Case No.

922

Application, Transcript,
Small Exhibits, Etc.

922: Application of Lowry et al
ing Account for extension of its
maintenance program in South-
Tocito Pool.

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

July 18, 1955

COPY

Mr. James W. Kellahin
P.O. Box 597
Santa Fe, New Mexico

Dear Mr. Kellahin:

In behalf of your client, Lowry, et al, Operating Account, we enclose a copy of Order R-664 issued in Case 922.

Very truly yours,

W. B. Macey
Secretary - Director

WBM:brp
encl.

BROOKHAVEN OIL COMPANY
FIRST NATIONAL BANK BUILDING
(MAIL) P. O. BOX 644
Albuquerque, New Mexico
PHONE 7-8843 TELETYPE AQ-96

June 13, 1955.

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: CASE NO. 922
Regular Hearing June 28, 1955.

Gentlemen:

For reasons expressed by testimony and in writing in previous Case No. 697, Order R-532, pertaining to the Tocito Pool in Township 26 North, Range 6 West, the undersigned object to Lowry et al Operating Account petitioning to use as an injection well, a well which they intend to drill to the Tocito formation for production. This matter should be determined after the well is drilled and not at the present time.

Very truly yours,

BROOKHAVEN OIL COMPANY
DACRESA CORPORATION

Thomas B. Scott

President

TBS:ms

BROOKHAVEN OIL COMPANY
FIRST NATIONAL BANK BUILDING
(MAIL) P. O. BOX 644
Albuquerque, New Mexico
PHONE 7-8853 TELETYPE AQ-96

June 13, 1955.

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: CASE NO. 922
Regular Hearing June 28, 1955.

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BROOKHAVEN OIL COMPANY
DACRESA CORPORATION

Thomas B Scott
President

TBS:ms

Lowry et al
Ex. No. 3
Case 922

SOUTH BLANCO TOCITO POOL

Lowry Operated Properties

March 1 to May 31, 1955

	Oil Production - Bbls.		Gas Production - MCF			Water Production		
	Month	Daily Avg.	Month	Daily Avg.	GOR	Month Bbls.	Daily Avg.-Bbls.	Per Cent
March, 1955	36,895	1190	60,020	1936	1627:1	3051	98	7.6
April, 1955	30,838	1028	58,659	1955	1902:1	3425	114	10.0
May, 1955	35,233	1137	71,241	2298	2022:1	6764	218	16.1

Daily average oil production past three months = 1,119 barrels
Daily average gas production past three months = 2,064 MCF
Daily average water production past three months = 144 barrels

