

1 NEW MEXICO OIL CONSERVATION COMMISSION

2 STATE LAND OFFICE BUILDING

3 STATE OF NEW MEXICO

4 CASE NOS. 10446, 10447, 10448, 10449

5 Consolidated

6
7 IN THE MATTER OF:8
9 The Application of Yates Petroleum
10 Corporation for Authorization to
11 Drill, Eddy County, New Mexico.

12 VOLUME III

13 BEFORE:

14 CHAIRMAN WILLIAM LEMAY

15 COMMISSIONER GARY CARLSON

16 COMMISSIONER BILL WEISS

17
18 FLORENE DAVIDSON, Senior Staff Specialist19
20 State Land Office Building

21 September 11, 1992

22
23 REPORTED BY:24 DEBBIE VESTAL
25 Certified Shorthand Reporter
for the State of New Mexico**ORIGINAL**

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1 CHAIRMAN LEMAY: We shall resume. For
2 those of you that haven't been here for the last
3 two days, this is the Oil Conservation
4 Commission. And we are hearing de novo cases
5 concerning oil and potash: 10446, 10447, 10448,
6 and 10449. My name is Bill LeMay. To my right,
7 Commissioner Gary Carlson; to my left,
8 Commissioner Bill Weiss. We are continuing with
9 the Yates presentation.

10 Mr. Carroll, do you want to continue
11 with Mr. Hutchinson, who has been sworn in?

12 MR. CARROLL: Yes, sir.

13 **GARY L. HUTCHINSON**

14 Having been previously duly sworn upon his oath,
15 was examined and testified further as follows:

16 EXAMINATION (CONTINUED)

17 BY MR. CARROLL:

18 Q. Mr. Hutchinson, yesterday at the close
19 of the day, we had just gone through your
20 economic presentation. And I think the last
21 question that I asked that we really did not get
22 into is that now, after having seen the
23 presentation about the potash industry as a
24 whole, what have you learned with respect to the
25 New Mexico Potash operation and in turn more to

1 the area in the case at hand?

2 A. All right. I need to explain Exhibits
3 51, 52, 53, and 54. You have blue-lined copies.
4 I have a base map and some transparencies. After
5 I've been through it, you'll get more out of this
6 than you will out of the ones you have because
7 you can't see through them.

8 If you would tell me what you would
9 like -- I've never appeared here before, so I
10 have prepared my presentation for the best
11 demonstration of what I thought we would have.
12 And I will prepare whatever you would like after
13 that.

14 Before I get into this, after
15 reflecting last night, I don't know if Walter
16 Case will testify later, but Walter Case is the
17 mine manager. Dick Lane is recently retired from
18 New Mexico Potash after being there many years,
19 chief engineer and mine manager and everything, I
20 understand. Ernie Szabo, you've met, who
21 testified earlier, and I think Mike Stogner, of
22 the OCD.

23 I would like to say that I would like
24 to apologize to those people for using their
25 information. I thought I was doing it properly.

1 I'm sure I did it properly. And I'm sure that --
2 and I'm aware that the mine people have been
3 chastised for letting that information get in
4 here. Mike Stogner gave it to me. He thought he
5 was doing the right thing. I apologize for any
6 discomfort I may have caused him.

7 And, to me, those four gentlemen were
8 acting in the spirit of R-111-P, trying to get
9 this thing worked out. I didn't recognize their
10 things as any economic life of mine reserves, but
11 they were just merely showing what was barren and
12 what wasn't or what was uneconomic -- obviously
13 uneconomic, and they were sure of that.

14 And Bill Lane, going to Ernie Szabo's
15 office, trying to explain when Ernie was looking
16 for more information how the costs were taken
17 care of, I think, is in the great spirit of
18 R-111-P. I think other people, Mr. High, hides
19 behind it and uses it to manipulate things, and
20 that's unfortunate. That's not the spirit of how
21 it came about in my view. At any rate, my
22 apologies, and I'll go on.

23 This is the base map. Here's the New
24 Mexico Potash shaft. The red outlines with the
25 dots is what we've already heard about as first

1 mined areas. Functionally they are entries that
2 are kept open so that you can get back to
3 different areas of the mine and mine what they
4 call second mined areas, which are panels that
5 come off of here and a room and pillar system,
6 and then eventually the pillars are pulled back
7 towards these entries which are maintained and
8 kept open and not allowed to collapse.

9 As of 1/7/92, this is where the mine
10 was as reported on the required mine opening
11 information that was submitted as required. The
12 black line is the lease boundary as of 1/7/92.
13 The green areas are what I interpreted to be
14 barren areas into which they had no intention of
15 mining ever. They just were not -- they were
16 sub-economic by any stretch of the imagination.

17 I'd like to point out that the lease
18 line as of 1/1/90 was down here. So between
19 1/1/90 and 1/1/92, New Mexico Potash took that
20 lease. A good move, they've obviously found some
21 good ore in there. This dashed green line here
22 shows the change of the barren line from the
23 solid -- or excuse me, the dash line was 1/1/90.
24 They've moved it in here and moved it out here,
25 I'm sure, as a result of doing some exploration

1 drilling.

2 Also over here, 1/1/90, the barren line
3 was here. 1/1/92, they moved it out here,
4 outside their lease line. Again I think the
5 result of some exploration efforts, which for
6 mining they have to go on all the time, find out
7 where you're going to go next year or five years
8 from now.

9 Also the barren line, 1/1/90, was here,
10 and it was taken out and extended down here.
11 This remained dashed on their map. I interpret
12 that to mean that they're not sure about this
13 area. And they brought the -- on 1/1/92 they
14 brought the barren line out here, extended it
15 down again near the WIPP area and into some
16 acreage off their lease line, which this is also,
17 as is this.

18 Q. Mr. Hutchinson, from the maps that you
19 viewed, were you able to tell where the most
20 recent mining is occurring?

21 A. Yes. Let me put up another.

22 Q. This most recent map mining would
23 actually occur, would be the overlay or your
24 Exhibit No. 53; is that correct?

25 A. This will be -- the Commissioners will

1 have a -- is that okay?

2 MR. STOVALL: Yes.

3 A. All right. The blue areas here were
4 mined from the date of the first map that was
5 turned in after R-111-P was enacted and effective
6 October 1988. So from October 1988 through 1990,
7 when the next map was submitted that I saw of the
8 mine workings, they came off of this entry,
9 developed up into here, over to here, mined
10 this. They had developed this -- they had
11 developed this panel here, and they completed
12 mining it, second mine.

13 They came down this entry. They hit a
14 barren zone and came up along this section line
15 and developed some entries here, I'm sure a good
16 mining practice, looking for minable reserves
17 down here. They apparently didn't know this was
18 there, which is often the case in potash mining.
19 This is most likely a salt horse. They drove
20 into it, came down, came across, hit it again.
21 And so they have concluded, and I certainly
22 agree, that this is a pretty good-sized salt
23 horse.

24 Same thing happened -- excuse me. I'm
25 jumping ahead here. The red is the mining that

1 they did from the end of 1989 -- or from 1/1/90
2 to 1/7/92, approximately a two-year period. Keep
3 in mind that their shaft is here through which
4 all the ore, supplies, everything has to move.

5 They continued mining here with an
6 entry back towards this entry. That shows very
7 good practice to me. It looks like they're going
8 to develop this ore block. They came south,
9 looks like they found something here because they
10 were here at the end of -- they were in Section
11 23 at the end of 1990. And then in the next two
12 years, they drove over, hit a barren area, may
13 have caused them to do some exploration. The
14 same in the same two-year period they hit this
15 one.

16 Then they drove north and back towards
17 the shaft. About that time they took this
18 lease. That leads me to believe that they have
19 some good ore in there. They've done their
20 exploration. They've got it blocked out.
21 They're heading back towards the shaft, I assume,
22 to cut down on their conveyor capital
23 requirements.

24 This ore now -- or at the end of this
25 period had to come all the way in that torturous

1 route to get back to the shaft. But these poke
2 through here perhaps, at least that's what I
3 would do, I would shorten this conveyance
4 distance back here.

5 I may have failed to mention that the
6 blue crosshatched lines are second mining where
7 all the pillars have been pulled, and I don't
8 have any idea the dates of that because, when I
9 first got involved, that had already been done
10 with the exception of taking out this panel and
11 completing this panel.

12 Now, they had developed down here with
13 their entries, and they mined this area in that
14 period from 1990 to 1992.

15 Q. Well now, Mr. Hutchinson, from this
16 material that you have gleaned from the files of
17 the Division, are you able to in any way
18 determine the rate of mining that has been going
19 on at the New Mexico Potash mine?

20 A. Yes, I have. I took that 39-month
21 period, and I broke it down into the two periods
22 that I knew about. And I read all of the public
23 information, USGS, et cetera, that I could find
24 about the thickness of the tenth ore zone in this
25 area. It averages about 6 feet from the

1 information that I was able to find.

2 I took -- I calculated the net acres.
3 By net acres, the way I did that was to say that
4 in their first mining, whether it was development
5 work, or even going into a panel like this, they
6 were extracting approximately 50 percent of the
7 ore in place during that first mining.

8 During the second mining, they add
9 approximately 35 to 38 percent of the ore in
10 place. So that where they had mined both first
11 and second, I would give them credit for 90
12 percent of the -- approximately 90 percent of the
13 net acres that they had mined.

14 From that I calculated that over that
15 39-month period, they had been mining a 6-foot
16 seam at the rate of about 136 net acres per year.

17 Q. Now, based on that information, Mr.
18 Hutchinson, and all the other information that
19 you've been discussing with us, were you able to
20 come up with a mine plan for this mine?

21 A. Yes.

22 Q. Could you also kind of describe or
23 define for the Commissioners what you mean by
24 "mine plan"? What's the purpose of it? What is
25 it used within the industry?

1 A. Well, every mine has to have a mine
2 plan, or it's not going to be in business very
3 long. And I'm sure as long as this mine has been
4 around and knowing the professionals that run it,
5 they do have a mine plan. I'm sure they keep it
6 confidential, as they should. I know the mine
7 plans that I've done, put together, administered,
8 change from time to time, as you get more
9 information and more exploration data.

10 When you know what the price of your
11 product is going to earn, it changes your grade
12 up or down. So if the prices are high, you can
13 mine a little bit lower grade; prices are low,
14 you have to go to those areas where you know you
15 have good reserves and mine those until things
16 get better.

17 In the potash industry, because all of
18 the ore has to be milled and the mills need to
19 run at a fairly constant grade of input to get
20 the product coming out the other end at a
21 consistent rate, they have to balance the product
22 that goes up the shaft.

23 And they do that, not only with
24 exploration, but everyday geologists are most
25 likely at those working faces taking samples.

1 They don't wait to see what comes into the mill
2 and sample it. They're most likely down there
3 taking samples. That's how they found this.
4 That's how they found this.

5 And this is a very sophisticated mine.
6 They're using continuous miners so they can vary
7 the width of their mining to keep their grade to
8 the mill constant. It's quite a balancing act.
9 But, as far as I can see, they do a terrific job
10 of that.

11 This is a hypothetical mine plan, and
12 it isn't in anywhere near the detail a real mine
13 plan would be because I don't have the costs and
14 the production data and the grades, et cetera.
15 But --

16 Q. For the record, Mr. Hutchinson, the
17 exhibit which depicts your mine plan is Exhibit
18 No. 54, is it not?

19 A. Yes. I have to refer to my notes to
20 get some of these sections straight here. It
21 became apparent to me that New Mexico Potash has
22 a conveyor constraint. They're staying very
23 close to the shaft. If you'll recall the last
24 overlay, they were operating here, which is close
25 to the shaft. They were trying to develop a new

1 ore zone down here, which is quite a ways, but
2 they're working back towards the shaft. And they
3 were working on this area and this area.

4 So now seeing the areas that I thought
5 never to be mined because of their grade, salt
6 horses -- they mined all the way around this
7 one. I don't think that's ever going to be
8 mined; you can't get to it now. Here is one.
9 And here is one that they found. So there, by
10 trying to get back to the shaft, I think
11 they're trying to take care of a transportation
12 problem.

13 It's also the matter of paying the men
14 from the time they get on the skip in the
15 morning, or at the beginning of their shift, to
16 transport them all the way back to the faces.
17 They're having to bring these men all the way
18 down around back into here. And last year they
19 were taking them over into this area. So that's
20 a consideration. There's no production, and
21 you're paying those guys. It's expensive.

22 Also, the line loss for electricity
23 that goes to these continuous miners is
24 considerable. And every now and then you have to
25 put in transformers or drill a hole from the

1 surface, as Mr. Muncy described, I think, to put
2 down electrical cables. I think the example was
3 the AMAX mine at the time. Then they can take
4 electrical power on the surface. They don't have
5 to worry about the headings collapsing or
6 anything on it and get it to the areas that they
7 need to have it.

8 This overlay with the orange areas I've
9 depicted as those areas that have some chance of
10 being mined. I don't know what their grade is,
11 but they weren't included in the barren areas on
12 the map that I saw. So I just surmised, okay,
13 they're going to be able to mine that.

14 The red lines are those first mining or
15 panel development areas to get back to the
16 different blocks of ore that I perceived to be
17 there with the information I have. I tried to
18 come up with a mine plan that would provide them
19 the flexibility to work in at least two blocks at
20 the same time, giving them a chance to vary their
21 grade and maintain the feed grade to the mill.

22 As you can appreciate, the bottleneck
23 is this shaft. They can only hoist so many
24 tons. That capacity is balanced with the mill.
25 The next constraint is how fast they can get it

1 from the headings back to the shaft. As they get
2 further from the shaft, it's obvious that it's
3 going to take longer. And that will become more
4 and more of a constraint and again take more
5 conveyors.

6 I concluded that blocks D -- up in this
7 area, here and here, are D, and blocks E, right
8 here, they're closest to the shaft. They have
9 entries developed to them. Those should be mined
10 first because of their relative proximity to the
11 shaft. And that should be followed by blocks F
12 and A, right in that area. As you can remember,
13 this is all developed. I mean, all the entries
14 are in there, really on four sides of this big
15 block. And it looks like a well planned, well
16 developed block of ore.

17 I was puzzled as to why management was
18 avoiding these areas. I began looking for an
19 economic reason why they weren't mining in
20 those. And instead they're mining down in blocks
21 L. Remember this development that was there,
22 I've named that L. G, where they have obviously
23 found some good ore, but they're way far away
24 from the shaft compared to D or A. Area H, again
25 I've separated this entry here. I've separated L

1 from H for later analysis. But they're down in
2 that area.

3 So I was puzzled by why they were down
4 here, down here, had finished up, up here, but
5 they didn't continue up into those areas. I
6 began to look for an economic explanation and
7 decided to look. The only thing I could come up
8 with is that given I don't know their grade, I
9 see what they've developed.

10 I looked to another significant cost in
11 mining, and that might be royalty. So I examined
12 who owned the minerals. And these are all
13 federally owned minerals except for this exhibit,
14 which is Exhibit No. --

15 Q. 55?

16 A. -- 55.

17 Q. Excuse me. I was listening.

18 A. It's real captivating stuff.

19 Now, these shaded areas that you can
20 see, they're outlined in yellow, are state-owned
21 potash. This gave me a little bit of an
22 explanation as to what was going on. It's
23 apparent that New Mexico Potash has been avoiding
24 mining state owned potash.

25 I can only conclude that those state

1 leases carry a higher royalty. I don't think the
2 grade of the potash knows whether it belongs to
3 the state or the feds. But it could be that the
4 royalty structure on state land is higher than on
5 the feds or that the feds are giving the mining
6 companies, or this mining company, some
7 preferential encouragement to mine the federal
8 potash first.

9 If you look at Section 32 in block D,
10 which is -- I mean it's just up the street from
11 the shaft, that's state land. Block 36 -- or
12 Section 36 in block C is right here. Now, this
13 is developed all the way up to here. And that
14 entire section that they have mined to in the
15 past, gone up to the lease line here with this
16 big second mining block, and there is state land
17 in Section 36, as well as up here, that is a
18 little closer to the shaft coming all the way
19 down around and up into here. But it's state
20 land.

21 Those are all closer to the shaft than
22 the current operations in Section 20, which I
23 call block L and F, this block here where they
24 have to come all the way around to get back up
25 there. In fact, it appears that is only a narrow

1 main development here through state land in order
2 to get to federal land.

3 So, as I was just saying, they
4 developed this over here. This is on a state
5 block, but they're obviously driving through it,
6 I presume to get into this federal potash over
7 here. It appears on their maps to be quite
8 narrow. They can go faster if they don't make
9 the entries so wide. They did a similar thing in
10 this area.

11 And here we see a state owned block,
12 but I don't think -- my thought is that they
13 didn't make this narrow because it's state
14 potash. They had to drive through a barren zone
15 to get to the other side, and they had to hoist
16 that material up the shaft or put it as gob into
17 an old working, which they don't generally
18 practice in potash.

19 The most obvious state land avoidance,
20 however, is in Section 18, right here. I can't
21 really explain. You can see that this is state
22 land, entire Section 18, plus the southeast
23 quarter of Section 13 in the next township.

24 In their second mining in the past,
25 they mined right up to the state lease line and

1 stopped, not just on one side but on three
2 sides. In addition, just in the past two years,
3 they took out this little area here.

4 Now, gentlemen, this is all subject to
5 collapse, if it hasn't already. That means that,
6 even though they did find a salt horse in here,
7 that they found this after they stopped mining
8 here apparently, according to the sequence of the
9 maps they submitted, that's going to be real
10 tough to mine. It's all state potash.

11 I don't think the grade, as I said
12 before, changed at the lease line. It doesn't
13 make sense to me anyway.

14 Q. Mr. Hutchinson, if they can't get back
15 in to get that ore, in your opinion would that be
16 wasted?

17 A. No question about it.

18 Q. And it would have been wasted by the
19 mine's own mining practices or mine plan?

20 A. I'm sure they have a logical reason,
21 and I would guess because it's my reaction to
22 most things, it's economical.

23 I feel some of Ernie Szabo's
24 frustration. I don't know that he has the
25 knowledge, as I do, to look at something like

1 this. But certainly if these open mine workings
2 are submitted to the state, the state should take
3 a look at whether or not their potash is going to
4 be mined or wasted and when.

5 If your royalty is out of line or if
6 your leases allow for overriding royalties that
7 prevent this from being mined, it should be -- I
8 would certainly, as a minerals management expert,
9 want to get those overriding royalties, as well
10 as the state together, to see if you couldn't
11 provide the mines with state leases some
12 encouragement to mine your potash.

13 Q. Mr. Hutchinson, just as a matter of
14 information, how do over -- if you will recall,
15 and I think it was Exhibit 12, the letter from
16 IMC to New Mexico Potash that was talking about
17 the trade of Section 2 to them that occurred in
18 December, and it said from the letter that it
19 provided that there was going to be a 1 percent
20 overriding royalty.

21 I know the Commissioners are probably
22 very well attuned to what a 1 percent overriding
23 royalty, how that works in oil and gas and its
24 magnitude. Can you give us a comparison or
25 compare that 1 percent overriding royalty in the

1 minerals business to the oil and gas?

2 A. Yes.

3 Q. And is there a significant difference
4 in your mind?

5 A. Oh, there definitely is. Many of the
6 western states that have large coal deposits in
7 the past 20 years have tacked on royalties equal
8 in percentages to oil and gas royalties. They've
9 caused many, many coal mines to shut down.

10 The difference between mining oil and
11 gas is that the risk in oil and gas is in finding
12 the product. You drill, you take the risk, you
13 get a lot of dry holes. But once you find the
14 product, the real risk dollars have been spent.
15 It's a matter of good science and engineering to
16 get it out of the ground.

17 When you find a deposit, a minable
18 deposit, your risk has just begun. The risk
19 really take place after you've spent \$100
20 million, 1991 dollars, which is probably what
21 this mine might cost today, and you're down there
22 and you start producing. How many tons can you
23 produce everyday? It's a materials handling
24 situation. And what does it cost per ton?

25 Those are so important. And those

1 coupled with the grade, and you better have your
2 exploration holes close enough together to know
3 -- to be able to predict your grade and your
4 recovery rates and the mining costs. Because
5 after spending 100 million bucks on a mine like
6 this, if you can't recover that, that's
7 tremendous risk.

8 So a 1 percent royalty in my
9 experience, and I've done dozens of very detailed
10 feasibility studies for both mining oil and a
11 gas, a 1 percent royalty in the mining business
12 is equal to a 4 or 6 percent net profits
13 interest. So if you get up to a 5 percent
14 royalty, as a landowner in the mining business,
15 you've got about a 25 to 30 percent net profits
16 interest.

17 Now, oil and gas is different than
18 that. You can pay a 12-1/2 or a 1/6 or a 3/16
19 royalty, but you've taken your risk dollars. And
20 if that royalty is too high, you're not going to
21 produce that well unless you can reduce the
22 royalty.

23 But usually there's so much product
24 there, if you've got a good well, that you can
25 bring the landowner in as a partner and share the

1 wealth because the risk is down for you.

2 Does that answer your question?

3 Q. Yes. I appreciate it. If you would
4 continue on, I think you were trying to get into
5 the area to utilize your mine plan in predicting
6 where this mine would go and over how many
7 years.

8 A. Well, I revised my mine plan to reflect
9 that blocks D and E would not be mined first. As
10 you can see, I've got my E block coming down into
11 state acreage; D, even though it's close to the
12 shaft and all developed to as state acreage. So
13 I put them back. I went through at that point,
14 of course, and I calculated what was closest. I
15 had already looked at what was closest to the
16 shaft.

17 I then looked at -- I compromised that
18 with whether it was state or federal, presuming
19 that the state acreage would be mined last in
20 most cases. So I developed all these blocks, and
21 I took the logical progression, that F would be
22 mined, G would be mined -- I mean, they found
23 something very worthwhile there.

24 They, I assume, are going to get their
25 way back to the shaft. And then that they would

1 come up here and mine block B. I can't
2 understand why they haven't been up in here
3 earlier. And then C is state. If they don't go
4 through the state, they can't get to this part of
5 block C and that part of block C.

6 Really, no reasonable idea why they
7 don't go up into A. You can see a little bit of
8 that is state, but predominantly it's federal.
9 And it's all developed, and it's close to the
10 shaft compared to down here to the south.

11 So then I put in some hypothetical
12 entries. From this, once they get this developed
13 and this mined out, presumably they will put an
14 entry in at some location and drive it down here
15 and develop this ore -- keep in mind this is
16 barren -- and this ore, and ultimately get down
17 to Section 2.

18 I did this without the benefit of
19 knowledge that they had worked a deal out with
20 IMC. So this is just a stand-alone mine plan
21 that they would work down to here at their
22 present rate of mining.

23 Q. And that rate is what you've told us
24 before --

25 A. Right.

1 Q. -- based on the net acres?

2 A. Based on what they've done over the
3 39-month period over three years, they'll get
4 down there to the edge of Section 2 in 80 years,
5 80.

6 But, gentlemen, look at this. Look at
7 what they have to go through. Those are all
8 state leases. And they've been avoiding state
9 leases. They have a good reason. I don't know
10 what it is. But their history speaks to that.

11 Q. Mr. Hutchinson, again the major concern
12 of this Commission is waste. Do you have an
13 opinion with respect to that concept and the
14 overall problem that we are facing here, and this
15 is the regulation of two competing industries,
16 trying to develop minerals that happen to be on
17 the same block or tract of land?

18 A. Well, if I were -- if I were consulting
19 for the state, I would find out what in the world
20 was going on here. I mean, they mined up to the
21 state lease line and stopped on three sides. If
22 they have -- according to their maps, they have
23 enough room to get down to this barren zone and
24 get back there, but I'm sure that they won't.

25 If they shut this down, that will

1 definitely be wasted. This area over here in
2 Section 12, which is on their lease line, appears
3 that it's going to be wasted. However, I don't
4 know the grades and it's very possible, since
5 this is federal acreage, that this area is a
6 barren zone and they know it and they just have
7 failed to put it on their map.

8 They have this barren zone shown north
9 of this green line. And so we can't imagine that
10 there would be any waste over there. Let's go
11 over to what I call block C, which is Section
12 36. They could eventually get into there, and
13 I've built it into my mine plan in its proper
14 sequence away from the shaft and the higher
15 royalty. But they've got a little strip up
16 here. I don't think that will get mined, nor
17 this.

18 And if they don't mine C, they can't
19 get to this. Now, here is a huge salt horse.
20 They know it's there. They've mined along this
21 edge of it. They've mined all the way along this
22 edge of it and stopped here. But keep in mind,
23 when they were developing this panel, ore had to
24 go all the way up and around to the shafts.

25 They were doing a logical thing. They

1 were driving a drift over here, developing a
2 panel. They hit this barren zone, said hey,
3 let's drill some holes out here. They found that
4 this was huge, and the expense of getting over to
5 there is too great.

6 But if this block C is not developed,
7 that area is going to be wasted also. Here's a
8 barren zone. Here's a big barren zone. Perhaps
9 they mined up to what they thought to be
10 uneconomic ore with this tremendous haul back to
11 the shaft. That makes a little sense to me. But
12 this doesn't and this doesn't.

13 This is just a stand-alone section that
14 they hole. It's state lease, but they don't have
15 anything surrounding it. Maybe they made a deal
16 with IMC on that one too. I don't know. If I
17 were them, I'd try to do that.

18 I think I beat that up pretty well.

19 Q. All right. Now, your exhibits have
20 shown that around the first of this year, the LMR
21 changed?

22 A. Yes. I had a map, dated 1/1/90, that
23 showed the LMR, as you called it. I just thought
24 it was uneconomic ore. And then the 1/7/92 map
25 changed that and brought it down here.

1 Q. Have you reviewed any information that
2 would allow you to render an opinion as to
3 whether or not that change was justified?

4 A. Well, I was perplexed. And preceding
5 doing this, I called Walter Case. He's also a
6 Mines graduate. He's been at this mine for many
7 years and asked if I could come and visit the
8 mine. I thought I would learn something about
9 that. He was very cooperative. He said -- I
10 told him that I was working for Yates.

11 And he said, "Well, I'd love to have
12 you come and look at the mine. But we have this
13 thing going on with this potash group, and I'll
14 have to check with Charlie High." And he called
15 me back and apologized. He said, "Charlie High
16 says 'no,' you can't come and look at the mine."
17 I don't think that's very cooperative. But I
18 might have a lot better mine plan, and it might
19 not be 80 years, to get down to Section 2.

20 But, at any rate, Section 2 is way down
21 here. I cannot make any sense of why they
22 suddenly find this so valuable when they've got
23 so much ore so much closer to their shaft. And I
24 can guarantee you, they don't have enough money
25 to put a shaft in down here.

1 Two days ago I saw a letter that showed
2 they had made a deal for this down here. Now,
3 that to me makes sense. That makes sense for IMC
4 because there's some langbeinite down here. It
5 makes sense for New Mexico Potash because it's so
6 far from their shaft. But until two days ago, I
7 couldn't make any sense out of why that suddenly
8 became so valuable to them.

9 Q. Now, Mr. Hutchinson, you also performed
10 some work for Yates. There's been a lot of
11 conversation about the recent lease purchase.
12 You were the consulting mine engineer that Yates
13 consulted to help determine whether or not they
14 should make a bid on that acreage?

