

VIRGINIA OIL AND GAS CONSERVATION BOARD

SPACING HEARING

NORA COALBED METHANE

JANUARY 26, 1989

DICKENSON COUNTY, VIRGINIA

REQUESTED BY EQUITABLE RESOURCES, INCORPORATED

BOARD MEMBERS IN ATTENDANCE

Mr. Joseph Johnson, Chairman
Mr. Benny Wampler
Dr. Robert Whisonant

Mr. Tom Fulmer, State Oil & Gas Inspector
Ms. Diane Davis, Recorder

10:30 am hearing
Conservation Board 1/26/89

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Joe Johnson

It is a little after 10:30 so we will get started. My name is Joe Johnson and this is a hearing of the Oil and Gas Conservation Board. The members present of that Board are Dr. Bob Whisonant, Professor of Geology at Radford University, Mr. Benny Wampler, on my left, who is with the Department of Energy, Mining, Minerals and Energy in Big Stone Gap. Mrs. Davis will record the proceedings of this hearing and Tom Fulmer, Oil and Gas Inspector with the Commonwealth of Virginia, Division of Mines and Minerals. So Mr. Counts, if you are ready, go right ahead sir.

Richard Counts

Mr. Chairman, I would like to request of the Board that we have a consultant employed by Equitable Resources (EREX), the spacing application in front of the Board involves the spacing for coalbed gas wells within the Nora Field in Southwestern Virginia. Since this is a new resource to Virginia and one that the Board has not had before it before and we also have a number of people in attendance today, I would like to request that for 20 minutes we go off the record and have the consultant for EREX present a series of overhead slides which would help, hopefully, orient not only the Board but also those people in attendance and have an interest in the development of this natural resource in Virginia.

Joe Johnson

All right, Mr. Counts, before you do that. Let me apologize first off. I should have stated that the purpose of this meeting is to hear arguments and evidence concerning the request by Equitable Resources for the establishment of provisional spacing of wells in the Nora Coalbed Gas Field. I wanted to get that on the record, Mr. Counts, if you don't mind. Any objections gentlemen to Mr. Counts showing this. All right sir, go right ahead. Mr. Counts, I think maybe we ought to state for the record that the Commission will view this but it will not become a part of the record. It is for our own information. O.k. Mr. Counts, go right ahead.

OFF RECORD FOR PRESENTATION

Joe Johnson

All right, Mr. Counts if you are ready, we will continue.

Rick Counts

Thank you very much Mr. Chairman. As you previously indicated, this is an application by Equitable for the granting of provisional spacing rules for the Nora Coalbed Gas Field for coalbed methane degas wells. As my first witness, I would like to call Mr. Don Hall. Mr. Hall would you state your name for the record please.

Don Hall Don Hall

Rick Counts Whom are you employed by?

Don Hall I am employed by Equitable Resources as a landman in Virginia.

Rick Counts Have you ever testified before the Virginia Department of Mines and Minerals before?

Don Hall Yes sir.

Rick Counts Don, could you indicate to me for the record what your background is? What your education is?

Don Hall I have a Bachelor of Science degree in Business Administration from Morehead State University in Morehead Kentucky.

Rick Counts And your work experience briefly for the Board please.

Don Hall I have been with the Equitable system in the land department for approximately 18 years. Almost 18 years.

Rick Counts Mr. Chairman, I would like to offer Mr. Hall as an expert witness as a landman in this matter.

Joe Johnson Any objection gentlemen? All right, Mr. Counts we will accept Mr. Hall as a expert in that field.

Rick Counts Mr. Hall do your responsibilities include the lands involved herein and the surrounding area?

Don Hall Yes sir.

Rick Counts How long have you worked in this particular area?

Don Hall Next month I will have worked in Virginia 16 years.

Rick Counts Could you state your duties in connection with your work?

Don Hall I work in lease acquisition, title , right-of-way acquisitions, damage settlements, permitting and other land related activities.

Rick Counts Thank you. Mr. Hall are you familiar with the application for the relief requested?

Don Hall Yes sir.

Rick Counts Is the applicant the owner with the right to drill wells in the land involved herein so as to produce from common sources of supply covered hereby?

Don Hall Yes we have a major portion of the area leased from Pine Mountain Oil and Gas which is a Division of Pittston.

Rick Counts I assume you have leases from others as well?

Don Hall And others, yes.

Rick Counts What is the boundary of the field which the applicant seeks to have spaced?

Don Hall I have a plat here with the boundaries located.

Rick Counts Before we go any further Mr. Hall, was this plat prepared by you under your direction?

Don Hall Yes

Rick Counts Mr. Chairman, I would like to offer this plat into evidence as **Exhibit 1**.

Joe Johnson Any objection? All right Mr. Counts. Mr. Counts I believe each member of the Board has a copy of this.

Don Hall If you will follow the boundary there, the eastern boundary is along the longitude line of 82 degrees and runs with a southern boundary latitude of 36 degrees and 55 minutes. The western boundary is the 82 degree, 35 minutes to the west there going up to the state line and the northern boundary would run with the state line until it intersects with the latitude of 36 degree, 20 minutes and then back to the beginning.

Rick Counts Mr. Hall, upon what basis do you propose to space wells within this area?

Don Hall We are proposing a 60 acre spacing to be as close in configuration of a square as possible.

Rick Counts How close to the unit line do you propose that wells be located within the unit?

Don Hall Three hundred feet.

Rick Counts Why?

Don Hall You have various problems topographically, geologically. You have lease restrictions and of course consideration of other mineral owners.

Rick Counts You also propose that wells that are drilled within a unit be located no closer than 800 feet to any well drilled to the same common sources of supply?

Don Hall Yes sir.

Rick Counts I have no further questions of Mr. Hall.

Joe Johnson Thank you Mr. Hall. Mr. Counts, gentlemen, any member of the Board have a question for Mr. Hall. All right, thank you Mr. Hall.

Rick Counts Mr. Chairman, I would like to now call Mr. Brint Camp.

Joe Johnson Camp

Rick Counts Camp (C A M P) Mr. Camp would you state your name for the record please.

Brint Camp Yes, my name is Brint Camp.

Rick Counts Whom are you employed by?

Brint Camp I am employed as a full-time salaried geologist with Equitable Resources.

Rick Counts Would you state your education background please?

Brint Camp Yes I have a BS degree in geology from the University of Kentucky. I graduated in 1977.

Rick Counts Would you also state briefly your experience for the record please?

Brint Camp Yes I have worked approximately 11 years in Eastern Kentucky and Southwestern Virginia as a geologist and completion specialist.