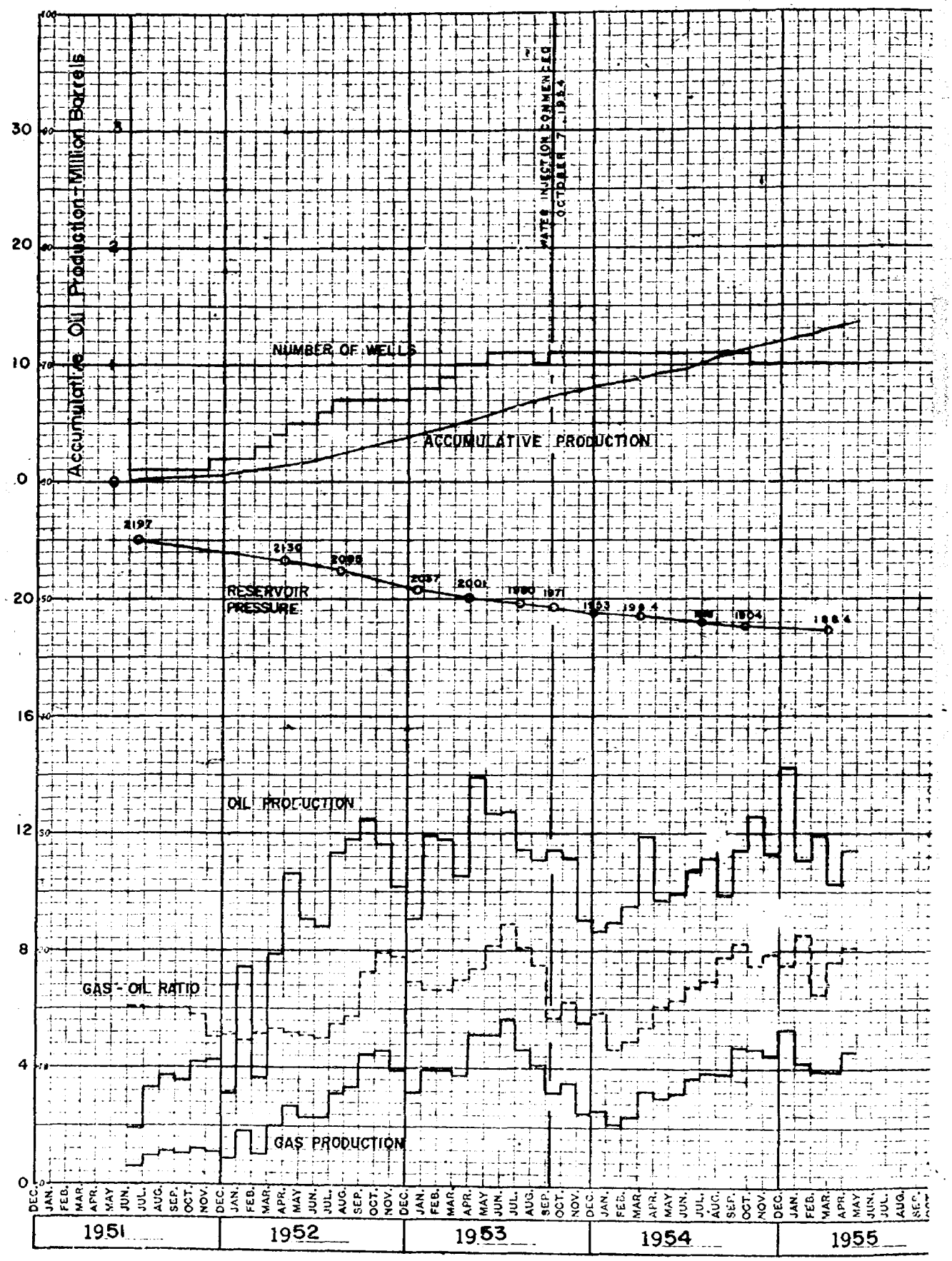
Cumulative oil production 6/1/55 = 1,368,881 barrels
Cumulative gas production 6/1/55 = 2,295,998 MCF
Cumulative water production 6/1/55 = 22,648 barrels

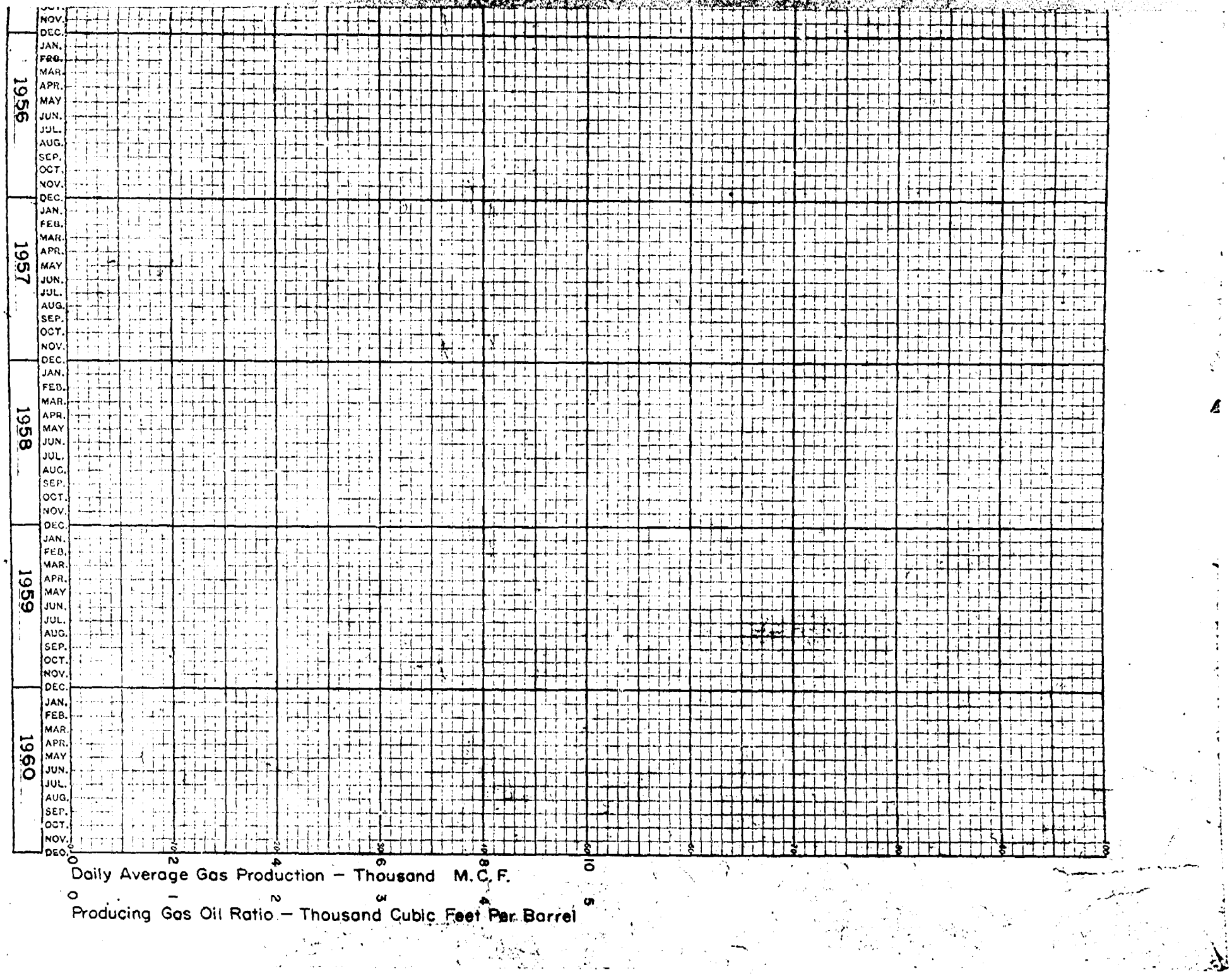
Well Status:

Water injection wells	2
Producing oil wells	9
Shut in gas or oil wells	2
Total	13

Daily average oil production per well past three months = 86 barrels

LOWRY OPERATED PROPERTIES
SOUTH BLANCO TOCITO POOL
Rio Arriba County, N.M.

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Daily Average Gas Production — Thousand M.C.F.
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Producing Gas Oil Ratio — Thousand Cubic Feet Per Barrel

Lowry Ltd
Ex No. 6
Case 922

LOWRY OPERATIONS - SOUTH BLANCO TOCITO POOL

PRODUCING GAS-OIL RATIO DATA

(1) Wells in Pilot Pressure Maintenance Area

	T-109	T-132	T-157	T-182	T-207
			Before Pressure Maintenance		
July, 1953	2219:1	1597:1	1638:1	5470:1	2213:1
August, 1953	2280:1	1548:1	1339:1	5405:1	2362:1
September, 1953	2463:1	1745:1	1497:1	S.I.	2399:1
			After Pressure Maintenance		
March, 1955	813:1	1186:1	810:1	907:1	653:1
April, 1955	995:1	849:1	800:1	800:1	783:1
May, 1955	1479:1	815:1	800:1	800:1	706:1

(2) Wells Remote to Pilot Pressure Maintenance Area

	T-125	T-127	T-129	T-177	T-179
			Before Pressure Maintenance		
July, 1953	Comp.	883:1	1173:1	4530:1	1271:1
August, 1953	Oct.,	988:1	1129:1	4128:1	1133:1
September, 1953	1953	1076:1	1230:1	4497:1	1587:1
			After Pressure Maintenance		
March, 1955	5086:1	3165:1	830:1	Well	5256:1
April, 1955	5531:1	3219:1	748:1	Shut	5595:1
May, 1955	4540:1	3459:1	800:1	In	4830:1

