CASE 4496: Application of BTA OIL PRODUCERS FOR A PRESSURE MAINTENANCE PROJECT.

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CONVENTIONS	BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION Santa Fe, New Mexico
	February 3, 1971
SELVICE, INC.	EXAMINER HEARING
S B F V I C 15. Expert 7	IN THE MATTER OF:
dearnie	Application of BTA Oil Producers) Case No. 4496 for a pressure maintenance project,) Lea and Roosevelt Counties,) New Mexico.
dearniey-meier seclalizing in derositions	BEFORE: Daniel S. Nutter, Examiner
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		1	MR. NUTTER: We'll call the next case, 4496.
		2	MR. HATCH: Case 4496, Application of BTA Oil
	¢ *	3	Producers for a pressure maintenance project, Lea and Roosevelt
		4	Counties, New Mexico.
- •.	2 4) 2 2	5	MR. KELLAHIN: Examiner, please, Jason Kellahin of
	₩₩2 Ν Σ	6	Kellahin and Fox, Santa Fe, appearing for the Applicant. We
	La dina dia dia dia dia dia dia dia dia dia di	7	have one witness we'd like to have sworn.
بىتىر	meie	8	(Witness sworn.)
ن ى سە	dearnley-meier	9	(Whereupon, Applicant's Exhibits 1 through 21 were duly marked
• 1	arn	10	for identification.)
¥. ¥.	de	11	JERRY I. MORITZ
į, B	IVENTIONS 87103	12	called as a witness, having been first duly sworn, was
÷ •	, CONVE	13	examined and testified as follows:
	DAILY COPY, CONVENTIONS New Mexico 87103 3 87108	14	DIRECT EXAMINATION
	оич, хісе хісе	15	BY MR. KELLAHIN:
3. *	tan tan tan tan	16	Q Would you state your name, please.
, 1 <u>5</u>	EXPERT 1 ● A L B C 1 0 A L B C	17	A Jerry Moritz.
k	EMENTS, 243-449	18	Q By whom are you employed and in what position,
	STA: ONE	19	Mr. Moritz?
* : t	HEAR!) 1092 -	20	A I'm employed by BTA Oil Producers as Secondary
	POSITIONS, 1 P.O. BOX	21	Recovery Engineer in Midland, Texas.
	0 2	22	Q Have you ever testified before the Oil Conservation
	SPECIALIZING IN: 2009 SIMMS BLD	23	Commission and made your qualifications as an engineer a
	SPECIA 209 SI	24	matter of record?
		25	A Yes.

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MR. KELLAHIN: Are the witness' qualifications 1 accentable? 2 MR. NUTTER: Yes, they are. 3 Mr. Moritz, briefly, what is proposed by BTA in Q the application in Case Number 4496? 5 Our application is asking that we be allowed to Α 6 inject water into BTA Oil Producers' 685 Ltd. Bond Well No. 5 7 which is located in the southwest quarter of Section 4, ŝ Township 9 South, Range 36 East. 9 The reason for this application is that, as 10 exhibits will show later, BTA and many other operators in the 11 Vada Trend, which this area is included in, have noticed that 12 1092+PHONE 243-6681+ALBUQUERQUE, NEW MEXICO 87103 DG. EAST+ALBUQUERQUE, NEW MEXICO 87108 the Bough "C" production has the characteristic of declining 13 at a very rapid rate. In several areas of the field, the 14 production is now below thirty barrels of oil per day, and 15 in this area, we feel, and we hope to show by exhibits, that 16 the production is at the point where it is going to begin this 17 very rapid decline. 18 BTA would like to conduct this pilot operation so 19 that a secondary recovery method can be proven or disproven 20 209 SIMMS BLDG. P.O. BOX PIRST NATIONAL EIANK BLC for this reservoir. If the pilot is successful, it is 21 anticipated that upward of 300 wells in the Vada Trend will 22 be unitized for secondary recovery operations. However, if 23 this pilot is unsuccessful, it is anticipated that in a short 24 25 time, the majority of the wells in the Vada Trend will have to

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTION

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	1	be abandoned.
	2	Q Now, referring to what has been marked as Applicant's
	3	Exhibit Number 1, would you identify that exhibit.
	4	A Exhibit Number 1 is a land plat of the so-called
	5	project area as we have asked for in this application.
د. -ح لر 4	6	We have shown it with a bordered area. Also, we
40 - 5 8	7	have shown the initial injection well in a red triangle.
dearniey-meier	8	The yellow area is BTA Oil Producer leases. We
ey-n	9	have actually even shown the ones outside of the project area
arni	10	so that you can have a better idea where all of our properties
9	11	are,
NTIONS 103	12	Q Now, where is this area located in relation to the
CONVEN	13	Vada Pool?
T TESTIMONY, PAILY COPY, CONVENTIONS Buoderque, New Mexico 87103 New Mexico 87108	14	A This is actually the easternmost edge of the Vada
	15	Trend or Vada Pool.
	16	Q Now, referring to what has been marked as Exhibit
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Number 2 through 14, would you identify and discuss the
TEMENTS, EXP 243-65916 A BUOUEROUI	18	information that is shown on those exhibits.
S, STATE Hone 2 Toalb	19	A Exhibit 2 through 14 are production plots, oil,
DEPOSITIONS, HEARINGS, STATEMENTS, 5.e p.o. box 1002.ephone 243-658 4. bank bldg. exst albuouef	20	gas and water of the thirteen leases included in this project
ITTIONS, I D. BOX NK BLD	21	area.
1 DEPUS 06.● P.C	22	I think, thumbing through some of these, I will
IZING IN MS BLD MATION	23	point out some specific ones, but you can see in general the
SPECIALIZING IN: DEPOSITIONS, HEARINGS, STAT 204 Simms BLDG. • P.O. BOX 1092 • PHONE FIRST NATIONAL BANK BLDG. EAST • AL	24	oil production has been very good, reaching, in some cases,
	25	as high as 300 barrels of oil per day. As you can also see,

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the water has been equally as good or greater than the oil
production in the latter part of '70; in general, you can see
that the production has begun to drop, the water production
has dropped even more than that, and the gas has begun to
increase.

In our mind, indicating that this is a straight depletion drive reservoir. Specifically, I'd like to have the Examiner look at Exhibit Number 4 as an example of the possible decline in this production.

10 This is BTA's 686 Harris lease which contains two
11 wells. As you can see, the production dropped from
12 approximately a maximum of twenty thousand barrels a month
13 to its present rate of about six thousand barrels a month
14 which represents about a sixty-seven percent decline in
15 production, oil production.

The water production also declined seventy-nine percent during that period.

Now, I will refer you to Exhibit Number 6. Exhibit Number 6 again shows the same characteristic in that the production has dropped off in the last few months, dropping approximately seventy-seven percent.

The water production likewise has dropped ninety-two percent.

There's another characteristic I'd like to show here in June and July of 1970. The production actually picked

SPECIALIZING IN: DEFOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONI 209 Simms Bldg.+P.O. Box 1092+PHONE 243-6691+ALBUQUERQUE, NEW MEXICO 87102 FIRST NATIONAL EANK BLDG. EAST+ALBUQUERQUE, NEW MEXICO 87108

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up, and this is due to the well being returned to a flowing status. There is, on some of these leases, the unique point whereby the water cut, the bottom hole pressure and the gas/oil ratio simultaneously agree that the wells will actually return to a flowing state. It does not happen on all the wells, but it does happen on some of them and this happens to be one of them.

