STATE OF NEW MEXICO
ENERGY, MINERAL AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

APPLICATION OF THE NEW MEXICO OIL AND GAS ASSOCIATION FOR AMENDMENT OF CERTAIN PROVISIONS OF TITLE 19, CHAPTER 15 OF THE NEW MEXICO ADMINISTRATIVE CODE CONCERNING PITS, CLOSED-LOOP SYSTEMS, BELOW GRADE TANKS AND SUMPS AND OTHER ALTERNATIVE METHODS RELATED TO THE FORE GOING MATTERS, STATE-WIDE.

CASE NO. 14784 AND 14785

VOLUME 2

May 15, 2012
9:00 a.m.
Wendell Chino Building
1220 South St. Francis Drive
Porter Hall, Room 102
Santa Fe, New Mexico

THE COMMISSION:

JAMI BAILEY, Chairperson

GREG BLOOM, Commissioner

DR. ROBERT BALCH, Commissioner

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EXHIBITS

PAGE ADMITTED

(Note: In session at 9:00.)

CHAIRWOMAN BAILEY: Good morning. This is the meeting of the Oil Conservation Commission on Tuesday, May 15, 2012 at Porter Hall in Santa Fe, New Mexico. I am Jami Bailey, chairman of the Commission. To my right is Commissioner Greg Bloom who represents the Commissioner of Public Lands. To my left is Commissioner Robert Balch who is the appointee of the Secretary of Energy, Minerals and Natural Resources Department. We are continuing testimony in Case No. 14784. Myke Lane has been sworn. You are still under oath. We were about to begin cross-examination for Mr. Lane from his testimony from yesterday.

MICHAEL LANE

after having been previously sworn under oath, was questioned and testified as follows:

MS. FOSTER: I have no questions for the witness.

MR. JANTZ: Thank you, Madam Chair.

CROSS-EXAMINATION

BY MR. JANTZ

Q. Good morning, Mr. Lane.

A. Good morning.

Q. I'm Eric Jantz with the New Mexico

Environmental Law Center. During your testimony yesterday, you talked a lot about stimulation fluids. Just so I'm straight, that's frac fluids. That's for frac jobs, right?

A. Predominantly, yes.

Q. So these multi-well management pits, if I understand it correctly, are predominantly for frac jobs, right?

A. That would be the intent, yes.

Q. Okay. You talked about -- if I could have Slide 7-2. You talked about the footprints of these. You talked about applying to the BLM for up to 40 wells; is that right?

A. Correct.

Q. So can you give me a sense of well spacing for an operation like this? Are these your typical 160 spacing, one per 160 acre or one per 40 acre spacing or is it closer? On the schematic they look a little closer than that.

A. On the surface they are about seven-and-a-half to ten feet apart. I do not know what the actual spacing is. That depends on the target zone that the well would be drilled for.

Q. Right. That's the well on each pad. How close are the pads to each other?

A. They could be as far apart as a couple miles.

Q. And they could be as close as?

A. You know, honestly, I don't know. The intent would be they wouldn't be very close together. But again, it depends on the plan of development, depends on the target zones and it depends on the geography.

Q. In your experience, what's been the closest they have spaced the well pads?

A. Again, it's so variable. They can be -- well, the intent here is to consolidate these wells onto a common pad.

Q. Sure. My question is in your experience, what's the closest the wells have been spaced?

A. Forgive me, but I'm not sure how that's relevant to the multi-well fluid management pits.

Q. Again, I think it's the Commission's determination about relevancy, but I wonder if you could just answer the question.

A. In my experience, wells have been on a common pad anywhere in a distance of, like I said, seven to ten feet apart or as far apart as about 50 feet. That's on a common pad, and pads are typically -- it's so variable. Pads can be anywhere

from a quarter mile apart to several miles apart.

Q. So in your experience, the closest they have been is a quarter mile apart? Is that your testimony?

A. No, I said it's variable.

Q. Sure. My question, again, was what's the closest in your experience the pads have been to each other?

MR. FELDEWERT: Madam Chair, I think he answered to the best of his ability. Are we talking about -- I guess at this point I would object on the grounds of relevancy. I mean, Mr. Lane's experience extends for a number of years in a number of different states.

CHAIRWOMAN BAILEY: You appear to be laying a foundation.

MR. JANTZ: Yes, Madam Chair, I am.

CHAIRWOMAN BAILEY: Then please answer the question to the best of your ability.

A. Okay. I have seen well pads across a common road. The distance between individual wells typically ranges, until we have gone to a closer spacing, somewhere around 50 feet apart.

Q. Thank you. So these fairly densely packed wells, the fluids from those go to this single

multi-well pit, right? Is that the way the -- the intent of the setup here?

MR. FELDEWERT: Object to the form of the question. I don't know what he means by fairly dense wells. What Mr. Lane described was a circumstance where the wells could be miles away.

MR. JANTZ: Let me rephrase it.

Q. The intent of this setup, the multi-well fluid setup, is to have the fluids from all these wells, whatever their spacing may be, go to the centralized area; is that right?

A. The intent is if that's where the source -- if that pad or if that multi-well fluid management pit is to service those wells, the intent is to gather the fluids from the other wells and recycle those produced waters.

Q. So from all these different wells, what kind of fluid volumes are we looking at typically?

A. As I said yesterday, it can range from less than a barrel a day to upwards of hundreds of barrels a day. That's on the current formations that we are producing.

Q. The current formations you are producing where?

A. In the San Juan Basin.

Q. In the San Juan Basin. So this is typical of the San Juan Basin?

A. That is where my experience is based.

Q. Sure. That's -- I don't want you to testify beyond your experience unless, I guess, I ask for it.

MR. FELDEWERT: Objection.

Q. So in the San Juan Basin, the fluid volume, you're saying, ranges from a barrel a day to 100 barrels a day? How much is 100 barrels a day in gallons? Can you give me a ballpark?

A. Well, about 42 times 100, so 4200.

Q. That's a typical frac job?

A. No. Oh, typical frac job?

Q. Yeah--

A. Excuse me. Let me let you ask the question.

Q. So my understanding is that the fluids that go into this are being reused for the fracking operations; is that right? The intent is to reuse these for a fracking operation, correct?

A. Correct.

Q. So is that fluid volume typical, 4200 gallons, typical of a frac job?

A. No.

Q. How much water does a typical frac job use?

A. Depends on the target formation. Depends on the design of the frac job itself.

Q. Could you give me a range?

A. I don't design frac jobs, but as I showed in the one picture, that footprint you had -- I can't remember how many were there, but upwards of 400 tanks, so 400 400-barrel tanks.

Q. So millions of gallons of water?

A. Yep.

Q. And are these pits, these multi-well fluid management pits intended to hold that much water?

A. Twenty acre feet, 30 acre feet, yeah.

Q. Twenty to 30 acre feet. Now that I have sort of a better idea of what kind of process is involved, I would like to take a look at the rule itself. Now, you said yesterday your testimony was that these multi-well fluid management pits were meant to be regulated like temporary pits, sort of like temporary pits. They were akin, analogous to temporary pits; is that right?

A. Correct.

Q. And you noted there were some differences between these multi-well management pits and

temporary pits? Could you refresh me about what those were?

A. Principally that, one, their size would be larger than ten acre feet or could be larger than ten acre feet; that they are intended to service a plan of development so, therefore, they may have an extended life relative to a temporary pit being beyond a year; that when they are closed, they would be closed essentially removing all of the material or waste that might be left behind, and then completely reclaimed; that they had a leak detection with that double liner system so the inspection not only would focus on the visual inspection of the liner system, the netting, the fencing or anything else that's there but also that the leak detection would be included in that inspection process. I think that's the vast majority of it.

Q. Okay. So the rules -- you said that these pits could be bigger than ten acre feet which is the limit on temporary pits; is that right?

A. Currently.

Q. How much bigger? Is there a limit? Let me rephrase that. Do the rules place a limit on the size of these pits?

A. They do not propose a limit on the size.

Q. You said that they had leak detection systems. Could you explain to me what those leak detection systems, how those are designed just generally?

A. In general, there's two liners. There is some type of piping system that goes underneath it and that there is a media between the two liners that allows fluid, should it seep from the primary liner, that would gather in the leak detection system. But each one is typically site-specific or case by case.

Q. So again, as with any liner operation, the efficacy, how good the detection system is, depends on how well the liner is installed; is that correct? If you have a rip in either of the liners as they are installed, you are not going to get a good leak detection system. Is that fair to say?

A. No, I think a leak detection system, if there's a rip in the primary liner then the leak detection system should have no problems. If there's a problem with the integrity of the secondary liner system, until the primary liner system fails you don't have to challenge the leak detection system. And --

Q. Please finish.

A. Part of proper liner installation is the QAQC requirements identified in here as part of manufacturer's specs. It's a performance-based standard.

Q. But if both liners happen to be compromised, then that would challenge how good the leak detection system was; is that right? Is that fair to say?

A. Conceivable, yes.

Q. Okay.

A. But it doesn't mean the leak detection system would not detect a leak.

Q. These pits, the new rules, the proposed amendments for the Pit Rule, intend for these to be open longer than temporary pits; is that right? Longer than a year?

A. Conceivably, yes.

Q. Is there any limit on how long they can be open?

A. Yes. As soon as all of the wells that are identified in the permit are completed, then the pit is to be closed in six months from then. It's stated in the closure.

Q. And how long do these fairly large frac jobs usually last?

A. A single frac job doesn't extend more than -- well, the largest ones I have seen with multiple stages extend no more than about a week to two weeks.

Q. Is that per well?

A. Per well.

Q. So a formation might be fracked for as long as 24 months? Is that conceivable?

A. To service multiple wells from that and to service those frac jobs it could conceivably be 24 months.

Q. Longer than that? Multiple wells?

A. Well, it depends on such restrictions and resources as drilling -- how long it takes to drill the wells before we can stimulate them.

Q. Let me just go back to the pit volume again. Is there any limit on how deep these pits go? So when you say 20 acre feet, you don't necessarily mean that the pit surface area is going to be 20 acres filled to a foot, right?

A. Correct. It's not going to be 20 acres.

Q. Filled to a foot?

A. Filled to a foot. Twenty acre feet of water in one of these pits will conceivably have a surface footprint of about two acres and a depth

of -- well, with freeboard, assuming it's a perfectly rectangular or cubicle box, you are talking about two acre feet by 12 feet deep to accommodate 20 acre feet plus freeboard.

Q. Could it be deeper than that?

A. Yeah.

Q. Is there a limit on the depth to these in the regulations?

A. Not in the regulations, other than the siting criteria and how close -- or the proximity to depth of groundwater.

Q. Let me go to the siting criteria. My understanding of the language in the regulation is that these multi-well management pits have the same siting criteria as temporary pits; is that right?

A. That was the intent, yes.

Q. So assuming that their contents meet the tables, you could be as close as 25 feet to unconfined groundwater; am I remembering the regs correctly?

A. I believe so, yes.

Q. And there's not really any sort of spacing in terms of how close the bottom of one of these pits might be to confined groundwater; is that right?

A. I would have to go back and look at the siting criteria on that one.

Q. Why don't we do that.

A. Okay.

MR. FELDEWERT: Is there a question?

MR. JANTZ: I am giving Mr. Lane a chance to look at the regulation. Have you had that chance?

A. I have.

Q. Is there any restrictions on distance in terms of confined groundwater?

A. No.

Q. One last series of questions. You said that, if I recall correctly, that part of the rationale for this multi-well management pit permit was to allow -- rather than asking for a variance for one of these type permits for operations, was that the variance process wasn't a sure thing and that it took a long time; is that correct? Am I remembering your testimony correctly?

A. The exception process.

Q. The exception process. I'm sorry. Is that right? Was that your testimony?

A. My testimony is it can be very lengthy.

Q. And there wasn't a guarantee?

MR. FELDEWERT: I object. Object to the form of the question. That wasn't part of his testimony.

MR. JANTZ: Can we read the record back then? I believe it was at the beginning of the testimony yesterday. Is that possible?

COURT REPORTER: Yes, it's possible. I would need to get into yesterday's file and have you help me search for the section you're referencing.

CHAIRWOMAN BAILEY: Would you like to rephrase?

MR. JANTZ: Sure.

Q. For the sake of time, part of it was that it took a long time to do these exceptions; is that right?

A. Exceptions, our experience at WPX Formerly Williams Production was that going through the exception process is very lengthy and resource-intensive.

Q. Do you expect the permit process to take a shorter period of time?

A. Yes.

Q. That's all I have. Thank you.

CHAIRWOMAN BAILEY: Ms. Gerholt? Would you like to cross-examine the witness?

MS. GERHOLT: No questions for the witness. Thank you.

CHAIRWOMAN BAILEY: Is Mr. Bruce in today? Mr. Dangler?

CROSS-EXAMINATION

BY MR. DANGLER

Q. My name is Hugh Dangler and I am with State Land Office. I think you have given us the 30,000 foot -- we like to say that -- view of this process.

A. Okay.

Q. How much do you know about horizontal wells?

A. I know of them and with my petroleum background what I have read about them. I have not designed them. I have not designed the drilling program and monitored it.

Q. I want to ask you a few general questions just to orient ourselves. Isn't it fair to say that horizontal well technology has been developing very rapidly in the last half dozen years?

MR. FELDEWERT: Madam Chair, I'm going to object on the grounds that Mr. Lane was not here to testify about horizontal well technology or horizontal drilling. He was here to testify about

multi-well fluid management pits in closed modifications, so I think we are getting beyond the scope of the direct.

CHAIRWOMAN BAILEY: If he is able to answer then he can answer based on his knowledge but not on his expertise because he was not qualified as a fracking engineer.

MR. DANGLER: Thank you, Madam Chair. Thank you, Counsel.

A. Could you repeat the question?

Q. From your general experience, without your expertise, is it fair to say that there's been a lot of progress and a lot of technological development in horizontal drilling?

A. I think that's fair to say.

Q. Is it fair to say in Texas they can go as far as five miles now?

A. Honestly, that's news to me. I have not -- I wasn't aware of it.

Q. Along with this progress in horizontal drilling, there are a lot of new opportunities for oil and gas. Is that fair to say?

A. That's what is in the media as well.

Q. Great. And along with this is this ability to send a number of different horizontal

wells off a single downward shaft; is that fair to say?

A. From what I've read, it is possible.

Q. And the reason this relates is because you are talking about multi-well fluid containment. Do you see how they relate?

A. Forgive me, no. I don't see the relationship between pits that we're talking about and the wells in your question.

Q. I am just conceiving of a number of uses for a large body of water that can be recycled and used for fracking.

A. That is the intent of one opportunity for these pits, yes.

Q. That's right. So you've described one opportunity, which is where you have a number of vertical wells, and I'm describing an opportunity with a single vertical well and a number of horizontal wells.

A. Those wells -- all that's represented -- if we're talking about the schematic up there, all I'm showing is the surface footprint. Where those wells actually go and how they are drilled, whether they are vertical, directional or horizontal, the intent of this is within the plan of development

each of those wells could be configured differently. And the intent is to be able to have sufficient fluids to stimulate those wells.

Q. Right. And maybe this is frightening but these are sympathetic questions. I am suggesting there may be a whole other area for this concept that you have that's going to be required. There's going to be a whole other area of multi-fracking operations that are going to require this kind of volume of water. That's all I'm suggesting.

A. Okay. I would agree.

Q. Thank you. Now, you didn't suggest, although you did suggest in terms of money, do you have any idea what the cost savings is in the industry of having a big volume of water that they can recycle on the sites?

A. You know, I have actually not looked at the cost associated with it. I guess from a practical perspective, looking at the efficiencies gained here, we are not filling tanks by trucking water. We could truck water here or we could pipe it here, so you have all of those costs associated with mobilization, demobilization of trucks. Here obviously we have the construction of conceptually one vessel versus multiple vessels if we just kind

of conceptually separate those two. So the costs associated with maintaining smaller individual or a tank farm versus this should be substantial.

Q. And there's a virtue in this recycling of water because we will use less water for the operations; is that fair to say?

A. Yes.

Q. That's the implication of recycling? Sounds like we would use the water more than once and that would save some water, would it not?

A. Yes.

Q. I would like to turn to Page 19 of the Exhibit A, the design of construction. I did hear you testify that these would be double-lined; is that correct?

A. That's the intent, yes.

Q. I had a little bit of trouble finding the words "double-lined" in the design and construction area. I will point out that I did find a primary liner reference in J-9, which would indicate a double liner and there's also a leak detection system, which I understand requires double-lined, but does it say double-lined in there?

A. I will have to look real quick. It does not. I don't see it explicitly spelled out as

double-lined.

Q. But it is the intention that they be double-lined and this was written with that in mind; is that fair to say?

A. That is the intent, yes.

Q. Now, the fluids that we're talking about that you're going to be recycling and using for more than one job, would they be considered low chloride or would they be considered a brine type?

A. Depends on the source of the water. So if they exceed the low chloride they would have to meet the siting criteria for a non-low chloride system. If they are fresher than that, if the source of the water is fresher than 15 or 15,000 parts per million, then it would allow us to site them to 25. But it's all operationally.

Q. So --

A. So it depends on the source of water.

Q. So would you know going into the permitting phase which kind of water you would be dealing with for the siting?

A. Hopefully with a plan of development we would know our source of water, yes.

Q. Because that would matter under the testimony that we heard yesterday about the two

different kinds of water and the plans for the different siting requirements for those different kinds of fluids; is that right?

A. Knowledge of process, yes.

Q. And while we're at it, if you would go to that page, Siting Requirements, Page 9 of Exhibit A. Just conceptually to fit these pieces together, you testified on direct that the plan of development might take as much as five years.

A. That's correct.

Q. And we just had some testimony about two years, and that was also in the range. Have you considered plans of development that might go longer than five years?

A. I have not been a part of anything that extends for five years out.

Q. There is no limit -- there's no five-year limit in the rule as proposed; is that correct?

A. We have not placed the timing restriction on it other than completion of the plan of development.

Q. So if an oil company were to develop a certain oil field, might they want to drill and see if they hit before they drill the next well?

A. Conceivably, if you are doing that, then

you are more in an exploratory phase, and I couldn't conceive of a company building a multi-well fluid management pit just to drill one well and test it. This is after you have pretty much proved up that the potential is there and that the level of success is -- of having successful wells, developing that resource. Now we are looking at how do we come up with a more efficient and effective way to extract or to develop -- to build out that development plan. But to put one or two wells in, we are going to stick with the current technology or the current methodology.

Q. And plans or multi-year plans are the best we do when we think about it at that time; is that fair to say? Based on the price, what we think the price is going to be?

A. Right.

Q. It's very sensitive. So when there's a huge fall in the price of the commodity like there has been in natural gas recently, that could cause your plan to get interrupted? Is that fair to say?

A. It's fair to say that a plan of development could get interrupted, yes.

Q. So we can conceive of a development plan that might last longer than five years to fully play

it out?

A. Fair enough.

Q. So given that problem, we are really talking about an animal that's somewhere between a temporary pit and a permanent pit, aren't we?

A. Fair to say.

Q. And that's why the double liner, which is a wonderful idea, and the leak detection to make it extra safe, is in there as well as the volume issue?

A. Correct.

Q. So you have taken a little bit of that into account. When we go to the siting requirements -- let me ask one more predicate. We are talking about building a big holding area that's going to service as much as a two-mile radius, maybe less depending on the development plan?

A. Currently that's how it's conceptually intended.

Q. And that's how you presented it, correct?

A. Based on what we have planned and my experience with it, yes.

Q. Okay. So presumably in that larger radius, you would have a certain amount of freedom in where you cited this large holding pond?

A. Correct.

Q. More freedom than, say, an individual well pad where you want to put it right there and you want to put the waste disposal pit right next to it; is that fair to say?

A. Fair to say.

Q. So since you have more freedom and since this could be considered more permanent, why wasn't the definition placed here with permanent pit and have all those distances and all of the reassurances that we have with the distances for a permanent pit? Why was it placed up here with the temporary pit?

A. Because in our view, it's more temporary in nature.

Q. Would there be some large economic cost to place it down here with the permanent pits, those standards?

A. There are additional costs associated with the siting and the studies and everything that's required to permit a permanent pit.

Q. Do you have any figures or can you cite any studies about the costs of a permanent pit?

A. I haven't permitted a permanent pit.

Q. So you wouldn't hazard an opinion about the cost benefit here of the risk versus the cost?

A. I have not done an analysis.

Q. Would a multi-well fluid management pit with a capacity for 20 acre feet require a permit from the Office of the State Engineer, do you know?

A. Depending on its design, it should not.

Q. I have no further questions. Thank you very much.

CHAIRWOMAN BAILEY: Dr. Neeper.

CROSS-EXAMINATION

BY MR. NEEPER

Q. Thank you and good morning. Would a person such as yourself or a worker for another company with your level of expertise be the person who chooses the site, who would assure that the site of a multi-well pit meets the criteria of the regulation?

A. Myself or someone in our permitting group.

Q. So you could be the person who says this site meets the criteria?

A. Yes.

Q. Could you explain why a confined aquifer then should have no setback from your multi-well pit? Would you maintain that it's impossible to contaminate a confined aquifer?

MR. FELDEWERT: Madam Chair, I object to this. I think this is beyond the scope of his

direct and we do have expert witnesses who will be addressing in more detail the basis for the siting requirements.

MR. NEEPER: I would like to respond.

CHAIRWOMAN BAILEY: Please.

MR. NEEPER: The witness testified that those siting and those decisions are within his authority and his position and within the authority of other persons of a similar position. He has to make the decisions based on his estimate in the field of the situation.

MR. FELDEWERT: I don't disagree with what Dr. Neeper said. Mr. Lane testified once we have established what the siting criteria are by way of the rule, then he and others within his company will make the decision as to whether they are in compliance with that rule as well as the members of the Oil Conservation Division to the permitting process. But that's a different question from what the siting requirements should be under the form of the rule. Mr. Lane is not here to testify to that.

CHAIRWOMAN BAILEY: I will sustain that objection. Mr. Lane is not testifying for the hydrology of this siting requirement.

MR. NEEPER: Very good.

Q. Mr. Lane, how would you know whether a site will qualify as having a confined aquifer?

A. We would have to go to data that's available or similar studies.

Q. Is it correct that the rule requires no inspection of the ground surface when a multi-well pit is closed and the liner is removed unless the leak detection system has indicated a leak?

A. That is correct.

Q. A primary liner is specified in the rule as meeting at least a particular criteria for its hydraulic conductivity; is that correct?

A. Yes.

Q. If a liner had that hydraulic conductivity or even something, let us say, that is ten times better, would not the seepage rate be so great as to give you a continuing input of fluid to your leak detection system?

MR. FELDEWERT: Madam Chair, I object. This is beyond the scope of his direct. He is not here to talk about liners and hydraulic conductivity of liners.

CHAIRWOMAN BAILEY: Will we have a witness who can --

MR. FELDEWERT: We certainly will have a

witness who can address those.

MR. NEEPER: May I address the Chair before the decision is made on the objection?

CHAIRWOMAN BAILEY: Please.

MR. NEEPER: The witness has stated that -- and described the operation of a leak detection system. A person in his position has to understand whether he is getting a real signal or a false signal out of a leak detection system. In particular, this knowledge impacts whether or not the ground is inspected when the pit is removed and the contents taken away.

MR. FELDEWERT: I have no objection to him questioning about how you determine whether there's a leak and whether a leak detection system works and how it works. But I think he was asking a different question when we start going into hydrology conductivity.

CHAIRWOMAN BAILEY: Would you like to rephrase your questions so he is capable of answering?

Q (By Mr. Neeper) Mr. Lane, do most membranes have some finite seepage rate, however small it may be?

A. I'm not an expert at liners, but that's

the intent of the design criteria.

Q. How can you tell the difference between seepage from a liner that you feel is working correctly and liquid that has gotten into the secondary liner from what we would call a leak or a penetration?

A. I can only speculate that one could test the fluid if there was fluid detected in the leak detection system to see if it's comparable to the liquid being stored on the liner.

Q. But in either case, the liquid came from the storage above the primary liner, so in either case would it not be the same fluid?

A. Not necessarily.

Q. I will have to clarify my question. If fluid seeps through a liner it came from the primary contained fluid, did it not? If it seeps through the primary liner, it must be the stored fluid that has seeped through the primary liner? This is not a trick question.

A. Well, it is in a sense. But the fluid in the leak detection system -- it is not a guarantee that the fluid in the leak detection system is from the fluid that's stored above it or below it.

Q. I understand. That is right. There could

be some other path.

A. Okay.

Q. But if the primary fluid seeped through -- if the stored fluid seeped through the primary liner or if the primary liner had a real penetration, in either case the same stored fluid would appear in the secondary liner.

A. If there's a breach in integrity of the primary liner then the leak detection system will detect the fluids that were stored on the primary liner.

Q. Yes. And how can you tell the difference of that, given the large area of the primary liner, from what might be ordinary seepage through the primary liner?

A. Seepage through the primary liner is a failure of the primer liner's integrity.

Q. Are you stating that all primary liners then have perfect retention? They do not seep fluid at all just by virtue of their nature?

MR. FELDEWERT: Madam Chair, I think we are getting again beyond the scope of his expertise. I think the premise of Mr. Neeper's questions is that there is a seepage component of these primary liners. Mr. Lane is not here to address the

circumstances associated with liners. He is here to address the multi-well fluid management systems. It seems to me this is a question best posed to the experts who will be following Mr. Lane.

CHAIRWOMAN BAILEY: I will sustain that objection.

MR. NEEPER: Very well.

Q. Do fracking fluids, particularly the return fluids, contain heavier hydrocarbons or things other than light hydrocarbons and chlorides?

MR. FELDEWERT: Madam Chair, I'm going to object here on the grounds that Mr. Lane isn't here to talk what is contained in fracking fluid or what is not contained in fracking fluid. That wasn't the scope of his direct.

MR. NEEPER: Madam Chairman, I would like to address the objection.

CHAIRWOMAN BAILEY: Please do.

MR. NEEPER: Madam Chairman, with witness after witness we hear that the witness is not the expertise in a particular area. Yet, we are trying to get answers that are relevant to the safety of these systems in the field. The restrictions within the proposed rule deal with what is detected. One needs to know whether those quantities, whether

those chemicals, are what is to be expected in the pit or whether something else is in the pit that's beyond the regulations. It seems reasonable that the expert on the pit should know what's in it.

