STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	)	
APPLICATION OF CHI ENERGY, INC., FOR COMPULSORY POOLING, LEA COUNTY, NEW MEXICO	)	CASE NOS. 12,157
APPLICATION OF CHI ENERGY, INC., FOR AN UNORTHODOX GAS WELL LOCATION OR, IN THE ALTERNATIVE, FOR NONSTANDARD SUBSURFACE GAS WELL LOCATION/PRODUCING AREA, LEA COUNTY, NEW MEXICO	)	and 12,158
	)	(Consolidated)

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

April 15, 1999

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, April 15th, 1999, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

April 15th, 1999
Examiner Hearing
CASE NOS. 12,157 and 12,158 (Consolidated)

(Continued...)

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A P P E A R A N C E S

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* * *

WHEREUPON, the following proceedings were had at 12:35 p.m.:

EXAMINER STOGNER: Hearing will come to order. Call Case Number 12,157, which is the Application of Chi Energy, Inc., for compulsory pooling, Lea County, New Mexico.

Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan. I represent Chi Energy, Inc., in this matter.

I would request, Mr. Examiner, that you also at this time call Case Number 12,158, which is an Application of Chi Energy, Inc., for an unorthodox gas well location. This is the well on the spacing unit that is the subject of the pooling case. Consolidation of the cases for purposes of hearing will shorten the proceedings this afternoon, and we would request they be consolidated.

EXAMINER STOGNER: Okay, in that case call Case 12,158 also.

MR. CARROLL: Application of Chi Energy, Inc., for an unorthodox gas well location or, in the alternative, for a nonstandard subsurface gas well location/producing area, Lea County, New Mexico.

EXAMINER STOGNER: Other than Mr. Carr, is there

any other appearances in either one of these cases or both?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of Santa Fe Energy Resources, Inc. We're appearing in opposition to Case 12,158. We oppose the approval of the unorthodox bottomhole location for the proposed Chi well.

EXAMINER STOGNER: Any other appearances?

Okay, so the compulsory pooling Application is unopposed; is that right, Mr. Carr?

MR. CARR: Yes, sir.

EXAMINER STOGNER: And we're here -- I'm assuming that you're representing an offset that's affected?

MR. KELLAHIN: Yes, sir.

EXAMINER STOGNER: Are there any witnesses in your side?

MR. KELLAHIN: I have two, Mr. Examiner.

MR. CARR: And I have three.

EXAMINER STOGNER: Mr. Carr?

MR. CARR: I have three.

EXAMINER STOGNER: Will all five witnesses please stand to be sworn at this time?

(Thereupon, the witnesses were sworn.)

EXAMINER STOGNER: Is there any need for opening remarks, or should we just get right on with it?

MR. KELLAHIN: I'd like to state Santa Fe's position for you, Mr. Examiner, if the time is appropriate.

MR. CARR: May it please the Examiner, I'm not going to present an opening statement. I do have a closing.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Mr. Examiner, if you'll visualize two sections, Section 19 and just south of Section 19 would be Section 30, in the west half of Section 30 Santa Fe Energy Resources operates what is called the Topaz 30-1 well. That well is at a standard location in the west half of 30, and it is a standard setback from the common boundary with Section 19. This is a Morrow channel system, and the Topaz 30-1 is a producing Morrow gas well.

In Section 19 to the north, Chi has proposed a standup east-half spacing unit, and they propose to utilize a surface location that is 1650 from the east line but only 480 feet from the common boundary between Section 30 and Section 19.

You're in the oil/potash area, and the BLM requires the minimization of adverse impact to potash. Chi proposes to drill this well at that location for that reason.

However, Mr. Examiner, the evidence will be conclusive and undisputed that the optimum location in the

east half of 13 -- of 19, in which to target this well, is at a standard location. You will find that all experts are in agreement on that point.

However, instead of drilling this well directionally, which has been the pattern for other wells in this area to satisfy the needs of protecting the potash, as well as maximizing the opportunity to increase ultimate recovery, instead of doing that, Chi proposes to drill this well vertically. They complain that doing it directionally will cost them additional dollars.

We're here to demonstrate to you, Mr. Examiner, that their Application should be denied, that the circumstances are such that they should be required to directionally drill this well to a standard bottomhole location, that it's economic to do so, that it's in the best interests of conservation to accomplish that, and they should be required to make that change.

If this location is approved, the locations -- the exception is significant to the Santa Fe Topaz well, it is our opinion that it will prematurely water the remaining production from the Topaz well and adversely affect the correlative rights of Santa Fe, who owns an interest in and does operate that well.

At the end of the presentation, then, we will ask you to deny their Application for the unorthodox well

location.

EXAMINER STOGNER: Thank you, Mr. Kellahin.

Mr. Carr?

MR. CARR: At this time, Mr. Examiner, we call John W. Qualls.

JOHN W. QUALLS,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record?

A. John W. Qualls.

Q. Where do you reside?

A. Midland, Texas.

Q. Mr. Qualls, by whom are you employed?

A. Chi Energy, Inc.

Q. And what is your position with Chi Energy, Inc.?

A. Land manager.

Q. Have you previously testified before this Division?

A. Yes, sir.

Q. At the time of that testimony, were your credentials as an expert in petroleum land matters accepted and made a matter of record?

A. Yes, sir.

Q. Are you familiar with the Applications filed in each of these consolidated cases?

A. Yes, sir.

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

A. Yes, sir.

MR. CARR: At this time, Mr. Stogner, we would request that the witness's qualifications be accepted.

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: So qualified.

Q. (By Mr. Carr) Initially, Mr. Qualls, I think it would be helpful if you would summarize for the Examiner what it is Chi Energy seeks with these Applications.

A. In Case Number 12,157 Chi Energy seeks pooling from the top of the Wolfcamp formation to the base of the Morrow underlying the east half of Section 19, Township 20 South, Range 34 East, Lea County, New Mexico.

In Case Number 12,158 Chi Energy seeks this to be dedicated to the Greenstone Federal Com Well Number 1, to be drilled as either, number one, a straight hole at a location 480 feet from the south line and 1650 from the east line of Section 19, or, in the alternative, to directionally drill from this surface location to an unorthodox gas well bottomhole location and a nonstandard

subsurface gas well to be applicable to either the Undesignated West Lynch-Morrow Gas Pool or the Undesignated Quail Ridge-Morrow Gas Pool, no closer than 760 feet from the south line and no closer than 990 feet to the western boundary of said spacing unit, which would be 1650 from the east line.

Q. Let's go to what has been marked for identification as Chi Exhibit Number 1, and I'd ask you to identify and review that for Mr. Stogner.

A. Exhibit Number 1 shows the subject spacing and proration unit, which is the east half of Section 19, 20 South, 34 East.

Q. Could you identify the Santa Fe-operated acreage surrounding this spacing unit?

A. Santa Fe operates the well in the west half of Section 19 -- I believe it's called the Topaz 19 -- and then the west half of Section 30, which would be the Topaz 30 Number 1.

Q. Does Santa Fe also own operating rights in the east half of Section 30?

A. Yes, sir.

Q. Are there other directionally drilled wells in this immediate area?

A. Santa Fe directionally drilled a well in the west half of Section 19, which was the Topaz 19.

Q. Is that the only one you're aware of?

A. Yes, sir.

Q. What is the status of the acreage in the east half of Section 19?

A. The status -- It's a fed lease. Chi owns a term assignment on that lease.

Q. And the primary objective in the proposed well is what?

A. Morrow formation.

Q. Let's go now to Chi Exhibit Number 2. Will you identify and review that?

A. Exhibit Number 2 -- There's actually two Exhibit Number 2s. There are C-102s, which is a well location and acreage dedication plat. The first one identifies a surface location 480 from the south line, 1650 from the east line. The second one indicates a bottomhole location of 760 from the south line, 1650 from the east line.

Q. And so what you're requesting is with the second part of this Application, approval of an unorthodox location that would be no closer than 760 feet to the south line of Section 19?

A. Yes, sir.

Q. Would you agree that Chi would prefer to drill a well at a standard location on this acreage?

A. Yes, sir.

Q. The unorthodox surface location is required because it is within the potash enclave?

A. Yes, sir.

Q. Let's go to what has been marked for identification as Chi Energy Exhibit Number 3. I'd ask you to identify this and then review it for Mr. Stogner.

A. Exhibit Number 3 lists all the working interest owners in the east half of Section 19. If you start at the top you have Chi Energy with 93 percent. This is with Lewis Dreyfus owning 50 percent of the 93 percent. Southwestern Energy has 45 percent of Chi's 93 percent.

The remainder of the working interest owners are Lerwick, Ltd., with 5 percent; Doyle Hartman with .71 percent; James Davidson with .25; James E. Burr with .015 percent; Ruth Sutton with .0078 percent; Larry Nermyr, .0156 percent; John H. Hendrix Corporation, .49 percent; Michael Klein, .49 percent; and Ronnie Westbook, .02 percent. This comprises a hundred percent of the working interest in the east half of Section 19.

Q. Mr. Qualls, could you identify the interest owners who have not voluntarily committed to the drilling of a well on this 320-acre unit?

A. Yes, sir, that would be Doyle Hartman, James Burr and Larry Nermyr.

MR. CARR: Mr. Stogner, at this time I need to

advise you that I have received the case when it was referred to me from Jim Bruce, and in the material I have I've been unable to find where notice was given to James Burr. It may have been, but I don't know that. And so at the end of the hearing I am going to request that it be continued for four weeks, and during that period of time I will establish either that he was given notice of this hearing or I will assure that he has proper notice, so that when the case is taken under advisement that issue has been addressed. And notice may have been given, I just don't know.

EXAMINER STOGNER: Thank you, sir.

Q. (By Mr. Carr) Mr. Qualls, what percentage of the acreage in this spacing unit has been voluntarily committed to the well?

A. 99.25 percent.

Q. And when did Chi first propose this well to other interest owners in this subject spacing unit?

A. February 15th, 1999.

Q. Is Exhibit Number 4 a copy of letters reflecting efforts to obtain voluntary participation of the interest owners in the proposed well?

A. Yes, sir.

Q. And in your opinion, have you located and made a good-faith effort to obtain the voluntary participation of

Mr. Nermyr and Mr. Hartman and Mr. Burr, we believe?

A. Yes, sir.

Q. Let's go to Chi Energy Exhibit Number 5. Would you identify this, please?

A. This is an AFE estimate summary prepared by Chi Operating, Inc., on February 22nd, 1999.

Q. And what are -- Could you just briefly review the totals that are set forth on this exhibit?

A. Dryhole cost is $1,065,000. Completed well is $1,361,000.

Q. What does this AFE represent? Is this for the straight hole?

A. No, sir, this is for the hole going to 760 from the south, 1650 from the east.

Q. And this is the AFE that was provided to the interest owners who have --

A. Yes, sir.

Q. -- committed to the well?

A. Yes, sir.

Q. Were those interest owners advised that cost variations could result from the outcome of this hearing here today?

A. Yes, sir.

Q. What is the impact on the cost of drilling this well if you directionally drill it?

A. Approximately $500,000.

Q. And that would be directionally drilling to what location?

A. From 480 to 760 from the south line is approximately $300,000. From -- To take it on out from 760 to 1650 is an additional $200,000.

Q. And are these the costs, total costs, for a completed well?

A. Yes, sir.

Q. Have you made an estimate of the overhead and administrative costs to be incurred while drilling this well and also while producing it if, in fact, it is successful?

A. Yes, sir, it would be $6000 while drilling and $749 while producing.

Q. And what is the source of these figures?

A. Ernst and Young survey, 1998.

Q. 1998 survey?

A. Yes, sir.

Q. And do you recommend that these figures be incorporated into the order which results from today's hearing?

A. Yes.

Q. Who do you request be designated operator of the proposed well?

A. Louis Dreyfus Natural Gas Corporation.

Q. Let's go now to Chi Energy Exhibits 6 and 7. Are these notice affidavits confirming that notice of today's hearing has been provided in accordance with OCD rules?

A. Yes, sir.

Q. And to your understanding, to whom was notice provided?

A. I understand all the working interest owners in the surrounding area, Santa Fe, the working interest owners in the east half, except for James Burr, were provided notice. Santa Fe was notified, Southwestern notified, Louis Dreyfus notified.

Q. Aside from the question about Mr. Burr, is it your belief that notice was provided to all interest owners who would be subject to a pooling that could result from today's hearing?

A. Yes, sir.

Q. And as to the unorthodox location, was notice provided to the adjacent, adjoining and diagonal spacing-unit operators in this formation?

A. Yes, sir.

Q. Were Exhibits 1 through 7 either prepared by you, or have they been compiled at your direction?

A. Yes, sir.

MR. CARR: At this time, Mr. Stogner, I would

move the admission into evidence of Chi Energy, Inc's., Exhibits 1 through 7.

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Exhibits 1 through 7 will be admitted into evidence at this time.

MR. CARR: And that concludes my direct examination of this witness.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Qualls, has the $6000 figure and $749 figure for the overhead charges been accepted in previous compulsory-pooling cases issued out of this office before?

A. I don't know, sir.

Q. So you don't have a previous order that uses those figures?

A. No, I took that out of the Ernst and Young survey, 1998 survey.

EXAMINER STOGNER: Do you have that with you, or did you provide that?

MR. CARR: Yes, I do. And our intent here, Mr. Examiner, is to use whatever they're recommending, Ernst and Young figures.

Q. (By Examiner Stogner) What's the depth of this well? Do you know, Mr. Qualls?

A. Right around 14,000 feet.

EXAMINER STOGNER: I'll take administrative notice of the Ernst and Young. Are these my copies or --

MR. CARR: Yes, sir, you may keep that copy.

EXAMINER STOGNER: This is a relatively new publication, isn't it?

MR. CARR: Yes, sir.

EXAMINER STOGNER: This --

MR. CARR: I received it this week, actually.

EXAMINER STOGNER: I think they were a little behind, if I remember right.

Okay, are there any other further questions of this witness?

MR. KELLAHIN: Yes, Mr. Examiner.

EXAMINER STOGNER: I'm sorry, Mr. Kellahin?

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Qualls, if you'll turn to Exhibit 3 with me, sir --

A. Yes, sir.

Q. -- if you do the math and take out the Dreyfus interest and the Southwest Energy Interest, what is Chi's working interest after that subtraction?

A. It would be like 4-point-something. I didn't calculate it exactly. 4.65.

Q. 4.65-percent interest is Chi's interest, then, in the east half of 19 under this proposal?

A. Yes, sir.

Q. In the section to the south, Section 30, are you familiar with the west half of Section 30 where Santa Fe Energy operates the Topaz 30-1 well?

A. I believe so.

Q. Chi does not have any interest in that spacing unit, does it?

A. No, sir.

Q. When you look at the letters that you sent proposing the wells to the interest owners in the eat half of 19, is the only letter you sent the one dated February 15th of this year?

A. Yes, sir.

Q. With that letter did you attach what was introduced as Exhibit 5, which is the AFE?

A. Yes, sir.

Q. You told us that this AFE represents the cost of a well that is deviated from the surface location 480 to a bottomhole location 760 from the south line. Is that not true?

A. I believe that's right.

Q. You also told us that Chi would subtract $300,000, approximately, from this AFE cost to get a

vertical well at this position. Was that your testimony?

A. I think that's what I said.

Q. You did or not say that?

A. Yeah, to go from 480 to 760 would be an additional $300,000.

Q. And so if I take this AFE, which is the directional AFE --

A. Uh-huh.

Q. -- and subtract $300,000, then I would know what it would cost for a vertical well under your estimate?

A. Yes, sir, I believe that's right.

Q. You don't prepare these estimates, do you?

A. No.

Q. Who prepares these for Chi?

A. The engineer in our office.

Q. And what is his name?

A. John Wolfe.

Q. Is Mr. Wolfe available for testifying today?

A. Not today, no, sir.

Q. So in order -- You're advising the Division that to drill to the closest bottomhole location, 1650 from the south line, Chi has concluded that it would be approximately $200,000 more than what we're seeing on Exhibit 5?

A. I believe that's right.

Q. Do you know how that's done?
A. As far as -- ?
Q. -- determining the additional costs or any of that?
A. It's based on a footage.
Q. That's not something that you do, is it?
A. No.
Q. When I look at the well-proposal letters, am I correct in understanding the proposal you made to those interest owners in the east half of 19 is only the proposal to go to the 760 bottomhole location?
A. Yes, sir.
Q. You did not propose a vertical well in the alternative, did you?
A. As far as drilling a vertical well versus a 760 bottomhole?
Q. Yes, sir.
A. We said we would like to drill a 480 vertical well if we could, but we're proposing that we're going to end up drilling a 760.
Q. Well, where in this letter does it say that, Mr. Qualls?
A. It doesn't say that.
Q. Doesn't say that, does it?
A. No.

