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

23 September 1987

EXAMINER HEARING

IN THE MATTER OF:

Application of Basin Disposal, Inc., for salt water disposal, San Juan County, New Mexico. CASE 9220

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

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I N D E X

E X H I B I T S

MR. CATANACH: All right, we'll call this hearing back to order and I think we'll call Case 9220 at this time.

MR. TAYLOR: The application of Basin Disposal, Incorporated, for salt water disposal, San Juan County, New Mexico.

MR. PEARCE: May it please the Examiner, I am W. Perry Pearce of the Santa Fe law firm of Montgomery and Andrews, appearing in this matter on behalf of Basin.

I have one witness who needs to be sworn.

MR. CATANACH: Are there other appearances?

MR. GOLDBERG: Mr. Examiner, my name is Joseph Goldberg from the law firm in Albuquerque of Carpenter and Goldberg, and I represent a number of local residents outside of Axtec, New Mexico, which I have entitled the Payne Plaintiffs.

MR. TAYLOR: Do you have any witnesses, Joe?

MR. GOLDBERG: No witnesses.

MR. CATANACH: Are there other appearances?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of Santa Fe, New Mexico, law firm, Kellahin, Kellahin & Aubrey.

I'm appearing in this case on behalf of Meridian Oil, Inc.

MR. TAYLOR: Anybody else?

MR. CATANACH: Okay, Tom, do you have any witnesses?

(Witnesses sworn.)

EWELL N. WALSH,

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

DIRECT EXAMINATION

BY MR. PEARCE:

Q For the record, would you please state your name and business address?

A My name is Ewell N. Walsh, President of Walsh Engineering and Production Corporation, Farmington, New Mexico.

Q And you say you're President of Walsh Engineering. Are you petroleum engineering consultant?

A Yes, I am a consultant and my firm

performs consulting services.

Q And are you familiar with the subject matter of Case 9220, which is presently being heard by the Division?

A Yes, I am.

Q Have you appeared before the Division or one of its examiners previously and had your credentials as a petroleum engineering expert made a matter of record?

A Yes, I have.

MR. PEARCE: Mr. Examiner, at this time I would tender Mr. Walsh as an expert in petroleum engineering.

MR. CATANACH: Any objections? The witness is so qualified.

Q Mr. Walsh, I would ask you at this time to refer to what we have marked as Basin Exhibit Number One to this case and briefly tell us what this exhibit is.

A The exhibit in total is the application I made on behalf of Basin Disposal to the Oil Conservation Division for a salt water disposal well.

Q And this application was prepared by you or under your direction and supervision, is that correct?

A That is correct.

Q All right, sir. Briefly tell us what Basin seeks in this case, please?

A Basin seeks to drill a salt water disposal well on their property adjacent to their present facilities, to utilize, be utilized as a primary source of disposing of water by injecting it into an underground formation.

Q And what formation do you seek authorization to inject the produced water in?

A We are seeking authorization to inject into the Mesaverde formation.

Q All right. Is there a specific member of the Mesaverde group that you propose for disposal?

A We, in our application we had proposed the Point Lookout formation, this being it is the lowermost member of the Mesaverde, and gives the ability to come up the hole to the other members if necessary; however, we have been informed through the Commission that they have received correspondence from Meridian stating that they would prefer that we use the Cliff House or topmost member of the Mesaverde formation for the injection, of which we have no problem with it.

Q You have reviewed the information relative to the Cliff House and you believe that that is a suitable Mesaverde member for disposal?

A Yes, I have.

Q And at this time we are restricting this

application to only the Cliff House member of the Mesaverde, is that correct?

A That is correct.

Q All right, sir. I notice that the second page of Exhibit Number One is a copy of Oil Conservation Division Form C-108, and the materials following are attachments to that.

I would ask you at this time, sir, to begin referring to that application and the pages attached to it, and go through this more fully, please.

A The Form C-109 is the standard form for making application for a disposal well or other type facilities, there are several.

In my application I have referred to certain attachments. I refer to these attachments as Attachment 1, which relates to Item 3, Well Data, on your Form C-108.

On Attachment 1 it sets forth our proposed drilling and -- program for the well, indicating the surface, the casing strings and tubing strings. We did amend the original application by letter dated September 21, 1987, to change our what we call production casing from 4-1/2 inch casing to 5-1/2 inch, and our 2-3/8ths tubing from -- to 2-7/8ths tubing.

Q All right, sir, let's look, please, at

Attachment -- what's marked as Attachment No. 2. I notice that refers to Exhibit Number One. That is Exhibit Number One to the C-108.

A That is correct. Exhibit Number One is the map that was included in the application.

Q And I notice, Mr. Walsh, some of the copies of the exhibit has -- have a reduced copy of that map. It is the same map, is that correct?

A It is the same map as the original map.

Q All right, sir, I notice on Exhibit Number One to the C-108 there is a circle drawn. What's that circle represent?

A This is to indicate, as required by Commission, the -- a radius of one-half mile that -- excuse me, one mile, one mile to -- when you're making your investigation and you're proposing your salt water disposal well, you are to include information concerning the wells that penetrate the proposed zone within that one mile. The circle is to give a visual indication of that area.

Q All right, sir. For clarification I believe the radius of that circle is a half mile and the diameter is mile, is that correct?

A That's correct, that's one-half mile.

Q All right, sir. Let's look at Attachment No. 3 to the C-108. Could you describe the information on

that attachment, please, sir.

A Attachment No. 3 relates to Item 6 of the application. This is the information within the area of investigation, as indicated on the previous -- on Exhibit One, the map, of the wells that fall within the half mile radius of the proposed disposal well.

The two wells are operated currently by Beta Development Corporation. The furtherest northwest well indicated on the map is the one in the square with the gas symbol in it, is the Martin 3 No. 1, located in the northwest quarter of Section 3, Township 29 North, Range 11 West.

This is a Dakota well only, completed in the Dakota formation. It is a producing gas well.

It was drilled in 1959 to a total depth of 6783 feet with perforations 6457 to 6584 overall from the Dakota.