CHAIRWOMAN BAILEY: I have to agree with you. Please try to answer that.

A. Could you repeat the question?

Q. Yes. The rule -- I will try to rephrase the question. The rule states certain things that may be detected in the ground under the pit when you remove the liner. The things that appear in the rule as regulated are chlorides and light hydrocarbons up through diesel range. Are there heavier hydrocarbons in a frac pit or are there other chemicals that might not be light hydrocarbons or chlorides? In other words, we know what we might expect in a drilling pit but would the contents of a frac pit contain potentially other chemicals?

A. I don't believe that the chemicals in a frac pit would be -- if we are talking the general chemical makeup in the water in a frac pit -- would be any different from the chemical makeup that's currently in temporary pits, workover and drilling pits.

Q. So there are not different chemicals

returned from the ground then in the fracking process?

A. The overall chemical makeup, if we're talking just the chemistry, should be consistent with what we currently see coming out associated with workovers and drilling.

Q. You showed a picture of a -- I believe your word was approximately two-acre multi-well pit.

A. The surface footprint of that pit was about two acres.

Q. And I believe you testified that it had a four-foot fence and netting; is that correct?

A. I did not testify to the height of the fence. It had a fence and a netting system on it.

Q. So is it within your testimony then that a suitable netting can be maintained over a two-acre pit?

A. Netting systems can be designed.

Q. The question is: Can they be maintained over a two-acre pit, not whether they can be designed.

A. That particular one had one, yes.

Q. So then may I infer from that that operators who say it is impossible to maintain netting over much smaller pits must somehow be in

error? Is that correct?

MR. FELDEWERT: I object. Mr. Lane is not here to testify on the nature of what other operators may or may not be saying or on the factual assumptions behind Mr. Neeper's question.

MR. NEEPER: I will rephrase the question.

Q. In as much as netting can be maintained on the pit that you have shown, is there any reason why the rule should not simply require netting rather than leaving it somewhat arbitrary saying, "Well, in effect, if it's too difficult you don't have to do it." That is the thrust of the rule.

MR. FELDEWERT: I object to the characterization of the rule. Mr. Neeper is characterizing the rule improperly. If we can go to the rule he can ask the question from the rule.

MR. NEEPER: I will be pleased to rephrase the question.

CHAIRWOMAN BAILEY: Please do.

Q. Would you please read the rule requiring netting on multi-well pits.

COMMISSIONER BLOOM: Page 14.

A. "Netting. The operator shall ensure that a permanent pit, a multi-well fluid management pit or an open-top tank is screened, netted or otherwise

rendered non-hazardous to wildlife including migratory birds. Where netting or screening is not feasible, the operator shall, on a monthly basis, inspect for and within 30 days of discovery report discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the appropriate division district, office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring."

Q. Thank you. So now we see that the rule would allow an operator not to have netting provided the operator inspects every 30 days and reports the dead wildlife. Given the fact that you have shown that netting is possible and is done on a two-acre pit, is there any reason why the rule should not simply require netting rather than stating well, if it is not feasible, then report the dead wildlife?

A. Yes. Netting is proscriptive. It forces us not to look at other alternatives.

Q. So it would be acceptable to you then if that situation were deleted from the rule that says if the operator finds it infeasible to do netting? You feel it is always feasible?

A. Not always.

Q. All right. Can you give us a case where

netting is infeasible?

A. Well, first of all, netting is intended to screen the pit to keep, in particular, migratory birds and wildlife off the pit. That also assumes that the material, the fluids in the pit, are going to be hazardous to that wildlife and those birds. If the material in the pit isn't hazardous, then why should we restrict the birds from having access to the water? I mean, inspecting the pit and having a bird sitting on it resting and flying off is -- the rule doesn't prohibit that. Putting netting on it restricts that. So it's back to looking at the site and determining whether or not netting is critical. The only purpose for the netting is to protect wildlife.

Q. I understand the purpose for the netting. I understand that if it's freshwater the netting shouldn't be needed. That is not an infeasibility. That is a question of whether it's necessary. But is it not true what the rule says is even, let us say, if the water is contaminated, if the operator finds it infeasible in his terms, he doesn't have to use netting?

A. I think that's a demonstration that we have to give as part of the permitting process and

the design process.

Q. Point is made. Thank you. Finally, I will ask about the visible layer of oil. At present I understand from other testimony that it is allowed to have a layer of oil that's approximately 30 percent of the area of the pit. In large pits such as the multi-well fluid pits are likely to be, would it be acceptable to specify an area of floating oil rather than a fraction of the pit, in that one-third of a two-acre pit is two-thirds of an acre of floating oil, and it would seem that the operator could confine the oil slick to something smaller than that. Should we not specify a given area rather than fraction of pit?

A. I believe the way it's set up makes it easier for an operator or an inspector or anyone to be able to evaluate whether or not there's an exceedance of the standard.

Q. I will agree it's easy to determine whether or not you have two-thirds of an acre of oil floating on the pit. I'm questioning whether we should allow that.

A. I would think so, yes.

Q. We should allow it? Thank you. Finally, I will address your testimony regarding the

difficult process you went through in getting an exception. If I am correct, I understood you to say the process took about eight months, and in the process you got two denials, one from the district office and one finally from the OCD in Santa Fe. Did I understand correctly?

A. Well, in general, the process was fairly convoluted, but essentially the denial from the district office was a statement that it needed to go to exception. They didn't per se deny it.

Q. Very good.

A. They said you have to go to exception so it took a fairly long period of time for them to even get to the point of saying, "Your application merits an exception." And then we went through the -- or then it rolled to exception.

Q. I will make a statement and then ask the question so that you can argue against the statement if you so choose.

MR. FELDEWERT: I object. That's not the proper cross-examination.

CHAIRWOMAN BAILEY: We will allow it.

Q. If an exception is granted, in effect it at least in part is a change in a rule because other operators should be allowed the same exception; is

that not correct? Would that not be expected?

A. No. Exceptions are case by case.

Q. They are, but by precedent wouldn't it be expected that other operators should have the same privilege if an exception is made?

MR. FELDEWERT: Object to the form of the question. I think it's already answered and kind of borders on a legal determination, Madam Chair.

CHAIRWOMAN BAILEY: He can answer to the best of his ability.

A. Repeat the question, please.

Q. I will try to rephrase the question in an attempt to honor the objection as well even though it has been overruled. An exception at least for one operator is a change in the rule. Many, many months of effort go into rule-making. For any reason, should it be easy to get an exception when it is, at least for that one operator, a change in the rule?

A. Exceptions, as I read them, are a case-by-case situation. An operator granted an exception in one situation does not guarantee that the operator will receive that exception on further situations.

Q. But it is, in effect, at least in that

case, a change in the rule; is that not correct?

MR. FELDEWERT: Object to the form of the question. Improper predicate and asks for a legal determination as to whether an exception is, in fact, a change in the rule.

CHAIRWOMAN BAILEY: He is asking for his opinion.

A. It is not a change in the rule. An exception does not change the whole rule. It does not set a precedent. It is specific to that one situation.

Q. Thank you. No further questions.

CHAIRWOMAN BAILEY: Mr. Fort?

MR. FORT: I have no questions. Thank you.

EXAMINATION BY THE COMMISSION

COMMISSIONER BLOOM: Mr. Lane, thank you for your testimony. I have a number of areas of questions. First I want to talk about rules and then risk and then impact. I want to talk -- I think I will go to rules first. We heard there's no volume limit. I believe in your testimony we hear 20 acre feet and later on something between 30 and 40 acre feet; is that correct?

THE WITNESS: It depends on the

application and what we're seeking. There is no volume limit placed in the rule.

COMMISSIONER BLOOM: And again, I think we established there's no lifespan limit to the multi-well pit, correct?

THE WITNESS: Other than it must -- it is to be closed at completion of a plan of development.

COMMISSIONER BLOOM: If the plan of development were to go on ten years perhaps as market forces force it to do, it could go on a period of time?

THE WITNESS: They have not placed a limit on it.

COMMISSIONER BLOOM: The rules for temporary and permanent pits, do they have instructions on the slope of the sides of the pits?

THE WITNESS: I believe they do.

COMMISSIONER BLOOM: Do they generally --

THE WITNESS: It's generally the angle of repose? It's whatever is stable and that stability is based on soils.

COMMISSIONER BLOOM: I believe if we look at the rule we see frequent mention of a two to one and three to one.

THE WITNESS: Correct.

COMMISSIONER BLOOM: Do you know why we have those suggested slopes?

THE WITNESS: They are convenient and it's a general design criteria.

COMMISSIONER BLOOM: Convenient. Do they also help the sides of the pit from collapsing?

THE WITNESS: They can, yes.

COMMISSIONER BLOOM: What would happen if the side of a pit collapsed? How would that affect the liner?

THE WITNESS: If you are talking a vertical wall, obviously it would stress the liner. But from the design of essentially almost any pit, you are going to have some slope to those sides.

COMMISSIONER BLOOM: Do you think it would make sense to add a stipulation here that we regulate the sides of the slopes of these multi-well pits as we do temporary pits and permanent pits? I'm looking at -- I think it's Page 19, Design.

THE WITNESS: The sides of the pit are specified in J-2. "The operator shall construct a pit so that the slope does not place undue stress upon the liner and is consistent with the angle of repose." The angle of repose is dictated by the soils.

COMMISSIONER BLOOM: The liners, we are looking at a 20 mil string reinforced LLDPE or equivalent liner material here?

THE WITNESS: Yes.

COMMISSIONER BLOOM: What do we use for the permanent pits? Is that 30?

THE WITNESS: Honestly, I will have to go back. It's 30 or 60 HDPE.

COMMISSIONER BLOOM: Do you know if other states that are using multi-well pits, what their liners are?

THE WITNESS: I honestly have not looked at their liner designs. I think it's comparable to what we are using certainly, but I don't know that. I have not looked at the specific liner design.

COMMISSIONER BLOOM: Madam Chair, can I reference an article from May 6th out of a Midland newspaper? It talks a little bit about large frac pits. I would like to read a little bit of the article.

"West Texas is known for its wide open spaces and Permian Basin oil fields are becoming home to wide open frac pits. At 400 feet wide and 800 feet long, these pits are more akin to small lakes but Nick Tomlin, vice president for Big D

Companies, still prefers the term frac pits. Midland-based Big D builds the pits and then lines them with 30-mil HDPE and two separate layers of eight-ounce geotextile, equipping the pits with leak detection systems and covering them to both prevent evaporation and to protect wildlife, especially migratory birds, attracted to the large body of water.

"Tomlin said the linings illustrate how technology has changed in the oil field. 'We're going to heavier liners,' he said. 'We used to use 6 or 8-mil, now we're using 30, 40 or even 60-mil liners.'"

It goes on to say the ultimate goal of the pits is to allow for more efficient use of water in frac jobs.

Twelve million gallons of water corresponds roughly to about a 40 acre foot pit at 325,000 gallons per acre foot, right?

THE WITNESS: (Witness nods).

COMMISSIONER BLOOM: So from that we can see that at least in Texas some folks are using a more robust liner?

THE WITNESS: If one is to believe that article, yes.

COMMISSIONER BLOOM: I will make that available to anybody that would like it. Does risk increase when volume increases?

THE WITNESS: I believe one of the other experts will deal with risk.

COMMISSIONER BLOOM: Is there more -- can you say if there's more forces bearing on a -- I will leave that question for a subsequent witness. Finally, I would like to talk about impact. I think this is an interesting point about the multi-well pit. The surface disturbance you showed us here is about a couple acres, Exhibit 7-1. The lake is a couple acres?

THE WITNESS: Yeah. That pit there is, if I recall, approximately two acres in surface disturbance.

COMMISSIONER BLOOM: And then 7-3, that was 4.5 to five acres?

THE WITNESS: That's five acres. It's in that ballpark, yes.

COMMISSIONER BLOOM: So in that size pad you could have four or five wells on as you showed in 7-2?

THE WITNESS: Actually, currently we are permitted to have as many as ten wells on a

two-and-a-half acre pad if we don't have to accommodate all of the stimulation equipment and tankage.

COMMISSIONER BLOOM: Is there a limit to the number of pads that one of these multi-well pits can have associated with it?

THE WITNESS: No. We have not placed a limit on it.

COMMISSIONER BLOOM: Is there anything in current regulation you see that would limit the number of pads?

THE WITNESS: Yeah. How many wells you are going to ultimately develop in the play.

COMMISSIONER BLOOM: The unit or something?

THE WITNESS: The unit or whatever, yeah.

COMMISSIONER BLOOM: Could a multi-well pit service multiple units?

THE WITNESS: Potentially, if they are under common ownership or common -- under a common operator is what I'm trying to say.

COMMISSIONER BLOOM: Is there any limit to distance that you would have between the multi-well pit and the pads?

THE WITNESS: I think the limiting

distance is more of an engineering issue about your friction losses and everything else associated with moving the fluids from there to stimulate the wells. I can't tell you what that distance is, because if we wanted to move it over greater distances we would have to use larger pipes, more pumps. You know, it becomes a balance between horsepower available or resources available.

COMMISSIONER BLOOM: We talked about a couple miles between multi-well pits and the pads?

THE WITNESS: I suspect the limit is going to be somewhere -- from what I am told in the Piceance operations up in Colorado, those distances don't get more than about two miles in a radius, if that makes sense.

COMMISSIONER BLOOM: Who is in charge of inspecting or making sure that the pipes are in operating condition and operating safely in New Mexico.

THE WITNESS: Well, it would be the operations folks, but I don't think -- the inspection that's specified here is related to pits. It has nothing to do with the infrastructure associated with the project.

COMMISSIONER BLOOM: So I think we would

replace then multiple acres of water tanks with this one multi-well facility as we saw in 7-1, right?

THE WITNESS: That's the intent, yeah.

COMMISSIONER BLOOM: I think this is my last question. If we can go to 7-2, please. You have trucks there. Would trucks and/or pipes be taking water in and out of the multi-well pit and to the wells?

THE WITNESS: Could be either. Something to keep in mind, what's shown up there in that plan of development is a schematic. I'm not aware of a multi-well fluid management pit existing in New Mexico at this time. We certainly, from WPX, we have a project that we are seeking permitting on but we haven't even been able to get to that point. So this is all conceptual at this point. We are trying to provide that mechanism out there.

COMMISSIONER BLOOM: Could the multi-well fluid management pit, could that be filled via pipeline from a nearby well?

THE WITNESS: Could be, yes.

COMMISSIONER BLOOM: You could have pipes going out to the well pads and the return flow would be pipes.

THE WITNESS: Yes.

COMMISSIONER BLOOM: So you could potentially eliminate trucking in and out?

THE WITNESS: That's the intent. That would be the most efficient way. Not only would we be eliminating trucking for hauling water but we're also eliminating all of that mobe/demobe associated with those temporary tanks.

COMMISSIONER BLOOM: Is there any -- do you have any information or can you speak to the impact on the environment between having trucks going in and out and having pipe instead? Is that quantifiable? It's probably quantifiable but do you have that data?

THE WITNESS: I have not quantified it, no.

COMMISSIONER BLOOM: You can see gains for the environment through such a system?

THE WITNESS: Yes, I see gains both from an air quality perspective, from a reduction -- if the scenario is elected to use pipes instead of trucks and Williams has built a -- or WPX has built a gathering system for produced water up on another part of our project where we have a unit, we have reduced the traffic which has impacts to wildlife, you know. All of those activities. So there's

multiple gains.

COMMISSIONER BLOOM: I have one last question. This is my single question. Do you think it makes sense to site a 12, 13 million gallon multi-well pit 100 feet from a sinkhole?

THE WITNESS: I certainly wouldn't. But then it depends on what's the cause of the sinkhole.

CHAIRWOMAN BAILEY: Commissioner Balch?

COMMISSIONER BALCH: Good morning. That was a thorough cross-examination so I only have a couple points to address. The first is more of curiosity. I understand it may not be in your realm. For the San Juan Basin and for your projects, what is the primary source of water for drilling and completions?

THE WITNESS: We have used a combination of freshwater where we have gotten water or purchased the right to use water from someone that has water rights, and then also we use our produced water where possible.

COMMISSIONER BALCH: What's the ultimate fate of water when you are done with it?

THE WITNESS: It's injected for disposal. At least in our operations it's injected for disposal.

COMMISSIONER BALCH: Water in New Mexico, of course, is a very important issue and there's a large cost associated with both acquiring it and disposing of it. So besides the economic benefit, being able to reuse the water, could you put some sort of a number on the ability to recycle in a very large multi-year, multi-pad, maybe 40 sets of completions.

THE WITNESS: You know, I haven't looked at the economics or been a part of that. I don't think we have even looked at those economics.

COMMISSIONER BALCH: Do you think it would be substantial?

THE WITNESS: It would be very significant. Freshwater alone, just the purchase of freshwater is a cost that we would not necessarily need to bear.

COMMISSIONER BALCH: And the disposal, of course, very expensive?

THE WITNESS: Right.

COMMISSIONER BALCH: In the current rule and in the proposed modifications, there are two types of pits, temporary and permanent. I think that with multi-well and the number of questions that have arisen for siting size and the protections

afforded by them and the environment, do you think it might be appropriate to add a third category that had its own separate criteria from temporary and permanent pits?

THE WITNESS: We attempted to do that with the multi-well but trying to -- again, in my thinking it's a temporary pit that has extended life to it, both in size and in life. But the intent is that the pit is not designed for waste disposal as far as permanent disposal of waste.

COMMISSIONER BALCH: To me it seems it's not exactly temporary but not permanent. It has a different set of uses than many temporary pits. You are going to have some filtering, maybe salination, maybe chemical additives going into the flow pipes. You have different operations going on there than you would at the temporary pit, yet it's not a permanent pit. So perhaps another set of criteria might make the issue a little easier to resolve.

THE WITNESS: We attempted to do that with the way we wrote the rule. It may not have got there, but that's what our intent was.

COMMISSIONER BALCH: No further questions. Thank you.

CHAIRWOMAN BAILEY: I would like to

explore a gray area. If we could all go to Page 38.

THE WITNESS: Of the rule?

CHAIRWOMAN BAILEY: Yes. No. 8 dealing with the closure of the pit. Are you there?

THE WITNESS: Yes, ma'am, I am.

CHAIRWOMAN BAILEY: This talks about an operator closing the pit within six months from the date that the operator ceases drilling and stimulation operations on all wells identified in the permit. Could you elaborate on what you mean by the permit?

THE WITNESS: The permit for the multi-well fluid management pit, in the application and ultimately in the permit. So if we permit -- well, not if. What's proposed in the rule is that this pit would be permitted using a C 144 and that that is an application and ultimately a permit. In there, we would identify those wells or those wells within the plan of development that this particular pit would service. So the permit we are referencing is the pit permit.

CHAIRWOMAN BAILEY: Now, the wells on that permit, would they have approved APDs?

THE WITNESS: Not necessarily. They wouldn't have all of them.

CHAIRWOMAN BAILEY: So they are just future planning reflections of the company's direction?

THE WITNESS: We haven't done one of these yet but the intent would be that we would identify -- to design the whole plan of development we would identify the wells that we intend to utilize this pit for.

CHAIRWOMAN BAILEY: Okay. Now, you are talking plan of development, which is a term used in unitizations.

THE WITNESS: Okay.

CHAIRWOMAN BAILEY: Is that the context for your use of the term plan of development?

THE WITNESS: I believe it's consistent with -- essentially we have identified all of -- we have identified how we would develop that resource within that plan of development. We have identified a number of wells that we anticipate being required to develop that resource and this would be a component of that entire development.

CHAIRWOMAN BAILEY: And we are not talking lease spaces, we are talking unitization is what I'm understanding from you.

THE WITNESS: In our scenario it's

unitized. Like I said, we haven't done one of these so I'm not sure whether there are other scenarios outside of what Williams and WPX plans that might conceivably be associated with this as well.

CHAIRWOMAN BAILEY: And because it is a gray area we need to explore precision in our terms here so that we will all be on the same page several years down the road.

THE WITNESS: Yeah.

CHAIRWOMAN BAILEY: Plans of development for unitizations can often cover one formation, one development of -- let's just take, for example, shale up in the northwest. And because shale has not been developed on a real common basis up there, units that may encompass those formations for plans of development could last for years and years and years for full development of the unit with plans of development. Hasn't that been your experience?

THE WITNESS: It has. I use the term plan of development, but within a plan of development you may identified that within it you're going to need -- let's take the scenario I had up there that you will have 40 wells developed over a particular period of time. This pit may only service a component of that plan of development. Say in the

scenario I threw up that actually there's 80 wells and there's actually eight well pads. That multi-well fluid management pit in that scenario is only servicing four of those eight pads, multi-well pads, and only those wells associated with those pads would have been permitted -- conceptually here -- would have been permitted for this pit. So when that part of that plan of development is completed that this pit is identified to service, then the pit would be expected to be closed. So the plan of development may not have been completed.

There may be other scenarios where you don't necessarily have a unit but that an operator, instead of having to do the scenario of moving tanks to different areas may want to be able to use this pit conceivably to service a different development where you might have shale development, conventional gas development, even coal development all serviced from this pit. As long as they are identified in the pit permit as those wells to be -- then you establish also -- I think the question is when are we going to close the pit. You can look at that as well.

You may not have all the APDs secured at the time, and if we don't secure the APDs, that

shortens the life of this particular pit conceivably.

CHAIRWOMAN BAILEY: But if the company decides not to drill all wells that are on that permit, at what point does the regulator step in and say, "It's been more than six months since you were drilling the well that used this pit"?

THE WITNESS: We did not put in here a temporarily abandoned component or an out of service component time-wise in here. In other words, what you are -- if I understand the question, you are saying should the regulators have the ability to say well, you have stalled your plan of development or at least for the foreseeable future you don't have a need for this pit; therefore, you need to close it. We have not put that component in.

CHAIRWOMAN BAILEY: And that's the dilemma of the regulator is when to step in and say this is no longer a multi-well pit, this is a permanent pit?

THE WITNESS: Or it's not an active pit, and at that point we are expected to close it. So there may be an inactivation component that needs to be built into this.

CHAIRWOMAN BAILEY: Those are all the questions I have. Do you have redirect on the

questions that were asked?

MR. FELDEWERT: I do.

REDIRECT EXAMINATION

BY MR. FELDEWERT

Q. Mr. Lane, going back to the concerns raised by some of the commissioners, while there is no size or time limit in the current rule, the multi-well fluid management pit at the end of the day will be linked to an approved plan of development, correct?

A. That's the intent.

Q. So as part of the permitting process under the C 144 and approval of of the development plan, there's going to be opportunities for both the operator and the division to address such things as the scope of the well development plan, in other words how big they are going to allow, correct?

A. Correct.

Q. There's going to be opportunities to address any concerns over siting?

A. Should be, yes.

Q. There's going to be an opportunity to address any concerns over the time period for this pit and the size of the pit, correct?

A. Correct.

Q. And in that circumstance, the way it's structured, those concerns could be addressed on a particular factual scenario that is presented by the operator in the permit?

A. Correct.

Q. Rather than conceptually?

A. At this point it's conceptual.

Q. Okay. There was concerns about -- if I look at Page 19 of Attachment A, there was concerns about the reference or having specific words in there stating a double liner. Do you recall that?

A. I do.

Q. If I look at J-3, and in particular J-9, if an operator is going to design a leak detection system adequate to detect any leak from the primary liner, are you not going to have to have a secondary liner?

A. Some type of secondary liner system has to be in place, yes.

Q. So while it's not expressed in here, certainly you are going to design one. You are going to have to have an ability to detect any leak --

A. That was the intent, yes.

Q. Okay. And again, referencing Mr. Neeper's

concerns about netting, once you present your C 144 here, your proposed permit --

A. Our application.

Q. That's another issue that can be addressed as part of the permitting process, correct?

A. It has to be addressed. We have to make a demonstration that we are protecting public health and the environment.

Q. And the same thing -- Commissioner Bloom raised a good question about slope. That's an issue where we have a certain factual scenario, a certain size proposed, a certain depth in which the slope can be addressed as part of the permit process, correct?

A. We have to demonstrate that we are meeting the requirement here in J-2.

Q. And again, any concerns over the liner, if needed, could be addressed as part of the permit process?

A. In the application, yes.

Q. Now, there was questions about whether you can -- this is an in between, right? It's in between the temporary pit and the permanent pit?

A. It is, yes.

Q. In some sense. Is it like a permanent

pit, Mr. Lane? I mean, does it serve the same purpose as a permanent pit? What are the differences?

A. Probably the biggest fundamental difference between the two is that the multi-well fluid management pit is intended simply to be a storage -- is to provide storage for reuse of stimulation fluids. Permanent pits have a wide range of uses but predominantly they are for the disposal of fluid by evaporation or similar means.

Q. And the permanent, it is designed for long-term indefinite storage, correct?

A. Indefinite.

Q. And it's designed for handling various types of waste, correct?

A. There's -- from what I read here, it can handle any type of waste that it's permitted to handle.

Q. Okay. So in your opinion, if we are looking at the in-betweeners, is it more akin to a temporary pit or permanent pit, a multi-well fluid management pit?

A. As we tried to propose it in the rule, it's more akin to a temporary pit. There again, one of the big fundamental differences is that at the

end of its life essentially nothing is to be left behind. We try to minimize its footprint and no waste is to be left in place.

Q. And the benefits we get from the multi-well fluid management pit is the reduced truck traffic and the mobilization of equipment, correct?

A. Among other things, yes.

Q. You have a reduction in the use of water because you are able to recycle water?

A. Yes.

Q. You have the ability to reduce the total surface footprint?

A. Yes.

Q. And as you pointed out, at the end of the day nothing is left behind because these are not disposal pits.

A. They are not intended to handle any waste disposal, ultimate disposal of waste.

Q. Now, you mentioned your problem with the -- or your concerns that you had with the exception process. I just want to clarify a couple things. Number one, that was an effort to get an exception in the way that -- under the terms of the current rule, correct?

A. It was under the current rule and I still

don't think we needed to go to exception.

Q. Okay. But part of the difficulty, if I understand it, Mr. Lane, was that under the current rule the process, and even the ability to obtain an exception or a variance, is really not set forth in any clear fashion.

A. It didn't appear clear to me as we went through the process.

Q. And the intent of NMOGA's proposed modifications is to clarify the process and clarify essentially the procedures.

A. That's what we have intended by the changes in the rule or the proposed changes in the rule.

MR. FELDEWERT: That's all the questions I have.

