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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 15, 1961

IN THE MATTER OF:

Application of the Oil Conservation Commission on its own motion, at the request of Paul E. Haskins, to consider granting permission to drill a well in the potash-oil area, Eddy County, New Mexico. In the above-styled cause, Paul E.Haskins seeks permission to drill a well in the Getty Pool in the SW¼ NW¼ of Section 13, Township 29 South, Range 29 East, Eddy County, New Mexico, which well would be located within the potash-oil area as defined by Order No. R-111-A, as amended.

CASE NO. 2432

REGULAR HEARING

BEFORE: Governor Edwin L. Mechem, Chairman
E. S. Walker, Member
A. L. Porter, Jr., Member and Secretary

TRANSCRIPT OF HEARING

MR. PORTER: We will call Case No. 2432.

MR. WHITFIELD: Application of the Oil Conservation Commission on its own motion, at the request of Paul E. Haskins, to consider granting permission to drill a well in the potash-oil area, Eddy County, New Mexico.

MR. PORTER: I would like to call for appearances in Case No. 2432.

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MR. BRATTON: Howard C. Bratton, appearing on behalf of Mr. Haskins, of Roswell, New Mexico.

MR. BLACKMAN: Appearing on behalf of the Potash Co. of America, Roy Blackman, of Carlsbad, New Mexico.

MR. PORTER: Does anyone else desire to make an appearance in this case?

I would like to have all of the witnesses who are going to testify in the case stand and be sworn at this time.

(Witnesses sworn.)

MR. PORTER: Mr. Bratton.

MR. BRATTON: This case comes on for hearing on the application of Paul Haskins to drill a well, an oil well, which would be located in the area defined by Order R-111-A. He has filed a Notice of Intention to Drill. The matter has gone through arbitration and pursuant to the rules of the Commission has come on for hearing on the Commission's motion.

As I recall, the last full hearing we had on this type of case, it was the Commission's ruling that the protestant go forward, the applicant having filed its Notice of Intention to Drill, that the protestant should show why he should be denied that Intention to Drill and I request advice as to whether that is the Commission's policy in this case.

MR. BLACKMAN: If the Commission please, my recollection as to what occurred the last time was that I accepted the burden of going forward. I strenuously contend that the burden

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of proof and burden of persuading this Commission that no damage to the Potash Company rests upon Mr. Haskins and Texaco who are the proponents in this case. Nonetheless, because of the fact that the evidence is of the type which will have to be presented in this case is peculiarly available more to the Potash Company than it is to Mr. Haskins, I have no objection to accepting the burden of going forward.

I feel if I am to have that burden and accept that burden that I should also be permitted to open and close the argument.

MR. BRATTON: I concur in that, that Mr. Blackman open and close.

MR. PORTER: Do you want to call your witness at this time, Mr. Blackman?

MR. BLACKMAN: Yes.

MR. PORTER: Will you have some exhibits to post?

MR. BLACKMAN: I think I'd rather post them, sir, as we get to them.

MR. PORTER: As you progress with your witness?

MR. BLACKMAN: I might say at this time Mr. Bratton and I had a little discussion and I think we can stipulate that Mr. Bratton's document which he has showing Mr. Haskins' interest may be accepted as authentic for what they purport to be.

I will call Mr. Cummings, please.

J. B. CUMMINGS

called as a witness by and on behalf of Potash Company of America, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BLACKMAN:

Q Will you please state your name and your position.

A J. B. Cummings, Potash Company of America, administrative assistant in charge of exploration.

MR. BLACKMAN: If the Commission please, Mr. Cummings has testified before the Commission and his qualifications have been accepted. I offer Mr. Cummings.

Q (by Mr. Blackman) What is your professional degree?

A I am a mining engineer with a BS degree.

Q When did you graduate from college?

A In 1935.

Q By whom have you been employed?

A I have been employed for a period of about five years by small gold mining operations, approximately five years with the United States Bureau of Mines, and for the past sixteen years with the Potash Company of America.

MR. BLACKMAN: If the Commission please, I offer Mr. Cummings as an expert mining engineer.

MR. PORTER: The Commission considers him a qualified witness.

You may proceed.

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Q (By Mr. Blackman) Mr. Cummings, I hand you a document marked for convenience Potash Company of America's Exhibit 1 and ask you what that is.

A This is a potassium prospecting permit issued by the Department of Interior, Bureau of Land Management, covering the following lands: Township 20 South, 29 East, NMPM, Section 11, all of Section 12, SW¼, Section 13, NW¼, containing 960 acres.

Q Mr. Cummings, does that prospecting permit embrace the land which is the subject of this hearing?

A It does.

Q I will ask you whether the Potash Company of America has applied for a lease under the privilege granted in that prospecting permit?

A Not to this date. It is their intention to do so.

Q I will ask you, Mr. Cummings, whether that prospecting permit contains a preferential right in the event of discovery by Potash Company of America of commercial potash?

A Yes. It contains the clause which provides the privilege of going to lease on subject lands.

Q Has a discovery of commercial potash been made upon the lands covered by the potash prospecting permit?

A It has.

Q What is the extent of that discovery and where is it located? Where was the discovery made?

A Well, the discovery was made -- would you furnish me

with that first exhibit and I can give it to you if you want it specifically.

MR. BLACKMAN: Would you mark this please.

(PCA Exhibit No. 2 marked for convenience.)

Q (by Mr. Blackman) Will you refer to PCA's Exhibit 2 on the wall and indicate the location of the discovery of the prospecting permit?

A It is marked on the exhibit PCA 175 drillhole which is located near the SW¼ corner of the NW¼.

Q That location is in the SW¼ of the NW¼ of Section 13?

A That's correct.

Q That is the same 40-acre tract in which Mr. Haskins proposes that his well be located?

A That is true.

Q What was the grade thickness of the potash disclosed by the drilling at that location?

A The thickness was four feet, grade 16% K20.

MR. BLACKMAN: Would you mark this, please.

(PCA Exhibit No. 3 marked for convenience.)

Q (by Mr. Blackman) Mr. Cummings, will you please refer to PCA's Exhibit 3 placed on the wall and identify it.

A Exhibit No. 3 is a plan showing our project area of development for the coming -- that is anticipated for the coming five years. The area colored red is the area of actual mining workings; the outer margins that are colored light orange are the

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areas in which we anticipate the development and mining that will take place during the coming five years.

Q Would you indicate the depth of the potash zone at the location of drillhole No. 175 as shown on Exhibit 2.

A At drillhole No. 175 it is approximately 515 feet. I might add that the range of that projected ore body within that 40-acre tract that is the SW¼ of the NW¼ would be between 515 feet and 550 feet.

Q Why does that vary?

A The variation is due to surface topography.

Q Referring to Exhibit 2, I am going to place the initials A and B designating a line which appears on that exhibit and I will ask you to identify the line AB.

A The line AB represents an estimated position of the cutoff of ore at a thickness of four feet and at a grade of 14 percent.

Q Mr. Cummings, is Exhibit No. 2 a print of the same exhibit which was introduced in the hearing in Hobbs in Case No. 2241 which was the case where the SW¼ of the NW¼ was ruled by the Commission as being properly within the boundaries of Order R-111-A -- the result of that hearing was Order R-111-F -- setting the boundaries to include this tract?

A This is a print of the tracing from which the print that was turned in as an exhibit in that case was made.

Q Will you explain how that line was fixed in the position

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in which it shows on that print?

A The line was fixed by interpolation on a straight-line basis.

Q Will you identify it?

A It is between Drillhole 175 and Drillhole 176. Drillhole No. 176 shows no potash. It is given a zero value. Drillhole No. 175 is given a value of four feet with sixteen percent. The method of formula which was used in arriving at the position of the interpolated line AB in that specific area was as follows: The product of the thickness and the grade at 175 which is 64 feet percent minus the assayed grade thickness at 176 which is zero, divided by the distance between the two holes which is 3600 feet equals the product of thickness times grade on the basis of four feet at fourteen percent over "X", the "X" being the distance from Potash Company of America's 175 to the position of the interpolated line.

Q It might otherwise be explained by stating that it is interpolated on the assumption that the grade and thickness will uniformly fall off from the position where you show it and prove it by the core test to the other tests which you use as a control and which shows no potash?

A That is correct. We envisage a uniform tapering or thinning out between the two control points.

Q You call that method straight-line interpolation?

A Yes, sir.

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Q Now, does this line as it is shown on Exhibit No. 2, line AB, coincide in the SW¼ of the NW¼ of Section 13 with a similar line of four feet or fourteen percent of potash which is calculated by the USGS mining branch?

A No, it does not, inasmuch as they have used a different method of interpolation, their method being that of arbitrarily projecting the thickness and the grade, or more clearly stated, the ore zone, 1000 feet beyond the point at which it is known to occur which places it approximately 550 feet further out.

Q Would you please place a line which I would like you to label CD on that map in the approximately location of the USGS line, limiting your line to the southwest northwest quarter of Section 13.

Is the line CD also on the basis of four feet of fourteen percent K20?

A Yes, it is.

Q Mr. Cummings, why did we make projections of this kind?

A The normal method for determing the existence or non-existence of ore deposit is by drilling from the surface and taking core intersections of the various strata that you pass through and it's quite necessary to arrive at some means of estimating and evaluating the results of these core tests.

First, in determining the economic aspects of the deposit, to determine whether or not it is of sufficient quantity and quality to justify the expenditure to develop it; secondly, core tests

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are used and the information is used for projecting mining plans.

Q Did either one of these lines, AB or CD on Exhibit 2 represent the boundaries of the ore body?

A Neither. It isn't purported that either line represents the terminus. It's an average line. It's an estimated line, and as you will note, a relatively regular line whereby we expect an actual indication that it's going to be, that actual ore boundary is going to be very irregular. It will be an undulating line. It's not affixing the actual terminus of the ore body. It will be found to be very conservative where interpolated by the method we have used, that is, by straight-line interpolation. It's a method that we have used and was used in the initial stage of development of the ore body. It has been used in projecting reserves over the years. It has been found that it is very conservative and when one is charged with the responsibility of making these projections, it is always wise to be on the conservative side, and therefore, the method has proven feasible from that standpoint.

Q When you use the word "conservative" do you mean we would expect to find ore of higher grade and thickness on the average than is shown by the interpolated line?

A It is anticipated that the ore will extend in all probability beyond the interpolated line.

MR. BLACKMAN: Would you mark this exhibit please.

(PCA Exhibit No. 4 marked for convenience.)

MR. PORTER: At this time, we will take a ten-minute

break.

(Morning recess taken.)

MR. PORTER: The hearing will come to order, please.

You may continue, Mr. Blackman.

Q (by Mr. Blackman) Mr. Cummings, would you refer for the moment to PCA Exhibit No. 2 and indicate the location of the potash ore body with respect to line AB.

A This is the tracing of the line on the print which represents Potash Company of America's interpolated line at four feet of fourteen percent. Line CD which lies to the outside of that is the USGS interpolation line. That is on the same footage and basis, four feet of fourteen percent.

Q Those are average lines concerning which you testified a few moments ago?

A That is true.

Q Now, Mr. Cummings, will you refer to Exhibit No. 4 and tell the Commission what the chart represents?

A This chart represents a condition, an actual condition that exists with relationship between the actual mined-out area or face with relation to the interpolated line at a definite footage or content cutoff. Now, this area is along the west margin of our mine workings. The first mining was completed here several years ago at which time we were using the conventional method of mining, that is, drilling and blasting, whereby now we use the continuous mining machine.

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Further, at that time, our grade cutoff was considerably higher than it is today. The actual thickness that we were breaking off at was 54 inches and we were stopping at an ore grade of 20 percent. So this line which has been placed on here -- this line here (indicating) -- is interpolated between the drillhole based upon actual grade to which we were mining at that time, grade and thickness.

Q Would you please put the letter A at the north end of the line concerning which you just testified and B at the south end of that line. That is the average line that you were talking about.

Now, the line AB on Exhibit 4 is the interpolated line?

A That's correct.

Q I notice an arrow and pink dots to the right of the line AB. Would you identify those pink-colored circles?

A The pink-colored circles indicate drillholes when core tests were taken and they represent drill holes which contained ore. Number 68 contained ore; 56 ore, 65 ore; Number 33 contained ore, Number 101 contained ore; 105 contained no ore; Number 34 contained no ore, Number 56 contained no ore; Number 67 no ore and Number 73 no ore.

Q With respect to the location of the principal ore body or the ore body lying to the east of that line AB would you indicate that on Exhibit 4 as to where that is? Those pink dots are within the ore body?

A That is correct. I might explain that is the north direction. We are mining in from the east and this line represents the actual mining face.

Q When you refer to "this line" would you please place a C at the north end of that line and a D at the south end of that line on Exhibit 4.

This area has been mined out by first mining methods to the east of the line CD?

A That is correct.

Q Did you use the same method in interpolating the line AB as was used on Exhibit 4 -- I will rephrase that question.

Did you use the same method in interpolating the line AB on Exhibit 4 as you used in interpolating the line AB on Exhibit 2?

A Yes, I did. That was straight-line method.

Q That was straight-line interpolation method?

A Right.

Q There is an area between line CD and line AB which in some cases is colored pink and some cases colored green. What is represented by the area colored pink?

A That represents the area that was actually mined beyond the interpolated line, the area that is colored green represents the area whereby the line was not reached when we reached this cutoff that we have interpolated to. In other words, this is a plus line and this is a minus area.

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Q In other words, the pink area is a plus area and the green area is a minus area?

A That's right.

Q With respect to the area that is contained in the pink there and the area in green, how much was gained and how much was lost with reference to line AB?

A On the basis of the area, the ratio of the area gained to the area lost is four-point-one-seven to one. Expressed in percentages it would be 80 percent over and 20 percent under.

Q You previously testified that interpolated line is a regular line. Does the line AB on there represent that kind of a regular line?

A Yes, it does. It's a straight line run between points interpolated points between the drill holes. That is a regular line.

Q Would you repeat that answer?

A It's a straight line drawn between the interpolated points, between each drill hole. In other words, a point taken on a line connecting Drillhole 105, 102, 101, the point of which falls here. The point was interpolated between Drillhole 33 and 34 which falls here and a straight line drawn between those two points which is a regular line.

Q You also testified that that represents an average. Is that the type line you were talking about when you used the word "average" in testifying concerning this line?

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A Yes, it is.

Q You also testified, Mr. Cummings, concerning an irregular line representing the boundary of the actual ore body. Does line CD represent that type of irregular line?

A Yes, it does represent that type of irregular line that I mentioned.

MR. BLACKMAN: Would you mark this exhibit?

(PCA Exhibit No. 5 marked for convenience.)

Q (by Mr. Blackman) Will you kindly refer to the document marked for convenience Potash Company of America Exhibit 5 and explain to the Commission what that represents.