Q Now, referring to what has been marked as Exhibit 15, 8 would you identify that exhibit. 9

А Exhibit Number 15 is a plot of all thirteen leases in the project area. The total of all the leases, oil, gas and water.

Again, you can see that the oil production has dropped from a maximum of about a hundred and sixty thousand barrels a month to the present rate of about a hundred and ten thousand or about a thirty percent decline.

Likewise, the water production has dropped some seventy-eight percent and, as you can see, the gas/oil ratio and gas production has increased tremendously.

I might point out the December figures were not available at the time of preparation of these exhibits, but the oil production for December has dropped another thirteen percent.

> MR. NUTTER: What would that level be, Mr. Moritz? THE WITNESS: It would be about ninety thousand

dearnley-meier SPECIALIZING IN: DEFOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, COMVENTIONS NEW MEXICO 87103 87108 I . ALBUQUERQUE. 243-669 1092 • PHONE .0. BOX ANK BLE SIMMS BLDG. - F.O. 2 00 5 FIRST

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barrels, and the water production dropped on down to about sixty thousand.

Q (Mr. Kellahin continuing) Now, would you discuss the information that is shown on Exhibit Number 16.

А Exhibit Number 16 is a time plot of the bottom hole 5 pressures that BTA has measured on the wells in the project 6 area only. We do have the practice of drill stem testing 7 most all of our wells on initial completion and, likewise, 8 periodically, when the pumps need changing, the hydraulic 9 pumps, we have run bottom hole pressures on all of the wells 10 and you can see that rather significant decline in pressure 11 here, again indicating that this is a straight forward :2 depletion drive reservoir. 13

I might also point out that the project area of 15 pressure is nearing a thousand pounds and it has been our experience from the operation of about eighty wells in this 16 Bough "C" Trend that once the bottom hole pressure gets to 17 18 about twelve hundred pounds, this is the point that the production does start to decline oil and water and the G.O.R. 19 starts to skyrocket. 20

21 I have included here Exhibit Number 17 which is of BTA Oil Producers' 673 Limited Vada "C" Number 3. This well 22 23 is approximately twelve miles west of the project area, in an 24 area that was drilled about one year earlier than the project 25 area, and this area or this curve, as you can see, has

EXPERT TESTIMONY, DAILY COPY, CONVENTION 1 • ALBUQUERQUE, NEW MEXICO 87103 1 QUE, NEW MEXICO 87108 DEPOSITIONS, HEARINGS, STATEMENTS, 243-669 BUQUE UN NO 1092 + PH ô ā SPECIALIZING IN 1RS1

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declined tremendously.

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The well went from essentially a top allowable, well down to almost an uneconomical state in something like ten months. Again, I might point out that this well has the characteristic of going back to a flowing status approximately in August of '69.

Has it continued to flow since then? Q

A Yes.

Q Now, referring to what has been marked as Exhibic Number 18, would you -- well, prior to that, based on the information that is shown on the preceding exhibits, what is your conclusion of the characteristics and feasibility of the pressure maintenance project in this area?

А My conclusions from these exhibits are that we can expect, or BTA can expect the production in the area to start this rapid decline and we estimate that within six to eight months, most of the wells in the project area will be at the state we have to consider abandoment of these wells.

It is likewise my conclusion that the pressure and the state of the production in this project is at the point where secondary recovery operations should be started. Since 21 the time to form a communitized project would take about 22 six to a year's time, at the minimum, BTA feels compelled to 23 24 initiate a project of this type in an effort to obtain some data regarding the floodability of this reservoir. 25

dearnley-meier SPECIALIZING IN: DEFOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTION NEW MEXICO 87103 87108 ALBUQUERQUE,
 OUE, NEW MEXICO 243-669 1092 • PHONE х 0 0 MMS BLDC. P.O. National evanx 2.09.5 F. R.S.

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Exhibit Number 17, we feel, is a good example of 1 2 what can happen to the production and, likewise, this shows 3 what can happen to a lease and how quickly it can be put into 4 jeopardy as regards to losing the lease and, of course, if 5 we lose the leases, we cannot conduct secondary recovery operations on these. 6 dearniev-meier 💼 Is that one reason you feel it essential that a 0 7 pilot project be started immediately? 8 Yes. A 9 Now, referring to Exhibit Number 18, would you 0 10 discuss that exhibit. 11 Exhibit Number 18 is a schematic of the initial EXPERT TESTIMONY, DAILY COPY, CONVENTIONS Α 12 NEW MEXICO 87103 87108 well that we propose to inject into, the 685 Limited Bond 13 No. 5. I have marked all the casing strings. 14 We did cement twelve and three-guarter inch casing 1. ALBUQUERQUE. 2QUE, NEW MEXICO 15 16 at 361 feet and this cement was circulated. We set eight and five-eighths casing at 4085 17 DEPOSITIONS, HEARINGS, STATEMENTS, BUQUEF 243-669 and cemented it with four hundred sacks with an estimated 18 C 1092. PHONE : top of the cement at 1550 and we set five and a half casing 19 at 9850 with three hundred sacks, with the cement top at 20 O. BOX 8290. 21 We perforated the Bough "C" interval from 9221 to -33, BLDG. • P 22 NATIONAL SPECIALIZING IN: $_{23}$ and if this application is approved, we will set a Baker Model R ωWS 209 SF FIRST packer at 9780 and run two and seven-eighths tubing on it and 24 we will inject below this packer. 25

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		1	We feel that we have adequately protected all of
. <i>1</i>		2	the various formations that we've penetrated in this well.
4 - 51		3	We will load the annulus with ar inhibited fluid and have
		4	pressure gauges on the annulus for periodic checks to see if
e 👼		5	pressure is built up on the annulus.
	с. В.		Q Will you use an internally coated tubing?
, 199 4	а 1 — 1 — 1 С — 1 2 — 1	6	
فببوه	5	7	A We will not use an internally coated tubing in this
	mei	8	case. We have looked at the water, and the water is not of
	ley-	9	the corrosive characteristic and we do not anticipate any
	dearnley-meier	10	problems from this standpoint.
	9 P	11	Q Now, in the application, Mr. Mortiz, the Applicant
	TIONS 03	12	asked for administrative procedure whereby additional injection
	CONVENTION ICO 87103	13	wells may be included in the project and for injection of gas
y 1-k	со Р ⊀, М Е X	14	or air. Will, essentially, the same type of completion as
	A	15	shown on Exhibit 18 be utilized for those additional wells?
} 2 ₽	ESTIMONY, D Derque. W Mexico		
12	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16	A Yes, essentially the same.
. • •	'S, EXPE 691 ⊕ A L Erquë	17	Q And is your casing of cementing program on the other
÷ ,	STATEMENTS , STATEMENTS , ON€ 243-069 • AL BUQUEI	18	wells in the project area essentially the same as shown on this
		19	exhibit?
2 - 2 -	DE POSITIONS, HEARINGS, 5.0 2.0, box 10520PH	20	A Yes, sir, it sure is.
	ITIONS, V. BOX VK BLI	21	Q Now, referring to what has been marked as Exhibit 19,
r 5		22	would you identify that exhibit.
	2 B C	23	A Exhibit Number 19 is a reduced copy of the log on
	SPECIALIZII 209 SIMMS	24	the 685 Limited Bond No. 5 which we propose to use as the
	5 5 7		
		25	initial injection well.