CHAIRWOMAN BAILEY: Why don't we take a ten-minute break?

(Note: The hearing stood in recess at 10:34 to 10:35.)

CHAIRWOMAN BAILEY: Mr. Feldewert? You are through with your witness, Mr. Lane?

MR. FELDEWERT: I am.

CHAIRWOMAN BAILEY: He may be excused. Would you like to call your next witness.

MR. CARR: May it please the Commission, I'm going to present our next witness. Yesterday at the beginning of the case I failed to do something that I intended to do. I want to introduce our paralegal, Deb Tupler, who is helping us present the case. Deb is to us like Florene is to you. We've learned if we do what they tell us to do, we get along just fine.

We're going to call our last witness -- our last witness of the four that is going to explain the text of the rule. We are going to call Jerry Fanning. Jerry, as you will find out, is the chair of the NMOGA committee that developed these changes. He is going to basically identify those matters that have not been addressed by any of our prior witnesses so we will explain all of the proposed changes to the rule. I'm going to be working from some slides and also from Attachment A to our exhibit book which is the red-line copy of the rules so you might want to have that in front of you as well.

JERRY D. FANNING, JR.

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

DIRECT EXAMINATION

BY MR. CARR

Q. Would you state your name for the record, please.

A. Jerry D. Fanning, Jr.

Q. Mr. Fanning, where do you reside?

A. Artesia, New Mexico.

Q. By whom are you employed?

A. Yates Petroleum Corporation.

Q. What is your position with Yates Petroleum Corporation?

A. I am the environmental coordinator in charge of environmental issues in Texas and New Mexico.

Q. As an environmental coordinator, what are your duties?

A. I'm to make sure that Yates complies with all state and federal and environmental regulations. I supervise four environmental technicians, field technicians who are basically responsible for their mediation, reclamation of hydrocarbons, chlorides and natural releases.

Q. Mr. Fanning, have you previously testified before the New Mexico Oil Conservation Division?

A. No, I have not.

Q. Could you review your work experience for

the Commission?

A. From 2001 to the present I worked for Yates Petroleum as environmental coordinator. Prior to that from 1990 to 2001 I worked for the New Mexico Department of Game and Fish as the Pecos Valley Wildlife Area supervisor.

Q. Have you received any awards for your environmental work?

A. Yes, in 2002 I was awarded the Environmental Merit Award by the New Mexico Department of Energy, Minerals and Natural Resources.

Q. Is a copy of your resume included attached behind Tab 8?

A. Yes.

Q. Are you a member of the industry committee that developed the proposed amendments to the Pit Rule?

A. Yes, I was. I served as chair of the NMOGA Pit Rule committee.

Q. When was the committee formed?

A. We started in 2010 reviewing the recommended modifications to the Pit Rule.

Q. Were you also a member of the second committee, the Joint Committee between NMOGA and IPA

New Mexico that further proposed revisions to the rule?

A. Yes. In 2011 we made a decision to combine some of our forces together with IPANM to look at further concerns that were outside of the NMOGA membership with the IPANM membership and address those also in the rule.

Q. Since that time have you been further involved with the development of this proposal?

A. Yes, I have.

Q. How were you involved?

A. We worked on further modifications. We based our comments and recommendations on the various operators and proposed that to OCD in January.

Q. As chairman of that committee, are you here to identify and review the remaining revisions that are being proposed to the Pit Rule?

A. Yes, I would like to try to do that.

Q. Have you prepared exhibits for prepare takings in this hearing?

A. Yes.

Q. Are they contained in PowerPoint slides?

A. Yes, they are.

Q. Are hard copies of the exhibits contained

in NMOGA's exhibit book?

A. Yes, they are.

Q. Before we get into the slides, were you present at yesterday's hearing?

A. Yes, I was.

Q. And were you hearing when it was discovered that there is a discrepancy or a hole in the proposal when we are talking about regulating below-grade tanks and sumps?

A. Yes, I was.

Q. Could you refer to Page 1 of Exhibit A? Would you review for us -- go to the definition of the below-grade tank and explain how that term is defined?

A. Referring to Page 1 under Definition B, "Below-grade tank means a vessel with greater than 500 gallon capacity excluding sumps and pressurized pipeline drip traps, installed within an excavation or buried below the surrounding ground surface's elevation. Below-grade tank does not include an above-ground storage tank that is located above or at the surrounding ground surface's elevation as surrounded by berms."

Q. This provides the definition of the below-grade tank contains more than 500 gallons; is

that right?

A. That is correct.

Q. What does the definition of sump provide in terms of the capacity? And the definition of sumps is on Page 3.

A. If I can I will read the definition. It says, "Sump means a subgrade impermeable vessel that is partially burden in the ground, is in contact with the ground surface or is a collection device incorporated within a secondary containment system with a capacity less than or equal to 500 gallons which remains predominantly empty, serves as a drain or receptacle for de minimis releases on an intermittent basis and is not used to store, treat, dispose of or evaporate products or wastes. Buckets, pails, drip pans or similar vessels that are not in contact with the ground surface are not sumps."

Q. When you compare these regulations, is there any regulation under this rule that would be applicable to a below-grade tank that contains less than 500 gallons?

A. No, there's not.

Q. Have you reviewed the problem with NMOGA?

A. Yes, I have.

Q. Does NMOGA have a recommended modification to address the problem?

A. We believe so. We would like to recommend that the definition of below-grade tank is changed to release the capacity to five barrels.

Q. Why did you select five barrels?

A. We believe five barrels is addressed under the present NMOGA guidelines for spills and remediation, and five barrels is a minor release under those guidelines.

Q. And if you have a spill of less than five barrels, are you required to report that?

A. No, you are not.

Q. So by changing this definition, would all below-grade tanks be subject to regulation and disclosure of any release in excess of the limits contained in the rules of the Oil Conservation Division?

A. We believe that any release above five barrels is a reportable release and we believe this language would solve the issue of not having those regulated vessels with quantities less than that.

Q. Would the change you are recommending in the definition result in an overlap or inconsistency with the definition of sump?

A. Repeat the question.
Q. Does this definition create an overlap or inconsistency with the definition of sump?
A. It does, but it differs in the function of a sump.
Q. What is the function of the sump?
A. It's not intended for permanent storage.
Q. Below-grade tank --
A. It predominantly stays empty.
Q. Could a below-grade tank be used as a sump?
A. Yes, it could.
Q. Let's go to rest of your testimony. Previous witnesses have discussed permitting, siting, closure, below-grade tanks and multi-well fluid management. What are the topics you plan to discuss today?
A. Under which question? I'm sorry?
Q. I asked you if you could identify for the Commission the modifications that you are going to cover today.
A. I'm sorry, yes. We are going to talk about the permitting and the registration. We are going to talk about design criteria and I'm also going to talk a little bit about operational

requirements, about exceptions and variances and permit approval.

Q. Let's go to the first slide, which is Slide 9-2. Could you identify this and review it, please?

A. Yes. It has to deal with permitting and registration of closed-loop systems and sumps.

Q. Are these provisions from the proposed modification to the rule?

A. Yes, they are.

Q. Would you go to the first slide and review that for the commissioners. Explain what that shows.

A. Yes, it shows the excluded from permitting and registration requirements for closed-loop systems. It also talks about the notification or construction or use of closed-loop systems.

Q. Now, excluding closed-loop systems from permitting and registration, are we recommending that the OCD not regulate these closed-loop systems?

A. No, we are not.

Q. What do they require an operator to do if he intends to use a closed-loop system?

A. This allows the operators to continue to use the closed-loop systems without obtaining a

permit, and we feel like this verbiage also streamlines the process for the operators who are using the closed-loop system. And that permitting at times can be an unnecessary part of paperwork and could also be a stop in the system of getting those systems up and going.

Q. Before an operator installs a closed-loop system, are they required to notify the Oil Conservation Division?

A. Yes.

Q. How do they do that?

A. I believe we have a next slide talking about it. We have to do it on a C 101 or C 102 form from the Division or from the BLM.

Q. That is the provision set forth on the first slide?

A. Yes.

Q. Okay. Could you summarize the rules and explain what the rules as modified would require an operator to do who proposes to use a closed-loop system?

A. Of course. They have to notify the OCD or BLM. They must use appropriate engineering principles and practices and follow the applicable manufacturer's requirements or equivalent to that.

They are not required to stockpile topsoil because no topsoil is being used in a closed-loop system and it's also not subject -- wouldn't be subject to signing requirements.

Q. When we come to closure and site reclamation, the requirements for temporary pits, do these also apply to drilling pads and tanks that are used with the closed-loop system?

A. As far as closure?

Q. Closure and site reclamation?

A. Site reclamation? It would not in the case of using a closed-loop system in itself.

Q. But when we talk about a temporary pit?

A. You would.

Q. Do those temporary pits standards also apply when we are enclosing drying pads?

A. They do.

Q. And these have previously been reviewed by Bruce Gantner; is that correct?

A. That is correct.

Q. I would like you to go to the definition of temporary pit on Exhibit A, Page 3. Would you read the last sentence for us, please.

A. On Page 3 under Temporary Pit, it says, "Temporary pits may be used for one or more wells

and located either on-site or off-site of a well drilling location. Any freshwater containment structure such as a pond, pit or other impoundment is not a temporary pit."

Q. When we look at the last sentence, there were questions concerning what actually would fall within the purview of that sentence, whether it was treated waters. Is NMOGA prepared to recommend an amendment to that language to hopefully clarify that situation?

A. Yes. I think we noted yesterday that Commissioner Bailey had concerns about what kinds of water would be going into those pits, and we felt like it was part of our responsibility to address that and so we tried to do that. How we are doing that is we would like to add language replacing some of that that says so long as it does not include produced water.

Q. So at the end of the last sentence you would add the words "so long as it does not include or contain produced water"?

A. That's correct.

Q. That, you believe, would clarify?

A. We believe it would clarify.

Q. And produced water is a defined term in

the rules?

A. It is.

Q. Let's go now to temporary pits. I would ask you to turn to Slide 9-3. This slide addresses the determination of groundwater when siting a temporary pit. What is the change?

A. What it does change here is in instances -- it says when filing applications for temporary pits we have a determination, a responsibility to determine what the depth the groundwater is based on the data that's generated in several different ways: Through models, cathodic well lithology, published information or other tools as approved by the appropriate division district office. What this is doing is we are trying to address situations where information may not be available, readily available through all of these other examples that we first given. So that's what we are trying to do there, to make sure that we have done everything possible to determine what that depth the groundwater is, because we realize the importance of the siting in relationship to depth of groundwater.

Q. When you are trying to determine the depth of groundwater, you may have site-specific data; is

that correct?

A. Yes.

Q. And if you do not, then you would be able to use any of these other methods if approved by the division?

A. Yes. And emphasis on those -- that information must be approved by the division district office.

Q. Let's go to the next slide, 9-4. What does this change, this recommended change in the rule accomplish?

A. Well, the amendment also authorizes the use of standardized plans for pit construction, pit closure, and these plans remain approved until a subsequent plan is required or requested by the OCD office.

Q. So that once you have an approved plan, if you are siting another temporary pit you would be able to refer to the plan that's on file instead of developing an individual plan for each individual location?

A. That will remain in effect at the district level as an approved plan.

Q. If we go to Page 7 of Exhibit A, there are changes that relate to the provisions on how we file

closure plans. Could you review the proposed modifications that are set out on that page?

A. Sure. The plans submitted with an application or registration are to be filed with appropriate division district office. Not in Santa Fe. This deletes the requirements for filing closure plans under the transitional provisions of the 2008 rule, which has now expired. It also eliminates requirement for filing of other methods for closure on the chance the plan filed does not satisfy the rules' closure standards.

The idea we have done for this is that a plan remains in effect until such time that that district division office makes a determination that the plan is no longer an approved closure method, okay? So what we are trying to do then is then we would give the operator the opportunity to submit an alternate appropriate plan to the district division office for approval for that specific site. Before what we had to do is submit a plan along with backup plans, and we felt like this is just unnecessary, which could be not appropriate for the situation at the time the pit is constructed. So we felt like this was a better way to eliminate excess paperwork until the situation arises that requires that type

of an action.

Q. And the changes here really are just a change in the filing of the closure plan from the Santa Fe office to the district office?

A. And also not --

Q. An alternative plan --

A. Right. Not submitting an alternative plan or plans with the applicant.

Q. Let's look at the design criteria and the changes that have not yet been discussed in this section of the proposed rule. I would ask you to refer to what is marked Exhibit 9-5. These are two changes and I think you previously mentioned them, but this is actually the section of the rule that sets them out. Just state what they are.

A. Closed-loop system and sumps are not required to stockpile soil because there's not a need. Most of the time the reason for the stockpiled soil is in the instance of a temporary pit. When the pit is removed it's not there permanently, it's removed, then the stockpiled soil is used in the remediation project of the disturbed area.

Also the closed-loop systems and sumps are not subject to signing requirements for a couple

reasons. For the main reason, closed-loop systems are above-ground systems that would be very difficult for anyone to -- or anything to try to get into that could read a sign, and those are generally manned 24 hours a day during the drilling operation. The sumps, of course, would be considered because they do not hold fluid. They are not designed to hold fluid, and they are also very small in quantity.

Q. Let's go to Page 13 of Exhibit A and there are a couple of changes that were not previously discussed in the design specifications. The first is in Section D on Page 13 as relates to fencing. Can you explain that?

A. Yes, sir. It changes the wording on below-grade tanks. Fencing shall deter in lieu of the wording that says prevent unauthorized access, and it also states that it requires that fencing requirement apply only to homes, schools and et cetera that are occupied. We feel like this is basically a common sense type verbiage change that -- it's really hard to challenge, I should say, to construct a fence that would prevent anything from getting through it or under it or over it, so we felt like the verbiage of deter was more

appropriate for the situation. And also requiring fencing in an area such as homes and schools that are described in the rule, there would not be a need for those types of extensive fencing in areas where there were possibly vacated homes or schools or people would not be present that would present a risk factor there.

Q. Now let's move to Page 14. Page 14 we have Temporary Pits, Design and Construction Requirements. Paragraph 2, there's a deletion of the language concerning the slope of the sides of the pits and we have deleted the provision that says two horizontal feet to one vertical foot and replaced it with additional language. Would you explain that?

A. Yes. It's a true standard. This is an effort to achieve in the construction of the pit, which Mr. Lane referred to a little bit earlier in his testimony. I just heard that the main idea here is to construct a pit in a manner and also the slopes, to not place any undue stress upon the liner. That's the main focus is we want to do that. So this is an attempt to reach that standard, and we feel like there's a better way to address this.

Q. The standard is avoiding undue stress?

A. Undue stress. The main idea of the rule is to avoid undue stress upon the liner.

Q. Two horizontal feet to one vertical foot is simply an attempt to respect that?

A. That is true.

Q. What we are using is the true standard instead of one method to get to that standard?

A. That's correct.

Q. Let's go to Page 15. I direct you to Subparagraph 7 at the top of the page talking about anchoring the edges of liners and it provides "The liner trench shall be at least 18 inches deep" and we are proposing that the language be provided that provides "unless bedrock provides equivalent anchoring." Can you explain that please?

A. I think in a situation where you would not be able to go 18 inches per se below the grade to anchor your liner and you did happen to encounter bedrock, the option would be that you could use various methods of anchoring to the bedrock that would provide an equivalent or up to the standard required for anchoring that liner actually to the bedrock itself.

Q. When you do that, you could achieve the objective that's properly anchoring the liner by

anchoring into the rock itself?

A. Exactly.

Q. Let's go to Page 17. Mr. Fanning, on Page 17, Section H there are changes to the title and some deletions. Could you explain those?

A. The title emphasizes the drying pads and we deleted what we did to try to remove some of the redundant language.

Q. This is a wording change?

A. Just a wording change, no substantive.

Q. Let's go to operational requirements, and I would ask you to refer to Slide 9-6.

A. This slide speaks to operational requirements, notification of penetration or compromise of the liner integrity pertaining to the notice of leaks or penetration of the pit liners, and that's how that's required pursuant to the release to notify the division office.

Q. Changes require that an operator not just notify the division but also initiate a repair?

A. That's correct. It requires us to initiate that repair and liner replacement if necessary within 48 hours of the time we notify the district. It also amends the notice requirements in this rule.

Q. The amendment to the notice requirement refers to and makes this rule subject to the general requirements of OCD notification rules; is that correct?

A. That is exactly why we did that, yes.

Q. Would you refer to Slide 9-7 and explain what those notification rules actually are.

A. They require immediate verbal notice and timely written notice of a major release and a timely written notice of a minor release in a situation where there's five to 25 barrels or greater than 50 MCF but less than 500 MCF, and these are in accordance also with the present OCD guidelines pertaining to spills, releases.

Q. So basically we are making these rules subject to the general release notification rules?

A. Right. That's our intention, to conform to all of the notice requirements throughout the rule. We have tried to do that in compliance with general OCD rules to bring that consistency together. Also the notice will be provided in accordance with what SOPA also sets forth in that rule.

Q. Now, if we go to Page 22. There is a provision that deletes the requirement in the

existing rule to maintain an oil-absorbent boom on the site. That's the deleted Subparagraph 8 towards the bottom of the page. Why is that change recommended?

A. The way the rule is written, if in this situation there happens to be a quantity of oil which would occur on the surface of a temporary pit or a multi-use pit, it's required that we immediately remove those quantities and also a boom provides challenges from time to time, as far as being the correct device to use to remove those quantities and there's better ways to do that, such as with a truck, a vacuum truck to suck that quantity off and things like that. Immediately a device that could remove those quantities of oil from the surface and take them properly to dispose of or disposition of those quantities of oil instead of having a boom that has to be handled by other folks that could possibly pose some type of a hazard or a risk to those folks having to do that. It's just there are better ways in the oil field that we remove oil from the surface of water and impoundments. We do it in other situations where we have releases that we do those kinds of things.

Q. Is an oil-absorbent boom, in your opinion,

unnecessary?

A. It's unnecessary. If there's noted visible hydrocarbons on there, the boom would not do anything but just, in my opinion, hamper the process of removing the oil properly and taking it to a proper disposal or disposition site.

Q. Let's look at Slide 9-8. This sets out operational requirements for temporary pits. There was a question yesterday about whether or not only fluids would go into one of these pits. Is that addressed by the first sentence here?

A. "Disposal of Solids and Completion Fluid in Drilling Pits. Deletion of Requirement for Steel Tank for Hydrocarbon-based Drilling Fluids." That's what the section pertains to.

Q. So the rule has been -- the proposed amendment recognizes there will be solids and completion fluids that get into these pits?

A. Into temporarily drilling pits, yes.

Q. And then explain the reason for deleting the requirement for requiring the completion fluids be in steel tanks, oil-based.

A. We believe that the occurrence of a completion fluids in the pits do not pose a risk. A pit, a temporary pit is a short-term residency in

the pit, and if it doesn't meet the closure standards once those contents are sampled of the pit before closure, then the closure requirements that pertain to temporary pits, if there's anything there such as high levels of hydrocarbons, then those materials would have to be removed and disposed of at an alternative site. That's the reason we changed it.

Q. These fluids, oil-based fluids would have a short-term residency in the pit?

A. Yes, they would.

Q. And they are going to be removed if the standards are not met in a short period of time?

A. If the standards are not met for the siting criteria in the contents of the pits, those contents would have to be removed and disposed of at an alternative site.

Q. If the closure requirements are met do you see any risk to human health, the environment or --

A. No, I do not.

Q. If we look at Page 23 of the proposed revisions, NMOGA has maybe recommended under Subparagraph 2 at the top of the page the phrase "under normal operating circumstances." The proposal would read, "Under normal operating

circumstances, the operator shall maintain at least two feet of freeboard for a temporary pit." Maybe the question should be what is an abnormal operating circumstance to which this would apply?

A. From time to time in a drilling process, as much technology is applied and as hard as we try to see and plan for unexpected events, there possibly could be what we refer to in the oil field as a kick, which means that we would encounter an unknown section of higher pressures than we anticipated or fluid flows. And that is one of the reasons that a temporary pit is highly important to an operation in the oil field in drilling a well is this would allow a place with a two-foot of freeboard for the fluids to return to. In the situation of a kick, it would refer to something that would be an abnormal situation, a situation that we had not planned for or expected.

Q. Let's go to the next subparagraph, Subparagraph 3. Now, there are two changes that are being proposed. First is that the inspection of temporary pits shall no longer be required weekly but monthly. Why is that?

A. What we are trying to do here is to make sure that we are being reasonable in the

expectations and the operations of what we are doing in the field. There are areas in the northwest due to weather situations that we may not be able to get to in that time. And also we have heard from previous testimony that when we ask for a variance or an exception, sometimes that can take an extended period of time. So with the idea that we recommend monthly inspections, it means that the industry is trying to be more realistic in what we do on a day-to-day basis out there, but at the same time provide a time frame that we feel like still provides protection.

Q. Will other witnesses testify to the impact on risk that this change might have?

A. Yes.

Q. This provision also provides -- or this change in this paragraph, Paragraph 3 on Page 23 -- also provides that the operator -- it deletes the requirements that the operator file a copy of the log with the appropriate district office when they close the temporary pit. This is the log that evidences inspection. Why is that change?

A. Just another chain of unnecessary paperwork that we feel like if it's required by the division that it's upon the operator's

responsibility to produce that documentation so it doesn't keep the operator from having the responsibility of looking after the pit or also documenting what they find at the pit. It just deletes the one step of having to produce another piece of paper at the OCD. If there was something that comes up, then they can request that because it is required we keep that on file.

Q. So you maintain it still?

A. We maintain it still.

Q. You keep it still?

A. It streamlines the process.

Q. If the OCD wants it, it's available for inspection?

A. That's correct.

Q. Let's go to Slide 9-9. This slide sets forth another change in the operational requirements and it expands the time for free liquids to remain in the pit from 30 days to 60 days. What's the reason behind this change?

A. The 60-day requirement?

Q. Yes.

A. As I said before, there are areas in the northwest that from time to time due to weather, it makes it difficult for them to be able to get into

within that short period of time, the 30-day window. We also have issues as far as equipment availability, such as in the southeast it's very busy. From time to time it's hard for us to get folks out there to take those fluids off.

Also the time about asking for a variance or exception to this. Most of the producers and operators that we discussed this rule-making with felt comfortable with that time frame and being able to accomplish the goals of removing those fluids within that time but felt like it was too tight of a window at 30 days to do that. It doesn't say that you can't remove those fluids before 60 days; it just says it gives you an opportunity to work up until 60 days to do that.

Q. Mr. Fanning, yesterday there was concern during the presentation of confusion about the timing on how long you had to close a temporary pit. Would you look at the definition of temporary pit on Page 3, Exhibit A or Attachment A. That definition deletes the phrase, pursuant to NMOGA's recommendation, that the pit will hold liquids and deletes the provision "for less than six months." Do you see that?

A. Yes, I do.

Q. Under the definition of temporary pit then, the time for removing fluids from a pit is no longer set forth in the verbiage, correct?

A. Correct.

Q. Let's go to Page 37 of the draft. I direct your attention to Subparagraph 5 towards the bottom of the page. Do you see that?

A. Yes, I do.

Q. What does that provide in terms of the time for the closing of the temporary pit? What does it require?

A. It says, "An operator shall close any other permitted temporary pit within six months from the date the operator releases the drilling or workover rig. The operator shall note the date of the drilling or workover rig's release on Form C 105 or 103 filed with the division upon the well's or workover's completion. The appropriate division district office may grant an extension not to exceed three months."

Q. So although this proposal deletes the six-month provision in the definition, you find it again in this section, do you not?

A. Yes.

Q. If we look down, we get in the next

paragraph, we talk about a drying pad used for a closed-loop system. Again, this sets a time frame of six months for closure following the release of the rig; is that right?

A. That's correct.

Q. If we go to the next page we find in the multi-well fluid management pit there's a provision for removing fluids six months. This one is discussed earlier tied to the use of the wells identified in the pit; is that right?

A. That's correct.

Q. Each of these three sections we have just looked at also provides that the district office can grant an extension not to exceed either three months in the terms of temporary pits or six months in regard to the other. Do you see those? Does this pose a problem for operators?

A. It does.

Q. What is the problem posed by the limit on the extension?

A. Well, there's a couple problems. The first problem is when does the time start? The second thing is it may be too short even with an extension.

Q. What could cause that? Why might it be

too short?

A. There's several factors that could pose, as far as the timing, such as stipulations that we have already upon us as an industry as operations in certain areas in compliance with timing stips for wildlife, et cetera, where we are not able to go into an area and do any operations during those periods of time. So what would happen is if something stopped about the same time concurrently with when those stipulations came in, it might make it virtually impossible for us to go in and do that.

The other thing is, as I mentioned before, not as much in the southeast as in the northwest, but weather conditions could just be prohibitive to allow an operator to get in and do those kinds of things.

Q. Instead of trying in a rule to anticipate every possibility, this rule contains a variance provision, does it not?

A. That was the purpose for the variance.

Q. How would you recommend that each of these three paragraphs be revised so that they can deal with individual site-specific situations that relate to the closure date?

A. Our recommendation would be to delete the

language that pertains to anything such as a limitation of six months or three months within the rule and possibly replace that with a variance pursuant to 19.15.17.15 as we describe under the variance system.

Q. So how would the last sentence read in each of the rules?

A. It would read with the addition of a variance pursuant to that section, 19.15.17.15.

Q. So what it would say is the appropriate division district office may grant the variance pursuant to 19.15.17.15?

A. That's correct.

Q. Would that avoid all of these situations and enable the Oil Conservation Division, if there is weather or closure or something of that nature, to adjust the variance and the time for closure to meet the facts of the situation under the variance provision?

A. It would give the operator the opportunity to work with the division, to come up with an agreeable solution to extending the time of removing the fluids.

Q. Does NMOGA recommend that the rule be modified in this fashion as to Subparagraphs 5, 6

and 8 on Pages 37 and 38 of the draft?

A. Yes, we do.

Q. Let's go to the next slide, 9-11. Easy slide. What does it provide?

A. I don't think that's 9-11.

Q. I'm sorry, 9-10?

A. No changes in emergency action.

Q. Let's go to the next slide. Let's look at Slides 9-11 and 9-12 together, and I would ask you to review for the Commission the proposed exception and variance provisions.