A This is another illustration of a relationship between an interpolated line based on straight-line interpolation and actual ore faces taken in another section of the property. I might point out that these are the only two places where we have reached the margin of our ore deposits within our mentioned lease area.

That area lies right in here. It's a somewhat lesser distance or length of face than we have here. If you will note on Exhibit 4 that distance is two miles whereby here it's 1.2 miles.

Q Would you explain the round pink dots on Exhibit No. 5.

A Here again the round pink dots represent drillholes in which ore intersections were found.

Q How about the yellow dots?

A And the yellow dots represents drillholes in which no ore was found.

Q Will you kindly label on Exhibit 5 the interpolated line by using the letters AB and indicate on Exhibit 5 the boundary to which mining was actually conducted with the line CD and will you state whether Exhibit 4 and Exhibit 5 show the same condition except that in Exhibit 4 the ore body lies along the east boundary of the sketch and the ore in Exhibit 5, the ore body lies along the west boundary of the exhibit?

A That is correct. In Exhibit 5 we mined westward to the east.

Q Does the line AB represent an interpolated line fixed by using the same method which you used in fixing the line AB on Exhibit 2?

A Yes, by the same straight-line method of interpolation.

Q Although the values used were different?

A The values used here were the same as the values used in Exhibit 4.

Q The values used in Exhibit 5 were the same as those used in Exhibit 4?

A That is correct. In other words, here again this area was mined seven years ago during which period we were using conventional mining methods and ore grade cutoff was substantially higher than used at the present time.

Q Does the line AB in Exhibit 5 represent a cutoff at the

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same point as the line CD in Exhibit 5?

A Yes, it does.

Q And again, it's the same as the cutoff line AB in Exhibit 4?

A Yes, it is.

Q And the line CD in Exhibit 4?

A Yes.

Q Mr. Cummings, will you explain just what is this so-called four feet or fourteen percent line which you have interpolated on Exhibit 2. Where did that come from?

A I have been unable to testify as to how it was arrived at. I have tried to find out and nobody seems to be able to tell me. However, it was a thickness grade established by the USGS some ten or twelve years ago. What basis they used for establishing it, I do not know.

At that time, the ore thicknesses and ore grades being mined were substantially higher than those being mined today.

Q Can you tell us what those grades and thicknesses being mined ten or twelve years ago were?

A The thickness of the ore on an average was about a minimum of five feet. The grade ranged between 18 per cent K20 and 28 percent K20.

Q Now, what thicknesses are currently being mined at Potash Company of America?

A Potash Company of America is currently mining thicknesses

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as low as 48 inches. I might add that we have on the drawing board, and pretty well along with the engineering to the point where it looks practical, a continuous mining machine with which we anticipate we are going to be able to mine as low as 42 inch thickness.

MR. PORTER: Provided it is fourteen percent or better?

THE WITNESS: Not necessarily so down the line. It might even be less than fourteen percent.

MR. PORTER: Thank you.

MR. BLACKMAN: I would like to have this marked, please.

(PCA Exhibits 6, 7, and 8 marked for convenience.)

Q (by Mr. Blackman) I hand you a document marked PCA Exhibit 6 and ask you if you will identify that document, please.

A This document is a mineral production and royalty statement submitted to the New Mexico State Land Office by International Minerals Chemical Company setting forth the tonnage and grade of ore mined on a parcel of land which is under lease from the State of New Mexico.

Q What does Exhibit No. 7 indicate with respect to the grade of ore in percent of K20 which was mined during the period covered by this report?

A The first period covered by the report is the month of May, 1961, with a total tonnage reported as being mined was 64,662 tons. The average grade of this tonnage is 8.38 percent

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K20.

Q How many tons were mined during that period?

A Approximately -- during that period it was 64,662 tons.

Q Mr. Cummings, I hand you a document marked for convenience PCA Exhibit No. 7 and ask if you will identify that document and give similar testimony concerning it.

A This document is another mineral production and royalty statement submitted to the New Mexico State Land Office with regard to tonnage and grade of ore mined by International Minerals and Chemical Company on the same parcel of land for which Exhibit 6 was submitted. This covers the period of the month of June, 1961, and shows tonnage mined as being 66,201 tons, averaging 11.3 percent K20.

Q I hand you a document marked PCA Exhibit No. 8 and ask if you will give similar testimony concerning that document.

A This document is another mineral production and royalty statement submitted to the New Mexico State Land Office relative to tonnage mined by International Minerals and Chemical Company on this same parcel of land that was previously mentioned in connection with Exhibit 6 and Exhibit 7, covering the month of July, 1961, on which they report tonnage mined, 62,098 tons with an average grade of 9.44 percent K20.

MR. BLACKMAN: Would you mark this as PCA Exhibit 9.

(PCA Exhibit No. 9 marked for convenience.)

Q (by Mr. Blackman) Mr. Cummings, I hand you a document

marked PCA Exhibit 9 and ask if you will identify that document.

A This document was prepared by me and it summarizes the production mentioned in documents labelled Exhibits 6, 7, and 8 showing a total tonnage mined during the period May, 1961, through July, 1961, as being 192,961 tons, the average grade of which is 9.72 percent K20.

Q Will you testify concerning the new construction which is currently in process and progress at Potash Company of America.

A We are well underway with a construction program at Carlsbad which entails a complete plant, refining plant modification which we estimate will cost in the neighborhood of $4,000,000 to change over our process whereby we will be able to produce from ores of much lower grade than we presently can by current process. Also, at a much higher recovery rate. I might explain that the current process is one of flotation. The new process is one of flotation whereby in the first instance the process currently being used is the first flotation process developed for recovery of a concentration of potash ores whereby the salt is floated, that is, it's brought to the top and the potassium chloride is depressed. In the new process, which is termed amine flotation, the potassium chloride is floated and the salt is depressed.

Q Mr. Cummings, will you state what the present average grade of ore being treated at the Potash Company of America plant is?

A It is on the order of 20 percent at the present time,

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20 percent K20 content.

Q After this process change is in operation, what percentages do you feel we will be able to treat?

A It is my feeling that with the introduction of this new process combined with the mining techniques that we have developed, that we will certainly be mining ore to a grade cutoff of four feet of 10 percent K20.

Q When do we expect this new process to be on the line?

A Our schedule for the new process plant modification completion is about twelve months from now.

Q You have testified concerning grade cutoff and average grade. Would you kindly distinguish between those two?

A Yes. Grade cutoff line is a point at which you stop mining. In other words, the average grade of ore back of that line may be substantially - will be substantially higher than the actual cutoff.

MR. BLACKMAN: Will you mark this.

(PCA Exhibit No. 10 marked for convenience.)

Q (by Mr. Blackman) Will you please refer to the chart marked PCA Exhibit 10 and identify it please, particularly with reference to Exhibit No. 2?

A The area covered in Exhibit 10 is the same as the area represented in Exhibit 2. This exhibit shows -- Exhibit 10 shows the interpolated line four feet of 10 percent grade cutoff line using the same straight-line method of interpolation which was

used in arriving at line AB on Exhibit 2. That line is represented by this at the end of the pointer, here, that's the place of it.

Q Will you please identify that line which you just traced with your pointer by the line E and F.

There is another line that appears on there as a dashed line outside of the line EF. Will you please identify that line.

A That line shows the boundary of what we anticipate might be the edge of subsidance as evidenced on the surface as the result of removal of the ore in this particular area assuming that the ore grade cutoff is line EF. This line was arrived at by using the average actual measured established angle of subsidance which is taken at 45 degrees.

Q If the ore body itself is an irregular line such as is shown in Exhibits 4 and 5, the subsidance line would also be an irregular line, is that true?

A Yes, because it is the distance from the four feet of 10 percent interpolated line and it is the same. It parallels at all points.

Q Will you please identify the subsidance line on Exhibit 10 with the letters GH. Will you please locate the proper location of Mr. Haskins Texaco well in the SW¼ of the NW¼ of Section 13 on Exhibit 10.

A That is represented by this cross right there (indicating).

Q That is practically on the line EF, is that right?

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A That is correct. It is well within the inside of the area of influence, of subsidance.

Q Now, if an oil or gas well were drilled in that location, how close could you mine to that well location?

A If it was a live well or a producer, I would say that it would be necessary to leave a pillar, a solid pillar of at least 200 foot radius.

Q And on second mining by removal of a substantial part of the potash, how close would you be able to mine to that proposed location?

A In second mining, our cutoff would automatically be at this point here which is represented by line E.

Q That's the first mining cutoff?

A The first mining cutoff.

Q Now, where would the second mining cutoff line be?

A Let me correct that. That is not the first mining cutoff necessarily. If the ore should continue beyond that, on this irregular line, this would be the cutoff for first and second mining, this line (indicating).

Q Could you mine that close to that well on first and second mining if it were a live well?

A With the 200 foot pillar radius allowance. In other words, we would have to stop 200 feet inside or this side of the well.

Q Would you explain the difference in first and second

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mining?

A First mining is a method by which we first use the roof and pillar method which is accomplished by -- in our case by using continuous mining machines and conveyor-belt hauling.

In first mining as we are mining out to the margin of the ore body, we extract from 60 percent to 65 percent of the total reserves. At second mining, which we have not done up until now, but we certainly anticipate doing in the future, will be that of the removal of a substantial portion of the pillars that were left, probably amounting to about 25 percent to 30 percent of the total reserves while we are retreating back from the margin.

Q If you perform both first and second mining you will remove a total of approximately how much?

A Approximately 90 percent.

Q If you remove 90 percent, what will happen to the roof of the area in which you have mined?

A Based on experience of other companies where this has been done, we know that the roof is going to come in. The overlying formations are going to move. Movement will be vertical. It will also be horizontal. The subsidance as a result of this will be evidenced on the surface by a depressional area.

While this movement is taking place there will be shearing stresses and forces set up within the mass of material that's being moved that will be of great magnitude. It will be

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fantastic. So fantastic that certainly no oil well casing or multiple string of casings could withstand that. It would rupture them.

Q Now, if the producing well were discovered at the areas shown at Mr. Haskins' proposed location then you could not remove the 90 percent near that well?

A No, we could not.

Q You could not remove the 90 percent in any area where the subsidance movement might affect that well?

A No, we could not.

Q You testified that a 45 degree angle of subsidance was a reasonable average, I believe. Will you explain that?

A If I may refer to my notes in regard to this. Mr. Libby, who at that time was employed by United States Potash Company, introduced testimony in the case known as the Velma Case No. 1130, and produced exhibits showing that the angle of subsidance measured from the vertical ranged from 27 degrees to 52 degrees and 20 minutes.

Q That's degrees from what?

A From the vertical.

Q Why did you use the 45?

A The forty-five was used because it was so stated in that testimony that pointed out that one might expect or anticipate in virtually all cases an angle of 45 degrees.

Q Now, Mr. Cummings, you are familiar with the fact that

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Potash Company of America has an ore reserve in Lea County, New Mexico. Will you tell the Commission the approximate extent of that reserve?

A Several years ago, dating back between 1950 and 1952, Potash Company of America conducted quite an extensive exploration program on 10,000 acres of land held under lease from the Federal Government by Potash Company of America, spending approximately $600,000 on this program.

The program resulted in the development of an indicated reserve of potash, the grade of which averaged approximately 17 percent K20 and average thickness of about six and a half feet. Some oil-gas drilling had been done in the area prior to that time but not as much drilling as since that time. In fact, it has been so extensive that it is my feeling that now what we thought to be at that time prior to this drilling an economic ore deposit has been rendered sub-marginal at best as the result of this oil-gas drilling.

The depth to the potash bed in the area is on the order of 2300 feet. Allowing for this 45 degrees subsidance angle, that means that you're eliminating approximately three-quarters of a section for every oil-gas well that is drilled on 160-acre spacing. This to me is quite serious so far as conservation practices are concerned.

In dollars and cents, the impact of that might be expressed. My estimate of the gross value of that ore deposit --

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I am speaking of gross values based on current prices for potash -- was on the order of $300,000,000. By denial of the right of recovery of approximately 25 percent of that reserve -- 25 percent to 30 percent of the reserve -- which was planned in our first estimate that would be taken by second mining which now has been denied, we have reduced the value, the gross value of the deposit to approximately $180,000,000, by approximately $180,000,000 -- pardon me.

Q Mr. Cummings, you testified that that ore body at the present time was sub-marginal at best. Would you give your opinion as to whether or not that Lea County ore body could be profitably mined on the basis of the present market and mining conditions?

A In my answer, it cannot.

If I may make a correction. I was right in the first instance when I stated that it reduced the gross value of the deposit to $180,000,000.

MR. PORTER: From what figure?

THE WITNESS: From $300,000,000.

MR. PORTER: Thank you.

Q (by Mr. Blackman) I understood you to say that in substantially all of that area second mining would not be possible because of the producing oil-gas wells which are there, is that correct?

A That is correct. I might add that there is current

drilling being conducted or there has been additional drilling done to which we have objected but to no avail.

Q Mr. Cummings, will you testify concerning the leakage of oil which we have had in Potash Company of America mines?

A We have encountered in one section of our mining an oil seepage within the salt section in the proximity of our, of the horizon, which is attributed to an oil-gas well which was drilled, I believe, in the '20s some 1500 feet from a point at which this seepage has been noted underground. I might add that a record of this well indicates that it was abandoned as a dry hole.

Q What are the extent of open workings at Potash Company of America mines?

A The total linear extent of our workings is approximately 700 miles.

Q You mean the equivalent of a tunnel 700 miles long?

A If it all were put end to end, yes.

Q And about how wide?

A The average width is approximately 32 feet.

Q And are all of those openings inter-connected?

A Yes, they are.

Q What would be the effect of a leakage of gas in the mine?

A Well, it is very doubtful that a leakage of gas could be isolated. It probably would permeate the entire mining work-

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ings.

Q Would it then be possible to conduct mining any more?

A Not if a leakage was of, we'll say, a concentration of one-tenth of a percent or more throughout the mine workings. It would not be possible because of the hazard to life and the danger of explosion.

Q You have testified concerning some values. Will you please give the basis on which you calculated those values?

A The basis used in calculation of values was, first: Tonnage was calculated by using a tonnage factor of 15.3 cubic feet per ton and the process recovery at 90 percent unit sales price at 36.5 cents per unit of K20.

Q Can you give me some values on per acre basis of four feet of ten percent, say?

A Yes, I can.

Q What would they be?

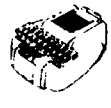
A The total value per acre based on a 90 percent recovery of the reserve -- that's by mining -- is $33,620.

Q And what part of that is divided into first and second mining?

A First mining, assuming we had mined 65 percent on first mining, that value is $24,270 per acre.

Q And the second mining?

A Second mining, assuming a removal of an additional 25 percent of the total reserve, would be $9,350.



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Q Making a total of $33,620?

A Right.

Q Would you convert that to four feet of fourteen percent?