15 A. I've done so much work in potash, and I
16 knew what was going on with langbeinite, and I
17 knew that Western Ag was making a few bucks down
18 there. They're a terrific medium-sized mining
19 company. They've diversified into several
20 minerals. And they're a public company in
21 Canada, so I was able to get some information on
22 how they're doing economically. And I think
23 they're doing well. They have a well run
24 operation, and it's making some money.

25 So I was told about this state lease

1 sale, and Yates people said, "What do you
2 think?" And I said, "Well, let me take a look at
3 it." So I gathered up all the information with
4 the help of a geologist. We took a look at the
5 information that the BLM supplied to the
6 bidders.

7 And I made an absolute nuisance of
8 myself in Artesia. I thought I was going to get
9 thrown out of town one day by Mr. Yates. He said
10 he didn't want to be in the potash business. I
11 said, "You're a minerals company, if you really
12 want to look at it this way. You know geology;
13 you know exploration. You might as well turn a
14 bid in on it."

15 Also, another consideration for that
16 was there's so much secrecy, so much
17 confidentiality. And the oil companies really
18 don't know whether they're getting a fair shake
19 or not, and they get enough information to
20 confirm what's going on. So I thought, well,
21 that would solve a problem there also.

22 But the heart of the matter was that I
23 think this area down here that was put up for
24 lease has some tremendous economic potential. I
25 did not make an exhibit, but there's been quite a

1 bit of conversation about this. So I had a map
2 that I had made to present to Yates management
3 flown up here so that I could show you what I
4 think is going on down there. And this is not
5 confidential.

6 Here's the WIPP area in red -- I hope
7 you can see it -- is the area that was put up for
8 lease. This is on an oil and gas map. We looked
9 at all of the logs where it was logged through
10 the salt zone through these wells.

11 And I found that from around
12 exploration standpoint, giving you guys a little
13 tip here, there's a little strip of state land
14 there that was not part of the sale. There is a
15 very prospective ore body there identified by
16 these wells or coreholes that the BLM gave the
17 bidders.

18 And by virtue of the oil well logs,
19 where we can tell a little bit about
20 mineralization of potash, this may extend out
21 here. That's down in the fourth zone. It's all
22 langbeinite. It's of minable thickness almost.
23 The grade particularly in this hole is
24 excellent. This is excellent. I stopped the ore
25 body 500 feet from WIPP because I don't know what

1 their requirements are in this presentation to
2 Yates.

3 This well is -- corehole is marginal.
4 This is marginal. AEC-8, which has been the
5 subject of some discussion here, is a dandy
6 corehole for langbeinite. And so we just kind of
7 contoured that in.

8 This black outline that runs down this
9 north-south leg of the lease is sylvite, and
10 there's absolutely no way in my mind that this is
11 economical.

12 Getting back to, after I had done this,
13 I compared it to my mine plan, and I found that
14 in the tenth ore zone, which is what this is,
15 it's up hundreds of feet above the fourth ore
16 zone. You recall they're numbered from the
17 bottom up.

18 Here's Section 2. When I made this
19 map, it was my understanding it was owned by New
20 Mexico Potash. That may or may not have changed
21 by now. But this is, by any stretch of the
22 imagination the north -- if you had a mine here
23 already, that would be the north end of an
24 economic ore body. If you had a mine there
25 already and the capital cost was written off and

1 you had the return on that investment, just on an
2 operating cash basis, you could mine that if you
3 had a mine already in place.

4 So there's a gap between here and
5 here. In fact, to my best information, there is
6 a gap between here and down in the south half of
7 11 where it picks up again. And I have no
8 exploration information through there.

9 There's one corehole that Yates was
10 given in confidence that shows an indication of
11 what might be called commercial ore. It's only a
12 10-inch hole, but it doesn't have anything to
13 connect with around it to prove that the tenth
14 ore zone continues. So I just don't think it's
15 there.

16 Q. Did you attend that auction, Mr.
17 Hutchinson?

18 A. No, I didn't.

19 Q. You were aware that New Mexico Potash
20 didn't attend that auction?

21 A. It was reported to me by Nelson Muncy,
22 who did go to the auction.

23 Q. From a mining standpoint did that
24 strike you as odd?

25 A. It did until two days ago. I couldn't

1 understand why New Mexico Potash wasn't in there
2 bidding. They're very proud of Section 2. But
3 now I know they've made a deal with IMC. So
4 maybe they had decided between themselves that
5 only one person would bid and -- or maybe they
6 bid as a joint venture. I have no idea.

7 Maybe they'll split the -- if they had
8 gotten the lease, split the minerals up between
9 the tenth ore zone and the fourth ore zone or any
10 number of things. That's not bad. That's good
11 business. IMC knows how to mine langbeinite.
12 They're a huge company. They've got the money to
13 put in a new mine, but I don't believe New Mexico
14 Potash does.

15 Q. Now, Mr. Hutchinson, with this kind of
16 situation facing a regulatory agency like the
17 Commission, how do you think it should be
18 handled? What's your opinion?

19 A. Well, the mining companies certainly
20 have my sympathy. They are in a tough
21 situation. They're, as I said, fighting for
22 their economic lives. They do need sufficient
23 reserves for their future. Whether it be two
24 years or ten years, they need to have those
25 reserves. They need to have them protected.

1 To help them protect those reserves, I
2 think that this Commission or the state
3 regulatory bodies that control them should
4 require them to come up with some definitive mine
5 plans. I'm groping in the dark here. And I'm
6 pretty experienced at mine plans.

7 I don't put much pride of authorship on
8 this, but this is the best I could do with the
9 information I had. And I had to figure out how
10 long it would take to get down there. Certainly
11 that's a consideration that you would like to
12 know about.

13 Q. Well, Mr. Hutchinson, can both
14 industries coexist?

15 A. There's no question about it. We did
16 it in Oklahoma. We did it in Texas. They do it
17 in Montana. They're beginning to have a little
18 bit of a problem with Atrona mines in Wyoming.

19 But I've always found with people like
20 Walter Case and me, Randy Patterson -- if you can
21 encourage those people to sit down and talk
22 things out, they'll always find a way to
23 compromise. I've never heard of anyone in the
24 potash business down here, a mine, that just
25 absolutely didn't want any drilling for any

1 reason, except perhaps IMC, and that could have
2 another agenda.

3 But Walter Case was -- if it hadn't
4 been for R-111-P, I think the two of us could
5 have sat down and worked this problem out.

6 Now, at the time we talked, I wasn't
7 privy to the agreement that they had with IMC.
8 It would have been inappropriate for him to tell
9 me. But still he could have told me, if we had
10 sat down, he really can't discuss that now, but
11 let's see what happens in the future.

12 Q. What about the safety concerns? You
13 just gave the opinion these companies can, in
14 your mind, work together. You've said that
15 they've been doing it all over the rest of the
16 United States.

17 We've heard for many years and through
18 the cross-examination in the last couple of days
19 time and again safety concerns. Have you looked
20 at those issues also, Mr. Hutchinson, and do you
21 have an opinion there?

22 A. There's been so much technology
23 developed. In 1977 when all the coal mines were
24 required -- underground coal mines were required
25 to submit mine plans and subsidence research,

1 that research of subsidence really took off.

2 Today there are a lot of parameters
3 that a guy like me can just pick up and get some
4 estimation of subsidence situations. The casing
5 requirements specified by R-111-P are quite
6 good. They seem to solve the problem.

7 I know that the mining companies here
8 are quite concerned, mainly because the New
9 Mexico Potash mine, long before it belonged to
10 New Mexico Potash, I think back in 83, they had
11 some explosions. And they weren't related to oil
12 and gas. But there was some naturally occurring
13 methane that showed up. That brought MSHA in,
14 and the mining companies had to fight tooth and
15 nail with them. And finally they have held them
16 at bay, I think, realistically.

17 Q. Now, Mr. Hutchinson, in your experience
18 and education of underground construction and
19 mining, have you been involved with and been
20 required to apply the principles of rock
21 mechanics and specifically with respect to the
22 issue of surface subsidence?

23 A. Sure. But let me back up and pick up
24 one point that I missed.

25 Q. Sure.

1 A. You asked me about a situation of the
2 mining companies and what the Commission might
3 do, which I did talk about. I came across a
4 Commission case, I think it was a Commission
5 case, No. 4312. It was dealt with in 1970.

6 Here's the WIPP area. And this area
7 I'm talking about is down in here. I don't know
8 who the oil company was. I could go -- or anyone
9 can go to this case number. But US Potash came
10 in in 1970, objected to drilling, saying they
11 were going to put a mine in any day. There's a
12 lot of correspondence between US Potash and the
13 Commissioner at that point, and it was going to
14 happen any day.

15 Well, here it is 22 years later, not
16 one bit of oil and gas has come out of area, and
17 there is no indication of a mine. For those
18 people like US Potash, they probably don't even
19 own it and they're not even in the basin anymore,
20 and for Narranda that holds some leases, state
21 leases, federal leases--

22 MR. HIGH: Excuse me, Mr. LeMay. I'm
23 going to object to this. The Narranda is pending
24 at the Hearing Examiner level. And I'm going to
25 object to Mr. Hutchinson --

1 CHAIRMAN LeMAY: Fine. I think any
2 references to Narranda can be eliminated for that
3 reason.

4 THE WITNESS: My suggestion is for
5 those companies that don't have any operations
6 but have outlying leases --

7 MR. HIGH: Excuse me. Again I'm going
8 to object. We have a mine here. We're not
9 talking about a leaseholder that doesn't have a
10 mine. New Mexico Potash has a mine in this
11 case. So any testimony about someone who doesn't
12 have a mine I think is irrelevant.

13 MR. CARROLL: We do have outlying
14 leases, and I think that's the point and the
15 drift that Mr. Hutchinson is trying to address.

16 MR. HIGH: Well, then that's not what
17 he's testifying to. I have no objection to that.

18 CHAIRMAN LeMAY: All right. I'm
19 confused as to why you're objecting to outside
20 leases.

21 MR. HIGH: I'm not. Mr. Hutchinson is
22 talking about leaseholders who have no mines.

23 CHAIRMAN LeMAY: Well --

24 MR. HIGH: The leaseholder in this case
25 has a mine.

1 CHAIRMAN LeMAY: What's wrong with
2 talking about leaseholders who don't have mines?

3 MR. HIGH: Because that is a case that
4 is pending now.

5 CHAIRMAN LeMAY: Oh, Narranda is. And
6 I've advised Mr. Hutchinson not to talk about
7 Narranda. I'm assuming he's referring to someone
8 else besides Narranda.

9 THE WITNESS: I was referring to the US
10 Potash case that took place in 1970 and
11 responding to the question that Mr. Carroll asked
12 me about what would I tell the Commission. Well,
13 I covered what you might do with existing mines,
14 get them to work together.

15 For nonexisting mines, you might have
16 those mining companies deliver some at least
17 preliminary mine plans and review whether or not
18 they're taking any action on those leases every
19 two or three years.

20 Q. (BY MR. CARROLL) All right. Now, Mr.
21 Hutchinson, getting back to the safety
22 considerations. If you recall, the question I
23 asked was, specifically in your experience and
24 with your educational background in the areas of
25 construction and mining, have you been involved

1 with the application of rock mechanic principles
2 and especially with respect to the issue of
3 surface subsidence?

4 A. Yes. I guess because I was a mining
5 engineer and knew quite a bit about geology, I
6 was working for Morrison-Knutson and S. J. Groves
7 the first eleven years out of school, I was
8 involved in a very large underground powerhouse
9 construction. I was the project engineer back in
10 rural Massachusetts.

11 I opened up a coal mine for S. J.
12 Groves in Utah, put it into production. And
13 before that I worked with other Groves divisions
14 to do contract mining of coal in West Virginia.
15 Those are all underground projects.

16 And currently, in fact next week, I'm
17 going to Europe to look at an underground
18 precious metals property for a client, and of
19 course it's in Scotland. I have a great
20 appreciation for what the chance of subsidence
21 might be there. So --

22 Q. Have you --

23 A. -- yes, I have quite a bit about it.

24 Q. Thank you. Have you studied and
25 applied what you know, your knowledge of rock

1 mechanics and subsidence principles, with respect
2 to the New Mexico Potash industry?

3 A. Yes, I have. It's obvious, as we heard
4 yesterday, that there's some subsidence out
5 there. US Borax Mine back in the mid-50s wanted
6 to expand their reserve base, and they thought
7 the best thing to do was do it internally and
8 start pulling some of their pillars or go to a
9 more or a higher recovery rate. And they did a
10 lot of studies there. And I was able to get
11 ahold of those.

12 We have a special situation here in New
13 Mexico in the potash because above the potash is
14 several hundred feet of salt. And those of you
15 familiar with oil and gas geology, you know that
16 salt will flow. It's fairly plastic. And that
17 the salt that's above the mines, when they are
18 mined out, is going to flex down and fill up that
19 void. And the sandstone, shale, limestone,
20 whatever is above it will react to that void, and
21 there will be some subsidence.

22 But this is a sedimentary basin,
23 evaporite basin. And they're relatively
24 flat-lying. So those are some special
25 considerations that you don't have in the

1 mountains or in hilly country or where there are
2 a considerable number of volcanic intrusions
3 involved.

4 Q. Are you aware, Mr. Hutchinson, of any
5 site specific studies that have studied the
6 actual effects of subsidence in the potash basin
7 in the area that we're talking about?

8 A. Yes, I am. But, if I could, I would
9 guess you're not subsidence experts. I might
10 give you a little nomenclature.

11 Q. If you would. And also one other term,
12 Mr. Hutchinson, we've used it a lot, and I think
13 there will be some other. We keep hearing the
14 word "plastic." I know we hear the term
15 "plastic" and "elastic." What's the difference
16 here?

17 I think having a good understanding of
18 that term and how it works is basic to one's
19 understanding of how the salt reacts when it
20 flows as a result of mining.

21 A. Well, a plastic substance is going to
22 -- I guess one way to describe it, has a lower
23 internal friction. Cold molasses might be
24 considered plastic in a sense, but it's really a
25 fluid. But it will bend and not break. And it

1 will, as though it's going -- it can even
2 extrude, but it will bend, reform, but it won't
3 break.

4 And some of these salt horses that we
5 see in the mines might be -- one explanation of
6 them might be that there was a resolution of the
7 potash that might have been there at one time and
8 -- it was eroded away or became -- went back into
9 solution for some reason. Goes back into
10 solution much faster than salt.

11 And so the salt formation would flow
12 into that void and recrystallize. Hopefully
13 that's --

14 Q. As opposed to the word "elastic,"
15 though, there is a major difference between
16 plastic and elastic?

17 A. Oh, certainly. Something that is
18 elastic, like a rubber band, if you pull it far a
19 enough apart, it's going to break. But if you
20 just go up to its -- and stay below its yield
21 strength, it will return to its original shape.

22 Q. Now, these salt formations, once they
23 have been put under pressure and they flow, they
24 don't return to their original shape?

25 A. They can take quite different shapes is

1 my understanding.

2 Q. All right. If you'd carry on.

3 A. Okay. I think you have an exhibit.

4 Q. Next exhibit is 55. No. Exhibit 55 is
5 a map.

6 A. Excuse me.

7 Q. So it would be exhibit --

8 A. 56?

9 Q. 56.

10 A. Looks like this.

11 Q. Mr. Hutchinson, that's not 56.

12 A. Okay.

13 COMMISSIONER WEISS: You've got two
14 55s.

15 THE WITNESS: Okay. This is 55-A, I
16 guess.

17 MR. CARROLL: I don't even have it.

18 MR. STOVALL: Is this it?

19 THE WITNESS: I want the Commissioners
20 to know that I do this under tremendous pressure,
21 talk about subsidence, because my mining
22 engineering/rock mechanics professor is sitting
23 over at the next table. And I don't know if he's
24 going to give me a grade but--

25 MR. STOVALL: Mr. Hutchinson, is the

1 exhibit labeled, "Figure 2.35, Definition of
2 Radius and Angle" --

3 THE WITNESS: Right.

4 MR. STOVALL: -- that will be 55-A?

5 THE WITNESS: Yes. I've tried to put
6 it to scale more than this diagram. I'll draw it
7 more to scale than that is. But this represents
8 the in-place material, in the case here, potash.
9 And I'm just going to show you half of the
10 section.

11 This is all open ground.
12 Diagrammatically the subsidence over the open
13 workings will take a shape something like that
14 with the original ground being here. Now, this
15 distance is the maximum subsidence. If you take
16 half of that distance, you can see that I have a
17 radius here. And keep in mind this is
18 diagrammatic. It's tough to find this perfect in
19 nature.

20 There's a radius point here. It will
21 come up. There will be an inflection point at
22 $1/2 S$, or the maximum subsidence. And then it
23 will take a reverse curvature about the same
24 radius back till it hits the original ground.

25 Now, at this point, this inflection

1 point, you come down to where it's been mined
2 out. And there is a D, distance, here. And in
3 the coal seams in the east, I think we have found
4 information in New Mexico that this distance, D,
5 extends into the open workings that would be half
6 of the maximum subsidence.

7 Also studies just -- we'll get into
8 this more -- I've shown this at about, oh,
9 whatever its total depth is, this would be about
10 70 percent of that. It varies between half to --
11 or 45 percent to 80 percent. Of course, that's a
12 large function of what goes on here in terms of
13 geology. Hopefully this is Exhibit --

14 Q. (BY MR. CARROLL) 56.

15 A. -- 56. Again I'm going to make a
16 similar sketch, but I'm going to give you some
17 better nomenclature.

18 Mr. Weiss, can you see?

19 COMMISSIONER WEISS: Yes.

20 A. This is the edge of a mined out area.
21 Here's the other edge. There is another opening
22 here. Getting over to this edge where there are
23 no more openings, this might be the edge of a
24 mine or the edge of a panel where there wouldn't
25 be any more mining towards me. Here's a vertical

1 line to the surface. Before there's any
2 subsidence, there's the surface. After
3 subsidence we have something like this.

4 Now, the chairman or the head of the
5 mining engineering department at the University
6 of West Virginia, a Dr. Peng, has given some
7 nomenclature to a couple of angles. You've heard
8 one in the last couple of days, I think, called
9 the angle of draw.

10 He describes this angle as the angle of
11 draw. And he says in his book entitled, Surface
12 Subsidence Engineering, and I quote, "The angle
13 of draw is more or less of academic interest
14 because the subsidence profile levels off and
15 subsidence become very small far before it
16 reaches the edges of the subsidence basin. And
17 from surface structural damages point of view, it
18 is in practice meaningless. In this respect,
19 the angle of critical deformation and angle of
20 break are more useful."

21 This Dr. Peng calls the angle of
22 critical deformation. Now, this is -- it's a big
23 variable. If the surface structure is a large,
24 brick building with a concrete floor that is
25 being used to carry huge cranes back and forth,

1 you'd want -- that would be a pretty large
2 angle.

3 If it's a frame structure, it wouldn't
4 be nearly as critical. If it were an 8-1/2 inch
5 oil well casing, it wouldn't be very critical.
6 This angle would be much smaller. But that's
7 called the angle of critical deformation.

8 And they're all kinds of tables. I
9 don't put myself up as a rock mechanics expert.
10 My professor does that. But I've learned a few
11 things in my career, and I've had some major
12 problems where I've had to use people like
13 professor Grosvenor to help me figure these
14 things out. I've learned from that.

15 The angle between the vertical line and
16 this angle of critical deformation depends on the
17 types of deformation and the types of surface
18 structures. So there's no exact science to it,
19 and no one can say that it's 45 degrees or 15
20 degrees or 4 degrees universally. If they do,
21 you guys now know that they don't know what
22 they're talking about.

23 If before this surface is disturbed you
24 are able to put some survey and some points out
25 there very accurately, you could -- and with some

1 scientific measuring devices, and since we've
2 talked about these formations that are in here,
3 they must bend; some will break. But they need
4 to fill up this void.

5 And, of course, this can be the case of
6 New Mexico anywhere from 600 feet to 2,000 feet
7 from the top of this to the surface. So there
8 can be a lot of geology in there.

9 They've been able to measure the
10 tension, tension in pulling something apart.
11 You're going to get cracks. Or you may not see
12 the cracks, but may be down below a limestone bed
13 in tension might crack.

14 On the surface you can measure that
15 tension, and there will be a point here. I'll
16 call this zero. Tension will grow. At the point
17 of maximum tension and angle down -- I haven't
18 really drawn this very well because this area of
19 tension will move for different situations.

20 But where this is the highest is a
21 fairly critical point on the surface, if there's
22 no buildings or anything else there. So that's
23 another critical thing to think about.

24 Getting closer to the situation here in
25 New Mexico, a Dr. Deere, who we'll get to later,

1 went to the US Borax mine when they were doing a
2 lot of studies. In 1961 he came up with some
3 other nomenclature. And it's not all that
4 different, and I'll just put it over here.

5 There's a vertical line. He again
6 takes -- this will be a better example. That
7 area of maximum tensile strain, and he calls that
8 -- he uses some Greek that I won't use. But from
9 the vertical to this point where the maximum
10 tensile strain is measured, he thinks that's
11 critical. I agree, particularly on the structure
12 whether there are structure or not.

13 Then he goes to another point where the
14 tensile strain gets back down to zero. That
15 might be a pretty safe place to be. Those -- if
16 you can get outside the tensile strain, you
17 really shouldn't have a subsidence problem on the
18 surface at all.

19 Now, down below here, below this line
20 you have very little disturbance to any oil well
21 casing or pipelines or things of that nature.
22 Over in this area you might have a problem. But
23 over here you should not. Now, Dr. Deere says
24 that this angle, over to the point where we have
25 zero tensile strain, minor tensions or

1 compressions may occur beyond that point. That
2 would be in this direction. Minor tensions or
3 compressions may occur.

4 Inside this point structures are liable
5 to experience substantial disturbance. So in
6 this area, if you're from here over -- actually
7 over to here in this example, you may, if you're
8 inside that line, experience some substantial
9 disturbance.

10 Now, getting to your question, Mr.
11 Carroll, about site specific situations, Mr.
12 Deere said that in this case, where there's no
13 more mining out here, that angle out to that
14 point where you would have virtually no effect,
15 or something you could certainly design for, that
16 angle would be at the mine, at the US Borax mine,
17 approximately 31 degrees from the vertical out to
18 a point of zero horizontal tension.

19 Over on this side and in the potash,
20 the way potash is mined here, you have another
21 opening. This would be -- actually there would
22 be three of these options out here.

23 So these options are going to
24 eventually have some effect on subsidence because
25 that, when the mine is closed, if they pull out

1 of an area and decide they're never going back,
2 they'll just let this collapse. This is going to
3 have some effect on subsidence.

4 And if we take a parallel line to this
5 critical deformation limit from here, that means
6 that this angle -- or this angle is equal to this
7 angle. Those lines are parallel, excuse me. And
8 since this is laboratory type stuff, out in the
9 real world all these openings are out there, and
10 they're in the business of getting potash out of
11 the ground, not keeping track of subsidence.

12 But what happens, and before they did
13 all this research, they would say here's the edge
14 of our full mining. That would be the angle
15 outside of which you would have no subsidence.
16 We can see that that's faulty reasoning.

17 But still if they don't have any better
18 information and they can only -- they don't have
19 tension tests on the surface and they can only
20 measure that point and compare it to here, that's
21 all they have. And you'll find information in
22 the data that comes up that way. But it's not
23 very scientific.

24 If I might, let's say that we have an
25 angle like this out to the point of critical

1 deformation on the surface, subsidence. Now, if
2 you have a mine plan and you have entries coming
3 in here like this, you stabilize that because you
4 want to be able to use it to get back to the
5 shaft.

6 But you come in here and you put in
7 panels. And then you mine into those panels, and
8 the conveyor takes it back to the shaft, and out
9 it goes. And you'll work by panel from the end
10 of the commercial ore back to the permanent
11 opening here.

12 You can see that if this cross-section
13 that I've just done is through this area, and you
14 calculate the subsidence or did a study of the
15 subsidence with all the geology and other aspects
16 that are necessary that I'll get into, you can
17 see in this example if this whole thing gets
18 mined out, you don't have a very good picture of
19 what the subsidence picture may be on the
20 surface. Again, this is a planned view, and this
21 is a cross-section.

22 So, trying to get away from the purely
23 design mode of the situation, try to imagine this
24 plane of subsidence, which would be here. And
25 let me project it out, trying to make it look

1 three dimensional, so that you have a sloping
2 face and it goes quite a ways.

3 Now, here in this example, it's going
4 to bend around, and the subsidence is going to
5 come out like this. The subsidence is going to
6 come in again like this, or that point of
7 critical deformation.

8 Since we're going to be talking about
9 oil wells later, keep in mind that on this plane
10 that oil well may be 8 inches. It may go up to
11 17 inches at surface casing. I think, Nelson,
12 it's 17 inches or less until you get to the
13 salt? Okay.

14 Think of 17 inches and think of the
15 huge expanse of this plane where this may go for
16 literally miles, as we've seen in the New Mexico
17 mine, New Mexico Potash mine has actually done.

18 So someone starts talking about a plane
19 and everything in that plane being disturbed,
20 keep in mind from an oil point of view, it's one
21 little 17-inch diameter casing that is designed
22 to withstand a lot of stress.

23 On the stress situation, however, a
24 mine opening -- we'll get to this in the gas
25 thing later -- but there's a mine opening. And

1 where that material was mined out was supporting
2 the earth above, it's gone so it can no longer
3 provide any support.

4 So the stress pads will revise their
5 locations and will come together back down here,
6 as though this never existed. But keep in mind,
7 if you're looking across, as I showed, maybe a
8 70-foot panel that was mined out and with some
9 entries on the side of it, that may be 70 feet
10 wide.

11 Well, that's going to have a 70-foot
12 effect on subsidence at the surface at a
13 minimum. It's going to be a little bit more than
14 that. But keep in mind we're talking about 18
15 inches or less casing. There's a big area there
16 where the stresses in plan, in a big plane around
17 an 18-inch oil well, that's designed or can be
18 designed to withstand a tremendous amount of
19 stress, there's not going to be a big effect on
20 that.

21 These are things that can be
22 calculated. I'm not capable of doing it.
23 Perhaps Mr. Grosvenor is. But there are people
24 out there that can. And I just want to bring
25 this to your attention.

1 Gentlemen, since 1977 there has been a
2 tremendous amount of subsidence studies and
3 research because of the coal mines in the east
4 predominantly. Take advantage of it. Know that
5 it exists and get your own answers rather than
6 seeing what we see in the "Miner's Bible," where
7 they come out to an angle here, and they make it
8 45 degrees or 50 degrees or 60 degrees.

9 There are plenty of coal mines in the
10 east where it's less than 10 degrees to that
11 point of critical deformation, which varies on
12 whatever the problem is you're trying to solve.
13 I have some, and I've made up some copies of some
14 specific studies.

15 What kind of grade am I going to get?

16 MR. HIGH: Are you asking me?

17 THE WITNESS: I don't think you're
18 qualified to grade me.

19 This is the --

20 Q. (BY MR. CARROLL) Exhibit 57, is it
21 not?

22 A. I believe so.

23 Q. Yes, Exhibit 57.

24 A. I have a series of these. I'll try and
25 do them fairly quickly. If you'll help me,

1 Nelson, get the right ones up.

2 US Borax was the subject of Dr. Deere's
3 examination that I talked about earlier where he
4 commented that outside the point of maximum -- or
5 where the tensile strain got to zero really
6 didn't mean anything as far as surface structures
7 go.

