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

9 September 1987

EXAMINER HEARING

IN THE MATTER OF:

Application of Hixon Development Company for a gas storage well, San Juan County, New Mexico.	CASE 9208

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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

For the Applicant:

MR. STOGNER: This hearing will come to order.

I'll call next Case Number 9208, which is the application of Hixon Development Company for a gas storage well in San Juan County, New Mexico.

At the Applicant's request this case will be continued to, and it will also be readvertised for, September 23rd, 1987.

(Hearing concluded.)

C E R T I F I C A T E

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

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9208, heard by me on September 9, 1987.

, Examiner
Oil Conservation Division

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

23 September 1987

EXAMINER HEARING

IN THE MATTER OF:

Application of Hixon Development Company for a gas storage well, San Juan County, New Mexico. CASE 9208

BEFORE: Michael R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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

For the Applicant:

MR. CATANACH: We'll call next Case Number 9208, which is the application of Hixon Development Company for a gas storage well, San Juan County, New Mexico.

The applicant has requested that this case be continued to the October 7th, 1987.

(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. 9308, heard by me on Sept 23 1987.

David R. Catanach, Examiner
Oil Conservation Division

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

7 October 1987

EXAMINER HEARING

IN THE MATTER OF:

Application of Hixon Development Company for a gas storage well, San Juan County, New Mexico. CASE 9208

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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

For the Applicant: Tommy Roberts
Attorney at Law
Farmington, New Mexico

I N D E X

E X H I B I T S

MR. STOGNER: Call next Case Number 9208.

MR. TAYLOR: The application of Hixon Development Company for a gas storage well, San Juan County, New Mexico.

MR. STOGNER: Call for appearances.

MR. ROBERTS: Mr. Examiner, my name is Tommy Roberts. I'm an attorney in Farmington, New Mexico, and I represent the applicant, Hixon Development Company, in this case.

I have one witness to be sworn.

MR. STOGNER: Are there any other appearances in this matter?

There being none will the witness please stand to be sworn at this time?

(Witness sworn.)

BRUCE E. DELVENTHAL,

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

DIRECT EXAMINATION

BY MR. ROBERTS:

Q Would you please state your name and place of residence?

A My name is Bruce Delventhal and I currently reside in Farmington, New Mexico.

Q What is your occupation?

A I'm a petroleum engineer.

Q Have you testified before the New Mexico Oil Conservation Division on any prior occasion?

A No, I have not.

Q Would you briefly describe your educational background which would be relevant to your profession?

A Okay. I received a Bachelor of Science degree from New Mexico Institute of Mining and Technology in petroleum engineering.

Q And would you please briefly describe your work experience prior to becoming employed with Hixon Development Company which is relevant to your profession?

A Okay. I worked one summer for Northwest Pipeline. I've worked during -- while I was going to school at Petroleum Recovery Research Center in Socorro, New Mexico.

Most of my experience is with Hixon De-

velopment Company.

Q How long have you been employed by Hixon?

A I've worked for Hixon for four and a half years.

Q And would you briefly describe your responsibilities with your employment position?

A Okay. I'm responsible for all company engineering and operations and all aspects in that regard.

Q Would you describe the extent of the operations of Hixon Development Company in the Carson Unit Area?

A Yes. As unit operator of the Carson Unit Hixon Development Company's involved in all aspects of that unit operation.

Q And are you directly familiar with those operations?

A Yes, I am.

Q What have been your responsibilities within that area?

A I'm involved in all engineering projects and operation projects within that unit and also (unclear) other engineers that work that area.

Q Are you familiar with the application in this case?

A Yes I am.

MR. ROBERTS: I would tender Mr. Delventhal as an expert in the field of petroleum engineering.

MR. STOGNER: Mr. Delventhal, when did you graduate?

A I graduated in December of 1982.

MR. STOGNER: And you were at the PRRC when?

A I worked several -- on and off while I was going to school several years.

MR. STOGNER: That's where I remember you.

A Yeah.

MR. STOGNER: Okay. I thought you looked familiar.

A Yeah.

MR. STOGNER: Okay. Yes, Mr. Delventhal is so qualified.

Q Mr. Delventhal, would you briefly describe the purpose of this application?