A Yes. The total value would be $47,100.

MR. BLACKMAN: That's all I have from this witness at this time.

MR. PORTER: Are there any questions of Mr. Cummings?

CROSS EXAMINATION

BY MR. BRATTON:

Q Mr. Cummings, going to your Exhibit No. 1, the prospecting permit, what is the date of that permit?

A I don't have that with me.

Q The reason I asked is that the copy does not show the date.

A November 1, 1960.

Q It can be converted into a potash lease?

A That is correct.

Q But you have not done so?

A We have not done so.

Q The particular 40-acre tract to which our attention is being directed in this hearing was added to the potash oil area by Order R-111-F on what date?

A I believe the date was April 13, 1961.

Q Do you know if this 40-acre tract is in what is known as the Secretary of Interior Potash Oil area?

A No, I do not.

Q But, prior to November 1, 1960, you had no prospecting permit on this 40-acre tract?

A To my knowledge, no.

Q Prior to April of 1961 this area was not in R-111-A?

A That is correct.

Q Now, I believe this Exhibit 3, the one on the far right -- I would like to direct your attention to that. The light pink-colored area are your existing mine working areas?

A That is correct.

Q How long has Potash Company of America been mining in this area?

A We have been mining approximately twenty-five years.

Q And the lighter area is the area that you anticipate mining in the next five years?

A No, not actually mining all of that area. That represents areas in which we expect to do some mining and to conduct development work.

Q What do you mean by " development work?"

A The driving of entryways preparatory to the establishment of panels and commencement of installation of haulage equipment, conveyor belts and so forth.

Q So it does not represent the area that will be mined in the next five years?

A No, definitely not.

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Q I notice the area that we are concerned with is in the little area on the lower left-hand corner of that map.

A That is correct.

Q And there is a barren area between that and the main potash deposit?

A From drilling hole information it's indicated there is not commercial potash in that area.

Q Do you anticipate running your tunnel through that barren area or do you anticipate sinking a new shaft?

A We anticipate a tunnel connecting with our main haulage way which is indicated by this line, these two lines here (indicating).

Q Now, Mr. Cummings, pursuant to Order No. R-111-A, you filed with the Commission a five-year project development plan, is that right?

A That is correct.

Q Does that five-year project development plan which you have filed with the Commission cover the 40-acre tract in question in this hearing?

A Yes, it includes that area.

Q When was that projected plan filed, sir?

A That I cannot answer because it was filed by our mining engineering department.

Q Mr. Cummings, if you have a copy of that five-year development plan, would you examine it to verify your recollec-

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tion with regard to this acreage?

A I don't have it with me.

MR. BRATTON: If the Commission please, I would ask the Commission to take administrative notice of the five-year plan filed by Potash Company of America to determine whether or not that plan does cover the 40-acre tract in question.

MR. PORTER: The Commission will take administrative notice of this plan and according to the regulations the file should have been filed in January of this year.

MR. BRATTON: I would further ask, I believe instead of the Commission taking administrative notice, I would ask that the plan be made a part of the record of this hearing. We do not have a copy of it, of course.

MR. PORTER: Is there any objection on your part to making this five-year development plan a part of this record?

MR. BRATTON: The one having been filed in January, 1961, I have no objection.

MR. BLACKMAN: I would like to ask Mr. Cummings a question here. I have asked Mr. Bratton and he said he had no objection. I wanted to ask Mr. Cummings when he last saw the exhibit which is on file with the Commission or a copy of it. He testified that this 40-acre tract shows on that plat. It's my recollection and Mr. Bratton said it does not and I don't think it does.

THE WITNESS: I misunderstood the question in regard

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to that. I thought he was referring to Exhibit No. 3.

I didn't realize -- as a matter of fact, I have not seen the one that was submitted in January.

MR. PORTER: Mr. Nutter, would you get that for us, please. I believe it might be in order.

MR. BLACKMAN: I can furnish you copies of it.

MR. PORTER: We will wait until we see what we come up with.

Mr. Bratton, would you please continue with your cross-examination while he's getting that document.

MR. BRATTON: Yes, sir.

Q (by Mr. Bratton) Now, Mr. Cummings, as we understand each other, the five-year development plan filed with the Oil Conservation Commission is not co-extensive with this projected development area on Exhibit 3, is that correct?

A As I say, I have not seen this development plan that was submitted in January of 1961.

Q But the project development area shown on Exhibit 3 are not supposed to represent the five-year forecast plan filed with the Commission?

A Not the one that is presently on file. This is the development plan that will be filed the first of January -- if that is the filing date -- 1962.

Q Now, to repeat for a moment, this light-colored area doesn't mean that you are going to mine all of that area?

A Definitely not.

Q Within that time?

A Definitely not.

Q Now, I direct your attention to the specific 40-acre tract in question here and let me ask you if the line which you have drawn there, separating the blue and yellow areas -- I take it the yellow being the area in which you anticipate some work?

A Yes.

Q Is that line the same line that you have on your Exhibit No. 2?

A No, it is not. It would coincide with the four feet of ten percent interpolated line shown on Exhibit 10 -- or it should coincide.

Q So, it is not supposed to coincide with the line of four foot of fourteen percent which is the line you used in the May hearing?

A In the May --

Q April hearing.

A In the April hearing -- no, it does not.

Q Now, Mr. Cummings, I don't have a ruler to measure but as I look at mine it still does not come up to the location, the proposed location of the Haskins well, does it?

A I would say on that map it may not. However, this map which is drawn more accurately, that is when I refer to the map I mean Exhibit 10, it is drawn on a larger scale and was more

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accurate in depicting the relative position.

Q Mr. Cummings, as I understand it, your average grade of ore that you are mining now is 20 percent?

A That is correct.

Q And the line that has been used by the USGS to define commercial potash -- I believe the line that's been used by everybody who has testified in one of these hearings up until this date has been the four feet of fourteen percent, has it not?

A To the best of my knowledge, I think it has.

Q So today for the first time we are getting a line of four feet of ten percent?

A I believe that is true.

Q Now, Mr. Cummings, I will direct your attention to a map which has just been placed on the board and which I will ask be identified as Haskins Exhibit No. 1.

(Applicant's Exhibit No. 1 marked for identification.)

Q (by Mr. Bratton) Do you recognize that map, Mr. Cummings?

A Yes, I do.

Q Is that the map that you introduced at the April hearing?

A Yes, it appears to be the same map.

Q It is the same map as your Exhibit No. 2 except it is colored?

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A That is correct.

Q Now, I notice on the line there that depicts the commercial limit of potash that part of that line is solid and part of it is dashed, is that correct?

A That is correct.

Q And at the April hearing Mr. Blackman asked you the difference between those. Would you repeat your estimation?

A The difference between the two dotted sections of the line represents an area on which we have too little information to actually determine what the average line might be.

In other words, we haven't completely delineated the ore body in this direction. The same is true here, that we are interpolating or we are connecting two points that are quite widely separated here that are interpolated.

Q Now, directing your attention to this 40-acre tract, Mr. Cummings, is the line, your commercial potash line that you have drawn to the north and east -- in other words, the direction of the Haskins well, that's a solid line?

A That's correct.

Q And basically the difference between the solid and the dotted line is that you are more certain of the solid line?

A Yes, we are more certain insofar as limitations of the interpolation is concerned.

Q So, at the time of the April hearing, insofar as this 40-acre tract was concerned, you placed this in evidence as de-

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picting commercial limits of potash in this 40-acre tract.

A Depicted on the basis of interpolation by the straight-line method. I might add that it was anticipated that there would be -- this entire 40-acre parcel subdivision would be included in the oil-potash area, was in anticipation of possible projections of the ore past that interpolated line, and also, to allow some area for subsidance.

Q And on the basis of the line of commercial potash as shown on that exhibit, would the Haskins wells at this location interfere with primary mining or with the secondary mining?

A If the ore actually stopped at that line, no.

Q All right, sir. On the basis of that line there would be no interference whatsoever with your operations?

A If the ore stopped at this line, there would not be.

Q So, in this hearing today Potash Company of America is having to move that line out to prevent the drilling of the Haskins well, is that correct?

A What we have attempted to do is to point out the possibility that it might interfere with the mining operations. In other words, that the ore might possibly project out far enough to the Haskins well so that it would interfere with the mining operation.

Q So, the most you can say about these other exhibits is that they're calculated to show that the ore might project out?

A That is correct.

Q Now, Mr. Cummings, on the basis of these three royalty statements about the production of one state tract for three months you're not saying, are you, that an average of 9 percent is commercial, are you?

A Yes, I am saying so because International actually is mining and processing that ore and at a profit.

Q Do you know that there could be other factors as to why they are processing this relatively low-grade ore?

A I think that I am not qualified to say what factors are involved insofar as International Minerals and Chemical Company is concerned.

MR. BLACKMAN: I have a witness from International who might help us.

MR. BRATTON: Fine.

Q (by Mr. Bratton) Going back to Haskins Exhibit 2, that shows the dry cores as far as potash is concerned, those barren of potash and those that do have potash, is that correct?

A You are referring to Exhibit No. 4?

Q No, Haskins Exhibit No. 1 which is the map you introduced in the April hearing.

A All right. The drillholes which are colored yellow have no potash. The drillholes colored red are ore intersections.

Q Have you calculated, Mr. Cummings, the distance from

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your commercial potash line as shown on that map to the proposed Haskins well?

A Yes, I have.

Q What is that footage, Mr. Cummings?

A If you will permit me to refer to my notes --

MR. PORTER: At this time we will recess the hearing until 1:30.

(Noon recess taken.)

(Hearing reconvened at 1:30 P.M.)

MR. PORTER: The hearing will come to order, please.

Mr. Bratton, would you continue with your examination.

MR. BRATTON: I believe we had a question pending at the time we recessed.

Mr. Reporter, would you read the question.

(Whereupon the reporter read the question as follows: "Q Have you calculated, Mr. Cummings, the distance from your commercial potash line as shown on that map to the proposed Haskins well. A Yes, I have. Q What is that footage, Mr. Cummings? A If you will permit me to refer to my notes --")

A The footage is 800 feet.

Q (by Mr. Bratton) That 800 feet to which you refer, Mr. Cummings, is the distance between the proposed Haskins well and the commercial potash limit as shown on Haskins Exhibit No. 1?

A Yes, that's right.

Q And the depth that we are talking about is 515 feet, is that correct?

A At the drillhole intersection, it is 515 feet. Projected beyond the area, it would reach a maximum depth of about 550 feet.

Q Using either figure you want to and using the 45 degree subsidance angle to which you have made reference, the Haskins well would not interfere with either primary mining or secondary mining within your commercial potash limits as shown on Exhibit No. 1, Haskins Exhibit No. 1?

A No, it would not if the ore terminated at that point.

Q Would you, just for the record, spot the Haskins well location, Mr. Cummings, on Haskins Exhibit No. 1 and also over on your Exhibit No. 3, the projected area.

Now, there has been some testimony about a four feet of ten percent cutoff line. Is it true that there are variables whatever cutoff line you use that in some areas ten percent might be commercial and in other areas fifteen percent might not be commercial? Are there variables depending on the amount of pay in the area?

A I can think of no variable that would cause that wide range in the grade.

Q But there are variables that could cause a range?

A I would say the range would be substantially less than ten to fifteen percent, something on the order of ten to twelve

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percent.

Q The four foot of fourteen percent is a figure that has been established by the USGS?

A I believe that is correct.

Q Is it being utilized by them?

A To my knowledge it is.

Q And the most you're saying about this four foot of ten percent line is that it might be commercial at that point?

A No. I am saying specifically that it is my belief with the modification in our plans which will make for higher recovery, lower processing costs with the mining techniques which we have developed, it is my firm belief that four feet of ten percent as a cutoff is realistic today in our operations.

Q These developments in your plant, Mr. Cummings, and the new mining techniques have not occurred since April of 1961, have they?

A No, they have been in the making for a considerable period of time. The mining development is something that has progressed over a period of the last ten years.

Q Would you refer, Mr. Cummings, to your Exhibit 10.

I believe it's covered up there.

Could we remove the one on top there, please.

First, I would like to ask in your primary mining, I believe you said you had needed a 200 foot radius pillar around a well in the area?

A Yes, I stated that. I believe that is the minimum that would be required if it was a producing well.

Q Is my memory correct -- has the footage of 100 foot radius been used in previous cases before this Commission?

A It possibly has inasmuch as there are occasions where we have left only 100 foot radius, but these were in a case where the well had been abandoned or it was a dry hole. It's also the radius of pillar left around our core tests within the area.

Q Was the 100 foot radius figure used in the last case before this Commission, that is the one involving the Cities Service and Colton wells?

A I could not say.

Q Would you use the same footage depending on the depth? Would you use -- if you were to use a 200 foot radius pillar would you use a 200 foot pillar if you were talking about a 900 foot depth?

A Yes, within that range I would use the same radius pillar. In the event you've got to depths of 2,000 feet, a substantially greater pillar would be necessary.

Q Refer to Exhibit No. 10, Mr. Cummings. Would you draw in light pencil -- or whatever you have -- a rough 200 foot radius around the proposed Haskins well.

A It will be very rough.

Q Yes. A very small portion of that circle comes within your four foot ten percent line, is that correct?

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A About one quarter, I would say.

Q A quarter of it?

A Yes.

Q What would be the estimated economic loss on potash on primary mining that would occur to Potash within that small circle?

A Are you speaking of the entire circle?

Q No, sir, the part you show as being potentially productive of potash.

A The 200 foot radius would constitute approximately one acre, so it would be one quarter of an acre or about $6,000 on primary mining at 65 percent extraction.

Q In other words, you draw a circle representing your 45 degree subsidance area, your secondary mining circle. Have you calculated, Mr. Cummings, what your loss on secondary mining would be within that area of the circle which is within your projected four foot ten percent line?

A No, I haven't.

Q Could you make a quick rough estimate, Mr. Cummings, or would that take too much calculation?

A Well, I'm afraid it might be meaningless because of crudeness with which I would have to measure the area.

As an estimation, I would say something on the order of one-fourth the 40-acre subdivision, or 10 acres, which would be excluded from secondary mining, and assuming 25 percent of

the total reserve recoverable by second mining, the value on that basis would be some $9,350 plus the additional loss in first and second mining which would be something on the order of $100,000.

Q Now, I am talking about the portion of the area that is within your line. When you say it would be one-fourth of the whole area of the 40-acre subdivision --

A That's an estimation.

Q -- Does that include the entire circle or the part within your line?

A I was looking at the part within the interpolated line, inside the interpolated line.

Q So, assuming all factors in favor of your interpolation of a four foot ten percent line, the uppermost estimate that you could talk about losing would be $100,000.

A That would seem to be in order.

Q Would that be affected, Mr. Cummings, by the fact that you are at the edge of the area? Here, we have been talking about a 45 degree angle of subsidance and I believe you said the gentleman who started that used, estimated between 25 and 52 percent.

