	STATE OF NEW MEXICO
	ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
	OIL CONSERVATION DIVISION
IN T CALL DIVI	HE MATTER OF THE HEARING) ED BY THE OIL CONSERVATION) SION FOR THE PURPOSE OF)
LONS) CASE NO. 10249 & 10250
OIL	COMPANY (USA))
	REPORTER'S TRANSCRIPT OF PROCEEDINGS
	EXAMINER HEARING
BEFO	RE: JIM MORROW, Hearing Examiner
Marc	h 7, 1991
	Santa Fe, New Mexico
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2		APPEARANCES
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4	FOR THE DIVISION:	ROBERT G. STOVALL, ESQ. General Counsel
5		Oil Conservation Commission State Land Office Building
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8	FOR THE APPLICANT:	117 N. Guadalupe Santa Fe, New Mexico
9		BY: W. THOMAS KELLAHIN, ESQ.
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HEARING EXAMINER: Call case 10249. 1 MR. STOVALL: Application of Pacific Enterprises Oil 2 3 Company (USA) for a non-standard gas proration unit and an unorthodox gas well location, Eddy County, New Mexico. 4 HEARING EXAMINER: Call for appearances. 5 MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the 6 7 Santa Fe law firm of Kellahin, Kellahin & Aubrey, appearing 8 on behalf of the applicant, and I have three witnesses to be 9 sworn. 10 Witnesses will please be sworn. HEARING EXAMINER: 11 (Witnesses sworn.) 12 HEARING EXAMINER: Go ahead, Mr. Kellahin. 13 MR. KELLAHIN: Thank you, Mr. Examiner. Have we called 14 both cases? 15 **HEARING EXAMINER:** No. 16 MR. KELLAHIN: We would ask at this time, Mr. Examiner, 17 that you also call case number 10250, and that these matters 18 be consolidated for hearing purposes. 19 HEARING EXAMINER: Call case 10250. 20 MR. STOVALL: Application of Pacific Enterprises Oil 21 Company (USA) for the rescission of special pool rules and 22 for two non-standard 640-acre gas proration units or, in the 23 alternative, to amend Division Order No. R-2917, as amended, 24 Eddy County, New Mexico. 25 HEARING EXAMINER: Use the same witnesses in both

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1	cases?
2	MR. KELLAHIN: Same appearances and same witnesses, Mr.
3	Examiner.
4	HEARING EXAMINER: We'll consolidate those two cases
5	for the purposes of the hearing today.
6	MR. KELLAHIN: Thank you. By way of introduction of
7	this topic, Mr. Examiner, I'd like to direct your attention
8	to the last exhibit in the package. It's Exhibit Number 15;
9	it's called the land data map.
10	HEARING EXAMINER: Yes, sir.
11	MR. KELLAHIN: We're dealing with the McMillan-Morrow
12	Gas Pool in Eddy County, New Mexico. And the current
13	outline of that pool is shown in the hashed lines around the
14	outsides of Sections 7, 13, 18, 19 and 24. This pool is
15	spaced on 640 acres. There is a prior division order that
16	froze the special pool rules to areas contained within this
17	boundary, and so the acreage adjacent to but outside this
18	boundary is not subject to the 640 spacing rules either for
19	acreage dedication or well locations.
20	We are asking you, in what started off to be a
21	shopping list of requests in the combined cases, multiple
22	alternative solutions because we were not sure then, as we
23	are now, whether or not there would be any parties that
24	cared how we handled future development and spacing for the
25	pool. There are now only two producers on 640 gas spacing.

It's the producing gas well in 19. There's a producing gas
 well in Section 13. None of the other wells within the pool
 currently produce gas out of the McMillan-Morrow.

Pacific desires to develop the next well in the 4 south half of 18. Our first preference is to change the 5 McMillan-Morrow pool rules back to 320 gas spacing statewide 6 locations, and to grandfather Sections 13 and 19 as 7 8 exceptions, to leave them on 640 spacing, and leave it up to the operator of those two wells to decide at what point he 9 wants those spacing units to revert. That will allow us the 10 11 opportunity to go ahead and develop the rest of the acreage within the pool on 320 gas spacing, and our technical 12 presentation, we hope, will persuade you that that is 13 14 appropriate.

15 That's our first choice. All the rest of the 16 choices shown in the combination of cases were alternative 17 remedies, none of which is nearly as attractive as simply 18 taking the pool back to statewide rules, grandfathering out 19 the two spacing units now that have producing gas wells and 20 freeing up the balance of the acreage to be treated under 21 statewide rules.

I have three witnesses to present to you. Mr.
Paul Lerwick is a petroleum engineer.