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We have marked the normal tops of formations 1 encountered in this well, plus the perforated interval and the 2 packer setting point that we're proposing. 3

Q Now, would you please explain what is shown on Exhibit Number 20. 5

Α Exhibit Number 20 is a summary of the calculations 6 of the fluid volumes involved in the project area for the Bough "C" Formation.

As can be seen, we are estimating that the project 9 area has approximately nineteen million eight hundred sixty 10 thousand barrels of pore space contained in the Bough "C". 11 Of this nineteen million barrels of pore space, we believe 12 that approximately eleven million nine hundred thousand barrels 13 was oil, and the remaining seven million nine hundred thousand 14 barrels contained water. 15

Now, we have converted the next two figures, these stock barrels which is approximately six millions six hundred thousand barrels of stock tank oil and approximately seven million nine hundred thousand barrels of water.

The next group of figures are the recoveries to 20 12/1/70 showing that we recovered approximately three million 21 barrels of oil or about a hundred and fifty-two thousand 22 barrels per well and approximately five million five hundred 23 thousand barrels of water or two hundred twenty-five thousand 24 barrels of water per well. 25

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTION IMM5 BLDC. • 2.0. BOX 1092 • PHONE 243 • 6441 • ALBUQUERQUE. NEW MEXICO 8.1103 F NATIONAL 1JANK BLDC. EAST • ALBUQUERQUE, NEW MEXICO 87108 200 S FIRS

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1 Me estimate that the oil recovery has been forty-six 2 percent of the oil in place at 12/1/70, and approximately 3 sixty-nine percent of it water. We also are estimating that 4 a successful secondary recovery project will recover one 5 million three hundred and eighty-nine thousand barrels of additional oil or approximately seventy thousand barrels per 6 7 well in the project area. 0 Now, Mr. Moritz, you have discussed, in regard to 8 g converting the 685 Bond No. 5 Well to injection and your 10 initial plans to inject water into this well, will you tell the Examiner what fluid you plan to use and where it will come 11 EXPERT TESTIMONY, DAILY COPY, CONVENTIONS from and the volumes and pressures expected to be used in 12 NEW MEXICO 87103 87108 13 connection with this project. BTA Oil Producers operates an extensive salt water Α 14 15 disposal gathering system in this area, collecting Bough "C" BLDG.+ P.O. BOX 1092+PHONE 243-0601+ALBUQUERQUE, TIONAL PANK BLDG, EAST+ALBUQUERQUE, NEW MEXICO 16 water. We plan to divert part of this water to injection BUQUERQUE. 17 HEARINGS, STATEMENTS, 18 in this Number 5 Well. We presently have about seventy-five EASTOAL 19 hundred barrels of water a day available. Of course, this is rapidly declining. 20 We expect to initially begin with about fifteen 21

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hundred barrels of water a day in the Number 5 and, initially, 22 we expect no pressure at all. 23

MR. NUTTER: How many barrels a day?

THE WITNESS: Fifteen hundred.

Q Now, in your application, you ask for considerable flexibility in the operation of this project; namely, the 2 3 ability to change injection wells and to change injection fluids, possibly to gas or air. Would you explain the necessity for this? 5

Α Yes. I have already talked about the time factor involved in this project in that the production from this reservoir is expected to decline very rapidly, expect it in the next few months, and we have already pointed out that we feel that there is sufficient oil left in the reservoir or will be left in the reservoir to justify secondary recovery operations.

13 Therefore, we are asking for this flexibility so 14 that we can properly evaluate the secondary recovery technique 15 or recover the maximum amount of oil. Flexibility asked in 16 regard to changing wells is tied in with the request for 17 flexibility of injecting different fluids.

18 BTA has some limited data that indicates possibly 19 that the water is not the fluid to inject into this reservoir. 20 Therefore, since BTA would like to evaluate this reservoir 21 in the best manner, we are requesting that we be allowed to 22 inject different fluids so that in case one fluid does not 23 work, we have the ability to try and change to another. 24

Since we would probably not want to inject gas into the well that had previously injected water, we therefore need

SPECIALIZING IN. DEFOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS 1092 + PHONE 243-4691 + ALBUQUERQUE, NEW MEXICO 87103 36. EAST + ALBUQUERQUE, NEW MEXICO 87108 K BLC MMS BLDG. P.O. 1 NATIONAL BANK 209 S

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	1	the flexibility to change wells. BTA, of course, would
	2	advise the Commission and the offsets by administrative
	3	procedures of its intent to change operations.
	4	Q Now, from your Exhibit Number 1 it would appear
··· 4	5	that the acreage involved in the project area is federally-
	6	owned.
n, 1 − 1 3	7	A Yes. Most of the acreage is federal.
	8	Q Have you received approval from the Department of
dearnley-meie	9	the Interior Geological Survey?
arnl	10	A Yes, we have discussed this project with the federal
de de de	11	government, and Exhibit 21 is their letter to us in this
с. Б. С.	12	regard.
CONVEN	13	Q Mr. Moritz, do you know of any other efforts
ESTIMONY, DAILY COPY, CONVENTIONS UERQUE, NEW MEXICO 87103 W MEXICO 87108	14	directed toward either pressure maintenance or secondary
AONY, DAIL	15	recovery in the Bough "C" reservoir?
T TESTIMO	16	A Yes, I know of one project called the Imbe Unit
ਾ ਰਟ ਘ ੁ ਸ਼ਾਹ ਪ	17	which is approximately sixteen miles south or west of here.
★ TEMENTS, EXP 243-6691 • Å	18	This unit was actively engaged in attempt to form a unitized
, 5,51ATE ⊣on∈ 2 ⊺-A∟B⊡	19	project. However, we have now received word that the operator
	20	has given up on attempts to form this unit. We know of no
POSITIONS, F	21	projects now that are attempting or are injecting fluids into
1 DE 001	22	the Bough "C" for secondary recovery purposes.
SPECIALIZING IN. DEªOSITIONS, MEARINGS, STAT	23	Q This would be a pilot project to determine if it is
SPECIAL 209 SIM	24	feasible, is that correct?
	25	A Yes

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	1	Q In your opinion, will the approval of this
	2	application result in the prevention of waste or correlative
	3	rights protected by the proposal you have made?
	4	A Yes.
	5	Q Were Exhibits 1 through 21, inclusive, prepared by
	6	you or under your supervision?
2	7	A Yes.
neie	8	MR. KELLAHIN: I would like to offer Exhibits 1
ey-I	9	through 21, inclusively.
dearnley-meier 🛛	10	MR. NUTTER: BTA's Exhibits 1 through 21 will be
de	11	admitted.
VENTIONS 87103	12	(Whereupon, Applicant's Exhibits 1 through 21 were duly admitted
1, CONVI XICO 87	13	into evidence.)
FESTIMONY, DAILY COPY, CONVENTIONS Querque. New Mexico 87103 Ew Mexico 87108	14	MR. KELLAHIN: That completes the direct examination
ом¥, рА Que, р Х1С0 8	15	of the witness, Mr. Nutter.
TTESTIM UQUER NEW ME	16	CROSS EXAMINATION
EEXPER 1 ● A PER Router	17	BY MR. NUTTER:
STATEMENTS, E DNE: 243-0691 • AL BUQUER	18	Q Mr. Moritz, which well other than the well shown on
¥ Z ◄	19	Exhibit 17 was the one that you mentioned that started
S, KEARIN X 1092 6 F	20	flowing and increased its production after you removed the
JEPOSITIONS, KEARINGS, J. P. O. BOX 1092 • PHI	21	pump?
е це 1 с. 4 1 с	22	A On Exhibit 17? I believe it is
SPECIALIZING JEI	23	Q Was it Exhibit 4?
SPECIA 209 SH FURST	24	MR. COOLEY: 6, I believe it was, Mr. Nutter.
	25	THE WITNESS: Yes, 6.