A 27 degrees from the vertical and 52 degrees 20 minutes from the vertical.

Q Would you not, toward the edge of the area, be safer in using less than 45 degrees?

A Very definitely not.

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Q You think the fact that it is on the edge makes no difference?

A It makes no difference to the angle of subsidance.

Q Mr. Cummings, on Exhibit No. 10 your four foot ten percent line there is a solid line all the way through. Is there any significance one way or another upon the fact that you are now using a solid line all the way through rather than part solid and part dotted?

A No, there is not. It was merely made solid to make it very visible at a greater distance.

Q Do you show on there the existing Haskins well, the first one drilled?

A No, I do not.

Q You know there was a well drilled?

A Yes.

Q And completed there?

A I am familiar with that.

Q Did you obtain the reports on that from the laboratory?

A No, I did not.

Q Do you know if your company did?

A To my knowledge they did not. I think that if the company had obtained it it would have come through my department.

Q Does the information obtained from the drilling of oil wells sometimes reflect whether there is potash in the area or not?

A It may be. It all depends on what type of log is run.

Q You don't know whether you obtained the logs on that well and whether or not they reflected the presence or absence of potash in that well?

A I have not seen a single log on the well.

Q If it indicated an absence of potash in the well, would that not draw your interpolated line back further to the southwest?

A If you used straight-line interpolation as I have used in this case.

Q Or if it showed potash it would certainly bring your --

A The reverse would be true, it would bring it out. I might add in that connection that the logs -- I am sure you are referring to gamma logs, which is a logging device, a diagnostic tool indicating the presence of potash. They are not infallible. They could not be used for any more than to indicate the presence unless they were run by a special method, that is at a special speed calibrated source material and so forth.

Q That will be substituted for core?

A No, not a substitute for core.

Q If a log indicated potash it would have aroused your interest?

A Yes.

Q On the original line, four foot fourteen percent line that was in your April exhibit, Mr. Cummings, even allowing for

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considerable error in that line, it would move over quite a ways before you get into any disturbance of your potash activity by the proposed Haskins well. Is that not correct?

A So far as the primary mining is concerned, it could move it a 100 feet.

Q As far as secondary mining --

A As far as secondary mining is concerned, the subsidance line, I believe, would be about 250 feet from that well.

Q So, even if you have some error -- certainly extrapolations are subject to some error -- you could move over at least 250 feet before you got any interference with that line?

A May I ask are you referring to the subsidance line?

Q Yes, sir.

A Or are you referring to --

Q The area up to which you mine.

A Up to which we could mine?

Q Yes, sir. You could move 250 feet at a minimum before you interfered with your secondary mining?

A The subsidance line would extend 550 feet beyond this point. Measuring from the well back, 550 feet which is what we would want to leave, this would permit us going ahead approximately, oh, 350 feet beyond the four feet of fourteen percent interpolated line.

Q All right. Referring, Mr. Cummings, to your Exhibit No. 3 in your projected workings and referring particularly to

the 40-acre tract that we are talking about here, can you state to this Commission when you are going to be forming either primary or secondary mining in that area?

A I can't at this time state when the mining would take place in that 40-acre tract. I might definitely give you some indication within the range of years as to when it might happen.

It is our itent that development of the ore body of which that is a part will be taking place within the next five years. Our over-all estimated total reserves at the present time, of course, we are all hopeful we might extend that, but at our present rate of production, sixteen years in this mining area.

Q Is that primary or secondary or both?

A Inclusive of all mining within the present mining area.

Q So, you might be mining in this area some time after five years and up to sixteen years?

A That is right. That's as close as I could tie it down at this time.

Q Mr. Cummings, I believe Mr. Blackman asked you some general questions about the damage if a gas well were to cut loose in the middle of your potash mine and about an oil well that was completed and plugged before Order R-111-A and some damage that occurred from it. Is my judgment correct, is it a fair statement, Mr. Cummings, that what you actually want, what Potash Company of America wants is to close the entire R-111 area

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to oil well drilling? Is that what you want?

A We think that it is quite necessary for the preservation of the potash that no oil wells be drilled within the mining area, within R-111-A area that covers our mining lease area. We feel very strongly about that.

Q Any possible area within the R-111-A area that might be within range of your operations you want closed to oil well drilling?

A That is right.

Q If the other companies adopt the same attitude the effect would be to turn R-111-A area into another potash reserve?

A Yes.

MR. BRATTON: I believe we have no further questions.

MR. PORTER: Who's next?

REDIRECT EXAMINATION

BY MR. BLACKMAN:

Q Mr. Cummings, you did not by your testimony concerning the possibility of $100,000 loss up there mean to give the Commission the impression that you think that's where the ore body boundary is, do you?

A No, I did not.

Q Your previous testimony that that is a variable line and it might be anywhere between those points?

A It might not go beyond that, that is right. In all probability, it does go beyond that line based on our past experience.

Q Referring to PCA Exhibit No. 5, you note that drillhole 77 which appears in the pay area shows no potash. How did that happen and yet it shows it was mined all around.

A That's one of the things that does happen. It happens more than once within the interior of our ore body. By that I mean within this mining area where it appears that we may have done it intentionally, I can tell you it happened. We drilled into an isolated salt horse of very small size.

Q Is there any way to tell a salt horse or a general extended body of salt?

A Not by a pinpoint core test, no.

MR. PORTER: What is a salt horse?

Q (by Mr. Blackman) Will you explain what a salt horse is?

A A Salt horse is a portion of salt formation that is completely devoid of any potash mineralization or contains less than commercial value.

Q Drillholw No. 77 showed no potash, is that correct, as shown on Exhibit 5?

A I beg your pardon.

Q Drillhole No. 77 showed no potash as shown on Exhibit No. 5?

A It showed no potash.

Q Drillhole No. 81 showed no potash?

A No, it did not.

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Q And yet, potash occurred out to and beyond both of those holes?

A That is right.

Q Will you tell the Commission about the development of the Potash Company of America's mining machine, the kind of machine it is?

A I would prefer to send them a picture because it's quite a complicated device. It is a track-mounted machine with a revolving head with cutter teeth inserted in the head which cutter teeth virtually tear the potash out of the face. It is scooped up by a mechanical mining device to a conveyor and it is transmitted to the back end of the machine and further to a shuttle-type conveyor which in turn conveys the material to the main line haulage way whereby, in the greater portion of our mining, the main haulage system is a conveyor belt system.

Q The use of mining machines makes it possible to mine ore of considerably less thickness commercially than is possible with what we fefer to as conventional mining methods, is that right?

A Yes, sir, that is right.

MR. BLACKMAN: That's all.

I think we should do something here. I would like to ask Mr. Cummings to examine this exhibit here and with your permission, I would like to mark it and offer it as an exhibit.

MR. PORTER: You are referring now to the five-

year development plan as submitted last January:

MR. BLACKMAN: Yes, I have not looked at it.

Q (by Mr. Blackman) I hand you Exhibit No. 11 and ask you if you have ever seen that document before.

A No, I have not.

Q Was that document filed with the Oil Conservation Commission by Potash Company of America's employees or by employees in some other department?

A No, it was not filed from my department. From the initials on the drawing, I assume it was filed by the mining engineer department.

Q You testified this morning on cross examination that the 40-acre tract concerning which we are now before the Commission, in Section 13 appeared as part of the development plan on that map which had been filed with the Commission. Did you testify in error, Mr. Cummings?

A I testified in error. I misunderstood the exhibit to which reference was being made.

MR. BLACKMAN: Thank you, Mr. Cummings.

MR. PORTER: Mr. Morris?

RECROSS EXAMINATION

BY MR. MORRIS:

Q Mr. Cummings, on this exhibit that Mr. Blackman just handed you, the five-year projection, that shows the outline of the potash-oil area in ink, does it not, as it existed on January 16 of this year?

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A Yes, it is marked as such.

Q That's the date that that exhibit was submitted, was it not, January 16?

A January 9, 1961.

Q It was prepared on the 9th and, I believe, Mr. Jordan submitted it on the 16th.

A Yes, it was submitted on the 16th.

Q Does it show any indication of present or projected mining in Township 20 South, Range 29 East?

A No, it does not.

Q Mr. Cummings, I take it from your testimony that you would object to the potash -- would object to the drilling of this well of Paul Haskins anywhere in the southwest quarter of the northwest quarter of Section 13?

A Yes, we would object.

Q If the Commission should decide to consider approving an unorthodox location for this well, unorthodox meaning closer than 330 feet to the boundary line of the 40-acre tract, and approve an unorthodox location closer than 330 feet to the north line of the quarter quarter section, would Potash Company of America still object?

A Again, as to what management policy would be in that regard, my recommendation would be, however, that they do object. At this time, that's what my recommendation would be.

Q Would there be any objection on the part of Potash

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Company of America if the well were located at a surface location in the 40-acre tract immediately north of the tract under consideration and the well directionally drilled to the Abo location?

MR. BLACKMAN: I would object to that question. It seems to me we are here on a location within a particular 40-acre tract. The question whether we would object to a location in some other tract is not before the Commission at this time.

MR. MORRIS: Mr. Blackman, the Commission, in trying to arrive at a solution to this problem, a solution that would adequately protect the correlative rights of the potash operators and oil operators, might, it seems to me, very well consider alternative solutions to the problem.

MR. BLACKMAN: I think that is absolutely true. However, I think that the question of whether or not a well can be located on another 40-acre tract is a different question which would require a re-publication and a new notice.

I can tell you as far as I am concerned that we would object to the drilling of such a well at such a location.

MR. PORTER: Possibly that answers the question that he was trying to get at.

MR. MORRIS: I have no further questions.

MR. PORTER: Are there any other questions?

RECROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Cummings, what is your position with the Potash Company of America?

A I am administrative assistant in charge of exploration.

Q These five-year plans are filed by the mining engineering department?

A Yes.

Q I presume under your direction?

A No. The mining engineer department is under the operations and I am not connected with -- directly with the operating department.

Q So, that's the reason you hadn't seen the five-year plan --

A That's right.

Q --before it had been submitted?

A Yes, sir.

Q On your exhibit that has the pink and yellow on it, I don't know the number - Exhibit No. 3, did you state that you had been mining in this area for twenty-five years?

A Approximately twenty-five years.

Q It has taken twenty-five years to mine out this pink area?

A Twenty-five years to mine out that particular area on first mining only. I might state that our mining rate for the first half of that twenty-five years was very substantially less than our present rate of mining -- about one quarter of our present rate.

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Q Well, now, just by a casual observation of Exhibit No. 3 it would appear that the yellow area is almost the same size as the pink area. Do you expect to mine out in five years the yellow area --

A No.

Q -- what it has taken you twenty-five years to mine out?

A No, I would like to clarify that, that this yellow area is not what we expect to mine during the next five years. We have outlined the areas in which we can expect to be mining and conducting development work.

Q Is that what the five-year plan refers to, merely to run a drift back in there and find out if there is ore?

A Yes, that's what this five-year plan is as evidenced by Exhibit 3.

Q You don't mean necessarily it would be mined out within five years?

A No. As a matter of fact, it will not be mined out in five years. I can state that.

Q Do you know how far this extension of R-111-A sticks out like a peninsula in which you expect to run the drift in the proposed yellow area? Would it be necessary to sink any additional shafts in that area?

A No, it will not be necessary.

Q Are the little ink dots on this exhibit shafts that

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you have installed?

A No. That merely indicates the approximate location of the entryway which will be excavated to reach that particular ore body.

MR. BLACKMAN: I don't know if the witness misunderstood you.

Q (by Mr. Nutter) The little ink dots on that exhibit, two of them in section 4 and one down there.

A Those are shafts.

Q State law wouldn't require the drilling of any additional shafts over there in this other township?

A No, it would not.

Q On your Exhibits 4 and 5, Mr. Cummings, you have those lines AB which I understood to be straight-line interpolation of the limits of the ore body at the time the holes were drilled and then subsequently you mined past those straight line interpolations, is that correct?

A It's not quite correct. This interpolation was placed on here using the same basis of thickness and grade as we were using for a cutoff at the time the mining was done but that line was placed on there by myself just recently. I superimposed that on the mining plan.

Q What is that line AB based on? Is that ten percent, twenty percent, or fifteen percent?

A That is based on 54 inches at 20 percent.

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Q What is that, what Potash Company of America has been mining up to date, a minimum of 54 of 20 percent?

A No. As I stated in my testimony in regard to both of those sections those areas were mined several years ago; one area approximately ten years ago, and the other one about eight years ago and that was at a period when we were using conventional mining methods at which time our minimum height that we could mine and operate in the area efficiently was 54 inches, and our grade cutoff at that time was 20 percent.

Q With this new process that you expect to have installed within twelve months, you will be able to mine four feet of ten percent efficiently and economically, is that right?

A I feel that we will be able to, that is correct.

Q Has the money been budgeted for the modification of the plant to put that new process in effect?

A The budgeted construction is about 25 percent complete at the present time.

Q So this is firm?

A This is firm. It will be completed within the year, we hope.

Q Well, now, on your Exhibit No. 2, I believe it is, Mr. Cummings, you have got line AB, the crescent-shaped line,as the straight-line interpolation of your reserve. Is that a ten percent line or a twenty percent line?

A That is four feet of fourteen percent.

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Q Fourteen percent?

A Yes.

Q What is the USGS line CD?

A CD is four feet of fourteen percent based on a different method of interpolation.

Q It is the same grade but a different interpolation?

A Right.

Q Potash Company of America's core hole No. 176 and 176, on Exhibit 10. Does 176 encounter commercial ore?

A 175 encountered commercial ore at four feet of sixteen percent K20.

Q What about 176? Was there any ore?

A No ore at all.

Q Any thickness or quality?

A No.

Q Well, then, how did you make an interpolation of four feet of sixteen percent to zero feet of zero percent?

A That is a good question, as to how much the interpolation means. As I have tried to point out, it is one method, one means of arriving at cutoff lines. It is one that we have found that by taking into consideration the entire ore body has suited our needs for mine planning and so forth, the purpose for which information was developed. I believe that either method of interpolation is a reasonable method to use but neither one represents or is purported to represent the actual cutoff point at

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which the occurrence might or might not occur. That could only be determined by drilling at an impractically close spacing of holes and tracing of the actual boundary which is a very irregular line as is evidenced in Exhibits 4 and 5. Those are very -- I would say -- normal situations that you might expect but I think that they are both reasonable methods of interpolation and for want of something better to use, we use it. We use the straight-line method as a matter of consistency.

Q Now, roughly, you have gone the limits of four feet or ten percent at one-third of the distance from 175 to 176, is that correct?

A I don't know offhand what that distance is. It was calculated by the formula which I stated when I was describing straight-line interpolation, proportioning your grade thickness product and spreading it out over the distance between your control points based on the assumption that you have a gradual lensing or pinching out of the ore body.