8 If you get too far inside of that, you
9 have a problem. You have to design for that.
10 This shows the development of the US Borax mine,
11 and I think the date of this paper was 1965. So
12 it preceded a lot of the research that's been
13 done since then.

14 Here is a development panel. Then it
15 would drive off here with an entry, and they
16 would mine that. These are large pillars left in
17 place to protect this area from subsidence or
18 anything.

19 What's the next number, Ernie?

20 Q. 58.

21 A. Okay. Does this look like the 58 you
22 gentlemen have?

23 COMMISSIONER WEISS: Yes.

24 THE WITNESS: This is a part in plan
25 view of that same mine. Part of it is hidden by

1 this cross-section, but so you'll know we're in
2 the same place.

3 Across the mine on this surface they
4 put in a line and began to measure subsidence.
5 This is the original ground set at zero. This is
6 five feet. And over on this side, this is
7 tension, horizontal tension.

8 So we can see that the complete high
9 rate of extraction area is from here to here.
10 Keep in mind we still have a big pillar here, big
11 pillar here, an entry over here. We know that
12 this entry is going to have some effect on this
13 subsidence that comes out here.

14 Over here it appears to be virgin
15 ground, but you can see it's at an angle. So the
16 importance of a planned view in subsidence
17 studies is quite necessary.

18 Notice that the subsidence here very
19 accurately follows Peng's curves that we had in
20 an earlier exhibit. I was very surprised. It's
21 1965; this is a 1992 book. So it does follow
22 that type of curvature, where it comes up and you
23 have a radius here, a radius here, and there is
24 very slight subsidence.

25 The tension on this side seems to be

1 maximum right here. Well, that maximum tension,
2 gentlemen, is inside the mine workings below.
3 Here's a point of zero tension. It looks like
4 it's about Station 4. The mining stopped at
5 about Station 7. That's about 300 feet to where
6 you had zero tension.

7 Now, you could go out here maybe a mile
8 and find a footprint out there that looked like
9 the subsidence and say, oh, the angle of draw is
10 out there a mile, but that's not very
11 scientific.

12 Over on this side where we have the
13 effect of subsidence of this panel, or of this
14 developed entry, you can see that the curve isn't
15 quite the same. But you can also see that it
16 does follow this rate of curvature that comes up
17 and becomes tangent to the surface. Here we have
18 two points of maximum tensile strain. It's
19 really not conclusive.

20 If you take this one and project it up,
21 or where it gets to zero, and project it up, you
22 find that you're not over -- excuse me, it's
23 right here -- you're not over the mined out area
24 by extraction. You jumped across a pillar, but
25 you do have this entry. You're actually right on

1 the edge of that entry.

2 So if you wanted to put an oil well or
3 something else down in here, you need to know
4 what in the world their mine plan is out there to
5 get a true determination of it. But according to
6 this stress diagram and subsidence, you wouldn't
7 have any trouble right there.

8 Q. That would be drilling an oil well
9 adjacent to--

10 A. Right.

11 Q. -- the mine opening?

12 A. Now, that would be silly to do. I'm
13 not proposing that that happen. I'm just trying
14 to point out there's some science, not just
15 conjecture, but some science. I'm sure Mr.
16 Grosvenor will agree with me that can allow some
17 predictability of subsidence.

18 Q. Your next exhibit is 59?

19 MR. HIGH: Excuse me. Is that the same
20 one we have here? I don't see all that on
21 there. The one he just had?

22 MR. CARROLL: That was 58. You've got
23 59.

24 [A discussion was held off the record.]

25 THE WITNESS: By the way in mind, this

1 comes from an article that was presented to the
2 AIME by Mr. Pierson, who was eventually the mine
3 manager at the US Borax mine.

4 I don't know if you can see it, but --
5 do you know which one that was, Nelson? US
6 Borax? Perhaps we can spot it for you on the
7 map. But it's over on the western edge of the
8 field, I think, about midway or towards the
9 south.

10 Q. (BY MR. CARROLL) These are actually
11 exhibits that were taken from Dr. Pierson?

12 A. Right.

13 Q. I don't know if he's a doctor or not,
14 but Mr. Pierson's actual report of their study of
15 subsidence over this US Borax mine?

16 A. Right. He did some previous studies in
17 the 50s. But this was a paper presented in 1965
18 to a professional group. Same sort of
19 situation. You may recognize this area. This
20 was the first line and plan view we looked at.

21 Here's the second one we're going to
22 look at. And again this appears to be the edge
23 of the mining. Virgin ground in this direction.
24 Here we have a big pillar. And we have entries
25 developed, except here instead of four, there are

1 many more than four, and it's quite a bit wider.

2 This is a zero point. This is minus 5
3 feet of subsidence and here is the compression
4 and tension situation over here. If we go to
5 this edge, where we have virgin ground, we can
6 see that subsidence has taken a little more
7 erratic curve. I don't know why. Erosion on the
8 surface -- it could be any number of things.

9 But by and large you can see this trend
10 coming up here and flattening out. It gets down
11 to the point of maximum subsidence about here.

12 Looking at tension, here is the maximum
13 tension, and here's where the tension gets to be
14 zero. And so you can calculate -- if you knew
15 the depth, which is about 1,000 feet, you could
16 calculate that angle.

17 My point here is that this point of
18 highest tension seems to be further to the left
19 than it was up here. But if you're looking at a
20 cross-section, look back this way, the mining is
21 at an acute angle to the cross-section. Here it
22 is also. But if you're looking in this
23 direction, it's getting further away. So
24 obviously this mined area is having some effect
25 on the subsidence here.

1 Planned views are very important. Over
2 on this side we have two spikes. But trying to
3 do some predicting or gathering this information
4 up for predictability of subsidence, the edge of
5 the mining -- keep in mind this is a big pillar
6 -- would be here.

7 The tension in this area gets to be
8 zero at this point. We can calculate that angle,
9 but I've kind of sketched that out at less than
10 500 feet. So what I'm getting to is this R-111-P
11 half a mile, quarter of a mile, whatever, is not
12 based in science, it does not appear to me, for
13 the New Mexico Potash area.

14 Q. Next would be Exhibit 60.

15 A. Now, here is a section across a totally
16 mined out room and pillar system. Here we have
17 high tension. This says, no doubt - here it says
18 "State Panel 3," "Panel F-2." I assume this
19 says "State Panel 2," since this has really just
20 been superimposed on a mine map. I think there
21 are probably some workings out here, but it's not
22 really clear on the exhibit or the original.

23 But you can see we've got -- here's 5
24 feet of subsidence. Maybe we have 8 feet total.
25 I think they were mining 12 feet thickness in

1 this mine. We have the edge of mining right
2 here. It's falling away somewhat so the
3 subsidence line might be something like that in
4 planned view.

5 But bringing this point down, we can
6 see that curve again here that Dr. Peng came up
7 with. We can really see it well here, how it's
8 developed. But the further you get away from
9 this inflection point, the less damage could be
10 caused by subsidence to a surface structure or a
11 pipeline in the ground.

12 This distance to virtually zero tension
13 is nothing. Maximum tension is here. You
14 certainly wouldn't want to put a structure inside
15 of that, but it falls off rapidly into this
16 virgin ground. And at some point in here there's
17 enough technology today that you can calculate
18 the stresses all the way down an oil well and
19 design the casing for that.

20 Q. Then the conclusion that these last two
21 or three exhibits are making is that, at least in
22 the potash basin of southeastern New Mexico, the
23 area that we're concerned in, the area of
24 influence, this area of subsidence nowhere
25 extends the distances that we have been hearing

1 for some years; is that a fair statement?

2 A. That's correct. And I don't know what
3 the proper distances should be, but the science
4 is there to make some really good predictions.

5 Q. And the amount of tension or the strain
6 that does exist in the area of critical concern
7 can be calculated; is that correct?

8 A. It can be.

9 Q. And there are casings designed to
10 withstand those?

11 A. That's true. Getting back to -- I'm
12 shocked that the BLM and also the state doesn't
13 require this type of study by the mines as the
14 coal industry is required to do. If you had --
15 if you didn't have such a sparsely settled area
16 here, mainly ranches and grazing and things like
17 that, if it were more densely populated, I think
18 you'd require that these mines do these studies.
19 It just makes sense to me.

20 You'd get their mine plan for one
21 thing, and you could do some more accurate
22 predicting.

23 Q. This next exhibit is 61.

24 A. Now, this mine is the Wills-Weaver
25 mine, which is up here. It's my understanding

1 this paper was made by Golder Associates for the
2 USGS.

3 Q. This is one of the studies that have
4 been contained in the "Miner's Bible" too?

5 A. I have no idea.

6 Q. Or this one isn't.

7 A. No, it isn't. But just to show you in
8 planned view, these guys put a shaft down here,
9 put another shaft down here: one for production,
10 one for services. That's a real good way to do
11 it. Two shafts are really necessary today.

12 They developed their panel or their
13 entries out here. And then they came off until
14 they hit uneconomic ore, and then they would pull
15 back on a room and pillar system, several panels,
16 looks like when this map was made. Here was a
17 panel. And maybe these pillars were pulled
18 later; maybe they weren't. Same thing over on
19 this side.

20 So this gives you some idea of how they
21 planned their mine. They put in two studies, an
22 A line and a B line.

23 Q. This is Exhibit 62; correct?

24 A. Yes. I'm going to mark mine up a
25 little bit just for demonstration purposes. But

1 there are a series of subsidence lines here.
2 They're over time. And, of course, you can
3 anticipate that immediately after mining, there
4 may not be some subsidence. But as the years go
5 by and that effect of that void area is
6 transmitted to the surface, the subsidence is
7 going to be deeper.

8 Q. Now, Mr. Hutchinson, just to make sure
9 that everyone understands, this diagram now is
10 actually the diagram of subsidence overlying "A"
11 that went across this Wills-Weaver mine that was
12 depicted in the previous exhibit?

13 A. Right. I drew the two vertical lines
14 just to highlight what was going on there. These
15 solid dots connected were done on January 26, 65,
16 the first one, 10/10/63.

17 But another thing to take into
18 consideration, they mined about 48 to 52 inches
19 of material. The maximum subsidence here is less
20 than 2 feet at this point. It may be more now,
21 but it may not. It may have reached
22 equilibrium.

23 At any rate, this average subsidence is
24 just a little over a foot-and-a-half, quite low
25 for potash basin site specific areas. But I'd

1 like to draw your attention to what -- this is
2 really an upset scale. I mean, there's 1,000
3 feet, there's half a foot. So it's not in the
4 same perspective as the last exhibits.

5 But if you come across here and look
6 for the point of maximum subsidence on either
7 side and look at this line up here, when it gets
8 to be zero, you know you're way out there, and
9 probably there's no effect on the surface at
10 all.

11 My point here is that this distance
12 from maximum subsidence out to where there is no
13 subsidence at all is about 400 feet.

14 MR. HIGH: I'm sorry. I didn't hear
15 that.

16 A. About 400 feet. Over on this side,
17 from here to there, that looks like about 600
18 feet.

19 As we get to the high station numbers,
20 we're going north on the planned view. To the
21 south we have the effect again of those entries
22 that were kept open for transportation and
23 service purposes.

24 Q. That, in your opinion, then would have
25 caused -- is why you had more to the south, 600

1 feet of effect, as opposed to the 400 feet?

2 A. Yes. But it --

3 Q. It plays some effect?

4 A. It probably had some effect. Here,
5 however, we know that this point of maximum
6 subsidence is well within the mined area at
7 station -- approximately Station 8, which is
8 right there -- woops, wrong one. Right there.
9 The point of maximum subsidence is well within
10 the mine limits.

11 Q. Exhibit 63 is your next one.

12 A. Right.

13 Q. The other vertical line on planned view
14 is depicted here. And again this last date was
15 March of 67. The first one was August of 64.
16 Two-and-a-half years later the subsidence went
17 from virtually nothing down to approximately 1.7
18 feet. Again mining a 48 to 52 inch seam down
19 below.

20 Again, the point of maximum subsidence
21 here. Virtually none up here. That's a distance
22 of maybe 350 feet. Over on this side, taking a
23 point here, it gets kind of garbled up here, but
24 you can see the majority of these lines come up
25 here. That might be 1 to 200 feet.

1 Q. Now, where you beginning measuring your
2 350 feet or your 1 to 250 feet, that is not
3 measured from the edge of the mine workings; that
4 starts in back over the mine workings, does it
5 not?

6 A. Right. Let me get to where that is in
7 planned view.

8 Q. All right.

9 A. This point here looks like it's about
10 Station 23. This point looks like it's about
11 Station 8. So let's find out where Stations 8
12 and 23 are on the B line. Station 8 is here.
13 Inside this area, this apparently was developed,
14 and they ran out of good ore or something and may
15 not have mined it.

16 And what did I say? That was 23?

17 Q. Yes.

18 A. 23 is right here --

19 Q. How much --

20 A. Excuse me. -- well within the limits
21 on this section. But you've just got to open
22 your eyes and take a look around. Look what
23 happens here. That's the edge of their mine.

24 So you just really have to take a look
25 at mine plans to know what is going on with

1 subsidence.

2 Q. What is the distance, just to put this
3 into perspective, from, say, that upper station
4 to the edge of the mine?

5 A. Well, here it goes from Station 23 to
6 31. That's 800 feet. But realistically here's
7 the edge of the mining. Let's not be blind.
8 Let's extend that over there and say this solid
9 rock out here is having some effect on that.

10 So if this line B were over here a
11 couple hundred feet, we'd be on the edge of the
12 mining at -- or just inside of it -- for this
13 point here.

14 I think that what you see here is
15 affected by the fact that they're very close to
16 the edge of the mine and really paralleling it.
17 A cross-section through here would really pin
18 down what effect the edge of the mine is having
19 on subsidence.

20 Q. And I guess the point is that, at least
21 with respect to each specific mine, you have to
22 look at it because here the range of subsidence
23 that you were talking about, 1 to 200 feet, when
24 you measure from the measure station, it's well
25 within the confines of the mine. The area of

1 influence never extended beyond the mine in this
2 particular exhibit.

3 A. That's true.

4 Golder says that, in talking about this
5 low percentage of subsidence versus what was
6 actually mined, that it appears that there was
7 very little break-up or bulking of the overlying
8 strata.

9 Certainly you gentlemen are sensitive
10 to the fact that this is -- the nature of the
11 strata above is going to have a lot of effect on
12 the subsidence.

13 If there were big sill, volcanic sill
14 up there that was very strong, the subsidence may
15 go up to it and may not be enough to cause it to
16 even flex. Or if it flexed, it wouldn't break,
17 and there would be no subsidence on the surface.
18 Maybe in a thousand years. That's how important
19 the geology above is to this.

20 Wills-Weaver mined about 80 to 85
21 percent of the ore where they mined in those
22 areas and pulled the pillars. The subsidence
23 rates that these charts were designed to measure
24 were anywhere from half an inch to an inch per
25 month. Something that just doesn't happen all of

1 a sudden. It's gradual and something that could
2 be measured if you had a surface structure
3 there.

4 Let me quote from the Golder Associates
5 report. "The zone of disturbance of strata above
6 the mine workings extends beyond the limit of the
7 mine workings, and data from southeast New Mexico
8 potash fields suggest that a reasonable limit for
9 defining this zone of disturbance" -- I mean,
10 that's any disturbance -- "would be an angle of
11 45 degrees from the vertical from the edge of the
12 mine. More significant disturbance would occur
13 with an influence angle of about 30 degrees."

14 That's a pretty good range. So if you
15 had -- we get back -- what's going to be within
16 that 30 degree and 45 degree range, if it's going
17 to be oil well casing that's strong, no problem.
18 If it's going to be a scientific lab, you better
19 put it somewhere else.

20 These areas of influence with respect
21 to possible damage to the No. 3 shaft --

22 MR. HIGH: What page is that?

23 A. 73. Here's the No. 3 shaft. Here's
24 the No. 4 shaft. I told you earlier that there
25 were two shafts.

1 You can see that they went out here a
2 ways before they started developing their entries
3 into the mine. The reason for that is that they
4 need to protect that shaft. This is a large
5 diameter concrete structure, I'm sure. I haven't
6 seen it, and the information I have, I don't know
7 what it's made of.

8 But you can imagine it's very important
9 for that mining company to protect those shafts.
10 If those shafts get out of kilter, those skips
11 don't run true in the guides. And you're going
12 to have a big problem handling that high volume
13 of muck that has to come out of shaft.

14 So they're very concerned about that.
15 And since this mine is abandoned, they wanted to
16 know if part of the study was to assure that
17 those shafts would not be damaged. And
18 apparently in that angle of 30 to 45 degrees,
19 they designed their entries so that there would
20 be a maximum number of big pillars down there and
21 no subsidence at the shaft.

22 "Three" -- again quoting from Golder
23 Associates, page 73, "The three producing oil
24 wells currently located on the Wills-Weaver mine
25 site are protected by salt pillars with radii of

1 approximately 150 feet," much less than some of
2 the predictions that we took off of this study,
3 which were, you know, in the range of 100 feet to
4 4- or 500 feet.

5 "Surrounding these pillars," and I'm
6 quoting again, "the average ratio of extraction
7 is about 70 to 75 percent. And some closure of
8 the mining horizons would probably have occurred
9 within these areas. These closures at the mine
10 horizon level would have impacted the oil wells
11 because of the limited pillar sizes. But the
12 level of disturbance has evidently not been
13 sufficient to cause problems."

14 Site specific data is not my
15 conjecture. That's just the way it is.

16 Q. Now, Mr. Hutchinson, there's also some
17 other considerations that may go in that are
18 glossed over. We know that there is a mine, the
19 Mississippi Chemical mine, that's been closed for
20 ten years, temporarily abandoned.

21 Well, why hasn't that mine just
22 completely closed in? I mean, there is
23 technology out there that these miners are using
24 everyday to protect those shafts. Many of these
25 mines have been open for years. There's things

1 going on that haven't been explained to us; isn't
2 that true?

3 A. That's true. These miners down here
4 are -- it's a violent environment. These mines
5 are like being in somebody's living room compared
6 to a big underground powerhouse or a big block
7 caving mine. When they're putting off big
8 explosions, you think the end of the world is
9 then.

10 But these people support, probably with
11 roof bolts, easy to put in. My tour through the
12 AMAX mine, or now the Horizon mine, I saw lots
13 and lots of rock bolts. They even put them in as
14 they're driving these panels up here to assure
15 that when they pull the pillars, they're going to
16 come out.

17 Now, if they leave those rock bolts in
18 there, those rock bolts could sustain that back
19 -- we call the roof the back -- for a long, long
20 period of time. So there would be no effect of
21 subsidence in an abandoned mine because of the
22 support in these entries.

23 Now, some would like us to believe that
24 on one hand that subsidence takes place
25 immediately, but that can't be true. They're

1 keeping those things maintained and opened.

2 If the Mississippi Chemical mine has
3 been kept open for ten years, you can bet there
4 are rock bolts or stulls. A stull is a timber
5 post that just takes some of the stress and
6 pressure to support the back. Or some form of
7 support. They will not take the risk. I mean,
8 their production system could be shut down and
9 the conveyors crushed if they didn't do that.
10 Since they do it, it has a much delayed, if ever,
11 effect on subsidence in those areas.

12 Now, a state or federal mining
13 requirement where you can get multiple use to
14 extract in this, as this case is, both oil and
15 gas and mining, might require that if there is an
16 existing oil well here and this mine plan is to
17 come up this entry, developed off of it, take the
18 muck to the shaft -- if the oil well is already
19 there, a reasonable compromise would be, rather
20 than waste potash and cry about it, put in some
21 rock bolts there and start pulling this material
22 back here. Put stulls in. We did it in the coal
23 mines all the time, mainly to protect our
24 underground workings. But the same thing could
25 apply to other structures.

1 Q. Your next exhibit is Exhibit 64.

2 A. This is another site specific study,
3 and I alluded to it earlier. This is of the same
4 mine, the US Borax mine. This was done by Dr.
5 Deere. It's included in the Golder report, which
6 is where I got it. It shows stations across the
7 mine.

8 What I wanted to point out is that they
9 have a maximum tension, zero tension, maximum
10 tension, zero tension. Shows the profile. Note
11 again we're picking up those curves, so Peng must
12 have something going on.

13 In this case the subsidence was 10 feet
14 and, I think, of the 12 foot of the mined area.
15 That's about 83 percent. So this is more typical
16 of the potash basin than the Wills-Weaver mine.

17 And these are -- I read to you some of
18 his descriptions of -- here's tension at zero,
19 bringing it down to the surface and taking this
20 angle out here. You've got to be careful inside
21 that. It's of very little consequence outside.

22 And that stress line, they're always
23 drawn straight, that's not true. It's just that
24 they don't know any better. None of us do unless
25 we've got some good corehole data and tests on

1 the strata between the surface and the top of the
2 mine.

3 In effect that with the series of beds
4 in there, the subsidence, say, through a
5 sandstone might have an angle that's very steep.
6 Through shale it might be a little flatter.
7 Limestone, it might break and be flatter yet. So
8 in essence it gets to be that way. In reality it
9 probably does not. Very important knowing what
10 the geology is between the surface and the mine
11 workings.

12 Well, if everybody is still awake, I
13 think I've covered most of those points, Ernie.

14 Q. All right, with respect to subsidence,

15 One of the other problems is the
16 problem of methane gas, and your last two
17 exhibits, I think --

18 A. Sure.

19 Q. -- deal with that issue. The first of
20 those would be Exhibit No. 65.

21 A. Before I go on to this, just to
22 reiterate again, I'm a mining engineer, a civil
23 engineer. I have a lot of experience, many years
24 working under ground in all kinds of nasty
25 conditions. With the tremendous education that

1 Mr. Grosvenor was able to help me get, I've been
2 able to apply these engineering principles to
3 real life situations. And I've been doing it for
4 a lot of years.

5 I'm not here as a rock mechanics
6 expert. I'm here as an interpreter of technology
7 available so that you know it's there, and we
8 don't have to continue past this point to have
9 hypothetical and loosely documented things come
10 out of the air. I think our technology is beyond
11 that.

12 Okay. The tenth ore zone has had some
13 problems with high pressured gas. I think when I
14 went through the literature -- before this I did
15 go to MSHA and get their reports. I concluded
16 from their reports, and I think that's what their
17 reports actually say, are that there is some
18 methane that was found in these blowouts in the,
19 then the Kerr-McGee mine, now the New Mexico
20 Potash mine, what is of small amounts.

21 They had some fatal accidents here that
22 brought the feds in and they had to do a thorough
23 examination of everything. I read those
24 reports. It seemed the predominating problem and
25 the cause of the injuries and the deaths were

1 high pressure gas.

2 The continuous miners had gone into an
3 area, and it wasn't a problem with ventilation.
4 Just suddenly the back would come down and the
5 rocks would fly out. And one instance, I think,
6 one of the operators was hit by a piece of metal
7 that had been knocked off of his piece of
8 equipment by a flying rock caused by this
9 explosion.

10 When I say "explosion," it is not a
11 fire, a detonated explosion; it's the release of
12 pressure. I think down in Nash Draw they may
13 have had one. But predominantly it's been in the
14 tenth ore zone. And I think with minor
15 exceptions, predominantly in what's now the New
16 Mexico Potash mine, they have not had an accident
17 that is on record that I could find since they
18 took over the mine, a tribute to their mine
19 management and engineering.

20 Q. This next exhibit is 66.

21 A. This is a diagrammatic area or drawing
22 of an area of where these blowouts occurred. And
23 they have measured the bearing of the fractures
24 that existed after the blowouts. You can see
25 that they kind of run in a northwest-southeast

1 direction. This one is a little off.

2 But what's interesting here is this
3 one. This crack developed here at the location
4 of the blowout, but the crack did not extend into
5 those entries. So as we heard -- as we have
6 learned, these are very limited in extent. This
7 one didn't go all the way through that entry.
8 And there's another one at another entry that
9 comes up here. I'm sure it wasn't found up there
10 in the literature I saw.

11 Q. That was the same phenomena that Mr.
12 Brent May was alluding to in his report on the
13 geology of this area?

14 A. Right. Well, I read the information
15 from the potash industry manual, and I was
16 skeptical. They were implying that this gas or
17 these explosions were caused by oil and gas. I
18 don't think that's the case. I think we have
19 testimony from competent geologists to refute
20 that.

21 But I drew on my experience. And
22 reading about how they solved the problem, they
23 started drilling holes in these intersections.
24 As they would go by and by driving this entry,
25 this one, this one, they would put a relief hole

1 in here. And I think earlier testimony talked
2 about how some of the gas was measured.

3 That seemed to solve the problem. Gas
4 did not communicate between these in the tests
5 that were run. And I postulate a theory that
6 seems to answer most of these questions, and that
7 is the idea that this tenth ore zone exclusively,
8 apparently, has some clay seams in it. That clay
9 seam might be at the top or the back. It might
10 be actually mined out and they built their mill
11 so that it can accommodate this. They don't have
12 to separate it underground and just take up the
13 ore.

14 Or it might be up here. And there
15 would be, in the case of it being up here, there
16 would be halite or salt predominantly between
17 there. They would mine up to the bottom of the
18 salt.

19 If this distance is sufficient, they'll
20 never have a problem with those blowouts. But as
21 this were to migrate down towards the top of the
22 potash that they wanted to mine, the thickness of
23 the wall and therefore its strength would
24 diminish, or they would diminish together. Or as
25 it got thinner, the strength of that, of the rock

1 above the opening would be less.

2 We have an entire industry in New
3 Mexico and in Colorado called the coalbed methane
4 industry. And they have found that they can go
5 into coal seams by drilling, frac them in the San
6 Juan Basin, for example, with 500,000 pounds of
7 sand as a propagate that will hold the little
8 coal seams open, called cleats, and develop some
9 porosity back into the coal zone.

10 Well, when the coal was deposited, it
11 contained gas. And over the years that gas
12 became methane gas and nitrogen and all sorts of
13 things.

14 But my point is that in studying the
15 coalbed methane industry, I learned that after
16 they had frac'd and put in the propagates to hold
17 those little seams open and reduce the pressure
18 on the coal seam by getting everything out of the
19 wellbore and reducing that pressure, that methane
20 gas and water would flow to the wellbore and they
21 could get it out and separate it and sell the gas
22 into a pipeline.

23 Well, that gas, those gas particles are
24 not chemically tied up with the coal. They're
25 absorbed. In a solid state you could say that if

1 you pick up a nail with a magnet, it's absorbed.
2 It's not chemically combined. The same idea
3 except it's a solvent gas.

4 When the pressure is reduced in the
5 coal, the gas desorbs, because of the pressure
6 differential, desorbs from the coal and goes out
7 the wellbore, along with a lot of water, by the
8 way.

9 I equated that to this, and it seems to
10 me that the solution that they found, if you can
11 imagine the opening and 2,000 feet of overburden
12 above, this rock potash that was taken out has
13 stopped supporting the rock above it. But the
14 pressure inside this opening is atmospheric
15 pressure.

16 You've got to maintain that pressure
17 for those miners down there and give them fresh
18 air. And fresh air comes from the surface. So
19 it's whatever the pressure is on the surface with
20 a little bit higher because you have to increase
21 the pressure to get the air to move to the miners
22 for ventilation.

23 Well, if you take away this area,
24 you're in essence creating a void. And if this
25 is the void and this zone, clay zone, gets to be

1 close to the back, the pressure of the nitrogen
2 -- it's principally nitrogen gas that's been
3 discovered in there -- it has to go somewhere.