A. It actually says, "Exceptions obtained from the Environmental Bureau in Santa Fe. Notice is provided to surface owner and persons who have filed a written request with the division to be notified of the filing of such applications. Variances are obtained from the appropriate division district office and notice is provided to the surface owner."

Q. So you have two routes. One is coming to the Santa Fe office for an exception and providing notice to both surface owners and individuals who request to be notified. The variances are at the district level.

A. That is correct.

Q. And again, notice to the surface owner?
A. That's correct.
Q. How do you go about obtaining one of these? Let's go to the next slide.
A. Okay. As it says in the slide, "the operator may request an exception or variance. If the operator demonstrates that the request provides better or equal protection to the freshwater, public health and safety, livestock and the environment, the Agency shall approve the application within 60 days. If there is agency denial or no action in 60 days, the operator may request a hearing. The application must meet requirements set out in the modifications concerning notice and contain a written explanation of the needed and justification for the requested variance or modification. If there's an objection to a request for an exception or variance and the director determines the objection has merit, the application may be set for hearing."
Q. Has the Oil Conservation Division proposed also a similar section for modification or variance and exception to the rule?
A. They are the same.
Q. They are exactly the same?

A. Yes.

Q. Has the Independent Petroleum Association proposed a similar provision concerning exceptions and variances?

A. Yes.

Q. And are they exactly the same?

A. Yes, basically they are the same.

Q. Well, do the Independent Petroleum Association proposed modifications address public safety and livestock?

A. Well, NMOGA added provisions that require the revised section to also provide that the requested exception is protective of public safety and livestock, and we did this at the request of the cattle growers because that was a concern of theirs. We also provide that when an operator files a request for hearing that the notice be provided to the surface owner of the location of the requested variance.

Q. Do you believe that if this provision governing exception to variance is adopted it would avoid some problems like Williams or WPX have experienced in trying to seek an exception?

A. Yes, that's our intent.

Q. Let's go to Page 47 of Attachment A.

There is no slide for this. On this page we have language relating to permit approvals, conditions, denials, revocations, suspensions, modifications of a permit. Would you refer to -- I think we ought to start, Mr. Fanning, with Subpart B. We will go to A afterwards but explain what the proposed changes are intended to do.

A. Subpart B, what we are trying to say is within ten business days of receipt of the application, the appropriate division office will rule the application administratively complete or provide written notice of deficiencies to the applicant's signator.

Q. What happens if there is no notice of the division within ten business days?

A. Then the application will be considered complete.

Q. Now, let's go to Part A and see what the second part of this is. Could you review that?

A. "The division must act on an administratively complete application within 30 days or application is deemed approved."

Q. Now, what is the purpose of this?

A. The purpose? The purpose is that we get an answer.

Q. Trying to avoid delays?
A. Avoid delay.
Q. What are you trying to avoid with all of this?
A. What we are trying to do is avoid instances such as Mr. Lane spoke about where we were hanging in space for a long time without an answer on what we need to do.
Q. How does this proposal from NMOGA differ from the modifications and proposals filed by the Oil Conservation Division?
A. We believe that this one gives us a time frame in which we would get a definitive answer to the situation.
Q. Did the OCD expand the time frame from ten days to 30 days on the rule of completeness?
A. Yes.
Q. Instead of deeming an application approved, if we don't hear from the OCD they believe it should be denied?
A. That's correct.
Q. What's the problem it raises?
A. The problem is that when we get to hearing there's a possibility that we have no idea why the application has been denied.

Q. And you believe if there's a denial you should know why?

A. We would like to know why we are being denied so we could possibly correct the situation.

Q. Mr. Fanning, you have the task of trying to kind of pick up the loose ends for everybody here. But if the modifications, the revisions that you have been discussing here today are adopted, do you believe it will make the Pit Rule easier for operators to comply with?

A. I sincerely believe that, that that was the underlying reason why we took on this great task is to make it easier for not only the operator and the OCD itself but also to provide an economical benefit to the industry.

Q. Would amendment of the rule as proposed result in a more efficient process managing these pits?

A. That's our intent and that's what we hope would happen.

Q. You're not qualified as an expert?

A. No, I'm not.

Q. There will be expert witnesses called who can discuss the risk associated with any of the changes?

A. That's correct.
Q. Your purpose here was to identify the changes?
A. That's correct.
Q. And speak for NMOGA on the proposed modifications and attempting to address concerns?
A. That is correct.
Q. Were NMOGA Exhibits 8 and 9 prepared by you or at your direction?
A. Yes, they were.
MR. CARR: If the please the Commission, at this time we move the admission into evidence of NMOGA Exhibits 8 and 9.
MR. JANTZ: No objection.
MS. GERHOLT: No objection.
MS. FOSTER: No objection.
MR. DANGLER: No objection.
CHAIRPERSON BAILEY: So admitted.
MR. CARR: That concludes my direct examination.
(Note: Exhibits 8 and 9 admitted.
CHAIRWOMAN BAILEY: I think we should delay cross-examination until after lunch. At this time we will take a break to address any kind of public comments from people who have signed on the

sign-in sheet in back so that we are able to have any public comments. No one has signed up for public comments this morning so we will try again this afternoon before we break for the day. We might as well go ahead and have an early lunch and return here by a quarter to 1:00.

(Note: The hearing stood in recess at 12:40 to 1:45.)

CHAIRWOMAN BAILEY: We will go back on the record. Mr. Fanning had just completed his direct testimony and it was time for cross-examination. Ms. Foster, do you have any questions of this witness?

MS. FOSTER: I do, Madam Chairwoman. Thank you.

CROSS-EXAMINATION

BY MS. FOSTER

Q. Good afternoon, Mr. Fanning.

A. Good afternoon.

Q. Just a few quick questions. I would like to direct you to NMOGA Attachment A Page 3, the definition of temporary pit.

A. You did say Page 3?

Q. Yes, of Attachment A.

A. Okay.

Q. Looking at that definition, it now has deleted the less than six months and states that it will be closed in less than one year. Do you see that in the definition section there?

A. Yes, I do.

Q. Could you please give me what would be considered the born-on date for a temporary pit, I guess, for the born-on date? When would your year start effectively?

A. That's a good question. We have struggled with that issue on numerous occasions of whether that would be the actual stud date or when the fluids would go in the pit. I'm not sure we have an answer to that.

Q. So giving you a hypothetical, if you get your permit, say, January 1, you go out and build the pit location on or about January 1, there is a requirement that you have to get that you basically need to get started before July 1 because you have to close the pit within a year; is that correct?

A. Correct.

Q. And you also have a six-month provision that's later on in the rule that Mr. Carr pointed to; is that correct?

A. That's correct.

Q. What was the six-month provision for?
A. The six-month provision was for the closure period.
Q. Right.
A. Yes. Then we also added language that would allow us to ask for a variance to that number.
Q. Right. And we will talk about the variance in a second. But the way that the rule now stands, if you start your well, spud your well after June 1, you effectively could put yourself out of that one-year time period, correct?
A. That's correct.
Q. And what you are saying is you would have to go to the OCD for variance if you are outside of the one-year period?
A. The way I understand it.
Q. Now, would NMOGA be opposed to adding the language "from the spud date," for example, after the one year, so it would state the pit will be closed in less than one year from the spud date? If you were add that to the definition for clarity?
A. I do not see a problem with that.
Q. Thank you. Now, the variance section, which is Section 17.15 starting on Page 43, I would like to talk to you about that. Now, the language,

the definition of exception as variance is new proposed by NMOGA; is that correct?

A. That's correct.

Q. And a variance means authorization from the appropriate division district office to depart from the requirements of basically the entire Pit Rule, correct?

A. That's correct.

Q. Now, it also states that -- who has the burden to demonstrate whether a variance is appropriate?

A. The operator can apply to the division requesting a variance, okay? It is appropriate that they will approve or disapprove the variance from the district level.

Q. So the operator is the one that is applying for the variance?

A. That is correct.

Q. And, therefore, in Subsection B-2 the operator must demonstrate a list of items there?

A. They must show, yes, the reason for requesting the variance. They must demonstrate is that in their request.

Q. Now, it states that the operator has the burden of demonstrating the requested variance

provides equal or better protection to freshwater, public health and safety, livestock and the environment, correct?

A. Correct.

Q. Now, where did you get this language, the protection of freshwater, public health and safety, livestock and the environment?

A. This is standard language that was used in the prior rule with the exception of livestock. We actually added that upon the request in cooperation with the cattle growers.

Q. Now, you do the regulatory work for Yates Corporation, you said?

A. Yes.

Q. And are you aware of the Oil and Gas Act?

A. Yes.

Q. And are you aware of the statutory requirements that the OCD has under the Oil and Gas Act?

A. Yes.

Q. And what is the basic primary statutory responsibility of the OCD?

A. Well, I'm not an expert in that but I believe the basis of that is the prevention of waste.

Q. And protection of correlative rights?
A. And protection of correlative rights.
Q. There's also an enumerated section that has, I believe, 22 different authorities of the OCD, correct?
A. I'm sorry, but I can't remember all of them.
Q. Would reasonable protection of freshwater, would that be one of the responsibilities of the OCD?
A. I can't remember that in the Act.
Q. How about protection of public health and the environment? Is that one of the requirements?
A. I don't remember that in the Act.
Q. And are you aware if there's any protection requirements for livestock in the Oil and Gas Act?
A. I don't remember that.
Q. Now, you said that you were with Game and Fish?
A. Yes.
Q. If there is a livestock that's hurt out on location, does that come under the jurisdiction of the Game and Fish or the OCD?
A. Repeat the question.

Q. If there's a complaint about an animal hurt out on the range, does that come out under OCD jurisdiction?

A. No.

Q. No? Okay. So the word livestock here that you added in B-2 was at the request of the cattle growers, but you don't know if it's an authority given under the Oil and Gas Act?

A. That's true.

Q. What about public safety?

A. I'm not aware of that being in the Act.

Q. Demonstration of public safety, what would an operator need to show for a demonstration of public safety?

A. In my definition?

Q. As you interpret it.

A. As I interpret it, I think we would take measures to ensure that the public was given a degree of protection in various ways, depending on the situation and the circumstances.

Q. Now, wouldn't that be --

A. It's discretionary.

Q. Wouldn't that be similar to what would be required by OSHA regs?

A. It could be.

Q. Now, under section B-3A, the other thing that the operator must do is provide proof of notification to the surface owner of the location, correct?

A. That's what it says.

Q. Do you know how many times the word "variance" comes up in the proposed NMOGA proposal?

A. No, I do not.

Q. And are you aware of how many times there is the opportunity for the division to approve an alternative plan?

A. No.

Q. Which would effectively be a variance, correct?

A. I do not.

Q. When you say notification to the surface owner, how do you envision notifying the surface owner?

A. How do I envision?

Q. Yes, under this provision.

A. I envision a certified mail possibly.

Q. Certified letter?

A. Certified letter.

Q. So the surface owner?

A. Return receipt possibly. Personal contact

with documentation.

Q. Okay. And what is your time frame in terms of response or notification to that surface owner?

A. We don't have that built into that.

Q. And which surface owner would you be notifying? Say, for example, you are on BLM land?

A. BLM land, we would be notifying the BLM.

Q. What about if you were on private land with multiple owners?

A. That would be a question that I would have to refer to the Land Department within our own company to answer because we do that on several situations. We have to notify those and I'm not familiar with how we do that process.

Q. What about on State Land Office land?

A. I would notify the State Land Commissioner's Office.

Q. What if there's a grazing in the area you are actually operating on that surface. Would you have to notify that person as well?

A. I believe this verbiage says the surface owner of location listed only. It doesn't say anything about the lessee.

Q. Now, you spent obviously a lot of time

rewriting the rule and working with both IPANM and NMOGA.

A. A substantial amount.

Q. And wouldn't it be accurate to say that this OCD rule is to establish conduct by an operator as pertains to the OCD in regulating sumps and closed-loop systems?

A. Yes.

Q. So the relationship that an operator has under this rule is with the OCD; is that correct?

A. For the most part, yes.

Q. But under this provision, are you not bringing in a surface owner into possible regulatory decision for a variance?

A. I don't think it requires approval of the surface owner. I think it only requires notification of the surface owner.

Q. Well, what about if the surface owner is notified and they are upset or they want to have some kind of say on what you're asking for in the variance?

A. Depends on the situation.

Q. So it's a subjective issue?

A. Yes.

Q. Would that not cause delay to an operator

if the surface owner is upset or wants to get involved?

A. It has the potential.

Q. Now, you are familiar with the Surface Owner's Protection Act?

A. Yes.

Q. Under the Surface Owner's Protection Act is there not a provision that states that an operator must try to get a surface use agreement with a surface owner?

A. That's correct.

Q. What happens if they cannot achieve a surface agreement with the surface owner?

A. I don't know the details of that.

Q. Is there not a bonding provision?

A. Three a bonding provision.

Q. And the bonding provision is in the instance if an agreement cannot be reached between the operator and the surface owner, correct?

A. That's what I understand. That's not my expertise. I have limited knowledge of the process but that's what I understand.

Q. But getting back to involvement of the surface owner, giving you a hypothetical where you have an operator who has tried to get a surface use

agreement with a surface observer, has not been able to do so and had to bond over and has to go ask for a variance, a change in the siting requirement or something under this proposal, do you think that the surface owner would cause any problems for the operator?

A. I think it goes back to the same thing I said earlier, that this rule only asks that we notify the surface owner. It doesn't necessarily say we have to have approval, agreement or disagreement with the surface owner.

Q. Now, in terms of approval of the variance by your district employee, district office employee, is there a time frame for a response?

A. It says they shall approve a variance in 60 days under 2.

Q. If they don't approve in 60 days what happens to the operator?

A. Then the operator may file an application for hearing with the division.

Q. How long does it take to get a hearing in front of the division?

A. There's not a set time.

Q. Not a set time, so there's no end date?

A. That's correct.

Q. And if you are a small operator, do you have multiple investors generally in your projects?

A. We would like to.

Q. And wouldn't it be advisable to try to have those multiple investors know when they are going to get the best return on their money?

A. We like to do that.

Q. Looking at Subsection 17.12, which is under the general specifications, I would like to talk to you about A 4, which is the liner integrity question. Page 22 of NMOGA Attachment A. NMOGA actually changed the language. Previously it stated that the operator shall notify the appropriate division district office within 48 hours of discovery, correct?

A. That's correct.

Q. And you added the words "shall initiate repair of the damage effectively within 48 hours."

A. That's correct.

Q. And then you added a provision there to seek a variance.

A. Yes.

Q. When is it that an operator would be asking for a variance in this provision that you changed?

A. I'm not sure.

Q. So how is it that an operator would initiate repair? Is that a phone call that you would make to the OCD in notification?

A. Generally speaking, just from my experience dealing with spills or releases is that it can be done in a couple of ways: Immediate notification by phone. Also a follow-up with an E-mail or direct conversation with an OCD division representative.

Q. So how is that different from just notification the way the rule was previously?

A. In saying that to notify the division office within 48 hours of discovery.

Q. Versus --

A. I think the things that were changed, I think it was just basically a language change where it said that we included the initiate the repair of the damage or the replacement of the liner. All of that in my copy is italicized in blue, within 48 hours or seek a variance, and the words "seek a variance" was added to that.

Q. Right. I'm asking you why, if initiate repair is basically communicating with the OCD, notifying them under the spill rule if you meet the

requirements, why is it that you would need to ask for a variance if you are just initiating repair?

A. I'm not sure.

Q. Would NMOGA be opposed to taking out "or seek a variance in the appropriate division office"? Let me throw it out and I guess you can think about it.

A. I'm not prepared to answer that.

Q. Okay. I will talk to counsel afterwards. I have no further questions.

CHAIRWOMAN BAILEY: Thank you. Mr. Jantz.

CROSS-EXAMINATION

BY MR. JANTZ

Q. Could I have Slide 9-2? Good afternoon, Mr. Fanning.

A. How are you?

Q. Well, thank you. So when you are talking about closed-loop systems here, the notification, it says, "Closed-loop systems shall use appropriate engineering principles and practices." Could you tell me what appropriate means? It's not in the definition section, is it?

A. I'm sorry, let me ask -- sometimes I have a hard time hearing and I apologize. What was your question about appropriate engineering?

Q. In the use of appropriate engineering principles and practices, is appropriate defined in the definition section?

A. I do not recall it being defined in there.

Q. Could you tell me what appropriate means then?

A. The intent of that is that appropriate to the liner manufacturer's specifications.

Q. What about for the closed-loop system generally?

A. For the closed-loop system?

Q. Yes.

A. The manufacturer of the closed-loop system would actually have operating standards how to operate that equipment.

Q. Basically you go by the user manual essentially?

A. That's correct. The way I understand it.

Q. Okay.

A. I'm not a drilling engineer and I'm not -- that's not my expertise but that's the way I understand from just knowing what goes on on the drilling rig.

Q. Let's go to the next slide or actually -- yeah, the next slide. So this has to do with the

information that's put into the permit application for pits. And in lieu of actual site-specific information, this rule would allow for pre-existing information to be used; is that understanding correct?

A. Yes.

Q. So it could be based on data generated by the models from the operator?

A. Yes. It could be from the operator or it could be from a contractor of the operator.

Q. Okay.

A. But it's provided by the operator, yes.

Q. And published information are things like monographs, geological monographs? Is that fair?

A. Could be various sources.

Q. All you're looking for there is depth of groundwater; is that right?

A. That's correct.

Q. Doesn't include pre-mining groundwater quality?

A. No.

Q. Doesn't include pre-mining site-specific soil quality?

A. It's possible.

Q. If it's already published?

A. If it's already published.
Q. For that specific site?
A. Correct.
Q. And for that specific site it doesn't include necessarily information about confining layers or the specific geology of the ground underneath the pit; is that right?
A. That would not be specifically -- but it may be part of the information to make that determination.
Q. Okay.
A. It could be.
Q. All right. Next slide, please, 9-4. This has to do with the standardized plan. Is it my understanding that if an operator submits a standardized plan for temporary pits -- for permanent pits, that that plan governs how the operator will build pits throughout that district, assuming he or she sticks to the standardized plan; is that right?
A. I do not believe that it applies through the whole district. It would depend on siting qualifications of that particular situation. It possibly could mean that, but it doesn't necessarily mean it would apply through the whole district.

There may be different circumstances in different situations where a different type of plan would be required for the construction of that pit, just for general location of where it was.

Q. Okay.

A. But, you know, for instance if you have hard rock, if you have, you know, just different situations on how you might have to construct the pit differently than what your plant says for that specific site.

Q. Is it fair to say that the standardized plan is like the default?

A. The standardized plan would be the plan you would use normally in situations unless you had an abstract situation that would require a different plan.

Q. So the operator submits a standardized plan to the district. That's the defaults. Anticipating a pit varying from the standardized plan, then you go to the district again?

A. Go to the district.

Q. What exactly -- how detailed are these plans? What goes into the plan, a standardized plan? Could you give me an example of what a standardized plan might look like?

A. I have never done a standardized plan myself so I couldn't answer that question.

Q. So going to the next slide, 9-5, the B subsection eliminates the requirement that closed-loop systems are required to stockpile topsoil; is that right?

A. That's correct.

Q. What happens if you have to level ground to put a closed-loop level on a site? Would you stockpile topsoil in that case for reclamation or not?

A. Each individual situation would have its own individual set of circumstances and we would just have to weigh those in the construction of that site.

Q. So it would be up to the operator about whether --

A. It would be up to the operator whether or not you would utilize the topsoil to do that or not. In reclamation, you would just have to look at all of the different circumstances surrounding that site.

Q. Can we go to Slide 9-8, Temporary Pits. Now, I think this is actually in the rules themselves. It talks about undue stress on a liner.

The liners are supposed to be installed without putting undue stress on the liner?

A. Yes.

Q. What does undue stress mean? That's not defined in the definition section, is it?

A. Undue stress would be in a situation where you might see protrusions coming from improper installation of having like rocks or other things behind the liner. Also if the liner was not installed correctly it could actually cause a stress on the -- just like you would take a plastic bag or something like that and pull it and see that stress point on it. That's what you want to prevent.

Q. So that's sort of a performance standard?

A. That's a performance standard, sure.

Q. And a lot of these seem to be performance standards like in the fencing section, whatever deters entrance into the pad site, that's a performance standard as well?

A. Yes.

Q. In terms of anchoring the pit liners, you talk about if you hit bedrock above 18 inches, the liner is supposed to be anchored to the bedrock.

A. I believe I stated that it could be.

Q. Could be. All right. So let's assume

that it is anchored to the bedrock. How are those usually anchored?

A. Personally, we have never done that. I have never experienced that. I only know from talking to the liner people how there are possibilities that you could do that.

Q. Could you describe what those might be?

A. Possibly you could have some type of a rock-type anchor where you would actually bore a hole into the rock and put a device in there that you could actually attach to the liner or put through the liner in some way that would hold that in place. In fact, in operations that would have to go through the liner manufacturer itself and to the standard uses of the liner and how you would install it.

Q. So going back to the bedrock situation, assume that you encounter bedrock. Could you even drill a pit in that situation or make a pit?

A. It would probably be questionable.

Q. That makes sense.

A. But I have seen occasions when we did have to do that.

Q. How did that work?

A. Now, that was under the prior -- that was

before Pit Rule 17.

Q. That was under old Rule 50?

A. Yes, that would before closed-loop systems were thought about in New Mexico.

Q. You mentioned in your testimony about the temporary pit closure that the completion fluids in a temporary pit don't pose a risk. How did you arrive at that conclusion? Because you weren't qualified as an expert.

A. That's true. The statement made that completion fluids do not pose a risk? The reason I said that was because for the most part, all the fluids will be removed from that pit before closure so they don't pose a risk.

Q. Assuming that everything goes as planned? There's no leaks in the liner, the leaks are detected, situations like that?

A. That could be a correct assumption.

Q. Sure. So let's go to Page 23 of Attachment A in NMOGA Exhibit 1. Subsection 3, you deleted "The operator shall file a copy of the log with the appropriate division district office." You testified that you still have to keep the log; is that right?

A. That is correct.

Q. You also testified that the purpose of eliminating that provision would be to minimize paperwork? Did I hear that right?

A. On the division.

Q. On the division. So really wouldn't it be a division thing to testify to?

A. They could.

Q. Okay. If an operator keeps that information, could somebody from the public get that information?

A. No.

Q. So I couldn't come to the Yates office and say, "Hey, Jerry, I would love to see your inspection log for your temporary pit such and such well"?

A. My suggestion would be for them to go to the district.

Q. So the public would have to go to the district to get to you or an operator?

A. I'm not an expert but that's the way I see the process working.

Q. Okay. So I think that the next line of questioning is going to go to the exceptions and variances. So there's a notice requirement and Ms. Foster talked about this some, a notice

requirement to surface owners when an exception is requested; is that right?

A. The variance requested -- I believe that's what Ms. Foster asked was in the case of a variance.

Q. Is that right that there's notices provided to the surface owner both in terms of exceptions and variances, right?

A. Why he.

Q. It's my understanding there's not a notice provision for pit closures; is that right? For closure of a pit?

A. To who?

Q. To a surface owner, I'm sorry.

A. Not to the surface owner.

Q. So why have the notice to the surface owner in the variance and exceptions section but not the closure section? What's the distinction?

A. The distinction is it would be something that would not be a usual practice as described within the rule or possibly within the -- there would be a potential for it to go outside of maybe what the original surface owner agreement was, which might be between the company and the surface owner. There could be. There could be. There are surface agreements between surface owners and companies and

for unforeseen circumstances that may happen beyond that. Then it would be behooving to the company to let the surface owner know of that change.

Q. Let's go next to Slide 9-12. You say or NMOGA says, "If the operator demonstrates that the request provides equal or better protection for freshwater, public safety, livestock and environment, the Agency shall approve the variance application within 60 days." What's the standard for that? You have to show by what, a preponderance of the evidence, beyond a reasonable doubt? I just want to get a sense of what you envision the standard for providing equal or better protection might be.

A. I think it says what it says.

Q. How many variances has Yates applied for since the Pit Rule?

A. There has not been an opportunity to apply under the present rule.

Q. Yates has never done that?

A. The present rule doesn't provide for variances. It only provides for exceptions.

Q. How many exceptions have you applied for?

A. We have not applied for any.

Q. You have not applied for any?

A. No, we have not.

Q. Okay. Let's go to the permit approval information. The Oil Conservation Division proposed changes to the NMOGA amendment; is that right, with respect to Section 16, the permit approval section?

A. Yes.

Q. And you disagree with those changes; is that right? Is that a fair statement or fair characterization of your testimony?

A. May I look at the section?

Q. Please.

A. What Page are you on?

Q. Page 47 of Attachment A, and I believe the OCD's --

MS. GERHOLT: On Page 47 of OCD modifications to NMOGA's modifications.

A. Do you mind repeating your question?

Q. Yes. I wondered if it was a fair characterization of your testimony on direct that you disagreed with the OCD's proposed changes, specifically the change that required an automatic denial if the OCD didn't act on the permit application within 30 days?

A. That's correct.

Q. The rationale is you wouldn't know why the

denial was given?

A. That's correct.

Q. Couldn't you just ask the OCD to provide a written determination?

A. I guess that would be possible.

Q. Okay. And if none was given, couldn't you appeal that decision to the Oil Conservation Commission?

A. I'm not aware that we could.

Q. That is sort of a legal conclusion.

A. It is.

Q. Regulations will speak for themselves.

A. That's not my expertise.

Q. Thank you. Appreciate it.

CHAIRWOMAN BAILEY: Ms. Gerholt?

MS. GERHOLT: May I please sit by Ms. Davidson for this questioning? I have to spread out a little bit.

CHAIRWOMAN BAILEY: Yes.

CROSS-EXAMINATION

BY MS. GERHOLT

Q. Good afternoon, Mr. Fanning.

A. Good afternoon.

Q. How are you doing?

A. Fine, thank you.

Q. If I could please point you to the OCD witness notebook that I handed you a little bit earlier and draw your attention to OCD Exhibit No. 2 and specifically Page 22.

A. Okay. I have that page.

Q. All right. Drawing your attention to 19.15.17.12, Operational Requirements, NMOGA has proposed to initiate repair or replacement of a liner; is that correct?

A. That is correct.

Q. And according to the exhibit before you, OCD's proposed language requires an operator to repair or replace the liner within 48 hours, does it not?