Now, it might be a sharp cutoff. We have encountered places where it is a sharp cutoff. In other words, you will be in ore and you will go a few feet and you're up against salt. More frequently it has occurred throughout this particular ore body that it has been a gradual tapering sort of thing, a lensing out of the mineralization.

Q As a general rule, which occurs first when you approach the limit of the ore, does the quality decrease to zero or does

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the thickness of the bed approach zero first?

A The thickness of the bed thins down normally. In other words, when you are approaching the edge of the limit, normally F, we'll say, a few inches where we had a few feet, it may be the same grade as was contained in that greater thickness.

Q So you have a thinning out?

A Yes.

Q Of the ore body itself?

A Yes.

Q Is potash a salt, Mr. Cummings?

A Yes, it is.

Q A mineralized salt that lines the sodium chloride bed, is that correct?

A It is inter-mixed with the sodium chloride and concentration occurs in members within the main mass of halite.

Q Now, Mr. Cummings, you have mentioned that some area in here has had $300,000,000 worth of reserves and was reduced by $180,000,000. What area was that and which wells were the villains?

A This is in the Lea County area. The specific location, Township 20 South, Ranges 33 and 34 East. There are some 10,000 acres within those townships.

Q Where there is no mining being conducted at the present time?

A There is no mining being conducted there.

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Q Now, do you have the lease or the prospecting permits on the entire area that you show colored in yellow on Exhibit No. 3 as being the little extension?

A Whereabouts are you referring to?

Q The area in question today, when you are going to run that drift out there.

A Yes. We have that under lease or prospecting permits, I believe, in this area. It's within our lease area.

Q The prospecting permit gives the automatic option to lease if you so desire, is that correct?

A That is right.

Q Now, on Exhibit 10 you drew your subsidance line out and away from the ore body limit there. Is that drawn to approximately 515 to 550 feet from the ore limits?

A It's drawn at 550 feet from the ore limits.

MR. NUTTER: I believe that's all; thank you.

MR. PORTER: Are there any further questions?

MR. BRATTON: I would like to ask Mr. Cummings one further thing.

RECROSS EXAMINATION

BY MR. BRATTON:

Q Would you spot on Exhibit 10 the Haskins Federal No. 1 well, Mr. Cummings?

A What is the location?

Q 1980 from the west and 660 from the north line.

A 1980 from the west and 660 from the north?

Q Yes. That's the well that's directly on the line that you use to interpolate between your one core hole that is productive and your one that is barren of potash?

A Yes.

Q That's the well that we said a log on might give some information as to whether there is potash at that location or not. Although it's not as reliable, it would give you some indication?

A It possibly could, yes.

Q I will hand you, Mr. Cummings, -- and I will ask that it be marked Haskins Exhibit No. 2 -- a log on that well and ask you if that reflects the presence or absence of potash in that well.

A I would not be able to answer that without a stratagraphic log, I am afraid, and without a stratagraphic log of one of your coreholes to specifically pinpoint it on the horizon.

Q So you cannot tell from an examination of that log whether it indicates the presence or absence of potash?

A Not in its present form without the aid of additional information.

Q If it does indicate either the presence or absence of potash that, of course, would materially affect the interpolations you have made?

A No, it would not affect the interpolations. It might give an excuse to check with a core test.

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MR. BRATTON: I have no further questions.

MR. PORTER: Are there any further questions?

The witness may be excused.

(Witness excused.)

MR. PORTER: Mr. Blackman, do you wish to offer your exhibits into the record? Are you offering among these exhibits the five-year development plan which was filed in January of this year with the Commission?

MR. BLACKMAN: I think I should. I am willing to have it made part of our case.

MR. PORTER: What are those exhibits?

MR. BLACKMAN: We will offer in evidence Exhibits 1 through 11 and ask permission to withdraw the original of Exhibit 1 and substitute a copy.

MR. PORTER: Exhibits 1 through 11 will be admitted in evidence and you will have that permission, Mr. Blackman.

MR. BLACKMAN: I also have three more exhibits which were, I believe, Exhibits 6, 7, and 8, which were the reports made to the State Land Office by International Minerals and Chemical Company. I would like to withdraw the originals and substitute copies.

MR. PORTER: Yes, you may.

MR. BLACKMAN: I would like to call Ira Herbert.

IRA HERBERT

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called as a witness by and on behalf of Potash Company of America, having been first duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BLACKMAN:

Q Will you state your name, by whom you are employed, and your position there and how long you have been there.

A Ira Herbert, chief mining engineer, Southwest Potash Corporation, Carlsbad. I have been there approximately twelve years.

Q What is your professional degree?

A I received a BS in mining engineering.

Q You have testified before the Commission before and your credentials have been accepted?

A I believe so.

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

MR. PORTER: His qualifications are acceptable, yes.

MR. BLACKMAN: I offer him as an expert. Thank you.

Q (by Mr. Blackman) Mr. Herbert, you have sat here this morning and this afternoon and heard the testimony that was given by Mr. Cummings concerning Exhibits 4 and 5. I should like to ask you if a similar situation as disclosed by those exhibits has occurred at Southwest Potash?

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A We have mined a similar area, similar length, of only about 3,000 feet where we have discovered the ore limits, using the same system of calculating ore reserves and limits of an ore reserves, using straight-line projection. We have found over this 3,000 foot limit that there was about 70 percent more ore found beyond the original limits and 30 percent inside the limit that I had drawn.

Q Would you characterize the straight-line method as a conservative method of projection?

A We believe it is.

Q Is it sufficient for the purpose of recommending to the Board of Directors that they budget certain amounts of money for mining plans?

A Yes. We have already done so, that is, management has done so.

Q And also for a possible refinery change and the like?

A In reference to refinery, I am going to back off because I am not a refining man but in the overall picture refining changes enter into the possibility of a lot of our work.

Q You found it necessary to have some system for projecting your ore body?

A Definitely..

Q And this is a reasonable system in your opinion?

A I would like to state that in all cases in ore projections so far in our mining we have been strictly conservative on

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it and we have met all the projections that have been made.

Q Mr. Herbert, you have done considerable second mining at Southwest Potash. What is your opinion of a 45 degree subsidance line?

A We have assumed that a 45 degree line is conservative in this respect: That there are possibilities that the subsidance line will go beyond or below a 45-degree horizontal but we believe in all of our figures that a 45 is the line to be used.

Q What size pillar do you leave surrounding a producing oil well?

A We have not mined around a producing oil well and we are rather fearful of the one that we do have because of the age of the well. We do not know about the casing and our plans call for 250 feet radius.

MR. PORTER: Are you speaking of the one you do have abandoned and plugged?

A No, we have one pillar of 125 feet around a dry plugged abandoned well. I am referring to a case in which we would come to a producing well.

Q (by Mr. Blackman) Would you ever consider coming any closer to a producing well than the angle projected by 45 degrees?

A May I ask if you are speaking of first mining or second mining?

Q On first mining and second mining.

A No, definitely not.

MR. BLACKMAN: I believe that is all.

MR. PORTER: Does anyone have any questions of Mr. Herbert?

CROSS EXAMINATION

BY MR. BRATTON:

Q I believe you said that on producing wells that you have in your area they're old oil-producing wells and you don't know about the casing program on them.

A We have a record of the casing program but I do believe after a certain number of years that there is deterioration in the casing.

Q Those are wells drilled before R-111-A went into effect?

A Some fifteen or twenty years ago, some of them.

Q And on those wells, as far as your primary mining is concerned, you would leave a 250-foot radius pillar?

A Correct. We would not mine. We would leave a 250-foot solid pillar around that well.

Q When you say you would not mine within the 45 degree angle, you are talking about secondary mining?

A Correct.

MR. BRATTON: I believe that's all.

MR. PORTER: Anyone else have a question of this witness? The witness may be excused.

(Witness excused.)

MR. BLACKMAN: We will call Mr. Tom Gamble.

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T. L. GAMBLE,

called as a witness by and on behalf of Potash Company of America, having been first duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BLACKMAN:

Q Will you state your name and by whom you are employed.

A T. L. Gamble, Jr. I am employed by U. S. Borax Chemical Corporation in the capacity of junior geologist.

Q How long have you held that position?

A For about four and a half years.

Q What is your professional degree?

A I have a BS degree in geology.

MR. BLACKMAN: Would you mark this, please.

(PCA Exhibit No. 12 marked for convenience.)

Q (by Mr. Blackman) Mr. Gamble, has secondary mining been conducted at U. S. Borax?

A Yes, sir. Secondary mining has been conducted for several years, having possibly much more experience in it than any other potash operator.

Q Mr. Gamble, will you please refer to Potash Company of America's Exhibit No. 12 and identify that sketch.

A This is a sketch that was prepared several years ago. I understand it has been exhibited in one of these hearings. It depicts a final mined area which is in red with the subsidance

effect area in green, the boundary on that effect area being two-tenths of a foot of vertical subsidance.

Q The vertical and horizontal lines on there are mine grids?

A Surface grids with first degree triangulation points located at the intersection of those lines.

Q Do you know the percentage of potash which was removed from the pink area?

A We calculated that to be approximately 85 percent of the potash which has been removed and a portion of this -- more than that was lost pillars that weren't final mined at all. The deposit at that location from the surface extends 1,000 feet.

Q How thick was the ore body at that point?

A The ore body in this area very probably betwen eight and fifteen feet in thickness.

Q What was the maximum surface movement which was encountered in your survey investigations?

A In this specific area, I think we had a maximum of somewhere on the order of nine feet, which isn't the greatest subsidance we have experienced.

Q What is the greatest?

A The greatest is about 15 feet.

Q And that 15 feet was showing on the surface?

A Yes, sir.

Q About how much, if you know -- how much ore was removed from the mine?

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A Again, this was about 85 percent.

Q And what was the thickness?

A Much of that ore varied in the total area. It varied between 13 and 20 feet in thickness. Now, the subsidance was out over the thicker portion of the ore.

Q What is the maximum angle from the vertical which is indicated by this exhibit?

A This exhibit indicates a maximum angle of approximately 52 degrees over an area that was first mined.

Q What is the minimum as shown by that exhibit?

A I think about from previous cases it was 28 degrees.

Q That is on the opposite side from where the 52 degrees displacement took place?

A Yes, sir, that is true. That was over solid ground. We also have subsidance in there over solid ground of 41 degrees. Now, this green just reflects as to the two-tenths of one foot vertical subsidance. The effect extends considerably farther than that -- the degrees that I am speaking of, or two-tenths of a foot subsidance. We have subsidance effects actually extending out farther than our controlled grid.

Q Is that area still moving on the surface?

A Yes, sir, it is. We re-surveyed this area last spring for a new refinery site and it's still moving.

Q MR. BLACKMAN: I think that's all.

MR. PORTER: Are there any questions of this

witness?

CROSS EXAMINATION

BY MR. BRATTON:

Q Mr. Gamble, may I ask if the point of all this testimony -- do you agree that the 45 degree angle that is commonly being used in these hearings or do you disagree with it?

A I would agree that is an average angle to use. We have measured subsidance angles up to 52 degrees and the subsidance that we measure -- this 52 degrees -- that was the last station indicating possibly that the subsidance was even greater than that.

Q But you do not disagree with the basic 45 degrees?

A No, we use that in our calculations.

MR. BRATTON: That's all.

MR. PORTER: Are there any other questions of the witness?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Gamble, if you took on out to where you had zero subsidance the angle would increase appreciably above the 52 degrees, wouldn't it?

A Well, we don't know. We have very little movement at our last station. It wasn't vertical movement. It was horizontal movement.

Q Do I understand you had subsidance beyond the grid section located on that exhibit out to the last section station?

A Yes, sir. We assumed that they went beyond.

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Q Your cutoff line, the green line, there, is two-tenths of a foot?

A Yes, sir, in vertical movement.

Q Now, when the secondary operation commences how soon after the subsidance starts taking place on the surface?

A Eleven days.

Q After the pulling of the pillar?

A Yes. Now, the major subsidance in our measurements starts from 38 to 60 days after we start pulling the pillars.

Q How long ago did you commence your first secondary operation?

A It was before I was with the company. I understand that it was in about 1955.

Q Is subsidance still occurring in that area?

A That is the area I referred to. It is going down -- we don't know if it's going down but it's moving. These points move in a tortuous path, horizontally, going both up and down month by month. They did this when we were measuring it every month. We stopped measuring this grade some time ago and we measure the places between where the points had moved. We don't know what's happened in the interim period.

MR. PORTER: Are there any further questions of the witness?

You had one exhibit, Mr. Blackman?

MR. BLACKMAN: I do not have an extra copy of this ex-

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hibit now. We have not been able to locate the tracing from which that was made. This was introduced as an exhibit in the Velma petroleum case and copies are available in that. I will try and get you a copy, somehow.

MR. BRATTON: We have no need for a copy.

MR. PORTER: Do you want to offer this one?

MR. BLACKMAN: Yes.

MR. PORTER: The exhibit will be admitted into the record.

(Witness excused.)

R. H. LANE

called as a witness by and on behalf of Potash Company of America, having been first duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BLACKMAN:

Q Will you state your name, please.

A R. H. Lane, chief mining engineer. I am employed by IMCC.

Q Fir how long have you been employed by IMCC in that capacity?

A Six years.

Q What is your professional degree, Mr. Lane?

A I received a BS degree in mining engineering.

Q Have you previously testified before this Commission?

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A I have.

Q As a mining engineer?

A Yes.

MR. BLACKMAN: I offer Mr. Lane's qualifications.

MR. PORTER: He is acceptable.

MR. BLACKMAN: Would you mark this exhibit, please?

(PCA Exhibits 13 and 14 marked for convenience.)

Q (By Mr. Blackman) Mr. Lane, will you refer to PCA Exhibit No. 13 and identify it, please?

A That represents a section of International's mine approximately a mile and a half in width. The scale is 300 feet to the inch.

Q Would you kindly move over to the exhibit, Mr. Lane, and indicate that shaded area and tell us what that is.

A The shaded area represents -- right through here -- represents mining as of May, 1961.

Q Mining conducted by IMCC?

A That's right.

Q On State of New Mexico property?

A State Section 16. It shows that we mined 64,662 tons at 8.38 per cent K20 silverite.

Q Will you indicate on there the area mined during the month of June, 1961?

A Again, we mined during June 66,201 at 11.30 percent K20 silverite.

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MR. BLACKMAN: Let the record show Mr. Lane has indicated the area mined during the month of June by some lead pencil marks.

Q (by Mr. Blackman) Will you now indicate, Mr. Lane, the area mined in the month of July, 1961?

A July is the fringe area on the edge here (indicating). There again, we mined 62,098 tons at 9.44 K20 silverite.

Q Mr. Lane, would you identify Exhibit 14, PCA Exhibit 14?

A Exhibit 14 is a section that we mined -- Section 13. It's a blown-up section of the area.