Q. So if I'm reading this letter that you have sent someone --

A. Uh-huh.

Q. -- I'm going to presume that your proposal is for a directional well to a 760 bottomhole location from the south boundary, am I not?

A. Yes, sir.

Q. That would be a fair assumption, would it not?

A. Yes, sir.

Q. All right. When we look at the Application today for the unorthodox location, you're asking for approval of a vertical well or, in the alternative, one that is slightly directional to the 760 bottomhole location; is that not true?

A. Yes, sir.

Q. You're asking for something in this case that you have not proposed to the interest owners under the force-pooling case; is that not true?

A. I guess. I don't see it that way, but if that's the way --

Q. So which way is it, Mr. Qualls?

A. Well, we're proposing that we want to go to 760. We didn't think we could get a vertical well, so we proposed a well to go to 760 and sent out an AFE based on that.

Q. Why didn't you think you could get approval of a vertical well?

A. We're trying to get away from the south end of that section line.

Q. Well, because 4 A, in your judgment, was much too close to the south boundary, wasn't it?

A. (Nods)

Q. In response to Mr. Carr's question, you said that Chi would want to drill at a standard location, right?

A. Yes, sir.

Q. And your reason for not doing so is what, sir?

A. Because of the potash.

Q. All right. Why would you want to be at a standard location?

A. That's what you usually do when you're drilling a standup in the east half of the section, you'd have to be 1650, 1650, which is a standard location.

Q. Are you aware of the general belief that a standard location in the east half of 19 is going to be geologically more favorable?

A. I'm not, no.

Q. You're not? But you do understand it's Chi's position that they would prefer to drill at a standard location?

A. We would do a standard location if it was

allowable, yes, sir.

Q. All right. Do you have available with you any evidence from Chi as to the economic consequence of spending the additional money to go to a standard bottomhole location?

A. No, sir, I don't.

MR. KELLAHIN: All right. Thank you, Mr. Examiner, that's all I have.

EXAMINATION

BY EXAMINER STOGNER:

Q. This James Burr, did you send a notice to him on --

A. Yes, sir.

Q. -- February 15th?

A. Yes, sir, there's a copy of a registered letter, certified letter, that was sent out to him, and it was accepted.

Q. Is that copy of that certification --

A. Yes, it's in the exhibit.

MR. CARR: Do you have one, Mr. Stogner? I can provide it if it's been left off the exhibit.

MR. CARROLL: Here it is.

EXAMINER STOGNER: And you were just going to provide me a copy of that letter or --

MR. CARR: The letter is in the material, and I

can provide the receipt if it's not there.

EXAMINER STOGNER: Okay, all right, I just wanted to -- that he --

Q. (By Examiner Stogner) He had been contacted, and that --

A. Yes, he had a well proposal filed, which was accepted, and got a return receipt, which is in your exhibit.

Q. Okay. I'm going to refer to Exhibit Number 5. There have been some -- a discussion about some additional costs for the directional drilling, and could you point that out to me in this exhibit?

A. As far as -- ?

Q. The directional drilling expenses.

A. My understanding, this AFE was prepared to go 760 from the south line, 1650 from the east line, which is a directional drill from 480 from the south to the 760.

Q. And that additional cost is covered in here?

A. Yes, sir.

Q. Where would I look for that?

A. I would assume it would be under the drilling day work. It was just incorporated into the costs of the well, to get to that 760 from the south line.

Q. Okay, so that cost just -- The estimated cost is just bumped up $200,000 --

A. Yes, sir.

Q. -- as opposed to a different entry?

A. Right.

Q. Are you aware that the casing cost was bumped up in this particular AFE for drilling in the potash area?

A. Yes, sir, I believe so.

Q. And that would be under the tangible drilling, under casing surface, the casing intermediate?

A. Right.

EXAMINER STOGNER: I don't have any other questions of this witness. You may be excused.

MR. CARR: At this time we would call Curt Anderson.

CURTIS A. ANDERSON,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. Curtis A. Anderson.

Q. Where do you reside?

A. In Midland.

Q. By whom are you employed?

A. Chi Energy.

Q. What is your position with Chi Energy?

A. I'm a geologist.

Q. Mr. Anderson, have you previously testified before this Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as an expert in petroleum geology accepted and made a matter of record?

A. Yes, sir.

Q. Are you familiar with the Application filed in this case?

A. Yes, I am.

Q. And have you made a geological study of the area which is the subject of the Application?

A. Yes.

Q. And are you prepared to share the results of that study with the Examiner?

A. Yes.

MR. CARR: Are the witness's qualifications acceptable?

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: So qualified.

Q. (By Mr. Carr) All right, Mr. Anderson, let's go to what has been marked for identification as Chi Energy Exhibit 8. Would you identify that and review it for Mr.

Stogner?

A. Exhibit Number 8 is a structure map that was drawn on top of the lower Morrow formation. Again, the lower Morrow formation is the primary objective of this project. It is at a scale of 1 to 2000.

You'll see the red wells that are -- or the red-colored well symbols that are in the area, are Morrow producers. Written in red alongside those wells are cumulative gas and oil production.

The proposed location for these cases is located down in the southeast quarter of Section 19. You'll see it -- which is labeled the BHL or bottomhole location, which is a square. And also the surface location is designated.

The proposed proration unit is outlined in green, which would be the east half of 19.

Q. What is the significance of the structure?

A. The structure in this case -- The proposed location is kind of on the south-southeast flank with positive or nosing feature. It is basically approximately 150 feet structurally high to the well located down in Section 30.

Let me clarify one other symbol situation in the southwest quarter of Section 19. Down in the southeast of the southeast of the southwest there is a circle that encompasses two dryhole symbols and an oil-well symbol.

One of those dryhole symbols is a deep well drilled by Cities back in 1968. At that time it was P-and-A'd. Okay, that wellbore was later re-entered and directionally drilled to the bottomhole location that you see in the southwest of the southwest of that quarter, and that would be the Topaz 19 Federal Number 1 that Santa Fe operated.

Q. All right, let's now go to Chi's Exhibit Number 9, the isopach. Will you review the information on that exhibit for the Examiner, please?

A. This isopach map is the same scale as the previous structure map. The location and the proration unit are the same.

The lower Morrow was deposited in a stream or fluvial situation that flowed from north to south across the prospect area. Potentially productive sand that was deposited during this time is colored in orange and yellow.

Now, the interpretation on this map represents what I call typical sandbody configuration throughout this depositional trend. Okay, and this depositional trend carries several townships to the north and is roughly equivalent to a number of other depositional trends throughout Eddy and Lea County.

The blue dashed line represents a suggested stream orientation or location for this typical depositional trend.

Now, subsequent meander cutoffs and migration complicate this picture some. The sandbody configuration changes or can change to either larger or smaller configuration.

Now, there's not enough, in my estimation, subsurface information here to define the more complex and complicated picture. Therefore, I believe that anything within the yellow and orange that's colored on this map is potentially productive. Offset wells in this trend may or may not be connected.

Q. When we look at this exhibit from the -- Was this prepared from well-control information?

A. Yes, sir.

Q. And as we look at the area between the Santa Fe well in the west half of 30 and the proposed location, have you seen anything that shows a separation in the reservoir at that point?

A. No.

Q. Are there separations in this sort of channel deposit?

A. Yes.

Q. So it's possible that we have not been able, and you're not attempting to show a separation?

A. No, we're not attempting to show a separation but that it is a possible situation in this trend.

Q. You also have a trace on this exhibit for the subsequent cross-section; is that right?

A. Yes, sir.

Q. Let's go to that now. That has been marked as Chi Energy Exhibit Number 10.

A. Exhibit Number 10, that cross-section is A-A', A being on the left or south, beginning at the Topaz well in Section 30, going through wells located -- the first one from left to right, second well on the cross-section is the old Cities well that was drilled back in 1968. It continues on up through the proposed well location into a well located in the north half of Section 18, and then two wells in Section 7.

The purpose of this exhibit is to demonstrate where in the Morrow section the proposed -- or the proposed primary objective is located. And that is colored in orange on the cross-section. The subject of the structure map we referred to earlier is the top of the lower Morrow, which is highlighted in brown on the cross-section.

Q. If we look at the cross-section in the acreage shaded in yellow -- or the acreage shaded orange, is it your intent with this exhibit to show separation through the reservoir between individual wells?

A. No, the intent is to kind of follow along with the isopach map in showing a -- what I would call again a

typical reservoir size.

Q. So you do not have particular data that shows separation, although it would be possible?

A. That's correct.

Q. Can you summarize -- Are you prepared to make a recommendation to the Examiner as to the risk penalty that should be assessed against nonconsenting interest owners in this well?

A. That should be 200 percent.

Q. And can you just summarize the basis for that recommendation?

A. A good example is, again, the deviated well located in the southwest quarter of Section 19, originally intended as a directional well to the lower Morrow formation. You can see it was deviated to the west and missed the objective. So you don't have to offset very far to get out of our sandbody.

Q. Do you believe there's a chance you could drill a well at the proposed location and it might not be a commercial success?

A. Pardon me?

Q. Do you believe there's a chance that a well at the proposed location might not be a commercial success?

A. Yes.

Q. In your opinion, will granting this Application,

the Applications pooling the lands and authorizing the drilling of the wells as proposed be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes, sir.

Q. How soon would you hope to be able to actually spud the well?

A. Middle, late June.

Q. Were Exhibits 8 through 10 prepared by you?

A. Yes, they were.

MR. CARR: At this time, Mr. Stogner, we move the admission into evidence of Chi Exhibits 8 through 10.

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: 8 through 10 will be admitted into evidence.

Thank you, Mr. Carr.

Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Examiner.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Anderson, if we'll look at your cross-section first --

A. Yes, sir.

Q. -- when we get from Exhibit 10, the cross-

section, in a minute, back to the isopach, Exhibit 9, the isopach'd interval is shown to us on Exhibit 10, is it not? You've coded that for us?

A. Yes, sir.

Q. You've shown the top and the bottom on the cross-section of the area that you're displaying on the isopach, which we'll talk about shortly?

A. That is correct.

Q. Where is the point on the cross-section upon which you have placed the structure map?

A. At the -- The line that's labeled "datum".

Q. All right, the brown line, the datum line, is the marker for the structure map?

A. Yes, sir.

Q. When we look at the cross-section and start at A, we're starting with Santa Fe's Topaz 30- --

A. Yes, sir.

Q. -- -1 well, and then as we read over to the right, we pick up the Cities Service Government 1-Y well?

A. Yes.

Q. When I look at the isopach, Exhibit 9, and I'm looking at the line of cross-section on the isopach, is this the log interval and the relationship for the well with the red dot at its bottomhole location?

I didn't make myself clear. Is this the deviated

well?

A. No, sir.

Q. All right.

A. This is the straight hole that Cities drilled.

Q. Okay. So I am looking at the straight hole that Cities drilled at the red dot. That was a vertical well?

A. Yes.

Q. And at that position in the reservoir, what is the footage you have associated with the thickness for that well?

A. Twenty feet.

Q. All right. So the 20 feet I see on the isopach is the value you have associated with the red dot immediately to the left of that number on the isopach?

A. Yes.

Q. Okay. In looking at the cross-section, am I correct in understanding your horizontal scale to be one that is relative?

A. Yes, sir.

Q. This does not truly represent the actual horizontal distance between the wells?

A. No, it does not.

Q. When I look at the Topaz well and the Cities Service well, then there geologically is a connection between those two wells? You've correlated them to be

continuous, have you not?

A. Yes, sir.

Q. And at the Santa Fe Topaz well, you have a value that is thicker than we get for that same sand member by the time we get to the Cities Service well, correct?

A. Correct.

Q. All right. When we look at the Santa Fe well, it appears to me that you've also coded in some perforations. Can I see those?

A. At the Topaz --

Q. Yes, sir.

A. -- 30? The Topaz 30?

Q. Yeah.

A. And I coded in some perforations?

Q. Well, maybe they're numbers that are so hard to read that they're black. So what I'm looking at in the Topaz well is a drill stem test?

A. Yeah, that big long black thing --

Q. All right.

A. -- is a DST, yeah. The perfs are actually just two feet, and they're on the bottom.

Q. All right. Is it the practice of operators that are targeting this particular sand member to perforate the entire sand member?

A. If it's all pay, yes.

Q. Okay. Would they do that without regard to whether or not there is water present within the sand member?

A. I would suspect if there's a suspicion of water present, you would not perforate that interval, you would stay with what you think is, at that time, pay.

Q. Are you aware of any water concern within the lower member of the Morrow channel system in this area?

A. Yes.

Q. There is one, isn't there?

A. (Nods)

Q. The strategy, then, would be to isolate your perforations in the very top portion of the isopach'd interval, would it not?

A. Yes.

Q. And that strategy would be successful because it would avoid perforating down to the sand member that has too much water content to be gas-productive. True?

A. That's true.

Q. Do you utilize a particular water-saturation value when you're analyzing these logs, for this subject?

A. It varies from area to area.

Q. What would you use in this area?

A. In this area, and from well to well and from different parts of the wellbore, it's relative, whether

it's productive gas and 40 percent water or 20 percent water and changes to 60, which would be an increase in the water saturation.

Q. All right.

A. In other words, there's no specific cutoff.

Q. As you calculate on the log a water saturation that is in excess of 30 percent, that would be of concern to you, would it not?

A. Thirty usually doesn't bother me too much. If can get over 40.

Q. When you hit 40 and above --

A. Yeah, I'm starting to worry.

Q. -- it would be your recommendation not to perforate if you had a water saturation of 40 or greater?

A. That's correct.

Q. When we look at the isopach, if you could drill vertically without regard to the potash -- Let's assume this is not a potash area and that is not an issue, and you can, in fact, drill vertically, then am I correct in understanding that it would be your opinion that you would drill, based upon this isopach, at the point of greatest thickness?

A. Probably not.

Q. Thicker is not better?

A. Well, not necessarily.

Q. Is there a minimum number you use to be satisfied?

A. In the Morrow sands it's permeability you're looking for, not necessarily thickness. You can have a 60-foot sand without permeability.

Q. When we're targeting a well location in the east half of 19, does it not substantially reduce the risk to target this well at a location which would penetrate the greatest net thickness under this map?

A. It may or may not.

Q. So what's the point of the map, Mr. Anderson?

A. Well, that's their interpretations.

Q. Yes, sir, I'm looking at yours.

A. That's correct, to maximize or minimize your risk in this situation, I'd drill at a standard location.

Q. Well, sure, and that's what I'm asking you.

A. Yeah.

Q. And why is that minimizing your risk?

A. Well, I wouldn't go to where the thickest contour is.

Q. Well, let me ask you this. If you're going to the thicker portion, you would drill at a standard location, right?

A. Sure.

Q. And why would you do that?

A. Those are the rules.

Q. Well, independent of the rules, isn't it better to minimize your risk by drilling to a thicker section on the net map?

A. In some cases.

Q. In this case?

A. Well, in this case I wouldn't locate at the thickest part, no.

Q. All right, but you've told me you would be at a standard location.

A. Be at a standard location.

Q. You would be. There is no advantage gained by Chi, by drilling at the unorthodox location?

A. Not at all.

Q. When we look at the isopach, then, am I correct in understanding that you want to be at least somewhere in the 20- to 30-footage range on this map? Is that not true?

A. Yes, sir.

Q. And why do you want to do that?

A. Well, then you get a more even continuity in your drainage pattern, yes.

Q. Okay. And so a standard location would be better?

A. Standard location would be fine, yes.

Q. Okay. And the unorthodox location is

geologically less favorable than a standard location; is that not true?

A. Not necessarily --

Q. All right.

A. -- because where I would locate the standard location would be about the same thickness.

Q. All right, so we could get 1650 from the southern boundary and satisfy whatever geologic criteria you wish to apply?

A. On structure, it's definitely improvement.

Q. All right, we'll get to the structure map in a --

A. -- standard location, we're going updip, yes.

Q. All right.

A. Isopachwise, either location is fine.

Q. Okay. Geologically, is there any evidence available to you to show that the proposed unorthodox location would be separate from the pod being produced by the Topaz well in the west half of Section 30?

A. No.

Q. All right, you would map them to be connected in some fashion?

A. Either way.

Q. Your attempt here is not to try to compete with the Topaz well, is it, sir?

A. No.

Q. I can't hear you.

A. No, sir.

Q. Your strategy and choice is to find new reserves, is it not?

A. That's correct.

Q. And when we look at the way this north-south fluvial channel system is being developed, there appears to be an exploitation opportunity to encounter a unique pod in the east half of 19?