A. I'm sorry, which section are you looking at there in your exhibit?

Q. In my exhibit it will be the bubble to the right.

A. Okay. That's what I read.

Q. Very good, Mr. Fanning. What does NMOGA mean by initiate?

A. To begin.

Q. Would they begin with a phone call or actually be out on the ground repairing?

A. The way I visualize it, it could possibly

be both.

Q. Would you agree that OCD's language of requiring repair or replacement or seeking a variance if you can't repair or replace within the time frame is clearer?

A. Maybe I'm missing something, but I don't see that big a difference.

Q. Okay.

A. I just don't.

Q. If you don't --

A. That's just my own observation.

Q. Okay. If I could then draw your attention to Page 42 of the Oil Conservation Division exhibits. Page 42 of NMOGA's Attachment A.

A. Under Emergency Action?

Q. Yes, sir. And specifically Paragraph B. NMOGA has deleted "during an emergency" and has inserted "an emergency pit," is that correct?

A. That's correct.

Q. And I understand that you are not an attorney and I'm not trying to trick you, but if I could now draw your attention to Paragraph E of the same section.

A. Yes.

Q. Emergency Pits. And the first sentence

states that 19.15.17.14 does not authorize construction or use of an emergency pit as defined, and it should be Subsection G; is that correct? Is that what the sentence states?

A. I'm not familiar with Subsection G of Section 14.

Q. Of Section 17.7?

A. I mean 17.14. I don't have a G on my sheet.

Q. That's correct, because it goes on to say Subsection G, 19.15.17.7. Part of what the New Mexico register requires of us is to write things not terribly clear when we are referencing the rule. Nevertheless, I would submit to you that emergency pit is defined in 17.7 G and that definition is "An emergency pit is a pit that is constructed as a precautionary measure to contain the spill in the event of a release."

A. Okay.

Q. This is one of those odd drafting issues. So within 17.14, Paragraph B NMOGA has inserted the allowance of constructing an emergency pit, but Paragraph E says you can't construct an emergency pit. If I could now have you turn your attention to OCD's exhibit, Page 42, our Paragraph B --

A. B as in boy?

Q. Yes, sir. You will see that the Oil Conservation Division has reinserted a pit during an emergency. Do you see that?

A. I do.

Q. Would you agree that by the Oil Conservation Division reinserting that language that it does allow an operator in certain circumstances to actually construct a pit during a course of an emergency, which I would believe is what NMOGA is seeking to do; is that correct?

A. That's the way I see that.

Q. So just a technical language differential?

A. I'm not an attorney. I think that would be between Legal to discuss that language.

Q. Very good. Thank you. If I could now draw your attention to Page 43 and it will be Page 43 of Attachment A as well as Page had 43 of the OCD's exhibit. They are the same.

A. Okay.

Q. Specifically drawing your attention to Paragraph B-2, so B as in boy, Paragraph 2. This paragraph requires an operator to make certain demonstrations to the district; is that correct?

A. Yes.

Q. And one of these demonstrations is that the public is safe; is that correct?

A. That is correct.

Q. And you have been a member of NMOGA for several years. You have also worked for Yates for several years; is that correct?

A. That's correct.

Q. Based on your experience, do you know of any operator who does not want the public to be safe?

A. No, I do not.

Q. Do you believe the inclusion of public safety is a reasonable requirement for the operator to demonstrate?

A. The requirement of the operator to provide or to demonstrate?

Q. Well, how the language is written is it states that an operator demonstrates to the appropriate division district office. So they would demonstrate that their proposed variance is protective of all of these things, including public safety; that you are not going to be drilling in a schoolyard, for instance.

A. You're asking for a personal opinion or industry opinion?

Q. Your personal opinion.

A. My personal opinion is you are never wrong doing the right thing.

Q. And the burden is upon the operator in requesting the variance, correct?

A. Yes.

Q. If the operator can't prove the variance is protective, the district office won't grant it, yes?

A. I would hope the operator had enough sense that if he couldn't do that, he wouldn't even ask.

Q. I agree with you.

A. Okay.

Q. But if the district office denies the variance, the operator has the right to go to hearing, correct?

A. That's correct.

Q. That's laid out in Paragraph B-3?

A. That's correct.

Q. Now if I could draw your attention -- just for clarification point, Paragraph B-3, that's the operator's right to hearing for a variance, correct?

A. That's correct.

Q. And if the operator submits an application for a hearing, they have to follow certain --

according to the language of this rule, the last sentence, "In addition to the information required by Subsection A of 19.15.4.8, the application shall also include proof of notification to the surface owner, the location of the requested variance," is that correct?

A. That's correct.

Q. If I could now draw your attention to Page 47. Specifically looking at Paragraphs A and B, and if you have Page 47 in both NMOGA and OCD in front of you.

A. I do.

Q. I appreciate your patience. If I understood you correctly on direct, you stated NMOGA's purpose in setting forth the time frames was to avoid delays and get answers; is that correct?

A. That is correct.

Q. Currently Southeast New Mexico is experiencing a boom, is it not?

A. Yes, it is.

Q. And OCD has two districts in the southeast. We have one in Hobbs and one in Artesia?

A. That's correct.

Q. Have you had a chance to work with these districts?

A. Yes, I have.
Q. And in working with these districts and in working with the division generally, have you had the opportunity to submit a C 144?
A. No, I do not do that. That's not in my duties.
Q. It's not part of your duties?
A. Not part of my duties with Yates.
Q. Does the current Pit Rule have a provision for multi-well fluid management pits?
A. No, it does not.
Q. And were you present when Mr. Lane testified there are currently no multi-well fluid management pits within the state of New Mexico?
A. I was present when he testified. I don't remember him specifically saying that but I was here when he testified.
Q. Do you know of any multi-well fluid management pits within the state?
A. No, I do not.
Q. And would you say that NMOGA has done its best to set forth your requirements for multi-well pits within its proposed rule? Do you believe that NMOGA has done its best job setting out the requirements?

A. Yes, I believe so.
Q. But there currently are no multi-well pits in New Mexico so there's no model for the Division to look at currently because there's nothing in the current rule either, correct?
A. Model within the State of New Mexico?
MR. CARR: I'm going to object. I think we are getting beyond the scope of direct.
MS. GERHOLT: I have one follow-up question. It was laying foundation. I will get completely back to the permit rule now.
Q. Would it be reasonable that some of these permits might be more complex, that the Division needs additional time to review the permits?
A. I do not know.
Q. You do not know --
A. I do not know.
Q. -- if that's reasonable or not?
A. I don't know if that's reasonable or not.
Q. In addition to the time frames, NMOGA's other change is that they want after a 40-day time period for the application to be approved; is that correct? If there's been no response from the Division?
A. Yes.

Q. And when Ms. Foster was asking you questions, she spoke of all the duties that the Division has, correct?

A. Yes.

Q. And one of those is to protect the environment, correct?

A. I don't remember that part of it. She said -- as far as the division, as far as the protect correlative rights?

Q. Right.

A. And prevent waste.

Q. And then we have other statutory authorities, correct?

A. I think she had 22 of them. I don't remember them.

Q. No --

A. I think that's what she referred to. I remember her referring to 22.

Q. That's correct.

A. I do remember that. I'm old but I can remember that.

Q. So given that the Division has certain requirements, and if the Division failed to meet the time frames, it would then be the Division who would have to explain to the examiners why they didn't do

something as set out in the rule, correct?

A. I'm not aware of your process. If you would tell me that was the case, I would assume that would be the case.

Q. But given that there's the potential of complexity of permits, that additional time may be necessary?

A. That I don't know.

Q. And as Mr. Jantz pointed out, there could always be some communication between the districts and the operators?

A. There could be.

Q. I have no further questions.

CHAIRWOMAN BAILEY: Mr. Dangler?

CROSS-EXAMINATION

BY MR. DANGLER

Q. Good afternoon again.

A. How are you?

Q. Let me just touch the horse that's been beaten a little bit and then get off of it. On Page 47, the concept of the 30-day turn-around.

A. Yes, sir.

Q. Just to take note of some just general facts, you may be aware we have lost something like 60,000 State employees and public employees in the

last recession, some figure like that. Are you aware of that?

A. No, sir, I'm not.

Q. And the oil field hasn't been losing people because the oil field is booming but, in fact, state government in New Mexico has shrunk. Are you aware of that?

A. Yes. I do not know to what extent but from what I have read, there are less state employees than there were previously.

MR. CARR: I don't see how this relates to the direct testimony. Maybe he can connect it for us.

MR. DANGLER: May I respond?

CHAIRWOMAN BAILEY: Yes.

MR. DANGLER: Thank you. I think when a suggestion is made that Administration can turn around a document in 30 days, it does open the question of adequate staffing and that's really what I'm raising.

CHAIRWOMAN BAILEY: Objection is overruled.

MR. DANGLER: Thank you.

Q. So given that there are less staff, is there a suggestion from NMOGA of additional staffing

for OCD to try to meet this kind of quick turn-around?

A. We are not making that suggestion.

Q. Now, if I can go to Page 22, and really this is just one small point, but I was intrigued that NMOGA is suggesting cutting out Point 8, "The operator shall install or maintain on-site an oil-absorbent boom or other device to contain and remove oil from the pit's surface."Do you remember testifying that on direct?

A. Yes, sir; I remember that.

Q. As I understood your direct testimony, and let me just make sure I understood it, you were saying no, we don't need a boom in a lot of situations. We have other methods of taking care of that problem. Is that fair?

A. That is.

Q. And I think you mentioned like a truck that might suck the material out. And I have several questions about it just seems like a small thing to eliminate. Do you have any idea what the cost of a boom is?

A. No, I do not.

Q. Do you know if they can be moved from site to site?

A. Yes, they can.

Q. Do you have any idea what the transport cost is moving that boom from site to site?

A. No, I do not.

Q. So you were aware there was kind of a boom shortage in the Gulf accident?

A. No, I was not aware of that.

Q. Wouldn't surprise you that --

A. It would not surprise me considering the magnitude of the release there.

Q. In fact, they were working overtime in the companies trying to make booms to supply it?

A. I wasn't aware of that.

Q. So it might be precautionary -- can you see a precautionary value in having a boom?

A. Not really. Different volume.

Q. Yes, very definitely different volumes. Are booms at all useful at the site as it is? Are they ever used?

A. I do not have permanent knowledge of that.

Q. Okay. So it might be that a boom is useful under certain circumstances?

A. It was in the situation of the Gulf spill.

Q. Besides the question of cost, which I wonder in a cost method analysis how much it cost, I

thought the point that you were making is you could do other things besides use a boom to clean this up.

A. Yes.

Q. And I'm drawing your attention to this language not as a lawyer but just as a regular human being. Doesn't it appear that it says "or other device besides boom" in the language as it's written?

A. Yes, it does.

Q. Okay. So wouldn't that allow you to have an explanation of another device that you use on-site like a truck?

A. I think the key phrase is that it says "a boom or other device that the operator shall install."

Q. As I understand it -- again, I'm not messing with you too much -- it says "shall install or maintain on-site," doesn't it? So isn't --

A. The deleted language says, "The operator shall install or maintain on-site an oil-absorbent boom or other device to contain and remove oil from the pit's surface," which to me implies that whatever you do, you have to have that on-site at all times.

Q. Yes, it does imply there has to be

something on-site: A mop, a bucket, some device to contain or maintain that would meet that in at inspection, right?

A. I'm not sure a mop or bucket would be appropriate.

Q. Might not be to contain that?

A. Might not be.

Q. But there is a flexibility in this particular wording, is there not, for you to have alternative methods of containing it?

A. On-site.

Q. On-site. So is the problem that you don't want to have something on-site?

A. I think the situation of having something on-site such as that requires other -- there's other aspects to that such as maintenance of that device, whatever it might be. Or just the sheer fact that -- don't take this in any way wrong because I don't want any of my roughneck friends to throw me in the river, but at the same time it's a very complex operation out there, and to keep track of a device like that, to make sure that it's maintained at all times could have a strong potential of -- because it's not something that's used in the everyday operation -- of maybe being misplaced, not

being properly maintained and things such as that. There's a potential for that.

Q. All of that makes perfect sense to me, and that's why I have a concern that there's a potential that when that's being maintained off-site that you lose a lot of time getting it there and you may suffer additional damage in that period of time. The risk of it. For the same reasons you stated, that there's a risk of having it on-site; is that correct?

A. That's a potential.

Q. You are not here with a risk assessment on this particular issue or any other that you testified to?

A. No, sir, I'm not.

MR. DANGLER: No further questions. Thank you.

CHAIRWOMAN BAILEY: Dr. Neeper?

CROSS-EXAMINATION

BY MR. NEEPER

Q. Good afternoon.

A. Good afternoon.

Q. You had your slide -- I believe it was Slide 8. This is a very quick question on that. It shows 17.12 B-1, and I know another witness answered

this but I think we want to make the point again. Right at the beginning of the paragraph it says, "Only fluids or solids used or generated." Is it acceptable to you as you represent the rule if that said "only fluids or mineral solids"? What this is doing is totally eliminating buckets, tools and things that I have seen in pits.

A. I think that would be acceptable.

Q. That's acceptable to you? Thank you. You have also testified on variances and exceptions and a question arose through Ms. Foster's questions. Would an exception or variance, as the wording states from the requirements of 19.15.17, does that imply that a variance would apply to the entire rule or does it imply that a variance applies only to the specific conditions the operator requests?

A. Can you repeat the question?

Q. Sure. Does the rule as written for exception or variance imply that the operator may depart from all of the requirements of the rule or only from those specific requirements that the operator specifies? What I'm getting at is the rule doesn't say either way.

A. I think the operator has the opportunity to request the variance for any part of the rule.

Q. But he specifically has to state which part?

A. He has to state which part and he has the burden of proof in requesting that variance, that it is equal to or provides more protection than the rule as written.

Q. So if the language said that the operator may depart from selected requirements of the rule, that will be acceptable language?

A. I'm not sure about that.

Q. Could depart then from specified requirements or requirements he specified?

A. I'm not sure about that either. I think that's a legal definition.

Q. That's a legal question?

A. Yes.

Q. The point has been made and you don't object to the philosophy?

A. I don't object to asking the question.

Q. You indicated an item had been discussed between the industry but no settled answer had been arrived at, and that was a spud date of dating the beginning of a well or pit or the date when an operator puts fluid in, not when it rains in but when the operator first puts fluid in?

A. That was an unanswered question.

Q. Yes. So it is still unanswered even if we made it the date when the operator puts fluid in it?

A. That's still unanswered question.

Q. Thank you. Finally, throughout the rule the term "used spring" is applied in setbacks. That suggests that unused spring has no setback. Is it in any way necessary for the industry that a spring be used before it merits a setback?

A. I don't believe that was within the context of my testimony.

Q. You testified on siting, and this is within the siting rule.

A. Yes, but I don't think that was within the part of the siting that I testified to. I think my testimony was more specific.

Q. That question remains unanswered then?

A. Yes.

Q. Is there a witness who will answer that?

A. Not to my direct knowledge there is not, but I'm not saying that there isn't.

Q. No further questions.

CHAIRWOMAN BAILEY: Mr. Fort?

MR. FORT: I have no questions, Madam Chair.

EXAMINATION BY THE COMMISSION

CHAIRWOMAN BAILEY: Commissioner Balch?

COMMISSIONER BALCH: I have a couple questions. Good afternoon.

THE WITNESS: Good afternoon.

COMMISSIONER BALCH: Referring back to 15.17.12 A-4. I guess this is touched on tangentially on A-4 as well. The removal of notification in A-4 for small breaches --

THE WITNESS: I'm sorry? If you can refer to that, it would help me a lot to be able to answer your question.

COMMISSIONER BALCH: This is 17.12 A-4. "If a pit liner's integrity is compromised, or if any penetration of the liner occurs above the liquid's surface, then the operator shall initiate repair or replacement within 48 hours." It omits the reporting requirement to the division or district office in this version of it. Then in D- 4 --

THE WITNESS: B-4?

COMMISSIONER BALCH: I think it's D 4. No, I'm referring to something else. Let's stick with A-4. Isn't one of the reasons for notification so that if there's a pattern of problems with a

particular pit, that they would be able to observe that pattern? If you're repairing the same pit multiple times in one month and you don't have to report it, could that pose a question about the overall integrity of the pit liner?

THE WITNESS: I guess I am having a hard time understanding your question. But I think that the reason that -- I guess I am having a hard time understanding the point of your question. Are you looking for a pattern with a problem there? Is that what you are asking?

COMMISSIONER BALCH: I think the division would be interested in observing if there was a pattern of problems with a particular pit. If you are not notifying a division, then how would they know if there's a pattern of problems developing?

THE WITNESS: Well, first of all, if the leak occurs above the water line, which I believe that's what it states here, I guess I fail to see an issue with a release occurring because of that. And if a release doesn't occur, then is there a threat from that failure?

COMMISSIONER BALCH: Your opinion is the deletion of the notification is because there's really no point?

THE WITNESS: Because there's no threat. I hope that answered your question.

COMMISSIONER BALCH: I think it did. When we were talking about 17.12 B-2. Under normal operating circumstances you gave the example of a kick which would potentially put the pit out of compliance as far as the freeboard of the pit. I never worked on a rig and I imagine I know what a kick is, but how much of a time span do you anticipate you might have a deviation?

THE WITNESS: Anybody's guess.

COMMISSIONER BALCH: Could be hours, weeks, months?

THE WITNESS: I wouldn't say months. In the situation of a blowout, each situation would be of its own merit. It is an unknown time frame.

COMMISSIONER BALCH: I would like to go back to the question Mr. Jantz raised on 17.11B, stockpiling of topsoil. This is hopefully something that you can educate me on. For lesser impacts such as leveling the ground to move in your closed-loop system or even building a road or a pad, is there any other protection or any other regulations that already address returning the surface to a natural state and maybe the Surface Owner's Protection Act

or another regulation?

A. With the BLM there is.

Q. How about with the State?

A. With the State Land Office, I'm not -- let me qualify that answer. Their standards have been changed and what they have been requesting to be done on-site has been changing as far as reclamation of those sites. So it's an evolving process right now.

Q. For private land it would be --

A. Private land has to do with the agreement with the surface owner. We also in New Mexico, as you are well aware of, we have a split of state issues where we may have federal minerals and private surface and those become challenging from time to time in reclamation because you may have an agreement with the surface owner and BLM may ask you to do something else, so that requires everybody to kind of come to the table and come to an agreement on that.

COMMISSIONER BALCH: Thank you. I think I would like to return, if you don't mind to my first question.

THE WITNESS: That's okay.

COMMISSIONER BALCH: That was having to do

with breaks in the liner above the water line.

THE WITNESS: Above the water line. Okay.

COMMISSIONER BALCH: Is that above the freeboard line or above any water line that could be in the pit? For example, if the pit was half full, the water line could be seven feet from the top of the line?

THE WITNESS: Yes, that's correct.

COMMISSIONER BALCH: If it was full it could be two feet?

THE WITNESS: That's correct.

COMMISSIONER BALCH: So a break in the liner at four feet in a half-full pit could in the future or likely would be in the future underwater?

THE WITNESS: There's potential for that to happen. Yes, there is. That's why the requirement that we built into the rule to immediately address and repair, to prevent an unwanted release to happen.

COMMISSIONER BALCH: Would you be comfortable notifying the division in cases where a penetration of the liner occurred below the freeboard? Above the water line? Say above the freeboard.

THE WITNESS: I'm not prepared to answer

that question right now.

COMMISSIONER BALCH: Thank you.

CHAIRWOMAN BAILEY: Commissioner Bloom?

COMMISSIONER BLOOM: I just want to go back and clarify something. On Page 1, Below-grade Tanks, the suggestion there is to change the 500 gallon capacity to five barrels?

THE WITNESS: That's correct.

COMMISSIONER BLOOM: Page 14 of Attachment A, if you would look at the proposed changes here. "The operator shall design and construct a temporary pit with slopes no steeper than two horizontal feet to one vertical feet." We'll change that to read, "do not place undue stress upon the liner and are consistent with the angle of repose." Can you explain to me -- just start from the beginning -- on why you want to change this?

THE WITNESS: The main reason for changing it is I think to make sure that we have -- if you don't mind me referring back to my notes, but let me look at that real quick.

COMMISSIONER BLOOM: Sure.

THE WITNESS: That we maintain the integrity of the liner. And that we have that consistency there. How the liner is anchored.

Really what's our goal here? Our goal is to make sure that the liner stays intact. So if there are other ways that we can do that and still accomplish the goal of ensuring the integrity of the liner, then that should be acceptable practice.

COMMISSIONER BLOOM: Is it more expensive to have a less steep side? Is it cheaper to have a sheer bank?

THE WITNESS: (Witness shakes head.)

COMMISSIONER BLOOM: No?

THE WITNESS: That I can't -- that I do not know, let me state that.

COMMISSIONER BLOOM: Do you think that maintaining the two to one ratio might make it easier if there's ever a disagreement as to whether the liner is properly installed? Somebody can go out and see that there's clearly a two to one ratio and it's not subjective?

THE WITNESS: I understand your line of questioning. I think the other part of that is that there could also be a discretion of whether or not is that really two to one or is it one and three-quarters or is it one and a half, and it becomes a discretion when really what we are trying to do is accomplish a goal of maintaining the

integrity of the liner where it does not leak. So in different situations, as we have mentioned here, the possibility of alternative ways of doing that, of anchoring that liner, is available to us to do that as long as we know that we are not placing undue stress upon the liner.

And I might expound on that slightly. As an operator, we most certainly have a vested interest in making sure that our liners are installed properly for various reasons, and we don't want to expose ourselves that way, so I, as an operator, would not want to go out and install a liner improperly knowing that I would have problems down the road. This gives us the flexibility to do other things outside of a two to one that would also show equal or greater protection as far as the integrity of the liner.

COMMISSIONER BLOOM: You don't think it would be easier to figure out the geometry and figure out the two to one slope versus having a disagreement with somebody on whether there's a penetration or there's a rock sticking out too far or roots coming in?

THE WITNESS: Like I said, the proper installation is the goal and to not place stress on

the liner.

COMMISSIONER BLOOM: Okay.

THE WITNESS: There may be other ways to do that. That was our goal in putting this language in.

COMMISSIONER BLOOM: Okay. Page 15, No. 7 up above. It talks about anchoring, and the addition there would be, "Unless encountered bedrock provides equivalent anchoring." When I read that closely, I'm not sure that actually says you have to anchor it into the bedrock. It could just be left there. Do you read it that way?

THE WITNESS: The way I read it says unless bedrock provides equivalent anchoring. I think what that means is if that liner can be anchored with that bedrock or in association with the bedrock, it would provide appropriate anchoring that would not put undue stress upon the liner.

COMMISSIONER BLOOM: Do you think we could make it clearer by saying the anchor trench shall be at least 18 inches deep or anchored into bedrock that provides equivalent anchoring?

THE WITNESS: I think the language that we have addresses it properly.

COMMISSIONER BLOOM: I also have some

questions related to Page 22 about the absorbent boom. The booms I remember seeing from the Deepwater Horizon spill, certainly I have never seen those. Can you describe what the booms look like that you used?

THE WITNESS: I have seen several different kinds of things. They are made of different material, different sized diameter, different materials all the way from something that might look like peat moss to cotton. There's all different things.

COMMISSIONER BLOOM: Right. I think I have seen ones that are roundish.

THE WITNESS: All the ones I have seen are round.

COMMISSIONER BLOOM: How are they deployed?

THE WITNESS: I have never deployed one. I only know from watching T.V. probably like you did that they roll them out and floated them around on the surface of the water and pulled them with tugboats. I did see that.

COMMISSIONER BLOOM: You mentioned that you could have a truck come out and do cleanup as well, but that would be cleanup. Isn't the point of

the boom to actually absorb a flow as it's moving and stop it from moving?

THE WITNESS: I think it can be used in both ways. It can be used as an absorbent to take up what fluids are there. It can also be used on the surface of a flowing stream or something else to keep it from moving further down the stream, and I think probably in those situations that might be an appropriate application for a boom in a river or somewhere like that or in a large body of water.

COMMISSIONER BLOOM: What kind of maintenance does a boom require? It looked pretty static to me.

THE WITNESS: They are pretty static. What I perceive happening is that moving from location to location, every 30 days they are going to become torn, they are going to become dirty, lost, misplaced. That's my perception.

COMMISSIONER BLOOM: On Page 23, it's continued over. It's No. 1 continued over from Page 22, you line out "The operator shall use a tank made of steel or other material" -- hold on. I'm not sure where it was, but I believe there was a proposal to allow hydrocarbon-based fluids in the pit, correct?

THE WITNESS: That's correct.

COMMISSIONER BLOOM: Do you know if hydrocarbon-based drilling fluids create any risk or do they a attack the liner at all, do you know?

THE WITNESS: Not that I'm aware of.

COMMISSIONER BLOOM: Because at the same time that we are going to put new things in the pit, you are also asking us to extend the life of the pit as well, correct?

THE WITNESS: Yes.

COMMISSIONER BLOOM: So Page 23 with the logs, you mentioned that the logs would be kept at company headquarters or company office?

THE WITNESS: Correct.

COMMISSIONER BLOOM: Have we seen a lot of acquisitions recently in oil and gas?

THE WITNESS: Yes.

COMMISSIONER BLOOM: Occasional bankruptcy as well?

THE WITNESS: Not personally I haven't seen that.

COMMISSIONER BLOOM: We get a few at this end. That's why I was asking. But is there a chance that during acquisitions or perhaps bankruptcies that these logs could be lost or just

filed away somewhere? Would they always be accessible in the case of acquisition or bankruptcy?

THE WITNESS: I think there's always the potential for paper to be lost.

COMMISSIONER BLOOM: I want to wind it up here. I have a little bit about exception and variances. You mentioned a couple of times that the exception process is slow, but later on in cross-examination you said that Yates had never applied for an exception.

THE WITNESS: That's correct.

COMMISSIONER BLOOM: I think we both heard Mr. Lane say that he dealt with an exception that took eight months.

THE WITNESS: That's correct.

COMMISSIONER BLOOM: Is there any testimony you can think of from the past day and a half, yesterday and today that establishes a pattern of slow exceptions?

THE WITNESS: Only in those references that were made.

COMMISSIONER BLOOM: Do you know if -- you have been working with NMOGA. Do you know if NMOGA has any data on the time that exceptions take?