Indicated is there surface casing is 9-5/8ths set at 256 feet; production casing, 5-1/2 set at 6783 feet, with two stage cementing, with the DV tool at 2190, or just below the Pictured Cliff formation.

Q All right, sir, let me break in. Let's back up to Attachment No. 1. What is the proposed perforated zone in the disposal well as you expect to encounter the Cliff House member?

A It will be approximately in the interval 3690 to 3750.

Q All right, sir. Now let's, if you would please, address the second well reflected on Attachment No. 3, the Martin A No. 1.

A It is the well to the southeast, indicated on the map as 1, the same symbol, the Martin A-1 in the southeast quarter of Section 3, Township 29 North, Range 11 West.

It is also a Dakota well, a producing gas well. This well was drilled in January, 1964, to a total depth of 6608 feet. It is perforated in the Dakota formation from 6400 to 6532 feet. Again as indicated, their surface casing is 8-5/8ths at 314 feet, 4-1/2 at 6608 with two stage cementing, with their DV tool at 2091 feet, which would be just below the Pictured Cliff formation.

Q All right, sir, let's look at Attachment No. 4 to the C-108, please.

A Attachment No. 4 relates to Item 7 of the Form C-108.

This refers to the injectivity into the -- our proposed zone. Of course, we have not drilled the well but we will run these injectivity tests after completion of the well, and the rates which we will be able to inject will be determined by the injectivity tests.

We're estimating at this time, hopefully, to inject about 2000 barrels a day.

The system will be an open system. In other words, we will -- the fluids will be exposed to the atmosphere and oxygen.

The source of the fluid comes from various sources, various wells, not only including produced water but in some cases unused gel water, which is not used in stimulation or frac jobs, or recovered frac water that is produced from the well during clean-up.

So these waters such as that are more the fresh, too, because you use fresh water; however, the variety of produced waters we get, we'll be injecting, will be from both Mesa Verde wells and probably Dakota wells, as far as the type well it will come.

Attached to Attachment 4 is a water analysis submitted at that time, dated July 17th, 1987, and we have subsequently submitted an additional water analysis, which was obtained on August 17th, 1987, to update the analysis of the water that we will be disposing of.

There is not a Mesaverde well, producing well either in Cliff House, Menefee, or Point Lookout, which is one mile of the proposed injection well.

Q All right, sir, for clarification, at this time you are seeking an order which allows the standard

quest permission to increase that injection pressure administratively with the District Supervisor subsequent to your injectivity test after the well is drilled, is that correct?

A That is correct.

Q All right, sir. The next item in my packet appears to be the second water analysis?

A Yes, I've referred to that already.

Q All right, sir. Let's now look at Attachment No. 5.

A Attachment 5 relates to Item 8 of Form C-108, concerning drinking water wells in the area.

I have investigated the State Engineer's records and have determined that there are no underground sources at this current time of drinking water within 3 miles of the proposed well.

Q All right, sir, I would ask you to look now at Attachment Number 6 to the C-108.

A Attachment 6 relates to Item 9 of the Form C-108. In all probability, knowing the history of other injection wells in the area, we will probably have to stimulate the formation, just as they were to provide proper pressures and rates for disposing; however, this will be determined after we have drilled a well and reviewed the logs, perforated, and see how it will inject in. Then we will establish a stimulation program if we deem necessary.

Q I assume it's fair to say you won't spend money stimulating the well if you don't have to.

A That's correct.

Q Let's look at Attachment Number 7 to the C-108, please, sir.

A Attachment 7 refers to Item 10 of the Form C-108. This concerns the logging and test data on the well.

This will be submitted to the Commission after drilling and completing the proposed injection well.

Q All right, sir, Attachment Number 8 to the form, please, sir?

A Attachment 8 refers to Item 11 on Form C-108. The -- it requests a chemical analysis of fresh water from two or more fresh water wells, if available, within one mile of the proposed well.

We have no fresh water wells within one mile of the proposed injection well.

Q All right, sir, relating that information to Attachment Number 9 to the C-108, could you read the certificaton contained on Attachment Number 9, please?

A Attachment 9, which refers to Item 12 on Form C-108, the certification: I do hereby certify -- I do hereby certify that I have examined available geological and engineering data and can find no evidence of connection be-

tween disposal zone and underground drinking water sources.

Q All right, sir, you testified earlier that you had not found underground sources of drinking water in this area.

A That is correct.

Q If you had found such underground sources of drinking water, do you have any information which leads you to believe that there would be geological connection between the disposal zone and any expected underground drinking water sources?

A I know of no evidence where there would be such connection.

Q All right, sir. Looking at Attachment Number 10 to the Form C-108, could you tell us please to whom you provided notice of this case?

A Proof of notice of publication in newspapers of the application was provided to the Commission for their files.

In addition, when it was our understanding that the Commission was going to not accept this as for administrative approval and we would have an Examiner's hearing, notice was given to Meridian Oil Company advising them that the application was being set for a hearing. This was sent with return registered, return receipt, and this information has also been provided to the Commission.

Q All right, sir, as I understand it, Basin Disposal controls the surface at this location, is that correct?

A They are the surface owners.

Q And Meridian owns the mineral rights underneath this location --

A They are the leasehold operator.

Q All right, sir. All right. Looking back, attached to the Exhibit Number One to the Form C-108, I find a series of data sheets. Could you describe for us, please, what's contained on those sheets?

A These data sheets are information concerning wells within the boundaries of the map. It gives a well number; the location of the well; for 19 -- this is for 1985; the oil production that year; water production; gas production; cumulative oil production through December 1985; cumulative water and cumulative gas production. In addition it indicates the type well it is; what formation it's completed in or pool; the operator and well and lease name, and as -- if it is a flowing well also.

Q All right, Mr. Walsh, the final page of my Exhibit Number One to this proceeding appears to be parts of two logs of wells, the two Beta wells that we discussed earlier. Could you discuss the information reflected on that, please, sir.

A Yes. This what we call a cross section of the Mesaverde interval within the area of the proposed water, salt water disposal well to be drilled.

