q. (By Ms. Foster) Solids.

A. Okay, solids on a 7500-foot well in the southeast, I was looking at 45 loads.

Q. 45 loads --

A. Yes.

Q. -- okay. You have -- in order to dispose of those wastes you're actually using trucks, correct?

A. Yes.

Q. All right. Did you do any research or talk to

anybody concerning the truck issue?

A. Yes, I did, I went on line and called up the New Mexico Traffic Safety Bureau's web page and looked at accident records that they had in their annual draft report for 2006.

And they had listed 2086 accidents involving heavy trucks. Of those, 84 entailed a fatality, a hundred and --

MR. BROOKS: Mr. Chairman, again, he's reciting hearsay. And he can give expert opinions based on hearsay, but I don't think he's been qualified as an expert on traffic accidents.

CHAIRMAN FESMIRE: I think we're real loose in our use of hearsay to support some of the cases here, so I'm going to go ahead and overrule it, because this is research that he's done and I think he's qualified to report on the research that he's done.

MR. BROOKS: Yes, sir. Continue.

THE WITNESS: And there were 117 injuries to individuals involved in these accidents. And as I looked at the county distribution they had -- they listed the seven counties that had the most significant accidents involving heavy truck traffic, and four of those -- one of them is Lea County, one of them is Eddy County, one was Chavez County, and one was San Juan County. So they're the

very areas where you're going to be doing to be doing the majority of your trucking.

Q. (By Ms. Foster) All right, and did you have any conversations with any operators concerning the safety issues with closed-loop drilling?

A. The safety issues that were brought to my attention revolved a lot around the control of the well. I've been on wells where, you know, we lost 600 barrels of fluid in a lost-circulation zone very quickly.

In my example, I used a four-tank system, the three water tanks and one solids tank. The three water tanks would be approximately 900 barrels of fluid you'd have in reserve, so if you -- one of the dangers you had, besides the kick issue that was brought up in previous testimony, is the issue, if you hit a lost-circulation zone and you lose your fluid, you're exposing the pressure zones above it to the wellbore, which puts you in an underbalanced situation, which will -- you know, will either create a kick or potentially create a blowout situation.

And with the steel tanks, if you were just to use the three, you know, you probably would get yourself in trouble.

Now you can add to that, of course, that's an option an operator has, and we're looking at impacts to

surface, but you know, you could put as many as 15 tanks out there to give you enough fluid in case you run into these situations.

Other than that, you're going to shut your BOP and you're going to either wait for fluid to come and hope nothing disastrous happens, you know, or you're going to have some flipped aside somewhere.

Other issues involve $H_2S$ that might come up, you know, with the fluids, if you're drilling through a sour gas zone. Any natural gas that might come up. They're going to have a tendency to accumulate in the steel tanks, that they won't in an earthen pit, because the earthen pit is more exposed to, you know, the air currents and all. So those things will tend to dissipate a lot better than they will in a steel tank.

And those are the primary safety concerns that were voiced to me and -- managers.

Q. Okay. Talking about the footprint, you mentioned that a prudent operator would have additional water on location. Would that enlarge the footprint?

A. Yes, it would. It would. As I just said, if you're going from 14 [*sic*] tanks to 15 tanks, that's going to add considerably to the equipment that you have on location?

Q. When you're going from how many tanks? Four

tanks?

A. From four tanks to 15, yes. That's what you can expect in some of the horizontal drilling activities in the northwest, are actually having that kind of fluid issues come up where they're actually using that much fluid in their drilling operations, you know, both as standby and for drilling operations. You know, if you've got 15 tanks you're going to have a bigger footprint than you are with four tanks.

MS. FOSTER: Okay, thank you. I have no further questions for Mr. Small.

CHAIRMAN FESMIRE: Why don't we go ahead and take a 10-minute break and reconvene at 20 minutes to 4:00?

(Thereupon, a recess was taken at 3:30 p.m.)

(The following proceedings had at 3:44 p.m.)

CHAIRMAN FESMIRE: Why don't we ahead and go back on the record?

Let the record reflect that this is again the continuation of Case Number 14,015, that Commissioners Bailey, Olson and Fesmire are all present, we therefore have a quorum.

When we broke for the break we had just finished the direct examination of Mr. Small.

Mr. Carr, do you have any questions of this witness?

MR. CARR: Mr. Chairman, I do not.

CHAIRMAN FESMIRE: Okay.

MR. CARR: I can make one up if you --

(Laughter)

CHAIRMAN FESMIRE: Mr. Huffaker, do you have any questions of this witness?

MR. HUFFAKER: I have nothing.

CHAIRMAN FESMIRE: Mr. Baizel?

MR. BAIZEL: I'm sure I could -- The State was not going to --

CHAIRMAN FESMIRE: I figure they're going to have a lot of questions, so I'm trying to clear up the ones that probably won't take as long first.

MR. BAIZEL: Okay, yeah, I do have some questions.

CHAIRMAN FESMIRE: Okay, why don't you come up and sit at the table?

CROSS-EXAMINATION

BY MR. BAIZEL:

Q. Mr. Small, preliminary -- I'm pitch-hitting today, so -- our counsel had to be absent, so you're stuck with me instead.

In your background, my understanding is, you've done a lot of operational, supervisory things; is that correct?

A. Operations and supervisory, both, yes, sir.

Q. And I didn't -- Maybe I missed it, but did you say whether you had actually overseen a closed-loop system operation?

A. No. I've overseen jobs that use just the tanks --

Q. Uh-huh.

A. -- primarily in the workover activities, but not where we used the solids-control equipment.

Q. So the information that you were presenting in your direct testimony came from conversations with others and reading reports; is that correct?

A. Yes.

Q. Okay. And I believe you said that you had seen the figures from Ms. Denomy; is that correct?

A. Yes.

Q. Do you still have those there?

A. Yes, I do.

Q. If you would go to her -- well, actually we could go to the last page or the first page. Let's go to the first page, it provides a little more detail. Can you go --

A. I'm not sure I've got these in the same order --

Q. Well, this would be the one that says average well income and costs, 7200 foot --

A. Okay. Okay, that one's -- yeah.

Q. And if you go to the fourth column, it says typical cost to drill and maintain over a lifetime?

A. Yes.

Q. And do you see a figure there to drill?

A. I mean, there's a cost to drill and maintain. Is that the number you're looking for?

Q. Yeah.

A. Yeah.

Q. And that number -- ?

A. They're showing $2,040,00.

Q. Okay, at the bottom, does that -- If you go up above that, it says --

A. Okay, 1500 -- 15 -- or one million -- $1.5 million --

Q. -- to drill --

A. Yes, sir.

Q. In your experience, does that seem like a reasonable figure?

A. Yes, it does.

Q. And the $1500 a month maintenance cost for 30 years, does that sound reasonable?

A. When we did AFEs, we'd apply a multiplier to it for inflation, we would figure in an inflation number for that.

Q. So then the total figure of about $2 million as a typical cost seems a reasonable figure to you?

A. It might be reasonable, yes, sir.

Q. Okay. Now if you go back over to the first column, lifetime production per well, and this third line there, it says lifetime -- she assumed 25 to 30 years. Does that seem like a pretty good figure?

A. It could be, yes, sir.

Q. And then if you go on down in that column, it says a million MCF, and that was an average over the lifetime of the well. Does that sound like a reasonable figure?

A. To me, that seemed high. That's not a number I would use. You know, a 1-BCF well, that's -- there aren't very many of those around anymore, and most of the wells I've seen wouldn't -- gas wells, with Hess Corporation in particular, probably wouldn't come close to a million BCF.