4 And if you stick a pin in a balloon --
5 the air in the balloon is of much higher pressure
6 than outside, otherwise the balloon wouldn't blow
7 up-- it's going to come rushing out. If you take
8 that same balloon full of air and compacted it
9 into a small area, that air in the balloon would
10 be very highly compressed.

11 If, in that medium that you compressed
12 it, you then drilled some holes and made those
13 holes bigger and bigger, pretty soon the pressure
14 differential between the holes and the pressure
15 of the air in the balloon would cause that
16 balloon to rupture and flow into that area.

17 So I think the gas problem is
18 particular to the mine and in no way a function
19 of oil and gas drilling or water wells or
20 anything of that nature. And we've learned from
21 the geologists, who are experts in that, this
22 gas, it flows, but it doesn't flow far.

23 And if you can imagine, these clay
24 zones being deposited from the volcanic fallout
25 or inflow of freshwater bringing hydrocarbons or

1 plant life or whatever, over the years that would
2 build up a little lens of gas of high pressure.

3 Q. All right. Mr. Hutchinson, getting
4 back then to our major consideration, waste,
5 could you summarize for the Commission what
6 circumstances must prevail for waste to occur in
7 Section 2 and if wells are drilled in that
8 section?

9 A. Well, you recall how far away Section 2
10 is from the existing operations of New Mexico
11 Potash. New Mexico Potash must find a way to
12 finance the capital costs of getting to Section
13 2, then completely write it up off, including
14 interested and required return on capital.

15 Next, the price of muriate must grow
16 faster than inflation on the cash cost of
17 production in spite of the Canadian oversupply.
18 New Mexico Potash must also unavoidably be
19 required to mine in a location of a well while
20 the well is in production and refuse to support
21 its openings, refuse to incorporate the well
22 location into its buying plan.

23 You saw the big pillars in some of the
24 mines. In fact, in some of those salt pillars in
25 the Wills-Weaver mine, there are existing oil

1 wells. It can be done. They must find reserves
2 in the well location exceeding 5 feet of 16
3 percent K_2O as sylvite in the tenth ore zone or
4 have ramped to another zone and written off the
5 capital costs, with interest and profit, to get
6 to that other zone.

7 Q. Is ramping a very easy, fairly cheap
8 method of obtaining additional production?

9 A. Well, they already have some continuous
10 miners. If they wanted to ramp down beginning
11 tomorrow, they have the equipment to do it. But
12 all of that muck created by ramping down has to
13 be hoisted and gotten out of their stream. So
14 there's going to be that expense. That's a
15 two-edged sword.

16 While that continuous miner or group of
17 continuous miners is doing that, they can't be
18 mining potash. So that's another negative that
19 has to be overcome and built into the
20 attractiveness of another ore zone for them to go
21 to it.

22 This mine has been in production since
23 1965. The mill has a long life, I'm sure. The
24 continuous miners, and I would estimate that they
25 probably have 10 to 12 of them, are a significant

1 capital cost. Here we are 25, 27 years after
2 that mine opened up.

3 Maybe they've been replaced, I don't
4 know. But they're going to continue to have to
5 replace those if they're going to continue to
6 mine. Those things are high-wear items. And one
7 of them might cost as much as 600,000 bucks.

8 Q. What additional circumstances must
9 prevail before there could ever be a waste of
10 commercial potash?

11 A. I would think that they would have to
12 develop proof of minable grade ore in Section 2
13 consistent with their mine practice. And they're
14 going to need the commitment of their management,
15 their parent company.

16 And I've spoken about the need for
17 their additional mining and milling plant and
18 equipment as they progressed through, as I expect
19 years and years, before they get to Section 2.

20 Q. Well, Mr. Hutchinson, this is of some
21 interest to me. It says, "to develop proof of
22 minable grade consistent with mine practice." We
23 know that there is one corehole in Section 2; is
24 that correct?

25 A. That's correct.

1 Q. Is that consistent with New Mexico mine
2 -- New Mexico Potash Company's practice of
3 drilling coreholes that you have seen?

4 A. Well, the most comparable thing, the
5 best comparison I can make -- and, Mr. Weiss, you
6 touched upon this yesterday. For another
7 situation I have obtained the location of all of
8 the coreholes that I can find in the entire
9 basin. I don't know the grades, but I know the
10 coreholes.

11 I know where their mined out areas
12 are. I'm in the preparation of this information
13 for another case, as I said, and so it is
14 preliminary.

15 But for this purpose and because we're
16 so far away from any operations that they're
17 going to have to put down a new shaft or drive a
18 tunnel or do something to get down to Section 2
19 in the foreseeable future, in my lifetime any
20 way, they're going to have to experience some
21 capital expense.

22 But to get back to Ernie's question, I
23 took their mine shaft location and when
24 Kerr-McGee put that shaft in -- and remember
25 Kerr-McGee was one of the last mines to come on

1 stream -- they just went down to the tenth ore
2 zone, the first minable zone that they could
3 find, to get their ore in the water in the potash
4 industry here.

5 They drilled around that shaft in the 4
6 sections, 4 full 640-acre sections around that
7 shaft. They drilled between 21 and 23 holes.
8 That's at least 5, almost 6 holes per section
9 necessary to prove up the reserves before they
10 sunk that shaft. I mean, any bank, any board of
11 directors, any financial officer is going to
12 require something like that.

13 The same situation exists in Section
14 2. If New Mexico Potash owns Section 2 and
15 they're going to mine it, they've got to put in
16 some capital equipment, and I don't think they
17 can finance that without a lot more exploration
18 data than has been made available to us.

19 Somewhere in the range of 5 to 6 holes
20 per section might prove up enough reserves to
21 justify a capital expense to be written off over
22 a 10- to 15-year period.

23 Q. Now, Mr. Hutchinson, did you also look
24 at the remaining sections that have been
25 developed in that mine and counted the number of

1 coreholes in those other sections around the
2 mine?

3 A. Yes, I did.

4 Q. Were the numbers consistent with what
5 you just testified to?

6 A. A little bit less. But keep in mind,
7 they probably have an average of 3 holes every
8 500 acres. I did the calculations for this case
9 on 500-acre blocks. So they have at least 3
10 holes for 500 acres that are mined out. That
11 doesn't count the holes that they drilled where
12 they didn't mine because it's of subeconomic
13 grade, or they hit a salt horse, or it doesn't
14 fit their mine plan.

15 So that if you count the holes just
16 within the confines of what they've mined out, it
17 will average around 3 holes every 500 acres. But
18 there's more to it than that. Once you have a
19 shaft down and you're into the deposit, as I
20 mentioned, everyday you've got a geologist down
21 there taking face samples. So you have many more
22 points.

23 And when you hit an area, as they did
24 in their 90 to 92 development period, where the
25 grade coming -- the sample's grade is below

1 economic grade, they've got to find out why. So
2 they have to go drill some more holes.

3 Well, those holes are most likely going
4 to fall in that barren zone. I haven't counted
5 those holes. But at 3 holes per 500 acres, plus
6 everyday samples, they have a lot of data to see
7 where they're going to be in the next 6 months,
8 12 months, 2 years.

9 Q. Well, it is safe to assume, Mr.
10 Hutchinson, is it not, that these coreholes were
11 not drilled after that mining occurred?

12 A. It's safe to assume. Nobody wants to
13 incur that expense.

14 Q. Then isn't it also reasonable to assume
15 that those coreholes were drilled in their normal
16 exploration process determining where they're
17 going?

18 A. First of all, to justify the tremendous
19 expense of putting in a mine and then to know
20 what direction to mine in, it's necessary.

21 Q. Let's just assume that maybe all of
22 these considerations take place, do you have any
23 thoughts with respect to how much potash would
24 actually be included in a reasonable island
25 around these wells during at least while a well

1 would be in a productive stage?

2 A. I calculated a 5-foot thick tenth ore
3 zone deposit down here. Some indication that
4 might be how thick it is. It might be 6 feet.
5 But it's close to that range. I used 5 feet and
6 a 16 percent grade or better, distances proven to
7 be acceptable in existing or closed mines with
8 experience around wells, AMAX, the Wills-Weaver,
9 you know, actual numbers, not my own conjecture.

10 I calculated that 15,000 tons -- 14,000
11 tons would be left in place and that most likely
12 temporarily.

13 Q. In today's actual costs and prices, in
14 your opinion what would New Mexico Potash realize
15 then as operating revenues for this at least
16 temporary loss of this salt or potash in these
17 pillars that you're talking about?

18 A. I think that if they were mining it
19 today, at today's price of potash, I think
20 they're getting about 72 bucks a ton of product.
21 That's fairly current information. Based on
22 actual costs of mining, not of New Mexico Potash,
23 but in the area, they would have an operating
24 profit, that is a cash flow profit, of about
25 \$154,000 in that 14,000 tons.

1 Q. And what would the royalty be lost to
2 the state on that, at least temporarily,
3 including in this drilling?

4 A. About \$20,000.

5 Q. Now --

6 A. That's at a 2 percent royalty. I don't
7 know --

8 Q. That number is calculated at 2 percent?

9 A. Right. 14,000 tons and \$72 and 2
10 percent.

11 Q. I think from your research that's what
12 you feel is a federal royalty; is that correct?

13 A. That's what I've read it is. I've read
14 some of the leases, and that's what they reduced
15 their royalty to.

16 Q. All right. Now, if the oil well is not
17 drilled, how does that compare, these amounts,
18 comparing the losses to the oil operators
19 compared to the mine operators?

20 A. Well, if the well is not drilled, the
21 present value of revenue lost at \$20 a barrel --

22 MR. HIGH: Excuse me. I'm going to
23 object. We've heard two or three other witnesses
24 already testify, and we have documents in
25 evidence already. Do we have to hear it from

1 someone else?

2 CHAIRMAN LeMAY: Let's take a 15-minute
3 break. I have no idea how long we're going here,
4 so -- I think we have a court reporter that's out
5 of paper.

6 MR. CARROLL: Just a couple of minutes,
7 though, for your information. I'm almost at an
8 end.

9 CHAIRMAN LeMAY: We'll bear with him a
10 couple of minutes, Counselor.

11 MR. CARROLL: I don't care about taking
12 the break. I just wanted you to know that we are
13 drawing to a close.

14 CHAIRMAN LeMAY: We're trying to figure
15 out timing, Mr. Carroll.

16 MR. CARROLL: Sure.

17 Q. Again, just for comparative purposes.

18 A. Just royalty at -- I think the state
19 leases are 1/6 royalty. That loss would be
20 \$420,000, or a swing of \$400,000 per well not
21 drilled.

22 Q. So economically this Section 2
23 decision, or these four cases, it could cost
24 realistically \$1.6 million?

25 A. Present value.

1 Q. At present value?

2 A. Yes. And if those four wells were all
3 successful, hypothetically, and they caused
4 geologic reason to be offset and those were good
5 wells, it would double, of course. Over \$3
6 million.

7 Q. Just one last question. You actually
8 have gone in, I think you've testified, to the
9 AMAX mine, or the Horizon mine?

10 A. Yes.

11 Q. And been privy to their mine plans and
12 the kind of pillars they're leaving around the
13 oil wells?

14 A. Yes. I was there with their mining
15 superintendent. He took me to their engineering
16 department. They laid out all their mine plans.
17 They're in detail. It takes a big sheet of
18 paper. And they showed me where the wells were
19 that they had to deal with and how they were
20 going to do it.

21 Q. The safety or the pillars that you've
22 been talking about, were they consistent with
23 what was in the actual practice there in the AMAX
24 mine?

25 A. Well, AMAX is going to use 100-foot

1 radius. The Wills-Weaver mine is actually
2 150-foot radius.

3 CHAIRMAN LeMAY: I'll have to stop you
4 there. We just ran out of paper, as I see it.
5 We'll have to take five-minute break?
6 Two-minute?

7 MR. CARROLL: Whatever. But I am.
8 I've got to the old question about waste and
9 prevention and that's it.

10 CHAIRMAN LeMAY: We have to get a
11 record.

12 MR. CARROLL: I understand.

13 CHAIRMAN LeMAY: Let's come back. If
14 you have a couple statements -- don't leave. My
15 inclination is to finish up those statements,
16 take our break for lunch now. Do you want to
17 start cross and finish up after lunch,
18 Counselor?

19 MR. HIGH: I don't know that I can
20 finish up after lunch if we're going to quit at
21 3:00.

22 CHAIRMAN LeMAY: We're going to
23 continue here today until we get through. The
24 3:00 o'clock deadline is gone. You have as much
25 time as you want then. For some reason we didn't

1 get a good indication of how much time you all
2 were going to give on your presentations, which
3 we usually do have, so our time limits must be
4 flexible. We're going to have as much time as it
5 takes.

6 MR. CARROLL: I apologize, Chairman
7 LeMay. These things do take -- you can practice
8 and rehearse them and --

9 CHAIRMAN LeMAY: We'll try to manage.
10 And I'm just giving you the option, Counselor, if
11 you want to break and have all your cross at one
12 time, we'll take a 15-minute break and come back.

13 MR. HIGH: I would like to have a lunch
14 break before I begin my cross. I have a lot of
15 exhibits to get in order.

16 CHAIRMAN LeMAY: Sure. Let's come back
17 at 12:15. We'll take an early lunch, and we'll
18 come back to finish up at 12:15. We'll keep
19 going until we finish.

20 [The lunch recess was taken.]

21 CHAIRMAN LeMAY: Let's continue.

22 Q. (BY MR. CARROLL) As we were just
23 breaking, Mr. Hutchinson, I realized that you
24 gave us some numbers for a safety pillar, or
25 pillar that you could -- that temporarily could

1 encase a producing mine, and you gave some dollar
2 figures.

3 We neglected to get into what that
4 width of that pillar or the radii of that pillar
5 was and that the factors that went into
6 calculating that. If you could briefly give me
7 that so that we can finish your testimony, I
8 would appreciate it.

9 A. Okay. I think I said when I calculated
10 the 14,000 tons, I had used some distance proven
11 to be acceptable in existing mines. The 150-foot
12 dimension that was experienced in the
13 Wills-Weaver mine and the 100-foot dimension --
14 that's radius -- in the AMAX mine.

15 And I just averaged those two, I
16 believe I used 125 feet, something that was there
17 and I felt to be reasonable, based upon probably
18 the most important information that is used in
19 the subsidence prediction. And that is site
20 specific data, not for a particular area, a
21 particular unmined area, but for the New Mexico
22 Potash enclave, if you will, or mining
23 set-aside.

24 I did fail to really point out those
25 most important aspects of input into predicting

1 subsidence. But far and above the most important
2 is these type studies that we have from Golder,
3 Deere, Pierson, perhaps there are some more.

4 But getting past that, the next
5 important thing is the physical properties of the
6 overburden strata. What is it composed of?
7 Sandstone, shale, whatever. In a generic sense,
8 anywhere you would try to predict subsidence, the
9 most important thing would be to try to find out
10 what the overburden is.

11 The next is the mined out opening.
12 That would give you some idea of what other than
13 salt that flows, if you just had sandstone above
14 a coalbed or something, what the size of the rock
15 would be that would fall into that. And that's
16 important as to the dimensions of the actual
17 height mined and how wide it's mined.

18 And then another very important factor
19 is mining depth. The deeper you are, the less
20 important mining department is. But the closer
21 you are to the surface, the more important it is
22 as an input into predicting subsidence in an area
23 where you have it mined or do anything else.

24 Then multiple panel mining, I think I
25 made that point in my discussion, that if you

1 have more than one opening or a big panel and
2 some transportation entries alongside of it,
3 that's an important thing.

4 And then the topography. Here in this
5 area of New Mexico it's relatively flat, so it's
6 not a big deal. But you can understand that if
7 you were in a rolling hill area or something
8 steeply dipping in topography, that subsidence
9 calculations would make a difference as to where
10 they intersect the surface.

11 And then the last major item is time.
12 And we saw from some of the exhibits that
13 subsidence can place over considerable amounts of
14 time. One property, Wills-Weaver, it was
15 measured at half-an-inch to an inch a month, but
16 at another property, it might be faster or
17 slower.

18 But I thought I would summarize those.
19 And I think that covers your question.

20 Q. Mr. Hutchinson, this Commission is
21 charged with the prevention of waste, both in the
22 oil and gas sense and in the potash sense, and I
23 think you're very familiar with those statutory
24 requirements. Plus you must look to the
25 conservation of both minerals, and it must

1 protect correlative rights.

2 In your expert opinion would the
3 granting of these four drilling permits that
4 Yates has made application for, would they
5 violate any of those principles by the granting
6 of them?

7 A. I don't believe so. I think getting
8 back to time and economics, there's a resource
9 there that Yates and others, I assume, are
10 willing to go after and put up the risk money to
11 do now.

12 The probability that there will be any
13 mining during the life of those wells, if ever,
14 is quite low in my opinion. And it's just not a
15 reasonable thing for me to think that there would
16 be any potash wasted at all, particularly
17 commercial potash, by the granting of those
18 permits.

19 MR. CARROLL: Mr. Commissioner,
20 Chairman LeMay, I would move admission of our
21 Exhibits 42 through 66. We will also mark, since
22 Mr. Hutchinson made extensive drawings and
23 diagrams on these exhibits, we will gather them
24 up at the end of the day and also, because I
25 think they are essentially part of the record,

1 but we will make sure that they are given to the
2 court reporter at the end of the day.

3 MR. HIGH: And we would request that we
4 get copies of the pad drawings, as well as the
5 exhibits on which Mr. Hutchinson marked, so we'll
6 have them. We have the clean copies of the
7 exhibit. I would like to have a copy of one that
8 he marked up as well.

9 MR. CARROLL: I don't have them and I'm
10 not going to be taking them home, but I think we
11 can make arrangements to allow you to come up
12 here and get them.

13 CHAIRMAN LeMAY: It's a matter of
14 public record, Counselor, so they're available up
15 here for anyone who wants to have copies.

16 THE WITNESS: I'll make the offer one
17 more time. If you would tell me what you would
18 best like to see with the mine map and the
19 overlays, I'll provide that for you.

20 CHAIRMAN LeMAY: Well, I think that's
21 adequate. That's going to be the court record,
22 or the Commission record right there. People --
23 except for the confidential maps. I assume you
24 want to keep those with the LMR on them as
25 confidential exhibits?

1 MR. HIGH: That's correct.

2 CHAIRMAN LeMAY: We certainly will so
3 honor that. That will be available except for
4 those exhibits to be copied.

5 MR. STOVALL: Mr. Chairman, in response
6 to Mr. High's needs, just make arrangements to
7 protect the custody of them, since they are
8 official exhibits. But we can arrange that with
9 Mr. High.

10 MR. HIGH: Does the Commission have the
11 authority to maintain the confidentiality? I
12 know you raised that issue before that there's no
13 statutes that allows them to keep that
14 confidential.

15 MR. STOVALL: The context in which I
16 raised that was one of the specific authority in
17 R-111-P. I think at this time, I believe, we can
18 keep these confidential because they are being
19 provided to us in the confidential setting. If
20 somebody fights it, we'll do everything we can to
21 protect that. I believe they can be.

22 CHAIRMAN LeMAY: We'll do our best to
23 do that.

24 Is there objection to exhibits?

25 MR. HIGH: I have no objection.

1 CHAIRMAN LeMAY: Then those exhibits
2 will be admitted into the record. And I assume
3 now it's time for Mr. High's cross-examination.
4 Mr. High.

5 CROSS-EXAMINATION

6 BY MR. HIGH:

7 Q. Mr. Hutchinson, let's pin down a little
8 bit more your expertise because you've covered a
9 whole lot of stuff this morning and yesterday and
10 this afternoon. Have you had any experience,
11 other than working for Yates on this particular
12 case, in the potash basin?

13 A. No, not in New Mexico Potash Basin.

14 Q. So, before you were hired by Yates in
15 the case, you had never done any work involving
16 potash mining operation in New Mexico; is that
17 correct?

18 A. That's correct.

19 Q. But you do have underground mining
20 experience elsewhere?

21 A. A tremendous amount.

22 Q. Is most of that in coal?

23 A. No.

24 Q. Do you have any underground mining
25 experience in potash?

1 A. No.

2 Q. Is the type minerals that are being
3 mined an important factor in terms of how you
4 mine, safety and those sorts of things?

5 A. Oh, it certainly is. There are many
6 different types of mining. And I do have some --
7 a considerable amount of underground mining
8 experience in coal where we had a drilling,
9 chute, and cutting operation going on, which is
10 identical to the system used in langbeinite.

11 While I was there, I took over that
12 mine as president of the mining company, we
13 developed it into a nice operation where we
14 converted the cutting and drilling and chuting to
15 a continuous miner operation. And to do so we
16 had to put in a wash plant.

17 What happened there was a 10-foot seam
18 of coal, had a 1-foot parting, which is
19 essentially barren in the middle of it. And any
20 seam by itself was not high enough to mine
21 economically, I felt. And so we designed and
22 built a wash plant and converted that mining
23 system to continuous miners identical to the
24 systems used here in potash.

25 And through that mining system I feel

1 very qualified to understand mining the system
2 that is used in potash.

3 Q. That's because of your experience in
4 coal?

5 A. Yes. That was a coal experience. And
6 to get back to your question --

7 Q. Thank you. Go ahead.

8 A. Oh. Precious metals mining in both
9 open pit and near vertical vein mining is
10 entirely different. Both of those are entirely
11 different types of mining systems. In fact, the
12 mining industry is a materials handling industry,
13 and I cut my teeth in the most competitive
14 materials handling industry, heavy construction
15 industry, in the construction of dams and tunnels
16 and things of that nature, big powerhouses, where
17 the most critical thing is to get the material
18 moved, no matter where it is, and get it out.

19 Those large construction companies that
20 are competitive bidders are the best at materials
21 handling.

22 Q. Would you degree with me, Mr.
23 Hutchinson, that a person's experience or lack of
24 experience in mining a particular mineral is at
25 least a factor that should be considered in

1 relying or not relying upon that person's
2 opinions?

3 A. Would you be more specific? Do you
4 want to talk about potash?

5 Q. No. I'd really like you to answer my
6 question. I'd ask you just to answer my
7 question, if you can.

8 A. Yeah. I'd just -- yes and no.

9 Q. That's the best you can do?

10 A. Yeah. If you want to be specific, I'd
11 be happy to do that.

12 Q. No, that's fine, if that's the best you
13 can do.

14 You mentioned several times and you
15 spent a lot of time talking about subsidence.
16 Subsidence is part of rock mechanics or what
17 people know as rock mechanics; correct?

18 A. They're certainly related. Rock
19 mechanics is a science that can help in the
20 understanding of subsidence, yes, sir.

21 Q. All right. And in the interest of
22 saving some time here, you said this morning
23 several times that you are not an expert in rock
24 mechanics; is that correct?

25 A. Yes. I am not someone that one would

1 hire to take care of a very complex problem that
2 involved rock mechanics. I have been in many
3 positions where I would go out and hire those
4 type of people. They usually come from academia,
5 and they don't have the production experience.

6 And so you have to combine their
7 knowledge with your problem of economic
8 production to understand that. And you know at
9 the time they don't understand your problems,
10 you're trying to learn how to apply their
11 technology to your problems. And I've been in
12 that situation many times.

13 Q. And you mentioned also this morning a
14 person by the name of Professor Grosvenor?

15 A. Yes, I did.

16 Q. Is that Professor Niles Grosvenor?

17 A. Yes, he's sitting at your table.

18 Q. And that's the gentleman sitting at
19 my left and has been sitting here most of the
20 day?

21 A. Yes.

22 Q. Would you consider Professor Grosvenor
23 an expert in rock mechanics?

24 A. He in the early 60s certainly taught me
25 a lot about what was known about rock mechanics

1 at the time. I was grateful to him for that.

2 Q. You were a student of his?

3 A. Yes, sir.

4 Q. At the Colorado School of Mines?

5 A. Correct.

6 Q. My question, do you consider Professor
7 Grosvenor an expert in rock mechanics?

8 A. I haven't followed his career in rock
9 mechanics. I consider him extremely proficient
10 and an expert in all aspects of coal mining. I'm
11 not sure of his expertise in coal processing, but
12 it may be very good. I just haven't used him for
13 that.

14 I recommended him to my father who was
15 responsible for the construction of the, then
16 called, Straight Creek Tunnel, and I think that
17 the Colorado School of Mines ultimately did some
18 work there. I regard him in a very high fashion.

19 Q. Would you consider Professor Grosvenor
20 an expert in rock mechanics?

21 A. I've never used him as a consultant for
22 rock mechanics, but I have recommended him so I
23 would say yes, I've used Dr. Reed, which was an
24 associate of his, and some other people that were
25 more in the hard rock construction situations

1 rather than sedimentary deposits.

2 Q. Now, you talked about some
3 misinformation from the potash people, and I
4 think you used the words that the oil and gas
5 people were arbitrarily being kept out of
6 drilling?

7 A. Yes, sir.

8 Q. That was some of your introductory
9 comments that went on for quite some length, and
10 I want to talk about that, Mr. Hutchinson. So no
11 one is left with any doubt as to what it is
12 you're talking about. Are you aware of the
13 history of R-111-P?

14 A. I can succinctly tell you what I know
15 about it. It was developed as an -- I don't want
16 to go all the way back to R-111-A, but I'll just
17 abbreviate and say that R-111-P came out of an
18 environment where oil and gas exploration were
19 encroaching upon the potash area, and there was a
20 valiant attempt made to get the parties to
21 communicate.

22 And I believe engineers and geologists
23 did so and tried to work out their problems. And
24 R-111-P came out of that attempt to do so.

25 Q. Well, you mentioned this morning that

1 one of the suggested solutions that you had to
2 this conflict between potash and oil is that the
3 people ought to sit down and talk and come up
4 with some kind of a resolution?

5 A. Yes, I did.

6 Q. My question to you is, do you or did
7 you know that this is precisely the process that
8 was followed that led up to R-111-P? Did you
9 know that?

10 A. Yes, I just said that I knew that that
11 was an attempt to do so.

12 Q. Did you know that the State OCD was the
13 one who initiated that process, the very one you
14 recommended?

15 A. No, I don't know who initiated it.

16 Q. And you are aware that there were
17 representatives from the oil and gas industry and
18 from the potash industry that actually sat down
19 with each other and did exactly what you
20 recommended?

21 A. Obviously there were petroleum
22 engineers that came up with a casing program and
23 I assume mining engineers from the potash
24 people. I don't know any of them, but I assume
25 that there were such people.

1 Q. You weren't involved in any of that, of
2 course?

3 A. No. And that really hits upon the
4 problem, not that it wasn't Gary Hutchinson
5 personally, but I could not find in my
6 questioning of anyone that told me about R-111-P
7 where there was anyone involved that had worked
8 in both industries.

9 And it's my direct experience that if I
10 had an oil and gas guy in Oklahoma and a coal
11 operator, both operating on my property that I
12 was responsible for, that I had to get them in
13 the same room and when one guy would say
14 something, I would have to interpret that to the
15 other guy.

16 And we did that for days until I was
17 confident that the oil guy knew the problems, the
18 real problems of the mining guy, and the mining
19 guy knew the real problems of the oil guy. And
20 we always worked it out, but I needed that
21 interpretation. I think that R-111-P didn't have
22 that.

23 Q. Did you realize, Mr. Hutchinson, you
24 didn't have to go very far to find out somebody
25 who had worked in both industries that was

1 actually there?