A Yes. Hixon Development Company seeks authority to utilize its Carson Unit 34-18 for a gas storage well.

Q Briefly explain the reason for that request.

A Okay. During the past twelve months we've experienced high line pressure in the Carson Unit that's prevented us from selling casinghead gas. During periods of high line pressure the alternatives available are, one, to continue producing oil but to vent the gas produced in association with that oil. Or the second option would be to shut in oil production until line pressure diminishes to the extent casinghead gas can be produced into the sales line.

Neither of these alternatives is satisfactory in that both result in waste. Temporary storage of the casinghead gas during period of high line pressure result in conservation of gas while at the same time permitting economic operation of the unit.

Q Who operates the gathering system into which the casinghead gas produced in the Carson Unit is delivered?

A El Paso Natural Gas operates that system.

Q What steps, if any, have been taken by Hixon Development Company to deal with the maintenance of high line pressure by El Paso?

A Okay, we've installed a gas compressor at that unit to try to increase gas pressure so that we can sell against their higher line pressures. The only problem is that's not really a cure-all for the situation since El Paso's system is a low pressure collection system and we're

limited to the pressure we can go to, 250 being the maximum that that system will stand.

Also, it doesn't solve the problem where we have down time or plant down time, I should say, that means that that gas system or collection system is shut in and we'd just be actually packing gas in that line. In other words, there's no movement of gas in the line.

Q Mr. Delventhal, refer to what's been marked as Exhibit Number One and identify that exhibit.

A Okay. Exhibit Number One is a base map of the Carson Unit area.

Q And what is the significance of this exhibit to this application?

A Okay, this base map, the slash marks represent the boundary of the Carson Unit. The red triangle represents the proposed Carson Unit 34-18 that we are proposing to use as injection or storage (unclear) and the red line represents a half mile radius around that -- that well and it also demonstrates that the wells wihin that half mile radius are well within the Carson Unit boundaries.

Q Is Hixon Development Company the operator of the unit?

A Yes, we are.

Q To what formation or formations does this unit apply?

A To all formations.

Q And from what formation or formations is the gas produced which is proposed to be reinjected --

A This gas --

Q -- and stored?

A I'm sorry. This gas is produced from the Gallup, Bisti Lower Gallup formation.

Q And, Mr. Delventhal, what pool applies to that formation --

A It would be the Bisti --

Q -- in this area?

A I'm sorry, Bisti Lower Gallup Pool.

Q Mr. Delventhal, would you describe the vertical limits of the Bisti Lower Gallup Oil Pool?

A Okay. The Bisti Lower Gallup Pool is -- its upper limit would be the base of the Upper Mancos and its lower limit would be the top of the Lower Mancos.

Q And are you familiar with the geologic characteristics of the reservoir which is encompassed by the unit?

A Yes, I am.

Q Would you describe those geologic characteristics?

A The reservoir is a northwest/southeast trending stratigraphic trap. The Bisti Lower Gallup reser-

voir is a sandbar complex which was formed during regressive and transgressive sedimentary cycle during the late Cretaceous time period.

This reservoir is bounded by the Massive Mancos Shale above and below, which serves as an impermeable barrier and trapping mechanism. There's no known geological evidence of faulting, thus gas stored in this reservoir would be confined.

Q Would you briefly describe the history of the development of the Carson Unit?

A Yes. The Carson Unit was developed in the late fifties and early sixties and at its peak it was composed of approximately 120 wells which at this time 78 of those wells are plugged. The remaining 44 wells consist of 22 wells that are currently -- I'm sorry, 20 wells that are currently oil producers. The remaining 22 wells are used as water injection wells and some of those are temporarily shut in.

Q Do you have an estimate of future recoverable oil reserves from the unit?

A Yes, it's approximately 4-million barrels.

Q And do you have an opinion as to the remaining producing life of the unit?

A Yeah. The reservoir has a -- or I should

say this unit has a long producing life which is a function of price of oil and the cost of lifting (unclear) in that reservoir.

Q What are the current rates of production of oil and gas from the Bisti Lower Gallup formation in the unit?

A Okay, we currently produce 2500 barrels of oil per month and the associated gas with that 3000 MCF.