A. Yes, sir.

Q. And that opportunity, then, would be new reserves independent of what the Topaz well might produce, true?

A. Correct.

Q. And it would also be independent of what had been developed in Section 18 to the north as a different pod, right?

A. It could be.

Q. As we get closer to the 20-foot line, it's your preference to be at a net footage thickness greater than 20 feet?

A. Twenty feet is plenty.

Q. Okay, what happens if you get less than 20 feet? What happens?

A. I've seen a lot of wells make plenty of gas in five feet, as long as you've got the permeability.

Q. All right, so permeability would be a key component here --

A. Yes, sir.

Q. -- and you can't measure that as a geologist?

A. And generally permeability is better towards the center.

Q. Okay, all right. So if the Chi location tags into what the Topaz well is producing in the west half of 30, then geologically that location would have the opportunity to compete for the same reserves that the Topaz well is being produced?

A. I would say that would be a correct statement.

Q. And the farther north you go in the east half of 19, the greater opportunity you have for producing new reserves?

A. You increase the chance for that, yes.

Q. Let's look at the structure map. When we look at the structure map, if I'm looking in the east half of 19, just confining the discussion to that point for a moment, am I correct in understanding that the unorthodox location is less favorable than the closest standard location? True?

A. That's correct.

Q. And that's true because at the standard location you gain structural advantage over the proposed unorthodox

location?

A. Correct.

Q. And here in this instance structure is important, is it not?

A. Yes, it is.

Q. The higher onstructure you get, the better it is for you, right?

A. Yes.

Q. When we look at the opportunity to adversely affect the Santa Fe well in the west half of 30, then the Chi well would be upstructure to the Topaz well, would it not?

A. The proposed Chi well is upstructure --

Q. Yes, sir.

A. -- at any location on that east half.

Q. I understand. At the proposed unorthodox location, it is what looks to be a hundred feet or so above the Topaz well.

A. About 150 feet.

Q. A hundred and fifty, and these are 50-foot contour lines?

A. Yes.

Q. A hundred and fifty feet above?

A. Uh-huh.

Q. We mentioned a while ago that there is an issue

about water saturation in the lower Morrow. Geologically, is there an opportunity to adversely affect the Topaz well if the Chi well is approved as requested, being upstructure from the Topaz well?

A. I think that based on other wells in the area, the potential exists that you could affect that well with any location in the east half.

Q. If that location is more standard, the opportunity to adversely affect the Topaz well is diminished, is it not?

A. Yes, sir.

Q. When we talk about your net clean sand isopach map, Exhibit Number 9, how did you arrive at net? What's the value you're using?

A. I used gamma ray.

Q. What gamma-ray percentage did you use?

A. I usually use -- It varies from log to log because of the different sensitivity of the tools they use. Roughly the 50 API.

Q. Okay. Your isopach, then, has a 50 gamma ray cutoff point to get you your net clean sand; that's what you're looking for in the log?

A. Yes.

Q. All right. Have you prepared a net-pay isopach?

A. No, I haven't.

Q. You have not done one?
A. Yeah, of porosity?
Q. Yeah, a net porosity isopach?
A. No.
Q. What would you use for a porosity cutoff if you were making such a map?
A. At least 6 percent.
Q. Six, 7, 8. Is 8 all right?
A. Eight would be good.
Q. Okay.
A. But I think you can go down to six.
Q. Okay.
A. At this depth in this zone.
Q. If you go from eight to six, you're making yourself a bigger container?
A. Yes.
Q. All right. Have you assisted the engineers from any of the companies that are aligned with your position in trying to determine the original gas in place for any of these spacing units?
A. No.
Q. You've not tried to volumetrically assist in the calculation of original gas in place for the east half of 19?
A. No.

Q. West half of 30? None of that?

A. No.

Q. In order to have a Morrow prospect in this area, Mr. Anderson, what is your opinion as to the targeted gas? What volume do you target?

A. Up and down this trend you've got wells that vary, of course, from very little to in excess of 30 BCF. I think you're looking at a realistic number between three and five B's.

Q. Three and five?

A. Yes, sir.

Q. Is that gas in place or recoverable gas?

A. That would be an ultimate.

Q. That's an EUR?

A. Yes.

Q. So somewhere between 3 and 5 BCF is enough that encourages exploration geologists like you to seek a well?

A. Sure.

Q. How would you go about determining whether or not you had 3 or 5 BCF of recoverable gas available to you in the east half of 19?

A. I -- In working the trend and other trends, I just kind of -- It's not something I put numbers on. It's the zone that we look for. This zone works in this area. The wells that have -- There's some pretty mature wells out

here. Those wells have averaged a good number. It makes a good primary target. And at that point it makes -- I feel comfortable with using it as a primary objective.

Q. All right. You don't have to put a pencil to it --

A. No.

Q. -- you have enough experience in here --

A. Yeah.

Q. -- and enough personal experience to look at the east half of 19 and say, This is a viable target for us, I've got at least 3 to 5 BCF of recoverable gas, I want a well?

A. Yeah.

Q. Okay. Am I correct in understanding that the closer this well is to the Topaz well, the greater the chance is that you're going to be competing for proven reserves and not establishing new and unique reserves?

A. If you're connected. I would think that pretty much any location in the east half would have an effect.

Q. Okay.

A. I think the closer you get, quite possibly the sooner you feel that effect.

Q. So by moving to a standard location, then, you would diminish the adverse impact potential that might exist for the owners of interest in the Topaz well?

A. If it's connected.

Q. Did you have anything to do with the cost analysis for establishing the costs for the Chi proposal?

A. On the AFE?

Q. Yes, sir.

A. I might have provided some tops, geologic tops.

Q. You have nothing to do --

A. Otherwise, I didn't figure any --

Q. That number?

A. No.

MR. KELLAHIN: Okay. Mr. Examiner, Santa Fe's Exhibit Number 1 Is taken from the case file of this case. It is the administrative application filed by Chi, or Mr. Bruce on behalf of Chi, for which there was a protest and resulted in the subject hearing. We would move at this time for the introduction of Exhibit 1.

EXAMINER STOGNER: Any objection?

MR. CARR: No objection.

EXAMINER STOGNER: Exhibit 1 will be admitted into evidence. This is Exhibit 1 of Santa Fe Energy, Case 12,158.

Q. (By Mr. Kellahin) Mr. Anderson, if you'll take Exhibit 1 and turn past the two opening pages, turn past Exhibits A and B, and let's look at Exhibit C. Did you provide Exhibit C to Mr. Bruce for the administrative

filing of Chi's Application in this matter?

A. Yes.

Q. This is your work, is it not?

A. Yes, it is.

Q. And this was filed back in February of this year. Is this not identical to the net isopach that you discussed with me this afternoon?

A. Yes, it is.

Q. You've not made any changes or modifications, have you?

A. I did.

Q. All right, sir, what would they be?

A. All right, just relative to the placement of the bottomhole location in the southwest quarter of 19, when our draftsman spotted that well on there it was off by a couple hundred feet. So I moved it back over to the east where it belongs. On this exhibit it looks like it's hugging the west line too much. It didn't go that far.

Q. Oh, I see where it is.

A. Yeah.

Q. Yes, I'm sorry.

A. Yeah, it's just a couple hundred feet to the east.

Q. Yes, it's hard to perceive the difference. But that is the only change?

A. Yeah.

Q. Okay. When we turn to Exhibit D, which is a portion of the structure map, did you modify Exhibit D in any way when you prepared and introduced Exhibit 8 today?

A. No, except for that bottomhole location.

Q. And when we look over on page 2 of Mr. Bruce's filing and we look at the top paragraph, when he's arguing that a certain approximate net thickness is necessary for a location, he's using the 20- and 30-foot range, he got that information from you, did he not?

A. That's correct.

MR. KELLAHIN: No further questions, Mr. Examiner.

EXAMINER STOGNER: Any redirect?

MR. CARR: No, no redirect.

EXAMINATION

BY EXAMINER STOGNER:

Q. In referring to both of your maps, Exhibits 8 and 9 --

A. Yes, sir.

Q. -- when I look at your surface location and proposed subsurface location, there seems to be a wellbore between the two. If that's -- what? A shallow oil well or -- ?

A. Okay, yes, you'll see an oil-well symbol there,

and that's an existing shallow oil well. One of the stipulations for potash in here is that you have to stay within 150 feet of that wellbore with your surface location. So directly north of the oil well you'll see kind of a ghost circle. It kind of even intersects the oil well. And then a bottomhole location just a little north of that.

Q. Now, if I look between the Topaz well in the west half of 30 and the proposed wellbore, there's another well symbol that looks like a plugged-and-abandoned gas-well location. Can you tell me anything about that wellbore?

A. Is that the one in the northeast of the northwest of 30?

Q. That's right.

A. Okay, yeah, that's a shallow dryhole.

Q. Oh, it's a shallow dryhole?

A. Yes, sir.

Q. That was a shallow oil -- didn't penetrate the Morrow?

A. Didn't pen- -- No, sir. I -- In fact, on this map, the deep control is circled.

Q. Okay. You said one of the requirements in potash is to stay 150 feet away from this particular well, existing well, or a well pad or an old wellbore?

A. It has to be a producing well. An old dry hole

won't work. So this is the only producing well down in that south part of the section there. That's the only surface location that's available.

Q. Were you involved in the negotiations with the BLM about the spotting of the wellbore out here?

A. No, sir.

Q. Do you know who was, with Chi Energy?

A. I believe that was John Qualls.

Q. Okay, I'm trying to still make up my mind here about -- I heard it said that if the potash wasn't out here, the best location would have been 1650 from the south line, 1650 from the east line; is that what I'm hearing?

A. That's the location that I would pick, yes.

Q. Based on both geology and surface constraints?

A. If there were no surface constraint, yes, that's --

Q. And that would basically put you between that 40- and 30-foot contour, just by eyeballing Exhibit 9?

A. Yeah, between 30 and 40.

Q. But being within that 40 is not attractive; is that what I'm understanding?

A. Being within the 40, yes, sir, would be okay. But it's not necessary.

Q. Okay.

A. I'm also looking at the proximity to the old

Cities well.

Q. But you're moving further from the old -- Oh, that's what you're getting at?

A. That's correct, if I move it further east, I'm going away from that wellbore that's got the sand in it.

Q. Oh, well, I'm not talking about moving further east. I'm talking about moving further -- just further north, staying on that 1650 line from the east line.

A. Yes, sir, and going up to 1650.

Q. Right.

A. Sure.

Q. Okay, I see where you're getting at. You could still go north, it looks like maybe about a quarter of a mile, and be within that 40?

A. Or within the 30 at least, yes.

Q. Exactly. So geologically speaking, anywhere between your proposed subsurface line and up there to 1650 would basically be geologically acceptable?

A. Anywhere between our current bottomhole location that's on here and 1650 from the south line, yes, sir.

Q. Yes, that's what I'm getting at.

A. Yes, sir.

Q. So anywhere in between that would be geologically acceptable?

A. Yes, sir.

EXAMINER STOGNER: Any other questions of Mr. Anderson?

MR. KELLAHIN: No, sir.

MR. CARR: No, sir.

EXAMINER STOGNER: You may be excused.

Mr. Carr?

MR. CARR: At this time we would call Jay Gabbard.

JAY GABBARD,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your name for the record, please?

A. Jay Gabbard.

Q. Mr. Gabbard, where do you reside?

A. Oklahoma City.

Q. By whom are you employed?

A. Louis Dreyfus Natural Gas Corp.

Q. And what is your current position with Louis Dreyfus Natural Gas?

A. I'm a reservoir engineer.

Q. What is the relationship in this case of Louis Dreyfus Natural Gas to Chi Energy, Inc.?

A. We are a working interest owner in the east half

of 19. We are supporting their proposed well, and we intend to operate --

EXAMINER STOGNER: I'm sorry, I can't hear you.

MR. CARR: You'll have to speak up. The way the cooling system is going, Mr. Gabbard, we can't --

THE WITNESS: Excuse me. We are a working interest owner in the east half of 19. We support the proposed well, and we will operate the well.

Q. (By Mr. Carr) Mr. Gabbard, have you previously testified before this Division?

A. Yes.

Q. At the time of that testimony, were your credentials as an expert in reservoir engineering accepted by the Division and made a matter of record?

A. Yes.

Q. Are you familiar with the Application filed in this case on behalf of Chi Energy, Inc.?

A. Yes.

Q. And are you familiar with the subject area and the wells located therein?

A. Yes.

MR. CARR: Are the witness's qualifications acceptable?

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: So qualified.

Q. (By Mr. Carr) Mr. Gabbard, initially, could you explain to the Examiner what interest Louis Dreyfus owns in this particular area?

A. In the subject spacing unit or -- I'm not sure --

Q. What do you own in the spacing unit?

A. In the spacing unit we own 46 1/2 percent. That could be reduced to 27.9 percent if Santa Fe elects to acquire its interests pursuant to our JOA and AMI.

Q. So you have an agreement with Santa Fe that would enable them to acquire a certain percentage of your interest in the property?

A. Yes.

Q. What percentage is that?

A. We are obligated under the AMI to offer 60 percent of whatever we acquire in the AMI.

Q. Okay. What are your interests, your ownership interests, in the offsetting units?

A. In the west half of 19 our interest is 40 percent, and in the west half of 30 it is 40 percent, and in the east half of 30 it's 24.15 percent.

Q. Based on your understanding of this area, do you have an opinion as to whether or not the Morrow formation under the subject spacing unit is in communication with the Morrow sand being produced in the Santa Fe well located in

the northwest quarter of Section 30?

A. I have no direct engineering information that could answer that question. There is a potential for communication. There are also some evidence of separations in the channel, and it is not uncommon to find separations both stratigraphically and structurally in the channel, and basically we feel we won't know the answer to that until the well is drilled.

Q. If there happened to be no communication, would there be any reason to impose a penalty on the on the well proposed by Chi in 19?

A. I believe not.

Q. Assume for the purposes of this question that there is communication. What impact should this -- the presence of communication have on the need to penalize the well at the proposed Chi location?

A. If there is communication, it might very well indicate that the east half of 19 has experienced some drainage from production, from the well in 30, and it would indicate the need for a well at the proposed location.

Q. You were present for Mr. Kellahin's opening. Do you concur with the opening and the statements that everyone agrees that a 1650-foot setback from the south line of this section is, in fact, a better location, or the best location?

A. I do not.

Q. Why is that?

A. Basically, it goes to the risk of what we know about the precise nature of the lower Morrow channel that is represented by Mr. Anderson's map. In his remarks, he said that this was a reasonable representation of the depositional system, and I concur with that.

In terms of the sampling of the area, there have been perhaps eight wellbores that have sampled an area of four sections. And indeed, without disputing his abilities as a geologist or anything about the integrity of his mapping presentation, in fact, our ability to know the precise nature of where the thickest and best target is, is very imprecise. Something like $3X10^{-6}$ percent of the total area has been sampled by wellbore.

So when we speak of where the best location is, we're using our best evidence with geology. But we also believe, in this particular case, that there's a big factor of risk that has to be applied, both to the geology and to the cost to drill. And we believe, further, that we know with a lot more certainty that we will incur greater costs to drill an extended-reach well than we will to drill a vertical well. We know that with very little doubt.

And we have participated in a reach well with Santa Fe in the west half of 19 and have firsthand

experience with how that can go. And we believe that the risks of doing that in this case are outweighed to drill the reach for the additional cost.

Q. Could you summarize the reasons that you're seeking Division approval of the proposed unorthodox well locations?

A. Principally, we are -- would have set out in the east half to not incur legal cost or the cost of a hearing and have taken a legal location at the 1650 setback, if that had been available to us.

But because this well is located in the potash enclave, surface location is restricted and must be on a designated drilling. A straighthole at this unorthodox location 480 feet from the south line is unorthodox and would need approval.

And principally we believe, as I said, a well at this location would substantially reduce the cost over drilling directionally, and it could influence our decision on whether to pursue development or not.

Q. And you agree with the cost increases that were testified to by Mr. Qualls, that $300,000 to go 760 feet out and $500,000 to go 1650 feet?

A. Yes, sir.

Q. In your opinion, will the well be drilled if it has to be directionally drilled to a point 1650 feet from

the south line of Section 19?

A. I can say that Louis Dreyfus's approval is currently limited to participation at the 760 from the south-line location, with no penalty. Should we incur some penalty or should we be required to drill 1650, we will have to go back and seek management approval for that. I don't know the answer.

Q. If the Division should impose a penalty on a well at the proposed unorthodox locations, what penalty would you recommend?

A. We're recommending that if the well is drilled as a straight hole, that a 27-percent penalty be applied to the results of semi-annual deliverablity tests. If the well is 760 or more from the south line of Section 19, we would recommend no penalty.

Q. Can you explain upon what you base this recommendation or how you derive the number?

A. We use a surface-encroachment approach, applied to a 660-foot setback.

Q. And why would you use a 660-foot setback?

A. In this particular instance, it relates to an equitable opportunity to develop reserves in the east half of 19. When our AMI was originally formed, Section 19 was not under lease to Santa Fe or to Louis Dreyfus. Chi Energy, in fact, was the first party to obtain a farmout

for the whole of 19, actually, and brought that to Dreyfus. And we had drilled a well in Section 30, believed that merit for pursuing development in 19 was attractive, and we sought to see development in the west half of 19.