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EXPERT TESTIMONY, DAILY COPY, CONVENTION

209 SIMMS BLDG. P.O. BOX 1092.0PHONE 243-0691.0LBUQUERQUE. NEW MEXICO 87103 FIRST NATIONAL BANK BLDG. EAST ALBUQUERQUE, NEW MEXICO 87108

SPECIALIZING IN DEPOSITIONS, HEARINGS, STATEMENTS,

A Yes, 6.

Q Now, I notice the same characteristic there on your Vada "C" Number 3 and this Allen Lease here on Exhibit Number 6, that when you took the pump off and the well started flowing, that there was a drastic increase in the amount of gas produced at that time. Did the increase in the production of gas result from putting the well on a flowing status and taking the pump off, or did the well, going on flowing status, result from the increase in gas production?

A It may be a little of both. There is, of course when we have the pumps in there, a certain amount of restriction to this gas production because we actually are having to pump the gas and we feel that this probably is one of the reasons we get a little production increase when we put these back on flowing, in that we are not holding back the fluids back there, that they're freely coming out. We have a slight tendency with the pump to hold the fluid back. Q Well, if you are holding it back, preventing this

dissipation of the gas energy from the gas reservoir, you are actually helping the reservoir by pumping it, aren't you, if it is going to let the gas break up and overproduce gas by putting it on a flowing status?

A I guess we would be.

Q So all this pressure that you have lost, would

page 17

have to be pressure you'd have to make up before you can get any response with your water injection program?

A Yes. We think that one of the big questions that we have to answer with this project is: What is the time of breakthrough of this water? This is one of the big problems.

If the time of breakthrough is instantaneous, which we can foresee and some other people have discussed, then I would say the possibilities of secondary recovery with water are almost nil.

However, if this idea that the water breakthrough
does not occur and we don't prove it out, then I think we
have a much better chance of recovering this oil and,
subsequently, if water does break through, I think there's a
chance that gas or air injection may be the answer in that
case, and this is just an alternate programing case; water
breakthrough does like essentially what everybody says it will.

Q Well now, on this recovery, you estimate that you recovered forty-six percent of the stock tank oil in place, up to December of 1970, and that the average in the project area is two hundred and seventy-five thousand barrels a day. This is a rather high recovery factor for solution drive reservoirs, isn't it?

A Yes.

Q So you've had exceptional performance, really?

A Yes, and I personally believe or we believe that the

GCALIZING IN DEFOSITIONS, HEARINGS, STATEMENTS, EXPERIT TESTIMONY, DAILY COPY, CONVENTIONS BOD SIMMS BLDG. F.D. BOX 1022-PHONE 243-6091-ALBUQUERQUE. NEW MEXICO 87103 FIRST NATIONAL FANK BLDG. EAST-ALBUQUERQUE, NEW ME. 87108

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		1	reason for this was the water contained in the reservoir,
: •		2	that you had a certain period in the reservoir production
, A.		3	where you actually were operating by water expansion.
		4	Q And this connate water, there was so much in there
. *		5	under so much pressure, the water expansion helped the flow?
. 8	 • , ŭ	6	A Right. The water expansion brought about the oil
	2010 N 201 201	7	well for a short period of time.
e sa 🌶	dearnley-meie	8	Q But all that is connate water; no edge water or
i d	ley-I	9	water drive, active water drive?
	arn	10	A We see no evidence of active water encroachment,
in de I	99	11	especially when we covered it with our study of dry holes
14	CONVENTIONS CO 87103	12	around this area, we found no place where there could be water
	. —	13	encroachment because all the evidence shows it has not been
	DAILY COPY, . New Mex 3 87108	14	encroaching.
	<mark>он v, da</mark> que, ₇	15	Q Has the Bough "C" of the Pennsylvania been subjected
	L TESTIM L C C C R R L R M F	16	to water injection or other forms of secondary recovery in
	. EXPER] 19 A L B Roue	17	Lea County or in any other area?
and the state	<mark>тежент</mark> я, е) : 243-6691• : 8⊔ д∪ ЕР д	18	A No, not that I know of.
	HEARINGS, JTAT 1092 • PHONE 96. East • AL	19	Q There was no project initiated in the Allison area?
1	, HEARIN , 1092 • . DG. EA	20	A No. No. There's one slight difference I might
	POSITIONS, HEA	21	point out in the Allison; the Allison prediction is somewhere
	IN: DE? - DG P	22	in the neighborhood of eighty percent and this was their
;	SPECIALIZING IN: DEPOSITIONS, HEARINGS, JTAYEMENTS, 2004 Strams BLDG.4 P.O. BOX 1092 + PHONE 243-009 Mirst National BANK BLDG. EAST + ALBUQUE	23	thoughts, that they would not have much left to recovery
	SPECIA 2005	24	anyway, so it was not attempted.
		25	Q That area was drilled on eighty-acre spacing?

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	1	A Right.						
	2	Q As compared to a hundred and sixty here?						
ı [*]	3	A Right.						
	4	Q Now, in this estimate of seventy thousand barrels						
	5	per well, secondary discovery, is that based on any scientific						
• 4. 6	6	procedure or just a guess?						
Çi X Xan in Nagana	7	A No. It is based on an attempt to arrive at what						
neie	8	we think the aerial sweep and the vertical displacements						
ey-I	9	will be. It is very difficult to make these predictions in						
dearnley-meier	10	that the evidence of what water, gas or the other fluids are						
de	11	going to do is very contradictory. Some people have shown us						
NTIONS 103	12	evidence that water will not work at all, so you might say in that case, the recovery would be zero.						
LY COPY, CONVENTI Ew Mexico 87103 1108	13							
TESTIMONY, DAILY COPY, CONVENTIONS Querque, New Mexico 87103 Ew Mexico 87108	14	But we have tried to make some predictions on the						
ONY, DAI Qur, Dai Xicos: N Xicos:	15	basis of the data we can see.						
	16	Q What is your estimate of primary recovery without						
EXPER I ● A L B	17	any secondary stimulation per well here?						
ГЕМЕNTS, 243-609 ВОДОЕР	18	A I'd say about a hundred and seventy thousand.						
INGS, STAT • PHONE : AST • ALL	19	Q Well, you've recovered two hundred and seventy-five						
HEARINGS, 1 1092 - PHO	20	thousand.						
ISITIONS, 0. BOX ANK BL	21	A No. We've recovered, on the oil, a hundred and						
NI DEPO DG.4 P. NAL BJ	22	sixty-two.						
SPECIALIZING IN. DEPOSITIONS, HEARINGS, STATEMENTS 209 SIMMS BLDG., # 7-0, BOX 1002 # PHONE 243-666	23	Q I beg your pardon. I'm looking at water. Oil is						
SPECIA SUG SIN FIRST	24	a hundred and fifty-two.						
	25	A Right.						

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Q And you say a hundred and seventy thousand? A Yes. This is based on this rapid decline point. Q Now, the secondary recovery would be in addition to the hundred and fifty-two thousand that you recovered or in addition to the hundred and seventy thousand?

A In addition to the hundred and seventy.

Q So you'd get a total of two hundred seventy thousand per well, approximately?

A Right. I might point out one other thing: We are
not wanting to enhance this project as an ultimate project.
Our ultimate concern is the area in which BTA operates, which
as I pointed out before, is about three hundred wells and
our ultimate concern is the formation of a unitized project
covering these three hundred wells.

