STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

27 April 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Meridian Oil, Inc. for the extension of the vertical limits of the Cedar Hill-Fruitland Basal Coal Pool and the concomitant contraction of the Mount Nebo-Fruitland Pool, San Juan County, New Mexico. CASE 9362

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Charles E. Roybal
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico 87501

For the Applicant:

MR. STOGNER: Call next Case Number 9362.

MR. ROYBAL: Case 9362. Application of Meridian Oil Company for extension of vertical limits of the Cedar Hill-Fruitland Basal Coal Pool and the concomitant contraction of the Mount Nebo-Fruitland Pool, San Juan County, New Mexico.

MR. STOGNER: At the applicant's request, this case will be continued to the Examiner's hearing scheduled for May 25th, 1988.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9362, heard by me on 17 April 1989.

Examiner
Oil Conservation Division

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

25 May 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Meridian Oil Inc. for the extension of the vertical limits of the Cedar Hill-Fruitland Basal Coal Pool and the concomitment contraction of the Mount Nebo-Fruitland Pool, San Juan County, New Mexico. CASE 9362

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Charles E. Roybal
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico 87501

For the Applicant:

MR. STOGNER: Call next Case Number 9362.

MR. ROYBAL: Case 9362. Application of Meridian Oil, Inc. for extension of the vertical limits of the Cedar Hill Fruitland Basal Coal Pool and the concomitant contraction of Mount Nebo Fruitland Pool, San Juan County, New Mexico.

MR. STOGNER: At the applicant's request Case Number 9362 will be continued to the Examiner's Hearing scheduled for June 8th, 1988.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9362, heard by me on 25 May 1988.

Michael E. Stogner, Examiner
Oil Conservation Division

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

8 June 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Meridian Oil Inc. for the extension of the vertical limits of the Cedar Hills-Fruitland Basal Coal Pool and the concomitant contraction of the Mount Nebo-Fruitland Pool, San Juan County, New Mexico. CASE 9362

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Robert G. Stovall
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico

For the Applicant:

MR. CATANACH: Call next Case Number 9362.

MR. STOVALL: Application of Meridian Oil Inc. for the extension of the verical limits of the Cdar Hill-Fruitland Basal Coal Pool and the concomitant contraction of the Mount Nebo-Fruitland Pool, San Juan County, New Mexico.

The applicant has requested that Case No. 9362 be continued to 22 June 1988.

MR. CATANACH: Case No. 9362 will be continued to the Examiner Hearing scheduled for June 22nd, 1988.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9362, heard by me on June 8 1988.

David R. Catanach, Examiner
Oil Conservation Division

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

22 June 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Meridian Oil Inc. for the extension of the vertical limits of the Cedar Hill-Fruitland Basal Coal Pool and the concomitant contraction of the Mount Nebo-Fruitland Pool, San Juan County, New Mexico. CASE 9362

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division:	Robert G. Stovall Attorney at Law Legal Counsel to the Division State Land Office Bldg. Santa Fe, New Mexico
For Meridian Oil Inc.:	W. Thomas Kellahin Attorney at Law KELLAHIN, KELLAHIN & AUBREY P. O. Box 2265 Santa Fe, New Mexico 87504
For Amoco Production Company:	William F. Carr Attorney at Law CAMPBELL and BLACK P. O. Box 2208 Santa Fe, New Mexico 87501

I N D E X

E X H I B I T S

MR. STOGNER: This hearing will come to order.

We'll call next Case Number 9362, which is the application of Meridian Oil, Incorporated, for the extension of the vertical limits of the Cedar Hill Fruitland Basal Coal Pool and the contraction of the Mount Nebo Fruitland Pool, both in San Juan County, New Mexico.

We'll call for appearances in this matter.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin & Aubrey. I'm appearing on behalf of Meridian Oil, Inc.

We have three witnesses to be sworn.

MR. STOGNER: Any other appearances?

MR. CARR: May it please the Examiner, my name is William F. Carr, with the law firm Campbell & Black, P. A., of Santa Fe.

We represent Amoco Production Company and we have one witness.

MR. STOGNER: Any other appearances?

Will all the witnesses please stand at this time?

(Witnesses sworn)

MR. STOGNER: Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Examiner.

The exhibit book Meridian has presented today contains Exhibits One through Six. They're packaged together in one folder.

In addition I want to hand you a copy of the two orders that establish the special rules for the Cedar Hill Fruitland coal production.

MR. STOGNER: And that's Order No. R-7588, is that correct?

MR. KELLAHIN: That is the first order, Mr. Examiner. That is the order that established on July 9th, 1984, the temporary special rules for this pool.

The case was reopened in March of '86, and on March 7th, '86, Order R-7588-A was entered and those rules were made permanent.

MR. STOGNER: Thank you, Mr. Kellahin.

MR. KELLAHIN: Mr. Examiner, we seek today to take the special rules for this pool and simply increase the vertical limits from the current vertical limits so that we have increased them sufficiently higher up into the Fruitland so that we can have included under these pool rules all the coal seams that are productive of gas so that they all can be operated in the same fashion that the lower basal coal member is now being operated by the rules you see set forth in R-7588.

We have three witnesses, a landman for Meridian; a geologist, and a petroleum engineer.

Our first witness is Mr. Van Goebel. He's a landman.

VAN L. GOEBEL,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A My name is Van Goebel. I'm with Meridian Oil, a landman.

Q Mr. Goebel, you've previously testified before the Division as a landman?

A Yes, I have.

Q Let me have you take a moment, sir, and refer to what is marked as Meridian Exhibit Number Two. It's about the third page down in the exhibit book. Did you participate with the engineers and the geologist to prepare this display?

A Yes, I did.

Q And your involvement included determining the accuracy of the land title information that's shown on the display?

A Yes.

Q And have you made a tabulation of the operators and working interest owners within the outer boundary of the pool?

A Yes, I did.

Q And you have also made a tabulation of those owners within a mile of the outer boundary of that pool, have you not?

A Yes.

MR. KELLAHIN: We tender Mr. Goebel as an expert petroleum landman.

MR. STOGNER: Mr. Goebel is so qualified.

Q Would you take a moment and simply identify Exhibit Number Two?

A Okay. Exhibit Number Two is a land plat showing the current boundaries of the Cedar Hill Basal Fruitland Coal Pool and the one mile buffer zone around it.

Q Let's find how to identify the existing boundary line around the pool.

A Okay, it covers 16 sections.

Q And how is it shown on the display?

A It's indicated by hatch marks. The bold dotted marks to the west there indicate a unit boundary.

Q And running vertically what is the dark dotted line or hatched line running vertically on the display?

A Well, that's the unit boundary.

Q Okay. How are the wells color coded on the display, Mr. Goebel?

A And what we've tried to indicate are proposed wells, currently producing wells, and wells producing from the Fruitland sandstones.

Q Let's start off with the pink dots. What are those?

A The pink dots are currently producing Fruitland coal wells.

Q Operated by who?

A These are operated by Meridian.

Q Okay, what are the green dots?

A The green dots indicate coal wells operated by other operators.

Q And then the orange dots?

A Are indications of where sandstone wells are located, Fruitland sandstone.

Q And then finally the red dots?

A Okay, the red dots indicate wells that we have proposed to drill.

Q In preparing to file this application, Mr. Goebel, did you prepare a mailing list that contained all the operators within the pool boundary and within a mile of that boundary?

A Yes, we did.

Q Let me show you what was attached to the application as an amended mailing list. Is that the list you prepared?

Is that the list you prepared?

A Yes, it is.

MR. KELLAHIN: Mr. Examiner, I'll show you the amended mailing list. There should be an original in your case file.

Q Did you satisfy yourself, Mr. Goebel, that that list is current and accurate?

A Yes.

Q And did you cause the individuals and companies shown on that list to receive notice of this hearing?