And when we originally proposed that, we proposed it as a directional well, using the old OXY well as a place to kick our well from, off to the northwest, which at that time was our best interpretation of where we thought the thick part of the sand channel was.

In fact, when we offered our *pro rata* share, offered to Santa Fe their *pro rata* share of the interest in the farmout that we obtained from Chi, they reproposed that we first re-enter the OXY well and try to complete the well as a standard or just a vertical well completion at the 660-from-the-south-line location.

And we, in fact -- Santa Fe, in fact, did that and attempted to get the well down. They were unable to stabilize the hole conditions, and we had pre-agreed that we would kick the well off to the northwest if they were unable to do that, and they did.

Now, it raises the issue that, given the opportunity that we believe Santa Fe preferred to drill 660 from the south line, which in terms of impact for the well in 30 would be more onerous than the location that we are proposing. It's considerably closer.

And now that we are in a position where we are restricted in where we can drill, and we would like -- and having participated in a very expensive cost overrun in a directional well that did not find the Morrow channel where we sure it would most certainly be, we still believe, based on the original Government 1-Y well, that OXY well, the original vertical well in the southeast of the southwest of 19, that there is indication that this lower Morrow sand is present in 19.

And we -- Having drilled off to the west, we think we've established that if there is a reasonable place to look for the channel it's not west, it's east. And that's where we would like to drill.

Now, if we had had the opportunity to drill at a 1650 location, we don't believe that we are any smarter about that particular location than what its meaning to our ultimate recovery is than the vertical location. Again, we know the costs are substantially more.

So with that in mind, and because Santa Fe both has an opportunity to participate and had an opportunity to drill a well at 660 from the south line or re-enter that well and, in fact, made that attempt, and we brought that before the Commission as an unorthodox location that was unopposed by Dreyfus, we feel like we should be afforded the low-cost opportunity to develop reserves in the east

half of 19 without incurring the additional risk, both to the mechanical integrity of the completion by drilling directionally, and just the general cost that we would incur.

Q. Let's go to what has been marked for identification as Chi Energy's Exhibit Number 11. Could you identify that and review it for the Examiner?

A. This is a plan for a directional well to drill to a point 760 from the south line of Section 19.

Q. Can you just briefly review the schematic for Mr. Stogner?

A. The schematic, of course, has a depth scale on the left and has a lateral deviation as the X axis, and it shows at a point of about 8550 that we would -- that would be our kickoff point, we would build three degrees per hundred, and we would, in that build, around 9000 feet, would begin to drop the well down to vertical, around 9508 [*sic*], and the end of the vertical drop would be at 10,400.

And the proposed bottomhole location shows to be 280 feet north of the surface location, which would be 760 from the south line of the section.

Q. How often will the well be surveyed while drilling?

A. It will be surveyed every 200 feet.

Q. And it will also be surveyed at total depth?

A. Yes, it will.

Q. And that survey will be filed with the Division?

A. Yes, sir.

Q. In your opinion, will approval of this Application, including approval of the well locations and the penalty on the straight hole as recommended, be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes, sir.

Q. Will the penalties as recommended by you enable you to go forward with the development of this acreage?

A. It would.

Q. Was Chi Energy, Inc.'s, Exhibit Number 11 prepared by you, or can you testify to its accuracy?

A. This was prepared by Halliburton and prepared in conjunction with our operations engineers.

Q. And it is correct and from your files?

A. Yes.

MR. CARR: At this time, Mr. Stogner, we would move the admission into evidence of Chi Energy, Inc., Exhibit Number 11.

EXAMINER STOGNER: Exhibit Number 11 will be admitted into evidence.

MR. CARR: And that concludes my direct examination of Mr. Gabbard.

EXAMINER STOGNER: Mr. Kellahin, your witness.

MR. KELLAHIN: Thank you, Mr. Examiner.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Gabbard, let me see if I can understand your argument. Let's use Mr. Anderson's Exhibit 9, just to give us locator map.

A. Very well.

Q. All right. One of your arguments is that it is okay to encroach upon the Topaz spacing unit because Santa Fe has the opportunity to acquire an interest in the offending spacing unit? Isn't that what you're telling me?

A. I'm not using that as a rationalization for the location itself.

Q. All this discussion about percentages and agreements and opportunities or options to participate in the offending well mean nothing, sir, does it not, unless it's an excuse for crowding the Topaz well without a penalty?

A. It is saying that they have an opportunity to participate at this location.

Q. And having said that, then, and if they decline to do so, are you suggesting to influence the Examiner that the location then can be approved without a penalty?

A. Not on the participation.

Q. All right, let's look at that. You talked about it. Are you aware that they have 40 percent of the Topaz spacing unit?

A. Which Topaz spacing unit?

Q. The west half of 30.

A. Yes.

Q. Okay. And you have a share of the Topaz spacing unit too, don't you?

A. Forty percent.

Q. All right. When you look at the east half of 19, under your arrangement with Chi you have acquired 46 1/2 percent, right?

A. Right.

Q. And you have a contractual obligation to offer 28 percent of that to Santa Fe, right?

A. I'll trust your math.

Q. All right. See what happens? So Santa Fe has the opportunity to participate in the offending well at 28 percent, as well as continue to participate in the Topaz well at 40 percent, true?

A. Yes.

Q. You also understand it's Santa Fe's belief, and will be their testimony in a moment, that the Chi well at its location is unnecessary because it increases the opportunity to water out the Topaz well? You've had that

discussion with the Santa Fe people, have you not?

A. I have heard their opinion of that.

Q. All right. And if their opinion is correct, then, they are being afforded the opportunity to pay for a well which they think is unnecessary, and yet you want the Examiner to know about all those percentages? How is that useful for his decision, sir?

A. Perhaps it's not.

Q. Okay, when we look at your argument about no penalty, if you're at least 760 from the common line and a 27 percent penalty if you're the 480, something like that, have you researched and are you aware of any other order by this Division that adopts a penalty like that?

A. The reason that --

Q. My question was a yes-or-no question, sir.

A. No.

Q. All right. When we look at your other argument, you are arguing that the Chi's new location should be approved without a penalty because on a prior occasion Santa Fe did not object to the re-entry and directional drilling of the well in the west half of 19? You've made that argument, haven't you?

A. Yes.

Q. So anytime -- Your position is, so anytime an operator fails to object to a prior unorthodox location,

that precludes him from objecting to a subsequent unorthodox location?

A. No, sir, I'm suggesting it's more equitable if they would not.

Q. Let's talk about the cost. Would you look at Santa Fe Exhibit 1? Is that still before you, sir? I showed it to Mr. Anderson. Do you have that available? I'll give you another copy.

On page 2 of Exhibit 1, Chi is advancing the argument administratively through Mr. Bruce that they estimate there's an additional $700,000 worth of costs to take this well to a standard bottomhole location, the 1650 location, versus a vertical hole; do you see that?

A. Yes, I do.

Q. Do you remember Mr. Qualls' testimony a while ago that the number is now $500,000?

A. Yes, I do.

Q. And your number is what, sir?

A. I agree with $500,000.

Q. All right, so you don't have a clue as to where the $700,000 came from, do you?

A. I want to make one comment about that.

Q. All right, sir.

A. This letter is dated February 15th. In fact, Louis Dreyfus had not committed to this proposed well at

that date, so some of the cost estimates that Chi has -- and Chi has represented they have a small interest but not the determinant interest on what the -- what is going to be the best location for this, given the participation of the other working interests, as long as it's not imprudent. And if that was their estimate at that time, I think they probably made it in good faith, and that's the best I can say about it.

There have been some revisions in our discussions about the casing program since the initial estimates were made, and there has been some reduction in cost.

Q. So you've reviewed Mr. Qualls' Exhibit 5, the AFE?

A. Yes, I have.

Q. You've done that personally, that's your work?

A. It is -- No, it's not my AFE.

Q. Is it your review of his work? Is that something you do?

A. I do in terms of considering the economics of a proposal, yes.

Q. All right.

A. As to the accuracy, no, our operations department would be more involved in the details of the accuracy of any particular number that might be in that AFE.

Q. All right. Well, let's talk within the frame of

your work in judging the cost relative to the opportunity. That's what you're doing, right?

A. Right.

Q. That's what you do regularly as an engineer, is look at the opportunity in relation to those costs, true?

A. That's right.

Q. Show me your economic analysis, sir, on the potential recoverable gas that could be accessed by this well.

A. May I see that?

Q. Have you prepared one?

A. I've prepared several.

Q. All right, which one do you want to talk about?

A. Which one do you want to see?

Q. I want to see the one that shows me what you have estimated to be the recoverable gas for a well drilled and accessing the east half of 19.

A. Let me see if I can produce it. I believe I have it, bear with me.

MR. CARR: Tom, we're going to need to make some copies.

Q. (By Mr. Kellahin) Before we talk about specifically what you're looking at, Mr. Gabbard, how many economic analyses did you perform on this prospect?

A. I couldn't tell you.

Q. More than one?

A. Absolutely.

Q. More than two?

A. I made numerous runs.

Q. And would you make numerous runs? What parameters are you changing?

A. Well, actually the numbers I'm going to show you that we based our first approval on, I think, would be prior to the revision of the new casing program. So our costs were a little bit different. I'm not -- If we had been assigned internally on a figure and I reduce the cost and nothing material has changed, I'm not required to run that back through for management, but I may well re-look at the economics as they affect us.

Q. All right, so each --

A. So, you know, I've probably done in the tens of --

Q. All right, let me understand. Every revision you have made has been a revision based upon some change of the cost component; is that right?

A. No, we also look at -- I may do sensitivity runs to look at what the reserves -- you know, range of reserves that we might expect, or based on what we think our risk profile is.

Q. Now, that's the number I want.

A. I may look at costs as well.

Q. I want the reserve number. I want the unrisked reserve number that you used throughout the calculation. What number did you use, sir?

A. We used 4.3 BCF.

Q. 4.3 BCF is a good number to rely upon, then, for the basis of your calculations on what would be the recoverable gas for this well, right? Is that the number?

A. Absolutely not.

Q. The number again, four point what?

A. 4.3.

Q. 4.3 All right.

A. Did you say unrisked? Did I hear you say unrisked?

Q. Unrisked, unrisked.

A. So that would absolutely not be anything that Louis Dreyfus would rely on.

Q. I don't care about whether you realize it or not; I just want to know the number you used. So you've used 4.3 BCF of recoverable gas, right?

A. Right.

Q. And how did you get that? Is that decline-curve analysis?

A. No, sir, that would be looking at wells in this trend and what we think that their ultimate reserves would

be.

Q. Well, the only way to do that is either P/Z or decline curve? Either one, right?

A. Yes, sir.

Q. And which one did you use?

A. Both.

Q. All right, so you did use production decline analysis to get you the 4.3 BCF, right?

A. Well, I don't have a decline for this particular well. You're saying --

Q. Well, I -- No, it hasn't been drilled yet.

A. Right.

Q. But you could take the Topaz well and establish a decline for that well and give you a number, could you not?

A. I could.

Q. And you could take the pressure data for the Topaz well, get your data points, and that would give you a P/Z analysis, and you could back into what would be recoverable gas, true?

A. Yes, sir.

Q. And that's what you did, isn't it?

A. I have done that.

Q. All right, and you would expect an engineer to do that, wouldn't you?

A. Yes, sir.

Q. Okay. Did you test that with any volumetrics with the net-pay isopach map, to see if you could fit that volume of gas within a container shaped, perhaps as Mr. Anderson has provided us?

A. Yes.

Q. Was that net-pay isopach done for you by Mr. Anderson?

A. No, sir, it was not.

Q. Where did you get your volume for your volumetrics?

A. It was backed out as a number from what I thought was net pay in the wellbore, and I may just routinely make a guess on what I think it might be in the drainage area. I might have used material balance, and it would then back out what it said the drainage area might be.

Q. Have you forecasted what you anticipate to be the initial rate of the Chi well if drilled?

A. I have not.

Q. Have you anticipated what its pressure might be?

A. Well -- Excuse me.

Q. Yes, sir.

A. Under several scenarios, I've made an estimate for economic purposes, yes. And that is based on average initial rates of wells in this trend.

Q. And that's what we're talking about, Mr. Gabbard.

What would you estimate would be the average initial rate?

A. Well, let me elaborate because -- since you asked the question on what other rates I'd looked at.

I also looked at the case of if we considered that we were just sharing the remaining reserves that you might want to assign to the Topaz 30 well, and have made an estimate of what we might expect our capabilities to be if we had the same kind of sand and deliverability as the Topaz 30 and what that would mean to both the well in 30 and to our well.

Q. And that's a good way to work, isn't it, Mr. Gabbard, to take the closest analogy, which is the Topaz well and use those values?

A. To take the closest analogy in terms of reserves? Not necessarily.

Q. No, I'm talking about taking data from the Topaz well, such as initial rate, current rate, original pressure. You look at Mr. Anderson's map, it looks like it's a comparable. Why not use that well?

A. I don't have a problem with using that. There are some peculiar things about the way that well was produced that make it a little bit untypical to other wells in the trend. I'm sure Santa Fe can elaborate more on that more accurately than I can.

Q. What is your opinion about the remaining

recoverable reserves available to the Topaz well? What number is that?

A. It's about -- estimating -- Well, let's see, I've got a few intervening months, but assuming that we might be able to put a well on the east half of 19 on or around October 1st, I would be estimating perhaps 1.4 BCF remaining --

Q. Okay.

A. -- to the Topaz 30 at that time.

Q. If the Chi well is approved at its requested location and it tags the northern edge of the Topaz pod, then you're going to be in competition with the Topaz well for the 1.4 BCF of remaining gas for that pod, right?

A. If we get in the reservoir, whether it's the tag in the northern -- You've drawn this distinction about the pods, but you also drew the distinction that there might not be any separation. And if there is no separation, indeed, we'll be competing for those reserves wherever we would be in the east half of 19, quite likely.

Q. All right. And that competition is more equitable, is it not, sir, if you're competing at a standard location common to the Topaz well along the common line? That would be fair, would it not?

A. If our opportunity to develop was equal, yes, you'd say that that would be the most equitable thing.

Q. All right. And when you get 480 feet off the line, or even 760 off the line, if you're in competition with the Topaz well, you're going to get gas underlying the west half of 30 that otherwise would be produced by the Topaz well?

A. We've offered that a mirror-image location be permitted for this location. We are in no way attempting to gain reserves from what is both our well and Santa Fe's well, the Topaz 30.

Q. Well, let's follow that up for a --

A. That is not what we are drilling this prospect for, for some percentage of what they perceive as remaining reserves for that well.

Q. Well, let's follow that thought. Did I understand you correctly that we should approve your location? If that's approved, then Santa Fe needs to replace the Topaz well with a well that's 760 from the common line, and that's the solution?

A. If they believe that there is significant drainage impact that was commercially important, then they would certainly have that remedy.

Q. By your own calculation that's not feasible, is it, if there's only 1.4 BCF of recoverable gas left? It won't support a third well, will it?

A. There is -- You asked me for an estimate of

remaining reserves. Let me address that. Remaining reserves -- I have looked at the material balance on the well in the south, the Topaz 30. I received a pressure test that was taken in 1998 that was supplied to me by Santa Fe. I had also had a previous surface shut-in supplied to me by an engineer there, just on a call to try to get some information so I could do routine reserve work that was taken in 1997, and there were a number of pressure tests taken when the well was first drilled, and I've analyzed all of that.

What I am seeing is that there is some -- between the first point that I had and the second point, there is some evidence that reserves might be -- or the material balances developed in a little bit of a kink, and you could -- the very first fit in the reserves that I assumed for quite a period of time, when I only had the first point, was that gas in place was on the order of 3 BCF, and my most conservative estimate for what the Topaz 30 might recover is about 2.6 BCF. And that's a very good fit with the material balance.

The latest point they supplied me, I will say, is indicating some increase in that. I'm aware that Santa Fe is saying that there may be, you know, a water problem here, and they've indicated some other places where they've seen evidence of that in this trend. It could possibly be

water support, I don't know. I have not seen evidence in the production characteristics --

Q. Mr. Gabbard, what question are you answering, sir? I asked you if 1.4 BCF of remaining recoverable gas, which is the number you gave me, is enough gas to support a third well.

A. You're -- 1.3 would not be.

Q. All right.

A. You're asking -- You also asked what I -- what you thought was the best model for reserves in the east half of 19, and you were suggesting --

Q. No, sir, I didn't ask you what I thought the best model was.

A. Well, you told me what it was, and you suggested to me that it was the Topaz because of its proximity to our particular location.