In the upper lefthand corner you will see a little map indicating that the Beta Development Company Martin 3 No. 1 is indicated as "A". The Beta Development Company Martin A No. 1 is indicated as "A'".

In between the two log sections indicates approximately where the salt water disposal well would be drilled.

This is to present -- give the Commission information, and ourselves, as to the type formation in the Mesaverde, depths to drill with.

Q All right, sir, earlier in the examination I asked you for what you expected to be the perforated zone in the disposal well. Is this the exhibit you looked at to determine that?

A Yes, along with a larger scale copy of the log.

Q And you -- you propose to perforate what's shown as the zone between the top of the Cliff House and the top of the Menefee, is that correct, basically?

A Yes.

Q And the Cliff House, Menefee, and the Point Lookout towards the bottom of that exhibit are the

Mesaverde group in this area, is that correct?

A That's true, all Cliff House, Menefee, and Point Lookout are a Mesaverde group.

Q All right, sir. At this time I would refer you to what we've marked as Exhibit Number Two to this proceeding. Could you describe what that is for us, please?

A Exhibit Number Two is a letter received from Beta Development Company. This letter states that -- that as owners or operators of the two Dakota wells, which I've referred to before, that they have no objection for us disposing of water in the Mesaverde formation.

Q All right, sir. At this time, Mr. Walsh, for clarification, let me ask you, you've indicated that the Form C-108 was prepared by you or under your direction and supervision. Were you responsible for securing copies of the two pages of Exhibit Number Two, the letter from you to the Division and a copy of the letter from Beta Development to Basin Disposal, were you responsible for securing copies of those?

A Yes, I was.

MR. PEARCE: Mr. Examiner, at this time I have nothing further of the witness.

I would move the admission of Exhibits One and Two to this proceeding.

MR. CATANACH: Exhibits One and

Two will be admitted into evidence.

MR. PEARCE: As I say, I have nothing further of this witness. I will tender him for cross examination.

MR. CATANACH: Mr. Goldberg?

CROSS EXAMINATION

BY MR. GOLDBERG:

Q You'll excuse me, Mr. Walsh, I'm sort of a city boy, (not clearly understood) maybe you can help me out.

You prepared or someone under your direction prepared the actual application for the permission to inject, is that correct?

A That is correct.

Q Along with all of the amendments to that application that you've referred to in your testimony.

A Yes.

Q Turning your attention to Attachment Number 4, I don't know whether you have those documents in front of you.

A Yes.

Q Do you have that in front of you?

A Yes, I do.

Q The data contained in Attachment Number 4

are the proposals with respect to the actual operation of the well, am I correct in understanding? That is to say how -- (interrupted).

A Yes, this refers to how the well is to be operated and also referenced additionally information requested by the Oil Conservation Division.

Q It is your estimation that you plan on injecting approximately 2000 barrels a day into that well. Is that correct?

A At the present time, yes.

Q And how did you reach that figure?

A We're hoping at times there will be that much water available. In checking injectivity of similar other wells, their injectivity rates are -- have been higher, even, higher than that, as high as 5000 barrels a day. I mean what you can inject (unclear.)

Q Again, I'm a city boy. By injectivity you mean the capacity of the actual pipe to take produced water and fluids down it.

A The capacity of the formation to accept it.

Q Okay, the pipe and the formation to accept the certain amounts.

A Yes.

Q So you're confident, first of all, that

the formation has the capacity to accept approximately 2000 barrels a day?

A Yes, I am.

Q And --

A That is correct.

Q And the size of the pipe you're using, does that bear in -- in determining how much you would -- the injectivity, if you will, I'm learning, the injectivity --

A Yes, your size pipe --

Q -- in the well?

A -- can be a limiting factor if you would get into high volumes, higher than this.

Q Are there other limiting factors, Mr. Walsh, and pardon -- pardon me for having you educate me, but are there other limiting factors besides the actual formation and the size of the pipe?

A The other would -- the only other one I can think of right now would be what we call fracture pressure of the formation, which would be determined during the injectivity test. In other words, we would pump at certain rates under -- at a certain pressure, keep increasing rates and pressure till we determine we had a fracture of the formation and then that would determine the absolute maximum.

Q You maximum amount that you could --
A At that --
Q -- put in there --
A At that time that you could inject maximum rate and maximum pressure.
Q Educate me some more, after you drill down to the place where you want to inject, you have to get the fluid out of the pipe and into the formation. Is that not correct?
A You mean after we have cemented our casing?
Q Yes. After -- after you've completed you see, you've got your pipe in, you've got your casing in, you have to get the fluid out of the pipe into the formation, is that not correct?
A In all probability we may not. We may swab it out.
Q Okay.
A But remove it, we may --
Q I'm talking about the fluid you're injecting.
A I'm talking about the fluid, I assume you're talking about the fluid that's in the casing after we cement the casing and have cleaned out the casing and like that, that's what you're --

Q No, pardon me, I'm not making myself clear and --

A Oh, I'm sorry.

Q -- I'm going to try.

A Sorry.

Q You're -- you're planning on -- on injecting approximately 2000 barrels a day. It's going to go down the pipe --

A Yes.

Q -- it's going to reach a certain level below ground and it's going to go into the formation.

A That's correct.

Q How does it go from the pipe into the formation?

A Oh, now I'm with you. Sorry. You'll have to bear with me. We will perform an operation that we call perforating.

Q Yeah.

A We will actually shoot holes through the steel casing or pipe, through the cement around it, into the formation we're going to inject.

Q So there will be a series of holes out there.

A Yes, just like you'd have holes in a colander.

Q Sure, exactly, I understand. I understand.

A So fluid can go through.

Q Is there -- what is the potential for those holes clogging up?

A There's always potential due to scale or something else, but this is part of what happens with injecting fluids in that you may have to treat them, the fluids going in, or possibly you'll have to acidize your well to clean up scale periodically, to cleanup these perforations so they can take it.

Q Would I be correct in saying that that would also be, potential for that would also be a limiting factor, at least occasionally, with respect to how much fluid would be injected through the well into the formation?

A Yes. Yes.