A Yes.

Q After sending out the notice, have you had an inquiries or response from any of those companies or individuals?

A We only received one response from Amoco Production Company and they are present here today.

MR. KELLAHIN: That concludes my examination of Mr. Goebel.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Goebel, in that April 12th letter that Mr. Kellahin just alluded to, as far as amended list, there wasn't anything amended in the application that was sent to these people, is that correct?

A Correct.

Q It was the same letter. It was just updating the particular people that had interest in the -- in the pool, is that correct?

A Yes.

Q And on your map you show proposed Fruit-

land wells. Are these Meridian wells or are they other wells?

A These are wells that Meridian is proposing to drill.

Q And when I look at your -- I'll save that for the -- for the next witness.

MR. STOGNER: I have no further questions for Mr. Goebel at this time.

MR. CARR: No questions.

MR. STOGNER: The witness may be excused. Mr. Kellahin?

MR. KELLAHIN: Thank you. Mr. Examiner, we'll call Mr.Dana Craney. Mr. Craney spells his last name C-R-A-N-E-Y?

MR. CRANEY: Yes, sir.

DANA L. CRANEY,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A My name is Dana L. Craney. I'm a Senior

Staff Geologist for Meridian Oil.

Q Mr. Craney, have you testified as a geologist before the Division?

A Yes, I have.

Q Have you been involved in the study of the Cedar Hill Fruitland coal production within this are that's identified on Exhibit Number Two?

A Yes, sir, I have.

Q Summarize for us what has been your specific involvement in this particular pool.

A I have -- I've looked at the stratigraphy of the Fruitland Coal Pool. I've looked at (unclear) and I've compared stratigraphic cross sections and have reviewed isopach maps that we will be discussing today.

Q Have you participated in analyzing and evaluating the geologic information that's been generated from the drilling and completions of wells in this pool?

A Yes, sir.

MR. KELLAHIN: We tender Mr. Craney as an expert petroleum geologist.

MR. STOGNER: Are there any objections?

MR. CARR: No objection.

MR. STOGNER: Mr. Craney is so

qualified.

Q Mr. Craney, would you take a moment and simply identify Exhibit Number Three for us?

A Exhibit Number Three is a south to north cross section, stratigraphic cross section; you're viewing it looking to the west.

Q Do you have a plat on that cross section display so that we can track the wells that are shown on the cross section as you move through the reservoir?

A Yes, sir, the index map is shown at the -- at the bottom of the cross section.

Q Would you take a moment and lead us from either north to south or south to north across the cross section without discussing the individual wells themselves and just orient us as to where you've gone through the pool in selecting wells for the cross section?

A Okay. The, proceeding from south to north, I started the cross section at the Harrison No. 1 Well in the southwest of 31.

I proceeded northward and eastward into the -- well, into the -- near the Cahn Well, the original discovery well in the pool. north from that to the Snyder Well, which is the Snyder Com V No. 1 Well, which was Amoco's type log they used to define the basal coal in their pool hearing, and then it extends northward to the

Union Texas Well; then northwestward into the one mile buffer zone to the (not clearly understood) No. 2-A Well, located in the northwest of Section 18, 32 North, 10 West, in San Juan County, New Mexico.

Q Do you have on your cross section the Amoco well that was used as the discovery well for picking the vertical limits that are set forth in the Division Order R-7588?

A The well, the Snyder Com B No. 1 Well, it's not the discovery well but it was the type log that Amoco used to define the -- the upper and lower limits of their basal coal zone, which is the zone producing in the Cedar Hill Fruitland Basal Coal Pool.

Q And that is the well in the center of the cross section ?

A Yes, it's located in the southwest of Section 28.

Q All right, let's go to that type log, then, and have you identify for the Examiner what the current vertical limits are for that basal coal zone.

A Okay. Shown on this log, the current vertical limits are what's shown labeled Current, the dark blue at the bottom part of --

MR. STOGNER: And you -- that is the Snyder Com B No. 1 Well in the southwest southwest

of Section 28, 32, 10.

Q What's contained within that vertical limit as the limits now exist in the pool when you examine that type log?

A The Fruitland Basal Coal is the zone contained within that limit.

Q How have you identified that by a color code in that type log?

A The Fruitland Basal Coal has been shown in the legend on the right side and the green correlated across the cross section shows this basal coal zone.

Q When we look at the top of the current vertical limits for the basal coal zone, the blue line extends on that type log up to a particular point?

A Yes. The -- the proposed extension of the vertical limits is extended up to include any and all coals within the Fruitland formation.

Q As we move up that type log, then, there is a dashed line running horizontally across the type log. What's that line?

A Yes, sir, it's -- this dashed line represents the boundary of the Fruitland formation separating it from the Kirtland Shale.

Q When we look at the total Fruitland formation from the top to the bottom, as shown on the far

right of the display, are you including the entire Fruitland formation that includes not only the coal zones but the sand stringers as well?

A That is correct.

Q What is Meridian seeking to accomplish with this application, Mr. Craney?

A Mr. -- Meridian is seeking to show that the coals within the Fruitland formation represent a common source of supply; that these upper coals are indeed a potentially commercial producer of hydrocarbons.

Q Have you identified on that display, using the cross section analysis, all the coal seams within the Fruitland formation that you anticipate to be commercially productive?

A Yes.

Q All right, now lead us from north to south and take us across the information shown on the cross section and tell us your observations, your conclusions, and your opinions.

A Okay, sir. The -- again the green denoting the correlation of the Fruitland Coals shows that the coals are quite continuous across the Cedar Hill Pool and what the red arrows denote are locations, the depths where upper coal zones have either (unclear) or blown out while we were drilling through the Fruitland formation.

Q What significance does that have to you as a geologist?

A The significance is that these zones are gas-bearing and potentially they are producable.

In addition, this cross section shows on the Payne No. 8 Well, the Union Texas Petroleum Well, the completion of several of these upper coals, which again Meridian believes is a common source of supply within the Fruitland Formation and are potentially commercial producers.

Q Does the display show in each instance how each of those wells is perforated in the various Fruitland zones?

A Yes, sir, it does.

Q And how do we see them?

A The -- the red within the depth track shows locations within the Pictured Cliff or Fruitland formation.

Q Geologically do you find any reason to justify and separate out, then, the Basal Coal Zone and treat that as a separate source of supply from any of the other gas-bearing coal members of the Fruitland formation?

A No, sir, I do not.

Q What then is your ultimate recommendation to the Examiner with regards to the extension of the

vertical limits?

A My recommendation is that the limits of this coal pool be extended to include any and all coals within the Fruitland formation as shown by the type log, the Snyder (unclear) B No. 1 Well.

Q If the Examiner agrees in your recommendation, what would be the specific footage interval in the type log by which we would increase the vertical limits?

A That specific footage is from 2579 feet to 2878 feet.

Q And that information is summarized on Exhibit Number One in the exhibit book?

A Yes, sir.

Q Do you have anything else, Mr. Craney?

A No, sir.

MR. KELLAHIN: Mr. Examiner, we'd move the introduction of Mr. Craney's Exhibit Number Three.

MR. CARR: No objection.

MR. STOGNER: Exhibit Number Three will be admitted into evidence.

Mr. Carr, before I let you --

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Craney, the proposed vertical depths you said was 2579. Does that correspond with the dashed line?

A No, sir, it corresponds with the top of the indicated blue proposed interval. This -- this is the uppermost coal in the Snyder Com B Well.

So the vertical limit extends from the top of the highest coal to the base of the basal coal.

Q Has there been any other coals found above that in any other wells that you know of?

A There could be, and again that definition would apply from the top of that uppermost coal through the pay.

Q Okay. Thank you, Mr. Kerney --Craney, sorry.

MR. STOGNER: Mr. Carr, your witness.