Q. And those Hess wells, they were in Texas or were they in New Mexico?

A. In the northwest, up on the Jicarilla reservation, primarily, and then there was three gas fields in the southeast.

Q. So what would you think would be a good lifetime-of-well production figure for gas?

A. You know, it just -- it depends on where you're

drilling. I mean, you're trying to take something statewide and look at a field. You know, it depends on the field you're drilling in. You know, the Jicarilla reservation, there are wells there that their calculated recoverable reserves probably didn't meet 300 million.

Down in the southeast, in the Eumont field, you know, half a million might be a reasonable amount.

Q. So even if you went with half a million --

A. Excuse me, half a billion, I'm sorry.

Q. Half a billion, so 500,000 MCF --

A. Right.

Q. -- you'd be looking at a -- what's -- She used a five-dollar figure, which is a bit low for the price right now, isn't it?

A. That's correct.

Q. So you'd be looking at somewhere between $2.5 and $5 million as total income over the life of the well? Does that sound right?

A. She's got -- probably a little lower than that, it would be, if you're using a billion, take a -- it would be a half a billion. Her number was almost $3 million for a full billion, so that would be $1.5 million, just using her numbers, so I think it's probably a little less than that. You're talking the net income --

Q. Yes. Then you also have a page that she labeled,

Earthen pit costs.

A. I'm sorry?

Q. A page that's labeled, Earthen pit costs. It should be -- in mine it's --

A. Okay.

Q. And you see that in the first column it's also for a depth of 7200 feet, so roughly similar to your 7500, right?

A. Right.

Q. If you would go -- Maybe you can explain something to me. When I was looking through your figures for cost of -- I believe it would be your page -- I believe it's your page 9, Cost of current methods employed to handle drill pit contents.

A. Yes, sir.

Q. And I was looking at both the southeast and the northwest. And maybe I'm wrong, I didn't see a cost of water included in there. Normally wouldn't you have to somehow obtain fluids to drill and complete a well?

A. Not to construct a pit. These numbers are for pit construction. You would -- you know, as part of your drilling -- that -- part of that $1.5 million you're looking at, the water would go into that number in a typical AFE, your fluids would go in there.

To construct the earthen pit, you're just looking

at a -- basically a 'dozer to go out there and dig your hole, and then putting in the liner. And so there's no fluid involved in that operation at all. That's just strictly a dirt operation.

Q. So in terms of the cost that you were looking at, it was actually a fairly restricted set of costs; it didn't include the full set of well costs?

A. That's correct. It's just strictly pit construction. You know, each one of those headings there, pit construction, trench construction, yes, sir. It doesn't include the whole cost because -- I'm sorry, go ahead.

Q. Well, but as I understand it, one of the benefits of a closed-loop system is that you actually can continue using the fluid well to well, right?

A. Not necessarily. You can if you have a number of wells being drilled in the same area to the same formation, yes, on your -- you know, your -- or you're drilling multiple wells off of one pad.

If you're drilling one or two wells, no, you're not going to store that fluid, you know, on location. You're going to move it off and dispose of it. So you can't, you know, necessarily reuse it.

I know recycling sounds really great -- And they're practicing that. I mean, it's not like this is

something nobody's done. There are companies that do that, where they have multiple-well drilling programs.

But I can't take a mud program that works, say, up in the north part of Lea County, and move that mud program south to a totally different well. There's issues of the weight of the mud, you know, it has to be compatible with your drilling program. Any materials you might have in it have to be compatible with your formation waters and the formations themselves to be able to use that mud.

So it's not necessarily something that you can just move around. There are places you can do that, yes, but it's not a universal thing.

And particularly for the smaller operators, that's problematic because, like I said, if you're only drilling one or two wells, where are you going to take it to?

Q. Which I guess, then, brings me back to why wouldn't it be -- if what you're comparing is an operator that may have a number of wells that can, in fact, move fluids around between wells with a single operator, there's going to be a fluid cost that is associated with that, which I don't see included in your --

A. It's part of your --

Q. -- pit calculations?

A. No, it's not, because that's part of that $1.5

million drilling cost. That's where that fluid comes in. Your mud program and any fluid you haul in are going to be included in that drilling cost. They're not going to be in my calculations, because I'm not concerned with bringing it on, I'm concerned with bringing it off location.

Q. So now if you look at Ms. Denomy's earthen pit costs, she has -- under the second column and the sixth column, she has -- excuse me, under the fourth column and the eighth column she has some water costs listed, she has drilling water costs and completion water costs?

A. Yes.

Q. And you see some figures there?

A. Yes.

Q. Do those look like ballpark figures for water costs these days?

A. They could be. Honestly, I didn't research that, so I wouldn't want to --

Q. So an additional roughly $45,000, if you're working with a pit system, to get your fluids?

A. (No response)

Q. Okay. In your background and experience, it sounds as though you've done some remediation of well sites?

A. Yes.

Q. And are you familiar with range of costs in

remediating a site, once there's been a release?

A. I'm very familiar.

Q. And what kinds of range of costs have you come across in your experience?

A. Most of the remediation work I've done has been associated with old pits, you know, with tank batteries, and those costs range anywhere from $20,000 to over a million dollars.

Q. And did any of those involve pits?

A. They were all -- most all of those issues were pit issues, evaporation pits associated with the tank batteries, yeah.

Q. So in terms of your cost analysis, I didn't see an item in there for remediation costs?

A. Yeah, because what I'm counting on, and maybe wrongly, but I -- you know, when we came up with a 20-mil liner, I was assuming that that would not be acceptable unless we were confident that that 20-mil liner would prevent any spillage from beneath the pit or anything.

So if the 20-mil liner behaves as we're saying it's going to behave, you won't have any remediation of materials.

Q. But in preparing -- Excuse me?

A. That's okay.

Q. But in preparing an AFE, wouldn't you also add in

some contingency costs?

A. There's always contingency costs, but it's not --

Q. And some of those might be related to spills and releases?

A. No, it'll be a contingency number. Generally, you take a percentage and throw it in to cover any number of possibilities. But you go into a drilling program assuming that if your pit's lined properly with a proper liner, you're not going to have a remediation cost. So there would not be a reason to build a remediation cost into a well.

Q. But in fact, you left that out of your cost analysis?

A. Yeah, I didn't see any reason to include it.

Q. You assumed that's general cost, rather than a pit cost, for the company, the operator?

A. Like I said, it probably would not be a cost that you would consider. You know, it's not a cost that people generally put in. You know, I can't speak for every company. There may be companies that budget it, but the AFEs I did, we did not budget in, you know, for the pit failing or anything.

Q. Now I think you mentioned that when you prepare an AFE that you're sort of looking a year ahead; is that right?

A. For a drilling AFE, it's generally a year out, yes, sir.

Q. What happens if a surface waste facility were to come on line in that year's time? Wouldn't that lower your -- some of your cost estimates here? Isn't that a likely possibility?

A. It's a possibility, depending on where the pit's located -- or the facility is located, yes.

Q. And I think you said you used the 100-mile radius, was the figure that you used.

A. Yes, sir.

Q. Do you know how many wells there are that are right at 100 miles in northwest New Mexico?

A. I could not tell you that.

Q. Do you know how many are at 50 miles?

A. No --

Q. So --

A. -- I didn't do any analysis of, you know --

Q. But if they were at 50 miles, wouldn't the hauling cost be less?

A. Yes, I included that on my -- those curves. If you can look at those, that's the hours -- you know, the time you spend on the road is going to impact the cost more than the mileage --

Q. Uh-huh.

A. -- but the mileage does impact the amount of time you're on the road. So if you're within that 100-mile radius, but because of the lease road configuration you're actually driving 150 miles or 200 miles, the time is going to go up. You know, obviously if you're within 30 miles of a disposal facility that number is going to come down.

