1	STATE OF NEW MEXICO
2	ENERGY, MINERALS AND NATURAL RESOURCE DEPARTMENT OIL CONSERVATION DIVISION
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4	IN THE MATTER OF:) APPLICATION OF GREENHILL PETROLEUM) CORPORATION FOR WATERFLOOD EXPANSION) CASE NO. 10154
5	CORPORATION FOR WATERFLOOD EXPANSION,) CASE NO. 10154 LEA COUNTY, NEW MEXICO)
6)
7	REPORTER'S TRANSCRIPT OF PROCEEDINGS
8	EXAMINER HEARING
9	BEFORE: DAVID R. CATANACH, Examiner
10	November 14, 1990 10:11 a.m.
11	Santa Fe, New Mexico
12	This matter came on for hearing before the Oil Conservation Division on November 14, 1990, at 10:11 a.m.
13	at the Oil Conservation Conference Room, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico,
14	before Susan G. Ptacek, a Certified Shorthand Reporter No. 124 and Notary Public in and for the County of Santa Fe,
15	State of New Mexico.
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22	FOR: OIL CONSERVATION BY: SUSAN G. PTACEK DIVISION Certified Shorthand Reporter
23	CSR No. 1224
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INDEX November 14, 1990 Examiner Hearing Case No. 10154 PAGE APPEARANCES **APPLICANT'S WITNESS:** RICHARD L. STAMETS Direct Examination by Mr. Carr Examination by Examiner Catanach **REPORTER'S CERTIFICATE** * * EXHIBITS Admtd APPLICANT'S EXHIBIT Form C108 Area map Blowup of unit area showing 18 proposed injection wells Well data sheets on proposed injection wells Well data sheets for plugged and abandoned wells 5A Summary of both well listings Remaining wells in area of review Basic injection parameters Geologic data Stimulation program Water analyses on two windmills Letters from Greenhill to offset interest owners

1				A P P E A R A N C E S
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3	FOR	THE	DIVISION:	ROBERT G. STOVALL, ESQ. General Counsel
4				Oil Conservation Division
5				State Land Office Building Santa Fe, New Mexico 87504
6	FOR	THE	APPLICANT:	CAMPBELL & BLACK, P.A.
7				Attorneys at Law BY: WILLIAM F. CARR, ESQ.
				110 North Guadalupe
8				Santa Fe, New Mexico 87501
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EXAMINER CATANACH: At this time we will call Case
10154.
MR. STOVALL: Application of Greenhill Petroleum
Corporation for waterflood expansion, Lea County, New
Mexico.
EXAMINER CATANACH: Are tehre appearances in this
case?
MR. CARR: May it please the examiner, my name is
William F. Carr with the law firm Campbell & Black, P.A. of
Santa Fe. We represent Greenhill Petroleum Corporation and
I have one witness.
EXAMINER CATANACH: Are there any other appearances in
this case?
Would the witness please stand to be sworn in?
RICHARD L. STAMETS,
the Witness herein, having been first duly sworn, was
examined and testified as follows:
DIRECT EXAMINATION
BY MR. CARR:
Q. Would you state your full name for the record
please?
A. My name is Richard L. Stamets.
Q. Mr. Stamets, where do you reside?
A. I live in Santa Fe.
Q. By whom are you employed and in what capacity?

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1	A. I'm an independent consultant working for
2	Greenhill Petroleum in this case.
3	Q. Have you previously testified before this
4	division and had your credentials as a geologist accepted
5	and made a matter of record?
6	A. Yes.
7	Q. Are you familiar with the application in this
8	case?
9	A. Yes.
10	Q. Are you familiar with the proposed expansion of
11	the Lovington San Andres waterflood project?
12	A. Yes.
13	Q. When were you employed by Greenhill in this
14	matter?
15	A. About October the 9th.
16	Q. Since that time could you briefly summarize what
17	you have done in preparation for this hearing?
18	A. At that time Greenhill had prepared a complete
19	application, and I have reviewed all of the material in
20	that application. I have made adjustments in it when I
21	have looked at every one of the well files in the area and
22	the area of review and corrected locations, setting depths,
23	casing, cement, so on and acquired some additional data,
24	reorganized it all and have it prepared today.
25	MR. CARR: Are the witness' qualification acceptable?