Lowry Jr et
Ex no. 7
Case no. 922

LOWRY OPERATIONS - SOUTH BLANCO TOCITO POOL

Bottomhole Pressure - Oil Production Data

(1) Wells in Pilot Pressure Maintenance Area

Before Pressure Maintenance						After Pressure Maintenance					
Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production, Bbls.	Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production, Bbls.
T-109	5/1/52	2108	1,642	126	35,086	T-109	10/5/53	1828	36,728		
	10/5/53	1828	36,728				4/4/55	1831	77,037	Pressure Increased	
T-132	12/17/51	2125	4,120	374	79,741	T-132	10/5/53	1912	83,861	1,141	67,319
	10/5/53	1912	83,861				4/4/55	1853	151,180		
T-157	3/20/52	2123	497	475	114,029	T-157	10/5/53	1883	114,526	Pressure Increased	32,685
	10/5/53	1883	114,526				10/27/54	1975	146,211		
T-182	6/5/52	2108	697	400	74,469	T-182	10/7/53	1982	75,166	642	13,483
	10/7/53	1982	75,166				10/27/54	1901	88,649		
T-207	8/2/52	2111	239	405	83,036	T-207	10/7/53	1906	83,275	1,431	92,449
	10/7/53	1906	83,275				4/4/55	1844	175,724		

LOBBY OPERATIONS - SOUTH BLANCO TOCITO POOL (cont.)

Bottomhole Pressure - Oil Production Data

(2) Wells Remote to Pilot Pressure Maintenance Area

Before Pressure Maintenance						After Pressure Maintenance					
Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production, Bbls.	Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production, Bbls.
T-125						T-125	10/19/53	2108	153		
							4/ 5/55	1954	57,557	373	57,404
T-127	4/28/53	2106	771			T-127	10/5 /53	2070	26,711		
	10/ 5/53	2070	26,711	683	25,940		4/ 5/55	1981	128,611	685	102,000
T-129	1/12/53	2111	107			T-129	10/ 7/53	1989	45,383		
	10/ 7/53	1989	45,383	371	45,276		4/ 5/55	1875	162,567	1,028	117,184
T-177	3/15/53	2091	466			T-177	10/ 7/53	2004	31,060	**	
	10/ 7/53	2004	31,060	357	30,594		4/ 4/55	1912	37,693	72	6,633
T-179	7/26/51	2197	3,924			T-179	10/19/53	1963	209,493		
	10/19/53	1963	209,493	879	205,569		4/ 5/55	1896	272,487	940	62,994

** Well has been shut in because of high GOR. Last oil production February, 1954.

Laury Lse
Ext No. 3
Case 922

SOUTH BLANCO TOCITO POOL

Laury Operated Properties

March 1 to May 31, 1955

	Oil Production - Bbls.		Gas Production - MCF			Water Production		
	Month	Daily Avg.	Month	Daily Avg.	GOR	Month Bbls.	Daily Avg. Bbls.	Per Cent
March, 1955	36,895	1190	60,020	1936	1627:1	3051	98	7.6
April, 1955	30,830	1028	58,659	1955	1902:1	3425	114	10.0
May, 1955	35,233	1137	71,241	2298	2022:1	6764	218	16.1

Daily average oil production past three months = 1,119 barrels
Daily average gas production past three months = 2,364 MCF
Daily average water production past three months = 144 barrels

Cumulative oil production 6/1/55 = 1,368,881 barrels
Cumulative gas production 6/1/55 = 2,295,998 MCF
Cumulative water production 6/1/55 = 22,648 barrels

Well Status:

Water injection wells	2
Producing oil wells	9
Shut in gas or oil wells	2
Total	13

Daily average oil production per well past three months = 86 barrels

Lowry et al
Ex. No. 6
Case 922

LOWRY OPERATIONS - SOUTH BLANCO TOCITO POOL

PRODUCING GAS-OIL RATIO DATA

(1) Wells in Pilot Pressure Maintenance Area

	T-209	T-132	T-157	T-182	T-207
			Before Pressure Maintenance		
July, 1953	2219:1	1597:1	1638:1	5470:1	2213:1
August, 1953	2280:1	1546:1	1339:1	5405:1	2362:1
September, 1953	2463:1	1746:1	1497:1	S.I.	2399:1
			After Pressure Maintenance		
March, 1955	813:1	1186:1	830:1	907:1	653:1
April, 1955	995:1	849:1	800:1	880:1	783:1
May, 1955	1479:1	815:1	800:1	800:1	706:1

(2) Wells Remote to Pilot Pressure Maintenance Area

	T-125	T-127	T-129	T-171	T-172
			Before Pressure Maintenance		
July, 1953	Comp.	883:1	1173:1	4630:1	1271:1
August, 1953	O.t.,	988:1	1129:1	4128:1	1133:1
September, 1953	1953	1076:1	2230:1	4497:1	1587:1
			After Pressure Maintenance		
March, 1955	5086:1	3165:1	830:1	Well	5256:1
April, 1955	5531:1	3219:1	748:1	Shut	5595:1
May, 1955	4640:1	3459:1	800:1	In	4830:1