Q. So that if -- since you used the 100-mile figure, it would be fair to say that this is a worst-case scenario in terms of cost?

A. No, it's a case -- I built this based primarily on the rule, or the proposed rule. Like I said, it can be more than that, and it obviously could be less than that. For comparison purposes you're going to have to come down some, and the 100-mile radius was what you're saying. If you're outside of that, you can use an on-site disposal. If you're inside that, you can't. So 100 miles is probably a good area to work with, because that is going to be, you know, a situation that you would definitely consider.

Q. You said that you talked to a number of vendors; is that correct?

A. Yes.

Q. Closed-loop system vendors?

A. I talked to two closed-loop vendors in the area that -- you know, were heavily used in the area.

Q. And they have systems available at this point in

time?

A. I honestly couldn't tell you whether they were. I didn't ask them availability, you know, at this point in time.

Q. These were in the northwest or in the southeast?

A. One in the northwest, one in the southeast.

Q. And that's what you based your 14-day, $4000-a-day cost estimate on?

A. That plus discussions with operators and foremen that had been on closed-loop jobs, that gave me their cost figures.

Q. And how many operators was that?

A. Three.

Q. I think one last question.

I think it was your testimony that in the northwest you were told, as I -- correct me if I'm wrong -- that they don't have to haul liquid because they evaporate it all in pits?

A. I've been told that that was a process being used, it's one of the processes being used, yes, sir.

Q. But all pits in the northwest evaporate, they don't have --

A. No, no --

Q. -- any liquid-hauling costs?

A. -- not all pits. I'm just saying the operators,

the smaller operators that I talked to said that was a procedure they're using, is to let them dry out and evaporate.

Q. Did they say --

A. Certainly not all pits are handled that way in either part of the state.

Q. Okay, did they say how long it normally takes them to evaporate those fluids from the pit?

A. I didn't ask.

Q. So it could have been six months, it could have been a year?

A. Yes, sir.

Q. So you're aware that under the proposed rule they would have only six -- the six-month --

A. That's right, yes, sir.

Q. Okay. And so then that's why you didn't include a cost -- a haul-off cost in the northwest?

A. In the -- which --

Q. I'm looking at your cost of current methods employed to handle drill pit contents.

A. That's right, that's correct.

Q. So you assumed there was no disposal cost for those --

A. That's correct.

Q. -- pits?

A. Correct.

Q. So if in fact they had to haul it, they would have a disposal --

A. Correct.

Q. -- cost, wouldn't they?

A. That's correct.

Q. And so this figure would be low?

A. Yes.

MR. BAIZEL: I think that's all the questions I have.

CHAIRMAN FESMIRE: Mr. Brooks, do you have questions of this witness?

MR. BROOKS: Yes.

CHAIRMAN FESMIRE: Oh, Ms. Belin?

MS. BELIN: If you want to go first, that's fine.

MR. BROOKS: Okay, well --

MS. BELIN: I don't want to be forgotten.

CHAIRMAN FESMIRE: I'm sorry, Ms. Belin, I did. Why don't we go ahead and let Ms. Belin go, and --

MR. BROOKS: That's acceptable.

CHAIRMAN FESMIRE: I expect hers to be shorter than yours.

MR. BROOKS: Well, I don't know about that. I'm fine with that.

MS. BELIN: I'll try to make good on that.

CROSS-EXAMINATION

BY MS. BELIN:

Q. Good afternoon, Mr. Small.

A. Good afternoon.

Q. My name is Lettie Belin, and I'm here on behalf of the New Mexico Citizens for Clean Air and Water. So I'm going to just go through your report and ask you a few questions about it here.

On page 2, your next-to-last paragraph, the last sentence, you talk about a number of the reported benefits of closed-loop systems have not been universally realized. What do you mean by that?

A. The company people I talked to, the drilling foreman and the petroleum engineers on closed-loop system jobs up in the northwest and the southeast both told me that they did not notice any significant reductions in pit -- or in the bit life -- or improvements, excuse me, improvements in bit life, they didn't notice any improvements in their penetration rates, you know, which were claimed, and the reduced mud volumes, they hadn't really seen that either.

Q. And these were the three operators you just --

A. Yes.

Q. -- mentioned a moment ago?

A. Right.

Q. And were those operators in the northeast or the -- northwest or the southeast?

A. Both the southeast and the northwest.

Q. There was how many in the northwest and how many in the southeast?

A. Two in the northwest and one in the southeast.

Q. So that -- you didn't do a statistical study, your information is based on the conversations with the three operators?

A. That's correct.

Q. Do you know of instances where any of these benefits have been realized?

A. Personally, no, I couldn't cite anything.

Q. So other than the information you've got from those three operators, you don't really have any information about the benefits realized by closed-loop in New Mexico?

A. No.

Q. Okay, on the last paragraph you say that the draft rule will potentially add as much as 8 to 10 percent of the current cost of drilling a well.

I didn't see anywhere in your report, and maybe you could point me to it -- Did you list what you're estimating the costs of drilling wells?

A. I basically used the $1.5 million number for a

7500-foot well, and I believe it was around $750,000 for a 400 -- or 4000-foot.

Q. Okay. On the next page, page 3, just below the middle of the page you talk about your reasons for assuming that the load would be 14 cubic yards, and I believe you testified about that. But you're aware that many -- most of the contractors offer 20-cubic-yard loads, right?

Q. They offer dumps capable of handling 20 yards. Actually, the majority of dumptrucks in the southeast are 12-yard dumptrucks, and there are a lot of 6-yard dumptrucks.

The northwest they also use 12-yard dumps, but I used the 20 because you could get more into a 20-yard dump than you can, obviously, into a 12-yard dump. So you know, that gave the advantage to -- actually fewer trips, you know, by doing that.

But again, like I said, there's weight restrictions that you run into. And just the loading techniques with the front-end loader, the bucket volumes and all, make it highly unlikely that they'll have anything close to 20 yards in that truck when it leaves its location.

Q. Did you talk to any of the haulers to ask them how many cubic yards they generally did haul?

A. Yes, I did.

Q. And what was the range that they gave you?

A. The range was anywhere from 12 to 18.

Q. Okay, and that was haulers in both the northwest and the southeast?

A. Primarily in the southeast.

Q. Did you talk to any haulers in the northwest?

A. No, I didn't.

Q. Okay, about the northwest, I think Mr. Baizel -- you had a little dialogue with him about the current method of in-place burial, and so you're assuming -- looking at your chart on page 5 for the northwest, you have no costs listed for deep burial. Could you just explain that?

A. That's using -- you know, in the current method, because they're not deep-burying -- and keep in mind, I'm looking from a small producer's point of view. I'm not saying that everybody in the northwest, you know, employs that drying-out technique, but a lot of the independent operators do use that technique currently.

Q. Are you recommending that technique by using it as the comparison for your cost estimates --

A. No, I'm not recommending it, it's just cost comparison.

Q. And as I understood your dialogue with Mr. Baizel, you assumed no costs of liquids hauling, but there may -- but a lot of people do haul liquids in the

northwest?