Q. And have you disagreed with that?

A. Yes, I have.

Q. Okay. Let's look at this water issue that you've mentioned.

A. Yes.

Q. Do you share Santa Fe's concern that if the Chi well is too close, its position allows it to prematurely water out the Topaz well?

A. I do not.

Q. You don't share that concern?

A. No.

Q. Tell me why not.

A. I think this is based on log calculations, principally, that they think they have determined what they would calculate as a wet stringer in the lower part of the sand in the Topaz 30.

Q. Do you remember what that percentage is?

A. The water saturation?

Q. Yes, sir, that they gave you for the concern about water?

A. No, I don't know what Santa Fe's number for that is.

Q. Okay.

A. But we were aware that there was some low resistivity there and that there could be an issue there. And their completion technique, as you alluded to, was not the full interval in this well because of their concern about water. I fully concur that that was a prudent thing for them to have done.

But I also agree -- or, by my instrument of looking at what is pay in and around -- in the wellbore, and might, I guess, what's out and about, around the drainage area of that well, I think I see 16 feet of net good pay, not the 1 1/2 feet that were perforated. I think

that you could easily fit that inside of Section 30 without putting it into 19. It could be in the north half, it could be just as portrayed on Mr. Anderson's map. It doesn't have -- You don't have to get too inventive to try and put these reserves into 30.

Q. That wasn't my question, sir. My question is, if the Chi well is drilled, and if it is in pressure communication with the Topaz well -- they would be connected -- and Santa Fe's concern is that connection would cause the Topaz well to be prematurely watered out, and you have disagreed. Why would you disagree that if they're connected, the Chi well would not water out the Topaz well?

A. I'm not absolutely sure that there is a moving water contact in the Section 30.

Q. Have you studied that issue in this channel to see if that's occurred in the past?

A. I have.

Q. Okay, has it?

A. It's not clearly evident that it was water that caused that.

Q. All right. Have you done any type of pressure analysis to see what the impact is of one well on another and how far that impact might be felt in this area?

A. Yes, I have.

Q. Where did you do it, and what did you find out?

A. I looked at the case of a 50-percent penalty, which it had been suggested to me that it might be something we should expect in coming here that is more in line with the footage calculations that the Commission is -- generally employs in their determination on penalties.

And I made the assumption that, yes, we were unlucky and could only expect to share some percentage of the remaining reserves with Topaz 30. And I determined that with that sort of penalty and all other things being equal in terms of deliverability, that the well at a vertical location might produce 465 million gas, that it might have a drainage area of roughly 61 acres if you applied a radial pattern, that perhaps something on the order of 28 acres might be in a little bit of a pie shape that would come into Section 30.

Q. Did you or did you not study pressure interference between two wells? That was the question?

A. Well, that was the extent of my study.

Q. Okay. If the Chi well is in pressure communication with the Topaz well, those wells will equally share whatever the remaining gas is, is it not?

A. Not necessarily.

Q. What initial rate do you anticipate for the Chi well under that analysis you've just described?

A. Let me refer to something here. An unpenalized rate?

Q. Yes, sir.

A. If we're using that October 1st date, we might be looking for a deliverability, assuming a line pressure 570 pounds, which is my best information about what it was in the past. Santa Fe probably has undoubtedly better information than I do. But the deliverability I would expect at that time for the Topaz 30, actually, would be 987 MCF per day. If you made the assumption that we had the same deliverability and all other things equal, then I guess you'd say we had that as well.

Q. All right. So you're forecasting that the rate of the Topaz well by October of 1999 is going to be a little less than a million MCF a day?

A. Yes.

Q. Okay. And that it would be your forecast that if the Chi well is completed and connected with the Topaz well at that time, it would have an equivalent unpenalized rate of about a million a day, right? Is that what you're telling me?

A. Yes, if that's all that -- if you're saying that the only reserves that they found at that location --

Q. Yes, sir.

A. -- were associated with what is being produced

with the well in 30.

Q. Okay. So at an unpenalized rate, each well producing a million a day, they would each produce 50 percent of the remaining recoverable gas, true?

A. Unpenalized, yes.

Q. And if it's unpenalized and the remaining gas is 1.4 BCF, they would share that 50-50, right?

A. Yes, sir.

Q. And they would do that if there was no penalty on the Chi well, right?

A. At the vertical location.

Q. Okay. Have you made any kind of calculation to determine what is the remaining recoverable share of the gas within this Topaz pod that is still under the Chi spacing unit?

A. You'll have to repeat that.

Q. Yes, sir.

A. You lost me.

Q. When we look at the remaining recoverable gas at the opportunity you exercise your correlative rights, and we try to apportion that between the Topaz well and the Chi spacing unit, do you know what that apportionment would be?

A. You're assuming -- This is just a scenario that we just set up?

Q. Yes, sir.

A. I said that we would produce perhaps -- well, I was looking at the 50-percent penalty. I did not assume that we would drill the vertical location without a penalty, so...

Q. And your assumption under your analysis was that the penalty, as high as you calculated, was a 50-percent penalty?

A. Yes.

Q. Okay. Under those circumstances you described, it would not be feasible for Chi to drill the well, would it?

A. Absolutely not.

MR. KELLAHIN: No, you wouldn't want to do it. Thank you, Mr. Examiner.

EXAMINER STOGNER: Mr. Kellahin.

Mr. Carr, redirect?

MR. CARR: No, sir.

EXAMINATION

BY EXAMINER STOGNER:

Q. This proposed penalty that you suggested for the straight hole, that was based on a proximity of 660 feet?

A. Yes.

Q. Why 660?

A. Because that was the distance that Santa Fe attempted to develop reserves in the west half, and on an

equity, considering our joint ownership in these lands, which is very nearly equal, regardless of the outcomes of the wells, assuming they participated with us, that it seemed to be the most equitable thing to allow us to -- given our restriction on the potash -- and again, I would say to you that it is clear to us there's gas being produced from this lower Morrow channel to the north of us in Section 18, there is gas being produced from the channel to the south of us in Section 30, still producing, good wells, and there is reasonable evidence to suspect that there could be quite a bit of net sand in the east half of 19.

I don't have any more evidence that we are not connected to the well in 18 or the well in 30. There is simply no pressure data for the original OXY Government 1 Y well there in the southeast southwest of 19. We do know that there was sand present.

And given that they had -- when they had their opportunity to develop, they chose to develop at that distance, and we would actually have developed at the 1650, had the potash not restricted us.

We were given some advice that we should expect no penalty if we were required to directionally drill to something greater than 660 that were unopposed, that we might very well not be penalized if we had done a laydown,

you know, we could have been 660 off the line, although there's a currently active unit in the west half of 19, but just in a suppositional way.

Therefore, we feel like that in terms of opportunity to develop, that that's a better number, even though it is not common for what the Commission has done in the past. That's why we make these appeals to the Commission to adjudicate these special cases where there are special circumstances.

Q. Was that put in some sort of an agreement when Santa Fe re-entered that old Cities well, to base your 660 on?

A. There was -- No, there was no agreement.

Q. Nothing official, just your assumption? Nothing official, just your assumption?

A. Assumption about what?

Q. Just what you told me, the 660 came from, assuming that they were allowed to develop a 660 -- or did you say something else, or did I just not understand all that lengthy discussion tat you just gave me?

Let me re-ask my original question. What do you base the 660 on for that 27 percent?

A. I'm basing it on where they attempted to develop. They, in fact, did re-enter at the vertical location, at 660 from the south line.

Q. Okay. Was there some sort of an agreement, a written agreement, whenever they did that with the offsets, that they be allowed to develop 660?

A. No, there was not.

Q. Okay.

A. Are you meaning the offset of the Topaz 30?

Q. What offset were you referring to?

A. That's the only offset that there was existing at that point, proposed or considered.

Q. Now, we're talking about the one in the west half of 19. I'll tell you what. We seem to be talking about this west half of 19. Can somebody give me -- In fact, I'll ask you, what was the approval order for that?

A. I don't --

Q. You don't know?

A. I don't know.

Q. But you will tell me, though, won't you?

MR. CARR: I can get that for you.

EXAMINER STOGNER: Good, okay.

Q. (By Examiner Stogner) Now, let me see if I get this straight too. You're proposing a 27-percent penalty on the production, proposed production, for this distance, but not penalty on the 760. I don't believe I've heard anything about a risk-penalty factor on the compulsory pooling. I think now would be a good time to see what it

is.

MR. CARR: Mr. Examiner, Mr. Anderson did testify in support of a 200-percent risk penalty.

Q. (By Examiner Stogner) Okay, now -- We heard geological. Now we heard some differences that make me believe that maybe 200 percent, because you can't have an unorthodox location without penalty and then come in and ask for risk penalty at 200 percent. I don't see the corresponding thing here. You say you want an unorthodox location because it's more acceptable; is that correct? But you also say it's risky? Doesn't this seem to be head-on to each other here?

A. We're saying that the risk of knowing where the sweet spot of this Morrow channel is, we consider to be far riskier than what we know about the cost to drill directionally.

Q. Which is $500,000 more to go over about 280 feet?

A. It is $300,000 to go from the vertical location to the 760. We believe it would be another $200,000, or a total of $500,000, if we were required to go to the 1750 -- or 1650.

Q. Okay. I'd like to find out a little bit more about this original standard location that the BLM denied, and I don't have anything on that other than Jim Bruce's letter. When was that application applied for, for the

standard location?

A. I'll have to --

Q. I'm getting a little confused here. Who is the Applicant? I mean, I'm -- Chi Energy, I thought, was going to be the operator. That's what compulsory pooling said, so that will have to be changed.

MR. CARR: Yes, it will.

EXAMINER STOGNER: And then the case that we're hearing now -- and what I understand from this gentleman is that that standard location would not be acceptable, was not even originally applied for. That seems a little bit --

MR. CARR: I'm not aware of an application for a 1650 off the south-line location.

MR. QUALLS: No.

MR. CARR: There was none. Mr. Stogner, the NSL number that you asked for --

EXAMINER STOGNER: Yes.

MR. CARR: -- is 3910, NSL-3910. That was for the Topaz 19 Federal Com Number 1 in 19. That's down in the southwest quarter.

EXAMINER STOGNER: So a standard location was never even requested by the BLM?

MR. QUALLS: I have talked the BLM and requested -- talked to the potash guy in Carlsbad. His

name is Doug Hope. He said there's no way we could do a standard location on a surface 1650-1650. He said we could come in and go 150-foot radius from that well in the southeast corner, the Yarbrough Number 1, 480 from the south and directional drill to a 760. That was what was applied for, was 760.

EXAMINER STOGNER: Based on what your conversation with the BLM was?

MR. QUALLS: Yes, sir.

EXAMINER STOGNER: As opposed to trying to go through his supervisor or make an application and then for them to come back to you and justify what you're saying today?

MR. QUALLS: He told me over the phone that we could --

EXAMINER STOGNER: So the answer is no, okay.

MR. QUALLS: -- that we couldn't --

EXAMINER STOGNER: Thank you.

MR. QUALLS: -- drill a --

EXAMINER STOGNER: Thank you.

I have no other questions of this witness. You may be excused.

MR. CARR: That concludes our direct case. We would request a ten- or fifteen-minute recess.

EXAMINER STOGNER: Let's make it ten.

(Thereupon, a recess was taken at 2:40 p.m.)

(The following proceedings had at 3:00 p.m.)

MR. KELLAHIN: Mr. Examiner, our first witness is Mr. Tom Tinney. Mr. Tinney is a geologist with Santa Fe Energy Resources. He currently resides in Midland, Texas.

THOMAS J. TINNEY, III,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Tinney, for the record, sir, please state your name.

A. Thomas Jordan Tinney, III.

Q. And where are you employed?

A. Santa Fe Energy Resources.

Q. In what capacity?

A. I'm the geological and geophysical manager.

Q. On prior occasions have you testified before the Division?

A. Yes, I have.

Q. And pursuant to your employment as a geologic manager for Santa Fe, have you made a study of the geologic issues involved in this case and prepared your conclusions and supporting displays?

A. Yes, I have.

MR. KELLAHIN: Mr. Examiner, we tender Mr. Tinney as an expert geologist.

EXAMINER STOGNER: Any objection?

MR. CARR: No objection.

EXAMINER STOGNER: Mr. Tinney is so qualified.

Q. (By Mr. Kellahin) Mr. Tinney, let's -- before we look at the specifics of your display, let's talk about some of your ultimate conclusions. You were here during Mr. Anderson's testimony concerning his presentation, were you not?

A. Yes, I was.

Q. All right. Do you have any agreement or disagreement with Mr. Anderson about the depositional environment of this north-south-trending fluvial Morrow channel system?

A. No, I do not.

Q. What have you concluded?

A. I agree with Mr. Anderson that this is a north-south-trending lower Morrow fluvial system.

Q. When you look at your results and examine the east half of Section 19, what is your conclusion about the geologic preference between a standard location versus the proposed unorthodox location Chi seeks to have approved? What do you conclude?

A. I conclude that a standard location, an orthodox

location, proposes the best chance of capturing the unique reserves, and that an unorthodox location has a high chance of encountering reserves that otherwise would be produced from the well in the west half of Section 30.

Q. When you look at structure in this area, in the Morrow, lower Morrow, is structure an issue of importance to you?

A. Yes, it is. I think there's evidence in this particular area that there are several separate gas-water contacts in this system and that the structural position does play a role in the well performance.

Q. Geologically, is there an opportunity or a reasonable probability that if the Chi location is approved it will be connected to the same Morrow pod that is currently being produced in the Topaz well?

A. Yes, it's my opinion that a well located at an unorthodox location would adversely affect the Santa Fe well in the west half of 30.

Q. When you look at structure and confined your examination to the east half of 19 and you're looking at a structural advantage or disadvantage, how does that information affect your conclusion about Chi's proposed location and the closest standard location for that spacing unit?

A. When you look at the structure map, you'll notice

that Chi's proposed unorthodox location will be structurally high to the Topaz 30, which does have a -- water in that reservoir, that an orthodox location would be structurally higher, and that would afford them the best opportunity for a well with unique reserves.

Q. All right. Would you agree or disagree with Mr. Anderson's opinion that if potash was not an issue and you could drill a vertical well, that you would drill that well at a standard location in the east half of 19?

A. I would agree with that.

Q. Do you find any geologic evidence to the contrary?

A. No.

Q. Nothing to suggest that there is some advantage gained by moving to an unorthodox location?

A. No, sir.

Q. This is not one of those circumstances that the only reasonable location in the spacing unit is at an unorthodox location?

A. That's correct.

Q. We don't have that problem?

A. No, sir.

Q. Let's look at your work product, Mr. Tinney. If you'll turn to look at Exhibit Number 2, before you explain the details, explain the code so we can understand your

color code and what you're showing us.

A. Okay.

Q. First of all, what are we looking at?

A. This is an isopach of the lower Morrow. It's a gross sand isopach, and the blue line is the measured potash boundary. The red square would be the proposed Chi Energy Greenstone Fed Number 1 at the 480-from-the-south-line location, and you can see the well is labeled. And then also you can see Santa Fe's acreage position is stippled in gray.

Q. Okay. We'll come to the cross-section in a moment, but are you isopaching a sand interval that is any different from the markers used by Mr. Anderson when he constructed his map?

A. I'm not isopaching a different interval. The way I determined the values is slightly different. Mr. Anderson used a gamma-ray cutoff that he said generally was 50 API. I chose to do a true gross sand map, which you just take the inflection of the bed from the shale and calculate that number

Q. Okay. Looking at the gross lower Morrow interval, you are looking at the equivalent interval that Mr. Anderson was examining, are you not?

A. That's correct.

Q. There's no disagreement between you as to what

interval we're examining?

A. No, not at all.

Q. On the gross map, you have displayed some information. First of all, you have shown the Section 19, 30, Section 18, these stacked sections, to be part of what appears to be a channel system; is that true?

A. Yes, sir.

Q. Within that you have confined some contour lines. What are those contour lines, and what do they mean?

A. Well, the contour lines, obviously, are the actual gross sand. The color is more for reference in terms of the eye so you can pick out the system and the way it trends north-south.

Q. In those instances where you had a deviated well and a bottomhole location --

A. Yes, sir.

Q. -- have you made the appropriate adjustments to the display to denote --

A. Yes, the bottomhole locations will be noted --

Q. All right.

A. -- as BHL for bottomhole location.

Q. Within Section 30, just to the south of the Topaz well, there's a dashed red line, and you've indicated gas/water. Do you see that line?

A. Yes, I do.

Q. And it says minus 10,143?

A. Yes, sir.

Q. You put that line there?

A. I did.

Q. Why did you?

A. That is based on log analysis calculations. We can show that on the cross-section, we have some water-saturation calculations on the cross-section. But what I've done there is, when the water-saturation calculations were greater than 40 percent, then I felt like that was at risk at being water-productive or predominantly water-productive, and therefore that's an arbitrary.