I think conceivably if we could prove that this project is successful, whatever we inject, we probably in a short period of time would ask for the dismissal of this project and we would instigate negotiation on unitization, simultaneously, on three different units to unitize the three hundred wells.

Q Well, for the time being -- have you ever examined
any of the Commission's rules for pressure maintenance projects
that have been promulgated in the past?

A No.

Q Some are rather complex and provide for conversion

DECIALIZING IN. DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS 2004 SIMMS BLDG. • P.O. BOX 1092 • PHONE 243 • 6091 • ALBUQUERQUE. NEW MEXICO 87103 FINST NATIONAL DANK BLDG. EAST • ALBUQUERQUE. NEW MEXICO 87103

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PAGE 21.

1 of water injection into m.c.f. of gas to apply against high 2 C.O.E.'s and such as that. They are rather complicated. Do 3 you think you need any rules such as have been promulgated by 4 the Commission for other projects for this pilot, or would 5 you just be able to --

A No, we are not asking for this. We do have some
7 spare allowable there. We're going to lose a hundred barrels
8 allowable on production in this well.

9 Q You will produce this from offsetting wells?
10 A We think there's a chance. Our production people
11 say that the fluid migrates around enough to where we may
12 make it up, but we are actually not worrving about it one way
13 or another.

14 0 Would you like to see some of our rules that we put 15 out for other projects to prove --

16 A No, not at this time.

Q -- offsetting wells? Not at this time; so your 17 authority seeks to inject water into this well, and administrative 18 19 procedure, converse to other wells, if not successful and if need be in the future, possibly convert to air or gas, is that right? 20 Right. The reason we ask for the possibility of А 21 22 area is that we have been negotiating or talking with Warren in this area and the possibility of gas being available for 23 injection is a little in question, it may be available; but 20 at what price is the problem. 25



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PAGE 2.2

		1	We would prefer not to inject air, but if it comes
. *		2	to it and our results are negative on water, we may have to
		3	go this way and we want this as an alternate to protect
		4	ourselves.
	х.	5	MR. NUTTER: Very good. Are there any further
. 4	с. 1921 1921 1921	6	questions of Mr. Moritz?
	1	7	MR. PORTER: I have one question.
1 - 8			-
	a me	8	CROSS EXAMINATION
الهي ۽	ley-	9	BY MR. PORTER:
	dearnley-meie	10	Q This well that you said had started flowing again,
• 3	Ū,	11	do you know how long that well flowed initially before it
÷ 1	471 045	12	was put on pump, or was it put on pump immediately?
- . *	CONVENT) ICO 87103	13	A The first one that I was referring to which is shown
. •	АІLY СОРУ , N EW MEXI 87108	14	as Exhibit 6, I believe?
	ESTIMONY, DAILY COPY, CONVENTIONS (Jerque, New Mexico 87103 W Mexico 87108	15	Q Yes.
	7 ESTINO Querro Ew Mex	16	A This one, as I remember, it flowed something like
: • . •	EXPERT 1 A L Bu 2 Que, N	17	two or three weeks. It was a very short it was less than
۲ ۱	57.4TEMENTS, EX 57.4TEMENTS, EX one: 2.43-06010.	18	a month, and then the water cut, as usual, increased to the
3 <u>2</u>	STA. O N E	19	point where the well died and we had to put it on pump.
, . 1 3	HEARINGS , 1092 - PH	20	Q At the initial point of the time you put it on pump,
		21	about what was the total fluid production per day?
• •	DEFOSITIONS, 5.e P.O. DOX	22	A I'd say, oh, something like eight hundred barrels
	SPECIALIZING IN. DE 209 SIMMS BLIDG.	23	of total fluid.
	ECIALIZ 9 SIMM		
:	3 6 8 201	24	Q And now, what is the production? Apparently, I
		25	looked at the graph, but

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		1	A Oh, we're looking at, probably there's about seventy
		2	barrels of oil and maybe twenty; so about less than a hundred
		3	barrels of total fluid now.
		4	Q Your water has declined apparently faster than the
		5	oil has.
1		6	A Generally, this is the case. The water does decline
	Agentin Maria di Santa di Santa Maria da Santa di Santa	7	faster.
:	meie	8	MR. PORTER: That's all.
ई औ	ey-1	9	RECROSS EXAMINATION
ş. X	dearnley-meiel	10	BY MR. NUTTER:
i î	9	11	Q Mr. Moritz, I have one more question with regard
ιi	ENTIONS 103	12	to Exhibit 16 which is your bottom hole pressure history. Now,
2	r, convi	13	you mentioned that you normally take bottom hole pressures at
1.2 1	aily Copy, convent i New Mexico 87103 87108	14	the time you put pumps on the well. Was that your testimony?
1-4 -	TESTIMONY, DAILY COFY, CONVENTION: Querque, New México 87103 Ew Mexico 87108	15	A No. I said when we change pumps, I believe.
\$ 5 1		16	Q When you change pumps. So this would be a history
1 × 1 <	ЕХРЕЙ 1 ● A L B I 3 Q U E , 1	17	of that defeats my question, because I thought it was at
3	世社王は丁5、王太戸王 243-6691 ● A L 8000 日 R Q U FI	18	the time you put pumps on, and that this would be a history
	165, 51AT PHONE 25T • AL	19	of decline of pressure as the need came up for installation
	HEARIN 109201	20	of pumping equipment.
1	OSITIONS,	21	A No. No. I'd say the majority of the wells in this
<u>*</u> :	N, DEFO DG. • F	22	area did not flow. There's probably not one out of ten that
i.	LIZING I	23	flows initially.
	SPECIA 209 Sit	24	Q So these wells that are represented here, these
		25	twenty wells, had pumps prior to the time of this bottom hole

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pressure as well as after the bottom hole pressure, there was 1 a pump change? 2 А Right. 3 MR. PORTER: Do you anticipate that some of these 4 wells that didn't flow initially will flow now or will flow 5 at a certain point of decline? 6 THE WITNESS: Some of them, yes, sir. I think 7 dearnley-meier there may be some. There's this three-phase point that has 8 to be reached and, for some unknown reason, I say some of the 9 wells may have the G.O.R., and what we predict to be the 10 right bottom hole pressure, but they may have a cut, something 11 HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS like thirty-five percent, and it seems like if it is thirty-12 NEW MEXICO 87103 87108 five percent, they won't flow. It takes about a twenty-five 13 percent cut to make it, 14 1092 • PHONE 243•3691 • ALBUQUERQUE, 36. EAST • ALBUQUERQUE, NEW MEXICO MR. NUTTER: If there's no further questions of the 15 witness, he may be excused. Do you have anything further, 16 17 Mr. Kellahin? 18 MR. KELLAHIN: Yes. As an owner of royalty under 19 acreage offsetting this project, I am in favor of it. MR. HATCH: The Commission has received a letter 20 SPECIALIZING INI DEPOSITIONS, 21 from Blackrock Oil Company supporting the Applicant in this 22 case. 23 MR. NUTTER: Les anyone else have any questions to F1RS1 24 200 ask? 25 THE WITNESS. You also, hopefully, received one