A. A number of companies do haul them, yes.

Q. Okay. Yeah, I had a few questions about your table 5 on page 8, about the hole volume ratio. Did you say that this chart is based on real data from real wells?

A. Yes, it is.

Q. And where are those wells located?

A. They're all located in the southeast.

Q. The southeast, okay.

And on the last column, looking at the ratios, I see there's a huge variation of hole volume to material hauled. It seems to vary between 6.9-to-1, up to 22.1-to-1. Do you have an explanation for that variation?

A. My guess -- and it would just be a guess on my part, it would probably be the amount of dirt they picked up with the pit. You know, like I said, when you're cleaning them up, you know, you're relying on a dozer operator. He's out there, he's going to scrape off -- you know, he's got to get below the liner to pick it up, and he's going to pick up a certain amount of dirt there.

And then you're also going to pick up additional dirts -- dirt, just to ensure that when you come back in to do a composite, that there isn't any leakage from beneath that pit. So most -- I think if you were going to be a prudent operator, you just do that to make sure you don't

have to come back and do more extensive cleanup because you missed something.

So you know, that's probably where those discrep-- different numbers -- number differences come from.

But that's one of the things with these wells, and that's why I have a lot of trouble with just taking two wells as a comparison, because it's not always an accurate representation of what happens, either through the drilling costs, the penetration rates or anything else, because they're -- each well is almost an individual.

And you look in those wells, in the first five wells -- actually the third well and the fourth well are within a quarter of a mile of each other, and you've got that much difference. So you know, I felt like with this at least I had 15 points.

And my recommendation, if I was going to do a very detailed, scientific study that I could, you know, get vetted through a journal or something, I'd use certainly a big enough population to where I could get numbers.

These were the numbers I had to work with. I didn't have any other numbers. I knew these numbers were there because I worked on those wells, so...

Q. Do you have any information as to whether any material might have been added to dilute the wastes and get to those ratios?

A. These wells, no, there wasn't any -- The only dilution would have been whatever you picked up --

Q. How do you know that?

A. Because I was on the jobs here --

Q. You were on all of those jobs?

A. Yes, I was involved in each one of those closures.

Q. So you might have gotten a ratio of 22 by just scraping around the edges and underneath the pit?

A. Uh-huh.

Q. That seems like an awfully high ratio for that.

A. It depends on how much you haul off. Six inches makes a very big difference in the amount of material, yardage you're going to have. So if you take a foot you're going to pick up -- from my calculations, pick up an additional six inches. And if you just -- Like I said, you're looking at a 'dozer operator out there, and he's not going out there and saying, I'm going to take six inches off. He's going to go out there and just start picking up dirt. And that's -- you know, that's just a fact of life --

Q. Okay.

A. -- that's the way it works.

Q. Now on your southeast pit -- I guess this could be -- looking at the top of page 9, I see that you have

costs for constructing the pit --

A. Uh-huh.

Q. -- but -- and the use of a 'dozer there. I don't see anything for a front-end loader where you would be moving the wastes into burial. Would you --

A. Well, that would be in the -- you know, where you're looking at the deep-trench burial, and they'd probably use a dozer part of the time.

This is just going out there and digging the pit, so they're going to come on the ground, they're going to use a 'dozer, they're going to dig out X number of volumes of dirt, they're required to take the topsoil, at least in the new pit reg, to -- proposed pit reg, to stockpile that for use for use. You're not disposing, you're just stockpiling it. And he'll just push it over with a 'dozer. You know, it wouldn't have a front-end loader in that operation at all.

Q. So for the deep burial, when you put in the 'dozer cost, are you saying that you calculated the time needed for the 'dozer both to construct the trench and to then move the wastes into the trench?

A. Yes.

Q. Okay.

A. You'd do that, rather than using a front-end loader.

Q. Okay, so -- but the 30 hours for there seem to be the same as the 30 hours for just building the pit, so I didn't see any time allocated --

A. I'm sorry?

Q. The 30 hours you estimated for the 'dozer use for the pit is the same as the 30 hours you estimate for the trench construction?

A. That's probably going to be fairly close, you know, because you move -- what you're doing with a pit, you dig the pit, and you're going to dig it deeper, it's going to be -- at least in the southeast, in the deep burials I've been on, it may be as much as 20 feet, as opposed to your reserve pit will be like 10 feet. So you're going to actually go down deeper in that pit, which is going to take you additional time. Even though it's a small construction, it's deeper.

Q. Okay. You talked earlier about using closed-loop systems in the northwest and how many tanks there might be there. Are you aware that most of the northwest was previously exempt from the requirement for pit liners?

A. Yes.

Q. So you're aware that most of the area either has groundwater at depths greater than 100 feet, or not much groundwater at all?

A. Yes.

Q. So you're aware that under this rule they wouldn't require closed-loop systems in most of the northwest?

A. That's not necessarily true. If -- Well, you leave it as an option, you know, for your operator. Again, if you're within 100 miles you're going to haul that material off --

Q. No, I'm talking about closed-loop systems.

A. Yeah, but you're -- but a closed-loop system may be a way of concentrating that dirt to make it easier to haul off.

The other issue you have is, if you go out there and do a TCLP, you know, the 3103 analysis on that material, and it exceeds the limits in the reg, you can't use the closed-loop even -- you know, whether there's water there or not. The reg says no, that's not an option.

Q. Yeah, my --

A. So there are places where you wouldn't, there are places where you would.

Q. My point is simply that the new rule won't require closed-loop systems in the large majority of the northwest.

A. As long as you're, you know, greater than 50 feet to groundwater.

Q. I think in your testimony earlier you said that

you thought an example of a time when it would be a good idea to use closed-loop systems, when you're drilling in very close proximity to groundwater. I'm wondering, can you explain what you mean, in very close proximity to groundwater?

A. Actually, you know, if your -- the bottom of your pit would be within 30 feet of the groundwater, it probably would be -- you know, it probably would not be a bad idea to use a closed-loop system.

And again, it would depend a lot on the fluid you're using, what your -- you know, the level of contaminants in the fluid might be.

Q. And your reason for that is to prevent contamination of groundwater, or what is the reason you think it's a good idea --

A. I just think, you know, you'd have a little higher probability of getting into it, yes.

Q. Getting into -- ?

A. The groundwater, yeah. If you're within a short distance of the bottom of the pit. You know, 50 -- I don't really know where that number came from. I could live with 30, but obviously other people feel that 50 is a better number, and I think the task force said 50 was okay.

Q. You talked about how you calculated -- I got a little lost in this calculation, trying to figure out the

weight of how much stuff you could put in the trucks before you got to your limit, and you were talking about your gallon jugs and you were putting stuff in that. And you were, I assume, trying to mimic what would be the solid waste from the southeast portion of the state or the northwest?

A. Both. What I -- The reason I went through that is, I got numbers from operators that gave me, you know, the 14-yard number. So I wanted to convince myself that 14 yards was a reasonable number before I used that number, and that's why I did my little experiment. I just -- I needed to convince myself before I put it in the report that that was a good number and, you know, that it was a number I could use.

Q. You said earlier that the range they gave you was 12 to 18 cubic yards. Do you remember -- and I guess you talked to one hauler in the northwest and two in the southeast. Do you remember which numbers went with which part of the state?

A. The lower numbers were in the northwest, the higher numbers were in the southeast.

Q. Because I thought I heard you say somewhere in your testimony that you weren't really aware of the nature of what would be in this solid waste up in the northwestern part of the state, that you didn't have experience with

that?