HEARING EXAMINER: Before you present those witnesses,
I'll ask you, was there any response from the operators of

the tracts in those two sections you mentioned as to what $f(u) \in S$ 1 their reaction would be to your request that the field (route 2 be rescinded? 3 MR. KELLAHIN: Yes, sir. In Section 19 Pacific is the 4 operator of that well. They have other interest owners. We 5 specifically notified Lario Oil and Gas Company shown on 6 7 that tract. We have had no objection and no response from anyone, including Yates, or any other interest owner for 8 9 whom we've provided notice. So the response has been none, so we're --10 11 HEARING EXAMINER: Was your notice such that they would 12 understand that these two sections would be left out of the 13 request? 14 MR. KELLAHIN: Yes, sir. We sent them not only my 15 cover letter of notice, but the actual applications 16 themselves in which we detailed the requests of what we were 17 seeking to do. 18 HEARING EXAMINER: Go ahead. 19 MR. KELLAHIN: My first witness is Mr. Lerwick. The 20 second witness is Dave Cromwell; he's a geologist. And, 21 finally, Mr. Craig Clark is a landman, talk about the 22 parties that we've notified to make sure we haven't missed 23 anyone. 24 PAUL LERWICK 25 the Witness herein, having been first duly sworn, was

1	examined and testified as follows:
2	DIRECT EXAMINATION
3	BY MR. KELLAHIN:
4	Q. Mr. Lerwick, for the record, would you please
5	state your name and occupation?
6	A. My name is Paul Lerwick, and I'm employed as a
7	reservoir engineer for Pacific Enterprises Oil Company.
8	Q. Mr. Lerwick, on prior occasions have you
9	testified before the division as a petroleum engineer?
10	A. I have.
11	Q. And pursuant to your employment by Pacific, have
12	you made a study of the area drained by the existing wells
13	in the McMillan-Morrow pool?
14	A. I have.
15	MR. KELLAHIN: We tender Mr. Lerwick as an expert
16	petroleum engineer.
17	HEARING EXAMINER: He's accepted as an expert.
18	Q. (By Mr. Kellahin) Let me direct your attention,
19	sir, to what is marked as the drainage area map. It's your
20	first Exhibit Number 1. Would you unfold that in front of
21	you?
22	A. (Witness responds.)
23	Q. Describe to the Examiner, Mr. Lerwick, the area
24	shown by the outline in yellow on the display.
25	A. This area is, again, the area that's designated

1	as the McMillan Field, Morrow production area. It's the
2	same area that was identified early, hatched on a land map.
3	Q. The McMillan-Morrow pool has been developed on
4	what kind type of spacing pattern, Mr. Lerwick?
5	A. 640 acres.
6	Q. Identify for us the wells that are still
7	classified as producing gas wells with production from the
8	McMillan-Morrow pool.
9	A. Those are the wells in Section 13 and Section 19.
10	Q. Have you tabulated information available to you
11	from which you could make calculations to show what area had
12	been actually drained and produced by those wells?
13	A. I have.
14	Q. What is the significance of the red dot on the
15	display?
16	A. The red dot is the proposed location in the south
17	half of Section 18 that we desire to drill.
18	Q. What's the purpose of the circles shown on the
19	display, contained with the yellow area?
20	A. The purpose is to show that the existing wells
21	are not effectively and efficiently draining 640 acres.
22	Q. Show us where the McMillan-Morrow pool is in
23	relation to other Morrow pools that have been established by
24	the division.
25	A. To the southeast of the McMillan-Morrow pool, the

1	closest Morrow production is the Avalon Field. And you will
2	see a number of gas symbols on the map.
3	Q. What's the spacing pattern utilized for the
4	Avalon Field?
5	A. 320 acres.
6	Q. When you look at any other areas shown on your
7	display, are there any other gas pools produced out of the
8	Morrow formation?
9	A. Not on this display.
10	Q. Where are we in relation to other pools in Eddy
11	County, New Mexico? Where is the McMillan pool in relation
12	to some community, town or
13	A. Well, it would be north and west of Carlsbad and
14	if I remember correctly, and it's primarily would be
15	north and west of the majority of Morrow production in Eddy
16	County in this particular area.
17	Q. Based upon your engineering studies, Mr. Lerwick,
18	have you reached conclusions about the appropriate spacing
19	pattern to continue to apply for wells to be drilled in this
20	pool?
21	A. I have.
22	Q. And what is your conclusion?
23	A. My conclusion is that the statewide 320-acre
24	spacing is the most effective and efficient spacing for
25	Morrow production.