1	EXAMINER CATANACH: They are.
2	Q. (By Mr. Carr) Mr. Stamets, would you refer to
3	what has been marked for identification as Greenhill
4	Exhibit No. 1 and identify that for the examiner, please?
5	A. Exhibit No. 1 is just simply the first page of
6	form C108.
7	Q. Was form C108 with all required attachments
8	supplied to all operators in the area of review and to the
9	surface owners?
10	A. Yes. I believe it has been.
11	Q. Could you refer to what is marked as Exhibit
12	No. 2 and identify that please?
13	A. Exhibit No. 2 is an area map showing the
14	sections in question here today, and all of the leases and
15	wells within a two-mile radius.
16	Q. Mr. Stamets, let's go to Exhibit No. 3, which is
17	another map of the unit area, and I would ask you to review
18	the information on this exhibit for Mr. Catanach.
19	A. This is a blowup of the unit area on which I
20	have noted the 18 proposed new injection wells with red
21	circles, and the existing injection wells in green circles,
22	and I have drawn a half mile circle around the outermost
23	line of red wells to establish the area of review and that
24	is also shown on the exhibit.
25	Q. There is one well that has a circle that is half

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1	red and half green, what is that?
2	A. That's a well which is a proposed new injector
3	but apparently at some time it injected in the past.
4	Q. When was this waterflood project initially
5	approved by the division?
6	A. Oh, this was originally approved in mid-1962 by
7	Order No. R-2226.
8	Q. When did injection commence?
9	A. About March of 1963.
10	Q. Could you tell the examiner what volume has been
11	injected during the life of this project?
12	A. Through December of 1989 about 45 1/2 million
13	barrels of water.
14	Q. How much oil has been produced during this time?
15	A. Again, through December of '89 about 4.9 million
16	barrels of oil.
17	Q. When did Greenhill Petroleum Corporation take
18	over operations of this waterflood project?
19	A. According to records in the unit file it was
20	December 29 of 1988.
21	Q. Could you provide the examiner with just a
22	general estimate as to the planned expenses that are
23	associated with this proposed expansion and also the
24	additional recovery that Greenhill is anticipating?
25	A. Initially Greenhill proposes to convert these 18

producing wells to injection, and they will be drilling as 1 many as 30 infill wells. The total projected cost will be 2 3 something on the order of 15 to \$20 million, and they estimate additional recoverable oil at essentially what's 4 5 been produced so far, at about 5 million barrels. 6 Q. This application was originally filed for 7 administrative approval. What is your understanding as to 8 why the matter has been set for hearing? 9 This is an older waterflood project originally Α. 10 not approved under the new division rules and regulations. 11 Because of the extent and scope of it, the district office 12 asked that it be set for hearing and reviewed under modern 13 rules. 14 Let's go now to Greenhill Exhibit No. 4. Ο. 15 MR. STOVALL: Mr. Carr, may I ask you something, 16 before we leave Exhibit No. 3? I count 17 red dots on 17 Exhibit No. 3. 18 THE WITNESS: I have 18 on mine. Let me count them 19 17. Well, perhaps we will find the missing red dot again. 20 as we go through here. I have 18 on mine. Would you just 21 like to change exhibits with me? There were 18 on mine. 22 MR. STOVALL: Let me see where I am missing one then. 23 Now we've got 18 dots. 24 (By Mr. Carr) Are you ready to go to Exhibit ο. 25 No. 4 now?

A. Yes.

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2	Q. Let's take a look at Exhibit No. 4, and first if
3	you could identify this exhibit and then review the
4	information contained in the exhibit for the examiner.
5	Since this is the first of three similar exhibits, you
6	might explain how you put these exhibits together.
7	A. Exhibit No. 4 is the individual well data sheets
8	on the proposed injection wells. And if you will take a
9	look at the first sheet, they're all laid out basically the
10	same way, you have the operator name at the top, the lease
11	name, well number location, you have a tabular summary of
12	all the casing and cement in each of the holes, the tubing
13	size, the proposed injection interval, the packer setting
14	depth and each of the each of the 18 wells has the same
15	information on it.
16	Q. Now, Mr. Stamets some of these well data sheets
17	have multiple setting depths; is that correct?
18	A. Yes. I'm not sure let me see if I can see an
19	example real quickly here. As I went through these there
20	were a number of older wells. I don't see any immediately,
21	but as you go through the whole stack you will see some.
22	The older well, and I find maybe three or four setting
23	depths on an individual string of casing or three or four
24	versions of how it was cemented. Where I could figure out
25	which one was right, that's the one that was used. Where