MR. CARR: We have no questions of Mr. Craney.

MR. STOGNER: Mr. Craney, I just wanted to verify something before I let him cross examine you and now it's my turn.

Q The purity, if you will, if that's the

word --

A Uh-huh.

Q These others that you show in green on your Exhibit Number --

A Three?

Q -- Three, is the purity the same as those that were originally designated the Basal Coal Pool?

A The -- you're saying the quality and --

Q Yes.

A -- of the coal?

Q Yes.

A The quality is very similar; again it's log density data and core data in this -- well, we haven't received back all the data on our -- on the first core that was done in the area but bulk density data would suggest that the quality of the coal is very similar and I'm assured that the rank of the coal is the same within this interval.

Q What do you mean by "rank"?

A The rank would be the degree of maturation of the coal, which is over a period of geological history response of that coal to temperature and pressure.

Q I'm not familiar with that word "matura--

A Maturation?

Q Maturation.

A It's the process by which coal, you know, originally from a swamp which was laid down as peat, to change that peat to different grades of coal is -- we're talking about different ranks of coal, and that's a process of coalification or maturation of the coal; sort of metamorphosis goes on there.

Q Is -- when you say "ranking", is there a designated number of or some kind of a unit designation?

A The ranks are going by names. It goes from lignite to sub-bituminous to bituminous, eventually all the way up to anthracite.

Q And what do we have here?

A This is a -- this would be a bituminous coal.

Q And what is the ranking below that, as far as quality, the better quality, below the bituminous?

A Oh, sub-bi --

Q What would be a better rank?

A Oh, a better rank than -- it would -- well anthracite, but actually there's grades of bituminous so it would -- you can improve bituminous. This would -- this is probably a high volatile A type bituminous coal and --

Q All of them?

A Yes.

Q So we're all talking about the same ranking whenever we talk --

A Correct.

Q -- the coal seams in this (unclear).

A Right, in this -- in this area, yes, sir.

Q In this area. Now on your cross section you show only the Union Texas Petroleum Well as having perforations in the upper coals.

A Correct.

Q What kind of gas do we see off of that? Is it the same as the gas that we see coming off of the original basal coal pool as opposed to the others or --

A We do not have a gas analysis from the tests (inaudible).

Q Does Meridian have any gas analyses?

A Not at this time.

Q Not at this time, so this was all done seismic -- I'm sorry, not seismic work, but log -- log analysis.

A If I could digress I could talk about the -- a brief geological history, which would, I think, paint the picture a little better.

Q Okay.

A Okay, sir, the Fruitland formation was laid down in a coastal plain environment consisting of the dunes, marshes, swamps, and the rivers.

And that deposited the peat for the coal, the siltstones and shales, and the river channel sandstones.

Now the -- the Fruitland was deposited landward, or southwestward, it's called the Pictured Cliff shoreline. This is a northwest/southeast striking strand line and it deposited the Pictured Cliff formation, and the -- to the northeast of this Pictured Cliff strand line was the Cretacean inland sea.

Now, in response to -- to burial of overburden of the Fruitland formation, the Fruitland formation responded to increasing temperature and pressure and formed essentially two sources for hydrocarbons and two traps.

The coal is its own source and its own trap. The -- that gases given off during the coalification process, which we just talked about, are -- are principally methane, carbon dioxide, and this gas was generated within the coal but it wasn't expelled from the coal but it wasn't expelled from the coal. Essentially the -- that gas was entrained within the coal and remains trapped in it today,

in the -- in the coal reservoir.

Conversely, hydrocarbons which -- the hydrocarbons of the -- of the sandstones have been sourced and subsequently migrated from the shales of the Kirtland, Fruitland, and to some extent the underlying Lewis formation and these gases have even migrated to sandstone.

So, again, these -- the coal is a separate and distinct source of supply but within a certain depositional framework, the coal represents a common source of supply.

Due to the similar depositional environment, all in the coastal plain, the similar geological history of its depth of burial and temperature in this area, it couldn't vary very much in this area and the fact that the gas hasn't migrated from an outside source; that it was indeed sourced from within the Fruitland Coal and it stayed within the Fruitland Coal.

Again, let me summarize that we feel that the coal within this sort of a stratigraphic interval represented common source of supply.

Q Not saying that they're interconnected in any way.

A No, they're a noncontiguous common source of supply.

Q Is there any migration of gases from the

coal into the sandstone or vice versa, for that matter?

A On a local level there is that possibility. You could have Fruitland -- channels can channel down into the coal and the coal could have sourced that. It's even possible that at some period geological history where there was maximum gas generation, that some of the very locally permeability seals were temporarily ruptured.

On a very local basis there could be some fracturing and there could be some faulting; however, major faulting in the San Juan Basin is not noted.

Q And like you said, it's local, so the --

A We should expect a distinct gas characteristics of a Fruitland Coal as compared to a gas characteristic of a sandstone gas.

Q And then we'll probably have two entirely different makeups as far as --

A That is correct.

Q -- the analysis.

Those wells that are producing from the upper coals presently, do they have or do they meet the criteria -- maybe this needs to be asked by the two petroleum engineers -- does it have the same producing characteristics as your lower ones as far as 320 acre spacing and such as that?

A In that I've seen the petroleum engin-

eer's testimony, I'd say yes, but I think it would be better --

MR. STOGNER: I have no further questions of this witness at this time.

Mr. Carr, do you have any?

MR. CARR: No questions.

MR. STOGNER: Mr. Kellahin, do you --

MR. KELLAHIN: Nothing else, thank you.

MR. STOGNER: Thank you, Mr. Craney. Mr. Kellahin?

MR. KELLAHIN: Mr. Examiner, we'd like to call at this time our petroleum engineer, Mr. Tom Joseph.

TOM C. JOSEPH,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A My name is Thomas C. Joseph. I'm a

Senior Reservoir Engineer with Meridian Oil.

Q Mr. Joseph, have you previously testified as an engineer before the Oil Conservation Division of New Mexico?

A No.

Q Would you tell us when and where you obtained your degree in engineering?

A I received a Bachelor of Science degree in petroleum and natural gas engineering from the Pennsylvania State University in 1981.

Q I'm sorry, what year did you graduate in, Mr. Joseph?

A 1981.

Q Subsequent to graduation in '81, would you summarize for us what has been your experience as a petroleum engineer?

A I was employed by El Paso Exploration from 1981 through 1986. I've been employed by Meridian Oil from 1986 to the present. All seven years of my experience has been in the San Juan Basin; as a drilling and completion engineer during the first five years of my employment and I've been a senior -- I've been a reservoir engineer for the past two years.

Q Summarize specifically for us, Mr. Joseph, what has been your particular involvement with re-

gards to analyzing and producing the coal seam in the Fruitland Coal.

A Specifically I've been the lead reservoir engineer for Meridian Oil's Fruitland Coal Development Project for the past one year.

Q Mr. Goebel has shown us on Exhibit Number Two that Meridian has interest in and operates a number of the Fruitland wells, both within and immediately adjacent to the Cedar Hills Fruitland.

Have you been involved in producing and drilling and operating those wells?

A Yes, sir.

Q With regards to the question of increasing the vertical limits in the current Cedar Hills Pool, have you made a study of that issue?

A Yes, I have.

Q And do you have an opinion?

A Yes, I do.

Q And what is that opinion?

A I am going to show with engineering data that all the Fruitland Coal Zone should be considered a separate common source of supply within the Fruitland formation.

Q Having completed that analysis and review, Mr. Joseph, without discussing them just yet, what

specifically have you done to reach that conclusion?

A I am going to show this with production plots of a typical Fruitland coal well and a typical Fruitland sandstone well, and also with a gas/water analysis comparison between the coal and the sand.

MR. KELLAHIN: At this point, Mr. Examiner, we tender Mr. Joseph as an expert petroleum engineer.