Q Mr. Lane, the squares that are shown on that Exhibit 14, what do they represent?

A They represent the first mining pattern with a pillar twenty-five by twenty-five foot with a break-through width of twenty-eight foot.

Q This is what the mining area looks like after first mining?

A Yes, sir.

Q Now, you actually mined considerably beyond this end to the left on Exhibit 13, is that correct?

A Yes, sir.

Q But that is not shown on Exhibit 13?

A Just the shaded area, from there back to the north.

Q After this you proceeded to the left or in a westerly direction as shown on Exhibit 13, on first mining, and reached the end of the mining zone and then you retreated, is that correct?

A That is right.

Q You backed up and mined it on secondary mining on the way out?

A That is correct.

Q Did you allow the roof to fall in there?

A Yes, after second mining.

Q So that this area then has been mined for both first and secondary mining all along?

A Correct.

Q Mr. Lane, on Exhibit 14 there are lots of figures shown. Will you identify what those figures are?

A The figures represent sample types and sample grades. One of our methods of calculating the grade of an area for a particular month. The number on top represents the type and inches. The number on the bottom is the K20 silverite.

Q Was this sketch made up during the time that you were mining this area?

A Yes, sir. It's a copy of our monthly report for that area.

Q This represents a sort of map that is made after first mining is completed but before second mining has started?

A That is correct.

Q I note here, right about in the center, Mr. Lane, that figure 68, and underneath is 4.36. What does that represent?

A 68 inches of height with a K20 grade of 2.36.

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Q Who takes the samples?

A We have regular people assigned to that job.

Q Is it their business to take samples in areas of this king?

A Yes.

Q Who does the analyses?

A Our laboratory.

Q In each one of these figures, reading again, 66 inches of 5.76 percent, and going up, 66 at 4.87 percent, and up still farther directly over the 68 inches of 4.36 percent, and still above that 64 inches of 8.77 percent; and still above that, 69 inches of 5.65 percent.

Now, going one step to the right, 62 inches at 3.17 percent; once again, going up, 82 inches of 3.42 percent; and on the other side of the pillar, 58 inches at 6.22 percent.

Do they represent the grades of ore actually mined during the month of May in this area?

A For this average 8.37 percent. That is the average.

Q On second mining you came back and took part of each one of these pillars?

A That is correct.

Q So that this area that was sampled was moved right out?

A Correct.

Q The total grades that were mined on there represent commercial potash as far as IMCC has mined?

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Yes.

Q Mr. Lane, you heard the testimony concerning Exhibits 4 and 5, which show the projected mining and the lines of actual mining. Have you had similar experience at International of going beyond the projection?

A Yes, we have.

Q What is the present cutoff line of International for planning purposes?

A 54 inches at 13.

Q Nonetheless, you mined considerably less than that?

A That is correct.

MR. BLACKMAN: Thank you, Mr. Lane.

MR. PORTER: Does anyone else have a question of Mr. Lane?

MR. BRATTON: Yes, sir.

CROSS EXAMINATION

BY MR. BRATTON:

Q Mr. Lane, in the lower right-hand part of Exhibit 14 I see the figure 61 inches mined and 12.52 percent of K20, is that the average of the area?

A No, the legend for that map indicates what the numbers are.

Q Now, do I understand that in this area you mined as shown on Exhibit 14, that your average was 8.37 percent?

A In May, 1961, yes. That is the shaded area of Exhibit 14.

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Q What was the height, the average height?

A That is shown on Exhibit 14.

Q Would that be 62 inches?

A That is correct.

Q Now, you stated that you consider commercial as being 54 inches at 13 percent, is that correct?

A No, 54 - 13 is only the planning figure.

Q Planning for what, Mr. Lane?

A Equipment needs, for one thing, reserve reports.

Q Is that the figure you plan mining on the average, 54 inches at 13 percent?

A No, sir. That is just for planning, sir, planning and reserve map.

Q You calculated your reserves at below that level; you're actually not mining them, is that correct?

A No.

Q What did you use that figure to plan on, then, Mr. Lane? I don't understand you.

A For reserve reports which will give years of mining life on the conservative side. For example, 54 - 13 would be approximately 60 inches at 11 at about equal in K20 content, so you had to work back with heights.

Q I understand that, but I still don't understand the significance of that figure.

A It is not the figure you figure as commercial. 54 inches

is the limit of our present conventional equipment that we have. That establishes the heights, the minimum height. There again, we took 13 as a grade to go with that height.

Q You need 13 percent at that height to calculate your commercial reserves?

A For planning and for the calculation of the reserves, yes.

MR. BRATTON: I believe that's all.

MR. PORTER: Are there any other questions of the witness?

RECROSS EXAMINATION

BY MR. NUTTER:

Q The USGS in establishing this area in 111-A uses four feet of fourteen percent. 54 inches of 13 percent would be about the equivalent of 48 - 14?

A That would be close.

Q You stated that you had had similar experience along with other companies of actually when you're mining the stuff, having your commercial ore extended beyond the originally projected limits so what you attributed this as the result of mining engineering would be a little conservative in making your original estimate?

A No economical limit of how many test wells you can drill to obtain this information.

Q Well, it must be that the interpolation lines that they are drawing must be too close in if you can actually mine beyond those lines.

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A It seems to be that.

Q To what do you attribute this conservatism?

A In going beyond the projected limits, there are a lot of factors that contribute to it, changes in milling techniques, availability of new mining equipment, power haulage systems. Many times you can extend beyond and actually come out with a profitable venture. Other times you can't.

Q Does Potash Company of America have efficient milling operations similar to what Mr. Cummings stated that PCA would install this year?

A I cannot say. I do not know.

Q You are able to process 8.37 percent commercial ore and make money on it?

A Yes, sir.

MR. NUTTER: Thank you.

MR. PORTER: Are there any other questions of the witness?

He may be excused.

(Witness excused.)

MR. PORTER: Do you want to offer the Exhibits 13 and 14?

MR. BLACKMAN: I want to, yes.

MR. PORTER: Without objection, Exhibits 13 and 14 will be admitted into evidence.

MR. BLACKMAN: That constitutes the burden of going

forward, as I view it.

MR. PORTER: We will take a ten-minute recess at this time.

(Recess taken.)

(Hearing reconvened.)

MR. PORTER: The hearing will come to order, please.

Mr. Bratton?

MR. BRATTON: We will call Mr. Montgomery.

(Witness sworn.)

RANDALL MONTGOMERY,

called as a witness, having been first duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRATTON:

Q Will you state your name, occupation, and address, sir?

A Randall Montgomery, independent geologist in Hobbs.

Q Have you previously qualified before this Commission as an expert witness?

A Yes, sir, I have.

Q Are you familiar with the area in question in this case and have you investigated this area at the request of Paul Haskins?

A I have.

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

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MR. PORTER: Yes, sir, they are.

MR. BRATTON: Would you mark these exhibits, please?

(Applicant's Exhibits 3 through 8 marked for identification.)

Q (by Mr. Bratton) Mr. Montgomery, you have what has been marked Haskins Exhibit No. 3. Would you identify that exhibit, please?

A It is the lease of oil-gas lands from the Federal Government to the Texas Company.

Q Does it cover the 40-acre tract that is the subject of this case?

A Yes, sir, it does.

Q What is the date of that lease?

A January 1, 1957.

Q Does it have any potash stipulation in it?

A No, sir, it does not.

Q Is it a competitive oil-gas lease?

A Yes, it was.

Q That means it's sold at competitive sales?

A Yes, sir.

Q It covers the 40 acres in question in this hearing and 400 other acres, is that correct?

A Adjoining it, yes, sir.

Q You have what has been marked Haskins Exhibit No. 4. I will ask you to state what that is.

A Exhibit 4 is a lease-operating agreement entered into between Texaco, Inc., and Mr. Lawrence Edwards wherein they provide for certain obligations on this particular tract in question.

Q What acreage does it cover?

A Township 20 south, Range 29 east, Section 13, northeast quarter of the northwest quarter and the southwest quarter of the northwest quarter.

Q Those are two 80-acre tracts covered by that operating agreement?

A Two 40-acre tracts, total 80 acres, yes, sir.

Q This grants Mr. Edwards operating rights on those two tracts?

A Yes, sir.

Q Does he have to drill both 40-acre tracts in order to earn them?

A Yes, sir. He had to drill a second well within ninety days after completing the first.

Q One of these 40-acre tracts is at the northeast offset to the tract we are talking about now?

A That's correct.

Q That northeast offset is where Mr. Haskins drilled his Texaco Federal No. 1?

A That's correct.

Q All right, sir. The other 40-acre tract that we are talking about here under the terms of the operating agreement

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must be drilled for him to earn his rights?

A That's correct.

Q What is Exhibit 5?

A Exhibit No. 5 is a consent agreement between Mr. Edwards and Mr. Paul Haskins wherein he conveys, Mr. Edwards conveys his rights to Mr. Haskins.

Q So Haskins has acquired his operating rights in these two 40-acre tracts pursuant to that assignment from Mr. Edwards?

A That's correct.

Q Now, you have what has been marked as Haskins Exhibit No. 6. I will ask you to identify that.

A Exhibit 6 is a Notice of Intention to Drill submitted on U. S. forms subject to approval by the USGS. It sets out the proposed location of the Texaco Federal No. 2, the proposed casing program and that they will abide with rule R-111-A.

Q What does it show as the proposed location of the well and the depth?

A 650 feet from the north line and 990 feet from the west line of Section 13, Township 20 south, Range 29 ease.

Q Is that the location that has been reflected on various exhibits introduced by Potash Company of America?

A It is.

Q Does the lease abide with all of the requirements of Rule R-111-A as far as casing and cementing programs, etc.?

A It does.

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Q Now, subsequent to the filing of that application, there was a protest and arbitration hearing, is that correct?

A That's correct.

Q Which resulted in this hearing today.

A That is correct.

Q I refer you to what has been marked Haskins Exhibit No. 7 which is on the board and I will ask you to explain that exhibit.

A Exhibit 7 is just a regional map outlining the oil-potash area defined as R-111-A in dark lines and also the area outlined by the Secretary of the Interior in the heavy lines. The red dots represent the existing productive shafts of the existing productive potash in the Carlsbad Basin. The small red squares depict the 40-acre tract the subject of this hearing.

Q Is that 40-acre tract in what is known as the Secretary of Interior Potash Area?

A No, it is not.

Q It is within Order No. R-111-A?

A Yes.

Q That was by a decision of this year?

A By Order No. R-111-A.

Q I refer you now to Haskins Exhibit No. 8 and ask you to explain that.

A Exhibit No. 8 -- the colors depict the potash leases. The red depicts Potash Corporation of America's lease in the area.

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The green, the National Potash, the brown, Duval, and the blue, an individual. The cross hatched red area in re-apportion of the map is a PCA lease that was dropped recently. It is no longer in effect.

The yellow squares depict the acreage that Mr. Haskins has the right to develop according to his operating agreement.

Q This tract in question is not under the potash lease. It is under permit but not under lease?

A That's correct.

Q Go ahead.

A Also on that map a little larger circle depicts the proposed location in the southwest of the northwest quarter of Section 13; and also in that general area I was furnished the general location of the core drillholes that were drilled for potash, one being located in the extreme northeast corner of Section 14 which encountered no commercial ore, and also, in the extreme northwest corner of the northeast quarter of Section 13. It, also, did not encounter any commercial potash ore.

The third corehole drilled for potash exploration is in the extreme southwest corner of the northwest quarter of Sec-13 which did encounter commercial ore as defined by the USGS. It has been referred to previously in this hearing.

Also on this map outlined with a small dashed line is the boundary of Order No. R-111-A. The initial well was outside the jurisdiction of that order but the present subject well is

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subject to Order No. R-111-A. The broader lines are structural contour lines depicting my interpretation of the structural conditions in and around what is known as the Getty Oil Pool and also a portion of this property. It is contoured on top of the tansil or the base of the salt, whichever you prefer to call it.

Q What does that reflect with relation to the possibility of oil in the 40-acre tract in question?

A That indicates that our proposed location should be approximately 50 feet higher than the existing well and there is no reason to doubt that we shouldn't encounter a little better production a little further above the water table. Further, if we are not permitted to drill this particular location, there is no way that the existing well can drain that particular 40-acre tract to any degree.

Q What kind of drive is this pool?

A Water drive.

Q So that this being up dip, the other 40-acre tract that Mr. Haskins owns cannot drain this well?

A That's correct. We are unable to lower the fluid level as it is.

Q What information do you have relative to recoveries in this area, recoveries of oil? What would that indicate to you with relation to potential recovery of oil from this well?

A Based solely on the producing history in the Getty Pool which this well is classified as, other wells in the field have

averaged about 153,000 barrels of oil per well. The largest well has produced slightly over a million barrels of oil and the medium in range of approximately 80,000 barrels of oil. I see no reason why they couldn't expect the same magnitude of recovery in this well.

Q If offset wells are drilled to this tract and Mr. Haskins is denied the right to drill on this tract, would that drain this tract?

A Undoubtedly the east location would drain it. There would be some minor effects if the north location was drilled.

Q Is the granting of Mr. Haskins' application to drill essential to the protection of his correlative rights?

A It is.

Q Is there anything else you would care to say with relation to the possibility of oil in this well or the recoveries?

A No, I have nothing.

Q Turning to the estimate of potash in this area, let me ask you: Prior to today, have you ever heard of a four foot, ten percent commercial limit line of potash?

A No, sir. I have reviewed all of the hearings in regard to the matter of this nature and it's never been referred to before.

Q What has been the standard?

A Four-foot of fourteen percent K20 silverite.

Q Referring to the subject area, Mr. Montgomery, and

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assuming you take the four-foot of ten percent line and the 45 degree subsidance angle necessary for secondary mining, did you come up with a figure as to how many acres would be affected?

A Yes. Just estimating something less than ten acres -- admitted Mr. Cummings was at a disadvantage on the sale of the map -- but looking at it a little closer, probably eight acres for that ten acres is fine.

Q Assuming then that you were talking of maximum recovery of potash, maximum of $100,000. How does that compare to the recovery of oil that you would anticipate in this area?

A $100,000 that they would lose by not being able to secondarily mine that limited area would be, in dollars and cents, equivalent to about 42,600 barrels of oil.

Q Based on the productive history of the other well in the pool with the northeast offset, now, your testimony in fact would anticipate recoveries considerably in excess of that?

A Yes, I would.

Q Mr. Montgomery, I know that you have limited experience in analyzing logs as far as looking for potash is concerned, but can you give us your best estimate as to what that Exhibit No. 2, Haskins Exhibit No. 2, reflects?

A In my opinion from examining the log -- apparently there is no potash ore log on the log. The neutron characteristics do not indicate that there is any potash present in that well bore.

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Q If that information were substantiated it would necessarily draw in to the southwest, northeast projected commercial limit of potash?

