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

11 July 1984

EXAMINER HEARING

IN THE MATTER OF

Application of Trans Pecos Resources, Inc. for authority to inject produced gas for an enhanced oil recovery pilot project, Guadalupe County, New Mexico. CASE 8246

BEFORE: Richard L. Stamets, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division:

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# I N D E X

JACK GAWRAN

Direct Examination by Mr. Hall 3

Cross Examination by Mr. Stamets 15

ROBERT McKINNEY

Direct Examination by Mr. Hall 20

# E X H I B I T S

Applicant Exhibit One, Resume 4

Applicant Exhibit Two, Application 6

Applicant Exhibit Three, Plat 8

Applicant Exhibit Four, Log 9

MR. STAMETS: We'll call next Case 8246, being the application of Trans-Pecos Resources, Inc. for authority to inject produced gas for enhanced oil recovery pilot project, Guadalupe County, New Mexico.

MR. HALL: Mr. Examiner, my name is Scott Hall from the law firm of Campbell and Black, P. A., Santa Fe.

I have two witnesses who need to be sworn this morning.

MR. STAMETS: Are there any other apperances in this case?

I'd like to have both of those witnesses stand and be sworn at this time, please.

(Witnesses sworn.)

JACK GAWRAN,

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

DIRECT EXAMINATION

BY MR. HALL:

Q For the record please state your name.

A My name is Jack Gawran.

Q How do you spell that?

A G-A-W-R-A-N.

Q And by whom are you employed?

A Trans-Pecos Resources.

Q And would you briefly summarize for the Examiner your work experience and educational background?

A I studied general engineering, specializing in geodetic surveying at London University, and from 1969 through '73 I worked in Mexico for a consulting firm, Asuna and Associates.

Thereafter I worked for Simpson and Associates, a consulting firm out of San Antonio, Texas, and worked all over the United States in oil and gas exploration.

Thereafter I was with Intrasearch out of Denver, Colorado, also a consulting company, geological consultants.

Since that time I've worked with Trans-Pecos Resources in New Mexico.

Q In what capacity are you employed by Trans-Pecos?

A Production engineer.

Q Mr. Gawran, I'll hand you what's been marked as Applicant's Exhibit Number One and ask you to identify that for the record, please.

A That's correct. My name is misspelled, incidentally. It's G-A-W-R-A-N.

Q Thank you. Is Exhibit Number One a resume of your experience?

A Yes.

MR. HALL: Mr. Examiner, are the witness' qualifications acceptable?

MR. STAMETS: Yes, they are.

MR. HALL: At this time we would offer Exhibit Number One into evidence and move its admission.

MR. STAMETS: Exhibit Number One will be admitted.

Q Mr. Gawran, are you familiar with the application of Trans-Pecos Resources in this case?

A Yes.

Q And the subject well?

A Yes.

Q What does Trans-Pecos seek by this application?

A The purpose is twofold. First, to prove productivity, sustained productivity in the Latigo "B" 2 Well from which the injected gas will be produced, and to test the feasibility of enhanced oil recovery out of the Atoka in the Latigo "A" 1, which will be the injection well.

Q Is this an experimental project?

A Yes, it is.

Q Is this the first of its type in New Mexico?

A To my knowledge. There are analogous ones but of this exact type, dry gas to be injected into an adjacent well, I haven't seen one like it.

Q Has this technique been employed in places other than New Mexico?

A I understand, for instance, that Conoco is attempting a missible flood but with CO2 in the Maljamar Field, the Grayburg formation in the Maljamar Field. The oil characteristics there are similar to the oil that we have found in injection well, proposed injection well.

Q Mr. Gawran, are there any other New Mexico state agencies participating in this project?

A We have availed ourselves of technical advice from the PRRC in Socorro, who have done some oil analyses and are currently studying our log data and some cores to further evaluate the potential of this project.

Q Mr. Gawran, I'll hand you now what has been marked as the Applicant's Exhibit Number Two. Would you please identify that for the record, please?

A How do I identify it?

Q Mr. Gawran, is this Trans-Pecos' C-108 application previously submitted to the Oil Commission?

A Yes, it is.

MR. HALL: Mr. Examiner, we would move the admission of Exhibit Number Two.

MR. STAMETS: Exhibit Number Two will be admitted.

Q Mr. Gawran, what is the identification of the well proposed to be used for injection?

A It's located 1980 from the north line,

1980 from the east line of Section 2, Township 9 North, Range 23 East.

Q And how is that well named?

A The Latigo Ranch Block "A" No. 1.

Q I'll ask you to refer to Exhibit Number Two again. Does Exhibit Number Two show the injection zone and perforated intervals?

A Yes, it does.