Rick Counts Mr. Chairman I would now like to offer Mr. Camp as an expert witness as a geologist in this matter.

Joe Johnson Any objection? All right Mr. Counts thank you.

Rick Counts Mr. Camp in order for the Board to understand the necessity for coming up with a special set of rules for production from the various coal seams underlying this field, would you please describe generally the geological history of these coals?

Brint Camp Yes, the coal is basically laid down in a lagoon type environment where fluid movement is restricted. You don't have a whole lot of oxygenation of the plant and organic matter that is laid down so that it does

not decay as it would in an environment where you do have a lot of movements of fluids through the earth. Over a time all this organic material will build up and with the addition of pressure of various sands and shells that will be laid down over top of them, they will form into coal seams.

- Rick Counts Could you expound upon the aerial extent of these coal seams?
- Brint Camp We are dealing with as many as 25 coal seams in the area of interest. I have a map showing the southern portion.
- Rick Counts Mr. Camp, was this map prepared by you or under your direction?
- Brint Camp Yes it was.
- Rick Counts Mr. Chairman I would like to offer this plat with the overlays into evidence as **Exhibit 2**.
- Joe Johnson All right sir. That is an overlay of the map of Exhibit 1.
- Rick Counts That is correct. I would like to offer the overlays as Exhibit 2.
- Joe Johnson All right, if no objection, go ahead.
- Brint Camp The map there is 1:8000 and this is a 1:4000 here. Basically showing this southern portion of that map. We are dealing with approximately 25 coal seams in this area. I have shown four of the major coal seams just to give you an aerial extent of what we are looking at. This is the Pocohontas #6 which would be deeper than the #4. I have got outlined all the area where it is approximately 18" thick or greater.
- Joe Johnson Mr. Camp, excuse me for a moment. Is that the map that, is that the same map that the members of the Board have before them?
- Brint Camp No it isn't. This is another map that was prepared after that map.
- Joe Johnson That is the same map that was presented to the Board as Exhibit 1 is it not?
- Rick Counts That is correct. The base map where the counties are designated.
- Joe Johnson O.k.

Brint Camp

Right here is the Dickenson County area. Buchanan County is to the east and Wise County to the south. The aerial extent of the coals we have outlined, this was based on some work that was done for the Pittston Coal Group by a consultant out of West Virginia. Like I said, I am showing approximately four of the more major coal seams to give you an idea of the aerial extent of what we are looking at. This is based on his work on seams of 18" or greater. This is the aerial extent of the seams 18" or greater.

Dr. Whisonant

Which seam is that?

Brint Camp

This is the Pocahontas #6 seam. One of the seams we are showing. On top of this you can see the aerial extent of the Lower Horsepen Seam. This seam lies above the Pocahontas #6. You can see that these are fairly large aerial extent seams that we are dealing with. But they aren't really continuous in places. You see where you have large gaps in here. This is basically due to the nature of the environment in which these coal seams were laid down. On this third seam we are depicting here is the War Creek Seam. The fourth seam, we show is the Upper Horsepen Seam. The areas that we have been pursuing so far, the PC#1 area is right over in here and the PC101 and 102 area is right over in this area. We also have a stratigraphic section over here showing basically the various coal seams we are interested in. This is gamma ray logs that were run on the wells after they were drilled. The yellow you see here in the tie lines of the various coal seams and how we correlated from one well to the other. The well on the left is PC1 which was the first well we drilled over on the western area and PC101 and PC102 were drilled over on the eastern development area.

Rick Counts

Mr. Chairman, if I might, I would like to introduce the exhibit showing the logs of EREX wells PC1, PC101 and PC102 in to evidence as Exhibit 3.

Joe Johnson

Any objection? All right, Mr. Counts.

Rick Counts

Thank you Mr. Chairman.

Brint Camp

As you can see, there are numerous seams within this area right here that we are dealing with. Our upper most seam at this time that we are looking at is the Jaw Bone seam. You can see here it is approximately 1200' deep around the PC1 area and it is approximately 680' deep in the PC101 and 102 area. The lower most seams that we have been dealing with are the lower Pocahontas Seams 1, 2 and 6. These wells are drilled approximately to a depth of 2000 to

2500' deep. So that is basically the range we are looking at the. The seams in between that.

Joe Johnson

Any question on that gentlemen. Dr. Whisonant?

Rick Counts

Mr. Camp, based upon your study and your opinion is development or trend of development of the area shown that the Nora Coalbed Gas Field is wholly underlain by several coal seams which you named which should be treated as one separate common source of supply?

Brint Camp

Yes

Rick Counts

Mr. Camp, does the applicant further request that the order provide that all coalbed gas wells now, or later drilled in this field, be declared exploratory wells so as to qualify for the two year period of confidentiality provided for in Virginia Code Section 45.1-322 for all logs, surveys and other reports as filed with the Inspector?

Brint Camp

Yes

Rick Counts

Mr. Camp, will the granting of this application be in the best interest of conservation, prevention of waste and protection of correlative rights?

Brint Camp

Yes it would. In terms of the conservation, smaller spacing requested for these coal wells as opposed to the conventional wells would be required to recover the gas that in place in a reasonable time. The coals that we are dealing with right now, as mentioned earlier, probably will not be mined at any expected time in the near future. If they are, then we are helping in de-gasing them for the safety of mining at a later date.

Rick Counts

Thank you Mr. Camp. I have no further questions, Mr. Chairman.

Joe Johnson

All right, gentlemen does anybody have a question of Mr. Camp?

Dr. Whisonant

I would like to get one thing clarified. I am a little bit unclear on. The map that we have, Exhibit 1, you are using 36 55 latitude as the south boundary. On that map don't some of those seams lap further south. It looks like a different map. I guess my question is going to be is we accept this as the Nora boundaries, then some of those seams are going to be south of the official perimeter. Is that right?

Brint Camp That is right. That is the area that we are requesting. We are just basically trying to give you an idea of the aerial extent. Coal seams will be outside of that area. Coal seams will be in the whole plateau region.

Rick Counts Dr. Whisonant, I believe, of course that the spacing we are requesting today is for provisional spacing because there of course has been virtually no development of coalbed methane from a production standpoint in Virginia. It is fully anticipated as Equitable gets further involved in the project, that they will come back before the Board and request a permanent spacing on a different area. This request before the Board today is strictly provisional with the recognition by Equitable that it doesn't follow the entire boundaries of the field and that there may be some areas of overlap.

Dr. Whisonant O.k.

Joe Johnson Mr. Wampler.

Benny Wampler Mr. Counts, do you plan to introduce a witness that would talk about the anticipated drainage?

Rick Counts Yes sir I do.