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1	it was never clear, I've shown both sets of figures or all
2	three or whatever. Usually I don't think it makes any
3	significant difference, but it is in there.
4	Q. Representatives of Greenhill have met with the
5	supervisor of the Hobbs district office and have reviewed
6	this information with him, have they not?
7	A. Yes, they have. I encouraged them to meet with
8	Jerry Sexton before today's hearing to try and isolate
9	which wells in the area of review were problem wells.
10	Q. On each of the injection wells will the annular
11	space be filled with a fluid?
12	A. That's correct, an inhibited fluid.
13	Q. And has Greenhill agreed to a pressure testing
14	of the fluid in this annular space as required by the
15	Federal Underground Injection Control Program.
16	A. Yes.
17	Q. Are you aware of any special work that's going
18	to have to be performed on any of these injection wells?
19	A. Well, No. 57 has a set of perforations from 4397
20	to 4624, which will be squeezed before conversion to
21	injection.
22	Q. Let's move on now to Exhibit No. 5. I would ask
23	you to identify and review this for the examiner.
24	A. Exhibit No. 5 are the well data sheets in the
25	area of review for plugged and abandoned wells. I have

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1 noted on each of these in the upper right-hand corner, like 2 the very first one, a letter P if that well was identified as a problem well, either by myself or through the 3 discussions with the Hobbs district office. 4 I have 5 summaries of problem well listings, which I can furnish the examiner, both for the P&A wells and the other wells. 6 7 We didn't put this in the form of an exhibit, 8 but I do have it here if you would like to take a look at 9 it. Also I have the same information which came to me from 10 Greenhill from their visit with Jerry Sexton. Of course, that could be confirmed with Mr. Sexton directly. 11 If it would assist the examiner, I would be happy to supply you 12 with a set of these. 13 14 Ο. Mr. Stamets, the sheets that were provided by 15 Greenhill are obviously sheets that you did not prepare? 16 That is correct. Α. 17 Ο. The first two sheets are exhibits and 18 tabulations that you personally prepared from the well files. 19 20 That's correct. Α. 21 MR. CARR: I think it's appropriate, perhaps, to mark 22 this as an exhibit with the understanding that the second 23 page is not being sponsored as to the accuracy of any of 24 those entries. It's just simply a tabulation supplied by 25 Greenhill after the meeting with Mr. Sexton. If there is

no problem with that, I would like mark it and put it in 1 2 the record as Exhibit 5A. 3 EXAMINER CATANACH: Let's go ahead and do that. 4 THE WITNESS: While you're doing that, Mr. Carr, I 5 will call the examiner's attention to a few of these plugging reports in here on the P&A wells. That I actually 6 had to make a copy of the plugging report, because they 7 were rather confusing in some cases, and I think perhaps 8 impossible to draw a diagramic sketch. For example, the 9 10 Magnolia Petroleum State R, which is about the third or 11 fourth from the end, is one that didn't lend itself to 12 sketching. Same thing would be true with the well that has 13 number 117 at the top, the Amoco State E Tract 18. That 14 the examiner can see those as he goes through. 15 (By Mr. Carr) Those have been indicated as Q. problem wells? 16 17 Not all of them, no. Some of them are okay. Α. А 18 few of them are. And we have something on the order of 1, 2, 3, 4, 5, 6 problem wells within the P&A, and I 19 20 identified Magnolia as a possible problem well. These problem wells are going to have some 21 Ο. 22 additional work done on them prior to the commencement of 23 additional injection? 24 Yes. As I understand it many of them will Α. 25 simply have to have a plug set at the base of the fresh