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		1	from Tenneco and I do have a copy of their letter that they					
÷		2	sent me, a copy of that.					
j Z		3	MR. NUTTER: You'd better give me that, because I					
		4	had that Tenneco letter and it's plumb disappeared.					
1-#	5 If there's nothing further in Case Number 4496,							
فاست :	22 	6	6 we will take the case under advisement.					
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	leiel	8						
	ш- <mark>у</mark> б	9						
	dearnley-meie	10						
	dea	11						
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4	CONVEN	13						
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: t	TESTIMONY, DAILY COPY, CONVENTIONS Guerque, New Mexico 87103 Ew Mexico 87108	16						
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e s	, state 10 Ne 24	19						
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	ТІОИЅ, Н . Вох 1 К ВСО	21						
1 5	DEPOSI G. • F. O AL BAN	22						
	ZING IN: AS BLD: ATIONJ	23						
	SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMERTS, EXPER 209 Simms BLDGF.O. BOX 1092.0.PHONE 243-66010ALB	24						
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PAGE 26

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	1	INI			
	2	WITNESS	WITNESS		
	3	JERRY I. MORITZ			
	4	Direct Examination by M	2		
	5	Cross Examination by Mr	Cross Examination by Mr. Nutter		
	6	Cross Examination by Mr	Cross Examination by Mr. Porter		
	7	Recross Examination by 1	Recross Examination by Mr. Nutter		
	8				
	9				
	10				
TEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS 243-6001 • Albuquerque, New Mexico 87103 .Buquerrque, New Mexico 87108	11				
	12	EXHIBIT	MARKED	OFFERED AND ADMITTED	
	13	Applicant's Exhibits 1 - 21	2	15	
	14				
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NG3, 51 • РНОИ • АЗТ • А	19				
IS, MEAR 0 x 1092 1 L D G. E	20				
РС-SITION Р.О. ВО В.Л.К.В	21				
SPECIALIZING IN: DEPOSITIONS, NEARINGS, STATEMENTS, 2009 Simms BLDG., P.O., BOX 1002 (PHONE 243-609 Finst National Bank BLDG. East-Albuoler	22				
	23				
84 E	24				
	25				

dearnley-meier regression SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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27 PAGE 1.2 STATE OF NEW MEXICO 1 SS COUNTY OF BERNALILLO) 2 I, CHARLOTTE J. MACIAS, Court Reporter in and for the 3 County of Bernalillo, State of New Mexico, do hereby certify 4 11-4 that the foregoing and attached Transcript of Hearing before 5 the New Mexico Oil Conservation Commission was reported by б و د ک me and that the same is a true and correct record of the said 7 dearniey-meier proceedings, to the best of my knowledge, skill and ability. 8 9 1-4 ŝ. 10 1. 6 Court Reporter 11 SPECIALIZING IN: DEFOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS 12 14 209 SIMMS BLDC. P.O. BOX 1002-PHONE 243-6691-ALBUQUERQUE. NEW MEXICO 87103 PIRST NATIONAL FANK BLDC. EAST-ALBUQUERQUE, NEW MEXICO 87108 . 13 1.8 14 1 : 15] ‡ 13 16 1.1 17 11 18 1 3 19 ì 20 1.5 21 1 20 2000 ĺ٤ 22 ÷ 144 4496 С., 23 71 40 24 .er Ľ m) Neu Lies 611 Compression 60 . intion 25



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO P. O. BOX 2088 · SANTA FE 87501 GOVERNOR BRUCE KING CHAIRMAN

LAND COMMISSIONER ALEX J. ARMIJO MEMBER

STATE GEOLOGIST A. L. PORTER, JR. SECRETARY – DIRECTOR

February 8, 1971

Mr. Jason Kellahin Kellahin & Fox Attorneys at Law Post Office Box 1769 Santa Fe, New Mexico Re: Case No. 4496 Order No. R-4098 Applicant: BTA Oil Producers

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours, a.L. Torler Ch.

A. L. PORTER, Jr. Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC × Artesia OCC × Aztec OCC

Other____

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

> CASE No. 4496 Order No. R-4098

APPLICATION OF BTA OIL PRODUCERS FOR A PRESSURE MAINTENANCE PROJECT, LEA AND ROOSEVELT COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on February 3, 1971, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 8th day of February, 1971, the Commission, a guorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, BTA Oil Producers, seeks authority to institute a pilot pressure maintenance project in the Vada-Pennsylvanian Pool by the injection of water into the Bough "C" zone of the Pennsylvanian formation through its 685 Ltd. Bond Well No. 5, located in the NW/4 SW/4 of Section 4, Township 9 South, Range 36 East, NMPM, Lea County, New Mexico.

(3) That the applicant further seeks a procedure whereby additional injection wells and the injection of air or gas may be approved administratively.

(4) That the proposed pilot pressure maintenance project is in the interest of conservation and may result in greater -2-CASE No. 4496 Order No. R-4098

ultimate recovery of oil from the subject pool, thereby preventing waste.

(5) That the proposed pressure maintenance project should be approved and an administrative procedure adopted for approval of additional injection wells and the injection of air or gas as well as water.

IT IS THEREFORE ORDERED:

(1) That the applicant, BTA Oil Producers, is hereby authorized to institute a pilot pressure maintenance project, designated the BTA Vada Bond Pressure Maintenance Project, in the Vada-Pennsylvanian Pool by the injection of water into the Bough "C" formation through its 685 Ltd. Bond Well No. 5, located in the NW/4 SW/4 of Section 4, Township 9 South, Range 36 East, NMPM, Lea County, New Mexico.

(2) That the Secretary-Director of the Commission is hereby authorized to approve additional injection wells in the area of the above-described 685 Ltd. Bond Well No. 5 and to authorize the injection of water, air, or gas into the Bough "C" zone of the Vada-Pennsylvanian Pool through such wells. To obtain such approval, the project operator shall file proper application with the Commission, which application shall include the following:

- (a) A plat showing the location of the proposed injection well, all wells within a radius of one mile of the proposed injection well, and offset operators.
- (b) A schematic drawing of the proposed injection well which fully describes the casing, tubing, perforated interval, and depth showing that the injection of water or air or gas will be confined to the Bough "C" zone of the Pennsylvanian formation.
- (c) A letter stating that all offset operators to the proposed injection well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection well if, within 20 days after receiving the application, no

-3-CASE No. 4496 Order No. R-4098

objection to the proposal has been received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

(3) That the subject pressure maintenance project shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations insofar as said rules are not inconsistent with this order.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO OIL CONSERVATION COMMISSION

ing

BRUCE KING, Chairman

Jr., Number & Secretary PORTER.



esr/



TENNECO OIL COMMANY + P. O. BOX 1031 + 1800 WILCO BUILDING + MIDLAND, TEXAS 79701

January 21, 1971

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New Maxico Gil Conservation Commission P. O. Box 2088 Santa Fe, New Mexico 87501

Gentlemen:

Tenneco 011 Company as an operator in the Vada and Bough Fields supports the application of BTA 011 Producers for approval to conduct a pilot pressure maintenance project in the Bough "C" formation of the Vada Trend in Lea and Roosevelt Counties, New Mexico.

We believe this project should contribute to increased recovery of oil reserves from the reservoir.

P

Yours very truly, 10/ J. McDonald `F.//

District Production Superintendent

WVP:gs

cc: BTA Ofl Producers 104 South Pecos Midland, Texas 79701

Blackrock Gil Company

1000 V & J TOWER - MIDLAND, TEXAS 79701 - 915 683-5691

January 25, 1971

O. DOYLE BUTLER President PEGGY L. HOLDEN Office Manager

NEW MEXICO OIL CONSERVATION COMMISSION P. O. Box 2088 Santa Fe, New Mexico 87501

Attention: Mr. Daniel S. Nutter

Re: Case No. 4496 Application of BTA Oil Producers For Approval of Pressure Maintenance Project, Lea & Roosevelt Counties, New Mexico

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Gentlemen:

This advises that Blackrock Oil Company does support BTA Oil Producers in their above mentioned applicaton for a Pressure Maintenance Project.