Benny Wampler O.k. I will reserve my question.

Joe Johnson Anything further? Thank you Mr. Camp.

Rick Counts Mr. Chairman I would now like to call Mr. Peter Raimondi. Mr. Raimondi, could you state whom you are employed by and in what capacity?

Mr. Raimondi I am employed by Equitable Resources Energy. I am a full-time consultant. I have been with them for 4 1/2 years.

Rick Counts Would you also state some other work experience Mr. Raimondi?

Mr. Raimondi Before that I worked for 27 years for Gulf Research, now Chevron in the area of enhanced oil recovery primarily.

Rick Counts Would you also state for the Board your education background?

Mr. Raimondi Yes, I have a B.S., M.S. and PhD in Chemical Engineering.

Rick Counts Mr. Chairman, I would like to offer Mr. Raimondi as an expert witness as an engineer in this matter.

Joe Johnson Any objection? All right, Mr. Counts.

Rick Counts Thank you Mr. Chairman. Mr. Raimondi, do your responsibilities with Equitable Resources include the lands involved with this application?

Mr. Raimondi Yes they do.

Rick Counts What is your position with regards to this project?

Mr. Raimondi Well, I am in charge of evaluating possible projects interpreting exploratory work to see where the coals are and also conducting management of the projects that we are involved in now. The wells that we drill.

Rick Counts Mr. Raimondi, you made a study of the lands involved in this application and the surrounding area?

Mr. Raimondi Yes, we have evaluated prospects in Alabama as well as here in Virginia.

Rick Counts Have you worked with other institutes or associations with regards to studies that have been undertaken in various parts of the country?

Mr. Raimondi Yes, I have worked with people from Gas Research Institute, Department of Energy. I attended meetings, technical meetings, schools and so on that relate or have to do with coalbed methane.

Rick Counts Have you also been involved in feasibility studies for development of coalbed methane in Virginia?

Mr. Raimondi Yes

Rick Counts Mr. Raimondi, could you indicate for the Board what data has been used in your analysis?

Mr. Raimondi We have used data such as that from the drilling of wells. There have also been stratigraphic wells that have been drilled and the information we have used. We looked at gas content, thickness of the seams, permeability, various aspects from actual wells that were drilled in these areas.

Rick Counts Have you also studied similar data which may have been observed or collected from other coalbed methane recovery projects?

Mr. Raimondi Yes, for example, the Warrior Basin in Alabama is very similar geologically to this basin. I am familiar with the work that is going on there since they have practically pioneered commercial exploitation of coal gas.

Rick Counts Thank you Mr. Raimondi. Are you familiar with the application filed in this case?

Mr. Raimondi Yes I am.

Rick Counts Would you please, briefly for the Board, summarize the broad purpose of the application?

Mr. Raimondi The main reason is to get this group of coal seams recognized as a separate source of gas. As a unique source of gas separate from the conventional gas formations. Therefore, because it is separate and because it is different, it will require different spacing. So that is really the main purpose.

Rick Counts Are there existing wells in the lands involved herein which are completed in or producing from the common sources of supply covered in this matter?

Mr. Raimondi Yes, we have drilled three wells already and plan to drill some more. They are, in your exhibit there, they are well PC1, that is the first one shown in the log. That was drilled last April 1988. East of that, to your right as well is PC101 which we drilled around August and PC102 which we just completed this month, January.

Rick Counts In otherwords, PC1, 101 and 102 have all been drilled within the past year?

Mr. Raimondi That is right.

Rick Counts Could you go through for the benefit of the Board, utilizing Exhibit 3 what the common sources of supply from which these are produced?

Mr. Raimondi The common source of supply is the various coal seams. We are not considering any seams above the Jaw Bone as source of supply. We think they will be to shallow and not be suitable for this kind of work. So we would consider all of the seams from the Jaw Bone on down to the Poca group as sources of gas. Some are thicker than others, some are grouped close together and we may perforate them as a group. If we have a thin one isolated here we may not be able to economically get into it at this time.

Joe Johnson I think someone said awhile ago, but would you for me again please, how deep are you thinking about for the deepest part there?

Mr. Raimondi These three wells, the deepest one is this one which was drilled from the top of a hillside. This one is 2700' and the other ones are about 2000' they are shallower. So the range, to cover everything, I would say 3000' at the most and we would not exploit seams that are at least 500' below stream level.

Joe Johnson And the greatest depth you are talking about, the furthest seam down would be about 3000'?

Mr. Raimondi That is right. If I were to state an average I would say it is closer to 2000 or 2200 feet the deepest average. But, there may be some exceptions.

Joe Johnson Thank you sir.

Rick Counts Mr. Raimondi, would you indicate for the Board why it is necessary to treat all of these coal seams as one common source of supply?

Mr. Raimondi First of all, because it would not be possible, I am not sure I follow the question, it would not be possible to treat each seam as a separate seam. We have to comingle, just for practical reasons....

Joe Johnson Economical reasons, right?

Mr. Raimondi Economic reasons and in some cases even technical reasons. Some seams are so close together you just couldn't work to separate them. The fracture would intersect them anyway.

Rick Counts Mr. Raimondi would you also state the approximate thicknesses encountered in the seams you may encounter?

Mr. Raimondi They go from just a few inches to as much as eight feet or so. In the Jaw Bone we have encountered some five to eight foot range and here the Poca #6 is about five feet, 4 1/2 to five feet and we have everything in between. The typical, average is probably 2 1/2 feet I mean the average.

Rick Counts Mr. Raimondi would you also state for the record each of the coal seams up there which you have listed?

Mr. Raimondi We have the Jaw Bone, Upper Seaboard A, Upper Seaboard, Greasy Creek, Middle Seaboard, Lower Seaboard, Unnamed A, Unnamed B, there are many unnamed seams, Upper Horsepen, Middle Horsepen, C

Seam, War Creek, Unnamed C, Beckley, Lower Horsepen, X Seam, Pocahontas 9, and then a whole series of Pocahontas starting with Pocahontas 1 up to Pocahontas 9.

Rick Counts

Thank you Mr. Raimondi. Would you also state the characteristics of the gas being produced from these seams with respect to BTU content, gas analysis and specific gravity?

Mr. Raimondi

Yes, it is a very good quality gas, pipeline quality gas we have encountered so far. The BT values is in excess of 975 up to 1027, I believe we had one. Our average is 96% methane, 1% ethane, about 1 or so percent of carbon dioxide then about again 1% of nitrogen. The specific gravity I think it is .575.

Rick Counts

Mr. Raimondi, does Equitable plan to comingle production from these various coal seams through the same well bore?