MR. STOGNER: Are there any objections?

MR. CARR: No objection.

MR. STOGNER: Mr. Joseph's qualifications are acceptable.

Q Let's go to your work. Exhibit Number Four just behind the plat, Exhibit Number Two, does this represent your work, Mr. Joseph?

A Yes, it's a computer generated plot.

Q Identify it for us.

A It's a histogram (sic) with production volumes on the Y axis and time on the X axis.

Q Describe for us what you see as an engineer when you look at this exhibit.

A The red line shows increasing gas volumes over time and the blue line shows decreasing water volumes over time.

Q Let's take a moment and find the well whose production is tracked on this display. Who's the operator and where's the well?

A This well is the Cahn Gas Com No. 1 operated by Amoco Production Company. It's located in the northwest quarter of Section 33, Township 32 North, Range 10 West.

Q This is the production from the well that's shown on Mr. Craney's cross section, Exhibit Number Three, as the type log? Are we talking about the same well?

A No.

Q All right. Would you show us on Exhibit Number Two where this well is that you've plotted the production on Exhibit Number Four? You said you were in Section 33, was it?

A Right, northwest of Section 33.

Q Okay. It's one of the ones with a green dot in the northwest quarter.

A Yes.

Q Okay. Have you analyzed sufficient numbers of wells like this to have a general conclusion as to whether or not this is typical of the production profile you would see plotted from a well producing out of the coal seams?

A Yes.

Q And what is that opinion?

A This is a typical coal well production characteristic.

Q All right, let's turn to Exhibit Number Five.

Please identify for us what Exhibit Number Five is.

A Exhibit Five shows the production characteristics of the Fruitland sandstone well, the Holmberg Gas Com A No. 1, located in the northeast quarter of Section 28, Township 32 North, Range 10 West.

Q When we look at Mr. Goebel's Exhibit Number Two, Section 28 is within the boundaries of the current pool?

A Yes, it is.

Q And when we look at the northeast quarter of that Section 28, is it the orange dot or the green dot?

A The green dot.

Q That's the -- I'm sorry, I've got you confused.

The green dot represents coal production from the coal seam, gas production from the coal well, and the orange dot is one from a Fruitland sand?

A Fruitland sand is in orange.

Q Okay, and this represents, then, one of the orange dots.

A Correct.

Q All right. Okay. When we look at Exhibit Five, have you plotted and analyzed a sufficient number of gas wells producing from the sandstone in the Fruitland to reach an opinion as to whether this production profile is typical of atypical of sandstone production in the gas?

A This is a typical production plot in a sandstone well.

Q Would you take Exhibit Number Four and Exhibit Number Five and show me in what ways you're able to utilize these displays and distinguish between them and show it either as a gas well producing from the coal or a gas well producing from the Fruitland sandstone?

A By Exhibit Five it can be seen that the gas production from this well follows a hyperbolic decline and is accompanied by very little water production; whereas, in Exhibit Four in the Cahn Well, we have increasing gas and decreasing water.

Q Are you satisfied as an engineer that this is one of the factors you use to determine the footprint, if you will, of what a well will be, either a

gas well in the coal seam or a gas well in the sandstone?

Q Have you done any other engineering work to determine how you as an engineer can distinguish production from either the coal seam of the Fruitland sandstone?

A Yes, I have.

Q Let me direct your attention, sir, to Exhibit Number Six. Is this your work also?

A Yes, it is.

Q What are we seeing here?

A Exhibit Six shows gas and water analysis comparisons between Pictured Cliff, Fruitland sandstone, and Fruitland coal wells, which are all in the boundaries of the Fruitland Basal Coal Pool.

Q Have you examined enough of the gas analysis from wells producing from the coal as well as the Pictured Cliff and the Fruitland sand to satisfy yourself as an engineer that you're using sound gas analysis properties for each of these values?

A Yes.

Q Give us a basis upon which, then, you have reached this analysis. How many wells have you looked at?

A In the Fruitland coal I've looked at 15 wells, 46 samples; Fruitland sandstone, 3 wells with 16

samples; in the Pictured Cliff, 19 wells and 66 samples.

Q Are you satisfied as an engineer that's a sufficient number of samples and wells to survey in order to have an accurate and reliable analysis upon which to make some conclusions and observations?

A Yes.

Q Describe for us using Exhibit Number Six, Mr. Joseph, what the major points are with regards to this exhibit.

A It's most evident that the Fruitland coal methane and CO_2 contents are higher and the BTU and specific gravity values are lower than they are in either the Pictured Cliff or Fruitland sandstone wells.

Q Okay. When we look at the top column on the display, we're looking at the average gas analysis. The very top one is Pictured Cliff; move to the second column to the right and we now find the methane values?

A Yes.

Q Okay. Show us how you can distinguish then between those values and decide that that is a factor that tells you it's sand or coal production.

A Well, the methane content of the Fruitland coal is 93, which is higher than it is in the Fruitland sand, which is 91, and the Pictured Cliff, which is 88.

Q If you're given a blind gas analysis sample from a well that you do not know where it is and have not examined the log, and you have a value, in what range would cause you to believe it's coal versus sand?

A It would be from a value of 93 or possibly greater.

Q If it's 93 or less, then that causes you to believe as to that value its' more likely to be sand production -- I mean gas production from the sand?

A Yes.

Q When we look at a value less than 91, what does that cause you as an engineer to believe with regards to that analysis?

A That is definitely a sand well.

Q Okay. You said another factor in analyzing the gas and deciding the source was looking at the CO_2 content?

A Yes.

Q All right, let's look at that one. That's the third column? Tell me what you see as an engineer when you look at those numbers.

A It is evident that the Fruitland coal CO_2 content is approximately 5 percent and the Fruitland sand and Pictured Cliff CO_2 contents are substantially lower.

Q At what point do you have to reduce the CO_2 content the almost 5 percent to get into a range where you begin to believe that you have production from the sand?

A Below 1-1/2 percent, in that area.

Q Okay. There was another value used on the display that you thought was a significant factor in making the analysis. Which one was that?

A BTU.

Q All right, and that's the second from the far right?

A Yes.

Q When you as an engineer look at those values, what do they tell you?

A That Fruitland coal values will typically be under 1000 BTU type gas and Fruitland sand and Pictured Cliff gas is generally over 1100.

Q Do you have anything else about the gas analysis of the display?

A Typically a Fruitland coal specific gravity will also be lower than the Fruitland sand or Pictured Cliff.

Q What is the approximate cutoff then that tells you you have one or the other?

A Typically it would be from .62 or lower.

Q Okay. Anything else about the gas analysis?

A No.

Q All right, Mr. Joseph, let's turn the bottom portion of that display when you look at average analysis. What have you done here?

A I examined water analysis from a representative sample of Pictured Cliff, Fruitland sand and Fruitland coal wells in the Cedar Hill area.

Q And what was your conclusion?

A It's most evident that the Fruitland coal TDS, sodium and bicarbonate contents are higher and that chloride contents are lower than they are in the Pictured Cliff or Fruitland sandstone.

Q As we go through that portion of the display, take each of those values and tell us what, in your opinion, is the benchmark or the value above which or below which it causes you to put the production either in gas from sandstone or gas from coal seam.

A For a total dissolved solids, or TDS, a value of about 13,000 or above should typically be considered a Fruitland coal type value.

Q Okay.

A The sodium should be slightly higher in

the Fruitland coal with a value of about 5000 or greater.

The chloride in the Fruitland coal should be typically lower than 1300 parts per million.

And the bicarbonate content should be above 10 or 11,000 parts per million.

Q Taking all these factors together and analyzing the production, the gas and the water, are you confident that you as an engineer can distinguish then coal production from the sandstone versus the coal seam?

A Yes.