Lowry et al
Ex No. 4
Case 922

SOUTH BIANCO TOCITO POOL

Water Injection Operations - Lowry Properties

March 1, 1955 to May 31, 1955

	Water Injected - Bbls.			Water Prod. Bbls.	Net Water Injected - Bbls.		
	Month	Daily Avg.	Cumulative		Month	Daily Avg.	Cumulative
Inception to 3/1/55			780,696	9,408			771,288
March, 1955	47,411	1529	828,107	3,051	44,360	1431	815,648
April, 1955	57,991	1933	886,098	3,425	54,566	1819	870,214
May, 1955	65,862	2125	951,960	6,764	59,098	1906	929,312

Average daily water injected past three months = 1,862 barrels

Average daily water produced past three months = 144 barrels

Average daily net water injected past three months = 1,718 barrels

Lowry et al
Ex No. 5
Case No. 922

SOUTH BLANCO TOCITO POOL

Reservoir Voidage - Lowry Properties

March 1, 1955 to May 31, 1955

	Daily Avg. Oil Production, Bbls.	Producing GOR	Daily Gross Reservoir Voidage, Bbls.	Daily Avg. Water Inj. Bbls.	Daily Net Voidage, Bbls.
March, 1955	1,190	1687:1	3,294	1,529	1,765
April, 1955	1,088	1902:1	3,285	1,933	1,352
May, 1955	1,137	2022:1	3,925	2,125	1,800

BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

June 23, 1955

IN THE MATTER OF:

CASE NO. 922

TRANSCRIPT OF PROCEEDINGS

ADA DEARNLEY AND ASSOCIATES

COURT REPORTERS

605 SIMMS BUILDING

TELEPHONE 3-6691

ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 28, 1955

IN THE MATTER OF:

Application of Lowry et al Operating Account for approval of an extension of its pressure maintenance program in the South Blanco-Tocito Pool, Rio Arriba County, New Mexico, to permit the drilling of an additional well to be located in the NW/4 SE/4 Section 4, Township 26 North, Range 6 West; said well to be used as an injection well in the event it is not a commercial producer in the Tocito formation. Case No. 922

BEFORE:

Honorable John F. Simms
Mr. E. S. (Johnny) Walker
Mr. William B. Macey

TRANSCRIPT OF HEARING

MR. MACEY: The next case on the docket is Case 922. Mr. Kellahin?

MR. KELLAHIN: Jason Kellahin, appearing for Lowry Oil Company in Case 922. Before we put on our testimony I would like to make a brief statement to the Commission, if I may? This is an application for an extension of the pressure maintenance program which has heretofore been approved by the Oil Conservation Commission. In connection with the case, we felt that the Commission was entitled to information in regard to the progress of this pressure maintenance program, it being a unique program in the State of New Mexico.

In the past we have offered considerable testimony, both

engineering and geological testimony in other cases, in an effort to make a full and complete disclosure to the Commission of all the information which is available to Lowry Oil Company, rather than attempt to review the testimony at this time, and a portion of it is essential to our case before the Commission today. We would ask that the Commission take notice of the testimony and exhibits offered by Lowry Oil Company in Cases Nos. 537, 555, 607 and 697.

While the testimony we are offering today we feel amply supports the order which we are seeking, and the case will stand on its own merits, of course, we do feel that a consideration of the full information is advantageous to the Commission. That is the reason we ask that the Commission take notice of this testimony. The information which we offer today will, we believe, both enlighten the Commission and give them some information on the progress of this pressure maintenance program, and also show the necessity for an extension of it at this time. We will have one witness, Mr. Art Holland.

MR. MACEY: Do you wish this witness sworn also for Case 923?

MR. KELLAHIN: We might as well, and just proceed right into it.

MR. MACEY: Let the record show that Mr. Holland has been sworn for testimony in both cases.

MR. KELLAHIN: We are not consolidating the cases.

MR. MACEY: That is right.

A. F. HOLLAND,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. KELLAHIN:

Q Would you state your name, please?

A My name is A. F. Holland.

Q By whom are you employed?