Mr. Raimondi

Yes

Rick Counts

In your opinion is production from such coalbed methane de-gas wells from these various coal seams the most efficient and economical way in which to produce such gas?

Mr. Raimondi

Yes

Rick Counts

Are there other coal seams from which commercial wells presently produce or could produce in the lands involved in this application?

Mr. Raimondi

You mean other than the ones that were named?

Rick Counts

Yes sir

Mr. Raimondi

Yes, there are a lot of other unnamed seams. There is probably a total of 30 or so seams that we have looked at some logs on.

Rick Counts

Should all coal seams be involved in any order resulting from this hearing whether yet encountered or not?

Mr. Raimondi

Excuse me, I didn't understand.

Rick Counts

Should all coal seams be involved in this order resulting from this hearing whether or not you have encountered those seams or not as of yet.

Mr. Raimondi

Yes, definitely.

Mr. Johnson Mr. Counts, those thirty seams you referred to, are those in addition to those shown on that exhibit shown over there?

Mr. Raimondi Yes, there are some that are just very slivers.

Mr. Johnson O.k.

Rick Counts Mr. Raimondi, it is true that there are a number of seams that are so close together that they could not be separated in any practical way.

Mr. Raimondi That is right. It just wouldn't be feasible to separate some of them.

Rick Counts Mr. Raimondi, what does the information that you have gathered from the three coalbed methane de-gas wells drilled in this field and similar wells drilled elsewhere indicate to you concerning whether an operator can apply traditional reservoir engineering calculations in matters such as spacing and drainage?

Mr. Raimondi Well, the results from these wells confirm what we have seen in other areas, particularly in Alabama. That you have these incline curves rather than decline curves in the production scheme. We know that the gas, as I was saying, in the talk I gave earlier is absorbed in the coal rather than being in the pore like it would be in conventional gas. The gas has to defuse out for it even starts to flow in the conventional way through the pores. So you have defusion and you have regular permeability to deal with. It is a different way you have to analyze these flows the gas in a different way in the coal.

Rick Counts In otherwords because of unique characteristics of these de-gas wells, traditional engineering methods such as decline curve analysis and volumetric calculations typically used to determine well spacing are of little benefit with regard to coalbed methane wells?

Mr. Raimondi That is right. It is a little more complicated with coal.

Rick Counts Thank you sir. Mr. Raimondi, current Virginia Oil and Gas Regulation 6.06 promulgated by the Board in 1983 prevents the flaring or venting of gas after seven days following completion of the well except to blow off accumulated fluid or except for operational reasons approved by the Inspector. Do you request that the Board, as part of this order, extend the period of time to 30 days that you may be allowed to

vent your coalbed methane wells in order not to damage the reservoir and also to conduct your tests?

Mr. Raimondi

Yes, I would recommend that definitely. Because production starts very slowly in coalbed gas and you need a little more time. Also, the way you produce gas from coal is through a compressor, you almost have to pull a vacuum on the well. So it isn't the typical production mode, so you would like to test it a little longer period of time under that mode of production, that is venting so that you are not flowing against the pressure to speak of. Of course, we are mindful about the wastefulness, but it isn't really because usually gas production is low initially. It is not like the conventional gas where it is maximum at the beginning and then comes down. Here it actually creeps up so it is very low.

Rick Counts

Mr. Raimondi, you have indicated that you have looked at data from a number of other areas including the Black Warrior Basin and other technical literature. Is that correct?

Mr. Raimondi

Yes

Rick Counts

Do you have for the Board today a representative sampling of the literature contained?

Mr. Raimondi

Yes, in fact, we do have it.

Rick Counts

Mr. Chairman we have an exhibit which I would like to be introduced as exhibit 4 which is a booklet containing a representative sampling of literature both general and technical available on coalbed methane production.

Joe Johnson

It looks like it is pretty thick there.

Mr. Raimondi

Yes sir, I would like to introduce this to the Board. Mr. Raimondi may make reference to certain articles but primarily for the benefit of the Board, I won't require you to digest it in the next 30 minutes, but...

Mr. Johnson

In the next 30 days....

Rick Counts

That would be good, yes sir. Mr. Raimondi with regard to the production of coalbed gas, could you indicate how the production initially starts and how it is different from conventional gas?

Mr. Raimondi

Well generally the formation is flowed with water so you have to de-water the formation and this is until you have produced water, the flow of gas is slowed

down is impeded for petroleum engineers this means the relative permeability to gas is extremely low at the beginning and as you get the water out then it increases. So this is the main difference from a conventional gas production where you have gas production single phase right away. The other thing that we know about the coals is that even the coal is fractured in various directions, its effective permeability is still rather low so there you have it. You have to flow water out through the low permeability medium and you have to get that out and you have to get the gas out. That is the major difference between them.

Rick Counts

Mr. Raimondi, based on your study in your opinion has development or trend of development in the areas shown that the Nora Coalbed Gas Field is wholly underlain by several coal seams which you named in addition to others which may exist and should be treated as one separate common source of supply?

Mr. Raimondi

Yes I agree.

Rick Counts

Mr. Raimondi, in your opinion how large a tract will a well in the Nora Coalbed Gas Field producing from this common source of supply effectively and efficiently drain?

Mr. Raimondi

Well, from what we know outside of here and from what we have learned from our wells, we think that probably 60 acres each well should be able to drain 60 acres in a reasonable economic time. This is the reason that Mr. Hall requested to have the spacing rules changed as he stated. We would like to start off with 60 acres which means really 1600' between wells but then work it so that you set up a grid system, you would be at least 300' lets say from a unit line and at least 800' between wells. You don't want to have a different distance between wells because geography and topography so you want to have some leadway so even if we set up a 60 acre square grid, you want to be able to move the wells within that grid a certain amount.

Rick Counts

Mr. Raimondi, could you use easel in describing that to the Board and also the people present.

Mr. Raimondi

There are two patterns side by side, these are approximately 60 acres. There are 1616' on the side and in the ideal world we would put a well in the middle of these 60 acres and have a lot of repeated patterns like that but as I said because of various reasons you cannot do that so we want to be able to locate the well within that space and have some

freedom to move this way or that way. But in any case we fell that we do not need to get any closer than 300' to any of the unit boundaries or if we were that close, lets say if we had a well here which was close to the boundary here and only 300' from here on the next, let me do it here, if we had a well here we wouldn't want to drill another one right here which would only put it 600' away from that well because we would like to then have the next well be at least 800' away from that. So, in otherwords we want to stay within 300' of the boundary with an additional constraint of 800' between wells. I think this would probably, what we envision now, to be the case. But was stated earlier, this is provisional. We are still looking at our data and it could be that later on we find that 40 acres might be required as they are doing now in Alabama, maybe even more maybe 80 acres.