Q So there may be times when, while this well may have a capacity for 2000 barrels a day, it may have a capacity for substantially less than that because of the clogging up of those perforations.

A And at that time we would attempt to repair the well, work on the well, to bring the capacity back up.

Q Yes. I'm sure this causes happiness for the people who have to repair the well. How long does it

take and what is the process for doing it, and again you'll have to, excuse me, for educating me.

A You mean to work on the well?

Q Yeah, to do that.

A There are so many things that can happen, Mr. Goldberg. I have mentioned one, scale, carbonate scale.

There's such a thing as iron sulfate that may get on the perforations.

There's bacteria; there's silt, it may not have been filtered out. Many numerous things.

In any case, I'd say the well would be out of operation maybe three days.

Q Could you give me some parameters? Could it be longer than that in unusual circumstances?

A In unusual --

Q Yeah.

A -- circumstances? Yeah, in any business do you have that possibility, so I'd have to answer yes.

Q Could it be six months?

A No.

Q Certainly not.

A I don't anticipate that.

Q You certainly don't anticipate six months.

A No.

Q But would you in making your reasonable anticipation, would you anticipate that possibly the well could be down for several weeks while you're making --

A I would not think in this case several weeks because what we -- what I am talking about comes from past experience and knowledge of this type operation, and using this experience and knowledge, I can say the well would probably be down maybe three days while you're performing this operation but not weeks.

Q Not weeks.

A No.

Q Now, how -- do you anticipate -- do you anticipate deterioration as we've been discussing?

A Deterioration?

Q Yeah, what I'm calling deterioration; that is, the perforations plugging up that require some type of adjustment periodically?

A To the point that we would check the water going into the well and treat the water, if necessary, to prevent it, yes.

Q So you anticipate that in planning this project out, that there will be occasions when you're going to have --

A There may. There may be. Now I'm not saying there will.

Q Nothing is certain.

A We will -- that's true. I'm saying that it could possibly and we will try to avert that as (unclear) as possible.

Q And in your experience with these types of injection wells have you found that regularly they do clog up with respect to the perforations?

A Not regularly, no, sir.

Q Going back to the approximately 2000 barrels a day, Basin Disposal does have some experience with respect to the disposal of produced water on this site presently, is that correct?

A Insofar that -- mainly in the holding pond, disposal pond, yes.

Q The presently operating open air disposal, lined and -- lined disposal pond.

A An approved disposal pond approved by the OCD.

Q Surely, approved by the OCD, but they're presently operating it.

A Yes.

Q Do you have the information with respect ot how much is being presently disposed of per day in that lined pond?

A I don't have the information with me. I

have no information concerning it.

Q Why not?

A Because this case was concerning the injection well. I do have knowledge, yes.

Q I understand that this is only concerning the injection well.

A I do have knowledge, yes, of the influx over various periods of time.

Q Would you elaborate? Could you give us that?

A That can vary on a daily, daily basis, from no water --

Q To?

A -- to possibly, oh, if you had 20 truckloads, that would be around 1700 barrels.

Q And how -- and how long has Basin been accepting water for disposal in the approved pits?

A I believe since October, 1985.

Q And do you have an estimate as to what the average influx a day would be?

A Approximately 8-to-10 truckloads, so you're talking around 6, say, 700 to 1000 barrels day.

Q Somewhere between 700 and 1000. Is that -- and is the fluid that they are presently accepting at the site the same type of fluid that you are proposing to inject

down the well?

A Yes.

Q All right, so if the well is approved, do I understand correctly that the fluid will be trucked in and then put into the present pit as a holding and then from the pit go down into the injectin well?

A The present installation will be what we call a secondary to the primary, the injection well.

Q The injection well is primary.

A The injection well is primary; however, you have to realize that these incoming fluids have to be, or a simple use of the term, cleaned up before we can inject them; therefore, rather than -- we're going to use the present facilities to -- for this clean-up type operation.

Q By present facilities do you mean the existing approved pit?

A The existing approved layout, insofar as utilizing the skimmer tanks and the pond.

Q And the pond. By the pond you mean the lined pond?

A The lined pond.

Q And there are presently, what, twelve unlined pits there, also?

A Yes.

Q Is it proposed that they will be used at

all?

A If at any such time the -- we can receive approval to use that area either as unlined or simple lining for disposal of drilling mud, and approved the OCD, we will.

Q But presently you're not using them, is that correct?

A That is correct, we aren't.

Q And presently they are not lined at all, is that correct?

A They never have been lined.

Q And in --

A Nor were they required to be lined.

Q I understand. Let me, Mr. Walsh, there may be dispute between my clients and Basin Disposal with respect to the exixting operation, but I assure you, I'm trying to keep my attention to the injection well. I'm trying to understand how it operates and I take it, for the record, that your present operation has been and continues to be approved by OCD.

I want to understand, though, how this is -- how you are anticipating this is going to operate.

You anticipate a volume, is that not correct?

A Up to that volume.

Q Yeah, you anticipate a volume and the volume that you anticipate is approximately 2000 barrels a day and that 2000 barrels a day, you don't anticipat that it's going to be injected directly from the trucks into the injection well. Do I understand that correctly?

A No, that is correct.

Q Okay, so you're going to have to place that in the existing open air pits, is that correct?

A It will initially go there.

Q For holding and --

A Now the holding part, that is, probably only a short time to allow for settling of your fine silts and solids out of there because we will be pulling directly from that pit, and pulling that water out, and going to our injection well.

Also, it provides a means, one, in case we do have to repair a well or some other mechanical time that the well is not operating, it allows a storage area for the water incoming from these produced water areas, to be held until it will be injected.

Q Right. For purposes of further discussion, we can call that back-up, or do you call it something else? I --

A Well, it's either use the present facilities or set a bunch of tanks and we'd rather not set a

bunch of tanks when we've got a present facility.

Q No, I understand that, but the latter, the latter use of the present facility you described is for back-up purposes in case the well is down.

A I believe you could use that (not clearly understood.)