A. That's right, yeah.

MS. BELIN: I have no further questions.

CHAIRMAN FESMIRE: Thank you, Ms. Belin.

Mr. Brooks?

MR. BROOKS: Yes.

CHAIRMAN FESMIRE: And this time I really mean it.

CROSS-EXAMINATION

BY MR. BROOKS:

Q. Good afternoon, Mr. Small.

A. Good afternoon.

Q. Mr. Small, I notice that -- Be sure I've got the right papers here. I have to move -- these rotating seats, I have to keep moving my papers around.

I note that in your paper on page 15 you have a list of references.

A. Yes, sir.

Q. And one of those references -- in fact, the first one you list there -- is Rogers, Smith, Fout and Marchbanks -- Well, no, I want to ask you about the second one, Rogers, Fout and Piper, New innovative processes allowing drilling with closed-loop systems in New Mexico. Was that one of the resources that you used in preparing these estimates?

A. Yes, it was.

Q. I start this out, although it may not be -- I don't think it's going to be my first line of questioning, but I want to -- I would like for you to have access to that paper because --

A. Let me get a copy here.

Q. -- I'll be asking you some questions. Do you have a copy of it?

A. Yes, I do.

Q. Okay, then I won't need to bring you one.

MS. FOSTER: Mr. Brooks, is that an exhibit?

MR. BROOKS: Well, I plan to offer it as an exhibit after Mr. Small's testimony. I have no objection to marking it. But it was not an exhibit that was propounded by the Division, it is something that is being offered because Mr. Small relied on it.

CHAIRMAN FESMIRE: Do you have a copy for counsel?

MR. BROOKS: I have a stack of copies here. We can mark it if you want to mark it -- For purposes of identification we will mark this as, I believe, Exhibit -- it's Exhibit -- We want to mark it for purposes of identification, we can mark it as Exhibit 34.

CHAIRMAN FESMIRE: Mr. Brooks, do you intend to lay the foundation with this witness?

MR. BROOKS: Mr. Fesmire, I believe I already have, but I will ask one more question to do that.

Q. (By Mr. Brooks) Mr. Small, this is a published article, is it not?

A. This article I retrieved from the Internet. It was a paper presented at a conference, a 2006 conference, and I think the report gives you the web address for it.

Q. And this was one of the references which you --

MR. BAIZEL: Mr. Chairman, I think this is one of the exhibits that we have already submitted and was admitted. Our Exhibit 11, I have it marked as.

CHAIRMAN FESMIRE: Okay, let's ask Mr. Small if this is the same paper that he relied on, and if it is let's compare it to your exhibit.

THE WITNESS: I'm going to have to go through and read the whole thing?

CHAIRMAN FESMIRE: It depends on how much you need to authenticate it.

THE WITNESS: I'd say it's pretty much the same paper, yes.

CHAIRMAN FESMIRE: Okay, is it the same paper that's already been admitted into evidence as -- what exhibit is --

MR. BAIZEL: Well, in my copy of our filing I have it marked as Exhibit 11, OGAP Exhibit 11.

CHAIRMAN FESMIRE: Is that the same as OGAP Exhibit 11?

THE WITNESS: Let me take a quick look through here, make sure.

Yes.

CHAIRMAN FESMIRE: Okay. Mr. Brooks, it appears that this exhibit has already been offered and accepted by OGAP as OGAP Exhibit 11, but we will use your copy as -- for demonstrative purposes today.

MR. BROOKS: Okay. Now some of the OGAP exhibits were admitted, I believe that probably was, but could you ask the reporter -- Just so the record will be clear, could you ask the reporter to check and see if OGAP Exhibit Number 11 has been admitted?

(Laughter)

CHAIRMAN FESMIRE: You've got to be kidding.

MS. FOSTER: If I recall correctly, this was admitted over my objection.

CHAIRMAN FESMIRE: Okay.

(Laughter)

MR. BROOKS: Well, I may be mistaken as to the way the reporter operates. When I was in district court, the court reporter kept a tally of the exhibits that were admitted on a separate sheet from his notes, so it was always possible for him to advise the court whether or not

an exhibit had been admitted.

CHAIRMAN FESMIRE: I don't think after 15 days of hearing that that would be probable, so we'll just -- We'll take Ms. Foster's word for it and we'll assume that it has been admitted, and you can go ahead and question from it.

MR. BROOKS: Thank you, Mr. Chairman.

Q. (By Mr. Brooks) I'm going to come back to it, but I'm going to ask you one summary question first. If you will go to the last page of the text of the Rogers article, before he starts his figures and pictures, at the bottom of the last page of the text, Mr. Rogers makes the following -- Rogers, et al., make the following statement:

> The results of this analysis indicate that eliminating the pit in New Mexico is cost-effective and does not add significant cost to overall operation. When solids cannot be buried on site and must be hauled to commercial disposal, eliminating the pit actually saves money.

I take it you did not place any reliance on Mr. Rogers', et al.'s, conclusion in that respect?

A. My numbers didn't indicate that.

Q. And so you disagree with Mr. Rogers?

A. Disagree, yes.

CHAIRMAN FESMIRE: Let me state for the record that the witness actually is on record as disagreeing with Mr. Rogers.

MR. CARR: Oh, dear.

(Laughter)

CHAIRMAN FESMIRE: I couldn't pass that one up. Go ahead.

(Laughter)

MR. CARR: Mr. Chairman, what sort of a day are we having in our neighborhood?

(Laughter)

CHAIRMAN FESMIRE: Mr. Carr, if you'd eaten some of the cake, you'd be sugar-high too.

(Laughter)

Q. (By Mr. Brooks) Okay. Mr. Small, when you first started your testimony you were talking about what a closed-loop system is, and I'm afraid I'm not that good at note-taking. I'm not sure exactly what the expression you used was, but if I recall rightly you said it was a system for solids collection and removal; is that --

A. Solids control.

Q. Solids control.

A. Solids control.

Q. Now correct me if I'm wrong, this is based on my reading of the Rogers article. The Rogers article seems to

suggest that its primary function is to increase the amount of -- the primary function of the solids removal and control equipment in a closed-loop system is to increase the amount of solid material that is removed from the drilling fluid. Is that a correct statement?

A. Yes.

Q. If you increase -- Well, does that have the incidental effect of, when the process is over at the end of the day, you have better separation of solids and liquids than you would if you used a circulating pit without this equipment; is that correct? Because --

A. If you were given enough time in the pit to dry it out, not necessarily, the -- you know, to get the solid, you're going to end up with the same amount of solid material, if you're pulling the water off.

Q. Well, you have the same amount of total solid material, but doesn't it remain -- isn't there more liquid embedded in the solid?

A. Like I said, if you're given enough time to evaporate the material in a lined pit, I wouldn't necessarily agree that that would be the case. If it were, why would you have a drying pad? It's obviously not dried out completely, because you have to take it to a drying pad. So it still has liquids in it.

Now I think it you put your reserve pit, you

know, particularly in a horseshoe pit, where you have the ability for the liquids to drain off of the solids that are sitting in the pit, you could conceivably achieve the same amount of dehydration in the solid, yes. I think that could be accomplished, yes.

Q. You said given enough time. Do you have estimate for the length of time?

A. Well, do you want to do it in winter? Do you want to do it in the summer? I mean, you know, obviously the hotter, drier conditions are, the more evaporation you're going to get. You know, nine months, six months, nine months may be reasonable in a summertime environment.