THE WITNESS: I do not have any firsthand

knowledge of NMOGA having that information.

COMMISSIONER BLOOM: Do you think such information could be useful to us?

THE WITNESS: I do.

COMMISSIONER BLOOM: Do you think there's a chance we could be provided that information?

THE WITNESS: I think there could be a strong chance of providing you with that information.

COMMISSIONER BLOOM: Thank you. Finally, on Page 47 with the permit approvals, I won't repeat Mr. Dangler's line of questioning about shrinking workforce or go into some recent newspaper articles that talked about the limited number of inspectors or OCD staff out in the field, but essentially if permits aren't approved -- was it within 30 days? Then they will be granted automatically? Is that what you are proposing?

THE WITNESS: I believe Ms. Gerholt said 40 days, and I think that's the addition of the numbers possibly could be 40 days, but I would have to look at the section. It's 30 or 40 days.

COMMISSIONER BLOOM: Page 47, yeah. The sentence starts, "If the division does not take action within 30 days of the receipt of the

administratively-approved application, the application shall be deemed approved."

THE WITNESS: That's correct in that situation, yes.

COMMISSIONER BLOOM: Do you have concerns that could ever be abused?

THE WITNESS: In what terms?

COMMISSIONER BLOOM: Could the company maybe even unintentionally at one point in the year just submit a number of applications?

THE WITNESS: To be quite frank with you, I have not thought of that.

COMMISSIONER BLOOM: Could a flood of applications put an agency far behind in their workload?

THE WITNESS: There's always the possibility of that.

COMMISSIONER BLOOM: I think the last thing --

THE WITNESS: We experienced that within our last company so that's how I can relate to that.

COMMISSIONER BLOOM: Lastly, on Page 44, No. 2 at the top, second sentence says, "The division shall send E-mail notice of the filing of the application for exception to the persons who

have filed a written request to be notified." Is that in lieu of the typical certified letter sent out with return receipts?

THE WITNESS: I'm sorry, Commissioner, where are you referring to?

COMMISSIONER BLOOM: Page 44, No. 2, second sentence. I'm not sure I typically see E-mail as a standard for notification under the New Mexico Code. I maybe mistaken. Is this a departure from return receipt certified mail? I can just continue. Did you ever have something filtered out by your spam filter that you should have gotten?

THE WITNESS: Yes.

COMMISSIONER BLOOM: Do you think that could be a concern in this situation?

THE WITNESS: It's possible.

COMMISSIONER BLOOM: Thank you. No further questions.

CHAIRWOMAN BAILEY: Most of my questions were taken but I still do have one. You proposed to change to the definition of below-grade tanks to lower that level to the number of barrels instead of 500 barrels down to gallons. Should there be an equivalent change in the definition of sump so that it is with the capacity less than or equal to five

barrels?

THE WITNESS: I believe that we had stated that sump has the capacity of less than or equal to 500 gallons which remains predominantly empty. I believe that was what we suggested.

CHAIRWOMAN BAILEY: The suggestion was to maintain the 500 gallons for a sump but --

THE WITNESS: You are correct.

CHAIRWOMAN BAILEY: -- five barrels for below-grade tank.

THE WITNESS: You are correct. Because we had no gallons on that because those vessels remained -- and I'm sorry, I didn't clarify the question before I answered. But the reason we put that in there, your request was why would we not put an amount on a sump where we would on a below-grade tank? Because a below-grade tank is primarily used for storage where the sump remains predominantly empty. That was the reason for that, and I apologize for not listening closer to the question.

CHAIRWOMAN BAILEY: Those are all the questions I have. Do you have redirect?

MR. CARR: Yes, I do.

REDIRECT EXAMINATION

BY MR. CARR

Q. Mr. Fanning, in cross-examination from Ms. Foster there were some questions about the Surface Owner Protection Act and needing to bond onto a property and the suggestion that it might be impacted by the variance and exception provisions of what NMOGA is proposing. Do you recall that?

A. I recall something to that effect, yes.

Q. And you are familiar with -- generally familiar with SOPA, are you not?

A. Yes.

Q. That is the statute that governs relationships between operators and landowners?

A. That's my understanding.

Q. That statute allows for you to enter into agreements with landowners that govern a fairly wide variety of things as a condition?

A. In my limited knowledge, yes.

Q. Ms. Foster asked you about them perhaps being able to bond on a property?

A. She did ask that question.

Q. If you file an application as an operator seeking a variance, does that in any way impact your rights under SOPA? Do you know?

A. I do not know.

Q. If you filed an application for a variance

under SOPA and someone objected because they felt it did not provide reasonable protection for groundwater, would you anticipate that matter would be addressed here under the Pit Rule?

A. I would be quite sure that would happen.

Q. Independent of SOPA?

A. Yes.

Q. Mr. Jantz asked you questions about language concerning notification when you are using a below-grade tank, and then he pointed to language that said they are under our proposal and under the rule required to be constructed with appropriate engineering standards. Does that language come from the current rule?

A. I believe it does.

Q. When Mr. Jantz asked you about being able to file standard plans and have them approved by the division, and when he talked about using alternative methods to determine depth to groundwater, each of those things must be approved by the division or they cannot be used?

A. That's exactly correct.

Q. Both Ms. Gerholt and Mr. Jantz said that if you filed an application and you hadn't heard from the OCD, why don't you call them and ask. Do

you know of any better way to ask the OCD for an opinion on what you are proposing by filing a written application?

A. I think it provides clarification for both parties in that case to do it that way.

Q. Now, in questioning from Ms. Gerholt there were questions about multi-well fluid management pits and what standards might be required. You were here for Mr. Lane's testimony, were you not?

A. Yes.

Q. Are you aware of any multi-well fluid management pits that have been approved in New Mexico?

A. No, I am not.

Q. Do you understand that we are probably going to be looking at applications to consider multi-well fluid management pits before the OCD?

A. I do believe that.

Q. Wouldn't you think it appropriate to have some standards or process in place so that we could have a procedure to follow when going to the body to seek approval?

A. I think it would be highly appropriate.

Q. Wouldn't you think this would be the appropriate place to make that decision?

A. Yes, I do.

Q. You had some questions concerning stockpiling top soil with the closed-loop system. When you use the closed-loop system, isn't it usually on the well pad?

A. Yes, it is.

Q. When you complete drilling the well don't you remediate or claim the well pad?

A. We only reclaim the well pad after the life of the well.

Q. Wouldn't you anticipate that when you -- when are you required to reclaim a well site on state land?

A. After the well has been plugged.

Q. What about on federal land?

A. The same way. Now, we do have interim reclamation which occurs for the unused portion of the pad that may have been utilized during the drilling process on BLM.

Q. On BLM?

A. Yes, sir.

Q. Do you not do that on state land?

A. We do from time to time but it's not a required practice.

Q. When we talk about using booms on

locations, in your opinion would it be better to keep these at a central site than to carry them around from location to location?

A. Central site being a relevant term in the oil patch, that could be quite a distance from the location where they might actually be utilized.

Q. As you move them around don't they get damaged and break?

A. There is a high potential, as I think I mentioned in testimony, for that to happen. That's one of the reasons we addressed it like we did in the rule, to try to prevent that from happening and give us a better method of actually accomplishing our goal, which would be to remove the oil from the surface of the pit.

Q. That's all I have.

CHAIRWOMAN BAILEY: You may be excused. Let's take a ten-minute break.

(Note: The hearing stood in recess at 2:22 to 2:38.)

CHAIRWOMAN BAILEY: We are trying to work out continuance into next week. The Commission is available Wednesday, Thursday and Friday if we can figure out what to do with the examiner hearings on Thursday. Are any of the attorneys here part of the

examiner hearings that are docketed for Thursday?

MR. FELDEWERT: I would be happy to speak with my clients to see what the circumstances are with respect to Thursday. I haven't looked at the docket. I think there are a few cases on Thursday's docket.

CHAIRWOMAN BAILEY: Quite a few.

MR. FELDEWERT: Chances are a number of them will get continued anyway, but with some prodding by the Commission perhaps a number of them can be continued.

CHAIRWOMAN BAILEY: And there will not be penalties against the continuance rule. Mr. Jantz, would be available Wednesday, Thursday and Friday of next week?

MR. JANTZ: Yes, Madam Chair, I can be here.

CHAIRWOMAN BAILEY: Dr. Neeper?

MR. NEEPER: Only Monday of next week and then I am absent for two weeks thereafter.

CHAIRWOMAN BAILEY: We will just have to continue our cogitations here then. We will have to get back to you.

MS. FOSTER: In terms of Dr. Neeper's schedule, it is only Tuesday. I would be willing to

delay my opening and putting on my case so Dr. Neeper could get his case on and finished and cross-examined if that would help in terms of scheduling, because I'm available all next week.

CHAIRWOMAN BAILEY: The problem is you would not be able to cross-examine.

MR. NEEPER: That can happen. I would like at least the opportunity to testify, and Monday would be acceptable.

CHAIRWOMAN BAILEY: Wednesday, Thursday and Friday are the days next week that we are all available. Not Monday.

COMMISSIONER BALCH: I think you would be able to give your case this week?

MR. NEEPER: I could testify on Friday of this week if that fits with the schedule.

CHAIRWOMAN BAILEY: Let's see if we can't work this out. Let's proceed.

MR. HISER: Thank you, Madam Chair. Members of the commission, I am Eric Hiser. I'm another of the attorneys for the Oil and Gas Association and I will be leading the direct examination of Dr. Ben Thomas.

BENJAMIN THOMAS

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. HISER

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

A. Yes, I'm Forest Benjamin Thomas, III.

Q. Where do you reside?

A. Houston, Texas.

Q. And could you tell us a little bit about your academic training?

A. Yes. I have a bachelor's degree in biology with a chemistry minor from Tulane University. I got my master's degree and my Ph.D. degree from the University of Texas Graduate School of Biomedical sciences in the field of pathology, which is a fancy way of saying the study of disease processes.

Q. And can you tell us a little bit about your professional background and training?

A. Yes. After I completed my doctorate I was named a Rosalie B. Hite fellow at the M.D. Anderson Hospital and Tumor Institute in Houston where I was doing research on mechanisms of toxicity and carcinogenicity. After completing post-doctoral work, my wife suggested I get a real job. I was

hired by Shell Oil Company and I worked for 12 and a half years at Shell where I was responsible for providing internal consulting with regard to the health effects of chemicals and products that Shell uses or produces.

After twelve and a half years there I was approached by an environmental consulting company to become a regional project manager for toxicology and risk management, and I have been a consultant ever since 1990. Right now I am independent, an independent consultant in Houston and I am kind of toning back the amount of work that I do because of my progressive paralysis here, but in general I am having a good time.

Q. Have you had experience working with petroleum waste characterization assessment?

A. I have. Once I became a consultant, I found that a variety of different groups started to access my expertise, both governmental groups and industry groups and others. I was named, for example, when Congress created what's called The Clean Air Act Amendments of 1990 they created a thing called the National Urban Air Toxic Research Center and I was asked to become a member of their science advisory panel.

The State of Louisiana, the Secretary of Natural Resources retained me to provide them risk assessment guidance with regard to their E & P waste disposal program and so I was the consultant with regard to disposal of waste or treatment of waste for Louisiana's D & R. Did I answer the question?

Q. Do you have similar professional experiences in the area of toxicology and risk management?

A. I do. In addition to my consulting I'm an adjunct professor at the University of Texas Health Science Center where I teach in pathology, toxicology and risk management.

Q. If you look at the NMOGA exhibit book behind Tab 10 there is a document which appears to be a resume. Are you familiar with this document?

A. Yes, I am.

Q. And did you prepare the information on this?

A. Yes, I did.

Q. Is it correct?

A. It is correct.

MR. HISER: I would move the admission then of NMOGA Exhibit No. 10, the resume of Dr. Ben Thomas.

MR. JANTZ: No objection.

MS. GERHOLT: No objection.

MR. FORT: No objection.

DR. NEEPER: No objection.

CHAIRWOMAN BAILEY: It's admitted.

(Note: Exhibit 10 admitted.)

MR. HISER: Thank you. We would tender Dr. Thomas as an expert in the areas of petroleum waste characterization, toxicology and risk assessment.

MR. JANTZ: No objection.

MS. GERHOLT: No objection.

MR. NEEPER: No objection.

CHAIRWOMAN BAILEY: He is admitted.

Q. Dr. Thomas, behind Tab 11 of the NMOGA exhibit book, is there a presentation that you prepared to assist the Commission in understanding some of the issues raised in this rule?

A. I did.

Q. And are you prepared to discuss this specifically?

A. Yes, I am.

MR. HISER: If it please the Commission, what we thought to do is part of the exhibit is a discussion of what Dr. Thomas looked at in terms of

the materials found in the pits. Rather than me asking a lot of questions that takes a lot of time, if it's okay with the Commission I will just have him sort of go through and talk about the different pieces of information he looked at to characterize the petroleum waste issues here, if that pleases the Commission.

CHAIRWOMAN BAILEY: I appreciate the interest in speed.

MR. HISER: Thank you very much.

Q. Dr. Thomas, if we start with your first slide, which is NMOGA Exhibit 11-2. What was the objective that you had as you were evaluating the revisions to the Pit Rule currently being proposed by NMOGA?

A. Well, as you mentioned, I'm an expert in risk assessment/risk management and NMOGA is essentially paying me to give some consideration to the risk issues associated with the proposed provisions of the Pit Rule; in particular, to make sure that they are revisions are reasonable and provide an adequate margin of safety for the public health, the environment and natural resources as stated in the state law.

Q. And one of the steps that you took or that

you evaluate is you look at risk and appropriate regulatory response to risk?

A. There are a couple terms commonly misused and thrown about pretty loosely. One is called risk and the other is hazard. Hazard is defined technically as the ability to cause an adverse effect. Risk is defined technically as the probability of an adverse effect occurring. An example I use when I am giving classes is that you can step out in front of an oncoming bus. That clearly presents the hazard of being injured or killed, but if the bus is five blocks away when you step out in front of it, the risk is small.

Similarly with chemicals. You have got to have an exposure in order to have risk. You can have the world's most toxic chemical, but if there is no exposure there is no risk. It becomes important in the regulatory setting because it is the risk that determines whether or not regulation is warranted. It is not hazard, it's risk. Because the terms get thrown about so loosely, I think it's important to make sure we all have a standard vocabulary.

Q. So as you started your assessment of hazard and risk, did you look at what was possibly

found in the oil and gas pits covered by the proposed revisions of Rule 17, Slide 11-4?

A. I did. Essentially what we have here is a situation where we have got potentially hundreds if not thousands of chemicals present in oil and the various additives and fluids used and so on. So the question immediately came up, which of these chemicals should we spend time looking at? Which ones could really have an impact in terms of public health or environment or natural resources?

So my recommendation to the industry group was we ought to do some chemical analysis. Let's use standard EPA procedures and look at the broad categories of chemicals that are potentially found in these kinds of pits and start to determine just how much of each chemical is there and which of these chemicals are really present at high enough concentration to perhaps warrant regulatory attention.

So there are two analytical programs that were created, one by the industry and one by the OCD. There are significant differences between the two. I'm just briefly going to go through them.

The programs that the industry designed essentially said that we want to collect samples in

the pits. We want to collect -- what we are most concerned with are the pits being closed so let's take the pits that have dewatered and take samples of the solid in the pits. We want to sample at the surface, but because certain things volatilize off, the surface may not give you an accurate reading of what's in the pit. So let's also sample at depth. So there were samples that were collected beneath the surface and so on.

In the OCD program, what they did is they collected surface samples. They collected at the four corners of the pit. My recollection is they then combined those samples together and then analyzed that composite sample there for the chemical analysis. What happened essentially is they now have an average of all the samples. And this one may have been high, this may have been low, this one in between, but by compositing all the samples together, they have essentially gotten an average.

In the industry program, our recommendation was let's not deal with average. Let's deal with individual samples. If I see any analyte from any of the testing that's above a criterion, I want to take a look more closely at

that particular chemical. If it doesn't exceed regulatory criteria, you know, even simple criteria, then I don't need to spend -- I don't think anybody needs to spend time on that particular chemical.

So what we are trying to do is now get some reasonable set of chemicals that gives us a good handle of what's in the pit so if there's any kind of thing, these are the chemicals that we will start to focus our attention on. Make sense?

Q. Dr. Thomas, I look at the slides, just the industry sampling program was done in 2006 and the OCD sampling program approximately a year later. There's been some concern discussed in the hearing about evolutions in drilling practices. Has there been a substantial change in the chemical composition of the fluids that you would expect in the pits between these studies and today?

A. No.

Q. Are the information gathered in the studies in the industry sampling program and what's done in the OCD the type of information that would commonly be relied upon by an expert in the area of waste assessment or toxicology or risk assessment as you're looking at what should be done?

A. Yes.

Q. Why don't you proceed in detail for us a little bit about what you found when you looked at the studies.

A. All right. As I mentioned, the industry program was designed to start to identify either chemicals or classes of chemicals that gave us a way to identify the areas of concern. That's poorly stated, but nonetheless.

One of the first things that we found was total petroleum hydrocarbon. There are a number of ways to define TPH and the preferred way that I have is to combine what's called gasoline-range organics and diesel-range organics. The reason for that is just a general terminology, but gasoline-range organics are essentially hydrocarbons that distill in the range of about 120 degrees to 350 degrees. That's gasoline. Diesel-range organics are generally between 350 and 550 degrees up to 750 degrees Fahrenheit depending on whether they are kerosene diesel or automotive type diesel. So, therefore, diesel-range organics, 350 to 750.

All right. The reason why those are important -- tell you what. Let me tell you that. We have two areas that we were looking at. We had pits in the northwest in the San Juan Basin. Those

pits are primarily for natural gas. I'm sorry, those wells out there in the San Juan are primarily natural gas wells. They generally are drilled to depths of about 1,000 feet. We also had three pits in the southeast of New Mexico, and in those cases those are drilled for oil purposes, often at depths of like 7500 feet beneath the surface. So they differ in the types of fluids that are used and they differ in the types of composition that you might find as a result of the natural gas versus oil production.

Q. So part of the goal of looking at both the northwest and the southeast was to make sure that you had a broad overview of all of the fluids likely to be found?

A. That's correct. Not only that, but you start to realize that things like diesel-range organics are part of the formulation of an oil-based drilling mud; therefore, it's going to be present. Whereas it also could be created from the petroleum that you are extracting from the formation. So, therefore, it may be coming in not as part of the formulation but because you are actually producing oil in the drilling process.

In any case, we had the oil range -- we

had total petroleum hydrocarbons that were present, and what you will see is the OCD had a criterion of 2500 milligrams per kilogram, so I used that as the first screen. Do we have any at all that exceeded that? Sure enough, we found some that exceeded above 2500 milligrams per kilogram. What does that mean? I will talk about that in just a minute.

Essentially for screening purposes, the TPH now felt like as one of the issues or one of the chemicals that I would start to take a look at.

Q. When we talk about total petroleum hydrocarbons you distinguished between gasoline-range organics and diesel-range organics. Is that the sum total of total petroleum hydrocarbons or are there other hydrocarbons as well?

A. There are two other fractions that create the total. There's the oil range organics, which are more like the lubricating oil for automotive type things, and there's the asphaltenes, which you see in asphalt roads and so on. Those tend to be very, very large molecules that don't do anything or go anywhere. So as a result, from what I was seeing here with regard to the industry purposes and OCD's purposes, they really weren't relevant to the

concern.

Q. So in your professional opinion they don't present a human health concern or freshwater concern?

A. Not in any scenarios that I could see in regards to oil type waste.

Q. Were there other constituents of concern?

A. Yes. We had chloride anion. Once again, we didn't really have a lot of criteria but chloride anion is an important analyte and I will get to that in more detail. As we saw in the southeast, there's a substantial amount of chloride anion seen in the southeast in the pits.

Arsenic. Arsenic is not part of an oil-based formulation or drilling E & P formulation but it occurs naturally in the geologic formations being drilled. So arsenic is not uncommon to see.

We didn't see high levels, but we did see some that were larger than what was called the Tier 1 residential SSL or soil screening level, so arsenic now became something that I wanted to identify.

Q. You note here that you didn't believe that it was TCLP hazardous. What does that mean and why is that important for us to understand?

A. EPA -- arsenic is determined in our analytical program as total arsenic. What that means is that they take a sample and they dissolve it in a very, very strong acid so we get the total arsenic concentration. But arsenic is a solid in most cases, and the question is could it possibly be either environmentally mobile or is it possibly that it's toxic. In order for it to be toxic it's got to be absorbable into the body.

So one of the ways that EPA came up with to evaluate those two issues, environmental mobility and bioavailability, was to define an analytical procedure called the toxicity characteristic leaching procedure where they took a weak acid that you might find in the environment, keep the material solid overnight in that thing and then analyze to see how much of it was actually dissolved in the acid. That's called the TCLP.

When we did the analysis on arsenic it was not leachable in the TCLP test. That means it doesn't dissolve in water, even acidic water, and, therefore, it doesn't mobilize in the environment. Likewise, it's not absorbable into the body. So even though arsenic is toxic, it's only toxic if you absorb it into the body.

Q. So this is a case where what you were finding in the pits is this particular arsenic we are seeing here is not bioavailable and is not biomobile?

A. That's correct. Barium. Barium is part of the formulations of drilling waste. It's a weighting agent and often it's barium sulphate that's used. Barium sulphate, as you may know, is what they use in the barium enema, and again, we see the TCLP here. It was not soluble in the TCLP test. Barium sulphate is used for barium enema because it's a great x-ray contrast agent but not absorbed in the body. If you have a soluble form of barium it can be very toxic and fatal, but barium sulphate itself is not. What we have here showed up as an anolyte that exceeded criteria, but when we take a look at it under the TCLP test, not environmentally mobile, not in the form that's environmentally mobile and it's not in the form that's potentially toxic.

Benzene. Benzene is a hydrocarbon that is found in the gas organics. It is of regulatory concern almost always because it is one of the known human carcinogens. As a result, it will normally fall out as that. In the case of Benzene, we had

one sample that showed high levels of Benzene, and the problem is that one particular sample was diluted 1,000 fold, which is much higher dilution than normal in all the other samples. It was this one sample that gave us some concern to the point that we also -- I started to think well, what I am really looking at here is an artifact of the analytical procedure, and the problems that they had with this particular sample, rather than real Benzene. However, nonetheless, it exceeded my criterion and, therefore, as a result Benzene is here. It's part of the list of compounds.

Q. And when you looked at the OCD data, what was different about the materials that were sampled by OCD and did it cause you to reach any opinions?

A. The OCD data are consist with what the industry found. I didn't see any significant differences or new chemicals or anything like that looking at the OCD data. As I mentioned, the OCD data represented an average of the samples that were collected, and I preferred to use the industry data set to make any kind of firm decision rather than OCD. But essentially they were comparable.

Q. Now, did the OCD data set also include the samples from pit liquids whereas the industry

samples were mostly derived or directed at pit solids? Is that correct?

A. Yes, that's correct. It appears that not all the pits that the OCD sampled reached the point of dewatering. They still had some liquids in it, so OCD went out and collected some of the liquids.

Q. So your evaluation has, in fact, looked at both liquid and solid fractions, in effect?

A. They did, yes.

Q. What did you determine were the constituents of concern based upon your review of the data collected both in the industry study and the OCD study? This would be NMOGA Slide 11-11.

A. I think that the industry program gave us a pretty good handle on what types of chemicals were present that now exceeded criteria and, you know, of the several hundred or thousands of chemicals present, there were relatively few high enough concentration even to exceed basic, very conservative screening criteria.

So of those, the TPH or the total petroleum hydrocarbon which as I defined it is a combination of gasoline-range organics plus diesel-range organics, the chloride anion and then Benzene were the three that I identified as being

the ones of concern. I might mention that in the state of Louisiana, it turned out to be Benzene and organic compounds like TRO/DRO that turned out to be the same, so we are getting consistency between the New Mexico data and the Louisiana data.

Q. In addition just to the information that was presented in the industry study and the OCD study, did you consult with the information that you had gone through as part of the Louisiana study and current information that's available to experts of your nature about possibly toxic compounds in pits and drilling fluids?

A. I have done that, yes.

Q. So I believe that your initial testimony was that there are hundreds, if not perhaps thousands of chemicals that are in a pit potentially; is that correct?

A. That's correct.

Q. So it's your opinion then that out of all those chemicals, that these are the three chemicals that are of greatest concern being chloride anion, Benzene and total petroleum hydrocarbons defined as gasoline-range organics and diesel-range organics?

A. From the analytical data we developed, these are the three.

Q. Tell us a little bit more about the specific concerns with each of the three and why they should be of concern to the Commission.

A. With regard to total petroleum hydrocarbon, I told you a little bit about the gasoline-range organics. The gasoline fraction contains the hydrocarbons that are most water soluble. Of those Benzene, Toluene, Ethylbenzene and Xylene are the light aromatics and they tend to be more water soluble than some of the other compounds. Because they are water soluble, if there were ever a release from the pit, then these would be the ones that could get into the water and migrate and, therefore, they become a concern.

The DRO fraction is less water soluble as you can imagine. These are larger molecular weight compounds but they do have some light aromatics. Naphthalene and Methylnaphthalene are diesel-range aromatics that have high water solubility, and because of that, they also are environmentally mobile.

The gasoline-range and diesel-range organics are not so much a concern from the toxicity point of view but they are a concern because they affect the odor and taste of water. So I identify

the hazard. Its the odor and taste type of property that's a concern.

Q. What about for chloride?

A. Chloride anion surprises people when I tell them that it's not toxic. It is not considered to be toxic either in animals or in people. Chloride anion, however, is extremely water soluble, and from the petroleum industry environmental perspective it is a great marker for when you've got a release. And not only that, but by looking at chloride you can also determine that this is the boundary of potential impact. I don't know if that makes sense, but essentially this is very early marker of a release and the potential area that might have been impacted.

Q. So essentially you can use chloride as a way of saying if there has been a release of pit fluids or well fluids, that the chloride is a distinctive signature of that in many cases?

A. That is correct. That is correct. Now, I see in the literature that chloride is often talked about having toxicity to plants, affecting or inhibiting the growth of plants. But when I take a look at the data itself, it's not the chloride per se but it's the salt the chloride form is in.

Sodium chloride is different from magnesium chloride is different from all the other types of salt. And as a result, it's not the chloride, to me at least. It appears to be more of the salt form that really is the thing that affects the toxicity.

