STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	CASE NO. 13,121
APPLICATION OF BENSON-MONTIN-GREER DRILLING CORPORATION FOR QUALIFICATION OF CERTAIN ACREAGE WITHIN THE EAST PUERTO CHIQUITO MANCOS UNIT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, RIO ARRIBA COUNTY, NEW MEXICO	ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

August 21st, 2003

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, August 21st, 2003, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

August 21st, 2003
Examiner Hearing
CASE NO. 13,121

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E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	6	12
Exhibit A	6	12
Exhibit B	7	12
Exhibit C	7	12
Exhibit D	11	12
Exhibit 2	7	12

* * *

APPEARANCES

FOR THE DIVISION:

GAIL MacQUESTEN
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FOR THE APPLICANT:

HOLLAND & HART, L.L.P., and CAMPBELL & CARR
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P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: WILLIAM F. CARR

* * *

WHEREUPON, the following proceedings were had at 10:08 a.m.:

EXAMINER CATANACH: Call Case 13,121, the Application of Benson-Montin-Greer Drilling Corporation for qualification of certain acreage within the East Puerto Chiquito Mancos Unit for the recovered oil tax rate pursuant to the Enhanced Oil Recovery Act, Rio Arriba County, New Mexico.

Call for appearances in this case.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe office of Holland and Hart, L.L.P. We represent Benson-Montin-Greer Drilling Corporation in this matter, and I have one witness.

EXAMINER CATANACH: Okay, will the witness please stand to be sworn in?

(Thereupon, the witnesses was sworn.)

<u>JAMES M. HORNBECK</u>,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?
A. My name is James Hornbeck.
Q. Mr. Hornbeck, where do you reside?
A. I live in Farmington, New Mexico.

Q. By whom are you employed?
A. I'm employed by Benson-Montin-Green Drilling Corporation.
Q. Have you previously testified before this Division?
A. Yes, I have.
Q. At the time of that testimony, were your credentials as an expert in petroleum geology accepted and made a matter of record?
A. Yes, they were.
Q. Are you familiar with the Application filed in this case on behalf of Benson-Montin-Greer Drilling Corporation?
A. Yes, I am.
Q. Are you familiar with the plans of Benson-Montin-Greer for the implementation of a tertiary recovery project in the East Puerto Chiquito Mancos Unit area?
A. Yes, I am.
MR. CARR: Are Mr. Hornbeck's qualifications acceptable?
EXAMINER CATANACH: They are.
Q. (By Mr. Carr) Would you briefly summarize for Mr. Catanach what it is that Benson-Montin-Greer seeks with this Application?
A. It is our intent to apply for the recovered oil

tax rate for the tertiary oil recovery project at East Puerto Chiquito Mancos Unit.

Q. Have you prepared or had prepared exhibits for presentation here today?

A. Yes, I have.

Q. Would you identify what's been marked as Benson-Montin-Green Drilling Corporation Exhibit Number 1?

A. Exhibit Number 1 is the Application for the enhanced oil recovery project tax qualification.

Q. Attached to that exhibit as Exhibit A is a plat. Would you take that out, please? Mr. Catanach, it's maybe not stapled to it. It's the large plat that's marked Exhibit A at the bottom.

Mr. Hornbeck, would you review the information on this exhibit for the Examiner, please?

A. Okay. This is a plat outlining the East Puerto Chiquito Mancos Unit. The yellow outline is the unit outline. The red area is our best interpretation of what will be included in the tertiary recovery project. The yellow-colored wells are wells that we potentially plan to use for chemical injection, and the green circled wells downdip are the existing producers in the field currently. The structure is the structure on the top of the Niobrara, which is the main pay in the unit.

Q. The unit encompasses 9440 acres. How much of the unit is actually involved in this tertiary project recovery area?

A. Well, we're computing it's 6300 acres, which is 67 percent of the unit.

Q. Does Exhibit Number 1 contain as Exhibit B to that exhibit a list of all the producing and injection wells within the project area?

A. Yes, it does.

Q. And what is Exhibit C to this Application?

A. Exhibit C is a type log for the producing interval, as defined in the original unit agreement. It just shows the Mancos shale productive interval, with the two main pays, the Niobrara A and the Niobrara B identified on the type log.