Q All right, now, tell me if I understand correctly because I'm still trying to understand this, that if you inject fluids into this well at the capacity that you are anticipating, at approximately 2000 barrels a day, this will require holding, accepting and holding at the existing site approximately twice as much water as the average influx over the history of this facility. Is that not correct? You said that your estimate is on the average you'd be taking in what, 8 to 10 truckloads, or 6 to 8 truckloads, at about 1000 barrels a day, and you would be taking about 2000 barrels a day under this application. Is that not correct?

A I'm sorry, but you can also inject at lower rates. We can inject at 100 barrels a day.

Q Okay.

A In other words, we can maintain, we'll have the capacity, if we only have 300 barrels coming in, we can -- we will have the capacity to inject 300 barrels, but we also will hope we will have the capacity in case of a great influx to be able to handle up to that.

Q You're seeking approval for capacity of aprpoximately 2000 barrels a day. Is that not correct?

A You got to start somewhere.

Q How -- that's fine. I'm -- I'm not -- at this point I'm not contesting it, I'm trying to understand it. You're seeking approval for a capacity of approximately --

A I'm estimating --

Q -- 200 barrels a day.

A Let me agree, estimated at this time average daily injection rate to be approximately 2000 barrels a day; however, we may get approval and inject higher than that after injectivity tests, and we -- if we get the influx, we may go higher.

Q Well, let's deal just with 2000 barrels a day and not -- and on 2000 barrels a day, if this is approved, and if you are operating up to your anticipated approximate capacity, am I correct that you will be putting into the existing pits 2000 barrels of fluid a day?

A In all probability, yes.

Q And that is approximately double the average influx of fluids, as you've testified, over the history of the existing site.

A On an average basis, yes; however --

Q And would --

A However --

Q Go ahead, explain.

A We can have greater influx on certain days.

Q Is there a compacity for, in your estimation, the existing lined pit?

A I'm sorry, I don't understand your question.

Q How much fluid can that hold?

A The present -- up to the approved level, approved by the OCD, we can hold approximately 105,000 to 110,000 barrels, somewhere in there.

Q 105 to 110,000, so the existing lined pit would be sufficient in size, you believe, to hold an influx of 2000 barrels a day, holding it for purposes of injecting it into the well.

A Definitely.

Q Am I -- over the last half a dozen months, or so, there have been problems with respect to the emissions of hydrogen sulfide from the existing facility. Is that not correct?

A Yes.

Q Have you or your organization done any analyses or tests or models to determine what the impact on the existing lined pit will be of putting 2000 barrels of

fluid in there a day and doing what you will be doing to that and then taking it out and injecting it into the well? Have you done any analysis to determine how that will affect the level of emission of hydrogen sulfide?

A I'm sorry, I'm not following your question.

Q Have you looked --

A I'm sorry.

Q Well, I'm sure it's the unartful way that I'm posing the question.

Have you looked at the question of whether what you are proposing here, which is to build an injection well, change the existing facility from a primary source of disposal of produced water to a -- what you call a secondary source of disposal, increasing the amount of fluid that's going to go in there, taking fluid out of there, and whatever else that you're planning on doing with that fluid while it is above ground, have you addressed the question of whether that's going to have in impact on the level of emissions of hydrogen sulfide?

A All right. We --

Q Again --

A No, no, let me start from the beginning of how you stated that.

Let's go to the part that we are taking

in less barrels per day than the 2000, correct? You said that.

Q On the average.

A On the average.

Q I base that on your testimony.

A Fine. Therefore, that gives us complete capability of maintaining the lowest operational fluid level in the holding pond, since we aren't even going to exceed 2000 barrels a day.

Q Let me stop you for a minute. The first question I just asked is did you address the question of what the effect of this application would be on the level of hydrogen sulfide emissions from the existing holding pond. Did you address that question in your analyses or not?

A That was your -- that was the first time and then you came back with utilizing our influx and disposing rate, and that's what I'm trying -- I'm leading -- I'm coming up to that just like you did the second time.

Q Well, let me -- let me then restate the question.

A Go ahead.

Q I'm not trying to stop you from explaining your answer. I want to start first with the answer and let you give the explanation.

Did you in your preparing this applica-

tion or doing whatever analyses you did, did you address the question of whether this application, if it were approved, would have an affect, an impact on the level of emissions of hydrogen sulfide from the existing facility? Just yes or --

A To answer that question, in my opinion, the less fluid we have in the holding pond the lower level which we can maintain by having the injection well, will provide a storage medium that will make a lesser chance of any generation of hydrogen sulfide.

Q So it's your opinion that this application will predict, you would predict lower emissions. Do I understand you correctly?

A I would go so far as to say that we can eliminate the emissions.

Q That's -- that would be terrific, if it occurs, but as we all agreed before, life is unpredictable.

That's your prediction. Do you -- did you do any tests or analyses to come up with your conclusion?

A Actual tests or analyses?

Q Yeah.

A No.

Q None.

A No.

Q Did you in reaching your conclusion --

A Wait a minute, no, that -- may I refer back to that?

Q Sure, please, and I certainly don't want you to leave an inaccurate or incomplete answer in the record.

A It came to mind it wasn't what you'd call formal testing, as such, but through checking the water in the ponds, and so forth, that if you have a, say, a shallow depth, like we put it in a gallon jar, consider that a shallow depth at the present time, leaving the top off, exposing it to the atmosphere, that due to aeration what we call aeration, or introduction of oxygen from the air into the water, the H2S situation you mentioned becomes less and less prevalent.

Now, I'm going to use that possibly as a test under your question.

Q You're saying that you understand that aeration of fluids in the pit would have the tendency to reduce the emissions of H2S.

A What I'm saying is with a shallow water depth, that normal aeration, natural, by the atmosphere above it, will have a tendency to lessen this H2S emission.

Q Now, turning your attention again to your Attachment Number 4, Item 3, average and maximum injection pressure to be determined after injectivity tests.

A That is correct.

Q Would you explain that to me?

A This goes back in part to what we was talking about before when I said that the -- we would have to run an injectivity test under the supervision of the OCD to determine where we had parting or fracturing of the formation. Remember me stating that?

Q No, no, I understand.