Q Do you see any significant difference in the values obtained when you make that analysis and identify production from a portion of the coal seam producing above the current vertical limits for the pool?

In other words, when we look above the basal coal zone --

A Yes.

Q -- can we find a coal zone up in there when those factors from that production with the values from the basal coal? Do you see any significant differences in any of those values?

A No.

Q What, then, is your recommendation to the Examiner with regards to increasing the vertical limits of the coal pool so that we include all those members of

the Fruitland that are contributing gas from coal seams?

A My opinion is that the coal zones can be distinguished from sand zones by their production characteristics and fluid analysis, and therefore, the vertical limits of the Fruitland Basal Coal Pool should be extended to include any and all coal zones within the Fruitland formation.

Q Before we leave this subject, Mr. Joseph, let me have you turn to what is marked as Exhibit Number One in the exhibit book and ask you what's on -- what's on that exhibit? What's depicted on there without reading it? Let's summarize it.

A It shows the current pool name and boundaries and our proposed vertical pool limits.

MR. KELLAHIN: That completes my examination of Mr. Joseph, Mr. Stogner.

I've lost track of the exhibit numbers. We have admitted -- Mr. Examiner, we move the introduction of Exhibits One, Four, Five, and Six.

MR. STOGNER: Exhibit One, and Four, Five and Six will be admitted into evidence at this time.

MR. KELLAHIN: That concludes my examination of Mr. Joseph.

MR. STOGNER: Mr. Carr, your

witness.

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Joseph, I believe the testimony has shown that Meridian operates approximately six wells in the area of this pool, is that correct?

A We are tied in and producing.

Q Just based on the wells you've got here, are any of those actually open and producing from the upper sand intervals, or the upper coal seam?

A Yes, they are.

Q And when you have completed those wells is it necessary to dewater and depressurize those zones just like you would a basal -- a well completed down in the basal coal?

A Based on our production, I don't see this as a problem.

Q Do they perform the same? My question is do you have to also dewater and depressurize the upper zones like you do the bottom or do you not?

A Yes.

Q And when you -- you would go in and open all of these up in a new well that you would drill, you would -- is it fair to anticipate that you could depres-

surize and dewater these zones all at the same time?

A Yes.

Q The wells that are now operated by Meridian, are any of those only producing from the basal zone?

A No.

Q They're all opened up throughout this entire interval?

A Yes, they are.

Q And when you completed them, did they initially produce from this entire interval?

A Yes.

Q Have you any pressure information on those separate zones or is it all together?

A Yes, I do and it's all together.

Q Yes, you do and it's all together, so you --

A Yes, I have pressure data.

Q You wouldn't have information that would show you pressure differential between the various coal seams?

A Not at the present.

Q On your Exhibit Number Six you had what was indicated proven samples, proven coal samples, and I assume that those include samples from all the intervals

that are depicted on the cross section shaded in green, is that right?

A They would include our three wells. They're the only known wells that we would have access to that information.

Q And would you have any idea as to whether or not the samples were from -- the samples that were taken from the basal zone as compared to the upper zones were comparable or if they had all been mixed together?

A They were all mixed together.

MR. CARR: That's all. Thank you.

MR. STOGNER: Thank you, Mr. Carr.

Mr. Kellahin, do you have any questions?

MR. KELLAHIN: No, sir.

CROSS EXAMINATION

BY MR. STOGNER:

Q On Exhibit Number Four, Mr. Joseph, do you know what the perforated interval is in that Cahn Well?

A I don't know the exact footages but it was the basal coal interval.

Q The lower basal coal, right, or the basal coal as it exists now.

A Right.

Q So you have no separate information or production data on the upper zones in which you want to extend the vertical limits today.

A Yes, I did.

Q Where are they?

A I --

MR. KELLAHIN: Hold it. What was the question? No, we haven't put them into the record. Is there some other information you want, Mr. Stogner?

MR. STOGNER: Yeah, I was wanting the production information on an isolated zone of your extended vertical limits.

MR. KELLAHIN: Let me take a moment, if you will, and we'll find who --

MR. STOGNER; We'll take about five minutes.

(Thereupon a recess was taken.)

MR. STOGNER: Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner.

Just before the break when we were still on the record you had requested of Mr. Joseph two general topics for consideration. I must tell you that during the break we have reviewed the data we have brought with us and we do not have either item with us and with your permission and concurrence of Mr. Carr, we would like to leave the record open for a ten day period following today in which to submit to you two items of information, the first of which is the analysis based upon the core reports and information to demonstrate that the gas analysis values for the coal -- the gas produced out of the coal seam above the basal coal member has characteristics that are sufficiently similar to the gas analysis out of the basal coal to give you confidence that you were in fact dealing with the same types of gas.

Second of all, we would like to submit to you subsequent to the hearing the engineering calculations to show drainage so that we can demonstrate that those coal seams above the basal coal in fact have drainage characteristics similar to those presented by Amoco in the original spacing case where they were utilizing only the basal coal values to make those calculations, and if we're permitted to do those two submittals to you, we would appreciate it.

MR. STOGNER: Thank you, Mr.

Kellahin. In that case we'll leave the record open on this particular case for ten days pending the additional information.

MR. KELLAHIN: Mr. Carr has a witness to present.

MR. STOGNER: Okay, Mr. Carr, are you prepared to present your witness at this time?

MR. CARR: May it please the Examiner, we have one very brief bit of testimony we would like to present.

MR. STOGNER: With what Mr. Kellahin had to say, Mr. Carr, do you concur?

MR. CARR: Oh, yes.

MR. STOGNER: Continue, Mr. Carr.

JAMES W. HAWKS,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

Q Will you state your full name for the record?

A James W. Hawkins.

Q Mr. Hawkins, by whom are you employed?

A Amoco Production Company.

Q And in what capacity?

A Senior Petroleum Engineering Associate.

Q Have you previously testified before this Division and had your credentials as a petroleum engineer accepted and made a matter of record?

A Yes, I have.

Q Are you familiar with the application filed by Meridian in this case?

A Yes, I am.

Q Are you familiar with Amoco's interest in this general area?

A Yes, I am.

MR. CARR: Are the witness' qualifications acceptable?

MR. STOGNER: Are there any objections?

MR. KELLAHIN: No objection.

Q Mr. Hawkins, would you briefly state what Amoco's purpose is in appearing in this case?

A The first thing I'd like to state is that Amoco is not in opposition to the application by Meridian to extend the vertical limits.

I think Amoco would like to have the

Division be aware of a broader picture in that many of the wells that were originally drilled and completed in the Cedar Hill were completed only in the basal coals and to bring in the upper coal zones in those sections that have previously been developed may cause some potential problems and those are the problems we'd like to express today.

Q Approximately how any wells does Amoco operate in this area?

A We have currently eight wells on production, two additional wells that are waiting on pipelines out of the basal coal.

Q Now, when Amoco completed all of these wells, did they complete them just in the lower basal coal?

A That's correct.

Q And if, in fact, there is commercial production to be obtained from these shallower coal seams, what kind of problem are you concerned about?

A Well, the nature of coal methane production, as previously testified to by Meridian, is to dewater the coals, depressure the coals in order for the gas to desorb from that coal and be produced through the wellbore. It's very unconventional as compared to a normal gas reservoir.

To open up the upper coals which have

heretofore not been produce, and expose the wellbore to probably higher pressures on the order of virgin pressure, and significant production volumes of water, and that is to expose the basal coals to that production of water, could result in some potential damage or potential waste.

What we would like to see is some flexibility in the field order to allow us to eliminate or remove any of that potential waste or damage.

Specifically, we'd like to be able to utilize a second wellbore to selectively produce the upper coals while we continue to produce the basal coal from the current wellbore. This would give us a very good means to, one, protect that basal coal from any higher pressure or substantial volume of water; and secondly, to obtain some individual upper zone data in selective wells.