A Yes, sir, it would.

Q So that there'd be even less likelihood of any interference of potash deposits?

A That's correct, using the straight-line method that has been used throughout this hearing.

MR. BRATTON: I believe I have no further questions of Mr. Montgomery.

I would like to offer in evidence Haskins Exhibits numbered 1 through 8, I believe.

Exhibits numbered 7 and 8 were prepared by you?

THE WITNESS: They were.

MR. PORTER: Without objection, Exhibits 1 through 8 will be admitted.

Are there any questions of Mr. Montgomery?

CROSS EXAMINATION

BY MR. BLACKMAN:

Q Mr. Montgomery, did I understand you correctly to say that Haskins Texaco No. 1, which is in the northeast quarter of the northwest quarter of Section 13, would not drain any oil which might be located within the southwest quarter of the northwest quarter because the oil presumably in the southwest quarter is on a higher level?

A Yes, sir.

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Q Did I understand you correctly?

A Yes, sir, you did. I qualified it to a minor degree. There could be some minor effects but they'd be quite minor.

Q Well, then, if this well is not drilled now and wells are not drilled at other locations in this 40 acres offsetting it, then that oil will be there fifteen or sixteen years and will be available then?

A A portion of it conceivably might migrate to the Getty Pool to the south. I wouldn't think there'd be any great quantity.

MR. BLACKMAN: That's all.

MR. PORTER: Are there any other questions of the witness?

MR. NUTTER: Yes, sir.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Montgomery, you stated that the Getty Pool here has one well that produced a million barrels. What did you say the average production for the pool was?

A 153 barrels.

Q Does that count the million-dollar barrel well?

A Yes. It also counts wells that produced 8,000 barrels and a well that produced 943 barrels.

Q If you marked the million-dollar barrel well off, what is the average production per well?

A May I also take off the smaller wells?

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Q I think so.

A 76,942.5 barrels.

Q What happened to these two No. 3 wells on your plat, Mr. Montgomery, the two marked as being abandoned producers?

A I am not sure about the No. 3 well located in the northwest, northwest of 24. I understand the well located in the southeast of the southwest of 13 is still abandoned. It was abandoned back in 1941, temporarily abandoned, but it's still setting there apparently ready to operate if you had a prime mover, but I don't know the history. I presume maybe the price of oil at that time, or perhaps it wasn't moving enough water. Those could be factors. I don't know.

Q The one in the northwest of the northwest of 24 has been replaced by another well in the same tract?

A Yes, sir.

Q The hole was lost?

A Yes, sir.

Q Were either one of the three wells, the two small wells deducted from the total before you took the average?

A I did deduct the one in 13 but I did not deduct the one in 24. I deducted the No. 3 well located in Section 13 and also the No. 1 well located in Section 25, northwest of the northwest of 25, and also the million-barrel well, the one indicated, No. 7, in the southwest of the northwest of Section 24.

Q How about the Haskins No. 1 well up there in Section 13?

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What kind of a history does it have?

A It came in top allowable in May. It does not produce a full month but it was top allowable for the period it did produce. In June it produced 1145 barrels of oil, with 2290 barrels of water. In July, it produced 865 barrels of oil, with 1730 barrels of water. In August 669 barrels of oil with 2,007 barrels of water.

The September and October reports, the official reports, are not available to me. Mr. Haskins informs me that the well levelled off at approximately 650 barrels.

Q Is the water going up on it yet?

A No. Actually, we are pumping at capacity. All the other wells in the south end of the pool have much larger pumps and larger tubing. They're running two and a half or three inch tubing where this well only has two-inch tubing. Many of the wells are moving as much as 2,000 barrels a day.

Q That would be fifty and sixty thousand barrels a month?

A Yes. We are basically not equipped to handle that, but it is the intention to go back in the well to do that.

Q It was your estimate that approximately ten acres of potash would be affected by the drilling of this well?

A I thought it was less than that, probably seven or eight.

Q What was your estimation of the value of the potash in the ten or eight acres?

A Mr. Cummings value that they would lose if they were not permitted to mine would be $100,000. That would be equivalent to 43,600 barrels of oil.

Q You expect that a well would recover more than 43,000 barrels of oil?

A Yes, sir. I think it would.

Q Do you think No. 1 is going to recover 43,000 barrels of oil?

A It's always dangerous to estimate with a well. I think the Getty Pool is an excellent example of that. It produced more oil out of the same pool in 1961 than we did in 1955 so it's a water-drive field and something you have got to set there and be right on. It's low gravity oil. There are many producing problems involved, but the reason I am saying I hesitate to estimate reserves due to the fact it's a reef-type reservoir. It's cable tool. We have no core analysis available and even if you had one, I think it would be quite dangerous to estimate other than on production, a greater history of similar nature.

Q You don't have any core analysis, do you have any fluid analysis to indicate that Number 1 well and possibly the proposed location would be producing from the same pool as the Getty?

A It's been classified as the same pool and producing from a reef in the Yates section. We perforated to 1462 to 72.

Q Do you know anything about the fluid characteristics of the two areas?

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A They are apparently similar water levels, about the same as the Getty Pool. The water is practically surface fluid in the hole and the water on our Haskins No. 1 stands 200 feet from the surface, about the same bottomhole pressure.

Q How about gravity?

A The gravity is similar.

MR. NUTTER: I believe that is all. Thank you.

MR. PORTER: Are there any further questions of Mr. Montgomery?

FURTHER CROSS EXAMINATION

BY MR. MORRIS:

Q Mr. Montgomery, in your Exhibit 1, is that the lease from the Federal Government to Texaco?

A No, sir, Exhibit 1 was our map taken from a previous case.

MR. MORRIS: Which exhibit is it?

MR. BRATTON: Exhibit 3.

Q (by Mr. Morris) Can you tell me from Exhibit 3 the acreage involved in that lease?

A Yes, sir. Township 20 south, Range 29 east, Section 13, northwest quarter.

Q The entire northwest?

A In Section 14, the northeast quarter, the north half of the southeast and the southwest of the southeast.

Q Mr. Montgomery, would the well that now is located and producing in the northeast of the northwest of Section 13, would

that hold the southwest quarter of the northwest quarter by production?

A Not as far as Haskins is concerned, no, sir.

Q I mean as far as Texaco is concerned.

A Yes, sir, it would.

I am not here for Texaco.

Q That would be the effect of the lease, would it?

A Yes.

Q So, we are not -- Texaco is not going to lose its lease but Haskins is going to run out of time on his farm-out assignment?

A Yes, sir. Mr. Haskins' correlative rights are a little shorter than Texaco's.

Q Right. What was the date of the assignment of the farm-out from Mr. Edwards to Mr. Haskins?

A It was some time in April, this year, as I recall -- the 28th of February, 1961.

Q Under that assignment was Mr. Haskins obligated to drill his first well within a certain time.

A Yes.

Q He met the requirement?

A Yes, sir.

Q How does he stand now concerning his obligation to have the second well drilled within ninety days after the completion of the first?

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A We are getting a temporary extension based on the outcome of this hearing.

Q That date was prior to the extension of the R-111-F area, the date of the assignment of the farm-out agreement was before addition of the tract under consideration to the potash-oil area?

A Yes.

Q If the permit to drill the 40-acre tract in question today should be denied by the Commission, is there any arrangement between Mr. Haskins and Texaco whereby Texaco will give Mr. Haskins a substitute 40-acre tract?

A I am not qualified to answer that question. I don't know.

Q You don't know whether there is such an arrangement?

A No comment -- I don't know.

Q Does Mr. Haskins have a location in mind within the 40-acre tract in question where he intends to stake the location if we should just give him a blanket approval to go ahead and drill?

A Yes, sir, in the 1650 from the north line and 990 from the west.

Q 1650 from the north line and 990 from the west?

A Yes, sir. That would be 330 out of the north and east corners.

Q If the Commission should see fit to approve a location

for the well closer to the corner of the northeast corner of this quarter quarter section would Mr. Haskins have any objection to that?

A I am not qualified to answer that. However, it would tend to prevent protection of his correlative rights if he did drill further from the center of his property.

Q In other words, he wouldn't get as good a drainage pattern having to drill up in the corner because of the other producing wells?

A Yes, that would be true to a degree more because of it being further down structure than the other wells.

Q His rights would be impaired if the Commission allowed him to drill but required him to drill closer to the northeast corner of the quarter quarter section?

A I mean he'd recover less oil than he would otherwise.

Q Has any consideration been given to directionally drilling in this area, bottoming of the hole on the southwest quarter of the northwest quarter?

A I have not considered that. I can see some difficulty in doing such a thing.

MR. MORRIS: I believe that's all; thank you.

MR. PORTER: Are there any further questions of the witness?

FURTHER CROSS EXAMINATION

BY MR. NUTTER:

Q Could this well have been staked in the center of the

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40-acre tract or maybe 330 from one of the south corners of it?

A Strictly on geology, perhaps it could have, yes.

Q So you'd move up to 330 location as a result of the potash?

A Recognizing that they had some problems, yes.

MR. NUTTER: Thank you.

MR. PORTER: Does anyone else have a question?

The witness may be excused.

(Witness excused.)

MR. BRATTON: If Mr. Morris is interested, we will be glad to put Mr. Haskins on to answer the questions he was propounding to Mr. Montgomery that he couldn't answer.

MR. MORRIS: I would appreciate that.

(Witness sworn.)

PAUL HASKINS,

called as a witness by and on his own behalf, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRATTON:

Q You are Paul Haskins who owns the operating agreement on the 40 acres in question and who wants to drill the well involved in this hearing?

A Yes, sir; that's correct.

Q You have the two 40-acre tracts, one of which you have drilled and this one you have to drill to own, is that correct?

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A That is correct.

Q And your time for drilling that well has expired under the operating agreement but it has been extended pending outcome of this hearing?

A Yes, sir, that's correct.

Q If your application is granted you will need some time to start your well?

A Yes, sir.

Q If your application is denied, what, if any, understanding do you have with Texaco?

A I have no understanding, no firm understanding whatsoever. At the time I drilled the first well I had signed the papers and then learned the second location had been placed in the area. I went to the Texas people and asked them if they'd give me a deal stating that in the event I was not able to drill this second tract they could give me an alternate 40-acre tract. I was denied this request but there was some indication that the local office would look on it favorably. They didn't indicate which 40 acres I would be given, even whether I would even want to drill it. Maybe I wouldn't even want it. There again, there was no assurance, even if everybody in the Midland office recommended it, there was no assurance that management would approve it.

So, as far as having any assurance that I would get anything else, I did not. I'd say it was pretty slim.

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Q Mr. Haskins, going further to the question about the possibility of moving closer to the line. You are now 330 from the north and east lines of the 40-acre tract. What is your feeling about the possibility of moving closer to the north line of that tract there?

A I would prefer to recover all of the reserves in the oil under that tract to drill in the center of that tract, to stay away from the other wells. However, I feel like that in this situation Potash Company certainly has a problem there in that I was willing to forego some of those reserves there by moving to the other location with the hopes that they would maybe give a little, bend a little and reciprocate. As far as moving further north, I would still be giving up some additional reserves. However, part of the pie is better than none at all. Rather than lose the whole tract, I would probably agree to drill closer to the line but I would prefer to drill at the location we are asking for.

MR. BRATTON: I have no further questions.

CROSS EXAMINATION

BY MR. MORRIS:

Q Mr. Haskins, if the Commission should enter an order approving the location for your well 150 feet out of the northeast corner of the quarter quarter section, would you drill the well?

A Yes, sir, I'd drill it.

Q You feel that your ultimate recovery from that well would be diminished because of having to move further to the

northeast?

A That's correct. I would be moving down dip structurally and then in this type of reservoir you are naturally leaving some reserves up dip that you would not be able to drain from this well moving down dip.

Q That would amount to giving up certain amounts of what you feel are your correlative rights?

A That is correct.

Q Do you know whether Texaco has any intention to drill the other two 40-acre tracts that are in the northwest quarter of Section 13?

A I don't know whether they are or not. They are in the oil business and if it looks like to their engineer that it would recover sufficient reserves, I am sure they would.

Q If your application to drill was denied altogether, would you still retain your rights in the other well? Would you have already earned the one 40?

A Yes, sir.

Q You'd be under no contractual obligation that you could not fulfill as far as this subject 40-acre tract is concerned?

A No, sir, no other obligation.

MR. MORRIS: Thank you.

MR. PORTER: Are there further questions of the witness?

FURTHER CROSS EXAMINATION

BY MR. NUTTER:

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Q How much did that No. 1 well cost to drill and complete and equip?

A Around $35,000, $38,000 in the original well.

Q You anticipate about the same cost for the second well?

A Slightly less due to the present installation of tank battery facilities which would probably make it $5,000 less.

Q Well No. 1 to date has recovered something like 3500 barrels of oil?

A I think so.

Q Do you know what the production during September and October was?

A No, sir; I don't have the exact figures. However, both months were something over 600 barrels; around 650 barrels.

Q It levelled off to where it makes 20 barrels of oil per day?

A That's correct.

Now, we have a two-inch tubing in the hole and an inch and a half pump and we are not capable of moving the amount of fluid necessary for the well to produce top allowable.

With the installation of a larger pump of some sort, I don't have any doubt but that the well would produce top allowable. We are not losing any total capacity fluid.

Q What percent of water is the well cutting?

A From 60 percent to 70 percent water.

Q Was the water free?

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A No.

Q Who owns the oil-gas lease on the southwest quarter of Section 13?

A The southwest quarter?

Q Yes.

A I couldn't say positively who owns that least. I think it's Robert E. McGee in El Paso has the entire west half, but I'm not positive. No, he has the east half of the southwest quarter. I think it is held by -- the production is held by Getty Oil Company.

MR. NUTTER: Thank you.

MR. PORTER: Does anyone else have a question of this witness?

The witness may be excused.

(Witness excused.)

MR. BRATTON: We have nothing further to offer.

MR. PORTER: Do you gentlemen have any statements to make in the case?

MR. BLACKMAN: I would like to ask the Commission to take administrative notice of and to incorporate by reference in this case the record in consolidated cases 1233 and 1234 in the matter of Yates & Copper which involved Section 34, Township 19 south, Range 30 east, and also in the Velma Case No. 1130 before the Commission.

I would also ask the Commission to take administrative

notice and incorporate into the record by reference the evidence of Mr. Stanley, Oil Conservation Commission engineer given in Case No. 862 before the Commission, which is the matter of the North Benson-Green Oil Pool in Eddy County. Mr. Stanley's testimony concerned salt section porosity and it established that a salt section could be charged with oil and gas and he further testified concerning the presence of hydrogen sulfide and its corrosive action on the casing in wells in Lea County.