A This is what -- when you conduct this type of test, increasing rate and pressure, until you have an indication of parting, that's the injectivity test I'm speaking of.

Q Now, again, you need to educate me. Does this well necessarily have to be pressurized in order to get, when it's ultimately done, to get the fluids down there and into the formation? I mean pressure --

A No. The Mesaverde formation within the San Juan Basin area is well known to be an underpressured reservoir and to the point that it won't even hold a hydrostatic head of pure water to the surface. In other words, if you fill up your casing through your perforations, from your perforations up, that water won't stay there. In other words, quote, water will go out into the formation --

Q Because the pressure --

A -- because of simple hydrostatic pres-

sure, no additional pressure on top of it.

Q I'm just -- tell me if I understand this right. That's because the pressure in the formation is lower than the pressure at the top of the well.

A Is lower than the hydrostatic pressure of the water or fluid.

Q Okay, I'm sorry, all right, lower than the -- so if -- are you anticipating that this well will be pressurized or not?

A We anticipate in order to, say, maybe up to 2000 barrels a day, yes, we are anticipating of having to put surface equipment on to put the water away under pressure.

Q Under pressure, and did I understand in your response to the questions from Mr. Pearce that you're anticipating two pounds per foot injectin pressure? Did I -- did I -- .2 of a pound? Did I get that correct?

A This is what we anticipate. This is a limitation of the Oil Conservation Division.

Q That's the limitation.

A If you can indicate that your injectivity is under .2 per pound times your depth, this is fine, but if you want to exceed that, then you have to run your injectivity tests.

Q Okay.

A To get approval for going above that pressure point.

Q I see. So that's just a threshold. Below that threshold you don't even have to conduct an injectivity test.

A No, you have to inform them, but if you -- I doubt seriously if you could find many areas like that.

Q (Not understood) but you're going to run an injectivity test.

A We will run an injectivity test.

Q And you anticipate pressure in excess of that. And do you -- do you --

A Yes.

Q Do you anticipate pressure --

A Yes, in excess of that.

Q In excess of that.

To your knowledge, Mr. Walsh, does Basin presently have contracts for the acceptance of fluids from wells or other sources?

A Do they --

Q Presently have contracts.

A I'm not aware of any contracts.

Q So they've been -- as they accept the fluids at the disposal site presently, they're not doing it under a contractual obligation, they're doing it on a truck

by truck basis?

A Yes.

Q Do you anticipate -- to your knowledge do you anticipate that they will be entering into contracts?

A To my knowledge, I do not anticipate it.

Q To your knowledge do you anticipate whether they will be accepting fluids from sources substantially different from the sources that they are presently accepting fluids from?

A I would say probably not, 'cause they have accepted fluids from many areas.

Q The -- the fluids that they -- you anticipate that they will be accepting, will they -- I notice that you are -- let me state it differently. I notice that your --at least your 7-17 test --

THE REPORTER: I'm sorry, sir, I didn't understand what you just said.

Q I changed my question and I said "let me start it diffently." I notice that your July 17th test shows some degree of sulfates in the waters that are presently on -- or were on the site at that time. Is that correct?

A Yes, that's true.

Q And you anticipate that waters will continue to have sulfates in them.

A Any of your incoming waters are going to have sulfates.

Q Because of where they come from .

A By virtue of nature (not understood).

Q Turning to what I guess would be Exhibit or Attachment, rather, 1 to your application, you testified in response to Mr. Pearce's question that that has been amended by September 21, 1987, letter, is that correct?

A That is correct.

Q And basically, would you just explain to me what the nature of the changes are that you're proposing?

A Yes. The decision was made by the owners of Basin Disposal on my recommendation that we install the larger size casing, therefore being able to utilize a larger diameter tubing to, one, lessen friction pressure during injection, and secondly, be able to handle who knows in the forseen future, what volumes we may handle. Then we could handle higher volumes up to our approved limits.

Q Does your amended Attachment 1 make any material change in the casing?

A Well, the size of the casing. When you change size of casings you -- you have your characteristic of your casing change; insofar as the steel material itself, no. You change how much it weighs per foot as in your diameters; that's about all.

Q And constructing an injection well like this, are you -- are you concerned about leakage from the well, not at the bottom but out?

A Not only are we concerned but the State is, also; therefore that is the reason, and we would do it anyway, at the time we start injecting the, what we call the annular volume between our tubing, which we're injecting down through, and the casing, inside of the casing, which is protecting the hole, will be one, sealed off from the bottom by a packer to prevent any movement of fluid up from that point alongside in the annular space; also the annular space will be filled with an inert fluid which will help prevent deterioration, as you say, or corrosion of our metal on the outside of the tubing or inside the casing.

Also, by having this, if there was a leak in that tubing string, we have a method at the surface with this fluid in there of monitoring the pressure on this annular space and will have the indication, well, we have a leak in the tubing, but that way we maintain our casing as the primary protection. We're using the tubing as secondary and if it goes apart, well, we've got our casing.

So, no, as far as seeking outside the casing, we do not anticipte. We may have leaks inside but not outside because we are not subjecting that casing except in the injection interval to the type of fluids that might

be detrimental to it.

Q And if there were to be some leakage out, you would know that because of the pressure of the fluids --

A In the annular space, leakage from our tubing.

Q Yeah, leaking from the -- let's talk about leakage first from the tubing.

Now, if there were leakage from the tubing, you would know that because there'd be an increased pressure in the fluids in --

A In the annular space.

Q In the annular space, and how would you -- and how do you monitor that?

A Well, by a pressure gauge; check the wellhead with a pressure gauge. If you're injecting, say, for example, 1000 pounds, and you check the pressure in your annular space and you have none, that's 1000 pounds at the surface.

Q You know it's going somewhere.

A We know it's going out through the packer into the formation. It's not coming up in your annular space.

Q Down at the bottom of the well you have some sort of -- I forget the term you used -- cap to make sure that it doesn't come back up?

A A packer.

Q A packer. How far up does that packer (inaudible)?

A The packer is normally only about overall six feet long.