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What is your recommendation to the Examiner 1 Q. concerning how he should handle or how the division should 2 handle the spacing units currently dedicated to the two 3 producing gas wells? 4 5 My recommendation would be to grandfather those Α. two 640-acre spacing units, and -- at 640 acres, and leave 6 7 it up to the operators of those wells whether they would pursue smaller spacing back to 320 in the future. 8 9 Do you see any potential for the violation of Q. 10 correlative rights if the Examiner adopts your 11 recommendations and conclusions? I don't. 12 Α. 13 If the rules are changed to allow 320 gas spacing Q. 14 for further development in the pool, what will that allow 15 your company to accomplish? 16 A. It will allow us to develop and produce 17 commercial quantities of gas that would otherwise not be 18 able to be developed and produced. 19 0. Where is the next prospect location for your 20 company within the outline of the pool? 21 A. Are you speaking --22 Where do you want to drill? Q. We'd like to drill the location as indicated by 23 Α. the bright pink dot in the south half of 18. 24 And that would be a location within a section 25 Q.

1	that has already had a producing gas well on it?
2	A. That's correct.
3	Q. Why would you do that?
4	A. Because the current wells, in my estimation, and
5	according to my calculations, are not effectively and
6	efficiently draining the areas assigned to the 640 acres.
7	Q. Let's go to your calculation. Is that shown in
8	part on Exhibit Number 2?
9	A. Yes, that's in the upper part of the Exhibit
10	Number 2.
11	Q. What's the caption on Exhibit Number 2?
12	A. It's entitled "Morrow Volumetric Worksheet," and
13	that upper part is the McMillan Field Morrow wells.
14	Q. Let me ask you to go from right to left and look
15	at the third column over from the right that's captioned
16	"Estimated Ultimate Recovery."
17	A. Yes, sir.
18	Q. And as we go down on each line of that column,
19	what does that represent?
20	A. That represents the ultimate recovery from each
21	of the five wells existing in the McMillan-Morrow Field.
22	Q. If we're looking at Exhibit 1 as the display map,
23	how will we find the well location for each well shown on
24	Exhibit Number 2?
25	A. If you look to the far left-hand column entitled

1	Well Location, you will note that there are some there's
2	a location with the section first, the particular location
3	in the section designated with an alphabetic letter
4	following that, and then the township and range following
5	that.
6	Q. How did you derive the estimated ultimate
7	recovery for each of those wells that you've shown in the
8	column on the display that shows the estimated ultimate
9	recovery?
10	A. From decline curve.
11	Q. Have you attached decline curves to the package
12	of exhibits?
13	A. I have.
14	Q. And how are those shown?
15	A. Those are shown as Exhibits 3 through 7. And you
16	will have an actual decline curve on each of these wells.
17	I'd like to bring to your attention that three of these
18	wells have already been plugged and abandoned, so that the
19	ultimate recovery is certainly established. The remaining
20	two wells the well in Section 19 is producing roughly 50
21	MCFD, which is very near its economic limit. It's operated
22	by Pacific Enterprises at this time. We recently purchased
23	the operating working interest in that well, and it's near
24	the economic limit. The well in Section 13 has been
25	producing at less than 50 MCFD for the past several years

and is certainly a marginally economic well. 1 To what degree of accuracy then do you find your 2 Q. estimates of ultimate recovery for each of these five wells? 3 They're very accurate. The wells have all Α. produced in excess of 95 percent what they'll ever produce 5 from the Morrow. 6 7 Q. Having established ultimate recovery using the decline curves, what then did you do as an engineer to 8 determine the area that had been drained by each of these 9 wells? 10 11 Using the ultimate recovery for each well, I used A. 12 standard engineering procedures of using the net perforated, 13 or in some cases open-hole Morrow sand pays, having 14 established the net pay and using a porosity cutoff and a 15 water saturation cutoff, I backed into an area of drainage that would be consistent with the ultimate recovery that 16 17 we've established through the decline curve on these wells. 18 0. When you looked at the possible area of ultimate 19 drainage for the well in 13 as compared to 18, did you make 20 any adjustment in the area in which those two wells are 21 competing? 22 I did. Α. 23 And how did you make that adjustment? 0. 24 That adjustment was made based on the performance Α. of the individual wells. 25