I would like to state that it seems to me, gentlemen, that the problem that we have here is relatively simple to state but most difficult to prove. The problem is: Does a commercial body of potash exist in the area which would be affected by an oil-gas well in this location. In other words, where is the boundary line of this potash ore body? This is a relative question. We have presented here the very best evidence we have as to the location of the boundaries of the ore body. There has been some discussion and some differences of opinion about whether the line should be 10 percent or four feet at fourteen percent or four feet at ten percent or four feet and 13 percent, but some sort of standard is necessary to put some line on a map with which to do your planning.

Now, we have used a method here. We have testified that that is the method which we used in planning our mines. The other witnesses have verified that the other companies used similar methods, possibly not all. There has been a little

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difference of opinion. We have showed on the basis of actual figures what that is when an ore projection is made on one of these bases. We have explained to you just how it happened that we located the four feet that 14 percent line in question. We requested that this area be included within the boundaries of R-111-A.

We have showed you how the USGS placed that particular project line but we have never said that that was the ore boundary. We don't know where the ore boundary is, so we are dealing with the problem of how do we project where the ore body might be. We have showed you by the most competent evidence that we know of, the only evidence that we know of, how we project it on an average basis to show the ore body boundary of the ore body. Now, we have also been perfectly frank in stating that we don't know that the ore body goes out there or not. It might stop at some other location than the one we have projected and it might go considerably outside of that location. This might be one of those areas in which the potash ore extends outside the project zone. As a matter of fact, the only evidence before this Commission is to the effect that the odds are about three-to-one that it does extend substantially outside of that zone that has been projected to. This is positive evidence and it is absolute fact. It isn't conjecture as to whether there is ore on a predicted part of the structure. Through our evidence we have shown the boundaries of our ore body on the west and east side and that testimony has also been corroborated by the other company to the extent that

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they have similar experiences in mining outside of their projected zone so I think we have completely showed to the Commission that the probability is that an ore body exists in this location.

Now, is it a commercial ore body or isn't it? We have done our projecting on the basis of both four feet and fourteen percent and four feet of ten percent. Mr. Cummings has testified he thinks four feet ten percent is commercial. He also testified that we were currently mining four feet. We are mining lower, I believe, than anybody in the business. He also testified to a machine on the drawing board for mining 42 inches, another at six inches. We believe this is the trend in the industry and we are going to have to mine the lower grade of potash. We are preparing to mine the lower grades of potash. We feel, gentlemen, that if IMCC can make a profit mining 8.3 K20 or 9.70 ore, we can do it that well or better. Now, I have this feeling about it that the problem here is a problem in conservation and that the Oil Conservation Commission is looking upon it as not necessarily what is commercial today but what might be commercial two years from now or ten or twenty years from now. That is what should be protected and I feel that the four feet of ten percent line is most conservative and that what the Commission should be protecting in this industry is something in the area of three and a half feet of possible five to eight percent. Something like that is what should be protected. What happens when you don't protect it? Well, most of you gentlemen have been on the Commission

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for a number of years. I have stood up before you and objected to the drilling of wells in our reserves out in Lea County. I stated before several times and it was put as testimony today that the value of that reserve in Lea County is about three hundred million dollars. The second mining has now been rendered impossible in substantially all of that area. According to Mr. Cummings' testimony he said in his opinion that the entire ore body has been rendered sub-marginal. Now, we wouldn't be testifying here today to only sixteen years of ore reserves if the Lea County reserves could be mined out. If we had that ore body in Lea County, we would have a commercial ore body for future reserves. That's what we are talking about. The sixteen years does not include any part of that. That is lost, I'm afraid, and the oil value I don't think is near that amount in that area in Lea County and it would not have been lost had the potash been saved. The same thing is true right here.

Mr. Montgomery has testified that in his opinion the well at the location in the northeast quarter -- that's the Texaco Haskins No. 1 -- will not drain the oil from under this particular 40-acre tract. It will still be there sixteen years from now and you can go get it at any time, either the individual or even this great Texas Company. It's the State of New Mexico whom we are seeking to protect. So far as the State of New Mexico is concerned, I just made a little calculation based on those records for three months. In this area that International

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mined during the months of May, June, and July, they mined some 193,000 tons, at an average of 9.7 percent. The value of that ore, of the finished product that they mined, allowing for a refinery loss, is over $600,000. Now this is every bit of ore less than percentage that we have stated we think is commercial. That's why I think that the Commission should be protecting ore of substantially less grade than 10 percent and thicknesses substantially less than four feet. Nobody has been able to figure out the economics below four and a half feet by conventional drilling, blasting, and undercutting because you have too many operations. Obviously if you can mine fifteen feet with one swing of an undercut and you get the whole fifteen feet of ore down with one swing and if your ore is only three feet, it costs five times as much to undercut. You still have to perform the same undercutting operations. It goes uncontroverted that four feet is most certainly commercial as far as mining is concerned and it is uncontroverted that 8.3 on an average is certainly commercial. As far as refinery methods are concerned, this obviously introduces a new problem before the Commission as to whether this so-called four feet of 14 percent standard should be changed.

Now, the testimony shows that something over 10 or 12 years ago, four feet of 14 percent was established, probably by the USGS as a cutoff line more or less as an arbitrary cutoff line and at that time grades in thickness of ore which were being then mined and those grade thicknesses were well over 20 percent

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in grade up around six to eight feet in thickness. This is what the testimony shows. At that time they were just four feet of fourteen percent as the cutoff. Now the testimony shows that the grade and thicknesses are substantially lower than that. The potash mining industry, in particular, has been making tremendous strides. We have been able to learn how to mine it in lower thicknesses and we have been able to refine it at much lower grades and make money on it. Mr. Montgomery testified to some extent here on just how much potash would be lost if you were not permitted to do second mining on a circle surrounding this well location which would be 550 feet in radius and Mr. Bratton asked Mr. Cummings who furnished the basic information for that. The situation is that you have two lines, a four-foot of 10 percent line, a curved line in one direction and a subsidance protection line which is a curved line and where the two intersect was between eight and ten acres of value of something in the neighborhood of $100,000. Gentlemen, that's not the way to look at the problem. According to testimony introduced the ore cutoff is not at that location either inside of it, in which case no loss would occur, or outside, in which case the loss would be three or three and a half times the $100,000 because in that case you take in the entire 1100 foot diameter circle.

Mr. Haskins has testified that he did not have a firm understanding with Texaco, that he was going to get some other

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acreage if he is denied permission to drill on this one but the fact that the further explanation that he gave and the use of the term "firm understanding" certainly indicates that the Texas Company is not going to cast him out if he is denied the right to drill on this acreage. As far as his correlative rights are concerned, if Mr. Haskins drills in this area to protect his correlative rights, there will be others to drill to the east, west, and south in order to protect their correlative rights and this is a thing that could snowball all the way along.

I would like to close by stating that what happens if this well is drilled and intersects a potash ore body will prevent the mining of potash and the value of that potash will be forever lost, whereas if this application is denied, the oil will still be there. He can still get all his oil after the potash is mined out and we have gone away.

Now, with respect to the burden of proof, gentlemen, I have accepted the burden of going forward but I have not accepted the burden of proof. In this connection I should like to cite you the only authority I have been able to discover in this area as to who has the burden of proof in a situation of this kind. There may be some other New Mexico laws, but I have not been able to discover any. The laws that I cite here is Section 7 of the Administrative Procedure Act which is a Federal Act. Section 7 of the Administrative Procedure Act is in part as follows: That except as statute otherwise provides the pro-

ponent of a rule or order shall have the burden of proof. Now, in this case Mr. Haskins comes before the Commission asking for permission to drill. He has the burden of proof, the burden of persuading this Commission that potash will not be lost. He has that burden. He has completely failed. The evidence which we have put in has not been controverted. It goes undenied. This Administrative Procedure Act probably does not have direct application in the State of New Mexico because it is a Federal law but this hearing will probably be followed by the USGS and if this Commission decides that no well should be drilled in this area, certainly past experience indicates that the USGS and the Bureau of Land Management who have the authority in this area will follow this Commission, and inasmuch as this is Federal land, I think that the principles of the Federal Administrative Procedure Act apply in this case.

I respectfully request that the Commission deny the order.

MR. PORTER: Mr. Blackman, prior to beginning your statement, I believe you made a motion to incorporate by administrative notice and to incorporate into the record certain records from previous cases, is that right? You enumerated particular cases in your motion. Would you do that again?

MR. BLACKMAN: I moved that the Commission take administrative notice of and incorporate into the record by reference into this case records in consolidated cases numbers

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1233 and 1234 and in Case No. 1130, which is the Velma case, and the testimony of Mr. S. J. Stanley in Case No. 862.

MR. BRATTON: We are not parties to those cases. We object. My objection goes to the basic right of cross examination, which we are denied, of course. One further ground for this objection -- I think the basic ground is sufficient but I don't have the faintest idea what's in those cases. It may be material or immaterial but certainly we are not a party to them and I don't see how we can be saddled with what was put into those cases.

MR. BLACKMAN: It concerned the Oil Conservation Commission Rule No. 1212 which states in part as follows: "In general, the rules of evidence applicable in a trial before a court without a jury shall be applicable, provided that such rules may be relaxed, where, by so doing, the ends of justice will be better served." We are asking the Commission to take administrative notice of our case involving generally the problems of subsidance and evidence which has been given in previous cases. I think this is the type of situation where the Commission can well take such notice.

We have spent a whole day in this hearing and if we undertook to submit all of that evidence all over again, we could well spend three or four days.

MR. PORTER: The Commission will deny your motion to incorporate into the record these various cases.

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Do you have a statement, Mr. Bratton?

MR. BRATTON: Yes, sir. I have a few brief remarks but before proceeding I would like to say with relation to who has the burden of proof to go forward, I shudder to think that the Federal rules of the Administrative Act would apply before this body or anything else of the State, the State having enough problems in those regards in hearings to which they do apply, but under any circumstance, it boils down to me as this: We have filed an application to drill, which is the normal regular-type application. Mr. Blackman has come in. He is the proponent of an order denying our application to drill. Now, it is the old question of the chicken and the egg. We are asking for the right to drill this well and he is asking for an order denying. It occurs to me that the whole setup of Order R-111-A is that the Potash Company shall be afforded an opportunity to show why that person should be denied the right to drill at the location that otherwise he would by all the rules of this Commission be entitled to drill. That person, to me, is the proponent and that person has the burden of proof.

Now, I would like to review this matter very briefly from the standpoint of Mr. Haskins, for whom Mr. Blackman has exhibited admirable sympathy from the standpoint of Mr. Haskins, if he were denied permission to drill. He acquired a farm-out on this acreage in January of 1961. The lease was issued on it in January of 1957. At the time Mr. Haskins acquired the

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rights, this land was not under the Section order. It is not to this date. It was not under the Commission's Order No. R-111-A area. He had no reason to think that he would be denied the right to drill. The Potash Company came after that and got this 40-acre tract into the Order R-111-A with an exhibit which is on the board here today and that exhibit is the standard that has been utilized before this Commission and by the USGS, by the Potash Company. According to the line drawn on that, the well is at the proper location and could not conceivably beat them out of one foot of potash. Now, today we come in and the rules have been changed. Everything gone before is out the window and we have a new line of four foot and ten percent, which by coincidence happens to run through Mr. Haskins' location.

Now, from the standpoint of Mr. Haskins, this is about as low a confiscation of individual rights as I have seen if he were denied the permission to drill. We don't have to worry about his correlative rights. If he's denied the permit to drill, it will be down the drain. I don't think that was the intent of R-111-A. I don't think it is to this date. I don't think that's the way the Commission has or is going to administer R-111-A. I think basically it boils down to just about what Mr. Cummings stated. They want all of 111-A locked up as a potash reserve. If that's the way it's going to be, we ought to have a hearing on R-111-A to see if we are going to go back the way it was before 1961 because the objection made to this appli-

cation is not at all incontinent with R-111-A or the way of its administration or the way it reads, in which I feel equity and justice require.

Now then, under these circumstances, giving the benefit of the doubt, this new four foor ten percent line it projects out and discounting the core log on the well in Mr. Montgomery's opinion it shows no potash present. We would draw the line back, but discounting that, giving the potash company the benefit of every doubt, the most it could be said if Mr. Haskins drills a well in that area, if they ever get this new line and if he still has a well in there at this time, whenever it is, fifteen or sixteen years down the road, they might be denied a maximum of $100,000 or recoverable potash reserves.

Now, I don't think that that is sufficient basis upon which to deny the application of Mr. Haskins, particularly in view of the situation surrounding the acquisition, his rights, and the way this whole situation has built up to today's hearing.

We have talked of this new four foot ten percent line. We have talked of some area that has been mined at a lesser percentage but greater thickness. We don't come out in favor of a four foot fourteen percent line. That is the basic line on which the Commission survey has operated and to me remains unchanged. I don't think there is a reasonable probability that at the location suggested that it is going to interfere with one

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foot of potash. I believe that the speculation as to the possibility some time down the road that we might lose a few feet of potash, I just don't believe that's sufficient to confiscate Mr. Haskins and put him out of business.

I respectfully urge this Commission to grant his application to drill.

MR. BLACKMAN: Potash Company of America has not been a dog in the manger about these locations. As the Commission is well aware, we have not been before this Commission and objected unless we thought we could prove the existence of a potash ore body. We are not trying to stop everything that occurs in R-111-A. That line goes all over the lot, as everybody knows; there are lots of areas inside R-111-A where it is perfectly proper to drill. That has not been our attitude in the past or is it now.

I will state that I'm going to be objecting to any location where we have evidence that the location will diminish the value of our potash deposit. We are trying to get the Commission to deny such locations but we're not going to be up here on the position that R-111-A denies the right to anyone to drill. That's what R-111 says.

MR. PORTER: Does anyone else have a statement?

MR. WALKER: The USGS has been referred to. I think the least we can do is to see whether Mr. Anderson has an opinion or statement in regard to this case.

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MR. PORTER: Do you have any comment, Mr. Anderson?

MR. ANDERSON: It is a Federal lease and, of course, I think all of us know that USGS believes in multiple use to the extent that it might be possible, and in those circumstances, why, I rather think that the suggestion of a 150-foot location might be applicable here and might be a compromise to the protection of the rights and interests of both parties and certainly we have no objection to the drilling of that location.

In fact, I think that, as I said before, would be a compromise that seems to me would give both parties a fair chance as could be worked out.

MR. PORTER: Are there any other comments to make on the case?

If not, the Commission will take the case under advisement.

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STATE OF NEW MEXICO)
) ss.
COUNTY OF SAN JUAN)

I, THOMAS F. HORNE, NOTARY PUBLIC in and for the County of San Juan, State of New Mexico, do hereby certify that the foregoing and attached transcript of hearing was reported by me in stenotype and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

DATED this 27th day of November, 1961, in the City of Farmington, County of San Juan, State of New Mexico.

Thomas F. Horne
Notary Public

My Commission Expires:

10-2-65

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