Q. In other words the cation more than the anion?

A. That's correct.

Q. I believe that brings you to Benzene.

A. Benzene. As I mentioned Benzene is a component of the light aromatics. It's the most soluble in water, and as a result it's potentially environmentally mobile. I mentioned before that Benzene is a human carcinogen and as a result there's always a concern, and as a result of that we wanted to make sure that Benzene was included among the anolytes that is monitored on a routine basis, and especially if there's a release.

Q. So given that these are the materials that are in the pits, do you believe that it's necessary to comprehensively try to sample for all of the thousands of constituents in the pit or can you choose a couple of indicators of the pit as an appropriate way of trying to address the risk that they provide?

A. Well, from the analytical data we developed, it appears that the only chemicals we need to monitor on a routine basis would be the three that we talked about here.

Q. How does the rule go about trying to address the risks that are presented by these constituents directly and I think indirectly by fluids generally? What steps does it take? How?

A. I'm not sure I understand the question.

Q. Let me rephrase it. How does the Pit Rule and the proposed revisions to the Pit Rule try to address or manage the risks that are being presented by the chloride anion, the possible presence of Benzene and the total petroleum hydrocarbons?

A. You may not like the answer, but I tend to think that both from the industry point of view and OCD's point of view, we are all doing a very poor job of addressing the risks. And that's not to say that the risks are substantial.

One of the recommendations that I had in my prior testimony before the Commission was that nobody is talking with a clear understanding of what the issues are. Do we know who we are trying to protect? From what kind of mechanism, what kind of pathway of exposure and so on. As a result --

because we do not. And I wasn't able to get a clear answer. What we are left with are a lot of conjectures and, you know, fear-mongering type of things and it doesn't allow for really concrete discussion.

The proposed rules from our proposal from NMOGA has a couple of tables that have criteria in there that the industry said we can live with. And I said that's great, but if you really think about it, I was very careful to state that the risk is determined by the potential for exposure. You have got to have a receptor; you have to have a complete pathway for exposure. And the question is, does that exposure result in a level of exposure to a toxicity then high enough to produce an adverse effect? That's the key question from the regulatory point of view. Is the exposure high enough to produce an adverse effect?

When I started to look at the E & P type of things and the various pieces of the Pit Rule, I came to the conclusion that in actual fact we don't have complete pathways of exposure. We have -- in most cases. And when I asked for what is the level of concern, what is the receptor and the pathway of concern, I wasn't able to get good answers either

from OCD or from the industry.

Q. And so if you were to look at this as a risk manager now looking at the pathways of exposure which create the risk, what are the types of pathways that you would be looking at evaluating?

A. Let me answer a little bit different way. As I started to think about a pit, the primary constituents of the pit is bentonite clay. And bentonite is a very fine particle. It's so fine that it's easy to suspend it in water and create what's called a drilling mud. And during the use of the drilling mud you form -- you get little rocks that are formed or created by the drilling operation. You get big rocks, as far as that goes. And the drilling mud will bring that up and put it into the pit and so on.

So suppose that all the drilling is now completed and they are ready to close the pit. Now you have no more circulation of all this mud and all the other things. So gravity starts to now take effect. You have got pits that are lined with geomembranes, all the leak detection systems and so on. You allow gravity to start to settle things, and these rocks, the big rocks settle first followed by smaller particles of sand and grit and so on, and

eventually the bentonite clay particles start to settle out. From the environmental point of view, if you have got a hazardous waste pit, what you do is you create it as build it in clay, because clay doesn't allow anything through. Very low permeability, both water permeability and chemical permeability. So here we have a pit that's now starting to fill with deposits of clay.

So as I look at it, the easiest way to see what's happening is imagine you have a container of ping-pong balls, and over that you now pour the bentonite clay which I assume are like little BBs. They go around and they completely seal the space between the ping-pong balls and you now essentially have clay everywhere. Low permeability clay. In that clay these are the samples that we collected in our industry program. These are the chemicals that were present in that clay. When I looked at it, these are chemicals that are not going anywhere. They are entombed in the clay lining.

Now the question is what do we do with it? Gee-whiz, we put four feet of clean dirt on top of it and then plant it with plants. As a result, the stuff is not even getting direct contact. So when I take a look at the exposure scenarios, somebody has

got to go four feet down before they even contact the clay, and the clay is not going to have a lot of chemicals in it. So as a result, I don't find really compelling argument to say we have got exposure scenarios that are really of concern.

Q. So when you say direct exposure risk, does that mean a person would actually contact the clay or the cuttings or stuff like that with their hands and have the possibility of ingesting it or putting it through their skin?

A. That is one exposure scenario, and that's the one that EPA uses in their most conservative, protective scenario; that you actually have somebody living and contacting the surface and eating the clay every day, every day for their lifetime, 70 years.

Q. Now, there might be some folks that are concerned that water is going to pass through this clay and the cuttings and go down to the groundwater and contaminate the drinking water well. Is that a significant concern in this case?

A. I don't believe so.

Q. Why not?

A. Because the clays are not that permeable. The hydraulic conductivity of clay is so low they

won't go through. Water will tend to form and go down around the clay.

Q. In addition, when you looked at the TCLP test, which I understand is a leaching test, and you combined the effect of the leaching test with the clay with the distance, what does that tell you about what you see in the point of reasonably foreseeable use of the water? Is it going to be a very high concentration of these constituents in there or will it have been reduced from what it would have been when I first disposed of it?

A. May I get you to repeat the question?

Q. You testified that the constituents have settled in the pit so now we have a mixture of drilling muds and cuttings. And we also have in this case the liner and the pit, because the temporary pits have to have liners. You testified there's a very low permeability. I believe you previously testified that for a number of constituents like arsenic and barium they did not appear to leach when subjected to the TCLP test.

A. That's right.

Q. So my question was: Would the concentration of any of these chemicals when you look at them in a reasonably foreseeable place of

use, draw from a well because there's groundwater, would that be lower than it was when I had disposed of it in the pit itself? In other words, is the concentration of the pit higher or lower than the concentration would be in the water?

A. It's going to be higher.

Q. And does that provide additional protection for people who might use that water?

A. Yes.

Q. And what are the steps that the rule has taken as you look at the rule as it stands now and the proposed revisions, to reduce direct exposure risk? Probably the most important one you said was the coverage with the four foot of soil. Are there other steps the rule has taken to deter or prevent direct contact?

A. As I recall, there's also in certain cases a geomembrane put over before the cover. But off the top of my head, I don't think so.

Q. So in summary, as you look at this as a toxicologist and as a risk assessor, do you believe that the proposed revisions of the Pit Rule as proposed by industry are protective?

A. I do.

Q. And are they protective of public health?

A. I do.
Q. What about of the environment?
A. Also protective of the environment.
Q. There's been some concern in cross-examination about drippage and leakage from the equipment going into pits or potentially into below-grade tanks. Do you believe that would introduce any risk over and above or different from the risk you considered in your analysis?
A. No.
Q. Would some of the drippage and leakage been included in the studies conducted?
A. If it occurred, yes.
Q. Even if it had not, would a volume of that in relation to the amounts that we are looking at be of a level that would cause you concern?
A. No. I might mention that the same issue came up in the discussions in Louisiana, and it didn't. It wasn't an issue there.
Q. If you turn to Page 23 of NMOGA's Exhibit 1, which is the text of the proposed revisions, there's been some discussion about a proposed change and allowing of hydrocarbon-based drilling fluids to go into a temporary pit instead of the current rule which is that they have to go into a steel -- a tank

made of steel or other material. Does that change cause you any concern?

A. No.

Q. Why not?

A. A couple reasons. One is that -- well, let me have you repeat the question quickly.

Q. Okay. Does the allowance of hydrocarbon-based drilling fluids to go into a temporary pit instead of keeping them in a tank cause you additional concern?

A. No.

Q. Why not? Why does it not cause you concern?

A. Again, as long as the tank is not leaking there is no -- really no concern. I mean, there's no exposure.

Q. Now, you said tank. We were talking about pits.

A. Pit. Whatever. As I'm trying to think of an exposure scenario that's relevant here, I'm not seeing one that gives me concern.

Q. And then just to back up to your initial assessment is you looked initially at the pit contents basically in an as-disposed mode before we've taking any closure activities rather than

drying. Were the concentrations of the constituents in the pit of such a great height that it gave you significant concern or a little concern about the exposure to it?

A. They actually give me very little concern.

Q. So if we implement these additional measures that are laid out in the rules, things such as fencing, siting restrictions, the closure with four feet of soil across the top, does that reduce your concerns about the exposure potentials?

A. I think so. I think the proposals here are a good balance of function with regard to needing to drill for oil and also protecting the health and safety and environment. I think the requirements as suggested by NMOGA are reasonable.

Q. I guess one final substantive question. If we focus on the chloride, the Benzene, the total petroleum hydrocarbons, do we have a high level of confidence that all the constituents of concern likely would be addressed if those are addressed?

A. Those are the primary ones. I can foresee there could be exposure scenarios where other chemicals could become an issue, but in general, these are the three that we want to make sure we get addressed.

Q. So if you were advising a regulatory body, would you advise them to look for any additional constituents or would these be the three or four that you would recommend?

A. These are the three that I would recommend.

Q. Dr. Thomas, attached to your exhibit book, and I believe this is behind Tab 12, there is a report. Did you prepare this report?

A. I did.

Q. Does this summarize the testimony that you have given for the Commission?

A. It does.

MR. HISER: Madam Chairman, I move to admit Exhibits 11 and 12.

CHAIRWOMAN BAILEY: Do you have an objection?

MR. JANTZ: I do not.

MR. FORT: No.

MS. GERHOLT: No objection.

MS. FOSTER: No objection.

MR. NEEPER: No objection.

CHAIRWOMAN BAILEY: It will be admitted.

(Note: Exhibits 11 and 12 admitted.)

MR. HISER: That completes my

cross-examination of Mr. Thomas.

CHAIRWOMAN BAILEY: Ms. Foster, any questions?

MS. FOSTER: I do not. Thank you.

CHAIRWOMAN BAILEY: Mr. Jantz?

CROSS-EXAMINATION

BY MR. JANTZ

Q. Good afternoon, Dr. Thomas. Good to see you again.

A. Good afternoon.

Q. Let's go back to 2007. You testified in the hearing adopting the Pit Rule; is that correct?

A. 2007?

Q. 2007/2008.

A. Okay.

Q. You did, did you not?

A. I testified before on this, yes.

Q. And you were qualified in that hearing as an expert in toxicology and risk assessment as well?

A. Yes.

Q. You went through a similar process in your testimony there in evaluating the Pit Rule as you did in evaluating these amendments; is that true? Comparing risk assessment to value judgments?

A. The data that I presented here is the same

data that was presented at that time.

Q. So you looked at the same data here as you did in the Pit Rule; is that correct?

A. That's correct.

Q. And did your analysis change at all between now and then?

A. No.

Q. Did your conclusion change at all?

A. No.

Q. Back in the Pit Rule proceeding back in 2007/2008, you essentially testified that all of the constituents of concern that you identified today were constituents of concern then; is that right?

A. That's correct.

Q. TPH, benzene and chloride; is that correct?

A. That's correct.

Q. And your reasons for those being of concern are the same as they were in 2007/2008?

A. They are.

Q. So I guess it's no coincidence then that the Table 1 and Table 2 in the industry's proposed amendments, that's Page 41 of NMOGA's Attachment A, reflect your recommendations?

A. Actually, no.

Q. I'm sorry, could you clarify?
A. The Table 1 and 2 are by the industry group. I was asked to evaluate and determine whether they were reasonable numbers and the answer is yes, they are reasonable.
Q. I'm sorry, did you have anything else to say?
A. No.
Q. I'm sorry, I thought I interrupted you. Back in 2007/2008 did you not recommend that TPH should be a screening constituent for the rules rather than the 3103 standards?
A. Repeat that.
Q. Sure. Back in 2007/2008 in the Pit Rule hearing, was it your recommendation that TPH be a screening constituent rather than the 3103 standards as proposed by the Oil Conservation Division at that time?
A. The answer is yes.
Q. And same with beetex?
A. In actual fact I didn't recommend beetex. I recommended Benzene.
Q. I'm sorry, Benzene. And chloride?
A. Correct.
Q. Now, looking at your Exhibit 12, you

prepared an overview and summary of your testimony in 2007/2008 as well, did you not?

A. That's correct.

Q. Is this Exhibit 12 substantially the same as that summary of your testimony?

A. It should be very similar, yes.

Q. Is it fair to summarize the -- let me withdraw that. Let's talk a little bit about some of these other risk assessments that you have done. You said that the solubility of TPH wasn't an issue of concern because it wasn't soluble? Is that right? Let me rephrase. TPH -- people can't get exposed to TPH because it's not soluble. Did I understand that right?

A. No.

Q. Please explain again.

A. TPH has certain constituents that are water soluble. The most water soluble are the light aromatics, benzene, toluene, ethylbenzene and xylene.

Q. And so if there's a leak in a liner, people may be exposed to those if they come in contact with groundwater that's been contaminated by the leak, is that right?

A. In certain terms, yes.

Q. Can TPH solubility be -- the heavier aromatics, can the solubility be affected by the presence of surfactants in flowback fluids?

A. By what?

Q. Surfactants in flowback fluids?

A. The answer is maybe.

Q. Maybe?

A. But probably not a significant amount.

Q. So it is possible?

A. Oh, yeah. But even if you don't have surfactants you're going to have beetex that dissolves in water.

Q. I think that's all I have. Thank you, Dr. Thomas.

CHAIRWOMAN BAILEY: Ms. Gerholt?

MS. GERHOLT: No questions for the witness.

CHAIRWOMAN BAILEY: Mr. Dangler?

CROSS-EXAMINATION

BY MR. DANGLER

Q. Good afternoon.

A. Good afternoon.

Q. I want to really understand your testimony. It appears that clay is kind of a magical lockup substance that you are testifying

about. Have I missed something about it?

A. Well, I guess it could be said that way.

Q. In that case is there any limit to what you would be concerned about being in one of these pits? Theoretically under your theory?

A. If you've got -- in theory, it's possible to have a contaminant that is so concentrated that you start to disrupt the packing of the clay and you change the permeability of the clay. That would require a huge amount of chemical, but if you give me a hypothetical like that, I have to tell you that it's possible you could have so much oil that you are not getting good settling.

Q. Okay. So there is a limit to what this clay can handle, what these clays can handle?

A. Yeah, but remember, these are -- you know, when you are looking at oil, you are looking at oil in a transmissive zones bounded by clays and shale, impermeable layers. All I am saying is it creates an impermeable layer for the most part that oil and other chemicals are not going to go through.

Q. And you said that Benzene is a concern because it's a carcinogen?

A. Benzene is a human carcinogen, correct.

Q. So let's just take the numbers with

Benzene.

A. I'm sorry?

Q. Let's just take the numbers with Benzene --

A. Okay.

Q. -- under the proposed NMOGA change.

A. What is that?

Q. The number is ten, I believe, if I am remembering it correctly, that's recommended?

A. As I recall, that's right.

Q. Yeah. Would you be comfortable with 100?

A. For a pit?

Q. Yes.

A. The answer is yes.

Q. Would you be comfortable with 1,000?

A. Yes.

Q. So some very high level carcinogen levels you would be comfortable with?

A. That's correct.

Q. Let me take you back a little bit in terms of the initial studies that you did to determine what were the chemicals that you were concerned with. How many pits did you guys sample in your study in the NMOGA study?

A. As I recall, there were three in the

southeast and three in the northwest.

Q. So you did like a total of six?

A. If I recall.

Q. As a scientist, does the sample size concern you at all with being just six?

A. It often does. In this particular case we took a fair number of samples in each pit and it was a pretty substantial program. The number of pits is small, but again, the data that we saw were comparable to what we saw in Louisiana.

Q. So there was a comparable study in Louisiana?

A. Yes.

Q. But staying here with the state of New Mexico, how many pits do you think we have?

A. I have no idea.

Q. Would it be fair to say we might have thousands?

A. Wouldn't surprise me.

Q. But you are comfortable with six pits being the sample size?

A. For the data that we have right now, correct.

Q. Are you familiar with land disposal limits set by the EPA under the RCRA hazardous waste

regulations --

A. Yes.

Q. -- for shallow land disposal?

A. Yes.

Q. Do you know what the EPA requires for the amount of Benzene allowed in a permitted waste dump, serious hazardous waste dump?

A. In the dump itself?

Q. Yeah. What's the concentration allowed by EPA, do you know?

A. I don't recall an upper limit.

Q. Do you think it might be the same ten number that we are using here?

A. In the dump?

Q. Yeah.

A. No.

Q. Do you think it's a higher number?

A. I would assume that it is. I think what you are asking is the screening level, and that is, as I mentioned before, a very health-conservative number that EPA has created as kind of a baseline. They apply the screening level in both RCRA and in these situations.

Q. Let me ask you about the chlorides. And I think you said the chloride is a good marker?

A. Yes.

Q. It's not as big a concern for you in terms of it's not -- I think you said it's not toxic?

A. Correct.

Q. But it's a good marker?

A. That's correct.

Q. So do other chemicals then, could you presume other chemicals might be moving with the chlorides?

A. Other chemicals can move but probably not as quickly as chloride.

Q. But the reason it's important as a marker is because other chemicals might move with it? Is that fair to say?

A. No.

Q. It's not fair to say?

A. No. Chloride gives you an idea how far a water leak has migrated.

Q. So it gives you the idea of the distance but doesn't necessarily mean anybody traveled with the chloride?

A. That's correct.

Q. How would you know where other chemicals have traveled, where Benzene had traveled?

A. You would measure it.

Q. But the chloride would give you an indication of the zone you might have to measure; is that correct?

A. That's correct.

Q. So if there were chloride plumes that were fairly large in scope, would that give you any concern about other chemicals moving around?

A. I think so.

Q. In the course of preparing for the testimony, have you been made aware of at least one chloride plume that's west of Hobbs? Has anyone talked to you about that?

A. No.

Q. If there were a large chloride plume, would it give you some concern? Because that's part of our clay area, 13 miles west of Hobbs. Isn't that one of the clays that you are saying are impermeable?

A. Would you ask the question again?

Q. What kind of evidence would give you concern about pits?

A. About?

Q. About pits. What kind of evidence would give you concern?

MR. HISER: Objection. Related to

esthetics or the chemical constituents which is what he testified to?

CHAIRWOMAN BAILEY: Maybe you could be more specific in your question.

Q (By Mr. Dangler) I think you said that you're not too concerned with the levels but at some point the level could interfere -- the level of the chemical mix could interfere with the clay's ability to seal.

A. What I said is that in general I'm not concerned because of the impermeability of the clay. However, in an answer to your question, I could see that there may be some massive amount of the material that could affect the ability of the clay to form a seal. But like I said, I think that's a pretty unusual if not almost negligible likelihood.

Q. Would the clay, in your opinion, seal in an unlined pit if there was no liner?

A. It's commonly used that way.

Q. I did hear you saying in answer to a question on direct, and unfortunately I think this is where the confusion of tank came in, "as long as the tank is not leaking" and that was corrected. So was your testimony as long as the pit is not leaking there was no concern about the hydrocarbons, the

additional hydrocarbons going into the waste pits?

A. That's right.

Q. Why would you say as long as the pit is not leaking if the clays don't leak?

A. Why would I say that? Maybe you can repeat that question for me.

Q. Sounds to me as if your testimony has been that given the quality of the clays, it doesn't need a liner and it doesn't leak. So then why would you say as long as the pit is not leaking?

A. I make a distinction between an operating pit and a pit that's being closed, okay? The liner, I think, is when you have got liquids circulating and liquids that are free. The closed pit, you are now taking liquids out and you now have the solids left in the pit. Those are the distinctions. As long as you have liquid there, you need the membrane or a liner of some sort.

Q. So you do need a liner?

A. Yeah.

Q. If there's liquids present?

A. Right.

Q. And your theories then would require that liner not to be leaking in order for the risk to be, as you stated, no pathway of risk?

A. I would assume you would need to have an appropriate engineered barrier of some sort.

Q. So there is a risk if the liner leaks; is that fair to say?

A. There is a risk if the liner leaks and there's a potential for exposure.

Q. That's what I am saying. That creates that pathway to exposure that you said doesn't really exist.

A. It has a potential pathway for exposure, correct.

Q. So the liners are at issue and that's important in what we are doing?

A. Yes, of course.

Q. No further questions. Thank you.

CHAIRWOMAN BAILEY: Dr. Neeper?

CROSS-EXAMINATION

BY MR. NEEPER

Q. As the others, I wish you good afternoon. It's pleasant to see you here again. You have stated the difference -- clarified the difference between hazard and risk. If I understand you correctly, risk is a combination of hazard plus exposure.

A. Correct.

Q. The evil substance like the bus, has to get to the person.

A. That's correct.

Q. You made the statement if I copied it correctly that the concentrations are so low they present no risk. That statement to me identifies the risk with the concentration. Is it that the concentration itself cannot provide a hazard?

A. The concentration -- one of the classic statements in toxicology is that it is the dose that determines the poison, and what you're highlighting is that particular statement. You can have exposure to a material that is toxic but if the amount of exposure is low, you generally do not exceed the toxic threshold, and as a result, you see no adverse effect. So it is, in fact, the dose that determines whether or not the material will have an adverse effect.

Q. But in this case specific to oil field substances, your statement that the concentrations are so low they present no risk, I take it you mean the concentrations in the pits are so low that that concentration by itself would eliminate the risk? The dose would be low? Is that what you intended?

A. Essentially that's what I'm saying, yes.

Q. So in that case we wouldn't need to bury the pits or do anything else with them because the concentrations as is would not present a risk even if you were exposed? Did I understand you right?

A. The pits that we are talking about, that's right.

Q. Aren't the concentrations even of the xylenes much higher than the drinking water standard?

A. Say that again because we are talking about solid here.

Q. I understand that you are maintaining that what is in the pits cannot get into the water in any way.

A. As I look at the way the pit's structure is and the bentonite clay, the likelihood of getting into the water is low.

Q. Likelihood is low. Does that mean it can never happen or if you wait long enough it will happen but it takes a long time?

A. If it gets in there, it's going to be an extremely low concentration that's leaking out slowly, so for practical purposes it's not leaking.

Q. In response to a question you said you felt so comfortable about that, that you could even

be comfortable with 1,000 milligrams per kilogram Benzene in this material?

A. That's correct.

Q. Do you have expertise in beta zone transport?

A. Some.

Q. Despite the presence of the clays, are you stating that Benzene at that concentration or even at the concentration in the pits could not diffuse to an aquifer at 25 feet below a buried pit or another burial unit?

A. What is the source of the Benzene?

Q. It's whatever is in the pit or it's your 1,000 milligrams per kilogram that you felt comfortable with.

A. From the pit?

Q. Yes, in the buried material?

A. In that case, no, it's not going to diffuse out.

Q. Cannot diffuse out?

A. That's correct.

Q. Are you aware of barometric pumping?

A. I am.

Q. Would it occur at a 25-foot depth?

A. Not the concentrations we are talking

about.

Q. Have you read any of my papers on barometric pumping?

A. No, sir.

Q. Thank you. You have acknowledged that we cite the chloride in regulations because it is the tracer so it runs ahead of other things.

A. Yes.

Q. But you have also said that chloride itself isn't the thing that could be most toxic if it got somewhere?

A. That's correct.

Q. Particularly, I think you meant in relation to plants.

A. I'm sorry, is there a question?

Q. Yes, there's a question. I'm trying to put many things together for the question. Are you maintaining then that the chloride will not, by some mechanism, come out of the buried wastes and therefore also sodium will not come out of the buried wastes?

A. What I'm suggesting is that the hydraulic conductivity of the clay is so low that you're not going to have significant passage of water through the clay layer, and as a result of that you are not

going to have substantial migration of the chloride out of the clay.

Q. Is that true for the unsaturated hydraulic conductivity?

A. Is that true for the --

Q. Isn't that what we are talking about here? The entire rate of unsaturated?

A. Yes.

Q. So what counts as the unsaturated hydraulic conductivity?

A. It should be true. Should be true. I mean, we've got --

Q. Should be true?

A. I'm sorry?

Q. Should be true. Is true?

A. I think it probably is true.

Q. I will be able to clarify then all of my further questions because I am sitting here in absolute shock. You are maintaining that really no matter how long we wait, and I like to think in terms of centuries because I don't think we should destroy the landscape now --

MR. HISER: Is there a question?

MR. NEEPER: Yes, there's a question.

Q. That the transport rate out of a pit or

out of pit material that's been dug with a backhoe and redumped into a trench will be so low that we never need to worry about the ground surface or about an aquifer that could be 25 feet beneath it or about a confined aquifer that could be arbitrarily close to the buried material?

A. I'm sorry, that is the question?

Q. Do you believe that the rate of transport, whether of vapor contaminants or soluble contaminants out of the pit material, whether that material is as it settled in the pit and was subsequently covered or whether that material was dug out and subsequently reburied in the trench, do you believe that the rate of transport is so low that even if we waited a century we would not have any problem with the transported materials either in an aquifer 25 feet under the burial unit, in a confined aquifer at an arbitrarily close distance to the burial unit or at the ground surface four feet above the burial unit?

MR. HISER: Madam Chair, I'm going to object to the compound, compound, compound. Maybe Dr. Neeper could ask the aquifer and the next one and the next one. I think that would be easier for the witness to handle.

CHAIRWOMAN BAILEY: I will overrule your objection because he is pulling together several different concepts that I think the doctor is capable of being able to answer.

MR. HISER: Thank you.

A. All right. Let's deal with a couple of things. First of all, as I mentioned, risk is determined by the magnitude of exposure. We are talking about the -- your questions seem to have more of an area of impact than it possibly has an escape and, therefore, eventually reach groundwater or something of that nature. What I'm saying is that, first of all, the likelihood of a massive escape so you could significantly impact groundwater so that you would have an adverse effect in health or for natural resources and things like that I think is very low. You can have slow, slow leakage, but again, net effect I think is minimal. Does that answer your question? I mean, you could have an impact but, I mean, it's such a small amount of impact after a million years that I don't think there would be any kind of adverse reaction.

Q. So after a million years you could not accumulate enough either in the groundwater or in the ground surface to cause a negative impact?