Q Mr. Delventhal, would you identify for the Examiner the exact footage location of the proposed injection well?

A Yes. It's located 660 from the south line and 1976 from the east line. It's in Section 18.

Q And what is the current status of that well?

A This well is currently shut-in.

Q Is it currently completed as an injection well?

A No, it is not.

Q What is the current status of the wells located within the one-half mile radius from the proposed injection well?

A There is a total of 22 wells which penetrate the Gallup formation within that half mile radius. Of these twelve wells six of these wells are plugged and aban-

doned. Four of the wells are -- currently are in the process of being converted to water injection wells. There's one producing well and one well that is temporarily shut in.

Q What will be the source of the gas which is produced and then injected in the proposed injection well?

A All the gas that will be stored will be produced gas from the Bisti Lower Gallup reservoir.

Q To your knowledge is ownership of unit production common throughout the unit?

A Yes, it is.

Q Turn away from what's been marked as Exhibit One, now, Mr. Delventhal, and refer to what's been marked as Exhibit Number Two, and identify that exhibit, please.

A Okay. Exhibit Number Two is a wellbore schematic of the proposed storage well and there's also attached a data sheet with additional information.

Q What is the sigificance of the data illustrated on this exhibit to this application?

A This exhibit basically gives description of the casing program and the cementing program that was used to complete this well.

Q Okay, in yoiur opinion will the casing and cementing results illustrated in this exhibit provide

adequate protection against loss of gas while it's being injected, withdrawn, or held in storage, and will it provide good and sufficient protection against contamination of groundwater?

A Yes, it will.

Q Mr. Delventhal, now refer to what's been marked as Exhibit Number Three and please identify that exhibit.

A Okay. Exhibit Three is an electric log run by Schlumberger when this wellw as initially drilled and it shows the proposed perforations that we'll inject gas into.

Q What is the significance of this data illustrated in this exhibit?

A I guess it -- it shows the injected -- as we say, the perforations that we will be injecting gas into and shows that those intervals are confined within the Gallup reservoir.

Q What conclusions can be drawn from the data illustrated in this exhibit?

A That there will be communication with other formations of any gas that's placed in storage in this well -- or in this reservoir.

Q Turn to what's been marked as Exhibit Number Four, please, and identify that exhibit.

A Okay. Exhibit Number Four is composed of wellbore schematics and diagrams of the additional twelve wells within that half mile radius around the proposed injection well.

Q What is the significance of the data illustrated on this exhibit?

A Okay. This exhibit shows the program or cementing and casing program that was used in completion of these wells. It also further defines the cement that was used to plug and abandon those wells that are in that status.

Q Do you draw any conclusions from this data relevant to this application?

A Yes, that there would be no loss of gas per these wells.

Q In your opinion will migration away from the wellbore of the injection well occur?

A No, not in this case. We're requesting to inject very small volumes of gas and for short periods of time. In other words, we're not going to store it for a long period of time. We plan to produce it back as quick as that line pressure decreases and allows us to do that.

The other -- the other point I'd like to make is also that the change in pressure, Delta P, is always going to be in direction of that wellbore; therefore, we

don't feel that there will be any migration away from it.

Currently we produce about 100 MCF a day at that unit. If you were just to make some calculations showing what the fillup would be with that gas, it would show that the radius that that would radiate away from that wellbore would be 550 feet, which is well within the forty acre spacing.

Q Refer to what's been marked as Exhibit Number Five, please, and identify that exhibit.

A Okay, Exhibit Number Five is a schematic of the storage facilities or the metering system and compressor system that will be used with this storage well.

Q Explain the data -- the significance of this data to the application.

A Okay. Looking at this schematic, we currently bring oil, gas, and water that is produced from the Bisti Lower Gallup wells into the main tank battery and there it's run through a separator and the gas is separated and sent to a gas sales compressor which I mentioned earlier that we installed.

Okay, from that point under normal sales conditions or line pressure that wasn't high, the gas would go to El Paso's meter and be metered there.

Okay, when we experience high line pressure we're going -- we have a control valve after the gas

sales compressor, which will sense that high line pressure and turn that gas towards a second compressor which will be used to increase the pressure in order to inject it into the storage well.