1	Q. In establishing the circles then for Exhibit
2	Number 1, you have established an area of no-flow boundary
3	between those two wells?
4	A. That's correct.
5	Q. And then adjusted the drainage area to
6	accommodate the area required to hold the ultimate reserves
7	to be recovered by each of those wells?
8	A. That is correct.
9	Q. Show us in the tabulation the column that
10	demonstrates the area depleted by each of the wells.
11	A. That would be the second column from the left.
12	Q. Second column from the right?
13	A. Excuse me, second column from the right.
14	Q. What does it show you?
15	A. And it shows you the area that would be drained
16	to recover the reserves that we know each well will recover,
17	based on the net feet of pay that was calculated for each of
18	those wells.
19	Q. Based upon that analysis, do you find any support
20	for continuing 640 spacing within the interior boundaries of
21	the McMillan-Morrow pool?
22	A. I do not.
23	Q. Go on the bottom half of the display and identify
24	and describe the purposes of that information.
25	A. The bottom half of the display is the same

1	
1	tabulation and represents the same engineering work as the
2	top half for the Avalon Field Morrow wells that are
3	identified on this exhibit. What it demonstrates, I think
4	very positively, that even wells that were drilled on
5	320-acre spacing in this part of the Avalon Morrow field are
6	not competing with each other for reserves even on statewide
7	320-acre spacing.
8	Q. What are the points of comparison between the
9	McMillan pool and the Avalon pool?
10	A. They're both completed in Morrow sands, a very
11	similar type of depositional environment, which I'm sure
12	Dave will address, and represent similar producing
13	intervals.
14	Q. Let's go to the final two small displays in your
15	package. I think they're described as Exhibits 8 and 9.
16	A. That's right.
17	Q. Do you have those?
18	A. Yes.
19	Q. Let's turn first to Exhibit 8.
20	Ignore the caption, Mr. Examiner. The caption is
21	wrong. It says the Northwest Spring Prospect. It is not
22	properly identified.
23	The rest of the information is correct, is it
24	not?
25	A. That's correct.

1	Q. Tell us what you're showing.
2	A. What I'm showing is the pressure data of the five
3	wells in the McMillan-Morrow pool. We had for the wells
4	that had significant amount of production, we have the
5	pressure data that's required to be reported to the state on
6	an annual basis. And what I'm attempting to show here is
7	whether or not these wells that were drilled to 640-acre
8	spacing were in communication with one another, which would
9	help establish whether or not they were draining large
10	areas.
11	What the conclusions that I can draw from these
12	curves follow, if you'll note the two curves, one being
13	curve let's see 13H, which is the one with the squares,
14	and the other curve being 18F, which is the one with the
15	diamonds and, again, these on your map would represent
16	the wells in Section 13 and 18 are the only two wells
1 7	that indicated that they may be in communication with one
18	another. They're essentially effectively drilled. Although
19	they're on 640 acre spacing, if you note the location of the
20	wells, they're effectively on 320 acres or less. And those
21	two wells, I think there's some evidence, looking at the
22	pressure data, that they may be in communication. Those are
23	also the two wells that with our volumetric drainage
24	calculations indicated that there may be some overlap in
25	drainage.

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1 HEARING EXAMINER: Looking at this exhibit, you can see communication. Is that what you said? 2 Yes. If you note those two curves, they 3 THE WITNESS: at least tend to track each other. It isn't a positive 4 indication of communication, but it's certainly an 5 indication that there may have been. Some may have been 6 7 draining the same pool. 8 Q. (By Mr. Kellahin) And those wells are on 9 effective 320 gas spacing? Yes. I think just a cursory look at the map 10 A. 11 would show that. 12 When we make the comparison of the well in 19F on Q. 13 your pressure display and compare that to the pressure 14 information from the other wells, what conclusion do you 15 draw? You have to conclude that that well wasn't being 16 Α. 17 drained by any other wells at the time it was drilled. If 18 you -- it's shown with the rectangles, and you note that the 19 original pressure on that well was actually as high or 20 higher than any of the other wells drilled, indicating that 21 by the time it was drilled and put on production it was 22 draining an undrained reservoir. 23 The information shows pressure depletion Q. 24 occurring in the reservoir with the other three wells, when 25 this one comes on, its initial pressure is higher than the

1	depleted pressure in the reservoir
2	A. Yes.
3	Q Established by the first three wells?
4	A. Yes.
5	Q. And if you look where the well 19F is in relation
6	to the other wells, that is on more conventional 640 gas
7	spacing.
8	A. That's correct.
9	Q. If you're going to draw a comparison, for
10	example, in the Section 19 well versus the Section 18 well.
11	A. Right. The spacing would be it's much farther
12	away than, say, the well in Section 13 is from the well in
13	Section 18.
14	Q. In summary then, what's your conclusion about the
15	pressure information?
16	A. The pressure information supports our case that
17	on 320-acre spacing probably is efficient, effective in
18	draining the Morrow, but 640 is not, that the wells don't
19	appear to drain an area that would be anywhere approaching
20	that large of an area and neither does any pressure data
21	support that there's been any communication over larger
22	areas.
23	Q. By comparison, do you have the pressure
24	information from the Avalon pool to show the Examiner?
25	A. Yes, I do, and it's shown as Exhibit Number 9.