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1	water zone.
2	Q. You propose that the details of any this
3	remedial work be worked out with Mr. Sexton in the Hobbs
4	district office?
5	A. Yes.
6	Q. Do you have anything further to present in
7	association with Exhibit No. 5?
8	A. No.
9	Q. Let's now go to Exhibit No. 6 and I ask you to
10	simply identify that for Mr. Catanach and explain what it
11	shows.
12	A. Exhibit No. 6 represents the remaining wells in
13	the area of review. Those that are temporarily abandoned,
14	or producing, or injectors or shut-ins or whatever. And,
15	again, if any of those have a problem, which was identified
16	in the meeting with Greenhill and Mr. Sexton, or if I found
17	as I went through them, I identified those as problem
18	wells.
19	Now, if you will look at the second page of
20	Exhibit 5A, that's the summary of the problem wells from
21	this listing, and you will see a number of those have an
22	asterisk on them, for example, No. 25. The number 25
23	refers to the number in the upper right-hand corner when
24	Greenhill originally filed this, they were in a different
25	order and all the wells were numbered. So I have kept that

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1 number. But this is the Greenhill Petroleum Corporation 2 Lovington Paddock Unit No. 18 well in 35-16-36. That's one 3 that when I've gone back and taken the top of the San 4 Andres and projected the height of the cement column on the 5 long string, it appears to me as though it is sufficiently 6 high in order for that well not to be a problem well. All of those which have an asterisk are in that condition. 7 Also, if you will look about two-thirds of the 8 9 way down the page you will find No. 165, which has been 10 crossed off. In meeting with representatives of Greenhill

11 this morning, they indicated that well has been surveyed 12 and falls outside the half mile area of review, even though 13 it does show inside on the map.

14 MR. STOVALL: Which number is that, Mr. Stamets? 15 THE WITNESS: If you look in the left-hand column, 16 it's the one numbered 165. It's the Lovington Paddock Unit 17 No. 71 well. At the bottom of that page is another one 18 that says "originally identified as a problem well." When 19 I looked at the file, I found a temperature survey 20 indicating the top of the cement at 3250. I believe that takes the well out of the problem well category. 21

Q. (By Mr. Carr) Mr. Stamets, again the details of
any remedial work that will be required will be worked out
in association with the Hobbs district office.

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That would be my recommendation, yes.

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1	Q. And Greenhill is willing to perform the
2	additional work prior to the commencement of additional
3	injection?
4	A. They certainly would work with Mr. Sexton.
5	Perhaps not all of the work has to be done before injection
6	begins, but whatever is appropriate.
7	Q. Do Exhibits 4, 5, and 6, when read together,
8	contain all the information on the wells within the areas
9	of review required by OCD form C108?
10	A. It's my belief that they do.
11	Q. Would you now go to what has been marked as
12	Exhibit No. 7, and referring to this exhibit, review the
13	basic injection parameters that will be employed by
14	Greenhill?
15	A. Yes. When Greenhill filed this application,
16	they indicated maximum injection pressure of 2000 psi and
17	1500 barrels of water per day. What they actually will be
18	proposing, what they actually intend to do, is begin
19	injection out there at or below the division's limit of
20	two-tenths of pound per foot of depth to the top of
21	perforations or the top of the open hole. As the pressure
22	comes up, if it comes up above that point, if they need to
23	inject higher pressures, then they would propose to take at
24	least some representative step-rate tests out there to get
25	the pressure somewhat higher.

1 I would note that the average injection pressure 2 recorded at the end of '89 was something on the order of 3 1900 pounds in this project. Most of the wells in June of 1990 were injecting at 1700 pounds. The pressures will be 4 5 declining on the older injection wells, and they will be 6 coming up on the newer ones so that eventually we will be injecting basically at the same pressure across the whole 7 8 project. What is the source of the water Greenhill will 9 Q. 10 actually be injecting in this project? There will be two sources of water. One will be 11 Α. 12 produced water return to the formation and the other will 13 be the Ogallala. 14 Ο. Do you have a water analysis on the Ogallala 15 water? 16 Α. The second page of this exhibit is the produced 17 water analysis. The third page is the water analyses from 18 the two water supply wells in the Ogallala. 19 What volumes does Greenhill propose to inject? Ο. 20 Up to 1500 barrels of water per day. Α. That's the maximum rate? 21 Q. 22 Α. Yes, per well. 23 Will this be an open or closed system? Q. 24 It will be closed. Α. 25 There is no anticipated problem with Q.