- Rick Counts Does Equitable propose to submit to the Board a uniform grid system overlying the area sought to be spaced?
- Mr. Raimondi Yes
- Rick Counts Does Equitable propose to submit this grid system to the Board within the next week?
- Mr. Raimondi Yes
- Rick Counts Thank you sir. Mr. Raimondi, does Equitable request that the order resulting from this hearing find that the vertical limits of this field comprise all coal seams within the equivalent of the stratigraphic interval from a depth of the surface to 3,000' below sea level?
- Mr. Raimondi That is right with the practical idea that you wouldn't want to have wells close to the surface.
- Joe Johnson Excuse me, you are talking about a depth of 3,000' on this Exhibit 3 over here and you are talking about 3,000' below sea level, that could be a lot of difference in this country.
- Mr. Raimondi No, not sea level. Did we say sea level?
- Joe Johnson You said below sea level.
- Mr. Raimondi Well, then I misspoke.
- Joe Johnson Somebody said below sea level.
- Rick Counts In otherwords, 3,000' below the surface.

Joe Johnson Below the surface

Mr. Raimondi Below the surface, that is right.

Robert Whisonant But you did say from surface to 3,000'.

Mr. Raimondi That is from surface except for practical, in reality, the coals near the surface would have such little gas, in reality we wouldn't drill it. In reality we would probably start taking from 500' on down.

Robert Whisonant The Jawbone to lower.

Mr. Raimondi Yea, the Jawbone and lower, although possibly in some other areas it could be the Raven might also be feasible if it falls down lower.

Rick Counts Mr. Raimondi, is this spacing requested only for coal bed methane de-gas wells in the subject lands and not for gob gas wells?

Mr. Raimondi That is right.

Rick Counts Why is a greater density needed for coalbed methane de-gas wells than for conventional natural gas wells?

Mr. Raimondi Well as we explained, the need is because (a) the flow of gas is impeded first by the water therefore if you have wide spacing it would be uneconomical to wait for all the water to be produced and the other reason is there is a lot of gas within an acre within the coal. The quantity is like 400, 500 or 300 to 500 cubic feet per ton. Therefore, there is so much gas that you can afford to put closer wells and therefore produce them in a more economical time.

Rick Counts What name does Equitable propose for the pool underlying this field?

Mr. Raimondi It is the Nora Coalbed Gas Field.

Rick Counts O.k., does Equitable request that this order be made effective as of today being January 26, 1989?

Mr. Raimondi Yes

Rick Counts In your opinion will the granting of the application foster, encourage and promote the safe and efficient exploration for and development, production and utilization and conservation of gas from this common source of supply underlying the lands involved in the application?

- Mr. Raimondi Yes, definitely.
- Rick Counts In your opinion, will the granting of the application be in the best interest of conservation, prevention of waste and protection of correlative rights?
- Mr. Raimondi Yes
- Rick Counts Mr. Chairman, I have no further questions.
- Joe Johnson O.k. thank you Mr. Counts. Are there any questions from any members of the Board?
- Benny Wampler I have some questions, if this witness is not the one you plan to have to answer this kind of thing, just let me know. In draining, in drilling into de-gas fracture, your coal seam, and de-water it, what kind of volumes of water have you experienced and what happens to that water? Is it going into your pond for example? If you will, describe that process.
- Mr. Raimondi We have so far have encountered four or five barrels of water in one well per day and about 15 from another well. The amount of water is still changing at this time. It is decreasing as a matter of fact as it should. We are currently containing the water in tanks. We are waiting to see what the wells will do. We were surprised actually that the water production is low compared to the Alabama fields and we are planning to construct a water proof basin if we need it for the wells that we will be drilling this year since we will still be drilling a few more and at the same time we are looking at ways to dispose the water through injection in disposal wells and so if we are going to drill 100's of wells and we have this kind of water, then that would be ultimately the best, most economical way to dispose of it.
- Benny Wampler What impact does de-gasification production of these wells have on the BTU of coal once that has occurred?
- Mr. Raimondi None, because when you mine the coal you expose it to the air and the gas escapes anyway. In fact it starts escaping as you are mining as we know.
- Benny Wampler Is the drainage area for the water estimated to be the same as the drainage area, in otherwords, if you were forgetting that you had gas in there and were talking about how much water you would drain, what area, is it approximately the same?
- Mr. Raimondi Approximately the same. That is in the ruling phase.

- Joe Johnson Could I follow up just a moment on that Mr. Wampler. Drilling other than the coal seams, you are drilling on this pattern over here. You have got to get to the coal seams to get to the gas and the coal has the water also. Drilling down one of these things to 2,000', you are experienced with well 101 and PC-1, how many natural aquifers would you go through. Do you go through natural aquifers? I am sure you must.
- Rick Counts Through the fresh water aquifers?
- Joe Johnson Fresh water aquifers.
- Mr. Raimondi The, what we call surface water, fresh water aquifers we case those off. Each of these wells are drilled and from experience we have had from drilling conventional wells, is we must do with conventional wells, we case all the aquifers that would contain fresh water. Usually that means casing 300 to 600 feet or something like that usually.
- Joe Johnson If that well is non-productive, I mean economically non-productive, you case it any way would it not. If you plugged the well it would still be cased, would it not? What I am trying to do is get an idea of what happens to this fresh water on a non-productive well. It is cased essentially as a productive well.
- Mr. Raimondi Essentially yes, because in conventional wells you can just log a well and say well I don't have productive sands, so you don't case it. Here you have to wait until you produce the well on its own to know whether you have a non-productive well. So you have to case it. You case it all the way regardless, even if it turns out to be a dry hole.
- Joe Johnson Thank you sir. Mr. Wampler I think has another question.
- Benny Wampler I was trying to thumb through this report and haven't been able to get to anything dealing with water at all, it deals with gas so far. Has there been any studies in Alabama as to the long term effect of the groundwater levels from a drilling program of de-gasification.
- Mr. Raimondi If there have been, I am not aware of it.
- Benny Wampler Do you in your professional opinion, believe that there is an overall lowering of the groundwater tables from this activity?

Mr. Raimondi No, I don't think so because as I have said we follow the same procedure that we must with conventional gas of casing off the groundwaters. Once you case them off, it is as if you hadn't disturbed it. So it is no effect that I can see.

Rick Counts Mr. Raimondi with regards to the associated production of water from the coalbed gas wells, does it bear certain similarities to a production of water that might be associated with the production of oil?