Should any further information be required, please advise.

Yours very truly,

BLACKROCK OIL COMPANY

Butler

ODB:jh

cc: Jerry I. Moritz BTA Oil Producers Midland, Texas 79701

Petroleum Engineering, Land and Management Consultants

TENNEC

TENNECO OIL COMPANY · P. O. BOX 1031 · 1800 WILCO BUILDING · MIDLAND, TEXAS 79701



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New Mexico Oil Conservation Commission P. O. Box 2088 Santa Fe, New Mexico 87501

Gentlemen:

Tenneco Oil Company as an operator in the Vada and Bough Fields supports the application of BTA Oil Producers for approval to conduct a pilot pressure maintenance project in the Bough "C" formation of the Vada Trend in Lea and Roosevelt Counties, New Mexico.

We believe this project should contribute to increased recovery of oil reserves from the reservoir.

Yours very truly, 10 a J. McDonald

District Production Superintendent

WVP:gs

cc: BTA Oil Producers 104 South Pecos Midland, Texas 79701
ROGER C. HANKS 2100 WILCO BUILDING P. O. BOX 554 MIDLAND, TEXAS 79701

February 5, 1971

Oìl Conservation Commission P. O. Box 1148 Santa Fe, New Mexico

Gentlemen:

Ant Core file - Core 4496

We fully support BTA Oil Producers' application to conduct a pilot pressure maintenance project in the Bough "C" formation of the Vada Trend, Lea and Roosevelt Counties, New Mexico.

Very truly yours

RCH:bb

Examiner Hearing - February 6, 1914

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5	CASE	449

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Application of BTA cill inclusions for a pressure maintenance project, Lea and Roosevelt Countries, New Mexice. Applicant, in the abovestyled cause, seeks authority to institute a pilot pressure maintenance project in the Vada Pernsylvasian Pool by the injection of water into the Bough "C" formation in its 685 btd. Bond Well No. 5 located in the SW/4 of Section 4, Tewnship 9 South, Range 36 East, Lea County, New Mexico. Applicant further seeks the designation of a project area and the promulgation of rules for the project including a procedure whereby additional injection wells and the injection of air or gas may be approved administratively.

CASE 4486 (Continued and Readvertised):

Application of Continental Gil Company for a waterflood expansion, a dual completion, and lease commingling, Lea County, New Mexico, Applicant, in the above-styled cause, seeks authority to expand its Langlie-Mattix Jack A-29 waterflood project, Langlie-Mattix Pool, Lea County, New Mexico, to include the NW/4 NE/4 of Section 29, Township 24 South, Range 37 East, prior to said tract being offset by an injection well. Applicant also proposes to drill and dually complete a well in the SW/4 NE/4 of said Section 29 in such a manner as to produce gas from the Jalmat Gas Pool and inject water into the Langlie-Mattix Pool as an additional injection well. Applicant further seeks authority to commingle the Langlie-Mattix production from its Jack A-29 and Jack B-29 leases (both in the proposed project area) allocating production by the subtraction method after separately metering production from the Jack A-29 Lease.

CASE 4497: Application of Twinlakes Oil Company for special pool rules and a nonstandard proration unit, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special rules for the Twin Takes-San Andres Pool, Chaves County, New Mexico, including provisions for the classification of oil and gas wells, spacing for oil and gas wells, and a limiting gas-oil ratio of 4000 to one. Applicant further seeks the establishment of a 160-acre non-standard Twin Lakes-San Andres gas proration unit comprising the W/2 W/2 of Section 36, Township 8 South, Fange 28 East.

CASE 4491: (Continued from the January 13, 1971, Examiner Hearing)

In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit W. C.Welch and all other interested persons to appear and show cause why his State Well No. 1 located 660 feet from the South and West lines of Section 28, Township 2 South, Range 26 East, De Baca County, New Mexico, should not be plugged and abandoned in accordance with a Commission-approved plugging program.

CASE 4492: (Continued from the January 13, 1971, Examiner Hearing) In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Norman K. Jones and all other interested persons to appear and show cause why his State A Well No. 1 located in the NE/4 SE/4 of Section 16, Township 30 South, Range 14 West, Hidalgo County, New Mexico, should not be plugged and abandoned in accordance with a Commission -approved plugging program.

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICC FOR THE PURPOSE OF CONSIDERING:

> CASE No. 4496 Order No. R-4098

APPLICATION OF BTA OIL PRODUCERS FOR A PRESSURE MAINTENANCE PROJECT, LEA AND ROOSEVELT COUNTIES, NEW MEXICO.

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NOW, on this 8th day of February, 1971, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

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(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, BTA Oil Producers, seeks authority to institute a pilot pressure maintenance project in the Vada-Pennsylvanian Fool by the injection of water into the Bough "C" zone of the Pennsylvanian formation through its 685 Ltd. Bond Well No. 5, located in the NW/4 SW/4 of Section 4, Township 9 South, Range 36 East, NMPM, Lea County, New Mexico.

(3) That the applicant further seeks a procedure whereby additional injection wells and the injection of air or gas may be approved administratively.

(4) That the proposed pilot pressure maintenance project is in the interest of conservation and may result in greater -2-CASE No. 4496 Order No. 8-4098

ultimate recovery of oil from the subject pool, thereby preventing waste.

(5) That the proposed pressure maintenance project should be approved and an administrative procedure adopted for approval of additional injection wells and the injection of air or gas as well as water.

IT IS THEREFORE ORDERED:

(1) That the applicant, BTA Oil Producers, is hereby authorized to institute a pilot pressure maintenance project, designated the BTA Vada Bond Pressure Maintenance Project, in the Vada-Pennsylvanian Pool by the injection of water into the Bough "C" formation through its 685 Ltd. Bond Well No. 5, located in the NW/4 SW/4 of Section 4, Township 9 South, Range 36 East, NMPM, Lea County, New Mexico.

(2) That the Secretary-Director of the Commission is hereby authorized to approve additional injection wells in the area of the above-described 685 Ltd. Bond Well No. 5 and to authorize the injection of water, air, or gas into the Bough "C" zone of the Vada-Pennsylvanian Pool through such wells. To obtain such approval, the project operator shall file proper application with the Commission, which application shall include the following:

- (a) A plat showing the location of the proposed injection well, all wells within a radius of one mile of the proposed injection well, and offset operators.
- (b) A schematic drawing of the proposed injection well which fully describes the casing, tubing, perforated interval, and depth showing that the injection of water or air or gas will be confined to the Bough "C" zone of the Pennsylvanian formation.
- (c) A letter stating that all offset operators to the proposed injection well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection well if, within 20 days after receiving the application, no

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objection to the proposal has been received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

(3) That the subject pressure maintenance project shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations insofar as said rules are not inconsistent with this order.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

A. L. PORTER, Jr., Member & Secretary

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BTA OIL Producers 685 Bond Lease Vada Pool 6 Wells