We also, in the Topaz 30, ran a DST and recovered water when we DST'd the sand in conjunction with gas.

Q. All right. We'll come back and integrate the gas-water contact line with the cross-section in just a moment.

After you have a gross map like this, there is an opportunity for you as a geologist to become more definitive and refine this map; is that not true?

A. Yes, it is. Yes, there is.

Q. Have you done that in this instance?

A. Yes, in the next exhibit.

Q. And what is that next exhibit?

A. The next exhibit would be Exhibit 3, I believe,

net pay of lower Morrow sand. And what I've done here is, the first number that's next to the well is net pay based on porosity greater than or equal to 8 percent, and I used 40 percent as a water-saturation cutoff to determine net pay. The second number is just a net-sand number, which is anything greater than or equal to 8 percent.

Q. You and Mr. Anderson, then, are in agreement about a water-saturation value? He said he would start being concerned at 40 percent, and you've used that 40 percent?

A. That's right.

Q. What does that mean to you?

A. Well, you just run the risk anytime you're higher than 40 percent in this area, of producing more water than gas. So it is a risk.

Q. And the porosity cutoff value, 8 percent, is within the range of reason?

A. Yes.

Q. All right. Once you do that, make the adjustments and reproduce the map, you can come to conclusions in Section 19, can you not?

A. Yes.

Q. Let's look at Section 19, and particularly the east half of 19.

A. Right, what I feel like will happen here is

reflected in the gross-sand map, is also reflected in the net-pay map, that there's a high probability that an unorthodox location on the Chi Energy Greenstone Fed Number 1 would encounter common reserves to the Topaz 30 Number 1, which is labeled in the west half of Section 30.

As you can see, it had a net pay, the Topaz 30 had a net pay of four feet, and a net sand of 14 feet. Obviously, the rest of that 14 feet was below the water-saturation cutoff. The Chi well, if they encounter a similar-type reservoir, would have all 14 feet above the water contact, and therefore you would -- one would conclude that their well might outperform the Topaz 30.

In addition to that, if you look at the orthodox location, that location has the best chance to encounter, I feel like, unique reserves.

Q. All right. Do you remember Mr. Anderson's testimony that his strategy also was to find new and unique reserves?

A. Yes.

Q. In your opinion, using your analysis, can you best achieve obtaining new and unique reserves at a standard location or at the proposed unorthodox location?

A. Well, it's my feeling, from the mapping I've done, that the best chance to do that is at the standard location or orthodox location.

Q. Let's integrate your net-pay isopach now with your structure map. You've also prepared a structure map, have you not?

A. Yes, I have, and that would be the next exhibit.

Q. All right, let's take Exhibit 4, which is the structure map, again have you define the coding, and then we'll talk about your conclusions.

A. The coding is similar to the other maps. Actually, it's the same with the outline of the potash, the stippled acreage being Santa Fe acreage. I've also got a gas-water contact on the structure map; it's minus 10,143. It shows the location of the Topaz 30 at a minus 10,106, and that moving to the north to the Chi Energy Greenstone Fed Number 1 at an unorthodox location, that they would be updip to the Topaz 30.

Q. Let's examine your structural conclusions as they affect the east half of 19. When you look at structure, does it matter whether you're at a standard location or the proposed unorthodox location?

A. Well, the standard location will just afford you to be structurally higher, and because of the fact that there is proof in this area that there are separate gas-water contacts, obviously even if you get into a reservoir that has unique reserves, you want to be as far structurally updip as possible.

Q. You can conclude, then, that the standard location is structurally preferable to the unorthodox location?

A. Yeah, I agree with Mr. Anderson that his map is similar to this one, and that it would be structurally higher at that location.

Q. And that structural difference is enough to matter?

A. Yes, anytime that you can gain structure in the Morrow, you have to take advantage of it, is my opinion.

Q. Let's look at the structural relationship between the Chi-proposed location and where the Topaz well currently exists and have you tell us your geologic conclusions about what, if any, adverse consequences the Chi well would impact or have on the Topaz well.

A. Well, as I mentioned, if you take the net-pay map and assume that they're going to have 14 feet of net pay, which will be somewhere near the Topaz 30, and that by moving 50 feet updip, that you would get all of that 14 feet above that water, therefore you would have a better performance of your well.

Q. Let's go to the cross-section so that you can illustrate that point. If you'll take Exhibit 5 for me and take a moment and unfold it.

A. Exhibit 5 is a northeast-to-southwest cross-

section. North would be on the left, so it is the proposed Chi Energy Greenstone Fed location.

Q. Let's go to the far right and look at the Topaz 30-1, the Santa Fe well.

A. Yes, the Topaz 30 Fed Number 1, you can see the sand labeled lower Morrow, also the water saturation calculations to the right of that well. We perforated a foot and a half in the very top of that particular well. And as you can see as you move down, your water saturations increase.

And I'd also like to note that the DST from 13,821 to 14,008, we'd like to note that they recovered eight barrels of water on that DST. And if you look at the interval, even though it's a rather large interval, the only zone that has any porosity that could give up water would have to be that lower Morrow sand.

Q. Is this occurrence unique to the Topaz 30 and 1 well, or has it occurred elsewhere in the immediate area?

A. No, this same thing occurs to the north. If you look at the Section 7, the well labeled TXO Production Corp Hamon 'A' Fed Number 1, that well, they perforated the top -- I think it's four feet in that particular well. If you do the water-saturation calculations, it's also wet in the bottom. They realized that, and I think that's the reason that they perforated only the top four feet of that

particular well.

Q. When you look at the current perforation relationship in the Topaz 30-1 well --

A. Uh-huh.

Q. -- to what you've calculated to be the 45-percent water-saturation value --

A. Yes.

Q. -- would that illustrate your concern about water encroachment if there's a second well in the Topaz pod?

A. Yes, any of those water-saturation calculations, I think, do indicate that there is water in that reservoir, and the fact that the well actually is producing water. And I think Mr. Adams will address that fact when he gives his testimony.

Q. But looking at the log analysis, you as a geologic expert can recognize and realize the risk imposed by the Chi well if it connects with the Topaz pod?

A. Yeah, absolutely. When you've only got a foot and a half of perforations open and you realize that you've got water below you, any well updip that has a superior structural advantage, you would feel like that that would have a chance of watering your well out.

Q. Does that probability affect where a well would be located in the east half of 19?

A. I think it should, yes. The fact that -- their

unorthodox location, and the way I've correlated and the way Mr. Anderson correlated, the fact that by drilling there they have a high probability of encountering that same sand, an orthodox location would give you the best opportunity to prevent that from happening.

Q. Summarize for us your geologic conclusions, then, Mr. Tinney.

A. My geologic conclusions are that I agree there is a fluvial north-south-trending system, that there is a high probability by drilling at an unorthodox location that a well would tag into a common reservoir with the Topaz 30 Fed Number 1, and then by having a structurally superior position would have an adverse effect on our well, that a standard location or an orthodox location would afford Chi and its partners the best opportunity to encounter unique reserves, and I think that, as they have stated, that's really their sole purpose, is to try to capture unique reserves, new and unique reserves.

Q. In your opinion, do the interest owners in the east half of 19 substantially reduce the risk involved in that well if they move to a standard bottomhole location?

A. I think that it actually is beneficial to them by moving to a standard location.

Q. It would reduce the risk, then?

A. Yes, sir.

MR. KELLAHIN: That concludes my examination of Mr. Tinney. We move the introduction of his Exhibits 2 through 5.

EXAMINER STOGNER: Exhibits 2 through 5 will be admitted into evidence.

Thank you, Mr. Kellahin.

Mr. Carr, your witness.

MR. CARR: Thank you, Mr. Stogner.

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Tinney, when I look at your Exhibits 2, 3, 4, when you constructed these exhibits, what information did you have? Well-control data?

A. Yes, sir.

Q. And are the wells shown on this exhibit that you were able to analyze to develop your interpretation?

A. Yes, sir.

Q. And did you have access to any seismic work over the area?

A. No, sir.

Q. Okay. If I look at your Exhibit Number 2, you have shaded in yellow what look like there are almost separate pods through the reservoir. Is that what you're intending to show?

A. Yes, sir, I think that's what the evidence does

show, is that we have separate pods in here.

Q. Do you have any geological evidence that would suggest that, in fact, you have separation running through the southern portion of Section 19 and that could not be just a continuous zone running through there, instead of two separate pods?

A. No, that's an alternative interpretation.

Q. And that's just your interpreta- -- The same would apply as we come across the southern half of Section 18 to the north?

A. Yes, sir, the only evidence that is there is, there is engineering data that suggests that those are separate reservoirs.

Q. Geologically, though, this is just your interpretation --

A. That's correct.

Q. -- they could be connected?

What do you mean by the Topaz outline that you've indicated down at the bottom, in the legend, with this block around six sections?

A. That's the original prospect outline.

Q. Is that the area -- Do you have your AMI in that area, or is that something else?

A. I'd have to defer.

Q. Okay.

A. That's not my area of expertise, sir.

Q. And you have ownership in five of the six sections; is that correct?

A. Yes, sir.

Q. If we look in 19, do you actually have in the east half any ownership at this time in the deep rights, or do you know?

A. Once again, I --

Q. Okay.

A. -- I don't have the expertise.

Q. If we go to Exhibit Number 3, again I see you have got what you've indicated coming across this channel permeability barriers. From a geologic point of view, this is just your interpretation; there's no particular geologic data that would support that; is that correct?

A. That is correct.

Q. And you've put across the southern portion of Section 30 a line that is your gas-water contact?

A. That is correct.

Q. You used a 40-percent cutoff in mapping or placing that line across the reservoir there?

A. Yes, sir.

Q. Now, if I understand it, a 40-percent cutoff means you've got 40-percent water; is that what that means?

A. Yes, sir.

Q. And conversely, you would still have 60-percent gas south of that line?

A. That's correct, sir.

Q. And so there would be some gas south of that line that you still would be able to recover; is that right?

A. Potentially, yes, sir.

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

EXAMINATION

BY EXAMINER STOGNER:

Q. Your Topaz 30 was completed in 1996; is that correct?

A. Yes, sir.

Q. What stimulation was utilized on it?

A. I'd have to defer, actually. Not my area of expertise. I believe it was natural, Mr. Stogner, but I don't -- don't really know.

Q. In looking at your Exhibit Number -- well, 2 and 3, is this one well adequate to drain this pod or the yellow pod? Is that you're indicating?

A. Yes, sir.

Q. And what is the acreage within the productive interval? Is that the -- Can I look at the yellow portion and say this is the productive interval, or does it extend beyond that?

A. I would really ask you to look at the net-pay

map. You can see on the net-pay map that the Topaz 30 has four feet of net pay. So really anything within that zero line potentially could be productive.

Q. Okay, what's the -- Do you know what the area of that would be?

A. Yes, sir, that's approximately 300 acres.

Q. 300 acres. I'm trying to realize something. Part of that small pod goes into their -- or reservoir goes into -- in the east half of Section 19?

A. That's correct.

Q. But I don't see how what you're proposing would allow them to recover their rightful share that goes into the east half of 19.

A. It's our interpretation that the Topaz 30 will drain all of those reserves.

Q. You mean will take reserves under 19 and come down?

A. Yes, sir.

Q. Isn't that a little bit beyond 320-acre spacing, since you're at a standard location?

A. Yes, sir.

Q. Then why hasn't Santa Fe asked for 640-acre spacing to adequately regulate or develop these reserves?

A. I couldn't answer that question.

Q. Hm. Who could?

A. I imagine our landman would have to answer that question.

EXAMINER STOGNER: Okay, good. I'll reserve that question for them, or hopefully Mr. Carr will ask a similar question where I won't have to.

Okay, any other questions of this witness?

You may be excused.

I'm sorry, I meant Mr. Kellahin.

MR. KELLAHIN: Yes, sir, Mr. Rod Adams is our next witness.

ROD ADAMS,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Adams, for the record, would you please state your name and occupation?

A. Rod Adams. I am a petroleum engineer. I'm employed by Santa Fe Energy Resources. I'm the division engineer responsible for New Mexico.

Q. And where do you reside, sir?

A. Midland, Texas.

Q. As part of your responsibilities for your company, have you as a petroleum engineer examined the engineering facts relevant to the topic before the Examiner

this afternoon?

A. Yes, I have.

Q. Have you testified on prior occasions?

A. No, I have not.

Q. Summarize for us when and where you obtained your engineering degree.

A. I have a bachelor of science in petroleum engineering from the University of Tulsa. I graduated in 1978. I've been continuously employed in the oil business for the last 21 years. I'm a registered engineer in the State of Oklahoma.

Q. The information you're about to present and the opinions you're about to express, were those arrived doing your normal engineering functions for your company?

A. That is correct.

Q. The method by which you have arrived at these conclusions is those typically used by members of your profession to reach conclusions on these subjects?

A. Yes, they are.

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

EXAMINER STOGNER: Any objection?

MR. CARR: No objection.

EXAMINER STOGNER: Mr. Adams is so qualified.

Q. (By Mr. Kellahin) Mr. Adams, was a copy of the

Chi administrative application, which included Mr. Anderson's net clean sand isopach map, made available to you?

A. Yes, it was.

Q. You had an opportunity to look at that information, did you, prior to the hearing?

A. Yes, sir.

Q. In addition, you had available to you the other reservoir data from the Topaz well that Santa Fe operates, as well as other data available from similar wells in the area?

A. That is correct.

Q. Let me ask you to address your major conclusions. First of all, the conclusion with regards to, if Mr. Anderson's map is correct, what does that mean?

A. If Mr. Anderson's map is correct, they should find a new, unique reservoir. That reservoir would cover the entire 320 acres in the east half of Section 19. The volumetric calculations from his mapping would indicate 6674 acre-feet of Morrow sand underlying that production area.

If you go ahead and use the log characteristics and the production information from the Topaz well, you come up with a gas-in-place number of 6.2 BCF, or something around 5 BCF recoverable, which compares with Mr. Gabbard's

testimony of 4.7 BCF.

Q. All right. If you use Mr. Anderson's map, calculate gas in place, apply an appropriate recovery factor, is there sufficient recoverable gas in the east half of Section 19 to pay for the cost of directionally drilling this well to a standard bottomhole location?

A. Absolutely. The next exhibit that I put together was an economic run showing 5 BCF of recovery with the comparable information of the other Morrow wells in the area, and it indicates that they would have a hundred-percent rate of return and pay out in a very short period of time. And this was done assuming $1.7 million as the cost to drill this directional well.

Q. All right. The $1.7-million directional well would get you from the 480 surface location down to a standard subsurface location?

A. That is correct.

Q. And you had engineering drilling people within Santa Fe to prepare and submit to you an itemized, detailed AFE that gave you that number?

A. And those are attached in the exhibits --

Q. All right.

A. -- that we did.

I would add that when I first did that, the number that they came up with was one point fifteen sixty

dollars, which is the same number that they have, and when I told them that I needed to come up here and be able to pound the table and testify to these numbers and to make it as high as it could cost, they were able to push the cost up to $1.7 million.

Q. All right. So even if it's required to be drilled to a standard bottomhole location, the additional expense that you show over a vertical well is about what? Four hundred and --

A. -- thirty-thousand dollars.

Q. How much?

A. About $430,000.

Q. About $430,000 additional costs. Those are the numbers you used?

A. Yes. And compared to the $500,000 they came up with.

Q. All right. And you have applied the current economic methodology used by reservoir engineers to show if this was profitable or not?

A. Right, the next exhibit, basically, is an economics evaluation of what the reserves on the well would yield economically. And so it basically -- the line on the left would show what kind of BTAX rate of return you would get, and the line on the right is the BTAX net present value, discounted at 15 percent.

You can see from these numbers that you basically need a well that makes about 1.4 million BCF to make a well that will pay out --

Q. All right, let's look at Exhibit --

A. -- and gain 15 percent rate of return.

Q. Let me look at Exhibit 8 and have you help me read it. If I'm reading the bottom horizontal graph, I'm showing a reserve number. These are recoverable gas in BCF, right?

A. Yes.

Q. And if I'm looking at the left-hand vertical column, I'm looking at a rate of return?

A. Yes.

Q. And as I match the two, the minimum for a rate of return would give me how much BCF?

A. Zero percent rate of return would be about 1.25 rate of return.

Q. All right. For 1.25 recoverable gas, that means I can pay for the well one time?

A. That's right, that's it.

Q. And that will give me my $1.7 back?

A. That's it.

Q. Okay. If we believe Mr. Gabbard's conclusion about the remaining recoverable gas in the Topaz pod, he was dealing in the range of perhaps 1.4 BCF; is that not

true?