Q Is that information shown on the attachments to the C-108 form, Mr. --

A Yes, it is.

Q -- Gawran? What is the proposed injection zone?

A It will be from 6165 to 6203. That's the gross perforated interval.

Q Right. When was the Latigo "A" 1 originally drilled?

A Beginning of '82.

Q And what is the present status of the well?

A It's shut in.

Q Is the bridge plug set in the Latigo "A" 1 as shown on the C-108 form?

A A bridge plug was set last week as shown at 6250, though we called for a bridge plug manufactured by Arrow to be used and we've used, in fact, one by Pengo, but it has the same specifications.

Q All right.

MR. STAMETS: Where is that shown in the Exhibit Number Two?

A Paragraph four.

MR. STAMETS: Is that shown on the 108 itself?

A Injection Well Data Sheet, Side two.

MR. STAMETS: Okay, very good.

Q Mr. Gawran, has any oil been recovered from the Latigo "A" 1?

A Approximately 50 barrels have been recovered by swabbing and during the setting of this bridge plug we recovered between one and two barrels.

The purpose was to set the plug and to get some fresh samples for additional analysis in Socorro.

Q All right, Mr. Gawran, I'll hand you what's been marked as Applicant's Exhibit Number Three and ask you to identify that for the record, please.

A This shows the location of the proposed injection well and also the well we propose to recomplete for the injection gas, and also all the other wells in the area.

Q All right. Do the attachments to Exhibit Number Three indicate the acreage ownership of the area of review?

A I understand they do.

Q Mr. Gawran, are there any wells within

the one-half mile radius of the Latigo 1-A?

A There are none.

Q I'll ask you to refer again to Exhibit Three and note the well located in Lot 4 of Section 2.

Would you identify that well, please?

A That's the Trans-Pecos McCoy State No. 1, which has been plugged and abandoned. The appropriate documentation is on file with the State and it was drilled to approximately 1200 feet and plugged about a year ago.

Q Does the McCoy State then not penetrate the subject interval?

A It does not.

Q All right. I'll hand you what has been marked as Applicant's Exhibit Four and ask you to identify that for the record, please.

A This is a gamma ray correlation log which -- with which the bridge plug was set to insure that it was set at the correct depth. And if, of course, correlates with the gamma ray logs on file with the State, which were filed in '82 with the C-105 for the reference well.

Q All right.

MR. HALL: Mr. Examiner, we would move the admission of Applicant's Exhibit Four.

MR. STAMETS: These exhibits will be admitted, or that exhibit.

MR. HALL: Mr. Examiner, I would also ask that Exhibit Number Three be entered into the

record. I don't believe I moved its admission.

MR. STAMETS: Exhibit Three is admitted.

Q Mr. Gawran, at what depth is the bridge plug shown to be set on Exhibit Four?

A At 6250.

Q Mr. Gawran, will you please explain the casing and cementing program for the Latigo 1-A?

A The production casing is set to 7202 and it's 5-1/2 inch J-55 17-pound casing, and it's cemented back in two stages. The top of the cement as is shown, is 4800 feet, and it's Class C neat cement.

Q All right, was the cement utilized designed for the temperatures expected to be encountered?

A Not really. That cement should normally not be used below 6000 feet. That is the recommended depth from Halliburton, the service company who did the cement work, and the temperatures should not really exceed about 160 degrees.

Q Is the cement in the hole actually capable of handling the temperatures expected?

A The bond log indicates an excellent cement job up to the top of the cement and we have every reason to believe that for the duration of this test that cement will -- will hold up and not permit any communication with the upper zones.

Q All right. What is the name of the form-

ation proposed to be injected?

A It's the Atoka.

Q And at what depth is that located?

A Well, the top would be at 6150 and extend to 7100.

Q All right.

A 7110, pardon me.

Q 7110.

A Right.

Q What is the source of the gas proposed to be injected into the subject well?

A That would be also from the Atoka and in the Latigo Block "B" No. 2 Well.

Q Is the Latigo "B" No. 2 shown the acreage map, Exhibit Number Three?

A It is.

Q Mr. Gawran, does Trans-Pecos own the gas reserves capable of being produced from the Latigo --

A Yes.

Q -- 2-B? Is the 2-B connected to a commercial pipeline?

A No.

Q Where is the nearest pipeline?

A The nearest pipeline we would be able to utilize is about 70 miles to the south, Transwestern.

There are closer ones but we understand it would be not possible for us to gain admission to them.

Q Will there be an actual sale of the gas produced from the B-2 and injected into the 1-A?

A No. The only sale will be of the gas liquids produced with the gas, or with the liquids produced with the gas.

Q So then there will be only a physical transfer of the gas.

A That's correct.