Q. Now in Mr. Rogers' article -- well, let me go back to -- Let's go back and look at what your conclusions are for a minute.

To arrive at the volume of solids you estimated hole volume, and you used an average -- you estimated hole volume --

A. Are you on --

Q. -- for certain wells that had actually been drilled. I'm looking at table 5.

A. Okay.

Q. You estimated the hole volume for the actual -- or calculated the hole volume for the actual number -- for the actual wells that had been drilled, correct?

A. Right.

Q. And you then estimated -- or estimated the amount of waste that was removed -- the amount of solid waste that was removed from that location; is that the way you --

A. That was an estimation, that was an amount of ticketed material hauled off to disposal.

Q. And based -- and in column K you calculated the ratio of the amount of solid material hauled off to the amount of -- to the hole volume, correct?

A. Yes, sir.

Q. Now, there's a lot of something in that material other than cuttings, because you came out with 10 to 16 times the amount of hole volume, right?

A. Correct.

Q. And is that not primarily fluid material that remains in the cuttings?

A. No, sir, it's not. These particular cuttings are very, very dry. As I explained earlier, you know, first you'll -- you know, the wellbore volume I calculate is based on the bit diameter, it's just a pure cylinder.

Q. Yes.

A. As you drill a well, you're going to get a certain amount of sloughing of the material from the walls of the well --

Q. Yes.

A. -- in the hole, and that's going to contribute to that number.

And then as I explained, when you take up the pit liner you're going to pick up an additional amount of material. And I just, you know, used six inches as a for-instance, but you're going to pick up an additional amount of hopefully noncontaminated material from beneath that liner, and that accounts for a large percentage of that difference.

Q. But you used a -- when you were calculating your volume from your 14 yards, you used a certain amount of fluid in the material, moisture content in the material --

A. Yes.

Q. -- which you determined empirically, correct?

A. Yes.

Q. So you're not saying there's not liquids in the solids?

A. No.

Q. Okay. If you look at Mr. Rogers' article, are you aware that the Rogers article says that a closed-loop system should be able to achieve an efficiency such that your solids volume would be four to five -- would be in the range of four to five times hole volume, rather than 10 to 15 times hole volume?

A. Yeah.

Q. And do you disagree with that -- Mr. Rogers on that also?

A. Not necessarily, no. Because again, like I said, when you pick up the pit you're going to pick up a certain amount of solid material from beneath that pit, that's going to contribute. It's probably going to be close to half of these numbers.

Q. Rogers says that a 20-to-1 volume -- You started out with a 20-to-1 volume -- estimating a 20-to-1 total waste to hole volume, correct?

A. To get the combination of liquids --

Q. Combination of liquids --

A. -- and solids, yes.

Q. -- and solids. And then you computed the solids based on your study in table 5?

A. Well, we actually computed the solids first --

Q. And you --

A. -- and then multiplied it times 20, and then used that as my total volume of material.

So my solids -- you know, if you take the solids, you know, number that -- you know, using the 16 ratio or the 10 ratio on the five, that will give you a solids volume. And then if you multiply that times the 20 ratio, which I got from that paper, that gives you a total volume figure. The difference is going to be the water volume.

Q. Well, that was what I was getting to.

A. Okay, yeah.

Q. You calculated the total volume of waste using the 20-to-1 -- assumed 20-to-1 ratio, and multiplying the diameter of your type hole -- or rather, multiplying the area of your type hole times 20, right?

A. Right.

Q. And then you calculated the solid-waste volume ratios using -- from the wells that you -- from your data in table 5, correct?

A. Using an average, yes, sir.

Q. And then you selected your -- you subtracted your solids figure, based on your computations in table 5, from your estimated total waste volume, based on 20 times the area of your type hole to --

A. Or the volume of the type hole.

Q. -- to figure your liquid waste by?

A. Yes, sir.

Q. Yeah. Okay. But you did not -- now let's see, 20 to 1 -- the Rogers article says that 20 to 1 is a reasonable ratio for a horseshoe-pit-type configuration, correct?

A. (Nods)

Q. But then it goes on to say, but you achieve much higher efficiencies with the closed-loop system. But you

did not allow any factor -- you did not allow anything for the improved efficiency that you would achieve -- solids removal that you would achieve from a closed-loop system?

A. Because I don't think there is.

Q. Even though -- Again, you disagree with Rogers?

A. I disagree with Rogers, yes, sir.

Q. Okay. And none of the -- none of the type holes -- none of the reference holes that you used to compute your waste volumes in table 5 utilized a closed-loop system; is that correct?

A. That's correct.

Q. Okay. And because you don't believe there's any increased efficiency with a closed-loop system, you came out with the same removal costs, dig-and-haul costs, for a closed-loop system model as you did for your --

A. Right.

Q. -- reserve pit model?

Okay. Now let me get to how you figured these. First of all, when you say commercial disposal facility cost on the tables on pages 4 and 5, that is the cost --

A. Excuse me, which table?

Q. Of your -- your paper, pages 4 and 5 of your paper --

A. 4 and 5 --

Q. -- tables 2 through 4 --

A. Okay --

Q. -- tables 1 through 4.

A. -- okay, yeah, I'm with you.

Q. When you say commercial waste disposal facility, the figure you have in that includes both hauling and the waste facility charge --

A. Yes.

Q. -- correct?

Okay. So if we want to know where we -- what your hauling charge -- what -- how you computed those figures, then we have to go over to your table entitled, Draft offsite disposal calculations on pages 14 and 15; is that correct? That's where you got the figures from?

A. Yes.

Q. Okay. Now I was a bit confused when I went over this by the fact that for the liquids hauling you used $212 per load for the vacuum truck, and you used $905 per load on the vacuum truck -- for the vacuum truck cost in the northwest. I believe you explained in your testimony, or direct testimony, that you used a shorter distance in your southeast computations; is that not correct?

A. That plus the cost for the equipment. The trucking costs were a little better than double for a vac truck in the northwest of what they charge in the southeast.

Q. But they weren't anywhere near five times as much --

A. No --

Q. -- which is about what you've --

A. And then --

Q. -- got here?

A. -- you've got the mileage factor in there too --

Q. Okay.

A. -- yes, sir.

Q. Now you said in the southeast you were familiar with where some of the disposal areas were --

A. Right.

Q. -- and you took that into consideration --

A. Yes.

Q. -- in determining...

Now in the northwest, though, if I understand you correctly, you simply took the 100-mile figure --

A. That's correct.

Q. -- which is the same figure used for the solids?

A. That's correct.

Q. And you did not make any study or analysis of where disposal facilities --

A. No, sir.

Q. -- were located in the northwest?

Okay, let's talk a minute about this 100 miles.

Bear with me a second here.

Well, I think I'll pass on to something else. Sorry.

Now, if the Rogers article were right -- assume for me that the Rogers article is right and that -- well, first -- let's see. The solids cost more per volume -- more per unit of volume to haul than the liquids; is that correct?

A. Correct.

Q. So if the Rogers article were right and the closed-loop system resulted in efficiencies which greatly reduced the volume of liquids in the waste, then that would bring your number for commercial facility disposal for a closed-loop system down to something less than the figure that you used for -- that you used, correct?

A. Uh-huh.

Q. And it would be less than the figure used -- than the figure for the -- for the pit?

A. I'm sorry, could you rephrase that?

Q. If the closed-loop system resulted in less solids in proportion to liquids, with the same total waste volume, as compared to the pit, as Rogers predicts that it will, that would reduce the hauling costs for the closed-loop system, would it not?