2 A. I don't know of anyone that was there.

3 Q. Do you know who the oil and gas
4 representatives were in the negotiating process
5 that led up to R-111-P?

6 A. I can't -- I've seen the signature
7 page. I don't know of any of them personally.

8 Q. You know whether or not any of those
9 people worked for Yates Petroleum Corporation,
10 the very party involved in this proceeding?

11 A. No, I don't.

12 Q. Do you know who Mr. Norbert Rempe is?

13 A. No.

14 Q. Let me tell you he was a geologist
15 that worked for Yates Petroleum, and he was one
16 of the oil and gas representatives, and he had
17 worked in the potash industry. The very
18 representative of Yates had been in both
19 industries, and he was there in that
20 negotiating process?

21 A. Oh, I'm not surprised.

22 Q. Do you think that was valuable?

23 A. I doubt it if he was a geologist.
24 Geologists are much more concerned about rocks.

25 Q. Okay.

1 A. Yesterday we had a very experienced
2 oil and gas geologist who has worked in potash,
3 and believe me, when we get down to mining
4 concepts, he knows very little about those
5 things. In fact, he said that he was
6 supplemented by Arco with a mining economist and
7 a mining engineer. You know, that's a pretty
8 good team.

9 Q. You don't know Mr. Rempe?

10 A. No, I don't.

11 Q. You don't know if he's good or bad or
12 knowledgeable or any of that stuff, do you?

13 A. Never met him.

14 Q. Now, in that process, the people not
15 only did what you recommended to meet and sit
16 down and try to come up with some resolutions,
17 but they, the people involved, Mr. Hutchinson,
18 were actually able not only to reach an
19 agreement, but to type it up and put it on
20 paper? Were you aware of that?

21 A. Oh, with R-111-P?

22 Q. No. The agreement between the two
23 industries on how to drill oil and gas wells and
24 mine potash in the known potash areas were able
25 to put in writing what they had agreed to. Were

1 you aware of that?

2 A. Yeah. Isn't that what R-111-P is?

3 Q. No, it is not.

4 A. Oh, then I may not be aware of that.

5 Q. Let me show you, if you will -- may I
6 approach the witness, Mr. LeMay?

7 CHAIRMAN LeMAY: Please.

8 Q. Look at Exhibit No. 9. And to speed
9 things up, Mr. Hutchinson, let me tell you that
10 the first part of Exhibit 9 is R-111-P and then
11 attached to that is another document.

12 A. There is no Exhibit 9 in this book.

13 Q. Well, let me just give you mine. I'm
14 sorry about that.

15 A. No problem. Exhibit B?

16 Q. Yes. Do you see that?

17 A. Yes.

18 Q. Entitled, "Industry Agreement"?

19 A. Right.

20 Q. That's the document that the people
21 were able to agree upon and sign. If you look on
22 the last page, you'll see the signatures of
23 people?

24 A. Yes.

25 Q. Do you see those?

1 A. I remember seeing that.

2 Q. Those are the signatures of the potash
3 people and the oil and goods people, and on the
4 left-hand side the signature from Mr. Rempe, who
5 was from Yates Petroleum?

6 A. Hard for me to read, but -- do you have
7 them typed out? Do you know who these people
8 are?

9 Q. Yes, I know exactly who they were.

10 A. Maybe.

11 Q. Do you know Mr. Jens Hansen?

12 A. Jens Hansen, yes.

13 Q. With Bass Enterprises?

14 A. Landman?

15 Q. Yes.

16 A. Okay.

17 Q. And Norbert Rempe from Yates Petroleum
18 Corporation?

19 A. You described him.

20 Q. And then John -- from Tailsman Energy,
21 John Wade. John Wade.

22 A. What was his expertise in this?

23 Q. With Tailsman Energy, he's an oil and
24 gas -- I don't know. He's an oil and gas
25 person. I don't know what he does.

1 A. So we have a landman and an oil and gas
2 person and a geologist.

3 Q. Well, those people, Mr. Hutchinson,
4 were selected by other oil and gas people. I
5 don't know why they're there. They were there
6 telling us they were selected to represent them.

7 A. Uh-huh.

8 Q. That's all we know about them. I don't
9 know how they were selected.

10 A. Okay.

11 Q. But that's the very process --

12 A. But could we go through the names on
13 the other side?

14 Q. Those are the potash people.

15 A. Okay. And that is --

16 Q. Are they important to you?

17 A. Yes.

18 Q. For what purpose?

19 A. To answer your question.

20 Q. I haven't asked you a question yet.

21 A. Okay. Well, then ask it and we'll get
22 back to it.

23 Q. The sitting down and talking and coming
24 up with an agreed upon way of doing it, as
25 reflected in that exhibit --

1 A. Uh-huh.

2 Q. -- is precisely what you recommended
3 this morning; correct?

4 A. No. It's close, but that's why I was
5 asking to get the background of the people on the
6 other side. I recognize Mr. Thayer's signature
7 and Mr. Lane's. I know Mr. Lane to be a very
8 reputable engineer. Mr. Thayer, I think, is a
9 manager of IMC. And Donald -- someone, at the
10 bottom -- who is that?

11 Q. Western Ag?

12 A. Western Ag.

13 Q. Don Gilbert.

14 A. Don Gilbert. What's his background?

15 Q. He is a mine engineer is my
16 recollection?

17 A. Okay. Is this your name?

18 Q. That's correct.

19 A. High?

20 Q. Yes.

21 A. So we have a lawyer, a management guy,
22 an engineer, and you think another mining
23 engineer.

24 Q. Those are just the people who signed,
25 Mr. Hutchinson.

1 A. Oh, I misunderstood. I thought they
2 were the committee.

3 Q. They were a very small part of a larger
4 committee.

5 A. Okay.

6 Q. That's the process that you recommended
7 this morning, just sitting there and talking and
8 agreeing upon this; correct?

9 A. No.

10 Q. Your --

11 A. I used the example this morning --

12 Q. Excuse me. Let me ask the question.

13 A. Okay.

14 Q. I don't want to argue with you or we'll
15 be here from now on.

16 A. Okay.

17 Q. Is your dispute with what I've just
18 asked you about, this sitting down and talking
19 with the people that are doing the talking, is
20 that your problem with it?

21 A. Oh, no. These are good people to have
22 there, I think, with the exception of a lawyer --
23 not you personally, but any lawyer.

24 Q. Do you know whether or not any of the
25 other oil and gas people had lawyers involved?

1 A. I have no idea.

2 Q. Of course you don't know. Let me
3 suggest to you that there were a lot of lawyers
4 involved.

5 A. That's reflected in R-111-P.

6 Q. That's right. Unfortunately a lot of
7 lawyers get involved in these things. But that
8 process is what you recommend, sitting down and
9 talking?

10 A. I think I've answered that question
11 three times.

12 Q. Okay. What is there about that process
13 that you disagree with?

14 A. There's no -- I don't see an
15 intermediary here unless it's the, OCD and the
16 OCD people have confirmed to me that they do not
17 have in-house the technical expertise to mediate
18 this thing and translate.

19 Q. Well, were you aware, Mr. Hutchinson,
20 that a representative of the OCD was present at
21 every step of the way reaching that agreement;
22 that a representative of the BLM was there every
23 step of the way in leading to that agreement?
24 Those people have that expertise; correct?

25 A. Oh, absolutely not.

1 Q. All right. So you think it ought to be
2 by sitting down and talking but in a different
3 way than it has already been done?

4 A. I think each party needs to know what
5 the other person is really saying. And I know
6 mining engineers that don't understand what
7 spudding a well means and petroleum engineers
8 that don't know what bulking is in a mine or
9 gob. I know that's true. That's the fact.

10 Q. You said also this morning that
11 something was craftily drafted to hold oil and
12 gas at bay?

13 A. Yes.

14 Q. What in the world were you referring
15 to?

16 A. I was referring to R-111-P and
17 specifically the wording that says and -- there
18 are other examples. But I've read it many times,
19 and I've tried to imagine the process and
20 application. And what it says to me, in my
21 words, is that a mining company must submit an
22 LMR to the state. They must submit a -- well,
23 they must submit an LMR --

24 Q. Excuse me.

25 A. -- which is their life of mine

1 reserves.

2 Q. Would you answer my question?

3 A. Yeah, I'm getting there.

4 Q. What part of R-111-P are you saying was
5 craftily drafted?

6 A. Those paragraphs that allow a mining
7 company to set down their life of mine reserves,
8 which is fine, but it goes on to say that the
9 state officer taking this information is not
10 allowed to question it; he just has to take it.

11 And then it's followed up by, almost
12 word-for-word, "There will be no drilling in the
13 LMR." To me that's unfair. That's crafty
14 draftsmanship that an engineer or geologist
15 probably didn't do.

16 Q. You disagree then with the concept of
17 the industry agreement in R-111-P, which and the
18 concept being, there will be LMRs in which there
19 will be no drilling and the other areas will be
20 freed up for drilling?

21 A. No.

22 Q. Do you disagree with that concept?

23 A. No. I disagree with the concept that
24 the LMRs are in essence shoved down the oil
25 companies' throats.

1 Q. And you believe that that's what
2 R-111-P allows?

3 A. Coupled with the fact that the state
4 has no right to question the lateral extent of
5 the LMRs.

6 Q. Okay. And that's the part you say was
7 craftily drafted?

8 A. I believe it is.

9 Q. But do you know whether or not the oil
10 and gas representative on this committee agreed
11 to that system?

12 A. I have no idea if he agreed or not.

13 Q. You haven't read and studied the
14 industry agreement, I take it?

15 A. Well, just in the interest of time, I
16 recognize the signature page, and I'm sure that
17 this is an industry agreement, as you stated.

18 Q. I didn't ask you that. My question
19 was, have you read and studied it?

20 A. No.

21 Q. Do you disagree with the concept that
22 there ought to be an area of oil reserves that
23 are protected from any oil and gas drilling?

24 A. Absolutely. I would fight tooth and
25 nail for that.

1 Q. You think that's a good concept?

2 A. You bet it is.

3 Q. Your problem then is with who
4 determines it? The scope of it?

5 A. The approval process.

6 Q. Okay. Do you know who drafted R-111-P?

7 A. No.

8 Q. Were you suggesting by the remarks --
9 and I've taken them to be somewhat derogatory
10 toward the potash industry this morning. Are you
11 aware of the fact that the potash people did not
12 draft R-111-P?

13 A. I don't think I said anything
14 derogatorily. If I did, it wasn't by design
15 towards the potash industry.

16 Q. Well, let me -- I'm going to move on to
17 some other things here, and perhaps that's
18 something else we disagree about.

19 A. Okay.

20 Q. You mentioned this morning that there
21 has been a lot of misinformation from the potash
22 industry.

23 A. Okay.

24 Q. What information are you claiming was
25 misinformation?

1 A. The concept of subsidence in terms of
2 the buffer zones that are included in R-111-P, in
3 my opinion, are not based in any particular
4 amount of good science.

5 Q. Let's stop there for a minute and we'll
6 continue. What information did the potash
7 industry put out concerning the angle of draw or
8 angle of subsidence?

9 A. I have come across it several times in
10 the transcripts of the hearings. I can't be more
11 specific than that from this desk.

12 Q. You're saying we put out
13 misinformation. My question is, what
14 misinformation?

15 A. Well, that the implication that there
16 should be absolutely no drilling allowed within a
17 buffer zone. I know it has some delineations as
18 to depth. But I think that's -- I don't think
19 that's fair to anyone.

20 Q. Okay. That's because you think the
21 potash industry has put out misinformation
22 concerning subsidence and the effect of
23 subsidence on a possible gas well?

24 A. Also the implication --

25 Q. Excuse me. Answer the question. Are

1 you claiming that the potash industry put out
2 misinformation about subsidence and the effects
3 or possible effects of subsidence on an oil and
4 gas well drilled within the angle of draw?

5 A. Yes.

6 Q. And do you recall the angle of draw
7 that the potash industry has said should be
8 observed to avoid any adverse impact on oil and
9 gas wells?

10 A. Yes. I think it's a one-to-one ratio,
11 horizontal to vertical, plus 10 percent. I think
12 that appears in R-111-P.

13 Q. Is another way of saying that, depth of
14 ore plus 10 percent?

15 A. Yes.

16 Q. That's what you're claiming is
17 misinformation?

18 A. Oh, undoubtedly. There's so much
19 science that refutes that broad-brush attempt
20 that it's appalling.

21 Q. What would the depth of the ore plus 10
22 percent be in the area of Section 2 that we're
23 talking about here, Mr. Hutchinson?

24 A. I think that -- and hopefully I'll be
25 within a couple hundred feet -- but I think the

1 depth to the ore in Section 2 is approximately
2 2,000 feet. So depth plus 10 percent would be
3 2,200 feet.

4 Q. Okay. And you think that's the
5 misinformation that's being put out?

6 A. Yes. There's an implication that it
7 should not be allowed to be drilled within that.
8 And I think that's misinformation.

9 Q. All right. Any other misinformation
10 that you can identify that the potash people you
11 say have put out?

12 A. Two other things: that the strong
13 implication that, if there is an oil or gas
14 well anywhere near a potash mine, that oil and
15 gas is going to leak into that mine,
16 notwithstanding the very expensive safety design
17 casing strength --

18 Q. All right. Let's stop right there. So
19 the second misinformation you're putting out --
20 you call it an implication --

21 A. Yes.

22 Q. You're saying that the concern
23 expressed by the potash industry over the
24 possibility that methane gas will escape from a
25 well into the mining horizons, get into the mine,

1 is misinformation?

2 A. Yes. In a practical sense it is just
3 not going to happen. We can say it might happen,
4 you know, in some great farfetched idea, but I
5 don't think, from a practical matter, it's going
6 to happen.

7 Q. And you know, Mr. Hutchinson, that
8 people used to think that for all practical
9 purposes it never happened in a domal salt mine,
10 didn't they?

11 A. I'm not familiar with domal salt
12 mines. Never been in one.

13 Q. Well, you know that coal mines for
14 years were the only ones required to comply with
15 gassy mine standards; correct?

16 A. Yes. I did it.

17 Q. And I take it that part of the reason
18 is because of the hazard of methane gas?

19 A. Correct.

20 Q. And in your work in other mines, did
21 you realize or understand that for a while
22 noncoal mines didn't have to do anything with
23 respect to methane?

24 A. Yes.

25 Q. And would you agree with me that that

1 was based upon the assumption that nothing would
2 ever happen?

3 A. I don't know what it was based upon.

4 Q. Well, don't you think that if the
5 regulators and the mining people and the union
6 representatives thought that there was a hazard
7 of methane gas in a non-coal mine, they would
8 have done something about it?

9 A. Oh, of course.

10 Q. Just like they did in the coal mine?

11 A. MSHA was created to do that.

12 Q. Okay.

13 A. OSHA was created to provide safety in
14 heavy construction projects in the workplace.

15 Q. In the absence of those regulations
16 concerning methane gas, wouldn't you agree that
17 people, pretty sophisticated people, in terms of
18 safety in mining, concluded that there was no
19 possibility of a methane occurrence in a domal
20 salt mine?

21 A. I have absolutely no idea what they
22 concluded.

23 Q. Would you agree that some time later
24 these non-coal mines were also subject to methane
25 gas regulation because people realized, hey, it

1 can happen here?

2 A. What do you mean "it can happen here"?

3 Q. Methane explosion, methane ignition.

4 A. Well, methane combined with enough
5 oxygen and a detonator is going to explode no
6 matter where it is.

7 Q. Are you aware, Mr. Hutchinson, that at
8 some time people found out in the mining industry
9 that methane is a hazard, not only in coal mines,
10 but in other types of mines also?

11 A. Methane mixed with oxygen and an
12 ignition anywhere, particularly in a mine that's
13 so confined or in an elevator shaft is -- I put
14 down 250 minuteman missile shafts and that --

15 MR. HIGH: Excuse me. Mr. LeMay, we're
16 going to be here a long time unless the witness
17 will just answer my question. I can move this
18 along very, very quickly if he will stop arguing
19 with me and just answer my questions.

20 CHAIRMAN LeMAY: I don't think he's
21 arguing with you. I think he's trying to be
22 direct. Maybe as to cooperation you can both be
23 a little bit more direct. Just hit the salient
24 features.

25 THE WITNESS: I'll try.

1 Q. Are you aware, Mr. Hutchinson, at some
2 point in time people in the mining industry and
3 the government came to the conclusion that
4 methane is a hazard in mines other than coal
5 mines?

6 A. Yes, through accidents.

7 Q. Because of an accident in that mine?

8 A. Right.

9 Q. And it blew up and killed people?

10 A. Most likely.

11 Q. So when you say that there's not very
12 much risk -- or whatever words you used -- from
13 an oil and gas well in the potash basin, would
14 you agree with me that there is always some risk?

15 A. I don't want to just give him a trite
16 answer or anything. Of course. Anything can
17 happen at anytime and anywhere. The probability,
18 with the science that we are using today, is very
19 low that there would be a problem in a potash
20 mine caused by an oil and gas well.

21 Q. Are you aware of the consequences if
22 something does in fact happen and methane gets
23 into one of these underground potash mines in
24 Carlsbad, New Mexico?

25 A. I would hope that the miners, for their

1 own sake and in following the MSHA rules and
2 regulations, to which they are required to
3 follow, would know and they would monitor these
4 things. I would hope that MSHA is doing its job
5 and the mining companies are also.

6 Q. Are you or are you not aware of the
7 consequences if methane gas gets into an
8 underground mine in Carlsbad, New Mexico?

9 A. If the ventilation is good and the
10 methane goes out, nothing is going to happen.

11 MR. HIGH: Mr. LeMay, we can be here
12 all afternoon.

13 MR. CARROLL: Mr. LeMay, I'm going to
14 lodge an objection here with Mr. High. He's
15 being extremely argumentative.

16 CHAIRMAN LeMAY: I think both -- I
17 mean, he can address the point, but at the same
18 time, sometimes your questions are such that it
19 leaves the witness no alternative but to explain
20 a little bit.

21 MR. HIGH: I don't have any problem
22 with that. I want an answer to the question.

23 THE WITNESS: Do you want a yes or no
24 answer?

25 CHAIRMAN LeMAY: Is there any way you

1 can get the probability rather than yes-no
2 answers because we are dealing with a complex
3 area. And "yes," "no," "sometimes" doesn't fit
4 the question asked.

5 MR. HIGH: I'm not asking for a yes-no
6 answer. I want my question answered. If he
7 wants to explain it, I don't have any problem
8 with that.

9 CHAIRMAN LeMAY: Let's go along with
10 that.

11 MR. HIGH: I have no problem if he
12 wants to explain his answer. None whatsoever.

13 CHAIRMAN LeMAY: The question has to be
14 phrased such that it gives him an opportunity to
15 answer correctly.

16 MR. HIGH: I agree with that.

17 CHAIRMAN LeMAY: Otherwise there's a
18 problem with yes-no.

19 MR. HIGH: That's correct. I'm going to
20 try once again.

21 Q. Are you or are you not aware, Mr.
22 Hutchinson, of the consequences if methane gas
23 gets in an underground mine in Carlsbad, New
24 Mexico?

25 A. Yes.

1 Q. And what is that consequence?

2 A. Okay. If methane gas gets into a mine
3 from any source and the ventilation design of the
4 mine is correct, the methane gas or nitrogen gas
5 or acetylene gas from a torch will be carried out
6 of the mine without any consequences whatsoever,
7 without any health hazard to the miners. That's
8 engineering.

9 Q. What is it that the Mine Safety &
10 Health Administration would do if methane gas
11 were detected in an underground mine in Carlsbad,
12 New Mexico, if you know?

13 A. Up to certain limits, there's no
14 problem. If you get consistently over a certain
15 minimum amount of methane, over a period of time
16 consistently, the mine would be reclassified as
17 one that would require permissible equipment.

18 Q. And do you know whether or not the
19 mines in -- the potash mines currently use
20 permissible equipment?

21 A. I'm aware of the AMAX mine or the
22 Horizon mine, and they are not.

23 Q. And would you agree that it would be
24 very costly to change from non-permissible
25 equipment to permissible equipment?

1 A. No question about it. Put them out of
2 business.

3 Q. Pardon?

4 A. It would put them out of business.

5 Q. So in your opinion if a mine in
6 Carlsbad, in the Carlsbad Potash Basin, were in
7 fact classified gassy, because of methane leaking
8 into the mine, and then was required to comply
9 with the gassy mine standard, it would put them
10 out of business?

11 A. Doesn't make any difference where the
12 methane comes from, Mr. High. They would be in a
13 world of hurt.

14 Q. That's correct. And you are aware of
15 the geological studies, I take it, in the basin
16 concerning the presence or absence of methane
17 from natural occurrences?

18 A. All that was in the MSHA reports that I
19 read about the explosions in the New Mexico
20 Potash mine, and I think there's some other
21 public information that I did read that talked
22 about the presence of methane in situ with the
23 salt including the potash zones, but the studies
24 all concluded it was at a minimal amount.

25 Q. Did you look into the history of oil

1 and gas drilling in the known potash area, Mr.
2 Hutchinson?

3 A. I've been told about it. I looked at
4 the maps. I tried to figure out what the
5 problems of the oil business was, particularly
6 Yates Petroleum's problems, so that I could
7 determine whether or not I thought I could help
8 them in this problem.

9 Q. Are you aware of the fact that at one
10 point in time no oil and gas drilling was allowed
11 in the known potash area?

12 A. No, I'm not.

13 Q. And do you know how many -- today, do
14 you know how many oil and gas wells have been
15 drilled in a known potash area?

16 A. Many.

17 Q. Would you agree with me that today we
18 have over 1,000 oil and gas wells in the known
19 potash area?

20 A. That's a number that's verifiable.
21 Whatever you say.

22 Q. You wouldn't disagree with the number,
23 would you?

24 A. No. I have no feel for the numbers.

25 Q. Would you agree with me that the more

1 oil and gas wells that are drilled, the greater
2 the risk becomes of a leak?

3 A. I suspect that in a fantasy world that
4 that's true. I think that the R-111-P
5 requirements eliminate any strong probability, or
6 even slight probability of that happening.

7 Q. Do you believe, Mr. Hutchinson, that if
8 this Commission were to grant the exceptions to
9 R-111-P being sought by Yates, what impact that
10 would have on R-111-P itself? Do you understand
11 that question?

12 A. No, I don't think I do.

13 Q. If the four APDs are approved in this
14 case as an exception to R-111-P, do you think
15 that every or most -- I'll make it not quite so
16 broad -- that most other oil and gas people would
17 then file APDs seeking similar exceptions?

18 A. I don't think the oil companies file
19 APDs because of what other oil companies do. I
20 think they have sophisticated geologic and
21 engineering staffs and land people who follow
22 their business plan of acquiring leases so that
23 they -- over which they have a good geologic
24 concept for finding oil and gas. I think that's
25 their primary reason.

1 Q. Do you have any basis, Mr. Hutchinson,
2 or a feeling as to the impact on R-111-P, if
3 these four exceptions are granted?

4 A. No.

5 Q. Do you believe that there is at least a
6 possibility that every oil and gas leaseholder
7 around will file an APD seeking an exception and
8 the exception will in effect swallow the rule?

9 MR. CARROLL: Mr. LeMay, I'm going to
10 object to this line of questioning. I let it go
11 far enough to see really where Mr. High was
12 going. But it seems like he's indirectly doing
13 what you told me I couldn't do.

14 CHAIRMAN LeMAY: Well, I think the
15 speculation on what we may do and the effect of
16 what we may do is a little bit out of the
17 ordinary.

18 MR. HIGH: Mr. LeMay, I know time is
19 getting short and I know you want to leave.

20 CHAIRMAN LeMAY: I'm not speaking about
21 that. Let's talk about the issue that you're
22 raising on speculation.

23 MR. HIGH: I feel like I'm getting the
24 short end of your patience because Mr. Carroll
25 went into some detail for a long, long time over

1 the granting of these exceptions. And now I'm
2 just asking this witness, as a follow-up
3 question, what the impact of that opinion would
4 be on R-111-P.

5 MR. CARROLL: I think that's totally --

6 CHAIRMAN LEMAY: That's fine. I
7 thought I heard the answer that he didn't know.

8 MR. HIGH: Well, that's fine. That's
9 fine.

10 CHAIRMAN LEMAY: Okay. But the
11 objection -- and I hope I'm not influencing your
12 objecting and response. But the implication that
13 anyone can possibly, one, decide what we would
14 rule in this particular case, and two, the
15 implication of what we would rule, when we don't
16 know how we would rule is highly speculative.

17 MR. HIGH: I don't disagree with that.
18 But I was asking about his earlier opinion is all
19 I was doing.

20 CHAIRMAN LEMAY: Fine. I'll ask the
21 witness to answer the question, if it's what I
22 heard before. Then repeat that, sir.

23 THE WITNESS: Okay. I'm a little
24 confused about the discussion of R-111-P. I was
25 told by counsel that was not to be discussed

1 here. I only used it to lay the groundwork for
2 how I got here and what I'm doing. And I have no
3 idea what the impact would be if suddenly
4 everyone filed an APD. I don't work in New
5 Mexico. I have no economic interest in this
6 question. And I don't know.

7 Q. (BY MR. HIGH) All right. Are there
8 any other areas of misinformation that you think
9 the potash industry has put out? You've named
10 two.

11 A. Well, I think I talked about -- oh,
12 there was one other thing. There is an
13 implication that was discussed by another witness
14 earlier, I think Brent May, that the oil seeps
15 found in one of the mines could have come from
16 oil wells. And I would think that with all the
17 research that's been done, or if that research
18 has been supplemented by the potash industry,
19 that that could be -- should be clarified.

20 Q. Anything else? Any other --

21 A. Those are the major things. There
22 might be more, but those are the major things.

23 Q. Fine. Are you saying, Mr. Hutchinson,
24 that's correct the potash industry put out bad
25 facts or that you disagree with the concerns

1 being expressed based on the facts that were put
2 out?

3 A. As a practical person, I think the
4 weight given to what could happen in the whole
5 world on any given situation carries too much
6 weight.

7 Q. Okay, sir.

8 A. There's very little science in that.
9 That's my interpretation.

10 Q. You don't have any problem with the
11 facts that you've seen from the potash industry.
12 It's just the potash industry's fears, or
13 whatever it is you're saying, about those facts?

14 A. Yeah.

15 Q. Okay.

16 A. What I could interpret as being facts,
17 I don't recall that I had any problem with
18 those.

19 Q. Okay. Very good. Now, I want to ask
20 you a few questions -- and I don't want to dwell
21 on this, I assure you -- about Canadian
22 competition over potash. From our standpoint you
23 didn't have to tell us Canada was in competition
24 with us.

25 A. I know that.

1 Q. We've known that for a long time. I
2 take it you're not suggesting just because of
3 that competition we ought to shut down and go
4 away, are you?

5 A. Absolutely not. I think every mine
6 should operate to its economic limit. I would do
7 whatever I could to help that situation.

8 Q. And, in fact, this is probably one area
9 where there's a pretty good parallel between the
10 potash industry and the oil and gas people with
11 the OPEC nations?

12 A. Almost identical.

13 Q. And what the Canadian potash people can
14 do to us, OPEC nations can do to the oil and gas
15 industry?

16 A. Much easier.

17 Q. But Canada doesn't have langbeinite,
18 does it?

19 A. Not at all.

20 Q. And the langbeinite reserves in New
21 Mexico, you know those to be the only langbeinite
22 reserves in the western world, don't you?