Q Mr. Hawkins, is it fair to say that the information available on exactly how this would be -- could be done is limited at this time?

A I would agree with that, yes.

Q And it's also fair to say, is it not, that Amoco is not opposing expanding the vertical interval.

A That's correct. We do believe that the testimony that's provided by Meridian is appropriate in the nature of the deposition of the coals in the geologic sense that it would be a common source of supply, and we are cer-

tainly not in opposition to their application.

Q And if in fact you get into this and start attempting to take these wells that are completed only in the lower zone, as you would evaluate how you may be able to bring other zones in, you may have to get some special flexibility from the Oil Commission to do that.

A That's correct.

Q Is there anything further you want to add to your testimony?

A No.

MR. CARR: If not, that concludes my direct examination of Mr. Hawkins.

MR. STOGNER: Mr. Kellahin, your witness.

MR. KELLAHIN: I have no questions. Thank you, Mr. Examiner.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Hawkins, I assume that you're referring to Rule 6 of the Basal Coal Pool Rules, where it says that any subsequent well drilled or recompleted in existing Cedar Hill Fruitland Basal Coal standard or nonstandard unit shall be authorized only after notice and hearing.

Is that what you're alluding to, to

perhaps modify that particular rule to allow, like you said, essentially two wells, one for the lower and one for the upper?

A I think that would follow the same intent that Rule 6 is designed to protect and it appears Rule 6 is designed to protect against more than one well being drilled in a spacing unit and concurrently producing from identical intervals, and our opinion is that to allow two wells selectively to produce the basal and the upper coals is really not going to be of a different intent than a single well that would either open all of those up or some other mechanical completion that would allow that through the same wellbore.

MR. STOGNER: Mr. Kellahin? Do you all have any --

MR. KELLAHIN: I don't have a position on that issue, Mr. Stogner. It's beyond, obviously the subject of this case. We will examine Mr. Hawkins' concern and see what we might recommend to you in terms of operation in this pool or amendments to the pool rules that will satisfy his concerns and not create problems for anyone else, but I can't give you a response one way or another at this point, Mr. Examiner.

MR. STOGNER: I'm afraid Mr. Kellahin is right. As far as this particular case, I feel

it's beyond the scope of it. I would suggest possibly looking into changing the pool rules to allow for this. You've got a very good point, Mr. Hawkins.

MR. CARR: We're aware that this is probably beyond the call of the case since this is an area that is not only subject to hearings today but next month. We thought it was important that the picture all be laid before you, but we're aware of the limitations based on the call of the case.

MR. STOGNER: Thank you. I have no further questions of Mr. Hawkins. You may be excused.

Does either party have anything further in Case Number 9362 at this time?

Like I said, the record will remain open for ten days pending the additional information.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9362, heard by me on 22 June 1988.

Michael E. Stogner, Examiner
Oil Conservation Division

8/12/88

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

Reopened and Readvertised

CASE NO. 9362

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

February 21, 1990
11:30 a.m.
Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on February 21, 1990, at 11:30 a.m. at Oil Conservation Division Conference Room, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Paula Wegeforth, Certified Court Reporter No. 264, for the State of New Mexico.

FOR: OIL CONSERVATION DIVISION

BY: PAULA WEGEFORTH
Certified Court Reporter
CSR No. 264

I N D E X

February 21, 1991
Examiner Hearing

CASE NO. 9362

* * *

E X H I B I T S

A P P E A R A N C E S

FOR THE DIVISION: ROBERT G. STOVALL, ESQ.
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FOR AMOCO PRODUCTION COMPANY: CAMPBELL & BLACK
Attorneys at Law
BY: WILLIAM F. CARR, ESQ.
Santa Fe, New Mexico 87501
AND
ERIC NITCHER, ESQ.

* * *

EXAMINER CATANACH: At this time we will call Case 9326.

MR. STOVALL: In the matter of Case 9362 being reopened pursuant to the provisions of Division Order No. R-7588-B, which ordered expanded the vertical limits of the Cedar Hill-Fruitland Basal Coal Pool in San Juan County.

EXAMINER CATANACH: Are there appearances in this case?

MR. KELLAHIN: Mr. Examiner I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin & Aubrey, appearing on behalf of Meridian Oil, Inc.

MR. CARR: Mr. Examiner, I would like the record to reflect "the little man" is here with big oil.

My name is William F. Carr. I'm with the law firm Campbell & Black, P.A., of Santa Fe. I'd like to enter my appearance on behalf of Amoco Production Company. I'm appearing in association with Eric Nitcher.

EXAMINER CATANACH: Are there any other appearances?

MR. STOVALL: Are there any witnesses? That was the question.

EXAMINER CATANACH: Will the witness please stand and be sworn in?

(Whereupon the witness was duly sworn.)

MR. STOVALL: Let the record reflect that Mr. Bruce

was in the room, but he left before his case was called.

MR. KELLAHIN: Mr. Examiner, at this time I'd like to call Mr. George Dunn. Mr. Dunn is a reservoir engineer with Meridian Oil Company he resides in Farmington, New Mexico.

GEORGE T. DUNN,

the Witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. My name is George T. Dunn. I'm the regional production engineer for Meridian Oil Company in Farmington, New Mexico.

Q. Mr. Dunn, on prior occasions, have you testified as a petroleum engineer before this division?

A. Yes, I am.

Q. Pursuant to your employment, have you been actively involved on behalf of your company in examining not only the Cedar Hills coal gas production but the Basal Fruitland coal gas production?

A. Yes, I have.

Q. Have you made yourself familiar with and knowledgeable about the Cedar Hill-Fruitland Coal Gas Pool

rules?

A. Yes, sir.

Q. And are you familiar with the prior case that was held by the division in Case 9362 and hearing held in June of 1988?

A. Yes, I have.

MR. KELLAHIN: At this time we tender Mr. Dunn as an expert petroleum engineer.

EXAMINER CATANACH: Mr. Dunn is so qualified.

Q. (By Mr. Kellahin) Based upon your information, study and review of this matter, Mr. Dunn, do you have a recommendation to the examiner concerning whether or not the temporary extension of the vertical limits of the Cedar Hill Coal Gas Pool to include those coals above the basal coal should now be made permanent?

A. Yes. We recommend that they should be made permanent.

Q. Let me have you go to the wall and look at the cross section that was introduced in the prior hearing. In the original Case 9362, it was marked as Exhibit No. 3.

To refresh the examiner's recollection, would you, first of all, identify for us what is the configuration or the boundary for the Cedar Hill-Fruitland Basal Coal Gas Pool as shown on that display?

A. The boundaries are shown in the bottom of the

cross section down here by the hatched lines around the Cedar Hill Pool, and then there is one section boundary shown external to the Cedar Hill Pool.

Q. Prior to the entry by the division of Order R-7588-B in October of 1988, whereby it extended the vertical limits for the pool, identify for us on the cross section what was recognized and acknowledged by the division and operators as the coal zone for that pool at that time.

A. The original?

Q. Yes, sir.

A. The original was denoted down here in the darker blue, listed as "current" -- or stated as "current." It would be these lower coals running across this cross section.

Q. Do you find the lower basal coal zone that is identified in Cedar Hills to be continuous with basal coals found outside of the pool?

A. Yes, in a general sense. Yes.

Q. When you look at the extension of the vertical limits of the Cedar Hill Pool rules to include other coal seams, identify and describe for us the extension.

A. The extension is shown on this cross section as the lighter blue section, and it's defined on the Snyder Com B No. 1 well going up to the top coal right here, and

it would include all the coals in this level.

The actual order takes the inclusion of any coals between the base of the Fruitland coal up to where this dashed line is, which would be the demarcation between the Fruitland coal and the Kirtland shale.