1	incompatibilities in the injected fluid?
2	A. No, these are the same waters that have been
3	used before.
4	Q. Would you now refer to Greenhill Exhibit No. 8
5	and review the geologic data on this particular formation?
6	A. Greenhill will be injecting into the San Andres
7	in this area. It's approximately 1350 feet of dolomite,
8	the upper 400 to 500 feet being productive. As a part of
9	Exhibit 8, the second page, is an injection profile which
10	shows which intervals in the San Andres are expected to
11	take the water.
12	The next page of that is from the unit agreement
13	file. The right-hand log shows that both the Grayburg or
14	the lower part of the Grayburg and the San Andres are
15	within the unitized interval and subject to injection at
16	least if the applications are revised.
17	Q. Would you now refer to Greenhill Exhibit No. 9
18	and review the proposed stimulation that Greenhill will be
19	using on the new injection wells?
20	A. Greenhill has provided a very detailed and
21	thorough stimulation program here. Basically what it
22	amounts to is they will clean each well out the total
23	depth, run tubing and packer with inhibited fluid. They
24	will test the casing and they will treat the intervals with
25	CO2 and acid.

1	Q. Are there fresh water zones in the area?
2	A. Yes, the Ogallala which is to a depth of about
3	200 feet.
4	Q. Are there fresh water wells in this area?
5	A. Yes, there are.
6	Q. Would you refer to Exhibit No. 10, identify that
7	that and review that for the examiner?
8	A. Exhibit No. 10 is our water analyses on two
9	windmills in the area and the locations are shown. One is
10	the southeast-northeast of 2-17-36, and the other one is
11	southeast-northeast of 35-16-36. And these samples were
12	these samples were taken August of '90.
13	Q. Mr. Stamets, are the logs of the proposed
14	injection wells on file with the OCD?
15	A. Yes, they are.
16	Q. Would you refer to Exhibit No. 11 and just
17	identify that, please?
18	A. These are copies of letters from Greenhill to
19	offset interest owners. Then there are copies of the
20	return receipts on several of those, and then there is also
21	the affidavits supplied by Campbell & Black.
22	MR. CARR: Mr. Examiner, at this time I would like to
23	point out that this Form C108 with all attachments has been
24	mailed to all of the operators in the area of review. It
25	has be provided to the surface owners. We have encountered

1 two problems, however, with the notice we have provided. 2 The one to surface owners did not go by certified mail, and 3 Tipperary was not included in the initial mail-out and they were not timely notified of this hearing. We have, as you 4 5 may be aware, received objections from both Penrock and Tipperary. I can advise that we are working with both of 6 them. We are meeting Penrock this week. The objection 7 8 that you received from Tipperary was mailed by someone with 9 the company, a consultant we understand, who monitors OCD 10 activity and was not aware of the meetings that we have had 11 with Tipperary and the OCD Hobbs office concerning their 12 wells.

13 The bottom line is we believe that we have --14 make peace with both Penrock and Tipperary in the next four 15 few weeks, and we request -- we are going to request the 16 case be continued to the December 12th hearing. This will enable us to send certified to each of the owners further 17 18 notice so that we're certain that the notice requirements 19 have been complied with and also provide us with a four-week week period of time to resolve differences with 20 21 Tipperary and Penrock. We believe four weeks from today we 22 will be able to come in and inform the proper notice has 23 been given and satisfy you that we no longer have 24 objections from either of those parties. That's where he 25 stand on the notice matter.

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1 MR. STOVALL: Mr. Carr, we rescheduled the December 2 hearing, since there is only one, to the 19th. MR. CARR: That won't be a problem. But where we 3 4 stand, although everyone has received the information, we 5 do have a glitch in the technical compliance with the rule. We prefer to have the order after we have done that, to 6 assure that once we get going we don't have anything slip 7 8 on us at a later date. 9 0. (By Mr. Carr) Mr. Stamets, in your opinion will 10 granting this application be in the best interest of conservation, the prevention of waste and the protection of 11 12 correlative rights? 13 Α. Yes. 14 Were Exhibits 1 through 11 either prepared by Ο. 15 you or compiled under your direction? 16 Α. They were or I have examined them to confirm 17 their accuracy. 18 MR. CARR: At this time, Mr. Catanach, we would move 19 the admission of Greenhill Exhibits 1 through 11. 20 EXAMINER CATANACH: Exhibits 1 through 11 will be admitted as evidence. 21 22 (Applicant's Exhibits 1 through 11 were admitted in evidence.) 23 24 MR. CARR: That concludes my direct examination of Mr. 25 Stamets.