Q Mr. Gawran, without the proposed injection into the 1-A, would the 2-B be shut in otherwise?

A It is shut-in now and we have been unable to produce it since we don't have a pipeline and since we don't have any extended production data on these wells, we have been unable to negotiate for a pipeline; therefore, this test is predicated to get extended production information from the B-2 Well the six-month duration of the test, and enable us to generate some income from the liquids.

Q All right, what volumes are proposed to be injected into the 1-A?

A We're predicating a maximum of 750 Mcf a day.

Q And will this system be an open or closed system?

A It will be a closed system.

Q What is the maximum pressure you propose to utilize?

A 5200 psi --

Q And how --

A -- at surface.

Q And how did you arrive at this pressure?

A This is from computer generated data using the gas gravity, friction, permeabilities of analogous cores. We do not have core data on this specific interval into which we'll be injecting but we have cores from the other wells we drilled in the area, which we feel are analogous.

Q All right. Do you anticipate that the Latigo B-2 will produce any water?

A We expect some water. It's hard to estimate how much. The nearest estimate I can give is from recent production testing on the Latigo 1-C, which is about two miles west of the 1-A, and we will -- we had a sustained water production rate of 1.9 barrels an hour; however, that well was fraced with an aqueous fluid and we feel that we release more connate water by using that treatment and we would not be using it on the B-2. It will be a methanol type frac and we feel we wouldn't be breaking out as much connate fluid as we have done with our other treatments.

Q How would you propose to dispose of the water produced, if any?

A If there -- if the amounts are moderate, then we propose to put it into a lined pit and dispose of it by evaporation.

If they're excessive, we have a well to

the south and west on our acreage, an old well, which we would then file to convert into a water disposal well.

Q All right, Mr. Gawran, are there any fresh water zones in the area?

A There are.

Q What are those?

A The aquifer there is in the Santa Rosa sands and it extends from close to the surface to a maximum depth of 900 feet, plus or minus.

Q Do you feel that those zones are adequately protected?

A I feel they are.

Q Mr. Gawran, are there any fresh water wells within a mile of the injection area?

A No, there aren't.

Q Has Trans-Pecos submitted well logs to the OCD on the Latigo 1-A and 2-B?

A Yes.

Q How will the oil be recovered initially from this project?

A We propose monitoring the injection pressures. If we obtain missibility, we feel injection pressures will decline and after a period of perhaps three months, and this can only be ascertained once the project gets underway, we propose to flow back in the A Well and see if the treatment that we've prescribed is effective.

Subsequently, if we -- if we find that

this a viable scheme, we will drill offset wells and produce through them, using this, the 1-A only as an injector.

Q All right, is it Trans-Pecos request then of the OCD that other than the ordinary drilling and permitting requirements for the additional offset wells, that those wells also be subject to the order issued pursuant to this application?

A Yes, it is.

Q All right. Mr. Gawran, in your opinion will the granting of this application result in the prevention of waste and recovery of additional hydrocarbons?

A Yes.

MR. HALL: That concludes my direct examination of this witness, Mr. Examiner.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Gawran, you've indicated that the length of the test will be six months, is that correct?

A That's correct.

Q And do you have a start up date, a firm start up date?

A We do not. As soon as possible and it would probably be the -- the most important factor governing that would be the conclusion of studies by the PRRC.

Q So what you would need then would be an order which would authorize you a six month period after you

have commenced operations.

A Yes, and also permitting us to drill offsets at a future date if the date we submit to you from this test is satisfactory to enable us to get administrative approval for such wells rather than having a hearing on each one.

MR. STAMETS: Off the record.

(There followed a discussion off the record.)

Q Now the gas that is injected into the Latigo "A" Well, when you start testing this well --

A Uh-huh.

Q -- that gas will be flared?

A Yes.

Q Now have you determined the fracture pressure of the Atoka?

A I have some computer frac models here and using all the inferred data from the adjacent wells, we -- we come up with a frac gradient of between .75 and .89 in this formation.

Q And is that a --

A That's frac initiation pressure.

Q Is that the surface pressure?

A No, that's bottom hole.

Q Bottom hole, okay. Do you show any calculations in here anywhere where the 5200 surface pressure

would cause you to not exceed that gradient?

A Not in our exhibits.

Q Can you supply that?

A Yes.

Q Okay, I'll appreciate that.

A The 5200, incidentally, again is derived from computer generated data and it's predicated on a maximum bulk injected volume of 700 Mcf a day into a formation of .01 millidarcy.

Now we have a range of permeabilities from .01 to .05 in our wells and also, as I stated earlier, we feel that as we achieve missibility, the permeability to gas will be increased.

Q Is the computer study that you talked about contained in Exhibit Number Three? Is that the report from --

A No, that isn't. That's merely our core analysis work done by Terra Tech.