Q. Summarize for us your conclusions about the
 pressure information in Avalon.

3	A. In this part of the Avalon Field pool that's
4	shown on the map here, I think looking at the three wells
5	that we had pressure data on, with their appreciates that
6	were reported versus time, that none of the three curves
7	tend to track each other at all, which would indicate that
8	they're draining separate sand lenses or sand bodies and are
9	not in pressure communication, which is also supported by
10	the volumetric drainage calculation.
11	Q. In terms of well spacing for the Avalon as
12	compared to the McMillan, what conclusion do you reach?
13	A. I reach that the conclusion that the spacing
14	in Avalon, which is on 320 acres, is not drilled too
15	closely, but 320 is certainly a reasonable spacing, and that
16	McMillan Field, to effectively produce Morrow reserves, the
17	320 acreage spacing would be a more efficient and effective
18	spacing as well.
19	MR. KELLAHIN: That concludes my direct examination of
20	Mr. Lerwick. We would move the introduction of his Exhibits
21	1 through 9.
22	HEARING EXAMINER: Exhibits 1 through 9 are admitted.
23	In Section 18 where you propose to drill a well,
24	what would prevent you from assigning the 640 to that well
25	at this time?

1 THE WITNESS: The location that we've chosen is consistent with 320-acre spacing, which puts it almost 2 equally spaced between the well in Section 18 and 19. If we 3 were to drill another well on 640 acre spacing, it would --4 5 the standard distance from lease lines would push the location to an undesirable from the standpoint of location 6 between other wells and from drainage, or else we'd have to 7 go to a rule non-standard type location. 8 9 HEARING EXAMINER: The 640 would be available to assign 10 to it now if you wanted to; is that correct or not? 11 THE WITNESS: Yes. We would -- on 320 acre spacing, we 12 would have the opportunity, if indeed our case for smaller 13 than 640 acre drainage, if the well turned out good, if we 14 get the 320 acre spacing, we would have an opportunity to 15 drill a well, let's say, in the north half of 18, maybe 1980 16 from the east end as opposed to the west end, if we felt 17 subsequent to the proposed well that there were still 18 reserves up there that were not effectively and efficiently 19 being drained. We wouldn't have that opportunity under a 20 640. 21 HEARING EXAMINER: Why do you propose this well at a 22 non-standard location? 23 THE WITNESS: It is a standard location for the 320 24 that we're asking for. It would be a non-standard if we had 25 to maintain a 640-acre spacing.

Then it would be standard on --1 HEARING EXAMINER: 2 THE WITNESS: Yes, 1980 from the west and 660 from the south. 3 HEARING EXAMINER: The witness may be excused. 4 MR. KELLAHIN: Mr. Examiner, for your reference, there 5 are two division orders of importance to the McMillan pool. 6 7 One is the order R-2917 which established 640 spacing in 8 June of '65. The 2917 was changed by order R-5829 entered October 6th of 1978 in which the limits of the pool rules 9 10 were established to be the interior boundaries of that pool, 11 and it deleted the one-mile provisions. 12 I'd like to call Mr. Dave Cromwell at this time. 13 DAVE CROMWELL 14 the Witness herein, having been first duly sworn, was 15 examined and testified as follows: 16 DIRECT EXAMINATION 17 BY MR. KELLAHIN: 18 Mr. Cromwell, would you please state your name Q. 19 and occupation? 20 Dave Cromwell, consulting geologist for Pacific A. 21 Enterprises. Mr. Cromwell, have you testified on prior 22 Q. 23 occasions before the division? 24 Yes, sir. A. 25 Pursuant to your employment as a geologic Q.