Q. And the Niobrara A and B are the intervals into which you're proposing to inject; is that correct?

A. That is correct.

Q. What is Exhibit Number 2?

A. Exhibit Number 2 is -- I'm sorry, you'll have to give me a second here. Exhibit Number 2, oh, thank you. Exhibit Number 2 is the order by the Division by which we were given -- it's Order 6448, and it gives permission for the pressure maintenance operation and the injection of air, gas and chemicals for tertiary recovery in the unit field.

Q. This unit was actually approved by Order Number R-6409; is that right?

A. Yes, that is.

Q. And then secondary and tertiary recovery operations were authorized by Order R-6448, which is our Exhibit Number 2?

A. Correct.

Q. And that approval was obtained back in August of 1980; is that correct?

A. That is correct.

Q. Could you describe the tertiary recovery methods that Benson-Montin-Greer is proposing to employ in this unit.

A. Well, as based on evaluation and some recommendations from a consulting company that we've employed to help us, they've recommended an injection of soda ash and a surfactant. The volume would be -- We're trying to approach this with a 10-well-injection initial startup, and each well would have about 40 barrels of this potash -- soda ash and surfactant, 40 barrels a day. So we'd be injecting, cumulatively, for all wells, about 400 barrels a day of the chemical in the 10 injectors.

Q. What are the capital costs that will be incurred for facilities related to this project?

A. We have field installations and upgrades of around $215,000. We'll have some workover on the existing wells to get them in shape to be able to inject chemicals. We're thinking that's going to be around $650,000. And then we have water costs to convert a dry hole up on the structure for makeup water, and that's going to be a $75,000 remediation.

Q. So what are the total project costs?

A. Project costs, we're thinking right at $950,000.

Q. Have you determined the value of the additional production that will be recovered if the project is successful?

A. Well, our best interpretation at this time before starting is, we believe we can recover about another incremental 151,000 barrels of oil, and we've given that a price of $24 and $66 [*sic*], and that's just based on an average -- or five-year average, for west-Texas intermediate crude, and that gives us a $3.7 million gross revenue for the project.

Q. And the average price is $24.66 a barrel; is that correct?

A. Yes.

Q. Now, if we look at the incremental production, you have assigned no value for gas. Why is that?

A. We plan to reinject the produced gas back into the reservoir upstructure to help maintain pressure in the reservoir and improve our overall recovery efficiency.

Q. Has Benson-Montin-Greer Drilling Corporation implemented any type of enhanced oil recovery effort to date in this unit?

A. We are currently reinjecting gas upstructure on the structural top of the field, and we're also taking produced water and injecting it downstructure to try and float up some remaining oil in the downstructural setting.

Q. The use of this soda ash, though, is a new enhanced oil recovery method that has not been employed prior to this time within the unit?

A. Yeah, the tertiary recovery using the soda ash and surfactant is all entirely new to the field recovery.

Q. When do you think you'll be ready to commence the injection of the soda ash into the reservoir?

A. We would like to try and initiate chemical injection in early 2004.

Q. Based on your understanding of the time frames involved before you'll see a positive production response, how long do you anticipate it's going to be before you see this sort of a response?

A. Well, it probably will be fairly slow. It could be as much as five years before we start to see a response from the chemicals. The longer it takes, the more effectively we'll be able to wash the reservoir with the surfactant and the soda ash, and it probably will lend itself to a higher incremental recovery. So up to five years.

Q. You understand that there's a five-year window within which you need to see the positive production response to receive the tax credit?

A. Yes, I do.

Q. Does Benson-Montin-Greer Drilling Corporation therefore request that the order provide that they be able to notify you prior to the injection of the soda ash so that you have as much of the five-year window as possible available to you within which to see this positive production response?

A. We would like to notify the Commission as soon as we start so we have that window.

Q. Is Exhibit D to Benson-Montin-Greer Drilling Corporation's Application graphs showing production and injection history and also the forecasted response to the injection that you are proposing?

A. Yes, it is.

Q. Were Exhibits 1 and 2 and all the subparts thereof either prepared by you or compiled at your direction?

A. Yes, they were.

MR. CARR: May it please the Examiner, at this time we'd move the admission into evidence of BMG Exhibits 1 and 2.

EXAMINER CATANACH: Exhibits 1 and 2 will be admitted as evidence.

MR. CARR: And that concludes my examination of Mr. Hornbeck.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hornbeck, back in 1980 the Division authorized BMG to inject chemicals into this unit. Is this the first time that it's been done?