I might note that before going into that storage well we'll have a gas meter or gas storage meter that will record the gas that is injected into that well. When line pressure increases or decreases to the point that we can produce that gas back, it will be run back through the -- another meter, a second meter, that will record the volumes that we produce back and from that point it will re-enter the -- our sales system and be sold via El Paso.

Q Do you draw any conclusions from this data with respect to the request in this application?

A Yes. That we will accurately measure both gas injected and produced from the well and that accurate records can be kept of those volumes.

Q Mr. Delventhal, would it be accurate to say that all gas produced from the reservoir which is reinjected will be reinjected into the formation from which it was produced?

A Yes, it would.

Q Will the injection well be equipped to permit a determination of injection pressure and annular pressure at the wellhead?

A Yes. We'll have gauges both on the annulus and the tubing; also that the gas storage meter will be able to record the injection pressures.

Q What average injection rate to you propose to maintain?

A Okay, we propose to maintain an average injection rate of 800 and 974.

Q And what would you expect the maximum injection rate to be?

A It wouldn't exceed the 974.

MR. STOGNER: I'm sorry, what?

A The 974 would be the maximum.

Q Now, this is the injection rate.

A Oh, I'm sorry, I'm talking about pressures.

Q Yes.

A Excuse me. Our average injection rate would be around 100 MCF and the maximum would be 250 MCF.

Q In your opinion, Mr. Delventhal, will injection pressures be maintained in accordance with applicable rules and regulations?

A Yes, they will be.

Q And what would you expect the average injection pressure to be?

A As I said earlier, 800.

Q Okay, and what about the maximum injection pressure?

A 974.

Q Okay. Who is the owner of the surface of the lands on which the proposed injection well is located?

A The Bureau of Land Management is.

Q And have they been provided notice of this application?

A Yes, they have. We sent a certified letter notifying of that with a return receipt requested, which we did receive the return receipt showing that they did receive the letter.

Q Mr. Delventhal, in your opinion will the granting of this application result in the prevention of waste and the protection of correlative rights and be in the interest of conservation?

A Yes, it will be.

Q Were Exhibits Numbers One through Five either prepared by you or at your direction and under your supervision?

A Yes, they were.

MR. ROBERTS: Mr. Examiner, I'd move the admission of Exhibit Numbers One through Five.

MR. STOGNER: Exhibits One through Five will be admitted into evidence.

MR. ROBERTS: I have no other questions on direct for this witness.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Delventhal, let's talk about the completion here for a second.

A Yes, sir.

Q I'll refer to your Exhibit Number Two. Now, you plan to run just one string of 2-3/8ths inch tubing and --

A That's correct.

Q -- injection going down in and then also coming back up.

A Correct.

Q This being the same gas going in and the same kind of gas going out, there really would not be any requirement to have this plastic lined like we usually do in our salt water disposal or water injection wells, is that correct?

A Correct.

Q Okay. Now, as far as the zones that it is actually being injected into, are these the same perforations or within the same gas-bearing zone or producing zone that the other wells are being produced at or is --

A Yes, it is.

Q -- this --

A No, it's all the same, same sand intervals within that Gallup.

Q Okay.

A Bisti Lower Gallup.

Q Now what is the reservoir pressure in this reservoir?

A Currently right now?

Q Yeah.

A Well it would be an estimate -- I'm sorry, calculated at 200 psi.

Q What was the virgin pressure?

A The virgin was 1550. That calculation, by the way, is -- is at this particular well, the gas storage well.

Q And the actual injection itself would not occur until such time as El Paso wouldn't be able to -- you wouldn't be able to buck El Paso's pressures.

A That's correct.

Q Okay. How many wells out there are actually producing gas that you will be injecting into --

A As far -- I'm not sure I understand the question.

Q Is this going to be unit-wide gas collect-

ed at one central point and then injected?

A Yes.

Q Or are you just going to take a few wells?

A No, it's -- it will be all the unit gas produced that -- from wells that penetrate this same formation we'll be injecting to, which would be the Bisti Lower Gallup.

Q Okay, and your present monthly production out there, you said was 3000 MCF?

A Yes, that's correct.

Q Which comes out to about 100 MCF a day.

A Correct.