Q Six feet. I just have one further thing. This is your engineering and production from the Walsh Engineering and Production Corporation?

A That's correct.

Q Do you have an ownership interest at all in Basin?

A No, sir, I do not.

MR. GOLDBERG: I don't have anything.

MR. CATANACH: Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Catanach.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Walsh, the original application was to drill the well for a full depth to penetrate perhaps 100 feet below the base of the Mesaverde, was it not?

A That is true.

Q And that footage distance was estimated

to be approximately 4700 feet?

A That is true.

Q Based upon your conversations with Meridian, you're now prepared to confine the injection inteval to an upper member of the Mesaverde, being that Cliff House section, is that not correct?

A That is correct.

Q Do you see an continuing need to drill the well to the original total depth or will you reduce the total depth of the well?

A We will reduce -- I will actually file an amendment to the application for permit to drill and an amendment for the application here showing that we will -- I believe Meridian's request was a depth of approximately 3850 feet, I believe in thier letter?

Q I believe so, and that approximates, then, about 100 feet below the base of the Cliff House member.

A That is correct.

Q And approximately 100 feet, then, gives you enough of a rathole in the well that you can handle production equipment problems.

A To tell you the truth, I'd like another 50 foot but I'll stick with it.

Q Let me talk about the area in question in

terms of other disposal facilities utilizing the Mesaverde and the Dakota formations. Are there any?

A There is one, yes, to the northwest of the present Basin Disposal facility.

Q And in what formaton does it dispose of fluids?

A It's going into the Mesaverde formation.

Q And, to your knowledge, has there been any difficulty in utilizing that well for disposal into those formations?

A To my knowledge, no. Their injectivity tests, they have -- I have reviewed the information on this well to utilize for knowledge in this application, and their injectivity up there has been good. They haven't had any severe problems of plugging or anything like that, to my knowledge.

Q What has been your experience about the compatibility of produced fluids out of the Dakota and the Mesaverde for re-injection or disposal into the Cliff House member?

A By virtue of mixing them like they will be mixed, I would say that the compatibility would be good in the Mesaverde formation.

Q I assume by the answers to your questions you're not proposing something that's unique, novel, and

unusual ot your profession in terms of disposing of water in this particular fashion?

A No, I'm not.

Q Is there an economic need for your disposal facility, the injection well, in this area?

A Economic in many respects. It is economic to Basin Disposal, yes, because the -- at the time the disposal facility was built we anticipated so much water over a period of time.

Well, unbeknownst, here comes all this water, so we have been operating at our maximum approved level or below it for some time. By utilizing the injection well we will be able to not only maintain the operation and maybe not have to close because we do not (not clearly understood) to operate, and be able to accept water up to our volume of injection, even, whatever it might be.

It's also an economic situation for the companies in this area in that basically this is the only commercial disposal site for produced water and with the present environmental rules and regulations, this has been more or less a godsend for them to have some place to take it without having to build their own disposal facility or drill their own injection well.

Q My question was in terms of those other operators. Do you have an opinion, sir, based upon your ex-

perience and the knowledge you have as to whether or not the approval of this facility will aid other operators to continue to produce and thereby avoid the waste of hydrocarbons that might otherwise be recovered?

A Yes, it would.

Q In the absence of approval of this disposal facility, are you aware of any alternative disposal means for the operators in this vicinity?

A No, sir.

Q Thank you, I have nothing further.

MR. PEARCE: I have just a couple, if I may, Mr. Examiner.

REDIRECT EXAMINATION

BY MR. PEARCE:

Q Mr. Walsh, you had discussion with Professor Goldberg dealing with the chance of scaling or other decrease in capacity of this well. You mentioned the possibility of treating the injection fluid, I believe, if you saw that the capability of the well was decreasing, is that correct?

A That's correct.

Q If you took these remedial steps during the actual disposal process, do you believe there's a high likelihood that you would not have to shut the well in for

any period of time but could resolve the scaling problem during actual operations?

A We could resolve it in normal operations.

Q Okay. You also discussed with Professor Goldberg some unlined ponds that are presently on location, do you recall that?

A Yes.

Q And am I correct that in the present application Basin Disposal is not seeking authorization to utilize those unlined ponds for any purpose?

A That is correct.

Q You also had a discussion about the capacity of the pond which is presently being used as the primary disposal mechanism. If this application is approved, would you expect the level of fluid currently held within that disposal pond to be lowered through normal disposal operations of the well?

A Yes, I would.

Q Okay. Thank you, nothing further.

MR. GOLDBERG: Mr. Catanach, could I just (not clearly understood)?

MR. CATANACH: Yes, sir.

RECROSS EXAMINATION

BY MR. GOLDBERG:

Q Could you explain to me, Mr. Walsh, how you would treat the fluids in order to minimize the risk of the clogging up of the perforations?

A First by getting an analysis of fluid and working with a chemical treating company to determine what product would be needed. I don't know, I can't sit here and say that, because we don't have the proper analysis for it.

Q But you would make some sort of chemical alteration to the fluid.

A We would add a chemical treatament.

Q But that would alter the chemical --

A Yes.

Q -- the chemical analysis.

A Yes, chemical composition of the fluid to prevent this.

Q And do you have any idea -- you don't have any idea exactly what you would do.

A Now?

Q Yeah.

A Now, well --

Q No, I -- that's why I need you --

A No, I don't, without doing -- going through this procedure.

Q Then it would be fair to say, would it not, that you presently don't have any idea as to how that might affect the emission of hydrogen sulfide from the fluid.

A I don't understand that.

Q Well, if you presently don't have any idea of how you would treat the fluids, other than some chemical alteration of the fluids, then would it not be fair to say that you don't have any idea presently as to how that treatment might affect the emission of hydrogen sulfide --

A Yes, I do, because of the means and methods we would utilize this. We would not utilize it in a pond. We would inject it into the suction side of our pump --

Q Oh, you would not --

A -- to go downhole.

Q You wouldn't -- you wouldn't do it in the holding pond.

A No, no, this is something you would inject into your injecting fluid in order to take care of this. We wouldn't treat it in a pond.

Q Fine.