1	consultant to Pacific, have you made a geologic study of the
2	McMillan-Morrow gas pool in Eddy County, New Mexico?
3	A. Yes, sir.
4	Q. Based upon that study, were you able to reach
5	certain conclusions about the geology of that pool?
6	A. Yes, sir. I prepared several exhibits which I
7	had planned to show the commission to delineate the sand
8	bodies within that, and also have three cross-sections which
9	will illustrate the wells that are producing in the field
10	and some of the adjacent wells to that field.
11	Q. What are your ultimate geologic conclusions with
12	regards to future well spacing in the pool?
13	A. It is my opinion that the field could adequately
14	be developed on 320-acre spacing based on the lenticular
15	nature of sand distribution within the field area.
16	Q. Do you see any reason to treat the
17	McMillan-Morrow pool differently than we do Morrow
18	production on a statewide basis?
19	A. No. My experience has been that the 320 acres is
20	an adequate development procedure for the Morrow sand
21	throughout most of Eddy and Lea county.
22	Q. Let me direct your attention, sir, to the
23	structure map. Is this the structure map that you prepared?
24	A. Yes, sir, it is.
25	Q. In addition, you have also prepared an isopach

and the three cross-sections? 1 2 A. Yes, sir, I have. MR. KELLAHIN: At this time, Mr. Examiner, I tender Mr. 3 Cromwell as an expert petroleum geologist. 4 HEARING EXAMINER: We'll accept his gualifications. 5 Q. (By Mr. Kellahin) Let me have you identify the 6 structure map for us, Mr. Cromwell. 7 8 A. This structure map is a map that I made on the 9 top of the "A" --10 HEARING EXAMINER: Have we got one of those? 11 MR. KELLAHIN: Yes, sir. 12 THE WITNESS: This should be Exhibit Number 10, sir. 13 HEARING EXAMINER: Go ahead. I have outlined the five-section Morrow --14 A. 15 McMillan-Morrow Field for your reference there in the pink 16 outline. And then I have also delineated the three 17 cross-sections that I have prepared for the exhibit as well 18 on this cross-section. And once again, the pink dot is the 19 location 1980-660 from the south of Section 18, which is the 20 proposed location that we would plan to drill our initial 21 test. 22 This structure map is a structure map, as I said, 23 on the "A" Middle Morrow sand, which is the sand that's developed in the Morrow clastic interval which the 24 25 cross-sections will depict when I show them, that shows that

we've got homoclinal dip to the southeast. 1 (By Mr. Kellahin) What conclusions, as a 2 Q. geologist, can you reach about the relationship of the 3 geology to the boundaries of the pool? Is there any logic Δ to the fact that development hasn't continued to occur to 5 the south and east in the pool? 6 Yes, sir. What I've found geologically is that 7 A. there are a couple of wells, namely in Section 17 and 20, 8 which have tested the Middle Morrow -- some of the sands in 9 10 the Middle Morrow, being salt water bearing. And then on 11 the northwestern limits of the field, I have found wells 12 that show that the sand is non-permeable in type. In 13 essence, what we're looking at here is a stratigraphic 14 entrapment in the Middle Morrow clastic interval. 15 Turn now to the isopach that you prepared, Q. 16 Exhibit Number 11. 17 A. Yes, sir. 18 Would you identify that display for us? Q. 19 This is an isopach map of the "A" Middle Morrow A. 20 sand in the McMillan Field. This is a clean sand 21 development, being with a gamma ray of less than 50 units

Q. Why have you selected the "A" Middle Morrow sand
on which to make your isopach?

API. Contour interval is on two feet.

25

A.

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This sand I've delineated out of a package of

about five or six sands that are within the Middle Morrow 1 2 clastic interval because I've got fairly good data that 3 support that -- the instance that the sand is wet downdip and tight updip. 4 What's your judgment about how the deposition of 5 Q. this isopach of the "A" Middle Morrow might compare to the 6 7 deposition of the other Morrow stringers? This illustration indicates that this sand is 8 A. 9 mostly a strike-oriented sand, that it is probably a shallow 10 marine origin, probably a sand bar/barrier bar sequence. 11 This sand is slightly different, as my cross-sections will 12 illustrate, in that the trend from the fluvial system of the 13 Morrow where the sands are coming in along the dip section, 14 in other words, downdip oriented 90 degrees to this one. 15 Without going through each of the cross-sections, Q. 16 let's perhaps pick the one that you find, in your own 17 judgment, is most illustrative of the fact of the 18 discontinuity, both vertically and horizontally, of the 19 Morrow pool in the McMillan-Morrow gas pool. Which one 20 would you select? 21 Well, we could take a look at Section Q-Q', which Ά. 22 is the Exhibit Number 12. 23 Q. All right, let's do that. What I've done on this cross-section is a 24 Α. five-well cross-section constructurally on the datum of 25