A. That's probably true.

Q. As compared --

A. You know, looking at the water in the northwest, you know, that's the only -- I'd have to look at -- because you've got that increased trucking cost on your water, you know, I'd have to run that number. But you know, I'll accept what you're saying for now, yeah --

Q. And --

A. -- without having run --

Q. -- that increased trucking cost in the northwest for the fluids is based on your -- is based in large part on your assuming a longer distance, which is not based on any analysis of what's actually --

A. That's correct --

Q. -- available in the northwest?

A. -- that's correct.

Q. Now, this 100 miles is based entirely on the 100 miles in the rule, right?

A. Yes.

Q. Did you make any effort to determine what the distance to a Division-approved facility from any kind of average well might be, in either the northwest or the southeast?

A. I would challenge anybody to give me an average well. You've got a range -- you know, you'd have to look at each well and do a statistical analysis to see the

distances of each one of those wells and then take some kind of an average. I don't have that kind of information, no, I --

Q. And my question was --

A. -- I didn't --

Q. -- did you make --

A. No --

Q. -- any effort --

A. -- no, I --

Q. -- to do that?

A. -- did not.

Q. Okay. If you -- And I'm sorry to take so long to find these exhibits, but I don't have them all organized.

If you go back to -- Well, I'm probably not going to be able to find that, so I won't attempt to -- I won't attempt to find it because --

A. You're not doing any better than I am, are you?

Q. Did you look at the exhibit that was introduced in connection with Mr. von Gonten's testimony, which traced the 100-mile circles around various disposal facilities?

A. No, sir.

Q. Well, while I'm asking you something else, can one of you all find it for me? I'll need to show it to the witness if he hasn't looked at it.

We'll get back to that, okay.

Now, looking at your table -- at your table labeled Cost of Current Methods Employed to Handle Drill Pit Contents on page 9, you assumed a pit of -- for your 7500-foot well, of 100 by 30 by 10, 100-by-30 area and 10 feet deep?

A. Let's see, on page 10 or page 9? I'm sorry.

Q. Page -- your -- well, the figures are on page 9, and your computations of construction costs -- pit construction costs are -- your figures are --

A. Oh, okay.

Q. -- on page 10, is where you have your pit area --

A. Yeah, okay. Okay, I'm with you now.

Q. On page 9 you have your pit construction costs.

A. Okay, so you're looking at --

Q. -- 7500-foot well.

A. -- northwest, southeast?

Q. For the northwest.

A. Okay, for the northwest.

Q. What size pit did you assume?

A. Okay, yeah, 10 by 30 by 10, right.

Q. Okay, and did you calcu- -- and you assumed that area of pit in computing your pit construction costs?

A. Yes.

Q. Did you calculate the area of that pit, of the 10-by-30-by-100 pit?

A. I think I did, but I'd have to look back through all my calculations.

Q. Okay --

A. It was, you know, a pretty down and dirty calculation, using a slope of 2 to 1, and the --

Q. So you did factor in the slope?

A. Yeah. Yes, sir, I did.

Q. Okay. Would you -- We can provide you a calculator, I think, if you need it, but one of our people calculated that pit volume is 5343 barrels. Would you agree or disagree with that calculation?

A. I'd have to see the calculation.

Q. That was calculated without allowing for the slope, 5343 barrels.

A. Okay.

Q. But is that 10 by 30 by 10, is that the surface -- the area of the pit on the surface?

A. Using the -- Yeah, that's the area at the surface. And then if you take the draft rule, you're going to come in, you know, on a 10-foot-deep pit, you're going to come in 20 feet in each direction, so it's going to be real narrow on the bottom.

Q. Well, if it's 10 by -- if it's 100 by 30 on the surface -- that's what you're telling us, isn't it --

A. Uh-huh.

Q. -- 100 by 30? So if you multiply 100 by 30 by 10, then you're going to get a larger area than the actual area of the pit, are you not?

A. Yes.

Q. Okay. So once again I ask, would you like us to furnish you a calculator so you can calculate the area of the pit, or are you willing to accept --

A. I'll accept --

Q. -- our figure of 5343 --

A. Well, let me -- let me run it real quick.

And you're talking just using straight walls, right?

MS. FOSTER: Mr. Brooks, so we can do these calculations ourselves, could you repeat the question, please?

MR. BROOKS: My question -- my last question, I believe, was, would he accept our calculation of 5343 barrels, or did he want to do it -- to work it himself? And I believe he said he wanted to work it himself.

MS. FOSTER: Okay, but what are we calculating here? I didn't know this was going to be a math experiment.

MR. BROOKS: The volume of a 7500 -- of the 7500 -- of the pit he assumed for the 7500-foot type well in the northwest. And our calculation of 5343 barrels was based

on just multiplying by the cubic dimensions, which he's already said would make it larger than the actual volume.

MS. FOSTER: And does that include freeboard, or is that usable volume? What exactly --

MR. BROOKS: Does not, it's just -- it's just 100 times 30 times 10, converted to barrels.

MS. FOSTER: Okay.

THE WITNESS: Do you have the conversion factor off the top of your head?

MR. JONES: For which one?

THE WITNESS: To get from feet to barrels, cubic feet to barrels?

MR. JONES: Oh, I have it from --

MR. BROOKS: I believe you have it in your materials, Mr. Small.

THE WITNESS: Okay, I probably do, but you can find it quicker. I think I'm -- five-point -- ?

CHAIRMAN FESMIRE: 615.

THE WITNESS: 5344.

MR. JONES: Says 5344.

Q. (By Mr. Brooks) 5344 barrels. Well, Mr. Small, if you go to page 6 of your table, you computed the total waste volume for your 7500-foot type well to be 10,749 barrels, right?

A. That's correct.

Q. Okay. How are you going to get 10,749 barrels in a pit that holds less than 5344 barrels?

A. Probably figure I'm going to be hauling out of it.

Q. Well, if you have to have a larger -- Well, first of all, you assume 5386 barrels of that is solid waste, right?

A. (Nods)

Q. So the solid waste itself is going to fill the pit? There's not going to be any room for the liquids?

A. That looks like it may be the case.

Q. Now Mr. Small, if you had to dig a bigger pit, your cost of pit digging would be greater, would it not?

A. Yes, it would.

Q. Which would make the comparison to the closed-loop system less favorable to the pit, right?

A. Yes.

Q. And similarly, if there was less waste than you calculated, which might be the case because you took the pit volume from what the people told you they were actually using, right?

A. Right.

Q. If there's less waste, there again that's going to reduce your costs under the present system, right?

A. Uh-huh.

Q. It's also going to reduce your dig-and-haul costs?

A. Right.

Q. Okay. Now just for comparison, for your 4000-foot well you assumed a 75-by-25-by-8-foot pit --

A. Correct.

Q. -- based on page 10?

A. Right.

Q. Would you believe that that holds 4924 barrels? I'm sorry, 2672 barrels?

A. I'll accept it.

Q. Okay. And then going back to page 6, what waste -- what amount of waste did you calculate in the northwest for your 4000-foot -- well, you calculated the waste -- your waste calculation was the same for both areas.

What volume of waste did you calculate?

A. Total, solid, liquid?

Q. Solid, let's do solid.

A. Solid was 4924.

Q. And you're not going to get 4924 barrels in a pit that only holds 2000-and-something barrels, are you?

A. No.

Q. Okay, very good.

Now, Mr. von Gonten and Mr. Hansen were good

enough to pull this exhibit for me on the 100-mile radius.