Mr. Raimondi Yes

Rick Counts The types of disposals implemented would also be similar?

Mr. Raimondi That is right

Joe Johnson Basically the same also as if you were mining the coal, right?

Mr. Raimondi That is correct.

Robert Whisonant I have several technical questions. Some of this just out of my ignorance. Some of it is general interest. On the logs that you have shown us, what is the total coal thickness that you have got indicated up there?

Mr. Raimondi We have between 20 and 30 feet total coal thickness that we from the Jawbone on down. There is more above and we don't generally concern ourselves with. The range has been 32 I think it was. This is counting seams that are one foot thick or more. Now as far as completing, we are not necessarily completing that much. For example in PC-1 we have only completed about 10.5' of coal seams.

Robert Whisonant That was my next question. Which of those are you actually perforating?

Mr. Raimondi We have perforated I believe seven seams here in the Southwest group. One group was the Poca 1 and Poca 4. Then we came up and hit the Lower Horsepen, Beckley and unnamed. In this particular well we also hit the Poca 8. Here we perforated seven seams in this one for a total of about ten feet. In this one we have also perforated about ten feet and we had a mechanical problem with our work. We had planned to perforate 20 and we stopped at ten or some feet. We still have in our plans to eventually do these other ones which we couldn't do at the beginning. The last well which was just perforated this last Friday I believe, we tapped nine seams for a total of 20 feet.

- Robert Whisonant Do you perf and frac them one by one or do you perf everything and then frac it, swab it or what?
- Mr. Raimondi We use the ball and baffle technique. When we set the casing we put a like a ring or spacer that allows you to drop a ball and so what we do is we have three baffles in this particular well. The first thing we did was we perforated the lowest two seams which were in this case the Lower Horsepen and X seam. First we perforated those two. Perforated one went in with a perforating gun the second time and perforated the second one and then we went in and fraced. O.k. then we had a baffle above those two where we dropped the ball so we isolated those two now and we came in and perforated another three seams. I think it was three in the next group because it was close together. Perforating again each one separately, first one, then another got done and then another. Then we injected the same simulataneously. Hopefully they each took its outer line of sand possibly one of the seams ended up with most of the sand. This is the kind of risk you take. Because it would not be feasible to go in with each seam. Technically you can only use four baffles. We used three. Otherwise you don't have enough perimeter change to enable you to do that. So we cannot do each one individually. We have to do them in groups. So far we feel we can do four groups comfortably. Each group may have one seam or two or three seams.
- Robert Whisonant Are you finding the pressures in those seams are very much similar, or can you even tell?
- Mr. Raimondi Well, we can tell something. We can tell something. We can tell the continuous shut-in pressure for example. We do not test the pressure separately before right up to perf. The best indication of what we have of what the pressure is is from the shut-in pressure. In this case it usually ranges from 900 psi to 1300, 1400 psi.
- Robert Whisonant These are pretty typical.
- Mr. Raimondi Yes, for these depths, yes.
- Robert Whisonant You indicated that the wells have to de-water first. Then the gas will follow and reach a peak production. When would you anticipate that being in the life of those wells?
- Mr. Raimondi Peak production, I don't know. We had, one of our wells is still climbing the one we drilled in August it was climbing over a three month period and then we started doing some special testing on that well. We

wanted to see how much gas came from what coal so we would learn and so now our production is down because we are allowing production from each interval. But it was still climbing after three months. The same in the first well here.

Robert Whisonant

Did you find that one of the coals was real gasy compared to the other?

Mr. Raimondi

Generally that is right. You find quite a distribution from one seam just producing five percent to one producing 35 or 40 percent. We have not done enough testing yet to find a correlation across.

Robert Whisonant

One thing I am getting at here is when would we have a good indication of how much area we are really draining. It seems to me that when you are trying to see what the peak production is and the curves are starting to drop off compared to other regions...

Mr. Raimondi

Generally the experts tell us that we need two years history before we can get a good history match on what we have and then try to get that extrapolated on out. It takes time. It is a different world.

Robert Whisonant

I understand, it is early in the game. I would like to ask you about a phrase you used. You said you liked 60 acre spacing so the wells would produce in a reasonable economic time. What does reasonable economic time mean? What do you think it means?

Mr. Raimondi

I am thinking about in the range of ten to twenty years would be a reasonable time. Some gas wells, if you are familiar with some shell wells they last 350 years but not this kind because the economic life of these wells is probably not as long as it is for conventional gas because your operating costs are higher because you may have to keep a pump going all the time. So the life is shorter. But that would be a guess.

Robert Whisonant

That is longer than a conventional well, right?

Mr. Raimondi

Ten to 20, no. No I don't think so. The life of a conventional gas well. I think that 10 to 20 years is the life of a conventional well.

Robert Whisonant

Not a terribly important point, I was just curious. I would like to ask you about in your plan of 60 acre spacing over there you mentioned keeping the wells 300' away from any unit boundary. In your application under the relief sought, I can't find

that you actually specified that. Is that something you want to add?

Rick Counts That is correct, we want to amend the application to address that. That should come under the phrase "... and such other relief as may be requested..".

Robert Whisonant Will there be anything else on the amended application that we have heard this morning but isn't on ours?

Rick Counts Yes sir with regard to the fact since we currently have wells which are already drilled, PC-1, PC-101 and PC-102 and since we do intend to submit for consideration by the Board a uniform grid system, as I am sure you are all aware, this is a new tool which really has not been utilized before in the Appalachian Basin at least not to my knowledge, what we are trying to do is to tie that to some sort of system, perhaps even a USGS or Quad System or Topo system which may eventually end up having increased efficiency with regard to record keeping not only by the operator but also by the state and to the extent that we come, when we present this grid system before the Board, to the extent that one of those wells are more of those wells may end up being within 300' radius, we would request that the Board make a location exception for those wells in order that we can attempt to have a uniform grid system with some degree of reliability.

Robert Whisonant So we are going to see an amended application with the uniform map.

Rick Counts There will be no amended application. I will amend that on the record today.

Robert Whisonant Oh

Joe Johnson Mr. Counts that would be a part of Article 4 then under your relief sought.

Rick Counts Yes sir

Joe Johnson Somehow or another we will get it in writing when Mrs. Davis gets all this done.

Rick Counts If you would like for me to amend the application in writing for the benefit of the Board I would be happy to do so.

Joe Johnson I think I would like to see that the amended part of it.

would object to anything outside what should be contemplated by the Board in its decision.

Joe Johnson You would object to the technical part of it, scientific part of it Mr. Counts? I am talking about the things we have seen and heard about well production

Rick Counts Absolutely not. I would have no objection to questions with regard to those matters.