23 A. I think there's a langbeinite mine in
24 eastern Europe. And the only other one I'm aware
25 of is in a -- what was it? Centrally planned

1 economy. I only know of four that I've been able
2 to find in the literature. Two of them are right
3 here next to each other.

4 Q. There's only four mines you're aware of
5 in the world?

6 A. Yes.

7 Q. Two of them are in New Mexico?

8 A. Right.

9 Q. What are the names of those two mines,
10 Mr. Hutchinson?

11 A. One is operated by IMC, International
12 Minerals & Chemicals, and the other one Western
13 Ag, a subsidiary of Gray Rock-Yellow Knife
14 Resources, a Canadian company.

15 Q. Now, do you know what the core survey,
16 the core results of corehole No. 162 were in
17 terms of the ore indicated?

18 A. I've seen it. I can't spout it.

19 Q. Do you know whether or not the corehole
20 data showed the presence of langbeinite ore?

21 A. Yes. In the fourth ore zone.

22 Q. Do you know whether or not the corehole
23 data for corehole No. 162 showed the presence of
24 sylvite?

25 A. I don't remember. I could look at it

1 and refresh my memory.

2 Q. All right. Why don't we do that.

3 A. Okay.

4 Q. Look at the book in front of you, if
5 you will, Exhibit No. 6.

6 A. Let's see, tenth ore zone is sylvanite,
7 16.04 -- I'm sorry.

8 Q. Let's don't go into numbers.

9 A. I apologize.

10 Q. Do the corehole results of corehole 162
11 indicate the presence of sylvite?

12 A. Yes, it does.

13 Q. And do you know what type ores New
14 Mexico Potash mines?

15 A. Sylvite.

16 Q. Can it mine langbeinite?

17 A. It sure can.

18 Q. Can it mine langbeinite as a separate
19 product? Does it have a separate circuit, if you
20 know, to process langbeinite?

21 A. To process?

22 Q. Yes.

23 A. I thought you said mine.

24 Q. Process.

25 A. I don't believe -- the literature I

1 read about the milling process is not conducive
2 to milling langbeinite.

3 Q. Do you think that a mine would have a
4 whole lot of interest in ore that it couldn't
5 process?

6 A. Not in this basin.

7 Q. Do you think --

8 A. I think if they could mine it, they
9 could get it to one of the other mills that could
10 process it.

11 Q. Do you think a mine would have more
12 interest in a section that had ore that it could
13 process?

14 A. I assume so. I mean, that's their
15 business.

16 Q. And in this supply and demand business
17 that you were talking about, you're not again
18 suggesting that just because there's a low market
19 price, in a cyclical type industry, that that's a
20 licensing effect to go out and waste that
21 resource, are you?

22 A. So that I understand your question, you
23 know that I have a master's degree in economics?

24 Q. I saw your qualifications.

25 A. Okay. Cyclical to an economist means

1 not that that industry goes up and down, but that
2 industry goes with the general economy. For
3 example, oil is not cyclical. You're going to
4 drive your car and fly your airplane whether your
5 fees collected from your legal business are high
6 or low.

7 Q. All right. Let me stand corrected.
8 Again in the interest of moving along, let me
9 stand corrected, and I won't use those buzz
10 words.

11 A. Okay.

12 Q. Just because the market price of a
13 particular resource is low or lower than it was
14 at other times in history, you're not suggesting
15 that that's a license to waste that resource, are
16 you?

17 A. Oh, of course not. Anything that is
18 profitably minable at that price and it's there
19 to mine at a positive cash flow should be mined.

20 Q. Well, you do understand that there may
21 be times when the market price may not be high
22 enough to actually go out and get a resource at a
23 profit?

24 A. Oh, definitely, I do.

25 Q. Okay. But that doesn't mean at that

1 particular point in chronological time you should
2 go out and waste that resource, does it?

3 A. Oh, you shouldn't.

4 Q. Even though it can't be retrieved at a
5 profit at that particular time?

6 A. I agree with that.

7 Q. I want to ask you some questions about
8 these maps. Where are those overlays?

9 A. Of the mine?

10 Q. Yes. I'd like to have those back up
11 here.

12 A. Okay. This is, Mr. High, this is the
13 base one. There is an overlay -- do you want all
14 the overlays?

15 Q. Yes. I'd like to have all the
16 overlays.

17 A. Okay. There you are.

18 Q. Thank you very much. Now, I want to
19 fold this back. I'm not sure of this exhibit
20 number. But this is the mine workings, I
21 suppose?

22 A. As they are. The mine workings as of
23 1/7/92.

24 Q. Okay. You have indicated on this
25 exhibit, Mr. Hutchinson, the words "Barren

1 Limit." Do you see that?

2 A. Yes, I do.

3 Q. I assume that you're suggesting that
4 that's the green line around the bottom one, part
5 of which is dashed?

6 A. Yes. On the north edge of Section 2 --

7 Q. Well, let's not call out that section.
8 I really don't want to get into that.

9 MR. CARROLL: Mr. LeMay, let the record
10 show we are talking about Exhibit No. 52, which
11 is mine overlay No. 1, mine workings.

12 MR. HIGH: Thank you. Is everything
13 shown -- 51.

14 MR. CARROLL: It's 52. The overlay
15 that you're referring to is 52. The base map is
16 51.

17 MR. HIGH: Okay.

18 Q. So, Mr. Hutchinson, is everything on
19 Exhibit 52, which is green, is that a barren
20 limit line?

21 A. I interpreted it to be barren or
22 permanently uneconomic.

23 Q. All right. And you base that upon some
24 information, I suppose?

25 A. Oh, yes.

1 Q. Are you suggesting that by using those
2 words that New Mexico Potash can't mine and
3 process ore that is outside that green line? Do
4 you understand what I'm asking?

5 A. I don't think they can mine and process
6 ore in Section 3. They don't own it.

7 Q. Well --

8 A. I don't understand.

9 Q. All right. If you don't understand it,
10 please don't try to answer it. The green line
11 you have labeled "Barren Limit" -- correct?

12 A. Yes.

13 Q. -- you understand that that is not the
14 point at which the ore goes to zero?

15 A. I didn't interpret -- it could be zero,
16 but I interpreted it to mean that area outside of
17 the green line that they had no intent of
18 mining. There are green lines inside the mine
19 that they have mined around, and those are
20 obviously barren of economic ore. That was my
21 interpretation.

22 Q. So your testimony is that the green
23 line is the limit of ore that New Mexico Potash
24 intends to mine or wants to mine? Is that the
25 way you interpret it?

1 A. Not in the instance of being down in
2 the subject Section 2. I think you'll see here
3 that I show a dashed line all the way down
4 starting up at Section 7.

5 CHAIRMAN LeMAY: I wouldn't go into
6 where that dashed line goes. Just say "here,
7 here, here, and here," and that won't appear on
8 the record, for the simple purpose of trying to
9 keep this confidential.

10 THE WITNESS: Oh, I understand.

11 Q. (BY MR. HIGH) Let me ask you a
12 different way.

13 A. This dashed line was what I got from,
14 as I described, the source of my information. I
15 think that dashed line was -- I interpreted it to
16 be questionable as to its location.

17 Q. Okay. You don't mean by the use of the
18 word "barren" that it contained zero percent ore?

19 A. No. No economic ore is what I
20 interpreted.

21 Q. Okay. You understand that green line
22 -- I take it you got that off the LMR map of New
23 Mexico Potash?

24 A. I didn't know it was an LMR map at the
25 time, but that's where I got it.

1 Q. And you do understand that to be a
2 cutoff, a percentage ore cutoff used by New
3 Mexico Potash to establish their LMR?

4 A. Oh, I assume that that's what they do;
5 that they have a cutoff grade that they use to
6 establish their LMR. They don't use zero.
7 That's far from realistic.

8 Q. And you also testified that when you
9 were describing this exhibit earlier that New
10 Mexico Potash mined out here, and then they ran
11 into some barren stuff and turned around and did
12 this and did something else and that sort of
13 thing. You took quite a while talking about
14 that.

15 I take it that that's based upon your
16 interpretation of the maps?

17 A. Oh, of course. I had no other reason
18 to -- no other information.

19 Q. All right. You haven't talked to New
20 Mexico Potash and asked them where they mined
21 first, why they mined there, and why they turned
22 around, and that sort of thing?

23 A. No. I reiterate, I asked to go look at
24 the mine, and permission was refused by you, Mr.
25 High.

1 Q. Okay. That's when you say you called
2 Mr. Walt Case. He called me and I told him, he
3 told you not to let you in the mine?

4 A. That is correct.

5 Q. At the time you were working for Yates
6 Petroleum?

7 A. And still am.

8 Q. And did you know that Yates Petroleum
9 was reneging on the industry agreement they
10 signed?

11 MR. CARROLL: I object to that
12 classification.

13 CHAIRMAN LEMAY: I think that should be
14 rephrased, Counselor.

15 Q. Were you aware at the time that you
16 were told you could not go into the New Mexico
17 Potash mine that this case was in progress?

18 A. No. Mr. Walter Case very
19 apologetically, in a very friendly manner, said
20 that he was told by you that I shouldn't go in
21 the mine. He informed me, when I identified
22 myself and asked permission, which he was willing
23 to give, he said, "However, because you're
24 working with Yates, we have a conflict with them,
25 I'll just have to see."

1 Q. Do you now know that the conflict with
2 Yates was in fact this very case we're litigating
3 now?

4 A. No, I don't think it was identified.
5 It could have been. We had a fairly nice
6 conversation.

7 Q. Do you know also that the dispute
8 between the potash industry and Yates over the
9 BLM's adoption of the industry agreement into a
10 new secretarial order?

11 A. Yes, I'm familiar with that.

12 Q. And that Yates is trying to stop that
13 and the potash people want to go ahead?

14 MR. CARROLL: Your Honor, I would also
15 object to that classification. It's not Yates;
16 it's the entire oil and gas industry.

17 MR. HIGH: I just want the record to
18 reflect the reason why Mr. Hutchinson did not get
19 to go down to New Mexico Potash mine.

20 CHAIRMAN LEMAY: Maybe you can have a
21 witness that will testify to that. I'm not sure
22 Mr. Hutchinson knows that.

23 MR. HIGH: All he has to do is say no.

24 CHAIRMAN LEMAY: Okay. Fine. You may
25 answer the question.

1 THE WITNESS: As to why I was denied
2 entry? I have no idea.

3 CHAIRMAN LeMAY: You have no idea.

4 Q. (BY MR. HIGH) Now your hypothetical
5 mine plan that you came up with, which is the --

6 A. Next number, Ernie.

7 MR. CARROLL: That would be exhibit --
8 let's see, that overlay is entitled --

9 THE WITNESS: No. 3 overlay.

10 MR. CARROLL: No. 2 overlay is 53?

11 THE WITNESS: This is No. 3.

12 MR. CARROLL: Oh, No. 3. Excuse me.

13 Q. (BY MR. HIGH) Now, in coming up with
14 that mine plan, Mr. Hutchinson, you've already
15 told me you had no information from New Mexico
16 Potash; correct?

17 A. That's correct, except the map that I
18 found in the OCD office.

19 Q. So if they had a mine plan different
20 from this, you're not saying that plan would be
21 bad?

22 A. Absolutely not. I mean, they know so
23 much better than I do about it. I'm sure there's
24 is far better than mine. It should be -- there
25 are real good people down there that have been

1 down there a long time and know what they're
2 doing.

3 MR. CARROLL: Mine plan overlay No. 3
4 is Exhibit 54.

5 Q. Now, the change in the LMR --

6 A. Yes.

7 Q. -- and the change we could talk about
8 if we, in effect, took this one line; correct?

9 A. Yes. This was the barren limit as
10 shown on the 1/1/90 map, the north edge of
11 Section 2, and it was dashed. So I don't know
12 what that means. I interpreted it to mean that
13 they really didn't know.

14 Q. Do you know how soon after the corehole
15 162 was drilled in Section 2 that the LMR was
16 changed to take out that part?

17 A. I don't know. And -- I don't know.

18 Q. You are aware that corehole 162 was in
19 Section 2?

20 A. Yes, I've been told that.

21 Q. And you just looked at the result of
22 that?

23 A. Yes, sir.

24 Q. And corehole 162 showed sylvite --

25 A. Yes, it did.

1 Q. -- which New Mexico Potash can mine --

2 A. Yes.

3 Q. -- and process?

4 A. Yes.

5 Q. Something it would be interested in;
6 right?

7 A. New Mexico Potash should be interested
8 in any sylvite out of the tenth ore zone within
9 their lease boundary.

10 Q. Do you know what the corehole just
11 below Section 2 there in Section 11 is called
12 AEC-8 shows in terms of sylvite?

13 A. Not off the top of my head.

14 Q. Why don't, if you would, look at
15 Exhibit No. 8-A.

16 A. Yes.

17 Q. Can you read, interpret 8-A?

18 A. It's very, very small print.

19 Q. All right. Aside from the print, can
20 you read and interpret the results shown on 8-A?
21 And I don't mean the specific numbers, just with
22 respect to the conclusion of whether or not
23 corehole AEC-8 shows the presence of sylvite?

24 A. May I ask to look at the block diagram
25 Leo Lammers put in as an exhibit? It's much

1 larger, and I know that he has the figures on
2 there.

3 Q. I don't want to dwell on this.

4 A. Just tell me if you think there's
5 sylvite there.

6 Q. No. I'm asking, do you know whether or
7 not corehole AEC-8 shows the presence of sylvite?

8 A. Yes, it appears to.

9 Q. Do you know where corehole AEC-8 --

10 A. However, with the depths to the
11 intervals that appear to show sylvite, I don't
12 know what zone they're in. Granted.

13 Q. All right. Do you know where corehole
14 AEC-8 is located in relationship to Section 2?
15 Approximately. I don't mean exactly.

16 A. No. I know it's in the vicinity. Why
17 don't you just tell me.

18 Q. You understand it's just below Section
19 2 down here in Section 11?

20 A. Okay. I know that there is a corehole
21 there, yes.

22 Q. Okay. Would what is shown by corehole
23 AEC-8 -- would that be something you would want
24 to consider if you're trying to consider whether
25 or not Section 2 contains commercial potash?

1 A. You bet. Public information. I'd sure
2 use it.

3 Q. And both of those coreholes show the
4 presence of sylvite, that would be stronger, of
5 course, than just one corehole?

6 A. You bet it would be. Particularly if
7 they're both in the same zone.

8 Q. Let's assume for a minute that both of
9 them show sylvite in the tenth ore zone.

10 A. Okay.

11 Q. Those two coreholes would be some
12 evidence at least that there's commercial potash
13 down there?

14 A. Depending on the grade in the corehole,
15 right.

16 Q. Let's assume that the grade of the
17 potash or the sylvite shown is at least as high
18 as, if not higher, than the average mine in the
19 basin. Pretty good stuff.

20 A. Maybe I can help with this. I have
21 calculated what I think to be the cutoff grade
22 for an existing mine mining the tenth ore zone in
23 the basin.

24 Q. I'm going to ask you about your numbers
25 in a little while.

1 A. I'm just staying I don't want to
2 disclose your numbers. So I can give you mine,
3 and we can say higher or lower. But that would
4 accommodate your --

5 Q. Have you asked the BLM -- and this is
6 public information -- have you asked the BLM what
7 the average grade of ore that's mined in the
8 basin is?

9 A. No, I haven't. And I think that the
10 BLM potash people are a large part of the problem
11 in this conflict and that they are severely
12 understaffed technically.

13 Q. So the answer to my question is no, you
14 haven't asked them about the average?

15 A. I haven't.

16 Q. Would it surprise you if the average
17 grade of ore mined in the basin is between 10 and
18 11 percent?

19 A. Yes.

20 Q. Okay. Let's -- and I don't want to
21 argue the point -- but let's assume that the ore
22 shown by corehole AEC-8 and corehole 162 both
23 showed the presence of sylvite several rungs
24 above the average grade mine in the basin. Would
25 that be stronger evidence yet of commercial

1 potash down there?

2 A. If they were both above a minimum --
3 well, tenth ore zone, you've got to have about 5
4 feet to mine it because it's got clay in it.
5 You've got a lot of dilution.

6 Q. Let's assume the height is there.

7 A. Let's say it's 5 feet, and I think both
8 of them are, you need to have, in my estimation,
9 a 16 percent grade if you're already there and
10 don't have any capital expense to write off. You
11 can make about 14 percent operating profit at
12 that price.

13 Q. Are you suggesting or are you saying
14 that New Mexico -- that no ore is commercial
15 potash to New Mexico Potash unless it's 16
16 percent or higher? Is that what you're saying?

17 A. Today, yes, that's what I'm saying.

18 Q. You're saying by that, you mean that
19 New Mexico Potash cannot take out of the ground
20 at a profit any ore that is not at least 16
21 percent sylvite; is that what you're saying?

22 A. In that number --

23 Q. I'm sorry. Is that what you're
24 saying? Then you can explain.

25 A. Well, let me tell you where the 16

1 percent came from, if I may. Is that fair?

2 CHAIRMAN LeMAY: I guess you can say
3 yes first.

4 A. Okay. Yes. That's a long convoluted
5 question. It's my estimation that you must have
6 16 percent K_2O in the tenth ore zone, 5 feet
7 thick or greater, to make a positive cash flow
8 when you take your consumables and labor and
9 equipment maintenance, et cetera, all
10 consumables, subtracted from the price you get --
11 I'm using 72 bucks a ton of product -- and have
12 a -- it's really a minimum allowable profit of 14
13 percent on sales and pay a 2 percent royalty.

14 Now, I've added everything in there
15 that I can except capital, write-off, return on
16 capital, and interest and taxes.

17 Q. And I take it you developed this 16
18 percent number based upon public data?

19 A. Actual costs out of public data.

20 Q. Okay. And of course you don't know
21 what New Mexico Potash's actual cost is?

22 A. I don't have an idea.

23 Q. You don't know what minimum grade of
24 ore in New Mexico Potash can process at a profit?

25 A. Oh, what their mill will accept?

1 Q. Yes.

2 A. Or at a profit?

3 Q. What their mill will accept?

4 A. No, I don't know what their mill will
5 accept.

6 Q. You don't know what their mill will
7 accept and can be sold at a profit, do you?

8 A. I think I just said.

9 Q. Is that the 16 percent?

10 A. The 16 percent includes taking a ton
11 out and processing it, and selling it with those
12 costs attributable to doing that entire
13 operation.

14 Q. So you are saying that right today, if
15 New Mexico Potash is mining ore that's less than
16 16 percent, sending it through the mill and
17 selling it on the market, they are selling it at
18 a loss?

19 A. No. They're not getting 14 percent
20 return on sales.

21 Q. Oh, okay. Your 16 percent ore grade
22 means that they'll be making 14 percent profit?

23 A. On sales and I said that three times.

24 Q. Well, I missed it. I'm sorry. That's
25 why I'm going over it. So that assumes this 14

1 percent profit on sales?

2 A. Right.

3 Q. Okay. So they might be making a profit
4 less than 14 percent. Let's say 10 percent.

5 A. I said they should operate until they
6 have a negative cash flow. They should do that.
7 I would keep those miners working and go to the
8 state and ask for every -- and the feds -- for
9 every credit they can give them. Transportation
10 incentives.

11 Anything to keep those mines working, I
12 think the state and federal government should
13 assist them in that and help them without
14 compromising other industries' rights.

15 Q. Now, when you said -- well, I don't
16 even want to talk about the Yates lease.

17 Now, you've had some experience with
18 coreholes, Mr. Hutchinson, and you've talked a
19 lot about them. How much influence do you give
20 to a corehole in terms of the test results?

21 A. A single corehole?

22 Q. Yes.

23 A. Absolutely none. It's just an
24 indication there's mineralization.

25 Q. This is what Mr. Weiss asked

1 yesterday. One corehole in the middle of 100
2 square miles --

3 A. Doesn't mean a thing.

4 Q. That's right. And I wouldn't disagree
5 with that. A corehole put down here in Section 2
6 is not like a corehole in the middle of a 100
7 square miles, is it?

8 A. As far as potash goes, about the same
9 thing.

10 Q. No difference in the two?

11 A. No. It just shows there's some
12 mineralization there. I wouldn't invest a nickel
13 in a mine on one corehole.

14 Q. All right. And if you knew what was
15 shown down here just below AEC-8, would you give
16 any influence at all to a corehole there?

17 A. I'd say that if I could trace that they
18 both are at cutoff grade that I've come up with,
19 that includes profit -- I mean, we're a
20 capitalist particular society here, that there --
21 if I could trace that same zone between those two
22 and no faults in between, I'd say, hey, here's
23 something we ought to take a look at.

24 Q. If you had the two coreholes showing a
25 pretty high grade ore, you'd say this is

1 something we ought to take a look at?

2 A. Yeah, if it was above my cutoff.

3 Q. Let's suppose the gamma log of a well
4 up here also showed the presence of potassium.
5 That's even better yet, isn't it?

6 A. That doesn't give me an idea as to
7 grade, but it's an indication.

8 Q. All right. And if here in Section 5
9 the gamma log also showed potassium, it's getting
10 better all the time; right?

11 A. As long as we know they're in the same
12 ore zone.

13 Q. Okay.

14 A. This is all a hypothetical thing.

15 Q. Oh, sure. At some point you get enough
16 information that there may very well be ore down
17 there; right?

18 A. Oh, yes.

19 Q. And --

20 A. That's the way the business runs.

21 Q. Would you agree with me that in the
22 mining business you drill a whole lot more holes
23 if you're thinking about buying a mine or putting
24 in a new mine than you would be if you already
25 had an existing mine and simply going out in one

1 direction?

2 A. Oh, yes. I said that in my testimony
3 this morning. The coreholes that are put out
4 there, particularly when a hypothetical mining
5 operation runs into some uneconomic ore, they
6 better put some coreholes down to find out what
7 its extent is.

8 And everyday I'm confident that these
9 professionals are sampling every face to know
10 what their grade is. There's another point,
11 see.

12 Q. All right. So if you were looking at
13 Section 2 from a purchasing prospective, someone
14 going to buy Section 2 to put in a mine, you
15 would want more coreholes than just corehole 162
16 and AEC-8?

17 A. Far more.

18 Q. You wouldn't draw a whole lot of
19 conclusions from those?

20 A. No.

21 Q. But if you were already an existing
22 mine here and intended to mine that direction
23 anyway, you'd use fewer coreholes than you would
24 if you were buying it?

25 A. Buying it? I want to go back. Buying

1 it with the intent to open up a mine?

2 Q. Right.

3 A. You could get by with fewer coreholes.

4 Q. And that's part of what's reasonable in
5 terms of cost. How many coreholes do you drill
6 versus the worth of the information you get back?

7 A. Oh, sure. I have enough data to tell
8 you what New Mexico Potash has done in those two
9 circumstances.

10 Q. Now -- and again I'm not going to spend
11 a whole lot of time on all the subsidence stuff
12 given an earlier discussion. But would you agree
13 with me, Mr. Hutchinson, that most of your
14 discussion this morning you were talking about
15 horizontal tensile strain; right?

16 A. Not most of it. I did bring out that
17 that is information that can be acquired and
18 should be acquired when a mining company goes to
19 a high rate of extraction just so that the
20 surface owners have some idea of what might
21 happen over the lateral extent that the mining
22 company plans to extract that large percentage of
23 ore.

24 Q. You weren't suggesting that the only
25 movement of strata during subsidence is

1 horizontal?

2 A. Not at all.

3 Q. You understand that the movement is in
4 fact three-dimensional?

5 A. Yes, I do know that. I had a good
6 teacher.

7 Q. In fact you heard Professor Grosvenor
8 explain that last week in another case here,
9 didn't you?

10 A. Yes.

11 Q. I do want to cover a couple things, Mr.
12 Hutchinson, with respect to subsidence. And
13 again I'm not going to spend very much time on
14 this. You read from the Golder report this
15 morning, and we will be offering this exhibit.
16 In fact, we're going to offer the whole program
17 so the Commissioners can read it themselves. And
18 it's in our book as Exhibit 33, if you'll look
19 back there.

20 A. It looks like the one I have is limited
21 to Chapters 4 and 5.

22 Q. That's correct.

23 A. Okay.

24 Q. And Chapter 4 I, believe, is entitled,
25 "Subsidence"; correct?

1 A. Correct.

2 Q. And Chapter 5 is entitled, "Mine
3 Conditions," or something like that?

4 A. "Present Condition of Mine Workings."

5 Q. Right. But I want to refer you to
6 Chapter 4, which is the one you were really
7 reading from this morning --

8 A. That's correct.

9 Q. -- and ask, if you would, please, turn
10 over to page 63. Now, this report was not
11 prepared by the potash industry, was it?

12 A. No. There's a cover letter here that
13 -- or the --

14 Q. I don't think it's included in this
15 copy.

16 A. I think I said it was a report to the
17 USGS. I think Golder contracted with the USGS to
18 make this report.

19 Q. Who is Golder Associates?

20 A. They're a well-known consulting geotech
21 -- it says on their letterhead. I know them to
22 be geotechnical engineers of high repute.

23 Q. You don't have any problem in putting a
24 great deal of confidence in their work?

25 A. No. I think they, for what their

1 objective was, that they -- and I only -- I
2 started at Chapter 4, so the introduction to the
3 whole report must deal with the mandate they
4 received. I don't know what that was.

5 Q. Okay. You don't know the purpose of
6 this report?

7 A. Recommendations for abandonment of the
8 Wills-Weaver mine and mine shafts.

9 Q. Okay. Turn to page 63. You read one
10 sentence on this page. I want to read the one
11 just before it, so we can keep things in a little
12 bit of context.

13 A. Yes.

14 Q. You read the last sentence at the
15 bottom of -- or just before the last paragraph
16 starts, you read the last sentence. I want to
17 read the one before it. It starts out, "The data
18 do indicate, however, that the region of the
19 surface liable to experience movement as a result
20 of high recovery mining will correspond roughly
21 to an angle of influence of 45 to 55 degrees."
22 Do you see that?

23 A. Yes, I do.

24 Q. And you don't have any great
25 disagreement with that, do you?

1 A. That's what it says.

2 Q. Okay. And then in the second sentence
3 which you read is, "More severe movements and
4 strains will occur within a zone characterized by
5 an approximate 30- to 35-degree influence."

6 A. Right.

7 Q. That's the one you read this morning?

8 A. Yes, I did.

9 Q. Now, when talking about the effect of
10 the impact or possible effect of subsidence on a
11 well casing, you seemed to be talking this
12 morning about horizontal strain.

13 A. No, I didn't. That wasn't my intent.

14 Q. Well, were you suggesting that -- and
15 again I'm asking because we're going to cover
16 this area ourselves.

17 A. Uh-huh.

18 Q. -- but were you suggesting that it's
19 okay to put in an oil and gas well inside that
20 point that you identified as being the point of
21 zero horizontal tensile strength?

22 A. Two parts. Two-part answer, if I may.

23 Q. Okay.

24 A. My first objective was to provide the
25 Commissioners with the nomenclature as to what

1 the different angles meant. And then I gave them
2 an interpretation from, I think, several examples
3 of what was critical and why and how that could
4 vary depending on what the structure was to be
5 within that particular angle.

6 Okay. It just so happens, because we
7 can walk around on the surface and measure the
8 horizontal tensile strain of the surface, that
9 the rock mechanics experts that devise and
10 research this can make measurements to that
11 point.