The computer study I have copies of here and if you wish, we can admit them as evidence.

Q I'm not certain what I'd do with them if you gave them to me.

MR. HALL: Would you like us to make copies for you?

MR. STAMETS: I, really I don't. I would like just perhaps a summary of how the tests were done and who did them and the results. Something to

show that the 5200 pounds will not cause fracture pressure to be exceeded.

Q Is it possible that -- that as a result of this test you might want to continue injection into this well?

A Certainly. If it's successful, we would plan to drill an offset or several offsets on, initially on 160-acre spacing and then convert this -- this well into solely an injector.

Q And would something have to be done about this cement at that time?

A Well, if we found, if there was an evidence that the cement was not holding up, then we would have to go and probably drill another offset for an injector.

Q How would you make that determination?

A Because there would be no way we could do remedial work on it.

Q How would you be able to determine that, by running cement bond logs?

A Tracer, tracer logs, radioactive tracer.

Q Okay.

A Now, we have done extensive production testing on each zone in this well and with radioactive tracers and there is no evidence of any vertical fracturing or any microannulus throughout the producing zone.

These were run by Bell Petroleum Service out of Hobbs, New Mexico.

Q Okay.

MR. STAMETS: Are there other questions of this witness? He may be excused.

MR. HALL: We'd call at this time Mr. Robert McKinney.

MR. STAMETS: Excuse me, I'd like to ask one more question before we hear from Mr. McKinney.

Normally we require that injection wells have the casing tubing annulus loaded with an inhibitive fluid and a gauge put on the surface.

MR. GAWRAN: Uh-huh.

MR. STAMETS: Is that your intention in this case?

MR. GAWRAN: We will load the annulus, yes.

MR. STAMETS: Okay, so you will be able to determine if there is a leak --

MR. GAWRAN: Yes.

MR. STAMETS: Okay, thank you.

MR. GAWRAN: We propose to set a packer at 6150 and load the annulus.

MR. STAMETS: You may proceed, Mr. Hall.

ROBERT McKINNEY,

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

DIRECT EXAMINATION

BY MR. HALL:

Q For the record please state your name.

A Robert G. McKinney.

Q And have you previously been sworn in this case?

A Yes.

Q Please tell the Examiner my whom you are employed and summarize your background and educational experience.

A I'm employed by Trans-Pecos Resources of Houston as President of that company and my background, I have a Bachelor's degree from Massachusetts Institute of Technology in geology and engineering; Master's degree from the University of Texas in petroleum geology.

I have twenty-five years experience in oil and gas exploration and production with Gulf Oil Corporation and Coastal Oil and Gas; now with Trans-Pecos.

MR. HALL: Mr. Examiner, are the witness' qualifications acceptable?

MR. STAMETS: They are.

Q Mr. McKinney, are you familiar with the subject application?

A I am.

Q And are you familiar with the geology of the subject lands?

A Yes, I am.

Q Mr. McKinney, is there any indication of open faulting or any hydrologic interconnection within the injection, any drainage radius of the subject well?

A No. We've done fairly extensive seismic work in the area and determined that there's no major faulting within at least a mile and a half of the subject well, the proposed injection well.

We've done surface geology to the extent that we are able to determine that there is no -- there is no leakage of normally occurring fluids to the surface, nor is there any indication of any brecciation of the surface rocks nearby which might -- might cause leakage.

Q Mr. McKinney, is it your position that the granting of this application would result in the prevention of waste and recovery of additional hydrocarbons?

A Yes. I don't feel that there's any other way that those hydrocarbons can be recovered other than through a technique analogous to this.

MR. HALL: That concludes my direct of this witness.

MR. STAMETS: Are there any questions of Mr. McKinney? I'm not sure that my question is for Mr. McKinney. I was just going through the list of

things that are supposed to be with the application and I don't see a chemical analysis of fresh waters.

Is there a fresh water well within one mile of the proposed injection well?

A No.

MR. STAMETS: Okay. What is the closest water well?

A At least --

MR. GAWRAN: I can't say with any certainty but there certainly isn't one within one mile.

MR. STAMETS: Although it isn't called for, I think it probably will be well when you have an opportunity to pick a sample of water and just send it in on this record.

MR. GAWRAN: From the nearest well?

MR. STAMETS: From the nearest well and give us that.

MR. GAWRAN: Okay.

MR. STAMETS: If there is nothing further, then, this witness may be excused.

Is there anything further in this case?

MR. HALL: Nothing further.

MR. STAMETS: The case will be taken under advisement.

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 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. 8246 heard by me on 7-16, 1984

Richard L. Stamets, Examiner
Oil Conservation Division