A. That's correct.

Q. Is there enough left in the Topaz pod to support two wells at this point?

A. No, there's not. That's -- The gist of this statement is that if you split the remaining reserves between those two wells, you would be losing money and you'd be causing economic waste by drilling a second well to recover the remaining reserves.

Q. Well, let's talk for a moment about this concept of correlative rights. Mr. Stogner began to touch on it with Mr. Tinney. If you looked at the original gas in place before the Topaz well was drilled, you're going to have a certain portion of that gas not only underlying the Topaz spacing unit, but originally in place under the Chi spacing unit in the east half of 19, true?

A. That's the geologic interpretation that we have, that's correct.

Q. All right. Correlative rights is the opportunity to recover your share?

A. That's correct.

Q. If that opportunity is delayed and the offsetting well produces it, you simply lose it, do you not?

A. That's correct.

Q. At this point in time, in order for Chi to put a

well at the edge of their spacing unit, to get whatever is left of their share, is there enough to support that activity?

A. No, they would have to take more than all the remaining gas that's left in the Topaz well for that to work.

Q. At this point in time, you simply can't balance the equity, can you?

A. You can't.

Q. In order to achieve the best opportunity in the east half of 19, then, what would you do?

A. You need to drill a well that finds unique reserves.

Q. Mr. Qualls says that was their purpose.

A. That's right.

Q. And where do you best achieve that?

A. You achieve that at a legal location further north than the location they've proposed.

Q. Let's look at the rest of the parts that support the economics that you have concluded make this profitable as a directional well.

A. Okay.

Q. If you'll look at Exhibit 9, identify and tell us what that is.

A. Exhibit 9 is the well-cost estimate that was put

together by Mr. Burton and approved by me, saying what our cost would be for a directional well.

Q. It's the $1.7 million?

A. Correct.

Q. Do you have experience and knowledge about going through this and determining whether it's reasonable?

A. Yes.

Q. Were you involved in any of the other wells?

A. Yes, I've been in this area for five years, and I'm familiar with the wells that were drilled in the area and I've put together an exhibit showing the drilling times for the offset wells that Santa Fe has operated in the area.

Q. All right. So 9 is the directional well?

A. Yes.

Q. What is Number 10?

A. Straight hole.

Q. It's the AFE for the straight hole?

A. Uh-huh.

Q. You show a differential of about what? $430,000?

A. Yes.

Q. Do you find any support for the representation in Chi's letter to the Division that the additional cost is some $700,000?

A. No.

Q. Let's look at the comparison of times. If you'll turn to Exhibit 11, describe for us what you're illustrating here.

A. Santa Fe was the operator of the four mentioned here, the Sinagua 18-1, 18-2, and the Topaz 30-1 and Topaz 19-1.

The Sinagua 18-1 was a straight hole.

The 18-2 was a deviated well that was kicked off at 9750, and so what I did here is basically take the drilling days down to 10,000 feet, and then to take the drilling days below 10,000 feet so that I can compare how much longer it took to drill a deviated well from a straight hole.

I did the same thing on the Topaz 30 well.

The Topaz 19-1 is a re-entry, and so its top 10,000 feet didn't take as long because the well had already been drilled, and we were just re-entering an existing wellbore.

But from what I was able to conclude from this is that it took an average of 26 days to drill down to 10,000 feet on the first three wells, and it took 19 days to drill on down to the -- from 10,000 to TD, which is a total of 45 days, which is the number of days that Mr. Burton used on his AFE. And for a deviated well it took 33 days, or an extra 14 days, to get down to TD. And his original answer

was 60 days to drill the deviated well, but to go ahead and push the cost here, he used 70 days on this $1.7-million AFE.

Q. So for drilling days, you've used a number that's higher than any of the actual days, actually involved in any of the directional wells?

A. That's correct.

Q. And so it's a very high AFE number. And despite that AFE cost, you can show economics that justify the directional well?

A. That's correct.

Q. It would be highly profitable, wouldn't it?

A. Very highly profitable.

Q. What's the payout period of the directional well?

A. It would be 1.28 years at 5 BCF.

Q. You only have to wait what? Fourteen months --

A. Yeah.

Q. -- fifteen months, to get payout?

A. Yes.

Q. What's your rate of return?

A. A hundred percent. It's greater than a hundred percent.

Q. This development has occurred within the context of the potash enclave, has it not?

A. That's correct.

Q. That potash reserve was known to everybody before these wells were ever drilled?

A. That's correct.

Q. So everybody, including Santa Fe, has factored in the risk involved of having to pay for directional wells to get to the resource?

A. That's correct.

Q. Everybody knows that up front?

A. Yes.

Q. When you controlled 19, you knew that as an issue, right?

A. That's correct.

Q. And if Chi acquired an interest subsequent to that, they knew they were acquiring an interest that might require them to drill a directional wellbore?

A. That's correct.

Q. They weren't blindsided by any change in the rules, were they?

A. No.

Q. Let's look at 12. What's 12?

A. Exhibit 12 is a summary of pressure data of measured bottomhole pressures that I have on the Topaz 30-1, and the calculated Z factors that make up the graph that is Exhibit 13, that indicate a reserve -- excuse me, a gas-in-place number of almost 4 1/2 BCF for the Topaz 30

Number 1.

Q. Are you satisfied, Mr. Adams, that you've got good pressure data points to construct your P/Z curve?

A. Yes.

Q. And when we look at Exhibit 13, we're seeing that forecast?

A. That is --

Q. Thirteen?

A. That's correct.

Q. The P/Z gets you 4.5 BCF of gas?

A. In place.

Q. In place.

A. Not recoverable, but in place.

Q. Okay. Have you attempted to calculate that in any other way?

A. I did decline-curve analysis, and the decline-curve analysis I did came up with a 3 1/2 BCF recoverable from the well, which would be about 80-percent recovery factor, which is normal.

Q. Are you satisfied that you've got reasonable agreement between your P/Z analysis and your production decline curves?

A. Yes, I do, and that's why I would conclude that the existing well can drain the reserves that's represented on this P/Z plot.

Q. Have you taken the additional engineering step of satisfying yourself that these volumes, in fact, will fit within the size and the shape of the reservoir mapped by Mr. Anderson?

A. By Mr. Anderson?

Q. Oh, no, by Mr. Tinney.

A. Yes.

Q. It will fit within that net-pay isopach, right?

A. That is correct. Exhibit 14 shows the volumetric estimates to come up with 300 acres of drainage area for the Topaz well, which ties pretty well with Mr. Tinney's mapping.

Q. All right. So when you're looking at 14 then, you've got the -- you've backed through the volumetric calculation, and you've got a drainage area that's going to be 300 acres?

A. Yes, and I have made some assumptions here. The assumptions that I've made on this exhibit are that the average porosity will be 9 percent, which comes off the logs of the Topaz 30 Number 1. I assumed that all of the pay in the well, of the 14 feet that I counted on the well, would be above water and would be pay and that the water saturation was 23.3 percent, which was the average of the top four feet in the Topaz well.

So I assumed that over the entire 14-foot

interval, that those would be the average parameters that would give you a gas in place of 4 1/2 BCF which would match the P/Z.

Q. And you used Mr. Tinney's net-pay isopach, Exhibit 3, to get you your volumetrics?

A. Actually, this is assuming wellbore thicknesses, and it was done independently of Mr. Tinney's mapping, and it confirms that his mapping is reasonable.

Q. All right. When we look to the Division rules that are in place for developing wells and dedicating acreage, the rules in here require 320-acre spacing --

A. That is correct.

Q. -- wells 1650 from the end and 660 from the side boundary?

A. That is correct.

Q. In your opinion, those rules look to be fair and reasonable and appropriate?

A. Yes.

Q. A well that drains 300 acres in a 320-acre pool is about as good as you can do in southeastern New Mexico in the Morrow, isn't it?

A. That's not too bad.

Q. All right. When we turn to Exhibit 15, identify and describe what you're showing here.

A. I've gone ahead here and done the economics of a

straight hole and done a similar-type evaluation that I did previously on the deviated well. And what I tried to show here is that on the lower-cost well you -- it takes 1.3 BCF to get a 15-percent rate of return. And where I was headed with this was that anything less than 1.3 BCF, if you drilled a well for that, it would be an economic waste, it would be an uneconomic well.

Q. All right. Let's bring that within the context of your investigation of what is the remaining recoverable gas associated with the pod being produced by the Topaz well?

A. Basically what that's saying is that for Chi to drill an economic well that does not create economic waste, they would have to either get a unique reservoir, or they would have to take all the remaining reserves left in the Topaz well.

Q. And that number is what?

A. 1.3 BCF.

Q. Okay. You referred to the phrase "economic waste". What do you mean by that, Mr. Adams?

A. I'm saying that you would drill a well without getting a return on your money.

Q. And that's a probable occurrence in the Chi location if they connect with the Topaz pod?

A. I believe that to be true.

Q. Does that substantially increase the risk of the well at the unorthodox location, as opposed to the closest standard location?

A. I believe so.

Q. Let's look at Exhibit 16. What are you showing here?

A. Exhibit 16 is -- and 17 and 18, are basically production plots from three wells that I think are comparable to the Topaz 30 Number 1. They are the wells that are on the cross-section that Mr. Anderson presented. And what I was trying to show with these plots is what may potentially happen if Chi's well was granted.

On Exhibit 16 you see the Hamon A Fed Com Number 1 well, which was producing 2 to 3 million a day in 1994, and then for some strange reason in the middle of 1994, the well went down to nothing, and it's, you know, gone down to producing maybe 40, 50 MCF a day after that.

Q. Let's find that well. If I look on Mr. Tinney's Exhibit Number 2 and find Section 7, up to the north of 18, there is a code that shows the Hamon well, right?

A. Yes, that would be the location in the southeast of 7.

Q. All right. That well drilled, completed, produces, and by the second or third month in 1994, why, it just -- it stops?

A. Yes. You can see the well was making 80 barrels of water a day, and on the cross-sections it was shown that the perforations were at the very top of the section, and they were trying to avoid water, and this well was -- something happened to it in 1994 that caused it to quit producing.

Q. When you look at the Hamon well, is it completed in a manner similar to the Topaz well where there is small perforations high in the zone, in a point that you have lower water saturation?

A. It's the same, yes.

Q. All right. Let's turn to Exhibit 17 and have you show us what, in your opinion, was the direct result of the adverse consequences on the Hamon well.

A. As you can see in the middle of 1994, the Sinagua 18-1 was drilled, which is the direct south offset. The well came in producing 2 million a day, and we finally opened it up to 5 1/2 million a day. The well is only making two or three barrels of water a day. It's substantially higher structurally than the Hamon well, and it had a competitive advantage, and it, I believe, affected the Hamon well.

Q. And that was done with wells at standard locations from the common boundary?

A. That is correct. The other evidence that I have

of that is Exhibit 19, which is the pressure data on the Sinagua 18-1 well, and the original pressure that we had on the well, measured bottomhole pressure, was 3634, which is substantially less than the 6590 original bottomhole pressure that we had on the Topaz. So the Sinagua 18-1 well was depleted when it was originally drilled.

You can also see that in that it took four months to get the well connected, and the well lost 200 pounds of bottomhole pressure in the four-month period that we were waiting to get it connected.

Q. Apply that information to your engineering conclusions about what is the probable adverse consequence to the Topaz well if the Chi well is approved at the requested location.

A. Okay. Well, I think one of the things that's interesting is, the Topaz well right now, or back in June, had a bottomhole pressure of 3843, which is very similar to the original bottomhole pressure of the Sinagua well. And so you basically have analogy that the Sinagua well at a pressure of 3600 pounds, 3400 pounds, negatively affected the offset to the north.

And our concern here is that our well, which is in a similar reservoir-pressure condition, our well is making -- is producing water. Exhibit 18 shows that it's making 30 barrels of water a day and that if another well

was brought in updip, we have the potential loss of production from our well. That's our concern.

Q. Is that concern eliminated if the Examiner does what Mr. Gabbard proposed, and that is no penalty if it's bottomed 760 from the common line? Is that going to fix it?

A. I don't think that would fix it.

Q. Why?

A. I think that if they get a well that is in the reservoir and they produce it at its capacity, our well would be damaged, and we would never be able to get our production back.

Q. Is it a solution to suggest that a production penalty can be applied by the Examiner on the unorthodox location so that he could approve this location, put a penalty that's appropriate on it, and maintain the correlative-rights equity involved?

A. I believe that -- The one area where I would differ from Mr. Gabbard is that I believe that if they got a well in the center of the channel that had 14 feet of pay in it, that would be about the same thickness as our Sinagua 18-1 well, and at the pressure conditions of it, that well was able to make 5 1/2 million a day.

So I think that their location could make 5 1/2 million a day, compared to our million a day that we're

able to make at -- 1.3 million, that we're making out of our well right now. Instead of the million a day that he suggested, I think it's 5 1/2 million a day.

You would also see that in that we only have a foot and a half open in our well, and if they had 14 feet open they would have ten times the capacity in their well to produce. So I would think it would be reasonable to think that they could produce four or five times what we can produce in our wellbore.

Q. Even at a penalized allowable where it would produce no more than a million a day, it would still be an unfair competitive advantage to the Santa Fe property?

A. That is correct.

Q. Do you see any way to balance the problem and get a solution that lets them drill this unorthodox location without an adverse consequence to Santa Fe?

A. No.

Q. Summarize your conclusion for us, Mr. Adams. What would you propose?

A. You know, this is real simple. If we want to go out and drill a well, the goal is to make money, and the only way to make money is to drill for unique reserves, and we've heard all the witnesses testify to that.

If this location is drilled, we have four options: We will either drill a will that is in the Topaz

reservoir, we will either drill -- or we will drill a well that's in a unique reservoir, or we will drill a well that's a dry hole, or we could possibly drill a well that's in the Sinagua reservoir to the north. Those are the four possibilities that we have. And the only one that makes us money is that we get unique reserves.

And for that reason, my strong recommendation is that the best location be drilled for an economic well, and that would be a legal location.

Q. Do you share Mr. Gabbard's opinion that closer is better and the best way you handle the risk involved is to get as close to the Topaz well as you can?

A. No, closer means drained.

MR. KELLAHIN: That concludes my examination of Mr. Adams. We move the introduction of his exhibits.

EXAMINER STOGNER: Any objection?

MR. CARR: No objection.

EXAMINER STOGNER: His exhibits are admitted into evidence. What number --

MR. KELLAHIN: Yes, sir, they're 5 through 18, Mr. -- I'm sorry, 5 through 19.

EXAMINER STOGNER: Five through 19.

MR. KELLAHIN: I think they're 6 through 19, I believe.

EXAMINER STOGNER: Six through 19.

MR. KELLAHIN: Six through 19.

EXAMINER STOGNER: Mr. Carr, your witness.

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Adams, if we look at Exhibit Number 2, just for reference, and if I understand what you're recommending, is that the proposed unorthodox location, the straighthole location in the southeast of 19, simply needs to be denied. There's no penalty that would be effective. Is that your testimony?

A. Yes.

Q. And if that were to occur, the result of that would be that whatever reserves exist in the -- and based on this interpretation, in the southeast of Section 19 could never be recovered by the owners in Section 19?

A. That is correct.

Q. So that would be -- you would simply leave those reserves, and they would ultimately be recovered by the Santa Fe well in the west half of 30?

A. That is correct.

Q. Now, you are concerned about the potential for damage to the well in 30, if a well is permitted, and as proposed by Chi; is that correct?

A. That's correct.

Q. And if I understood your testimony, you cited as

an example what had actually occurred up in between the Hamon A Federal well in 7 and the Sinagua --

A. -- Sinagua --

Q. -- Sinagua --

A. -- 18 Fed Com Number 1.

Q. -- well in 17 -- I'm sorry, in 18. Is that right?

A. That's correct.

Q. Now, when that -- When did that occur? Was that 1994 or 1995 --

A. 1994.

Q. -- when that problem occurred?

A. 1994.

Q. In 1998, Louis Dreyfus came to Santa Fe and proposed a directional drill using the existing OXY wellbore in the southwest of 19; is that correct?

A. That is correct.

Q. Were you involved at that time?

A. Yes, I was.

Q. And wasn't it Santa Fe that recommended actually drilling a straight hole initially to test this very same formation?

A. No, what we recommended doing was re-entering an existing well and cleaning it out to TD and drill stem testing the well so that we could see if it was truly

unique reserves, if it was tied to the Topaz well or if it was tied to the Sinagua well, or if it was wet.

Q. And is it your testimony that you never intended to produce lower Morrow in that well?

A. No, that's not my testimony. If we would have had virgin pressure, we would have gone ahead and attempted to complete the well, because it would have been separate from the well in Section 30.

Q. You would never have produced that well if you had not had virgin pressure; is that your testimony?

A. My testimony is that after that testing we would decide whether to complete the well or to sidetrack it. Our intent probably was that the pressure was depleted, to sidetrack it and see if we could get into a unique reservoir.