A. Yes, it is.

Q. So up till this point, only water and produced gas have been injected?

A. That's correct.

Q. What's your understanding of how these chemicals that you plan to inject would help the recovery from this reservoir?

A. Well, the -- I will tell you up front that I do not understand completely the mechanics of how the chemicals interact with the reservoir, but for some reason this style tertiary recovery has been implemented in reservoirs across the Rocky Mountains for some time by this consulting group that we have employed out of Golden, Colorado, by the name of SurTech, and they have had good success using this technique and recommended it some time back.

For some reason a basic, you know, high-pH fluid in combination with the surfactant releases additional oil that would never be recovered just by a simple waterflood, and that's kind of the premise we're going on.

We do have laboratory analysis that we've conducted on the reservoir that shows that using this soda ash and surfactant and running it through the cores, we've seen as much as a 20-percent additional loosening of -- or mobilizing of oil that would never be seen if we didn't inject the fluid.

Q. Do you think that SurTech might have any literature regarding this type of injection, Mr. Hornbeck?

A. Oh, I know they do. I didn't bring any with me, though.

Q. Can you maybe try and get us something from SurTech --

A. Oh, yeah.

Q. -- that might help us out in this regard?

A. That's no problem at all.

Q. Okay, the --

A. May I -- Excuse me again.

Q. Sure.

A. What you're looking for is kind of a -- some information to help you understand how the process improves recovery? I mean, I just want to know what to ask for.

Q. Yeah, with these particular ingredients that you plan to inject, the soda ash and the surfactant, just how those work in this reservoir to help improve recovery.

A. It's called a caustic tertiary flood, is the basic root name. They had also recommended some time ago to consider a sodium-hydroxide-and-surfactant flood, but we elected to go with the soda ash because it's a much, much more environmentally stable material, it's not nearly as onerous to have, you know, out and be using. So that's why we've elected to use that.

Q. Okay.

A. Yeah, that would be no problem to get that to you.

Q. Knowing Mr. Greer, I would think that he did extensive research on this subject.

A. That is correct.

Q. So the plan is to inject 40 barrels a day per injection well, for how long a period of time?

A. We think for the whole life of the project.

Q. Okay.

A. Well, maybe I can give you a little more accurate statement. We think it might take -- I think the time line is 2036, is what we've projected out to, in just extrapolating the reserves. So that's 33 years. We'll only be able to -- You know, there's a certain efficiency after so many pore volumes have been cycled for the recovery. After about eight or ten, I've been told, your efficiency is greatly reduced. So however much time it takes to cycle that much volume through is probably the life of the project. So...

Q. Okay. And let's see, can you go over the project costs again for me?

A. Uh-huh.

Q. The $215,000 was --

A. The $215,000 was for field installation, installations and upgrades. And those are predominantly surrounding the installation of pipeline from -- we're going to -- Let me back up.

We're going to have to build a facility to mix up the chemical. It will be mixed daily. The soda ash will be actually a mineral material, hard, and it will be mixed in a series of -- a large building with mixing vats and things like that, with water that's been filtered and -- For that facility, is the majority of the $215,000.

The well remediation and miscellaneous is the $650,000, I believe, and that's really just going through all the wells, making sure they're mechanically -- they pass mechanical integrity tests, the casing is in good shape, and you know, setting packers so that we're prudently injecting properly under OCD Rules and, you know, know that we're getting it in where it's supposed to go.

Q. Okay.

A. And then there was a $75,000 workover cost to -- associated with taking a dry hole that was an Entrada test upstructure in the field. It's actually noted on the plat, it's in Section 28. It's in the southwest of Section 28 in 27 North, 1 East. It's called the Number 1 Phoenix, and it's an Entrada well. And we're going to go in there and case off the well. It's currently plugged, we have to re-enter it and run casing into the Entrada, because we're going to use that water for the makeup water for the project.

Q. Okay. Now, according to your plat, you're going to have 11 injection wells?

A. Well, these are all of the potential wells. We're finding that as we go through and work them over and inspect them, we may not be able to use all of them. Ideally, we'd like to have 10 up on the upstructure side. Yeah, there are 12 colored in as potential injectors.