minus 7,000 feet to illustrate that the wells downdip, 1 namely the wells in Sections 20 and 17 are gas water or salt 2 3 water bearing, as delineated by the drill stem test. And I've noted the drill test stem data by the stretched Z configuration in the center column of the well bores, sir. 5 I'm looking at the well on the extreme right-hand side of 6 7 the cross-section right now. Here we have -- as the data is written on the 8 9 right hand of each log, you see that the drill stem test 10 interval from 10,308 to 60, recovered gas to surface at 45 11 MCF and one MCF a day to recover the water blanket, and also 12 recovered some mud cut salt water. And then the drill stem 13 test interval from 10,398 to 413 had gas to surface 35 14 minutes at too small to measure. It also recovered mud, gas 15 cut water blanket and then some slightly gas cut salt water, 16 namely 7,840 feet of salt water. 17 And this sand is what I have identified as the 18 "A" sand. And you move updip to that to the well in 19 Section 17. They also ran a drill stem test in this 20 interval, and they recovered 3,720 feet of gas cut salt 21 water. 22 Moving further to the north into the pay section, 23 this is a well that blew out at 10,355. It subsequently made six PCF, but it was completed open hole, so we do not 24 have a lot of data for which of the sands completed, but 25

1 essentially the entire section was open-hole completed. It 2 is my feeling that the majority of the gas is coming from the zone that the well blew out, which is this thick zone at 3 the bottom, 40 to 50 feet of the well. Δ 5 And then moving further updip, you have production in the sand in the second well on the left. 6 And then moving even further towards the northwest, the well on 7 extreme left-hand side of the cross-section where they 8 9 tested the sand is tested in swab dry, which to me means 10 that the sand was fairly tight. In addition to that, the 11 sand -- total sand package is thinning, and I don't believe 12 that the quote, unquote, A sand is present in that well. So 13 the sand is absent by non-deposition up there. 14 Q. Can you approximate for us on this cross-section 15 the likely position of the well Pacific proposes to drill in 16 the south half of Section 18? 17 Well, I'd like to do that with this other Α. 18 cross-section I've prepared. And let's look at 19 cross-section O-O', which is Exhibit Number 14. This is, once again, a structural cross-section in more or less a dip 20 21 configuration that would include the well to the north of our location and the well to the south of our location. 22 23 Those two wells are the well second from the right and the 24 third well from the right, Mr. Examiner. 25 The well that -- the good well that's to the

north of our proposed location has the thick sand in it. 1 As 2 you move south, that sand diminishes in thickness and in 3 character and is not as well developed geologically and according to the electric log configuration as that well. And plus the fact that -- that we feel that there are 5 several other sands that have tested gas as the drill stem 6 test indicates, but have not been productive in the well to 7 8 the south of us.

9 So for those two reasons, I believe that the 10 lenticular of the sands in between the two wells shows that 11 there may be some continuity, but the reservoir potential is 12 not as good in between the two wells, and we feel that they 13 are not in communication as the pressure data had 14 indicated. In fact, if you look at the well that was 15 completed in 1968, the Sohio well, you will see that when 16 they ran the drill stem test that the pressures -- the gas 17 to surface went from 600 MCF a day to 175 MCF a day, and 18 they ended up having to frack that sand in order to produce 19 it. That, to me, is an indication that that sand is fairly 20 non-porous and is probably very heterogeneous in its 21 development and it probably does not extend too far. 22 Where will the Pacific well in the south half of 0. 23 18 be on your structure map?

A. It will be in between the second and the third
wells on the cross-section, and on the structure map I have

1	indicated it with that I believe you're back to Exhibit
2	Number 10, shows the structure map, and the proposed
3	location is the pink dot. So it's approximately half a mile
4	in between the two wells.
5	MR. KELLAHIN: That completes my examination of Mr.
6	Cromwell, Mr. Examiner. We would move the introduction of
7	his exhibits let me figure out the numbers here
8	Exhibits 10 through 14.
9	HEARING EXAMINER: Exhibits 10 through 14 are
10	admitted.
11	THE WITNESS: Did you have any questions of me, sir?
12	HEARING EXAMINER: Let me think just a moment before
13	you step down, Mr. Cromwell. What section the good well,
14	was that the one that blew out?
15	THE WITNESS: Yes, sir, in Section 18.
16	HEARING EXAMINER: So it was shown on both
17	cross-sections.
18	THE WITNESS: Yes, sir.
19	HEARING EXAMINER: I don't have anything further. The
20	witness may be discussed.
21	CRAIG CLARK
22	the Witness herein, having been first duly sworn, was
23	examined and testified as follows:
24	DIRECT EXAMINATION
25	BY MR. KELLAHIN:

1	Q. Mr. Clark, for the record, would you please state
2	your name and occupation?
3	A. My name is Craig Clark. I'm a landman for
4	Pacific Enterprises.
5	Q. Mr. Clark, on prior occasions have you qualified
6	as an expert landman before the division?
7	A. Yes, I have.
8	Q. Pursuant to your employment, have you made an
9	investigation to determine the ownership of the oil and gas
10	minerals in the McMillan pool within the pool boundaries of
11	that pool?
12	A. Yes, I have.
13	MR. KELLAHIN: We tender Mr. Clark as an expert
14	petroleum landman.
15	HEARING EXAMINER: Mr. Clark's qualification are
16	accepted.
17	Q. (By Mr. Kellahin) Let me turn you back to Exhibit
18	Number 15 that we started with, Mr. Examiner. Would you
19	identify and describe that exhibit for us?
20	A. Exhibit 15 is a called a land data map, and it is
21	gone through and for the McMillan-Morrow Field and for
22	one mile around this field, I went and checked through
23	records and also through various maps, notifying either the
24	operator or some of these tracts were unleased and did
25	notify both the state and the Bureau of Land Management,

1	they own the minerals that have been unleased over in the
2	far west portion and the other offsetting owners from the
3	McMillan-Morrow Field.
4	Q. Have you satisfied yourself that you prepared a
5	complete and accurate tabulation of the owners and operators
6	of any well in the pool?
7	A. Yes, I have.
8	Q. And that that list also included the working
9	interest and mineral ownership in the absence of an
10	operator?
11	A. Yes.
12	Q. Let me ask you to identify Exhibit Number 16 as
13	being a complete list of those parties for which notice was
14	provided.
15	A. This list was furnished we prepared it off the
16	information we had, as shown on our map of all the
17	offsetting owners.
18	Q. In response to sending out notification of this
19	hearing identifying the issues to all those parties, have
20	you received any inquiries or objections to what Pacific
21	seeks to accomplish in this hearing?
22	A. No, we have not.
23	MR. KELLAHIN: That concludes my examination of Mr.
24	Clark. We move the introduction of Exhibits 15 and 16.
25	HEARING EXAMINER: Tell me again about who you notified

outside the boundaries of the pool, Mr. Clark. 1 THE WITNESS: Well, I notified either -- the wells --2 we had done take-offs, the stuff up to the north for Harvey 3 E. Yates, I put "et al" there. It is broken up; there's 4 5 probably about 25 owners. We notified all of them. And we went through, and just whoever -- if the minerals were 6 leased, we notified the lessee; if they were unleased, then 7 we notified the mineral owners. And that's --8 9 HEARING EXAMINER: I guess that was --10 THE WITNESS: That was within a mile of the 11 McMillan-Morrow pool. 12 HEARING EXAMINER: The witness may be excused. MR. KELLAHIN: That concludes our presentation in this 13 14 case, Mr. Examiner. 15 HEARING EXAMINER: I think we said we would accept 15 16 and 16 into the record. If we didn't, we'll say it now. 17 What was involved in case 10250? Did we talk 18 about that any, Tom, where your proposed locations were in that case? 19 20 MR. STOVALL: That was the rescission of the special 21 pool rules and the two -- that's the basic case, isn't it, 22 Mr. Kellahin? 23 MR. KELLAHIN: Yes, Mr. Examiner, that's the basic case 24 that the witnesses have described, and that is their first 25 choice of a solution.

1	HEARING EXAMINER: So both cases talk about the same
2	single well location that you
3	MR. KELLAHIN: That's correct. The solution in case
4	10249 is not our first choice. And if you decide 10250, you
5	may simply dismiss case 10249. 10250
6	HEARING EXAMINER: All right. Cases 10249 and (110250)
7	will be taken under advisement.
8	(The foregoing hearing was adjourned at the
9	approximate hour of 10:58 a.m.)
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1	STATE OF NEW MEXICO)
2	:
3	COUNTY OF SANTA FE)
4	I, FREDA DONICA, RPR, a Certified Court Reporter, DO
5	HEREBY CERTIFY that I stenographically reported these
6	proceedings before the Oil Conservation Division; and that
7	the foregoing is a true, complete and accurate transcript of
8	the proceedings of said hearing as appears from my
9	stenographic notes so taken and transcribed under my
10	personal supervision.
11	I FURTHER CERTIFY that I am not related to nor employed
12	by any of the parties hereto, and have no interest in the
13	outcome hereof.
14	DATED at Santa Fe, New Mexico, this 5th day of
15	April, 1991.
16	Fréda Donica
17	Certified Court Reporter
18	CCR NO. 417
19	
20	I do hereby celling that the foregoing is a complete record of the proceedings in
21	the Examiner hearing of Case Nos 10249 + 10250 heard by melon March 7 1999.
22	Lun Anen, Examiner
23	Oil Conservation Division
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