Q What are you presently doing with this gas when you can't buck El Paso's line?

A Okay, this gas right now when we can't buck the line pressure is getting vented.

Q How often does this occur in the last year that you've had to vent?

A How often last year did it occur? Well, in the nine months between August of last year to, let's see, June of this year, approximately 11,000 MCF were vented and that's at a regular time that the pressure is up and down, it's not on a necessarily continuous basis. One day it's up, the next day it's down.

Q So this would prevent waste inasmuch as you'd be able to recover the gas that you'd normally have vented.

A That's correct. I might add that we've experienced the frequency of this high line pressure has become more of a problem than it has in the past. This has kind of come to a head.

Q I'm sorry, what was that again?

A Well, I guess I said the frequency of the high line frequency occurrences has become more frequent than it has in the past.

Q Oh, I see. Just within the last year?

A Yes, and that -- a lot of that has to do with the market problems that industry has experienced.

Q And then in the summertime you have a higher -- expect higher line pressure, anyway, don't you?

A That varies out there, you know, they've had problems with their Chaco Plant so we see down time at erratic times.

Q Now prior to the hearing, Hixon or -- yeah, Hixon submitted a form what, C-108? That's the application for injection?

A Yes, that's correct.

Q And all the data on that, that was required?

A Yes. I might add that that -- the one I think you have is for the Carson 24-18. We changed that well.

MR. ROBERTS: Mr. Examiner, I have provided written notification of the amendment of the application to identify the Carson Unit 34-18 Well as the proposed injection well.

Q And that was the reason for the readvertisement --

MR. ROBERTS: Yes.

Q -- was it not?

And the 24 Well is just, what, about 330 --

A It's due west of this.

Q Due west?

And there's no significant difference between what the application would contain in the 24-18 as opposed to the 34-18 --

A No, it would be the same --

Q -- in the C-108, right?

A -- basic information.

Q Now as far as the unit itself, is that made up of all Federal land or is there some State and fee land involved, too?

A I don't know of any fee land there and I

don't know of any State land in that unit. I believe it's comprised of Federal.

Q When I look at your Exhibit Number One, which is the plat, I show some -- looks like some squares or rectangles in that.

A Okay, yeah, for example the one in 18 there that's within the half mile circuit?

Q Yeah.

A Yeah, that's a water source well. It doesn't penetrate the Gallup formation. There are several of them within the unit when that -- the waterflood was at a -- in full swing.

Q Okay, so the box in Section 19, that's another water source well?

A Yes, the one with a 2 next to it, that is a water source well, as well as the one in 18 marked as 5.

Q Okay. And how about over in Section 13, it looks like you have one way down there in the lower southeast corner?

A Okay, that represents the Carson Unit tank battery and our main facilities for the unit.

Q Okay, and then your other source wells throughout there, 14 and 13.

A Yes, that's correct.

Q Is this unit presently under waterflood?

A We're -- we have one active water injector right now. We're currently in the process of reactivating four of these -- four wells; well, actually more than -- four wells within that half mile radius, and there's also, let's see, one, two, one additional well outside the half mile radius, we're going to reactivate that, also.

Q Okay, when you say reactivate, was it a waterflood project?

A Yes, yes, it was.

Q Do you remember when that was activated?

A The reactivation or the original?

Q The original.

A It was in the early -- I'm sorry, early sixties, I believe, two years after some of the earlier wells were drilled.

Q And that was known as the Carson waterflood, I assume?

A Yes, it was.

Q Has Hixon always operated the unit?

A No, we haven't. Shell developed the unit and we purchased it from them.

Q When did Hixon purchase it?

A It would have been in 197 -- not 70, 1982, I believe.

Q Will Hixon abide by the rules and regula-

tions as far as reporting on the appropriate forms, the Form 133-A that is for (not understood) project?

A Yes, we will.

MR. STOGNER: I have no further questions of Mr. Delventhal.

Are there any other questions of this witness?

If not, he may be excused.

Mr. Roberts, do you have anything further in this case?

MR. ROBERTS: No, sir.

MR. STOGNER: Does anybody else have anything further in Case Number 9208?

The case 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. 9208, heard by me on October 1987.

Examiner
Oil Conservation Division