Joe Johnson You had asked that these be exploratory wells.....All right sir, Mr. Reilly go ahead and if there are objections, we will consider them.

Barney Reilly Thank you sir. The first question that Mr. Raimondi has testified that there will be water associated with these wells and it appears that that will be just a little bit of water as he said 15 or 20 gallons of water. My question is is this salt water or is this fresh water that he is going to have pumping out of this well?

Joe Johnson I will have to direct that question to that gentlemen back there.

Mr. Raimondi Yes it is salt water. The same as you find in coal mine.

Joe Johnson You said soft water?

Mr. Raimondi Salt water.

Joe Johnson He said salt water the same as would come from ordinary coal mining.

Barney Reilly If I can continue Mr. Raimondi, when you pump this salt water out, what are you going to do with it?

Mr. Raimondi I addressed that question before. Right now we are holding it in tanks. When this becomes a burden we will plan to dig a waterproof pit to hold it until we eventually dispose it by trucking it into environmentally accepted places or until we can dispose it into disposal wells that we are already looking for and trying to permit.

Joe Johnson I believe that was part of the record. He stated that.

Barney Reilly Our concern was that this was not going to be poured out on the ground. It is going to be disposed of.

Mr. Raimondi No, no.

Joe Johnson

All right sir.

Barney Reilly

My next question involves the, when they stimulate these wells as we understand stimulating a well, yes the well. If they go down and they are in the process of stimulating the Jawbone seam which is the upper most seam that they anticipate doing, getting any production from. Will they be stimulating these as they normally stimulate a well. Forcing, under high pressure, liquid nitrogen and fracture sands into the coal seam? Is that the way they are going to stimulate these particular wells in that Jawbone coal seam.

Rick Counts

Mr. Camp or Mr. Raimondi.

Mr. Raimondi

No we aren't using nitrogen here, we are using water and sand in these stimulations.

Barney Reilly

Under high pressure?

Mr. Raimondi

Oh yes.

Barney Reilly

It has been our experience that when this does happen, this high pressure, water in this case, used to stimulate that the ground heaves a little bit as this is forced into that coal seam and this may in turn fracture some of those smaller coal seams above that Jawbone and result in gas escaping to the ground. Of course Mr. Raimondi testified that the fractures will intersect other overburdens or other seams. Do you anticipate any problems with this gas? We expect that gas to get into any of our wells or the fresh water above this.

Mr. Raimondi

First of all when I said the fracture could intersect vertically other seams I am only talking about short distances of 30 or 40 feet or so. We have never seen fractures to extend the several hundred feet that they would have to in order to possibly run into the problems you are talking about.

Barney Reilly

Is there that much difference between the upper part of the Jawbone to the next higher coal seam? Several hundred feet?

Mr. Raimondi

But what I am saying even if the next seam that I know is the Raven which is about 70 to 100 above the Jawbone, and we wouldn't expect to reach that much of a distance. Lets assume we did, that would still not be near contaminating any surface wells.

Rick Counts

Is that because of the casing string set and cemented?

Mr. Raimondi That is correct. Also because when we frac this we will not try to work with any seam that is less than 500' below stream level now. Which could be 1000' from the top of a hill.

Barney Reilly It could be 500' below where a well is. Lynn Haynes the hydrologist from Mr. Wampler's Division there indicates that most of our water is contained within the first 500' below the surface and this is what we are worried about. The Jawbone in many cases is within a couple hundred feet of that. The little seams above the Jawbone when the Jawbone is stimulated may cause cracks in that and cause gas in the water above that because although you expect or would like all the gas released to come through your production pipe, much of it is not going to come through the production pipe it is going to seep up through the overburden. We would like the Board to pay some attention to that and maybe get some further information about that.

Robert Whisonant Could I ask a question Mr. Reilly?

Barney Reilly Yes sir.

Robert Whisonant You mentioned the ground heaving, is that documented evidence or antidotal or what, I haven't heard of that?

Barney Reilly Well probably antidotal in discussing gas wells with a geologist up in West Virginia. He explained that to me that all that high pressure, no matter how far down you go, or at least to the 5000 or 6000 feet that the wells historically have been drilled around here, the ground heaves when all that pressure is applied down deep like that.

Robert Whisonant I would like to see that document.

Joe Johnson I would if we were going to accept that as testimony.

Mr. Raimondi These fractures end up being a small fraction of an inch at the widest point. Usually they are an 1/8 of an inch or so the fractures. In fact they have mined through places where they have fractured the coal for this purpose.

Rick Counts Mr. Raimondi what is the _____ extent of a penetration as a result of a fracture into the formation? How far into the coal seam would the fracture go?

Mr. Raimondi It could be several hundred feet.

Rick Counts You are penetrating with sand and water?

Mr. Raimondi Sand and water. Sometimes we add gel to the water to make it more viscous so it holds the sand better.

Brint Camp May I make a comment, Rick, on this?

Rick Counts Certainly

Brint Camp As far as the Jawbone is concerned, above the Jawbone there is a very thick sand body. When we design our frac jobs, it works as a barrier on any kind of jobs that we would design. We are looking at getting into, in the case of the Jawbone, a seam of say three to six feet thick. When we design this frac job, it is an expensive job. So you try to design it to stay basically in that small zone. If you are going 100 feet above that zone with a frac job, then you are expending a lot of materials that you are paying money for that are going to areas that isn't doing any good. So for those reasons, if nothing else, we are designing frac jobs based on fractured radiants of the rocks around it to keep it contained within the areas of interest.

Robert Whisonant Don't you have some evidence from mining into seams that have been fraced. Tell us a little bit about the fracture network. It goes out into the coal but not up and down generally, isn't that correct?

Mr. Raimondi Not into the roof. That is....

Robert Whisonant About how far would you say typically based on what you have actually observed?

Mr. Raimondi How far horizontally or vertically?

Robert Whisonant Vertically

Mr. Raimondi A few feet. That is all I have seen. A few feet, less than ten or so. Usually where they are found, some penetration into the roof it is usually where there were natural fractures, pre-existing natural fractures. In otherwords the fracture that you enduced will try to follow if there is already some natural fracture there. As I said, there is an article in the material I supplied there about coalbed methane from the miners viewpoint. Most of these fears, there is a reasonable fear that you would damage the roof, therefore you would not be able to go in and mined. Most of these fears have been allayed because they have found that the roof, in fact, was not weakened by this hydrolically induced fracture. Because most of the time that is

what they observed. The fracture followed the natural system anyway, something that was already there. Does that answer your question.

Robert Whisonant

Yes, thank you.