Q. But you were at that point testing this very formation, and the well was substantially closer than the location we're talking about?

A. That's correct.

Q. If we look at Exhibit Number 2, again, and we accept the geological interpretation, the pod that we have over Section 30 basically covers in excess of 320 acres, does it not?

A. I'm sorry, what?

Q. Covers in excess of 320 acres?

A. On the --

Q. On Exhibit Number 2?

A. The yellow pod does, but you need to cut it off from the gas-water contact. And so above the gas-water contact, my estimate in looking at his mapping is that there's about 360 acres that are above the gas-water contact.

Q. Below the gas-water contact, is there no gas contribution?

A. Below the gas-water contact?

Q. Yes.

A. I don't believe so.

Q. And that line was drawn using a 40-percent saturation?

A. The geologists picked that based on their calculations of water saturation.

Q. And the 60-percent gas below that point would not be produced; is that your testimony?

A. That is correct.

Q. You do believe 320-acre spacing is appropriate for the reservoir?

A. Yes.

Q. If we look at the well, the well -- Sinagua? I'm having --

A. Sinagua.

Q. Sinagua, in Section 18 --

A. Yes.

Q. -- have you calculated recoverable reserves for that well?

A. Yes.

Q. And what did you come up with?

A. 6.7 BCF.

Q. And have you run volumetrics and have you satisfied yourself that in fact you could fit the 6.7 BCF in that tract?

A. At virgin pressure it would have fit under that tract.

Q. And what pressures were you using? What bottomhole pressure did you use?

A. Well, the calculations that I did were based on the original reservoir pressure in the well, and it was about 550 acres, based on the depleted pressure.

Q. When Mr. Gabbard testified, you understood that he said that 4.3 BCF was what he considered necessary to make a successful well; did you understand --

A. No, I didn't hear him say that. I heard him say that that was his unrisked reserves on what he thought was the --

Q. All right, that's right.

A. -- potential for that unit.

Q. Right. And you understood that was unrisked?

A. Yes.

Q. And that you assign a risk to that?

A. Yes.

Q. Now, when you go out and drill, no matter what you do in terms of calculating this, you would agree with me that anytime you attempted to complete a well in the Morrow in this area, there is substantial risk associated with that?

A. To drill and complete a well, yes.

Q. And as we move out from this proposed location and go to the north, you are increasing the risk, are you not?

A. I think there's some questions about whether the original OXY well is productive. The resistivity on the well was very low and was not completed by OXY originally, probably because they thought it was wet, based on log calculations. So in one aspect, by getting structurally updip you are reducing the risk of doing a wet well.

If we do get a unique pod here in this east half of Section 19, there is a possibility that it has a different water contact than the well in 30 or the well up in 7, because those two wells do have different water contacts. So if you are at the bottom of a new pod, it could be wet also. So you want to get updip to stay above

a water contact, even though I have not identified one in the pod on the east half of 19.

Q. Is it your testimony that you have a lower risk associated with moving the well to a standard location, going 1650 off the south line in Section 19?

A. Yes.

Q. Do you believe that this is a high-risk well?

A. In -- ?

Q. In 19, if you would move to that location?

A. I think it would be less risky than the well that they're talking about drilling.

Q. Santa Fe has an opportunity to elect to participate in that well, do they not?

A. We are evaluating that.

Q. And that's through some contractual arrangements with Louis Dreyfus; isn't that right?

A. I think it's the AMI that was referred on that other map --

Q. Do you --

A. -- I'm not sure.

Q. Do you also have other arrangements with Southwestern and other people whereby you could acquire interest --

A. Yes.

Q. -- in this property?

And have you made any determination on that at this point?

A. No, I have not.

Q. Have you made any decision as to whether or not you consider this of such high risk if you move to a standard location that you would not participate?

A. Basically, this is beyond our authority at the local level and we have to present it to our corporate management, and we haven't had the opportunity to do that yet.

Q. Were you involved with the effort to sidetrack that OXY well and drill directionally off toward the north and the west?

A. Yes.

Q. And you would agree with me that whenever we attempt to drill in the Morrow, we are encountering substantial risk?

A. I would also note that we kicked that well off 1300 feet to try to get far away from that existing wellbore. So, you know, as far as far as kicking it off to get -- you know, closer is better -- we thought a better location is 1378 feet away.

Q. From the data that you --

A. And Louis Dreyfus agreed with that when we did it.

Q. And the data that you had available, if I look at the mapping we have in the well in the western half of Section 30, 4 feet --

A. I'm sorry, west --

Q. West half of Section 30, the Topaz well --

A. Okay.

Q. -- your well, what do we have? Four feet there?

A. Yes.

Q. And then we go north up to the OXY well, we have six feet there. Isn't it possible that what we've got is the --

A. I don't have that map, I'm sorry, I don't -- geologic exhibits.

MR. KELLAHIN: Two?

MR. CARR: Three.

MR. KELLAHIN: Oh, you have 2. There's 3.

THE WITNESS: Okay.

Q. (By Mr. Carr) If I look at the map, the well in 30 appears to have 4 feet in it, based on this mapping, correct?

A. Okay.

Q. And you go to the OXY location, you have six feet?

A. That's correct.

Q. Isn't it a reasonable interpretation that instead

of having a unique reserve in Section 19, we just have a reservoir that's improving as it moves in that direction?

A. Well, actually it's -- the gross sand is less. So I mean, it's -- The only reason there's four feet in the Topaz 30 is because it's structurally downdip. You go 14 feet updip to that well and you have 14 feet of pay.

Q. I understand it's your interpretation that you've got a separate, isolated pod. But I'm just saying, looking at this data, isn't it possible that we just have a common reservoir extending off into the east half of Section 19?

A. The same as in the 30?

Q. Yes.

A. That's what he's mapped, yes.

Q. Okay. And based on just the general nature of the Morrow, wouldn't you agree with me that you might have a unique sand and also a continuous sand in that area?

A. What do you mean by "unique" and "continuous"?

Q. Well, you're talking about intersecting or encountering a unique, separate or new pod that has separate reserves in it, in the Morrow, at a standard location.

A. Yeah, I'm looking for a well that has a virgin reservoir pressure.

Q. And isn't it possible that if you drill a well up there on the Morrow, just because of the nature of the

Morrow, you could have that, and also encounter another zone that's continuous across the area?

A. I guess that's possible.

Q. And the problem we have is that no matter what we do, if your interpretation is correct and we drill at the standard location, as to the reserves that are available to the Topaz well and also present in the southeast of 19, we will never get those reserves in 19?

A. Right.

Q. Okay.

A. And I'll add that my estimate of those reserves are about a quarter of a BCF right now --

MR. CARR: That's all I --

THE WITNESS: -- based on this mapping.

MR. CARR: Thank you, that's all.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Nothing further, sir.

EXAMINATION

BY EXAMINER STOGNER:

Q. Okay, let's first look at Exhibit Number 3. This is one I've referenced. Now, the west half of 19 is not being produced by anybody; is that correct?

A. That well is produced out of the middle Morrow right now.

Q. In the bottomhole location over to the --

A. -- to the west.

Q. -- far west?

A. Yes.

Q. Okay. So if your proposed location at a standard location, the east half of 19, is drilled and a reservoir, a unique reservoir, is obtained, would Santa Fe consider drilling up in the northwest quarter?

A. I would think if they found a unique well, what we would do is, we would drill a well offsetting the Topaz 19-1 and drill a directional well up to the north in that wellbore also.

We can't drill in the northwest quarter because of the potash problem. We're stuck around the old producing wells.

And so we would basically -- to protect the west half, we would have to offset the Sinagua 19-1 and kick it to the north.

Q. Or perhaps go up there in 18 and kick off. But anyway, you'll try to get those reserves in the northwest quarter, right?

A. Uh-huh.

Q. Why?

A. I'm sorry, what?

Q. Why would you do that?

A. Because they're unique reserves.

Q. Well, they wouldn't be unique, because the well in the east half of 19 discovered it, so they wouldn't be unique anymore.

So why would Santa Fe want to get the production in the northwest quarter now?

A. If that well was discovered, then we would have the opportunity to protect our interest in what was not drained underneath our lease, to go get what's not drained, and we would do it with a legal location.

Q. Well, if you didn't have a legal location, you would not even consider drilling an unorthodox?

A. Well, we would consider drilling at an unorthodox, and that's in effect what we did when we re-entered the 19-1. And the reasoning behind that was, is that those were reserves that would not be recovered by the Topaz 30-1.

Q. But you would go after those reserves in the northwest, you would feel compelled to?

A. Sure.

Q. Good. Sort of like what Chi is doing now?

A. Uh-huh.

EXAMINER STOGNER: That's all the questions I have.

Any other questions of this witness?

MR. KELLAHIN: Yes, sir.

FURTHER EXAMINATION

BY MR. KELLAHIN:

Q. Let's look at Mr. Stogner's hypothetical. Let's look at the opportunity in 19. Let's assume that Chi does get unique reserves. Aren't there some additional factors you have to consider for the west half of 19? For example, whether or not there is enough gas that can be produced in order to make the well profitable?

A. That's correct, it would need to be a well that would have 4 BCF or something that Mr. Gabbard was talking about earlier. Under that scenario you could split those reserves and have an economic well.

Q. In order for the example in 19 to be the equivalent of the Topaz example, you would have to find new reserves for 19 that could not support the drilling of the second well?

A. That is correct.

Q. And so you simply waived your opportunity because it would be wasteful to drill the unnecessary well?

A. That is correct.

Q. And that's the way of life down there, is it not?

A. Yes, it is.

MR. KELLAHIN: No further question.

EXAMINER STOGNER: Okay. Anybody else have anything further?

MR. CARR: No, sir.

EXAMINER STOGNER: You may be excused.

Does anybody else have anything further in both of these cases?

MR. KELLAHIN: Yes, sir, I have a closing statement.

EXAMINER STOGNER: Okay, Mr. Kellahin?

MR. KELLAHIN: Mr. Examiner, let's -- I'd like to dismiss with you some of the contentions Chi has made to justify the location.

It would establish a highly unusual solution to suggest that it's okay to drill an unorthodox location if you afford the opportunity of the parties being encroached upon to participate in the offending well. You would have to ignore a substantial portion of the testimony in this case, because the testimony of this case is such that our belief is, the second well is unnecessary.

And you're faced with a circumstance then, the dilemma, that if Santa Fe, in order to protect itself from being watered out, has to spend additional money, receive an interest that's less than the interest they now have in order to capture reserves that the Chi well will drain from the Topaz property, it's ridiculous to suggest that offering a percentage, whatever that percentage is, fixes the problem. It doesn't. It's a red herring, it's a

sidetrack, it's a dead-end, it's a detour, it's a distraction from where you ought to focus your attention.

You have processed thousands of location exceptions, Mr. Examiner, I don't doubt that there are thousands of them. Look at what you do.

When you examine those applications, administratively or by hearing, the first thing you're looking at is the applicant's geologic case. Occasionally you will see them give you an isopach that shows you the standard location is better than the unorthodox location they want, and you kick it back to them saying, Applicant, this makes no sense. You want an unorthodox that is less favorable geologically than the standard location that's already suitable to you.

That circumstance exists here. When we look at the kinds of cases that you do approve, you're looking at a circumstance where the unorthodox location is the best opportunity in that spacing unit. That's why you justify it. It's that it is preferable, it is better, it is superior to anything they can do in any other standard position.

That is not their own testimony. With the exception of Mr. Gabbard who thinks that closer is better, Mr. Anderson tells us his best place is at a standard location. That's where he wants to be.

We have taken their case and given you the rest of the story. The rest of the story is that you can calculate enough recoverable gas in the east half of 19 that can be accessed with a directional wellbore, and have a well that is hugely profitable. It's going to pay out in 15 months. These people fight to have wells that will do that. That's a huge home run if they can do that. If it pays out in 30 months, they're happy. Highly profitable.

The Applicant has failed to demonstrate the necessity of what they want you to do. It ought to be denied. You establish a different position for Mr. Carr and I to come back to you then for all these location exceptions. We can present a case and ignore our own proof and say, Here's what we need to do, Mr. Examiner. In each and every instance, if there is an existing well at a standard location and there is a sliver of that reservoir on my spacing unit, then shame on you if you don't let us have that chance. Well, if you do that, even with a penalty, I think you've run afoul of the definition of correlative rights.

Now, Mr. Carr wants to argue, I've got to have this unorthodox location. If I don't get it, then the Topaz well gets my remaining gas, and that can't be fair.

Sure it's fair, it happens all the time. And it's fair because in order to get their remaining share of

that sliver at this late date in the game, they have to drill an unnecessary well. They're also asking you to force-pool this acreage to avoid drilling unnecessary wells. How are they going to have it both ways? That well is unnecessary.

By their own proof they show you the remaining recoverable gas is only 1.4 BCF of gas. 1.4. They can't pay for the Chi well. They can't pay for the Chi well, and if they get the Chi well there, they damage the Topaz well. Is that what we do here?

In the masquerade of protecting correlative rights, you're going to incur economic waste, allow an unnecessary well to be drilled, damage an existing well.

This is one that you ought to tell them no. No penalty can solve this problem. The only answer is the one they should have been exploring, and that's to file the paperwork at the BLM, and let's test the BLM on how much potash is there to be wasted on a vertical wellbore? Let's go through that exercise. Let's find out if that potash is worth more than 4.5 BCF of recoverable gas in the east half of 19. Let's test that process. There is a process available. Let them file that application. Let's make the potash people come in here and justify that. That's where they need to go first. They don't need to come in here and damage the Santa Fe well.

We ask that you deny this Application, because that's the right thing to do.

EXAMINER STOGNER: Mr. Carr?

MR. CARR: May it please the Examiner, in the midst of all the frenzy that Mr. Kellahin is trying to create, I think it's important to take a look at what's happened in this area for some period of time.

We have a number of operators that cooperatively have attempted to develop the Morrow reserves. Now Chi comes before you, and they're proposing a well in the east half of Section 19. They're really attempting to do just what's been done before by other operators in the field, they want to economically test the Morrow, just as Santa Fe, Louis Dreyfus and others tried to economically look at the Morrow in the southwest quarter of Section 19.

With a location that is as close to the southern boundary, or at least using as the basis for any penalty calculations a figure which is the location which was used by Santa Fe, Louis Dreyfus and others in the southwest of the section, we do prefer a standard location. But we are in the potash area.

Mr. Kellahin has always great ideas for everyone else. Our economics are always better, according to him, than we view them. We always have an opportunity to just straighten things out at the BLM or in the federal court or

in the state Supreme Court.

But the fact of the matter is that we have potash problems, we have an unorthodox surface location, we have to directionally drill, which will increase our costs, to a high-risk formation, and it may jeopardize the well.

And so what we've come here before you requesting is approval of an unorthodox location for a straight hole with a reasonable penalty, or authority to drill to an unorthodox bottomhole location, moving father away from the Santa Fe well in Section 30.

We're seeking a penalty, Mr. Stogner, based on the 660-foot setback. That is not consistent with the rule. It would be if we oriented the spacing unit in a different way and if we let surface determinations control over what happened in the reservoir. But until the rules can be changed those are the rules, and we know that.

And we explain that we did that because we were trying to just continue to do what others have done, and so we're asking you to use that as the basis for the imposition of a penalty. We believe it's fair, and we believe it's in line with what has been done in the area before.

But the real reason we're asking for this is, we believe, based on our economics, that if the well is penalized as we recommended, then in fact the well will be

drilled and all owners in the acreage, then, will be able to participate in the production from the acreage. And all those owners will almost certainly include Santa Fe.

It's very simple. We'd like to be 480 feet from the south line with a 27-percent penalty, or 760 feet with none, and that's what we're asking for. We believe if that's approved, the acreage will be developed, and we will have an opportunity to produce what's under our tract.

And yet when you listen to the proposal advanced by Santa Fe, the net effect is to move us out of a portion of the reservoir and move us away from acreage that is productive, that we will have a right to operate and put our well in the position that if their interpretation is correct, we won't be able to access those reserves.

Mr. Kellahin talks about the fact that I will want to talk about correlative rights. Well, I do. And he always suggests I'm going to misspeak, but he needs to remember what the definition is. The definition is an opportunity to produce what is recoverable under your acreage. And they want to move us to a point where we cannot produce reserves that are recoverable.

We request that the Applications be granted, that the penalties we request be imposed. And by doing so, we believe you will protect correlative rights, you will prevent waste, and the reservoir will be developed.

EXAMINER STOGNER: Thank you, Mr. Carr.

Anything else?

Then in that case, Cases 12,157 and 12,158 will be taken under advisement at this time.

And the hearing is adjourned.

(Thereupon, these proceedings were concluded at 4:15 p.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 12158, heard by me on 15 April 1999.

Michael E. Stogner, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL April 18th, 1999.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002