1	EXAMINATION
2	BY EXAMINER CATANACH:
3	Q. Mr. Stamets, on your Exhibit 5A, you show six
4	wells that Greenhill agrees have to be reentered and
5	replugged in some type of manner?
6	A. These are wells which were on the list supplied
7	to me by Greenhill and Mr. Sexton, yes, and so I believe
8	that they are in agreement they do need to be fixed.
9	Q. The Magnolia State R No. 3, that has to be
10	looked at to determine whether that has be reentered or
11	not?
12	A. Yes, I think that deserves a little bit more of
13	a look. Let me see if I can tell you exactly why I think
14	that at this point. Yes, I see I have written myself a
15	note here as to whether or not this well is actually inside
16	the area of review. I think there is some problem with the
17	footage location. I see on the plugging report that well
18	is shown to be in the southeast quarter of Section 2 and
19	there is no there is nothing in the file that would tell
20	me exactly where that well was located. So if the well
21	winds up inside the area of review, it will have to be
22	fixed. If it is outside, then it probably does not need to
23	be fixed.
24	Q. The second page of Exhibit 5A you've got a list
25	of wells, which I assume the reason these wells were

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included in this list is that the cement top on the casing
 string did not come above the San Andres formation.

3 Α. Yes, or it did not come up 200 feet. I believe 4 that was the figure that I understood Mr. Sexton was using. 5 That it didn't provide that degree of coverage, and perhaps when he did this, he was just picking an arbitrary 4500 6 7 feet or something like that. I went through and I took the top of the San Andres off the Roswell Geological Society 8 9 Guidebook topographic -- not topographic -- stratigraphic 10 plat of the pool, and applied that against a couple of 11 figures that I had for surface elevations to come up with 12 those that I have identified with an asterisk that may have 13 enough cement.

14 Also I contacted Mr. Sexton, and I asked him --15 you know, they do surveys of these wells about every year, 16 and I've asked him if at any time during those surveys they 17 found any water flows, and he -- not these specific wells, 18 but in general, and he indicated that they had not. Also 19 as I went through the files, I found hardly any wells with 20 any problems with collapsed casing or casing leaks, and 21 again that leads me to believe that there is probably 22 sufficient cement on most of these wells. Of course, that 23 was true even of the ones I couldn't find the top came up 24 high enough.

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EXAMINER CATANACH: I believe those are all the

1	questions we have of the witness at this point.
2	What would I like to do, Mr. Carr, is we will go
3	ahead and continue the case to the 19th. I would like to
4	get a rough draft order from Greenhill if I could on this.
5	You do intend to show up at the 19th hearing?
6	MR. CARR: I will be here. We will appear on the 19th
7	and submit an additional affidavit concerning notice, and
8	we will be able to advise the division at that time of the
9	status of our negotiations with Penrock and Tipperary.
10	EXAMINER CATANACH: So they will have the opportunity
11	to come in on th 19th hearing and object if they so desire.
12	MR. CARR: That's correct.
13	EXAMINER CATANACH: We will continue Case 10154 to the
14	December 19th hearing.
15	(Whereupon, the hearing was concluded.)
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1	STATE OF NEW MEXICO)
2) ss. County of Santa FE)
3	REPORTER'S CERTIFICATE
4	
5	I, Susan G. Ptacek, a Certified Shorthand Reporter and
6	Notary Public, do HEREBY CERTIFY that I stenographically
7	reported the proceedings before the Oil Conservation
8	Division, and that the foregoing is a true, complete and
9	accurate transcript of the proceedings of said hearing as
10	appears from my stenographic notes so taken and transcribed
11	under my personal supervision.
12	I FURTHER CERTIFY that I am not related to nor
13	employed by any of the parties hereto, and have no interest
14	in the outcome thereof.
15	DATED at Santa Fe, New Mexico, this 10th day of
16	December, 1990.
17	Quan A Plack
18	My Commission Expires: Certified Shorthand Reporter
19	December 10, 1993 Notary Public
20	
21	I do hereby certify that the foregoing is
22	a complete record of the proceedings in
23	the Examiner hearing of Case No heard by me on19
24	, Examiner
25	Oil Conservation Division