Q. Do the current vertical limits for the basin coal rules conform to the current vertical limits of the basin Fruitland Coal Pool?

A. Yes, they do.

Q. Anything else about this display?

A. All I might note is, there are arrows pointing to areas when these wells were drilled where kicks or blow-outs occurred indicating productivity in all the layers of the coals that are shown on this cross section.

Q. Has subsequent development taken place in the Cedar Hills Coal Pool to test and produce the upper coals?

A. Yes. There has been within the pool and also external in the outer sections, and some of the future exhibits will indicate some of the high amount external to this. But also internal current completions are all produced from the full section of Fruitland coal.

Q. Let me direct your attention, Mr. Dunn, to the exhibit booklet that's prepared for today's hearing and ask you to look at the display following Exhibit No. 1 tab.

Do you have that before you?

A. Uh-huh.

Q. Identify for us the significance of the color code.

A. The two red symbols are Fruitland coal wells that we're going to provide additional data above and beyond what was shown in the original hearing on that substantiate the vertical limits of the pool. One is external to Cedar Hill Pool and one is internal.

The green-colored triangles are wells which have been developed since that original hearing external to the pool and completed in the total vertical limits.

Q. Let's turn to the information following the Exhibit Tab No. 2. Identify and describe what's shown on that display.

A. This is the same land plat with only the red wells denoted. The green aren't denoted on this one, and in addition, it's overlaid with a net isopach of the Fruitland coal indicating continuity through the Cedar Hill Pool of the Fruitland coal zones. This includes the full section of any seams greater than two foot thick.

Q. Would the coal isopach represent coals of two feet thick or greater including the basal coal?

A. That's correct.

Q. So this is an effort to map the coal thickness for the entire vertical limits that now currently exist and

apply to Cedar Hills?

A. That's correct.

Q. What conclusion do you have about the continuity of that coal seam within and without the boundary of the pool?

A. That it's continuous going within and without, and there's no real reservoir property-type differences within the vertical limits as they exist in the temporary rules.

Q. Based upon the isopach, do you see any compelling reason to reduce the vertical limits in Cedar Hills back to the original basal coal?

A. No, I do not.

Q. Let's turn now to the information behind Exhibit No. 3. Identify the display for us.

A. The display is an electric log. A density log primarily is what I'll be talking about on the left-hand side and a mud log for the Heizer 100 well, and that was the red triangle which was just north of the Cedar Hill Pool.

Q. The mud log on the Heizer well is in Section 15?

A. Section 15 of 32 and 10 northeast quarter.

Q. And the density log represents a well located where?

A. It's the same well. These two are the same.

Q. Oh, I'm sorry. Okay.

What's the point?

A. That they are located in Section 15.

The two logs are -- there are several points that can be made here. One, you can note the excellent correlation between mud logs and electric logs in the area. The purpose of this is, several wells don't -- coal wells are not logged electrically, and so we're going to show a mud log subsequent to this, and we just wanted to indicate the correlation between the two.

In addition, you'll note that these logs do not indicate any differences as you move vertically through these coal seams. Density correlations on the electric log indicate a range of 1.25 to 1.55 grams per cc density in any of the zones. There's no drastic difference in density.

All the coal seams exhibit similar properties. In terms of external data to what we're presenting today, we have drill cuttings and core analysis which show similar rank, similar reservoir properties and similar gas contents through all the zones in the vertical section.

Q. Let me have you go to the next display following Exhibit Tab No. 4 and have you identify and describe that exhibit.

A. This is a mud log from the Harrison No. 100,

which is on the same drill pad as the first electric log shown on the cross section, which would be on the far left, the Harrison No. 2, I believe it is. And it correlates quite well to that electric log also.

The significant points to note here are that from penetration of the first and uppermost coals all the way to TD there is gas flows indicated, and at the same time -- it's kind of hard to read on part of this -- there's a continual 15- to 20-foot flare through the drilling of the whole interval, again showing gas productivity from all the coal seams.

Q. From subsequent data developed since the adoption of the temporary rules increasing the vertical limits for Cedar Hills, Mr. Dunn, has subsequent information been developed to show that the additional coal seam added to the basin coal -- basal coal in Cedar Hills has been commercial gas production out of the coal seam?

A. Yes. There's been commercial gas production out of the full interval, whether it be the basal or in any other zone.

Q. Do you see any material differences in reservoir properties or parameters when you compare the coal seams in the new extension to the coal seams found in the original basal coal zone?

A. No. We cannot define any reservoir

characteristics or properties which would differentiate one seam from another, no matter how they are defined or called in a vertical sense or in terms of productivity or spacing. They all represent a common source of supply.

Q. In comparing the current extension of the vertical limits in Cedar Hills to what exists in the basin Fruitland coal, do you see any reason to not treat them in similar fashions?

A. No. They should be treated exactly the same.

Q. And if the current extension is made permanent, will that tend to make the treatment of the two pools similar?

A. Yes, it will.

Q. Do you see any reason, based upon your knowlege and experience, to do other than to make this extension permanent at this time?

A. No, I do not.

MR. KELLAHIN: We move the introduction of Meridian's Exhibits 1 through, I believe it, was 4.

THE WITNESS: 4.

MR. KELLAHIN: 1 through 4.

EXAMINER CATANACH: Exhibits 1 through 4 will be admitted as evidence.

(Whereupon Applicant's Exhibits 1 through 4 were admitted into evidence.)

MR. STOVALL: I'll be right back.

MR. KELLAHIN: Do you want a copy of the order?

MR. STOVALL: Yes. Do you have the order handy?

MR. KELLAHIN: Yes, we do.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Dunn, do you have any information as to how much of these -- or how much gas is produced from the individual coal seams, or is that all just lumped in together?

A. In general, it's all lumped in together. In this specific area we don't have any separate tests. In other areas of the basin we do.

Q. So you have proof that these other coal stringers are productive?

A. Yes. I should back up, I guess. We didn't present it today. There was presented at the original hearing a Spinner survey showing flow in -- throughout the zone, and we didn't show that today. And that was from a well within the Cedar Hill Pool.

Q. These coal seams are not in communication, however; is that correct?

A. Like through vertical fractures or something like that?

Q. Well, through -- yeah, through natural

fractures.

A. No, they shouldn't be.

Q. Mr. Dunn, approximately how many of the wells within the Cedar Hill are completed in the various -- in all of the various coal stringers?

A. I don't know if I -- I can't give you an exact number. I believe it's close to a hundred percent of them. I'm not aware of any that are not now.

EXAMINER CATANACH: I believe that's all I have of the witness.

MR. KELLAHIN: Let me follow up on one thought. I'm sorry.

MR. STOVALL: Go ahead.

RE-DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Let me follow up on the concept of the separation or the segregation of the coal lenses within the pool. All right?

For each of the well bores -- each of the well bores in Cedar Hills, Amoco, as the operator -- or other operators, if there are any -- have perforated most, if not all, of the potential productive coal seams within those given well bores, so within the well bore we have now comingled all the coal seams?

A. That's correct.

Q. When you -- set that aside for a moment. When you look at the coal seams and each lens and consider that as a separate source of supply independent one from another, is it hardly practical to create separate pools for each of the coal seam lenses?

A. It would be impractical to do that.

Q. Doesn't make any sense, does it?

A. No.

Q. Do you see any differences in reservoir parameters or characteristics as we move from one lens to the next?

A. No.

Q. It's not like gas production in southeastern New Mexico where you might have a difference in spacing, a difference in gas composition as you moved vertically down through the various members of the gas producing zones?

A. That's correct. You could not define a reason to separate them based on reservoir parameters.

Q. So while these pockets of gas-producing intervals within coal seams might at one point have been physically separated, in terms of administering those coal seams, your recommendation is to administer them as one common source of supply?

A. That's correct.

MR. KELLAHIN: No further questions.