A. In general you don't accumulate. You recycle and you redistribute things but you don't accumulate per se.

Q. Would the surface of a salt pan be considered as accumulating chlorides?

A. The surface of a salt pan?

Q. The thing we called a playa or a salt plan?

A. Yeah.

Q. So in some cases it's possible to accumulate?

A. That's right. That's right. Likewise, I mean, the Romans salted Carthage. If you go to Carthage today you will find there's growing plants all over the place because the salt has been washed out of the soil and is redistributed in the soil. Now, a playa is a little bit different in terms of the salt concentration and the ability to redistribute.

Q. No further questions.

CHAIRWOMAN BAILEY: Commissioner Balch?

COMMISSIONER BALCH: I have a couple questions. Unfortunately, I won't be able to argue transport chemistry with you since that's not my area of expertise. However, I am aware of isolation

of landfills and other hazardous waste using clay. Typically they will create a clay barrier in between the source of the hazardous material and the material and area that they want to protect.

THE WITNESS: Yes.

COMMISSIONER BALCH: From several inches to several feet thick either on top or on bottom or on the side as a barrier wall. In regards to isolating material left over from drilling or completions, would it be beneficial to add additional bentonite clay to isolate that material or even adding on to that in the absence of clay so you are not using a bentonite clay for your drilling fluid, do you feel that the risk is substantially increased?

THE WITNESS: I don't see any advantage of adding the bentonite clay. I think you have enough clay there to do that. There are other physical phenomena that are occurring. What's called absorption where you have these relatively insoluble chemicals that bind to surfaces of various types. And, you know, part of the struggle that I'm having over here is that some of these things I haven't really done a very good job of describing, you know. But they inhibit further migration of the chemical

in the environment. I think that you've got enough binding surfaces in the clay already there that adding additional clay is not going to really give you greater protection.

COMMISSIONER BALCH: In regards to the two studies that you cited, the industry study that you went into some detail, had samples from six pits, numerous samples, you said, and then there's an OCD study that had 23 pits plus two closure sites that they took four samples in each of those sites.

THE WITNESS: Correct.

COMMISSIONER BALCH: How many samples were taken at the industry sites?

THE WITNESS: I think eight or -- it's my recollection it was eight per -- eight.

COMMISSIONER BALCH: You have somewhere between 70 and 100 full samples.

THE WITNESS: Correct.

COMMISSIONER BALCH: How were the sample sites selected? Not necessarily within the pit although I would like that as well, but in general were they geographically distributed? Were they volunteered by companies or were they just the next pit to be closed?

THE WITNESS: My understanding is they

were volunteered by the companies.

COMMISSIONER BALCH: How about the OCD standard?

THE WITNESS: I don't know.

COMMISSIONER BALCH: Do you think that -- we have 23 composite samples from the OCD study and you have eight to ten samples for each of six other sites. Were you involved with the collection of the data at the six industry sites?

THE WITNESS: I did not collect samples, no.

COMMISSIONER BALCH: Were you involved with the design of the study of how they were sampled?

THE WITNESS: Yes.

COMMISSIONER BALCH: Can you talk about how the pits were sampled?

THE WITNESS: They were sampled were a boring tool at specific depths. The soils were collected and then put into -- is that the type of detail you are looking for?

COMMISSIONER BALCH: Yes.

THE WITNESS: Put in sample jars and sent to a certified laboratory for analysis. We specified -- we had full chain of custody. We

specified EPA standard analytical methods for VOCs, SVOCs, metals, and there were several other parameters that were looked at as well. I sent in a quality control quality assurance auditor to make sure that the laboratory followed all the procedures and that all the data were an accurate reflection of the analytical data and the summaries were in fact accurate as well.

We did statistical analysis to look at the averages and the ranges. We did comparisons with standard regulatory screening criteria and from that we generated a report.

COMMISSIONER BALCH: To the level of your understanding of the OCD study, did they follow similar processes?

THE WITNESS: It appears to me. I don't think they had the quality assurance audit or anything of that nature, but in general, I'm sure that they have their laboratory.

COMMISSIONER BALCH: So the OCD study you have composite samples for 23 sites and for your study you have individual samples, eight to ten per pit at six sites?

THE WITNESS: That's correct.

COMMISSIONER BALCH: Three in the

northwest and three in the southeast and those studies had similar results irregardless of the fact that they were separate studies?

THE WITNESS: They did. I think they were comparable results. As I mentioned before, they were comparable also to the Louisiana results.

COMMISSIONER BALCH: Those are my questions. Thank you very much.

CHAIRWOMAN BAILEY: Commissioner Bloom?

COMMISSIONER BLOOM: Dr. Thomas, my remembrance of my high school science was shaken when you said that arsenic wasn't poison, and I remember my sister having been in a play, Arsenic and Old Lace, and the spinsters were offing people with arsenic in their tea.

THE WITNESS: Absolutely.

COMMISSIONER BLOOM: Just to make sure I remembered things correctly I pulled out my phone and Googled arsenic poisoning, and 137 million people around the world face arsenic poisoning. It looks pretty ghastly at times. You told us arsenic is not a poison to be concerned with. Can you elaborate on that?

THE WITNESS: The form of arsenic that was used for the tea, it was, in fact, a soluble form of

arsenic and it is poisonous. It is extremely poisonous.

COMMISSIONER BLOOM: It's a different form of arsenic?

THE WITNESS: It is. If the arsenic is not a soluble form, it is not poisonous. It goes in one end and out the other.

COMMISSIONER BLOOM: I won't take you up on that dare. So what do we call the poisonous form and what do we call the form that we are finding in the OCD sampling and the industry sampling?

THE WITNESS: We didn't really characterize the form. For my purposes it was simply adequate to show that it wasn't soluble or leachable in the TCLP procedure. So exactly the typical form, I don't know.

COMMISSIONER BLOOM: So it wasn't leachable. All right. Now, is bentonite clay used in all drilling mud?

THE WITNESS: That's my understanding.

COMMISSIONER BLOOM: Is the ratio of water and other constituents in the bentonite clay always the same or can it vary?

THE WITNESS: Vary.

COMMISSIONER BLOOM: How thick is the

layer that's deposited on top of the pit?

THE WITNESS: How thick is the layer?

COMMISSIONER BLOOM: Of bentonite clay that ends up being on top of the pit that creates that seal?

THE WITNESS: If you were to look back at the photographs that were taken both in the sampling program industry and also the OCD program, what you find out is the entire pit is essentially mud. The OCD staff would be seen walking out onto the mud in order to collect their samples. I didn't see the industry group doing the same thing, but I would assume they did the same. So, I mean, this is a fairly substantial amount of solid.

COMMISSIONER BLOOM: How much of that deposit is clay and how much is the other solid that you mentioned, the cuttings that come up?

THE WITNESS: I don't know what the relative percentages are. As I mentioned, one way to view what's happening is to take a container of ping-pong balls and pour BBs on top of it. What you discover is the BBs now go around the ping-pong balls and saturate and fill the entire container. I think the clay is probably doing the same sort of thing because the clay particles are so small.

COMMISSIONER BLOOM: I didn't have the time to read through -- I will look at it later -- the sources you cite in your study. Did you cite any studies that speak to this capping effect, if you will, of the clay?

THE WITNESS: You used the term capping and I don't think I used that term. What do you mean capping?

COMMISSIONER BLOOM: Essentially you are saying that we have this pit and it's lined and liquids are taken out and evaporate and big pieces fall to the bottom, ping-pong balls fall to the bottom and the BBs fill in, which is the bentonite clay, and it surrounds everything. I guess I imagine it as a cap, but you say it permeates the entire thing, the clay?

THE WITNESS: Well, what's happening is the solids are being dewatered and they are just settling down. What I described as the initial things that settle out by gravity are the large chunks, the rocks and things like that. So I am simply trying to give you an idea that gravity is having an effect. Certain things are falling to the bottom of the pit. Other things are going to take a longer time, particularly the very fine particles of

bentonite clay will take a while to settle out. But as they settle out they will form essentially a impermeable layer of clay in the bottom of the pit. Just how thick the clay is, I don't know. From the photographs it appears that the entire pit is filled with solid, most of which is bentonite clay.

COMMISSIONER BLOOM: Your expertise is toxicology. Am I getting into geology here?

THE WITNESS: A little bit of both. And I guess I should explain that. My training is in pathology, which means I did autopsies and all that sort of thing on people. When I started to work in the consulting industry, I became the health and risk management expert for the company. As part of that, I interacted with technical disciplines of all different types, and what I'm telling you now is after the years of experience talking with geologists and trying to figure out what in the world is happening, talking to chemists and trying to figure that out, talking to people and talking about the gravitational sedimentation of particles. All these different things that have been important in different parts of the job that I had to do.

COMMISSIONER BLOOM: I don't have any further questions. Thank you.

CHAIRWOMAN BAILEY: I have a few. To follow up on Commissioner Bloom's question, what solubilizes arsenic?

A. What solubilizes arsenic?

Q. Yes.

A. You can solubilize it in a number of ways. One is you can combine arsenic with an anion of different types: Sulphate, chloride, all kinds of things. But in order to do that you have to have an anionic form of arsenic. But you can form salts that are soluble in water. Currently the arsenic form that's taken out of the well as part of the drilling process, like I said, it's not part of the formulation. This is part of the natural rock formation being drilled through. It is not soluble and not leachable.

CHAIRWOMAN BAILEY: So you are saying during the well drilling we have physical breakdown of the arsenic rock but we don't have chemical breakdown of the arsenic compounds?

THE WITNESS: That's correct.

CHAIRWOMAN BAILEY: I'm not a drilling engineer.

THE WITNESS: Nor am I.

CHAIRWOMAN BAILEY: Traditional lore says

that you add potassium chloride to drilling muds in order to prevent swelling of the clays down-hole.

THE WITNESS: Yes.

CHAIRWOMAN BAILEY: So with the addition of the potassium chloride to prevent the swelling of clays, what impact is that going to have on your theory of the clays forming any kind of barrier at all when the chlorides are not allowing those clay particles to swell?

THE WITNESS: A lot of potassium chloride is going to be removed with the water. It's highly water soluble. As you start to remove the water you are also removing sodium chloride, potassium chloride. Essentially what you are -- the answer to your question is I don't think it's going to have a substantial change in the overall settling of the clay.

CHAIRWOMAN BAILEY: So you think that the prevention of flocculation of the clay particles goes away?

THE WITNESS: Yes.

CHAIRWOMAN BAILEY: In the bottom of the pit?

THE WITNESS: I think what will happen is the gravity will cause it to essentially form that

sealing barrier and the sodium chloride and potassium chloride are largely going to be removed with the dewatering process.

CHAIRWOMAN BAILEY: I like to see things in relative exposures. Benzene is one of the aromatic hydrocarbons, isn't it?

THE WITNESS: Yes.

CHAIRWOMAN BAILEY: Highly volatile?

THE WITNESS: Yes.

CHAIRWOMAN BAILEY: Hasn't it also been used in Glade and Airwick and some of the air fresheners that are advertised so heavily and that people are supposed to be using to keep their houses fresh-smelling?

THE WITNESS: I don't think so.

CHAIRWOMAN BAILEY: Not anymore?

THE WITNESS: Well, at some point in the past it may have been a constituent of a solvent that may have been used, but they didn't add Benzene directly to it.

CHAIRWOMAN BAILEY: Do we encounter Benzene in any of our everyday household chemicals?

THE WITNESS: They estimate that Benzene may be present in a strawberry at one part per million, just naturally.

CHAIRWOMAN BAILEY: But how about our household chemicals? Not necessarily? Our exposure in normal everyday urban living is --

THE WITNESS: Gasoline will have 1 percent Benzene in the United States, for example. So any kind of solvent that is a gasoline-range solvent may have an aromatic content.

CHAIRWOMAN BAILEY: Have you any number that you can put on the usual exposure that a person filling their gas tank of the car would have for both the time and the dosage that they may encounter there at the gas station?

THE WITNESS: There is literature on that. It was estimated that a person filling the automobile gas tank before the advent of some of the cuffs that go on to the gas dispenser these days, before that there was estimates that they could see levels as high as 20 part per million coming out of the gas tank, the Benzene content.

CHAIRWOMAN BAILEY: You also early on discussed the liner cover that you believed would be remaining on burial of the pits, the waste pits.

THE WITNESS: Yes.

CHAIRWOMAN BAILEY: So you advocate keeping that cover between the four feet of soil and

the waste material in the pit?

THE WITNESS: That's more of an engineering design question. What I was saying is that having a cover gives one more additional barrier for direct exposure, and as a result from the risk point of view any kind of barrier is good.

CHAIRWOMAN BAILEY: Those are all the questions I have. Thank you very much. Any redirect?

MR. HISER: No, Madam Chair. I do not.

CHAIRWOMAN BAILEY: Then you may be excused. It is 4:20. Your next witness?

MR. HISER: We have about two hours of direct, and since he is our hydrologist I imagine a fair amount of cross.

CHAIRWOMAN BAILEY: Is there a logical breaking point, a half hour into this presentation?

MR. HISER: We can certainly make one.

CHAIRWOMAN BAILEY: All right. First Theresa, would you check to see if we have any people who have signed up for public comments? We have none, so if you could call your next witness and we will try to break about 5:00 o'clock. Is that possible? Let's take a five-minute break.

(Note: The hearing stood in recess at

4:21 to 4:26.)

CHAIRWOMAN BAILEY: Call your next witness, please.

MR. HISER: I would like to call Dan Arthur.

JAMES DANIEL ARTHUR

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

DIRECT EXAMINATION

BY MR. HISER

Q. Mr. Arthur, could you please state your full name for the record?

A. James Daniel Arthur.

Q. Where do you reside?

A. Tulsa, Oklahoma.

Q. Tell us your academic background please.

A. I earned a bachelor of science degree in petroleum engineering from the University of Missouri-Rolla, and following that I have taken either while at EPA or at other times throughout my career a number of different classes and training classes on a variety of subjects.

Q. Can you tell us about your professional experience?

A. I started my career with an oil field

service company in Oklahoma, worked after that with a small independent oil and gas producer watching the drilling and so forth of rigs, and then due to a downturn in the oil and gas industry I went on to complete a degree in petroleum engineering. I had another downturn in 1986 with a $6 price of oil and I interviewed for a job is the U.S. Environmental Protection Agency and took a job there as an environmental engineer and enforcement officer in the Underground Injection Control Program.

While I was there, for about three-and-a-half years I served as a regional expert in the UIC program. Before I left I was certified as a national expert. I also did some assignments in the RCRA program, the CRCLA program and the water program, and then from there went to work in Tampa, Florida for a large engineering firm, CH2M Hill, where I worked on water and environmental issues so I had the opportunity to work on, for example, the largest -- and managed the largest water reuse system on the planet, one managed by the City of St. Petersburg, Florida, the largest waste disposal system on the planet, Miami Dade, and do a variety of different water and wastewater environmental projects all over the country from landfills to

RCRA, CRCLA, Clean Water Act, Safety Drinking Water Act, disposal, site characterization, a variety of different things throughout the country.

In 1999 I left CH2M Hill and formed A & L Consulting. Through that I have focused on really water and environmental-related things really around the oil and gas industry doing a lot of research work for federal agencies such as the Department of Energy, the Bureau of Land Management in several states. I have been involved in a lot of data management activities, too. I was actually the lead person developing with GWPC, the risk-based data management system. I started that in about 1990 working with Dick Stamos way back in the day.

Through that time period, relative to kind of the subject matter here, I have been involved in throughout my career either directly or supervising the design, construction, construction oversight, assessment, closure and so forth of probably -- I was trying to estimate a number earlier, but I would say 6 or 7,000 pits across the United States.

I have been involved in -- and I say pits, but that would include to me pits, infiltration impoundments, water storage impoundments, temporary pits, permanent pits, multi-well fluid management

pits and really kind of managing water in the life cycle from both freshwater recycling and so forth. And along those lines really managing and directly being involved in the environmental issues that oil and gas companies have to address, including cleaning up old sites. I have done quite a bit of FIDO remediation, bioremediation and so forth using plants and just an assortment of things.

Q. So is it fair to say that your experience has encompassed a fair amount of training and professional experience in hydrogeology?

A. Yes.

Q. And in contaminant transport?

A. Yes.

Q. If you look at the NMOGA exhibit book behind Tab 13 you have something that appears to be a resume. Is this your resume?

A. Yes, sir.

Q. Did you prepare this?

A. Yes, I did.

Q. Does it accurately reflect your experiences and project work?

A. As close as I could get.

MR. HISER: Madam Chairman, we would move the admission of NMOGA Exhibit 13.

MR. JANTZ: No objection.

MS. GERHOLT: No objection.

MR. NEEPER: No objection.

CHAIRWOMAN BAILEY: It is admitted.

(Note: Exhibit 13 admitted.)

MR. HISER: Madam Chairman, we would tender Mr. Arthur as an expert in petroleum and environmental engineering, hydrogeology and transport.

CHAIRWOMAN BAILEY: Any objection?

MR. JANTZ: No objection.

MS. GERHOLT: No objection.

CHAIRWOMAN BAILEY: He is so admitted.

MR. HISER: Thank you, Madam Chairman.

Q. Mr. Arthur, behind Tab 14 is there a presentation?

A. Yes, sir.

Q. Did you prepare this presentation?

A. I did.

Q. Would it be helpful for the Commission in understanding a number of the issues before them?

A. I hope so. That was my intent.

Q. Why don't we start then with as you were looking at the proposed revisions that the New Mexico Oil and Gas Association was looking at doing

to the Pit Rule, what were the issues that to you were important in trying to determine the risk that needed to be addressed and whether the changes that the industry was seeking are protective of public health, freshwater and the environment?

A. Well, when I was asked to look at this, the objective that I really had were really trying to look at incidents in pit failures historically. I wanted to look at the current and proposed revisions to Rule 17 in an attempt to evaluate whether the current and proposed rules address the cause of failures and the potential failures and risks that may be faced. And then to provide an opinion on the proposed rules relative to their protectiveness of public health and the environment.

Q. And Mr. Arthur, why was it important to you to start by looking at the historic experience with pits when we are look at possible revisions to the Pit Rule 17 that we have in place now?

A. In looking at pits especially, and this maybe goes a little bit into everything, but what happens -- and I have seen this happen time and time again over the last 30 years -- is we tend to look at academic solutions to real world problems, and I tend to be more of a realist and experience and

seeing things firsthand means a lot to me.

I have done a lot of modeling. I use modeling, I condone modeling, but just because a modeling says that something is going to give you a particular result, it doesn't always turn out that way so then you are going pack to find out why.

Furthermore, we tend to ask questions sometimes that are academic in nature that aren't really applicable. So looking at history and historic events and what happened in the past and how things evolved, how we evolved in the management of pits, the design of pits, how we use pits, all of those sorts of things are important. Because oftentimes if you don't understand the history -- this was a big General Patton thing. Read the books so you can understand what happened and figure out how to beat them.

By looking at our history and how things evolved, and also knowing when we are going out doing sampling and that, what was the practice that the sampling is applicable to, for instance, but trying to recognize that is an important historical basis that you start drawing conclusions from. So that was real important to me.

Q. So there are really two things you are

looking at, the positive and negative aspect. On the positive side of that you are looking for where have pit failures occurred and how do we make sure we prevent those from occurring in the future.

A. Exactly.

Q. On the negative side where have pit failures not occurred, so therefore that may be less of a concern because we haven't seen it over 150 years or however long we have had pits.

A. I think that's a positive but yet.

Q. I said the negatives are --

A. You attorneys.

Q. And where we haven't seen pit failures. So if we look at the historic state statistics here in New Mexico, what do we see?

A. Well, you know, there was a reference to this earlier and there's a lot of things about New Mexico history that I think a lot of people don't know and just how large of oil producing wells New Mexico had in the Permian Basin, for instance. It was amazing the type of wells. They were offshore similar in production.

But if you look at the state, the estimates that I have seen put the total number of pits that have been in the state at something like

80- to 100,000 pits constructed in the state of New Mexico. A lot. And if we look at, you know, what I could find in looking at the prior proceedings and so forth, it looked like the OCD looked at something like 4- to 500 pits that had caused impacts to groundwater in the state of those pits.

So if we look at that on a real simplistic basis, so if we, you know, since we are dealing with 80 to 100 and 4- to 500, if we just assume 500 in this case, 500 pits or 0.5 percent of all of the pits that have been suspected of groundwater impact, this means, you know, if you look at it on a positive side, 99 1/2 percent of all the pits in New Mexico hasn't caused or been suspected of causing a groundwater problem. That, to me as a former EPA guy, I have written environmental rules while I was there, and several of my clients are states and I have done a lot of state rule-making, too, but that's a good success rate, I think.

The other thing that if I look at that from my perspective as a technical person that, you know, that really has a lot of experience in this, I could look from the history. There's been oil and gas in New Mexico for a long time. And many of these 80 to 100,000 pits were constructed with a lot

less stringent standards than the current Rule 17 or the proposed Rule 17. So the fact that we are looking at this kind of success rate without even the new Rule 17 is pretty amazing to me.

Furthermore, if we looked at that in going through those 4- to 500 pits, what we could find is ten of those pits being temporary pits. So of the 500, out of the 80 to 100,000, ten of them were temporary. So if I looked at the risk, you know, and just the statistical probability or whatever, you know, that represents 0.0125 percent of all the pits constructed in New Mexico or it means 99.98 percent of temporary pits are not suspected of causing groundwater contamination which for environmental programs is pretty darn good.

The other thing I will note is as I looked at these individually, none of the ten pits that were suspected of causing this were done under the current standards, so they would have either had, you know, no liners or sewn liners. So we are looking at less stringent standards. So when I started just doing some basic math, and I did a lot of that at EPA and we would look at a lot of that now just in success rates, if we look at what we have historically before Rule 17 or before the

proposed Rule 17 getting to where we are now, the overall risk issue is very minute.

Q. Now, you said that you had looked at the ten pits individually. Did you actually go in and look at the OCD records?

A. Yes.

Q. Now, back in, I think it was, around 2005, the OCD, actually the Oil Conservation Commission, adopted the order of Rule 50 that started to regulate pits and created basic requirements for how they would be handled. What was the impact on pits and releases from pits, from pits that were constructed in the time frame of roughly 2005 to 2007?

A. Well, what I could get in looking at the State's data from the 2005 to 2007 time frame, you know, from what I could find, I found 5763 wells were spud during that time period. And, you know, it certainly could be, you know, a little bit different than that. But nonetheless, what I also estimated is based on just my understanding from a number of the operators and practices is that about 95 percent of those wells would have used temporary pits as opposed to closed-loop drilling systems.

So if I look at that, as of November 2008

the OCD listed only six of the pits associated with what would have been the drilling of these wells as being suspected of impacting groundwater. So what that leaves me with is in a pretty rough evaluation, but still I think a very meaningful and effective one, is that of the temporary pits that would have been in place during that time period, and this is before Rule 17, is we had a success rate of 99.89 percent of all those pits not causing groundwater contamination.

Q. Now, Mr. Arthur, of course, one objection to that statistics might be that we have not had a very long period since 2005 since we are only in 2012. But if you look at the previous historic data from prior to Rule 50, were most of the incidents from the closure phase or did they seem to come more from the operating phase?

A. 100 percent of the ones that were noted as problems, so this is the six, but also the prior ones that we looked at all were during the operating phase. And this is really, kind of based on my experience, is generally, you know, you see two things that happen over and over. When problems occur, it's during the operating phase, and in general, when there's an issue, a contamination

issue or a leak or something happens, it's generally due to a tear, you know. You know, A roughneck loses his job and throws a drill bit and in the pit or whatever.

Q. It's when there's actual liquid in the pit and a liner and the liner is compromised?

A. And you had head to push it down or whatever, yes.

Q. So for you, what does the historic data demonstrate?

A. So even if we look at -- through the historic data, even unregulated, unlined pits have historically caused really few cases of alleged groundwater contamination. 99.5 percent not suspected of this over a long period of time. The year came to a close with Rule 50 in 2005, 99.89 percent of the temporary pits not suspected. So Rule 17 -- and I think what you will find with the existing rule is, I mean, it's over the top and conservative, in my opinion. So I think what you will see is an even better performance as a result of that and equaled by what we have here.

And I also note that when you look at -- and this is, you know, based on my experience in a lot of different places -- the one thing I found

interesting is that as you look at -- you know, we have got really a lot of pretty exact standards here. I mean, New Mexico is really, I think, a leader when it comes to dealing with pits. And in my experience I have seen people that have done like in closing pits and building pits and dealing with them do an amazing job. And I have seen other people that have done an okay job. What I have seen through both of those is that, you know, you have got such protections and in place, and I think that's a little bit where Ben was drawing his conclusions from in the prior testimony, is that in either case you still don't see problems, which is, I think, a good outcome.

Q. Now, as you look at the historical data, in your mind do you begin to split issues into sort of an operational phase and then a post-closure phase?

A. How I like to look at it, and especially since the regs are set up that way, is that, you know, to me I look at things in kind of an operational closure phase, and in those things you are looking at spills and overland releases. You are looking at direct contact with pit contents, punctures and so forth with the liner. Post-closure

phase you are looking at erosion, exposure at the surface, leaching of liquids from the closed pit. So there are different things you would look at depending on kind of the operational phase and trying to assess if there are going to be problems or what kind of problems you might have.

Q. And in terms of the relevant risks presented by those two phases, which one in your mind presents the greater risk?

A. Well, really, operational. That's generally where you see the vast majority of activity. And even if you look at some of the very old, old pits, you know, a lot of times the problems that you see are because they were -- I mean, we used to ship oil in trenches. We had a lot of different practices. And you had in New Mexico and Oklahoma and Texas you had pits or impoundments that were really injection wells that were just done via pit.

But if you look at, you know, through the time period and even now when you have problems it is generally during that operational phase and to a lesser extent the closure phase when you have people around and you have water on it and you have a head and things are happening. That's generally when you

are looking at the greatest risk, in my opinion.

MR. HISER: Madam Chairman, I know I am about ten minutes before the hour but this is where we are going to switch from the general overview, the history, what are the areas of risk and mechanisms and dive deep into the text of the rules. This might be a good place to quit.

CHAIRWOMAN BAILEY: Thank you very much. We will continue this case until tomorrow morning at 9:00 o'clock.

(Note: The hearing was adjourned for the day at 4:50).

REPORTER'S CERTIFICATE

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

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

JAN GIBSON, CCR-RPR-CRR
New Mexico CCR No. 194
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