12 They can't measure the horizontal
13 tensile strain of the rock below the surface.
14 Even if they opened up a mine down there to do
15 so, it would be prohibitive from an expense
16 standpoint. I think the data would be
17 compromised. I think Professor Grosvenor would
18 agree.

19 Q. All right. I'm not sure how that
20 responds to my question. But are you saying that
21 the horizontal -- or the point at which there is
22 zero horizontal tension is a factor that should
23 be considered by the Commission in deciding
24 whether or not an oil well should be drilled
25 there or not?

1 A. Oh --

2 Q. Are you saying that it's okay to drill
3 one inside that zero point?

4 A. Oh, I don't pretend -- with the
5 availability of half a dozen computer programs
6 that deal with this specific problem, I don't
7 pretend to hypothetically say that any particular
8 distance is safe or unsafe --

9 Q. Okay.

10 A. -- but that the science is there to do
11 that on a site specific basis. I wanted to make
12 them aware that the science is there. It can be
13 done --

14 Q. Do you know --

15 A. -- in Section 2 or any other place.

16 Q. Do you know the distance in Section 2
17 in feet if there was a separation between oil and
18 potash of a 45 to 55 degree angle?

19 A. It's geometry. I could calculate it.

20 Q. You haven't done so?

21 A. Forty-five degree. I just happen to
22 know, because I had a good teacher, that that's
23 the -- the height at 45 degrees is equal to the
24 horizontal distance.

25 Q. You don't know in terms of specific

1 feet what it would be with respect to these
2 wells?

3 A. No. I said earlier that I think that
4 the ore to the tenth zone is about 2,000 feet
5 there. 1,700 to 2,000 feet.

6 Q. All right. And also with respect to
7 the exhibit where you were talking about the
8 movements, let me get the number here, Mr.
9 Hutchinson. I want you to keep the Golder report
10 open, but also with respect to your Exhibit No.
11 62.

12 A. I'm with you.

13 Q. Sir? You're with me?

14 A. Yes. I think you asked me to look at
15 page 62.

16 Q. No. I'm sorry. I want you to look at
17 Yates Exhibit 62.

18 A. Okay.

19 Q. That's a copy out of a report, is it
20 not?

21 A. Yes, it is.

22 Q. And out of which report?

23 A. The Golder report.

24 Q. The very one we're talking about?

25 A. Yes, it is.

1 Q. Now, the movements shown on Exhibit No.
2 62 were over a period of time?

3 A. Yes. The first measurement was in
4 October of 63, the last measurement was in
5 January of 65.

6 Q. Okay. And you weren't suggesting by
7 your testimony this morning that this is the end
8 of the subsidence, are you?

9 A. No, I don't know that it is. It's been
10 32 years since the last measurement was taken.
11 It could be that they took out the shaft and the
12 surface buildings. And there would be so much
13 disturbed, they would be unable to measure the
14 subsidence.

15 Q. All right. Well, let's look at page
16 100 of the Golder report. Do you have it in
17 front of you? Do you have page 100?

18 A. Yes, I do.

19 Q. The very last sentence on that page
20 says, "Available data do indicate, however, that
21 deformations continue for very long periods of
22 time and probably, for all practical purposes,
23 they continue indefinitely."

24 A. I read that.

25 Q. Do you have any disagreement with that?

1 A. Yes. I think there's got to be some
2 finite end to it. In the words, "for all
3 practical purposes," if that means whether or not
4 you could go ahead and build a house there after
5 85 years, it might subside a little bit more.
6 You might get a few cracks. But for all
7 practical purposes it had stopped.

8 Q. You understand what the Golder report
9 is saying here is that the subsidence will
10 continue indefinitely until that point in time
11 that the strata has come back together?

12 A. The strata has come back together?

13 Q. Or fully subsided or whatever word you
14 want to use.

15 A. Oh, you mean at the mining level?

16 Q. Yes.

17 A. Yes. I mean, when that void is full,
18 sometimes it's got to go back up to the surface.

19 Q. Right. At some point it will
20 eventually end?

21 A. Yes.

22 Q. But the subsidence will continue until
23 the void below the mining horizon has been
24 completely closed; correct?

25 A. That's what they're saying. I'm sure

1 there's a circumstance, and this is probably one
2 where that will be the case.

3 Q. So that the area of the Wills-Weaver
4 mine may very well be continuing to subside
5 today?

6 A. Could be. Can't go over 4 feet,
7 however.

8 Q. Which would be the depth of the void
9 taken out?

10 A. Right. As a result of mining.

11 Q. That's right.

12 A. There is an aquifer under there. If
13 that aquifer is depleted, you'll have what's
14 going on in Venice; all the buildings are
15 sinking. And the surface would sink because of
16 the lack of water in that aquifer.

17 That wouldn't have anything to do with
18 mining. But there are lots of things that can
19 affect subsidence at the surface other than
20 mining. It's just in this area it's the most
21 rational explanation.

22 Q. Now, this angle of influence, Mr.
23 Hutchinson, that Golder found, the 45 degrees to
24 55 degrees, isn't that within the range -- isn't
25 that essentially what the potash industry has

1 been saying over the years?

2 A. Saying as to what?

3 Q. Well, I'm getting back to the
4 misinformation that you've talked about before.

5 A. Okay.

6 Q. And our 45 degree angle you said was
7 misinformation.

8 A. Yes.

9 Q. I'm just wondering, is the Golder
10 report misinformation also?

11 A. I think it's a pure coincidence. The
12 the Golder just dealt with one mine that was shut
13 down. If you'll look on page 74 and look at the
14 title, it says, "Recommendations for abandonment
15 of the Wills-Weaver Mine and Mine Shafts."

16 On page 74, if you'll locate the No. 3
17 shaft -- have you located the No. 3 shaft?

18 Q. I'm waiting on you. I'm sorry.

19 A. Okay. If you'll go out to the
20 crosshatched area, down into the left of the No.
21 3 shaft, that crosshatched area is 30 to 45
22 degrees in the nomenclature. You can see by the
23 legend that the wide crosshatch is the 30 degree
24 angle influence and that the close crosshatch is
25 the 45 degree influence.

1 And, as I said this morning, these
2 people, when they put that shaft down and drove
3 away from it and put in their shops, et cetera,
4 and left those huge pillars, they did it out to a
5 point of 30 degrees. Okay. So they felt -- then
6 they started their development. They said okay,
7 at 30 degrees, we're okay. We will not harm the
8 shaft. I think history will show that the shaft
9 was operational throughout the life of the mine
10 and that that solved the problem.

11 Then looking at Golder's mandate, which
12 is implied in the title, I don't see anything in
13 there about oil wells. So I think, getting back
14 to misinformation, if you apply one report across
15 the board for New Mexico Potash, I think that may
16 be unscientific.

17 Q. All right.

18 A. It could be in some areas the critical
19 angle of deformation is 60 degrees. It could be
20 in other areas it's 15. I'm just suggesting that
21 the science is there on a case-by-case basis to
22 do more.

23 Q. All right. Let's refer to your Exhibit
24 No. 64.

25 A. Okay.

1 Q. This will be Yates Exhibit 64.

2 A. That's also on page 62 of the Golder
3 report in Exhibit 33, I believe, of New Mexico
4 Potash.

5 Q. I guess if you disagree with Golder's
6 statements about the 45 and 55 degree angle of
7 draw, do you disagree with the calculations set
8 forth on Yates Exhibit 64?

9 A. I don't see any calculations there. I
10 see the table.

11 Q. All right. Then let's look at the
12 table.

13 A. Yes.

14 Q. Let's look at the bottom part of the
15 document.

16 A. Yes.

17 Q. Do you see in the center of the block
18 where it says, "Direction of Advance"?

19 A. "Direction of Advance," oh, yes.

20 Q. Do you see that?

21 A. Yes.

22 Q. You know what phi is, don't you?

23 A. Phi?

24 Q. Look at -- I'll call it angle.

25 A. Oh, okay.

1 Q. Look at angle 4.

2 A. I thought that was alpha, but my Greek
3 is not all that great either.

4 Q. Look at angle 4 on the right-hand side,
5 in the middle, on the bottom. Do you see that?

6 A. Right.

7 Q. That's the angle of draw that we call
8 it; right?

9 A. No. That is -- that's defined in the
10 Golder report as being the angle from the
11 vertical all the way out to an arbitrary
12 subsidence of 0.02 feet. I mean, that is
13 minuscule.

14 Q. Okay.

15 A. That's what that is.

16 Q. For the purpose of this report, point
17 S, 0.02 --

18 A. Yeah.

19 Q. -- do you see that?

20 A. That's where the subsidence is 0.02
21 feet.

22 Q. That's the point at which Golder said
23 there is no more surface subsidence?

24 A. No. That's where Golder said that's
25 the angle out to the point where an arbitrary

1 subsidence of 0.02 percent is found. And I see
2 that 0.02 percent in a lot of the literature.

3 As I said this morning, that could be
4 the critical angle. If you had a highly
5 technical laboratory on a concrete slab that was
6 like the Boulder Standards Bureau, where they
7 keep time all over the world, they cannot have
8 any shaking or deformation of that building.

9 Q. That's the area within which there
10 could be some effect from the subsidence, however
11 insignificant?

12 A. It would be insignificant, yes.

13 Q. But there will be something felt with
14 respect to subsidence within angle 4 on Yates
15 Exhibit No. 64; right?

16 A. That's right.

17 Q. Okay.

18 A. It's the same -- got it from the same
19 source.

20 Q. And the angles on the right-hand side
21 are those that occur when you're mining up
22 against a developed area; right?

23 A. The direction of advance is pulling the
24 pillars back towards the entry, or it's called a
25 hallway here, yes.

1 Q. And what is the angle of angle 4?

2 A. On the right side room and pillar area,
3 it's up to 56 degrees.

4 Q. All right. And that's within the range
5 that Golder mentioned back on page 63?

6 A. Yes. And if you walked out there with
7 your cowboy boots, you would have more than 0.02
8 feet depression. And beats me how that could be
9 measured.

10 Q. Looking on the left side, where you're
11 up against a solid, an unmined area --

12 A. Yes.

13 Q. -- what is angle 4 over there?

14 A. It says greater than 49 degrees.

15 Q. And again that's within the numbers
16 that Golder of course concludes back on 63?

17 A. Yeah. And this is the heart of the
18 misinformation problem. This interpretation of a
19 subsidence limit that goes all the way out to
20 0.02 feet has absolutely nothing to do with the
21 strong casing program required by R-111-P. It
22 can withstand tremendous stresses.

23 And like the BLM, Mr. High -- and I
24 think he speaks for the potash industry, I
25 attribute it to him, says that you have to go out

1 at 45 degrees, plus 10 percent, and that that's
2 the law. Fellows, it might be greater than
3 that. I think it will be a lot less from the
4 information I have derived from site specific
5 information of scientific studies in the potash
6 basin.

7 I read it before. It's in the record.
8 I quoted from Golder on page 63. Alpha sub-2
9 goes out from the end of the mining to the point
10 of zero tensile stress, something that could be
11 measured in another mine nearby and brought to
12 this area, the angle from the mine face to the
13 point of zero horizontal tensile strain.

14 Beyond this point, out further, as
15 shown by "T0" in figure 4.2, which we were
16 looking at in this exhibit, minor tensions or
17 compressions may occur. Minor tensions or
18 compressions. Keep in mind they're thinking of
19 closing this mine.

20 Q. May I -- are you through with your
21 answer, Mr. Hutchinson?

22 A. No. The rest of the paragraph says,
23 "Inside this point structures are liable to
24 experience substantial disturbance." So let's
25 look, to be fair, let's look at alpha 3.

1 MR. HIGH: Excuse me, Mr. LeMay. Mr.
2 Hutchinson is debating me instead of answering my
3 questions.

4 THE WITNESS: Okay.

5 MR. HIGH: He and I are not going to
6 agree on this issue.

7 CHAIRMAN LeMAY: You have a witness,
8 too, that's going to cover all this?

9 MR. HIGH: I sure do. Again, I don't
10 want to debate him. If he'll just answer my
11 question, I'll be glad to move on.

12 CHAIRMAN LeMAY: Before we move on, are
13 you through with this point, with this diagram?

14 MR. HIGH: Not yet, I will be very
15 quickly.

16 CHAIRMAN LeMAY: I'd like to take a
17 break at that point.

18 Q. (BY MR. HIGH) Mr. Hutchinson, forget
19 for a minute about the effect of subsidence on a
20 well casing. Okay. Forget about the effect. I
21 don't want to talk about whether a well casing
22 will or will not be able to withstand -- I don't
23 know anything about that. Okay. Forget about
24 that.

25 You agree, do you not, that angle 4, as

1 shown on Yates Exhibit 64, is at least the block
2 of dirt within which subsidence will occur, ever
3 how small?

4 A. I think they measured it that way, yes.

5 Q. You don't disagree with that part?

6 A. Oh, no. Assuming Golder did it, it's a
7 scientific measurement.

8 Q. And the disagreement, which that's my
9 word, that you expressed a moment ago is the
10 impact or the effect of that subsidence on a well
11 casing?

12 A. Or any other structure.

13 Q. Okay. Very good.

14 CHAIRMAN LeMAY: We were thinking about
15 taking a break, Mr. High.

16 MR. HIGH: Oh, I'm sorry. That's
17 fine.

18 CHAIRMAN LeMAY: Is that okay with you?

19 MR. HIGH: It sure is. I'm sorry.

20 CHAIRMAN LeMAY: Let's take a 15-minute
21 break.

22 [A recess was taken.]

23 CHAIRMAN LeMAY: We're continuing with
24 the cross-examination. Mr. High.

25 Q. Mr. Hutchinson, in the calculations you

1 gave of the potash that you said would be lost by
2 leaving a pillar around these wells, the four
3 we're talking about here, you came up with that
4 number, of course, without knowing the operating
5 costs of New Mexico Potash; correct?

6 A. I think I just made a volumetric
7 calculation.

8 Q. I understood your testimony was that
9 you used the price of \$72 a ton; correct?

10 A. Oh, I thought your question was about
11 the amount wasted. Go ahead and ask your
12 question again.

13 Q. All right. I'm sorry if you didn't
14 understand it. In coming up with what you
15 testified to be the lost profits to New Mexico
16 Potash --

17 A. Uh-huh.

18 Q. -- in the event a small pillar was left
19 around these oil wells, you said that you used
20 operating costs; right?

21 A. What I used was -- yes, it looks like I
22 used a cost of \$16 per ton. That's what I used.

23 Q. And do you know what New Mexico
24 Potash's cost is?

25 A. No. I think I made it clear that that

1 cost did not include taxes, royalty -- taxes or
2 royalty.

3 Q. Now, looking at the exhibit that has
4 the state leases on it -- I forget the number.

5 A. Overlay No. 4 -- yes, overlay No. 4.

6 Q. You testified earlier that it appeared
7 to you that New Mexico Potash -- I don't want to
8 put words in your mouth -- but I understood you
9 to say that, or suggest perhaps, that New Mexico
10 Potash was intentionally avoiding mining on state
11 leases.

12 A. That's the way it appears to me.

13 Q. Would you tell me, please, sir, the
14 basis for that suggestion.

15 A. All right.

16 MR. CARROLL: For the record to be
17 clear, overlay No. 4 is Exhibit No. 55.

18 Q. Let me see if I can speed it up. Is
19 that opinion or conclusion or suggestion based
20 upon anything other than your observations from
21 the exhibits you have in front of you right now?

22 A. Oh, no.

23 Q. Okay.

24 A. They mined up the lease line on three
25 sides and left it.

1 Q. That shortens it up.

2 A. Yeah.

3 Q. I take it you don't know when the state
4 leases shown on your overlay were acquired by New
5 Mexico Potash?

6 A. No, I don't.

7 Q. And it would be entirely possible,
8 would it not, that the areas shown in blue, which
9 you said had been mined, was mined long before
10 the adjoining state lease was even acquired by
11 New Mexico Potash; correct?

12 A. Yes. I'm sure Ernie Szabo can provide
13 that information. It's not my --

14 Q. If that were the case, then might that
15 be an answer instead of this intentionally not
16 mining on state leases?

17 A. In part. But right here, right here,
18 between 1990 and 1992, they mined right up to the
19 state lease line. Now, they mined this earlier
20 and this earlier and this between 90 and 92. It
21 doesn't make business sense to me that they would
22 mine around this and not own it and then mine up
23 to it on this side maybe years later.

24 I suspect -- we don't have the
25 acquisition dates there this. But hypothetically

1 speaking, this doesn't make good business sense
2 to me. You don't mine up to somebody else's
3 lease line on three sides. You just don't do it;
4 you make a deal with them.

5 Q. Wouldn't you really need to know, Mr.
6 Hutchinson, whether or not New Mexico Potash even
7 owned those state leases before you could render
8 or say that they are intentionally avoiding
9 mining on those?

10 A. Okay. That's Section 18, 21 South, 31
11 East. At the time I did this, I have a map that
12 says, "New Mexico Potash." I think it has a
13 lease number. Can you read this, Nelson?

14 Section 18. M65163504. I think those
15 are probably identifying numbers for that lease.
16 But, as of the time I made this, I knew that they
17 owned that state lease.

18 Q. And my question to you, Mr. Hutchinson,
19 was this: Wouldn't it be important to you that
20 when you make a statement, like you did in your
21 testimony about New Mexico Potash intentionally
22 avoiding mining state leases, that you would
23 check and see whether or not at the time this
24 area was mined they did in fact own the lease
25 that you said that they intentionally did not

1 mine?

2 A. Well, I don't think it's necessary for
3 me to do that.

4 Q. Now, in coming up with your -- again
5 the value of the potash that you say would be
6 lost, you referred to the size of pillars around
7 wells that have already been drilled, and you
8 referred to Wills-Weaver and AMAX.

9 A. That's correct. I used those as
10 guidelines for hypothetical.

11 Q. Do you know how deep those wells are?

12 A. Which ones?

13 Q. Either one of them. Wills-Weaver or
14 AMAX, either one.

15 A. I think we heard testimony -- and the
16 record will speak for itself -- but my impression
17 from testimony given yesterday is that those
18 wells are -- I'm going to say less than 4,000
19 feet deep.

20 Q. Well, your opinion this morning was
21 based upon those sized pillars; right?

22 A. That's correct, yes.

23 Q. Would it make any difference to your
24 opinion if the wells in those instances were
25 deeper than those that we're talking about here?

1 A. Not at all.

2 Q. Do you think the same sized pillar
3 would be okay?

4 A. For a hypothetical calculation. But
5 before I put a well down or before I let a mine
6 get to where a well was, I would require some
7 scientific data measurements in the field to make
8 sure that both industries could mine their
9 reserves and take care of each other, again
10 putting myself in the position of the regulatory
11 body that looks after having people work
12 together.

13 Q. All right. Let me see if I can get
14 right to the point here. Were you suggesting to
15 this Commission that it would be okay to allow
16 these wells to be drilled and only to be 150 --
17 I'm sorry, 125-foot pillar left around them?

18 A. Yes. I think for purposes of this,
19 with no other information, that that's a
20 reasonable calculation.

21 Q. Do you think that would protect the
22 wells from subsidence?

23 A. There are ways to protect them from
24 subsidence.

25 Q. If they would drill with 125-foot

1 pillar left in Section 2, would that protect them
2 from subsidence?

3 A. I don't think there will ever be any
4 potash mined in Section 2, so yes, it would
5 protect them from subsidence.

6 Q. Would it protect the underground mine
7 from methane gas?

8 A. Yes.

9 Q. And that would be true, in your
10 opinion, without regard to the depth of the well?

11 A. Yes, it is.

12 Q. Do you know the bottomhole pressure of
13 wells drilled in the Delaware?

14 A. No, I don't.

15 Q. Do you think that's something people
16 ought to know before they start deciding the size
17 of the pillar?

18 A. I think before somebody puts a casing
19 string in there, they better know what they're
20 talking about.

21 Q. Including knowing the bottomhole
22 pressure?

23 A. Of course.

24 Q. I don't know if I asked you -- do you
25 know what the bottomhole pressure is in a well in

1 the Delaware?

2 A. No.

3 Q. You don't have any idea?

4 A. No, I don't have any idea.

5 MR. HIGH: Thank you, Mr. LeMay.

6 That's all I have.

7 CHAIRMAN LeMAY: Thank you. Additional
8 questions of the witness?

9 MR. CARROLL: Yes, Mr. LeMay.

10 FURTHER EXAMINATION

11 BY MR. CARROLL:

12 Q. Early on, Mr. Hutchinson, in Mr. High's
13 cross-examination of you, there was an exchange
14 concerning, I guess it was an academic exchange,
15 but it dealt with the rules and the creation of
16 NMSHA -- I guess it's the Mining Safety Board,
17 the federal board.

18 And I think it was your testimony that
19 the board was created as a result of concern for
20 safety and they passed such rules as the Gassy
21 Mine Rules, which we've been talking about here;
22 is that correct?

23 A. Yes. I think its predecessor was an
24 organization called, or with the letters MESA,
25 but it was Mine Environment Safety Authority.

1 And that goes back to at least the early 70s, I
2 think, maybe before that.

3 And you're right, those were created as
4 occupational safety regulatory agencies to make
5 the work place safer: OSHA for heavy
6 construction and manufacturing, then MESA, and
7 then MSHA.

8 Q. Isn't it within your experience that
9 the corollary was also occurring in the oil and
10 gas industry, at least in New Mexico, with the
11 creation of the OCD and adoption of casing
12 regulations such as we find in the Order R-111-P?

13 A. I can't speak specifically for New
14 Mexico, but I am familiar with Oklahoma and
15 Kansas and Michigan. And yes, it seems that the
16 states really take care of the oil and gas safety
17 in the workplace situations rather than the
18 federal government.

19 Q. Mr. High, after some cross-examination,
20 threw a hypothetical at you that basically said
21 that isn't it fair to say that just because a
22 price is low for a mineral, it doesn't mean that
23 you should waste that product. Do you recall
24 that hypothetical being posed to you?

25 A. Yes, I have some gold in the ground

1 that I'm not going to waste.

2 Q. Right. And your answer was that just
3 because the price is low, you shouldn't waste
4 it. You said no, you shouldn't?

5 A. That's correct. It was a
6 hypothetical. We didn't talk about a specific
7 mineral.

8 Q. Let's put that hypothetical with
9 respect to the facts that we know. Section 2, in
10 taking into consideration the facts that you know
11 about it and with respect to the presence of
12 sylvite in the tenth ore zone, do you feel that
13 that hypothetical fits with respect to the
14 situation that we have before us in Section 2?

15 A. Not at all. I spent, what, an
16 hour-and-a-half going through the economics to
17 show that there will be no new sylvite mines
18 opened up in New Mexico. And those that are
19 here, I hope they can keep scratching for as long
20 as they can. But there aren't going to be any
21 new ones. You can't waste potash that doesn't
22 have any value.

23 Q. And along those lines Mr. High got into
24 talking about coreholes. And he talked about
25 AEC-8 that's down here below Section 2, the

1 corehole 162. You remember that?

2 A. Yes, I do. We tried to expand from one
3 hole out to another.

4 Q. You remember -- I think I remember you
5 asking if you could see Exhibit No. 41 that was
6 created and testified to by Leo Lammers; is that
7 correct?

8 A. I'm not very good with exhibit numbers,
9 as you know.

10 Q. Okay. Well, that's what the Exhibit
11 number reads. There are other coreholes -- I
12 mean, on that Exhibit 41, AEC-8 was talked about,
13 was it not?

14 A. Yes, it was.

15 Q. And you remember one of the other
16 coreholes besides 162, the YPC well and the logs
17 about it, the ERDA-6 hole, the K-158, K-157, and
18 the FC-81, do you not?

19 A. Yes. Those were brought into the
20 conversation.

21 Q. And isn't it a fair statement that --
22 or at least I think it's a statement that we've
23 all been agreed to -- that the more coreholes you
24 have, the better your information and the better
25 judgment that you can pass?

1 A. That's true.

2 MR. HIGH: Mr. LeMay, I'm going to
3 object. This is redundant. We've heard this
4 several times.

5 MR. CARROLL: This is an area that you
6 examined.

7 MR. HIGH: I agree. All I'm saying is
8 it's redundant, and I'm objecting to it.

9 CHAIRMAN LeMAY: Okay.

10 Q. (BY MR. CARROLL) The point being, I
11 think, that with respect to Mr. High's use of
12 just two or three holes, was in fact bad science,
13 wasn't it, Mr. Hutchinson?

14 A. Oh, definitely. And this is much
15 easier to read than the exhibit I was given with
16 very small print, and it wasn't summarized at
17 all. But AEC-8 is noncommercial in sylvite.
18 Even if you have a mine there, it's
19 noncommercial. K-162 is commercial. So this
20 hole that's in confidence, all by itself, there's
21 nothing around it. In fact, there are negative
22 results, drilling results around it, so it stands
23 alone.

24 If you would offset that well or offset
25 that corehole, a quarter of a mile in four

1 directions and still have that minable grade, the
2 fact remains that no matter how we hypothecate,
3 there is no mine there. You'd have to get up
4 into the 19, 20 percent and have a lot of it to
5 justify the tens, if not hundreds, of millions of
6 dollars for a new mine.

7 Q. Let's talk a moment about subsidence,
8 and let's try to put this issue into its proper
9 perspective, Mr. Hutchinson.

10 A. In your professional opinion is all
11 subsidence something we need to be concerned
12 about, or is there something about subsidence we
13 need to look at and hone down?

14 MR. HIGH: Mr. LeMay, I'm going
15 object. Not only is it repetitious, this witness
16 has admitted to me he is not an expert in rock
17 mechanics, and I didn't cover that area in depth.

18 CHAIRMAN LeMAY: That's fine with
19 cross. Can you get toward the point, Mr.
20 Carroll? We did hear that before.

21 MR. CARROLL: I understand. I just
22 want him to put it into perspective for us, and I
23 think he can do it in just a sentence or two.

24 CHAIRMAN LeMAY: Fine.

25 MR. CARROLL: And then I'm going to get

1 out of here.

2 CHAIRMAN LeMAY: Put it in
3 perspective.

4 THE WITNESS: All right. Subsidence is
5 something that we should consider. It is not a
6 fatal flaw in potash mining and oil extraction,
7 working in the same area. It's not a fatal
8 flaw. We can figure these things out.

9 If the oil well is there first and the
10 mine is mining towards it, the mine should be
11 required to do some scientific data gathering
12 that is site specific. And if they must go near
13 that well, there is enough science to determine
14 the stress on that well and see if the casing
15 with applicable safety factors is reasonably
16 designed and maintained.

17 As the mining gets closer to the well,
18 it could be required that the mining company put
19 in rock bolts. That would even minimize any
20 hypothetical loss of potash even further.

21 So there are very good scientific ways
22 and mining principles to allow that. If the mine
23 is there first, the oil company can do other
24 things, including directional drilling if they
25 think it's good enough, or then let them do the

1 subsidence tests to prove that their location is
2 a safe one.

3 But to out of hand exclude one from
4 working with the other, I don't think is fair.
5 There's science that allows us to do that.

6 Q. (BY MR. CARROLL) In other words, if
7 subsidence doesn't cause damage, it should be of
8 no concern?

9 A. That's true.

10 MR. CARROLL: Mr. LeMay, that's all I
11 have.

12 CHAIRMAN LeMAY: Thank you. Additional
13 questions of the witness?

14 MR. HIGH: I just have one.

15 FURTHER EXAMINATION

16 BY MR. HIGH:

17 Q. Did you say, Mr. Hutchinson, that AEC-8
18 does not show ore of a commercial grade and
19 quality?

20 A. It sure doesn't. It's public
21 information. It says 6.4 feet of 12.3 percent
22 sylvite. And I say if you don't have 16, you
23 don't have a today's price that's acceptable that
24 will generate a profit, given that mining
25 companies have alternate uses for their cash.