MR. CATANACH: Is that all you have?

CROSS EXAMINATION

BY MR. CATANACH:

Q I just have a couple of questions, Mr. Walsh.

As I understand it now, the total depth of the well is going to be how deep?

A Approximately 3850.

Q 3850?

A 3-8-5-0.

Q Are you going to change your -- your -- okay, you changed your 5-1/2, you've changed your casing to 5-1/2. Are you going to change your cementing program as a result of the change in depth of the well?

A I can change the cementing program; however, even that cementing program is subject to after running logs and getting our calipers. I can submit that with my theoretical, if you wish, or we can go ahead with actual afterwards.

Q That's fine. Let me ask you this.

A You see, that would be more, more than necessary to do the job.

Q All right. Do you intend to circulate the 5-1/2 inch casing to surface?

A We intend to circulate cement to the sur-

face.

Q Thank you. I have a couple of questions on your two Dakota offset wells that are operated by Beta Development.

A Attachment Number 3?

Q Yes, sir.

A All right.

Q Do you know or do you have any information on the cement tops in those wells (unclear) production casing?

A Utilizing (unclear) casing volume of cement, I have made some theoretical calculations.

Q Do you have those figures?

A Yes, on the first, for the Beta Development Martin 3 No. 1, the top of cement theoretically on the first stage, for the 5-1/2 inch casing is 5877 feet.

And, excuse me, on the Martin A No., first stage cementing on the 4-1/2 inch casing is 5884 feet.

That well was also squeezed in the interval 3586 to 4020 during a workover.

Q Do you have that volume?

A 400 sacks, sir, as I found out from the Commission records.

Q Okay. You gave me cement tops for the first stage. Do you -- did you have an information on the

second stage?

A I did not look into the second stage because the stage cementing took was set as it should have been, below the Pictured Cliff, and the cement went on up above.

Looking at the volumes on the Martin 3 No. 1, I know it would not have reached surface with 100 sacks. There is a possibility on the Martin A No. 1 with a 500-sack volume, that it could have reached surface.

Q So in at least the Martin 3 Well No. 1 you've got an interval in there that's noncemented.

A Yes.

Q Mr. Walsh, those are the only two wells in the area of review that penetrated the Mesaverde zone?

A That is correct.

Q What -- I show some other wells on your map. Can you point out what those are?

A In the area of review, let's start with the northwest quarter of Section 3, the 3-R is a Picturec Cliff well.

To the southwest, the No. 3 Well is a plugged and abandoned Pictured Cliff well.

Again in the northwest, very northwest/northeast, the -- what is symboled KK, which is a Kirtland well, that was drilled and abandoned.

Going up into the southeast quarter of Section 34, 30, and 11, the KFM/KFM is a Farmington well -- excuse me, a -- is a Farmington well.

Coming back to the northwest quarter of Section 3, the well indicated one dry hole symbol is a Farmington well, possibly penetrated the Pictured Cliff, but drilled and abandoned in 1959.

The -- also in the northwest corner of Section 3 the well indicated by 4 is a PC, Pictured Cliff well. It's plugged and abandoned in 1982.

Of course, there is the Beta Development Martin 3 No. 1 in the southwest quarter of Section 3.

There is a well indicated as a Pictured Cliff well. It was plugged and abandoned in 1977.

The southeast quarter of Section 3, you have again a Pictured Cliff well indicated by that symbol 1-N, also the Beta Development Martin A No. 1, Dakota.

So it's -- other than the two Dakota wells there was no penetration into the Mesaverde by a well in the review area.

Q Mr. Walsh, how did you determine that there was not any fresh water in the area? Fresh -- fresh water formations or --

A Insofar -- I did from a drinking water standpoint. One, during our original application for the

original disposal site, a geological review was made and submitted with the application. This indicated that in that area we had no shallow water sands. In fact, we have what was called a vadose zone, which is basically an impermeable shale of approximately 200 feet, down to any level that might be where water coming -- same level as the river, and again by reviewing the State Engineer's record, I determined that there was no fresh water drinking wells in that area.

MR. CATANACH: That's all I have of the witness.

Are there any other questions of this witness?

MR. PEARCE: One moment, Mr. Examiner, if I may.

Mr. Examiner, you asked the witness a question with regard to the total depth of this well. We've gotten an indication from Meridian that they do not object to that well being established as 3900 feet rather than the 3850 set forth in their letter, and as the witness indicated, that would make drilling the disposal well a little easier, and if that depth is to be included in the --in any order in this case, we would request 3900.

MR. CATANACH: Okay. Anything further in this case?

MR. TAYLOR: David, I think

there are some letters in the file and there's also a letter from Mr. Walsh regarding the use of the well as a primary. But we ought to supplement the record. We won't make them exhibits but we'll make sure they're in the record.

MR. CATANACH: You want to state what these are?

MR. TAYLOR: I think they're -- we have some objection letters and I think they may be from clients now represented by Mr. Goldberg.

There's one from, I believe, a Mr. and Mrs. Payne, and Mr. and Mrs. Litke, and Judy Stoltz. And I don't know if they --

MR. GOLDBERG: Some but not all of those are with me.

MR. TAYLOR: And we'll include those in the record, as well as a letter from Mr. Walsh of which we don't have a copy right now but I think I've got some in my office.

MR. PEARCE: One other thing, Mr. Examiner, I'd like to state for the record that since the objection to the administrative granting of this application was filed by the Litkes, I've had our office send notice of this hearing to them because of the administrative appeal process and I certainly hope we don't have to go through it, but if we could get Mr. Goldberg to indicate who

he represents in this hearing, because if a stranger comes forward later, I may not want to let them do it.

MR. GOLDBERG: I will be glad to provide a list of my clients and I'll provide Mr. Pearce with this also, so that --

MR. PEARCE: Thank you.

MR. GOLDBERG: -- we don't have any --

MR. PEARCE: Thank you, I appreciate that.

MR. CATANACH: Is there anything further in this case?

If not, it will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY 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. 9200, heard by me on Sept 23, 1987.

David R. Catanach, Examiner
Oil Conservation Division