EXAMINATION

BY MR. STOVALL:

Q. Mr. Dunn, aren't most of those wells open-hole or are they perforated?

A. There's a combination of both, the more recent wells probably being open hole.

Q. Is there any distinction between the Cedar Hill Pool and the Fruitland Pool?

A. In --

Q. Geologically speaking.

A. Well, that's a pretty broad question.

Q. In the immediate area.

A. No.

MR. STOVALL: Okay. No further questions.

EXAMINER CATANACH: No further questions?

The witness may be excused.

MR. NITCHER: Eric Nitcher with Amoco Production.

We don't have any questions of the witness. We would just like to support making the extension of the vertical limits and support the application and make the rules permanent.

EXAMINER CATANACH: Anything further in this case?

If not, Case 9362 will be taken under advisement.

(The foregoing hearing was concluded at the approximate hour of 11:50 a.m.)

* * *

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

REPORTER'S CERTIFICATE

I, PAULA WEGEFORTH, a Certified Court Reporter and Notary Public, DO HEREBY CERTIFY that I stenographically reported these proceedings before the Oil Conservation Division; and that the foregoing is a true, complete and accurate transcript of the proceedings of said hearing as appears from my stenographic notes so taken and transcribed under my personal supervision.

I FURTHER CERTIFY that I am not related to nor employed by any of the parties hereto, and have no interest in the outcome hereof.

DATED at Santa Fe, New Mexico, this 20th day of March, 1991.

Paula Wegeforth

PAULA WEGEFORTH
Certified Court Reporter
CSR No. 264, Notary Public

My Commission Expires:
September 27, 1993

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9662 heard by me on February 21 1991.

David R. Catanach, Examiner
Oil Conservation Division

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

CASE 9362, CASE 9420

EXAMINER HEARING

IN THE MATTER OF:

Case 9362 Being Reopened Pursuant to the Provisions of Division Order Number R-7588-B, which Order Expanded the Vertical Limits of the Cedar Hill-Fruitland Basal Coal Pool in San Juan County. In the Matter of Case 9420 Being Reopened Pursuant to the Provisions of Division Order No. R-8768, which Order Created the Basin-Fruitland Coal Gas Pool in San Juan County and Promulgated Temporary Special Rules and Regulations Therefor.

TRANSCRIPT OF PROCEEDINGS

ORIGINAL

BEFORE: MICHAEL E. STOGNER, EXAMINER

STATE LAND OFFICE BUILDING

SANTA FE, NEW MEXICO

October 31, 1990

A P P E A R A N C E S

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ALSO PRESENT:

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Santa Fe, New Mexico 87504

* * *

I N D E X

* * *

WHEREUPON, the following proceedings were had at 4:35 p.m.:

EXAMINER STOGNER: Call Case Number 9362.

MR. STOVALL: In the matter of Case 9362 being reopened pursuant to the provisions of Division Order Number R-7588-B, which Order expanded the vertical limits of the Cedar Hill-Fruitland Basal Coal Pool in San Juan County.

EXAMINER STOGNER: Do you have something, Mr. Stovall?

(Off the record)

MR. STOVALL: Mr. Examiner, this case is tied into Case 9420, the Fruitland Coal case, but in that case we're going to request a continuance until April. I request that this case also be continued to that time so that there be no changes.

MR. KELLAHIN: That's fine with me.

MR. STOVALL: You requested six months; is that not true --

MR. KELLAHIN: Certainly.

MR. STOVALL: -- Mr. Kellahin?

In other words, let me state this, that Case 9362 should be continued to the same date as Case 9420, whatever date that is.

MR. KELLAHIN: Mr. Examiner, I'd like to

enter an appearance for Meridian Oil, Inc., in both of these cases.

It had been my request that the --

MR. STOVALL: Excuse me, why don't we get that in the record for 9420, and then we'll tie this one to it.

EXAMINER STOGNER: Let's call Case 9420 at this time, since they are tied together.

MR. STOVALL: In the matter of Case 9420 being reopened pursuant to the provisions of Division Order Number R-8768, which Order created Basin-Fruitland Coal Gas Pool in San Juan County and promulgated temporary special rules and regulations therefor.

Mr. Examiner, Mr. Kellahin wants to say something about this case.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: I'd like to enter an appearance in both cases, and I believe Mr. Carr is here also to make an appearance.

MR. CARR: I believe Mr. Kellahin failed to mention he was appearing for Meridian Oil, Inc. That's his client.

I'd like to enter my appearance in each of the cases for Amoco Production Company.

Our concern is that the cases be heard at the same time since Cedar Hill-Fruitland Basal Coal testimony is interrelated to the testimony that will be presented in the base case for Fruitland Coal rules.

EXAMINER STOGNER: Now, the question is, when should these cases be continued to?

MR. KELLAHIN: We had earlier requested on behalf of Meridian that the existing Coal Gas Rules, if it was necessary to do so, be at least extended for a period of six months, and that within that time frame we would come back to a hearing whenever the Division deemed it was appropriate to do so.

We anticipated that hearing might be as early as the end of January, sometime in February, and it's up to, certainly, the Division to set that. But we wanted to have the comfort that there was no hiatus in terms of the rules for either pool that would cause those pool rules to somehow inadvertently lapse and have some interest owner out there in the Basin contend that we were on spacing of something other than 320 gas spacing.

MR. STOVALL: That would certainly create a confusion in the Supreme Court, wouldn't it?

MR. KELLAHIN: Yes, it would.

MR. STOVALL: Well, Mr. Kellahin, I believe

we have a letter from Amoco Production and also from the bi-state committee that is studying this pool, and I think they've indicated that their report would be available by January or sometime in January; is that correct, Mr. Kellahin, to the best of your knowledge?

MR. KELLAHIN: It's my understanding, and what we hope for, is that the Division would give us a period of time after that report was generally available so that individual companies, including my own, could examine that report and be prepared, then, to comment at the hearing that would come up shortly thereafter.

MR. STOVALL: I would recommend that, then, perhaps it be continued till either the first or second hearing in February; does that sound reasonable?

MR. KELLAHIN: Well, I guess we are subject to whenever this report is going to be available, and I don't want to delay the process, but I think it is important that everyone have two or three weeks to see the report and see to what extent they want to concur, adopt, or come to some different opinion.

MR. STOVALL: I'm just trying to come up with a hearing time.

MR. CARR: May it please the Examiner, a February date would be satisfactory, I'm certain, to

Amoco. If the report raised questions that we couldn't handle in that time we would again request further continuance. But so that we can have a set date to go forward with, that would be fine.

(Off the record)

MR. STOVALL: How about the second hearing in February? Does that suit for now? We don't have dates scheduled, so we can't make the specific date, but we know there will be two hearings a month.

EXAMINER STOGNER: Who are you asking, Mr. Stovall?

MR. STOVALL: I am asking, I guess, anybody who wants to answer.

(Off the record)

EXAMINER CATANACH: Mr. Stovall, it's my understanding that Mr. LeMay wanted the case to be heard as soon as possible after the report was issued, and he had in mind a January date. So February would probably be all right, the first part of February.

MR. STOVALL: Yes, I think the request to have some time to review the report is probably -- one month, I don't -- I can't see that making a big difference.

Second date in February is what I'm recommending, Mr. Examiner. And Mr. Carr is nodding

his head.

(Off the record)

EXAMINER STOGNER: In that case, both Cases 9362 and 9420 will be continued and readvertised for the second hearing in February, date unknown.

So with that, those matters are concluded.

(Thereupon, these proceedings were concluded at 4:40 p.m.)

* * *

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL November 14, 1990.

STEVEN T. BRENNER
CSR No. 106

My commission expires: October 14, 1994

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case Nos. 9362 and 9420 (Reopened) heard by me on 31 October 1990.

Examiner