Q. Initially, what are you going to start off with, realistically?

A. We think we're going to have 10.

Q. Okay.

A. I mean, we think we'll have 10.
Q. And only three producing wells?
A. Yes.
Q. The three that you've got shown in green?
A. That's right, initially to start -- It seems as though this -- the fractured reservoir, the cell that's in there that has been producing has been effectively drained by those three downdip wells. It's a gravity-drainage system, so things are flowing, you know, naturally downdip. We'll just pump the chemicals in on the top of the structure, let them leach their way down, you know, through gravity drive, and pick up the -- hopefully, you know, the incremental improvement downdip in those three green-colored wells.
Based on the performance, I mean, we may find we need to drill an additional producer. But right now we'd like to start with that before we go ahead and drill any additional wells. We'd like to see what the response is really going to be.
Q. Now, within the area that you've defined in red, there are some additional producing wells in there, are there not? Or are they plugged?
A. No.
Q. I mean, it looks like there's quite a few wells in there.

A. There are, there are. And they are either currently -- I'm assuming you're referring to wells such as the E-19 and the F-6, are those --

Q. Yeah, I mean, there's --

A. Call out some numbers or names, and I'll -- so I can follow your --

Q. Well, the F-6, the I-6 down in the southwest there, the K-5.

A. Yeah, okay.

Q. I mean --

A. Well, as part of going through the field and, you know, prudent operatorship, we are -- some of these wells have been, oh, temporarily abandoned or shut in, and we have intentions of returning wells that are structurally favorable for production back to production as we see the necessity to.

Some of the wells, like the -- Well, I'll point out the P-13, up in the very northwest corner of the unit --

Q. Uh-huh.

A. -- is going to be our -- We're going to apply for permission to convert that to our disposal well for end-product water. It's currently drilled through the Dakota, and so that's where we're going to apply for approval to dispose of our final water after we're done with the -- you know, working it through the filtration system, things like that.

Most of those other wells -- There's the two dry holes, the P-18 and the H-25, that are downdip from the three producers.

The E-19 and the I-6, I believe, are considered for a return to producers, based on the response that we see in the chemical injection at a later date, but -- I'm not sure I answered your question. If we can use them, we will.

Q. Uh-huh.

A. Some wells are -- Well, we have been working with the Aztec Office of the OCD. They have provided us with a list of wells that have been inactive, and they have asked us to either go in and return them to production or plug them, and so we're going through. And based on the -- This map shows some of those wells as still being productive. We are finding that we will probably plug those wells based on mechanical situations.

So they do show candidates that potentially could be used. Based on the mechanical condition we will either return them or plug them.

Q. Okay. The three wells that you've got producing now, do you know what the rates are on those wells for total production?

A. Yeah, they're averaging about 20 barrels a day per well. We've got about 60 barrels a day right now for the three wells, and that's about 10,000 barrels a month, cumulative production.

Q. Okay. I guess the reason that you're including such a large area is because there may be some potential for some of these wells to be used as producers in the future; is that your --

A. Yes, actually the I-6 well will be converted -- or will be returned to production as part of the flood efficiency. So we're hoping to have a well on the southwest flank of the structure to produce the oil that as we injected updip -- The wells located structurally high in Section 5, the F-5, the B-5, the H-5 and the K-5 --

Q. Uh-huh.

A. -- will probably -- the chemical injected there will probably drain its way down directionally towards the I-6, and we plan to use that at some point to capture some of that oil that's released. But those are the three wells right now that we have that are producing. We plan to start with that.

You know, Mr. Examiner, we really don't know how this is going to go. I mean, we have a confidence based on some work we've done in the laboratory, and we have fields that have responded in other areas, but I think Mr. Greer's concern is that we'd like to see how it's going to work in the existing wells before we go out and drill additional producers and spend that extra money. We just, you know, want to start up based on the results and then -- and tailor the project from there.

EXAMINER CATANACH: Okay, that's all I have.

MR. CARR: That's all we have, Mr. Catanach. We'll submit information from the consultant on the technical aspects of it.

EXAMINER CATANACH: That would be great.

Okay, there being nothing further in this case, Case 13,121 will be taken under advisement.

And I believe that's it. This hearing is adjourned.

(Thereupon, these proceedings were concluded at 10:35 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 13121, heard by me on Aug 21 ~~19~~ 2003.

David R. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL August 22nd, 2003.

Steven T. Brenner

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2006