Joe Johnson

All right Mr. Reilly, do you have anything further.

Barney Reilly

Yes I do. I would like to know if they are anticipating, according to these maps, they only have four or five different wells they are putting in now and I expect these are just exploratory wells to see exactly what they have down there and what they can get out of it. If these are successful, can we anticipate further wells throughout the Nora Coalbed area? Throughout all over Dickenson County?

Rick Counts

Mr. Chairman, I would say that that is simply just a matter of economics and a matter of development by the client. I would assume as any operator if the wells are successful, they will expand their operations to some extent.

Barney Reilly

That led to my next question. Will they putting more wells since these wells are going to be possibly 800 to 1600 feet apart. The gas field that they are using now, the wells are about 5,000' apart. Can we anticipate more wells to be put in in places where they already have the deeper wells in between those wells? If so, will this lead, we have had many property disputes since they started this in the mid 80's and can we anticipate more of the same?

Rick Counts

Mr. Chairman, here we are obviously getting beyond the wells of this area.

Joe Johnson

We are getting into pooling now. I think we will wait until this afternoon to get into that. Aren't we?

Rick Counts

Yes sir. Even beyond pooling matters.

Benny Wampler

Beyond that, I believe the jurisdiction is in another Board. This Board's jurisdiction is to deal with the spacing and pooling of the resources and not to deal with the matters of whether or not a permit well application is acceptable. That is the Well Review Board jurisdiction. So under this Board we can't get into those kinds of issues.

Barney Reilly

I have a few more questions. Mr. Raimondi mentioned because of the particular nature of these wells, they would like to have your approval for a 30 day venting to be sure that whatever else comes out is the gas

they are looking for. The problem with the venting of the wells as we have realized with the, I believe they are venting the deeper wells into the Berea sands formation 48 hours before they cap them off and start using the gas as a sellable item. The 48 hour venting has caused a lot of problems to the people living in this area. As you know in the coalfields many people have lung problems because of the nature of the work they have done or whatever the reasons. The 48 hour venting causes a lot of respiratory problems for people. If because of our land and these deep hollows and valleys and in the morning most of the fog settles in and just stays there most of the day before it gets burned off, will this 30 day venting have a health effect on these people?

Rick Counts

First off I would object on the basis that being totally undocumented. I don't believe that to be the case at all. Obviously it is in the best interest of the operator to vent the gas well for the least possible amount of time because they want the production from that well.

Joe Johnson

Thirty days you were asking for was, of course, the maximum time? If you got the water and everything out and got the production in 36 hours that is what you would do right?

Rick Counts

Well, I think in the vast majority of the situations it would be far less than 30 days. But I can state that for instance in the Fruitland Formation in New Mexico, Colorado and the Piceance Basin in the four corners area, that I believe 30 day venting is the rule which is applied there. One of the reasons being in certain situations with regard to coalbed methane wells that without being allowed to vent it for a certain period of time it may result in some damage to the formation. But any venting would have to be overseen by the Department of Oil and Gas.

Joe Johnson

I think we will sustain that objection. Mr. Reilly we are going to leave that part of your question out of the record right now.

Barney Reilly

I was just going to ask if they do that could they vent it higher into the atmosphere than just above the surface.

Joe Johnson

That is something I believe that would have to be worked out with the operator, I am sure.

Rick Counts

I would say Mr. Reilly we sincerely believe there is absolutely no health danger imposed by that. But I

would like to have someone with Equitable get with you and address your concern on that matter.

Barney Reilly

Let me look at my notes here just a minute. I believe that is all the questions I have at this time.

Joe Johnson

All right Mr. Reilly we appreciate your coming and expressing your concerns to the Board and to these people.

Barney Reilly

Thank you

Joe Johnson

I want you to know you are welcome anytime. Thank you sir. Is there anything further on this request? All right Mr. Counts you don't have anything?

Rick Counts

No Mr. Chairman

Joe Johnson

Gentlemen do you have anything further on this regards? All right, gentlemen, Mr. Counts the Board will take your request under consideration and all the technical.

Rick Counts

We will submit a revised application to the Board tomorrow and in addition within the next seven days we will submit a uniform grid system contemplating 60 acre spacing for consideration of the Board.

Joe Johnson

All right sir. Mr. Counts we will accept it then and at that time the Board will consider the application along with some others we need to consider.

Rick Counts

Thank you Mr. Chairman.

Joe Johnson

If that is all, this hearing is concluded.

EXHIBITS PRESENTED BY EQUITABLE RESOURCES

- EXHIBIT NUMBER 1 Plat
- EXHIBIT NUMBER 2 Overlay to plat (aerial)
- EXHIBIT NUMBER 3 Logs
- EXHIBIT NUMBER 4 Report Background Information

TO BE SUBMITTED BY EQUITABLE RESOURCES

- Revised Application
- Grid System

Note Exhibits 1-4 are on file in the Division of Gas and Oil. They are in a format which cannot be reduced. For viewing the office is open from 8-5 Monday through Friday. The address for the Division of Gas and Oil is 230 Charwood Drive, Abingdon, Virginia.

This is a true and accurate transcript to the best of my ability.


Diane Davis
3/7/89



O. GENE DISHNER
DIRECTOR

COMMONWEALTH of VIRGINIA

Department of Mines, Minerals and Energy

Division of Gas and Oil

P. O. Box 1416

Abingdon, Virginia 24210

(703) 628-8115

Byron T. Fulmer
State Oil and Gas Inspector

March 24, 1989

Mr. A. George Mason
EREX
Two Executive Park Place
1989 East Stone Drive
Kingsport, TN 37660

Dear Mr. Mason:

Enclosed you will find a copy of the "Order Establishing Drilling Units for the Nora Coal Bed Gas Field in Dickenson, Wise, Russell and Buchanan Counties, Virginia" as issued by the Virginia Oil and Gas Conservation Board.

This Order is on file with the Department of Mines, Minerals and Energy, Division of Gas and Oil, at 230 Charwood Drive, Abingdon, Virginia.

Should you have any questions about this Order, do not hesitate to call.

Sincerely,

Byron T. Fulmer
State Oil & Gas Inspector

dd
DJD

Enc.

cc: Mr. Rick Counts



O. GENE DISHNER
DIRECTOR

COMMONWEALTH of VIRGINIA

Department of Mines, Minerals and Energy

Division of Gas and Oil

P. O. Box 1416

Abingdon, Virginia 24210

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Sincerely,

A handwritten signature in cursive script, appearing to read "B. T. Fulmer".

Byron T. Fulmer
State Oil & Gas Inspector

dd
DJJD

Enc.

cc: Mr. Rick Counts