BTA 011 producers 685 Northcolt Lence Vada Pool 2 Wells







BTA OI1 Producer: 687 Davis Lense Vada Pool 1 Well







BTA Oil Producers 691 Cash Lease Vada Pool

BTA Oil Producers 685 Oliver Leare Vada Pool 1 Well



- RTA OIT Freducers -656 RGU Lease -Vade Pool 1 Well



BTA Oil Producers 686 Hanagan Lease Vada Pool 1 Wetl







BPA OIL Producer: CS7 Redd Less Lense Vada 17251 1 2011







BTA Oil Producers 686 Walker Lease Vada Pool 1 Well



BTA Oil Producers Project Area Performance Vada Pool Total 20 Wells



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CASE NO. 4496





PTA OIL PRODUCERS PILOT PRESSURE MAINTENANCE PROJECT VADA PENN POOL

SUMMARY OF RESERVOIR RECOVERIES

19,860,500 Bbls
11,916,300 Bbls 7,944,200 Bbls
6,620,200 Bbls 7,919,600 Bbls
3,046,300 Bbls 152,300 Bbls 5,518,960 Bbls 275,900 Bbls
46% 69%
1,389,850 Bbls 70,000 Bbls Per Well

BEFORE EXAMINER NUTTER
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EXHIBIT 20 Case NO. 4496

Packard House 1997



United States Department of the Interior

GEOLOGICAL SURVEY

P. O. Box 1157 Hobbs, New Mexico 88240

January 25, 1971

BTA Oil Producers 104 South Pecos Midland, Texas 79701

Attention: Mr. Jerry I. Moritz

Gentlemen:

Your letter of January 19 requests approval to institute a pilot pressure maintenance project in the Vada Pennsylvanian pool by the injection of water into the Bough "C" formation in well No. 5 Bond 685 Ltd. in the NWASWA sec. 4, T. 9 S., R. 36 E., Lea County, New Mexico, lease New Mexico 0449694-C.

The plan you propose for a pilot pressure maintenance project, by injection of water into the Bough "C" formation, lease New Mexico 0449694-C, is satisfactory to this office and is hereby approved.

Appropriate notices to convert the existing well to water injection should be submitted for approval prior to commencing the work. Duplicate copies of a monthly progress report should be submitted showing the volume of water injected and average pressures for each injection well and monthly oil and water production for the producing wells in the project area.

Approval of this project by the New Mexico Oil Conservation Commission pursuant to Rule 701 is also required.

Sincerely yours,

Arthur R. Brown District Engineer

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EXHIBIT 21 CASE NO. 4496 BEFORE THE OIL CONSERVATION COMMISSION

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STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF BTA OIL PRODUCERS FOR APPROVAL OF A PILOT PRESSURE MAINTENANCE PROJECT, LEA AND ROOSEVELT COUNTIES, NEW MEXICO

APPLICATION

Comes now BTA Oil Producers and applies to the Oil Conservation Commission of New Mexico for approval of a <u>pilot pressure maintenance project in the Vada Pennsylvanian</u> Pool under the provisions of Rule 701 D of the Commission's Rules and Regulations, with suitable provision for establishment of a project area, assignment of allowable, and operation of the project, and provision <u>for approval of</u> conduct of the project by an administrative proceeding, as hereinafter stated, and in support thereof would show the Commission:

1. Applicant proposes to establish a pressure maintenance project consisting of the following described lands: <u>Township 8 South, Range 36 East, N.M.P.M., Roosevelt County</u>

Section 33 - S/2

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Township 9 South, Range 36 East, N.M.P.M., Lea County

Section 4 - All Section 5 - All Section 6 - All Section 8 - All Section 7 - E/2Section 9 - N/2, SW/4

2. Applicant is the operator of the properties in the above-described area, insofar as the proposal in this application is concerned.

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3. Applicant proposes to convert its 685 Ltd. Bond No. 5 well, located in the SW/4 of Section 4, Township 9 South, Range 36 East, N.M.P.M., to an injection well for the purpose of injecting water into the Bough C formation. Initial injection fluid will be produced Bough C water. Injection will be through tubing, under a packer.

4. Applicant further seeks designation of the area as a project area, with suitable provision for the assignment of allowables, as provided by Rule 701 D.

5. Applicant further seeks an administrative procedure whereby it may add additional injection wells, change injection wells to producing wells, or convert producing wells to injection, and for an administrative procedure whereby it may change or add injection fluids, to permit the injection of water, gas or air, into the Bough C formation.

6. Approval of this application will enable applicant to evaluate the feasibility of pressure maintenance in the Bough C formation, Vada Pennsylvanian Pool, will prevent possible waste, and correlative rights of operators, both within and adjacent to the project area will be protected.

WHEREFORE Applicant prays that this application be set for hearing before the Commission's duly appointed examiner on February 3, 1971, and that after notice and hearing as required by law, the Commission issue its order approving the pressure maintenance project as prayed for.

Respectfully submitted,

BTA OIL PRODUCERS

W. Kellahi an Kellahin & Fox Attorneys for Applicant P. O. Box 1769 Santa Fe, New Mexico 87501

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GMH/esr	
2-4-71	BEFORE THE OUL CONSERVATION COMMISSION
\bigcirc	OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

4496 CASE No.

Order No. R

APPLICATION OF BTA OIL PRODUCERS FOR A PRESSURE MAINTENANCE PROJECT LEA AND ROOSEVELT COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on <u>February 3</u>, 1971, at Santa Fe, New Mexico, before Examiner <u>Daniel S. Nutter</u>.

NOW, on this _____ day of <u>February</u>, 1971, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, BTA Oil Producers, seeks authority to institute a pilot pressure maintenance project in the Vada-Pennsylvanian Pool by the injection of water into the Bough "C" zone of the Pennsylvanian formation through its 685 Ltd. Bond Well No. 5, located in the NW/4 SW/4 of Section 4, Township 9 South, Range 36 East, NMPM, Lea County, New Mexico.

(3) That the applicant further seeks a procedure whereby additional injection wells and the injection of air or gas may be approved administratively.

(4) That the proposed pilot pressure maintenance project is in the interest of conservation and may result in greater -2-CASE No. 4496

ultimate recovery of oil from the subject pool, thereby preventing waste.

(5) That the proposed pressure maintenance project should be approved and an administrative procedure adopted for approval of additional injection wells and the injection of air or gas as well as water.

IT IS THEREFORE ORDERED:

(1) That the applicant, BTA Oil Producers, is hereby authorized to institute a pilot pressure maintenance project, designated the <u>BTH Vada BOad</u> Pressure Maintenance Project, in the Vada-Pennsylvanian Pool by the injection of water into the Bough "C" formation through its 685 Ltd. Bond Well No. 5 located in the NW/4 SW/4 of Section 4, Township 9 South, Range 36 East, NMPM, Lea County, New Mexico.

(2) That the Secretary-Director of the Commission is hereby authorized to approve additional injection wells in the area of the above-described 685 Ltd. Bond Well No. 5 and to authorize the injection of water, air, or gas into the Bough "C" zone of the Vada-Pennsylvanian Pool through such wells. To obtain such approval, the project operator shall file proper application with the Commission, which application shall include the following:

- (a) A plat showing the location of proposed injection well, all wells within a radius of one mile of the proposed injection well, and offset operators.
- (b) A schematic drawing of the proposed injection well which fully describes the casing, tubing, perforated interval, and depth showing that the injection of water or air or gas will be confined to the Bough "C" zone of the Pennsylvanian formation.

-3-CASE No. 4496

> (c) A letter stating that all offset operators to the proposed injection well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection well if, within 20 days after receiving the application, no objection to the proposal has been received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

(3) That the subject pressure maintenance project shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations insofar as said rules are not inconsistent with this order.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.