1 Q. Again, when you say AEC-8 is not
2 commercial, you're using the little standard that
3 you have developed, the 16 percent which includes
4 a 14 percent profit margin?

5 A. Yes. And I might add I spent a lot of
6 years as a cost engineer for Morrison-Knutson,
7 and I think I'm pretty good at figuring those
8 things out.

9 Q. And you also understand that there may
10 be other people out there who have different
11 views than yours on commercial or not, don't you?

12 A. I think the people sitting in this room
13 have a better idea of what their costs are than I
14 do.

15 Q. Thank you.

16 A. I would bow to their experience.

17 MR. HIGH: Very good. Thank you.
18 That's all I have.

19 CHAIRMAN LeMAY: Additional questions
20 of the witness?

21 Commissioner Carlson?

22 COMMISSIONER CARLSON: I think I've got
23 some.

24 EXAMINATION

25 BY COMMISSIONER CARLSON:

1 Q. You testified that you don't envision
2 New Mexico Potash mine ever mining sylvite out of
3 Section 2; is that correct?

4 A. That's correct.

5 Q. And you said they're mining how many
6 acres per year?

7 A. The number I came up with was 136 net
8 acres per year.

9 Q. Net meaning --

10 A. That's how I made the -- the one
11 exhibit I showed, it showed where they were doing
12 second mining. If they did first and second
13 mining in that time period, I gave them 90
14 percent of the gross acres would be the net
15 acres. If they just did in that time period only
16 did first mining, I gave them 50 percent. If
17 they did second mining only in that period, for
18 that gross acres I gave them 40 percent.

19 Q. Okay. And that was based on their last
20 three years?

21 A. It was 39 months. I think R-111-P
22 required the submittal of an open mines working
23 map of October 1, 1988. That's within a month, I
24 think. And then they were to do it annually
25 thereafter. And so I got one that went from

1 October 1 through the following December. I
2 think that's, what, 15 months.

3 And then the next one I went -- the
4 next one I just had a two-year period, from
5 1/1/90 to approximately 1/1/92, and that's 24
6 months. And 15 and 24 is 39. So it's a 39-month
7 period. And I checked the first 15 months and
8 the last 24 months to make sure I was within a
9 pretty good range.

10 Q. So you based that on their plats that
11 they have to file annually pursuant to R-111-P?

12 A. Yes, sir.

13 Q. They've been open since 1965, but you
14 didn't take any average over the life of the
15 mine?

16 A. Oh, yes, I did.

17 Q. Do you have those numbers?

18 A. The first 26 years that's all I could
19 calculate.

20 Q. Is that factored into the 136 net acres
21 per year?

22 A. No. But I wanted to make sure I was in
23 the ballpark. Of course, their first 26 years
24 they were higher than that. That mine is not
25 operating at full capacity and hasn't been for

1 the last couple of years, I think. Maybe it's
2 operating at full capacity under some other
3 constraint, but potash demand isn't great.

4 Q. Do you know how much higher it was over
5 those first 26 years?

6 A. I apologize. I don't have those
7 calculations with me, but I can make an educated
8 guess that it was probably close to -- over a
9 26-year period, over maybe close to 200 acres per
10 year, net acres per year.

11 Q. But you used 136 acres and by that
12 estimated it would be 80 years at that rate until
13 they got to Section 2?

14 A. That's exactly how I made the
15 calculation.

16 Q. Then you mentioned that New Mexico
17 Potash mines will survive only as long as
18 Canadian mines will let them -- I think that's
19 what I heard -- that their days are numbered. Do
20 you have any feel for how many days that is, how
21 long will Canadian mines let New Mexico potash
22 mines mine?

23 A. I can make an educated guess. The
24 Canadian mines in Saskatchewan have plenty of
25 capacity that is unused. They're operating at --

1 I checked different mines -- they're going from
2 anywhere from 45 percent of what they can produce
3 up to maybe 65 percent of what they can produce.
4 Let's say they're a little over half of their
5 rate of capacity.

6 So they can really open up the valve
7 and turn out a lot more potash if the demand were
8 out there. If demand remains flat, making that
9 assumption, and the New Brunswick potash mines
10 come on, I think that they will be able to put
11 potash delivered to the customer at a lower price
12 because they're on the water, and water
13 transportation is about 60 percent that of rail;
14 that they're going to be in competition, serious
15 competition with the Saskatchewan potash, which
16 is going to require the Saskatchewan people to
17 get off their high horse of being a price setter
18 and go to the more competitive curve of operating
19 up to their marginal cost rather than their
20 marginal revenue.

21 That's going to put more supply out
22 there and reduce prices. When those prices are
23 reduced in those areas where Saskatchewan potash,
24 including transportation cost, is less than
25 what's being delivered from New Mexico with its

1 corresponding transportation costs, the buyers
2 are obviously going to buy from Saskatchewan.
3 And the demand for New Mexico Potash -- I mean,
4 the muriate of potash, exclusively here, will go
5 down.

6 The most marginal producer or producers
7 will drop out when they reach a negative cash
8 flow. And I think that those are just the cold
9 hard facts of the situation. Did that answer
10 your question? Oh, you wanted an estimate of
11 time?

12 Q. Yes. You're talking about the
13 relatively near future?

14 A. I'd say we'll see some people drop out
15 in the next five to eight years. But I think
16 there's a little glow or glimmer of hope there.
17 These places are wonderful places to put solid
18 waste. I think it would be a terrific business.

19 Q. You'd be real popular in Santa Fe.

20 A. I know.

21 Q. But yet you see a much longer and maybe
22 indefinite future for langbeinite?

23 A. Oh, langbeinite is terrific. As I
24 said, I made a nuisance of myself with all the
25 research I had done. And Yates has been paying

1 me my fee. I thought I was obligated to give
2 them the best information I could on that sale.

3 And, hopefully, they'll let me continue
4 to drill some coreholes and evaluate that
5 property. And maybe there will be a third
6 langbeinite mine in the basin.

7 Q. Aren't there commercial deposits of
8 langbeinite in Section 2? Hasn't corehole 162
9 confirmed that?

10 A. I have to make a calculation to convert
11 that to my economics, but I can say by inspection
12 that it's close. I can't -- you know, it's out
13 there by itself. And the fourth ore zone is in
14 AEC-8. Here's 162 and here's AEC-8. It's
15 obviously commercial, AEC-8, in Section 11. 2
16 could be. The fact that they're both together,
17 as Mr. High pointed out, perks up your ears.

18 It's no secret to me -- it is a secret
19 to me -- but it's no surprise to me that an
20 astute company like IMC, with big bucks to put
21 into mines, was very interested in buying Section
22 2 for the langbeinite.

23 Q. So even though it could be well out of
24 any future plans for New Mexico Potash to allow
25 oil and gas drilling, they still could waste

1 commercial deposits of langbeinite; is that
2 possible?

3 A. No, I don't think so. Langbeinite
4 consumption is -- let me say sulfates of potash
5 and langbeinite gets a little bit better price.
6 But total sulfates of potash is in the 200,000
7 metric tons total production in the United
8 States. I think 80 percent -- don't hold me to
9 that -- 80 percent of that is exported, which
10 doesn't make a lot of difference.

11 But if you're only mining 200,000 -- if
12 the whole industry, of which langbeinite is only
13 a small part, is only producing 200,000 tons, it
14 doesn't make much of a mine. You'd get a nice
15 price for it, but it would be a small mine.

16 I think I calculated that Western Ag,
17 their 35 years of reserves will only consume
18 about, in 35 years at their present rate of
19 mining, I think their stated rate of mining, I
20 think that only consumes about two to
21 two-and-one-half sections gross. So it's a
22 really small quantity.

23 Q. But there is a potential deal in the
24 works between IMC and New Mexico Potash for
25 langbeinite; isn't that correct? Haven't we been

1 shown that?

2 A. I don't know what the deal is for. The
3 letter that we got in the exhibits was for
4 Section 2. I presume since IMC is a big player
5 in the Canadian muriate or sylvite mining arena
6 that their interest is not in sylvite; it's in
7 langbeinite. But that's a deduction on my part.

8 Q. Have you done any work to see if
9 Section 2 is accessible to IMC's mine in some
10 future time period?

11 A. IMC is mining here. Can you see this,
12 this big blue area? They also come down here,
13 and they just recently -- oh, they bid on a
14 section here, but Western Ag got it. This is
15 Western Ag. Here is Section 2. IMC has been
16 mining in just this area since the 40s.

17 You can see that, even if they started
18 now, here's a jumble according to the BLM, a
19 jumble of maybe nonproductive potash. If they
20 went all the way through that, oh, that's maybe a
21 couple hundred years to get over there.

22 But they're somewhat blocked since they
23 didn't take this lease, and I think there's
24 commercial langbeinite on that lease that Yates
25 took or I wouldn't have recommended it. I think

1 IMC's interest in Section 2 may have waned.

2 Q. On subsidence, I think you mentioned
3 one of your exhibits shows that the subsidence --
4 I think it is Exhibit 64, I have in my notes --
5 was 83 percent of the mined out area. You said
6 that's typical of potash mines. And then Mr.
7 High on cross talked about that subsidence
8 essentially goes on forever until that void is
9 completely filled at some period.

10 How long a period is that? I mean,
11 when does the ground become stable again?

12 A. One of the exhibits that I showed
13 across the Wills-Weaver mine -- oh, I have it
14 here, I think. Yes. I don't know what the
15 number is of my exhibits -- I'm terrible at that
16 -- but on Golder Associates, page 70, the legend
17 shows a round black dot, dated 5/5/66. And you
18 can see where the bottom of the subsidence zone
19 was on that date.

20 Apparently ten months later, plus or
21 minus ten months, shown by the round, open
22 circles, unshaded circles, it appears to be about
23 the same point. And so it appears in that
24 instance that over that ten-month period, it, for
25 all practical purposes, stopped. You can see

1 that the upset scale of the vertical scale, we're
2 talking about virtually the same elevation after
3 eight months in 1967.

4 You can also see that with those V's
5 there that there's been what I suspect to be some
6 erosional things taking place. Or at this scale
7 it could be a Cat track or a jeep track or
8 something that would cause that.

9 Q. And the original reading on that was
10 July 23 of 64. So you're saying in less than
11 three years, it closed the gap completely; in
12 other words, the subsidence stopped?

13 A. I think that that's a reasonable way to
14 read that chart. I think that was the purpose of
15 the chart.

16 MR. CARROLL: For the record, that was
17 Exhibit 63 of Mr. Hutchinson's exhibits.

18 Q. So are you saying three years is a
19 reasonable time period, that anytime there's
20 mining that stops, then that should close
21 completely within three years?

22 A. I brought out, you know, one of the
23 main parameters in predicting subsidence is
24 time. And I think that this gives us some
25 indication that if you're mining 4 feet and you

1 have about 900 -- or say 1,000 feet of cover
2 above you in the northern part of the potash
3 basin, that that's a pretty good windage
4 application.

5 But if you look at the other chart, it
6 shows that from -- that's on page 68 -- from
7 September of 64 to January of 65, that would be a
8 three-month period, it went from at the deepest
9 point, say, 1.6 to 1.8. That's 2/10 of a foot;
10 that's 2.4 inches in -- what did I say? -- in a
11 three-, four-month period, four-and-a-half-month
12 period.

13 There's something strange going on with
14 that one because the right-hand lobe continues.
15 It has continued to hold its shape for most of
16 the readings. I can't explain what it is.

17 Certainly, Mr. Carlson, the depth from
18 the surface to the mine is going to have quite an
19 effect, as well as the geology is that I've
20 already spoken about.

21 MR. CARLSON: I guess I don't have any
22 more questions.

23 I do have one question of Mr. High.
24 Mr. High, when you present your case, are you
25 going to give us some indication of when those

1 state sections, state leases were acquired and
2 when the mining occurred around them?

3 MR. HIGH: I assure you, Mr. Carlson,
4 we will address that very issue. And we will
5 address the allegation that we have intentionally
6 avoided state lease, which we deny, and we will
7 address that in our case.

8 CHAIRMAN LeMAY: Commissioner Weiss.

9 COMMISSIONER WEISS: I have one
10 question.

11 EXAMINATION

12 BY COMMISSIONER WEISS:

13 Q. I doubt that you have experience, but
14 I'm going to ask it anyway. The oil field is
15 very aware of subsidence in the offshore
16 applications. And when those platforms get
17 underwater, they're no good. So they've studied
18 this extensively, and I'm not familiar with that
19 history to any great extent.

20 But have there ever been any instances
21 of sheared pipe in the subsidence situation in
22 the oil field?

23 A. You're right, I don't have much
24 experience and wouldn't know about those things.
25 And I do not know of any in the areas where I

1 have worked.

2 MR. WEISS: Thank you. That's all I
3 have.

4 CHAIRMAN LeMAY: Thank you,
5 Commissioner Weiss.

6 I just have a couple questions.

7 EXAMINATION

8 BY CHAIRMAN LeMAY:

9 Q. How important do you think
10 confidentiality is to the success and
11 profitability of mining companies, in particular,
12 potash companies?

13 A. I think that the potash companies need
14 to protect their grade, the grade in their
15 coreholes. If I were them, I would want to hold
16 that in confidence because, with a couple of
17 beers, you can find out just how fast every mill
18 operates, what the feed grade into it is, and how
19 many tons are shipped out of that mill on a daily
20 basis, if you'd like.

21 Q. Well, then how would that help the
22 competition? Can you go a little further?

23 A. If, for example, let's just assume that
24 the Mississippi Chemical mine were in operation
25 today competing with New Mexico Potash in the

1 tenth ore zone.

2 Q. Competing in what way? For leases?

3 A. No. No. No. No. They're both
4 producing out of the tenth ore zone.

5 Q. Okay.

6 A. It's a special unto itself zone.
7 They're all special unto themselves, that one
8 particularly so. It's the top one. And they get
9 to that and they mine to get some costs and cash
10 flow coming in, and that's as far as they ever go
11 usually.

12 But if I were managing New Mexico
13 Potash, I don't think I'd want Mississippi
14 Chemical to know what my average grade is going
15 to be for my next two or three years of mining.
16 But I can't understand why mine plans can't be
17 made public to everybody, particularly in this
18 case, the oil companies, or if there were other
19 mineral people wanting to mine or extract
20 something here, to know what their plans are so
21 they would know if they were interfering. That's
22 a frustrating thing, I know, for the oil
23 companies.

24 I know that any good mine has a mine
25 plan that they probably update it every quarter,

1 certainly every year. And it will probably go
2 out there a three-year period and maybe a
3 five-year period. And it won't change much from
4 that unless they run across something that is
5 anomalous.

6 If they hit high grade, they're going
7 to get in there and get it. If they hit a salt
8 horse, they're going to figure out how to get
9 around it and still provide that quantity, that
10 volume to the mill.

11 Q. Well, then, so the mine plans you would
12 recommend being made public, but the corehole
13 quality data, we'll say, should not?

14 A. Correct.

15 Q. The locations of coreholes are okay?

16 A. Yes, I think that's important to know
17 for anybody.

18 Q. But if you're getting into a discussion
19 or argument, or whatever you want to call it on
20 the commerciality of ore, how do you put all
21 sides equal when you -- I guess, you need that
22 kind of data to determine commercial deposits,
23 don't you, or do you?

24 Is the ore grade a critical element in
25 defining what deposit is commercial and what

1 isn't?

2 A. Extremely important, particularly once
3 you have a mine. The ore grade is, as I try to
4 describe, the most -- the biggest risk is getting
5 that ore mined to the shaft and up the shaft and
6 through the mill. You know what that costs after
7 a while. That tells you where you're going to
8 mine what grades and what your internal cutoff
9 grade is to make a positive cash flow. So then
10 you try to maximize your profits at that point.

11 Q. Well, then, let me go back to a
12 statement. I hope I quote you correctly. I
13 think you stated somewhere in your testimony that
14 we all agree that there should be areas of oil
15 reserves off limits to oil companies?

16 A. Oh, definitely.

17 Q. In trying to define that statement a
18 little further, if you're talking about, quote,
19 "oil reserves," that would -- implicit in that
20 statement would be the quality, the grade of the
21 ore?

22 A. Definitely.

23 Q. And if we're talking about what is
24 commercial and what isn't and we're arguing that
25 point, how can we argue that or discuss it if one

1 side has the -- we'll call that the secret
2 information, and yet by divulging that, they
3 would lose competitiveness in the marketplace,
4 but by not divulging it -- or by divulging it,
5 then you can have what might be considered a
6 fair, open, level playing field.

7 A. I don't think that the oil companies
8 care about or need to know what the grade is or
9 the commerciality of the ore. They want to know
10 where the mining company is going to be in the
11 next three years, then the next five years, and
12 then maybe the next ten years. In that
13 three-year period, they won't even come close.
14 If they want to get close, they can work
15 something out with the mining company and do some
16 subsidence experiments or whatever and decide
17 where that well could be.

18 But it should stay out of that
19 three-year commercial reserve. The next two
20 years perhaps, an oil company shouldn't be
21 allowed to drill in that zero-to-five-year
22 reserve without the permission of the mining
23 company.

24 But out past five to ten years, I think
25 that your organization or some regulatory person

1 should be able to listen to both sides and having
2 built -- if these mine plans are submitted
3 annually, build a confidence level that those
4 mining companies actually mine what they say
5 they're going to mine.

6 And with that confidence level, make a
7 determination that, okay, in the over five-year
8 reserve but less than ten, we're going to let you
9 drill in there or we're not going to let you
10 drill for a year. And let's see where the mining
11 company is then. The next year the mining
12 company submits their three-year, five-year,
13 ten-year plan. And after a while you've got the
14 people working together.

15 Q. Well, you're saying then it's all right
16 to drill in what might be considered ore reserves
17 but not minable for "X" amount of years?

18 A. Right. R-111-P doesn't have a time
19 factor in it for the Hearing Examiner to make a
20 judgment. There is none. You either can or you
21 can't into eternity. I think that's a shortfall
22 in a practical sense.

23 Q. I think I understand your statements,
24 but let me go back to one other question then,
25 because that's what I think we're getting down

1 to, is this trying to crystallize on this issue
2 of the time frame, what's commercial, what's not
3 commercial, what maybe two reasonable companies
4 could agree, one oil, one mining on where they
5 could put holes and where not to. But we're
6 trying to fine-tune this process, so if you'll
7 bear with me for one more question.

8 Do you agree with Mr. Lammers, that
9 gamma ray of interpretations of zones within,
10 like, the fourth ore zone, tenth ore zone, are
11 good tools to delineate the presence or absence
12 of commercial ore?

13 A. Of mineralization only.

14 Q. Of mineralization?

15 A. Yes.

16 Q. Have you looked at this area at all,
17 the extent of mineralization versus the amount of
18 gamma ray radiation in these zones?

19 A. When I wanted to look into whether or
20 not to recommend that Yates and Pogo bid on the
21 potash sale, I did what I could do. I went to
22 Leo, knowing he had some experience, and we dug
23 out a whole bunch of logs, and we sort of went
24 through those.

25 And I think on a map I showed there was

1 a dashed line that to me that means, hey, maybe a
2 corehole should go out here so we really know,
3 because there were gamma ray spikes. You
4 couldn't tell the thickness, but you could tell
5 that there was the presence of a radioactive
6 material.

7 Now, I have no idea what's going to
8 happen if they ever store anything in WIPP, what
9 would happen to those. But I think it's a tool
10 that, you know, it's like, as you're familiar
11 with, seismic data is a tool that might give you
12 some information before you drill an oil well.

13 Q. In terms of acquiring corehole
14 information, we maybe all agree -- I hope we all
15 agree -- the more the better. As Mr. Lammers
16 would say, you can't have too many coreholes. Is
17 it more expensive or less expensive to core maybe
18 the prospective potash zones when you're drilling
19 an oil well or drill a corehole, slim-hole
20 corehole, we'll say, from scratch?

21 A. That's a wonderful suggestion, and I've
22 had several discussions with it. And if we could
23 get the mining companies to let the oil companies
24 know where they're going to be in a certain time
25 and build some confidence in that, then I would

1 think the next thing that would take place,
2 particularly if there was going to be a
3 subsidence issue, is that the oil company, in
4 exchange for permission to drill, would core
5 those zones. I know I'd be open for it if it
6 were me.

7 It's a trade off. And it's a sharing
8 of information and probably maybe a smaller
9 incremental cost than the potash company going
10 out and setting casing and doing the rest of it.

11 Q. As far as actual dollars, do you think
12 it's cheaper to core while you're drilling an oil
13 well, or do you have any information?

14 A. I've cored some oil wells, and it's
15 pretty expensive. I've cored a lot of precious
16 metal properties, and it's a little less
17 expensive. So I'm not capable of comparing the
18 two.

19 Q. How about side-hole cores once you have
20 wellbore there?

21 A. Oh, I think -- again, I don't know what
22 the cost is, but there's the data. And, as you
23 know, sharing of data in the oil business keeps
24 everybody going. I would hope that that might be
25 a possibility.

1 CHAIRMAN LeMAY: Thank you, Mr.
2 Hutchinson. That's all the questions I have.
3 Additional questions or --

4 MR. HIGH: I'd like a few follow-up, if
5 I may.

6 FURTHER EXAMINATION

7 BY MR. HIGH:

8 Q. Under your proposal, Mr. Hutchinson, of
9 this letting people drill in reserves that are
10 not going to be mined beyond five years --

11 A. Yes.

12 Q. -- you, in effect, then would protect
13 only mined reserves for a period of that first
14 five years?

15 A. Yes.

16 Q. And then regardless of the grade of
17 those ores or the thickness of them, you could
18 have 10 feet of 30 percent potash, and you're
19 saying let people drill through it?

20 A. Well, I think that's something that
21 under that extreme circumstance, that you're good
22 at coming up with, I think that's a subject of
23 discussion that should come before the OCD or
24 someone else. That's an extreme situation.

25 Q. Mining, you agree, is a long-term

1 investment?

2 A. Oh, it certainly is.

3 Q. You wouldn't put --

4 A. These mines have all paid out by now.

5 Q. But you wouldn't want to be in the
6 mining business and buy one with only five years
7 reserves, would you?

8 A. Oh, I don't think that would be a
9 reasonable thing. But if we get down to muriate
10 of potash or sylvite mines today, and that's what
11 we're talking about today, rather than some
12 hypothetical tantalum mine in South Dakota, I
13 think that the life of the sylvite producers is
14 so short that that's a reasonable situation.
15 Perhaps it wouldn't be in a big open pit coal
16 mine or even a smaller high grade coal mine in
17 the east with low sulfur reserves.

18 Q. All right. With respect to
19 langbeinite --

20 A. Yes.

21 Q. -- if a mine is going into the
22 langbeinite business, they would want more than
23 five-year reserve, wouldn't they?

24 A. Well, if it takes 35 years to mine two
25 sections, I think any oil company would move

1 their location over a few hundred feet and
2 drill. Be happy to. And it wouldn't bother
3 anybody.

4 Q. So you think two sections is 35-years
5 reserves?

6 A. Well, I've done some calculations of
7 how fast Western Ag is mining, and I have their
8 mine, open mine workings advance since R-111-P
9 went into effect. It's not much.

10 Q. Do you know how fast IMC is mining?

11 A. They're much more difficult to
12 determine because they mine, I think, three
13 zones, maybe not all at the same time. But over
14 the period of the life of mine, they've mined as
15 many as three zones. AMAX is mining two. Now
16 they're only mining one. But last year they
17 mined a little bit out of the first zone.

18 Q. And one final question. You did agree
19 that there's langbeinite or an indication of
20 langbeinite from corehole AEC-8 and 162?

21 A. Yes, I did.

22 Q. And you didn't fault -- or you're not
23 faulting IMC for being interested in Section 2,
24 are you?

25 A. Well, I'd do it.

1 Q. In other words, you wouldn't disagree
2 with the fact that it was reasonable for IMC to
3 be interested or believe that there was
4 langbeinite there, would you?

5 A. Well, no. I'm sure that you gave them
6 the corehole data, or New Mexico Potash did.
7 They wanted to sell it to them.

8 Q. And it would be reasonable for them to
9 believe that there's langbeinite in Section 2?

10 A. You bet. Just like the oil companies
11 go out and take leases, they have reason to
12 believe that the geology will get them a good oil
13 well.

14 MR. HIGH: Thank you.

15 CHAIRMAN LeMAY: Additional questions
16 of the witness? If not, he may be excused.
17 Let's take about a five-minute break.

18 Do you have one more witness?

19 MR. CARROLL: That's correct. I have
20 one more witness. I suspect, and again I know my
21 judgment has not been good, I think it will take
22 at least two hours to put this witness on. That
23 poses a real problem because we'll then be
24 pushing into the area, and I'm sure Mr. High
25 would not be able to finish cross-examination.

1 And I think, since we've picked our
2 dates more than a month away, I think it's really
3 unfair to put a person on and then have him
4 cross-examined 30 or 40 days over what he said.
5 I think it's almost impossible to do that.

6 What I'm suggesting then is that my
7 feet are just about gone standing here before
8 this stand, and I'd like to adjourn to the date
9 that we've picked.

10 CHAIRMAN LeMAY: Let me talk about this
11 a little bit more. I thought you said yesterday
12 -- I thought you gave us a time schedule that
13 your direct would be --

14 MR. STOVALL: Mr. Chairman, I don't
15 think this discussion needs to be on the record.

16 CHAIRMAN LeMAY: I'm sorry. Let's go
17 off the record.

18 [A discussion was held off the record.]

19 CHAIRMAN LeMAY: Let's continue this
20 witness, your last witness, to the 21st, I guess
21 it is. We'll block out the 21st, 22nd, and
22 23rd. And we'll do our best to accommodate you
23 on those three days. And I hope you all will
24 work toward that end too.

25 Let the record reflect that we have

1 temporarily adjourned the case to be continued to
2 -- let's start it at 8:30 on the 21st, October
3 21st, here in Santa Fe. Hopefully we get the
4 hall, if not we'll be upstairs.

5 [And the proceedings were adjourned.]

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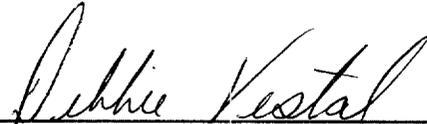
1 CERTIFICATE OF REPORTER

2
3 STATE OF NEW MEXICO)
4 COUNTY OF SANTA FE) ss.
5

6 I, Debbie Vestal, Certified Shorthand
7 Reporter and Notary Public, HEREBY CERTIFY that
8 the foregoing transcript of proceedings before
9 the Oil Conservation Commission was reported by
10 me; that I caused my notes to be transcribed
11 under my personal supervision; and that the
12 foregoing is a true and accurate record of the
13 proceedings.

14 I FURTHER CERTIFY that I am not a
15 relative or employee of any of the parties or
16 attorneys involved in this matter and that I have
17 no personal interest in the final disposition of
18 this matter.

19 WITNESS MY HAND AND SEAL SEPTEMBER 28,
20 1992.

21
22
23 
24 _____
DEBBIE VESTAL, RPR
NEW MEXICO CSR NO. 3
25