May I approach the witness?

CHAIRMAN FESMIRE: You may, sir.

Q. (By Mr. Brooks) Now you have some familiarity in general terms with where the intensive areas of oil and gas development are in --

A. Yes.

Q. -- northwest and southeast New Mexico?

I apologize, that exhibit is real hard to see. I don't know if Mr. von Gonten can get it up on the board again or not.

A. Well, I think I have a -- I think I have a copy of it.

Q. Well, it's real hard to see on that black-and-white copy.

A. Okay.

Q. But you understand -- do you understand the way it's constructed?

A. Yes.

Q. In other words, there are circles drawn around each disposal -- each facility which was assumed to be a -- that it would be available as a Division-approved --

A. Right.

Q. -- facility, right?

A. Right.

Q. And the area that's within any one of -- any one or more of those circles is within the 100-mile radius. In other words, it's less than 100 miles from a facility, right?

A. Right.

Q. Just eyeballing it --

A. Pardon me?

Q. Just eyeballing it, would you have an opinion as to whether or not most of the wells in New Mexico are within the 100-mile radius of one or more of those facilities?

A. Probably, yes.

Q. And would you have an opinion as to whether or not a very -- a large percentage of the wells are far enough from the circles on that map that you could say that they're probably quite a lot less than 100 miles from --

A. No, I wouldn't have a feel for that, because again, like I said, it depends on the amount of lease roads you're driving. You know, if you get -- this is a -- you can zig-zag your way through this, you know, and add quite a few miles, and still be within that 100-mile radius very easily.

You know, to say as the crow flies, yeah, as the crow flies. But you're not going to be able to drive directly there.

Q. But you will concede that many of the wells are well within the 100-mile radius?

A. Probably, yes.

MR. BROOKS: Thank you. May I retrieve the exhibit?

CHAIRMAN FESMIRE: You may, sir.

MR. BROOKS: Thank you.

Q. (By Mr. Brooks) Now let me go to another aspect of what Mr. Rogers said and see if you agree with -- and see if you disagree with Mr. Rogers again.

Mr. Rogers suggests that -- he discusses, I believe, a concept called dump water. Do you understand -- do you understand what he meant -- dumped water, do you understand what he means by dumped water?

A. You might refresh my memory --

Q. Well, as I --

A. -- there's a --

Q. -- understand it --

A. -- back up --

Q. -- you may -- you -- Okay. Well, I will call your attention, then, to the second page of the text, and under the title line that says, Eliminating the pit, the second paragraph, third sentence, Mr. Rogers says, With a highly efficient solids control system, very little fluid would need to be dumped and discarded. The discard stream

from the solids-control system should be relatively dry too.

Now you've already -- you've already said you disagree with the discards from -- would be relatively dry.

But what I understand to be Mr. Rogers' point here is that as the water goes through the circulating system, if you have a low solids-control efficiency, then you're going to lose water every time it goes around, because it's going to be -- there's -- it's going to have so much solids embedded in it that it's going to be taken out of the system in terms of moisture and -- that's embedded in the solids.

Do you understand that --

A. Yes.

Q. -- concept?

A. Yes.

Q. And if you had that -- if -- assume for me that you did have the dumped water phenomenon. Would you have to add more water to the system to keep your mud circulating?

A. Yes.

Q. So if that -- if the dumped water system is a valid scenario, then you're going to be using more total fluids with the pit system than with the proposed loop system, other things equal?

A. Other things equal, yes.

Q. And more liquids, more fluids used in the circulating system, if you assume as you do, that you can't recycle it, it's going to result in more disposal costs, correct?

A. Right.

Q. So once again, if Mr. Rogers is right about the dumped water concept, then your model is overstating the cost of closed-loop systems versus pit, right?

A. I still don't believe my numbers are overstating.

Q. But based on my assumption it would be?

A. Based on that assumption.

Q. Okay. Once again, on the last page of the discussion in Mr. Rogers' article he says, This represents a ratio -- he says the volume of cuttings -- Well, okay, let's see. He says this represents a ratio of 4.6 times the gauge hole, and he's talking about --

MS. FOSTER: I'm sorry, Mr. Brooks, what page are we on?

MR. BROOKS: The last page on -- I have problems because my pages are not numbered -- the last page of the text.

MS. FOSTER: Thank you.

MR. BROOKS: The paragraph above the title, Effect on drilling costs.

MS. FOSTER: Thank you.

Q. (By Mr. Brooks) And he says, This represents 4.6 times the gauge hole volume.

Now, without going into everything that he's said before, he's talking about -- Do you agree that he is giving an opinion as to what the volume of solids would be using a closed-loop system?

A. Yes.

Q. Okay. And then he says, This is dramatically lower than the 21.6 ratio to hole volume for cuttings and fluid left in the pit for disposal under the previous operating mode.

Now I realize you don't agree with his statement that the 4.6 can be achieved, but would you agree that it's dramatically -- that the 4.6 is dramatically lower than what you can reasonably expect using a pit?

A. Well, I'll go back -- You know, when you're looking at the 4.6 --

Q. Yeah.

A. -- I can live with that number. I'm not totally opposed to the number.

You still get into the situation, when you're picking up a pit, you're going to pick up that additional soil beneath the pit. When you're picking up a drying pad on a closed-loop system, you're going to be picking up clay

and six inches beneath the pit.

So that 4.6, while that's true, it's in the tank, and true what's on the drying pad, it's not representative of what you can actually dispose of.

That's the same way with the pits, that -- I think I mentioned before, when I calculated that area that you're going to use on a drying pad, you know, and it's just -- like I said, it was kind of an exercise, you know, to see what we had. When I did that calculation and I took from the material we disposed, you know, 1120, whatever it was, and you figure out how much of that was probably picked-up as material from beneath the pit, the 4.6, you know, is not that unreasonable for what's in the pit.

But it doesn't represent the total volume you're disposing of.

Q. So you're saying that that's -- it's additional material that's underneath the pit that's being removed, that results --

A. Well, a percentage of that, yes.

Q. -- in our number that you're using?

A. Yes, a percentage --

Q. Okay --

A. -- of that, yes.

Q. -- does the proposed rule require you to remove six inches or a foot underneath the pit?

A. No.

Q. Okay. Now let me ask you -- let's talk a minute about your calculation for the area of a drying pad. And you said you're calculating the drying pad area at 150 by 150, right?

A. Right.

Q. And if I understand how you did that, you took your estimate of solid waste volume, and you assumed that you were stacking it two feet high?

A. Yes.

Q. And then you calculated the amount of area it would take to stack that volume of waste?

A. Uh-huh.

Q. You took out for your six inches beneath the pad that you're going to remove, right? That's part of your waste volume?

A. Yes.

Q. And then you used the remaining volume to calculate --

A. Right.

Q. -- to calculate your area.

CHAIRMAN FESMIRE: Mr. Brooks, would this be a good place to break for the day?

MR. BROOKS: It would be, sir.

CHAIRMAN FESMIRE: Okay.

MR. BROOKS: It would be an acceptable place.

CHAIRMAN FESMIRE: Why don't we -- why don't we -- Is there anybody who would like to make a statement on the record?

Okay, seeing none, we will resume here tomorrow at nine o'clock in the morning.

Wednesday and Thursday we will not meet.

Friday we will start again at nine o'clock in the morning in this room.

And with that, we'll adjourn for the day. Thank you all.

(Thereupon, evening recess was taken at 5:13 p.m.)

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CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL January 15th, 2008.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2010