A I am employed by the Lowry Oil Company.

Q What is your position with Lowry Oil Company?

A I am employed as a Petroleum Engineer.

Q Have you testified as an expert, as a petroleum engineer before this Commission in the past, and had your qualifications accepted?

A I have.

MR. KELLAHIN: Are the witnesses qualifications acceptable to the Commission?

MR. MACEY: They are.

Q Mr. Holland, you are representing the applicant in Case 922. Would you state briefly what the application is?

A The purpose of the application is to add an injection well to the pressure maintenance project being operated by the Lowry et al Operating Account in the South Blanco-Tocito Pool.

Q Have you prepared a plat showing the location of that well?

A A plat has been prepared and is marked Exhibit No. 1, showing among others, the following items. The acreage colored in yellow is that operated by Lowry; No. 2, the dashed line represents the presently defined limit of the South Blanco-Tocito Pool, that is the New Mexico Oil Conservation Commission delineation. No. 3, it shows the present wells in the field that are being utilized for water injection.

Q How are those wells shown?

A They are designated by a red circle. Well T-85 is one, located in Section 4. Well T-134 is the other located in Section 10.

Q Where is the location of the proposed injection well?

A The proposed injection well is located in the northwest quarter of Section 4, Township 26 North, Range 6 West.

Q How is it shown on the plat?

A It is indicated by a green circle.

Q What is the status of that well at the present time?

A The well at the present time is nearing completion. The status yesterday was that the Tocito Formation was being cored.

Q Is that core information available to you as yet?

A It is not yet available.

Q Why did you select that location, Mr. Holland?

A The location was selected for several reasons; one being that it is low on structure to the Tocito Formation, another reason is that between the present wells being used for water injection there is a space there where no well had been drilled, and we considered further water injection without injection in that point would possibly trap oil. For that reason it was considered necessary to add an additional injection well.

Q How will that well be completed?

A The well will be drilled to total depth, and casing run to total depth, and perforated opposite the Tocito Formation.

Q Mr. Holland, have you prepared a contour map showing the contour of the Tocito Formation in the area involved?

(Marked Lowry's Exhibit No. 2, for identification.)

A A contour plat is hereby submitted as Exhibit No. 2, which shows the location of the Well T-87, and it shows that the well is low to structure and will probably be one of the lowest wells that has been drilled in the South Blanco Field.

Q Does that contour map show any other information that would be of value to the Commission at this time?

A It shows the structural relation of all the presently producing wells in the pool. It shows the structural position of the wells being used now for water injection.

(Marked Lowry's Exhibit No. 3, for identification.)

Q Now, referring to what has been marked as Exhibit No. 3, Mr. Holland, would you state what that is?

A Exhibit No. 3 is a statement of the Lowry operations in the South Blanco-Tocito Pool, as regards oil production for the past three months. In addition, a graph is attached which describes or outlines those operations since inception of the pool.

Q Referring to that portion of the exhibit which shows oil production during the past three months, what does that reflect in connection with the gas-oil ratios?

A It shows that the gas-oil ratios for the Lowry properties have increased. By referring to the graph it can be seen that gas-oil ratios have been arrested since the institution of the pressure maintenance project and that even with some control there have been increases. At the present time the ratio is, roughly, 2,000 cubic feet per barrel.

Q You say it shows that the gas-oil ratios have increased? You mean by that that they have increased during recent months, or

during the operation of the pressure maintenance program as a whole? Would you clarify that, please?

A The gas-oil ratio, the producing gas-oil ratio for the pool was relatively high. By that, I mean, around 2,000 to 1 at the commencement of the project. After the project had been in operation for several months, gas-oil ratios declined to, oh, something in the neighborhood of 1,200 cubic feet per barrel. Since that time, as production has proceeded, the gas-oil ratio for the pool has gradually increased.

Q What does the Exhibit show, in relation to pressures, as compared to your daily average production?

A It shows that prior to the water injection program, that the average reservoir bottom hole pressure had a rather steep decline. Since commencement of the project the average bottom hole pressure has been retarded. It has not been completely arrested, but the decline has been retarded.

Q The Exhibit does reflect that the gas-oil ratios have been controlled also, does it not?

A They have been aided.

Q Have they been controlled or benefitted to the extent that you believe possible?

A Taking into consideration the present number of injection wells, yes.

Q Would an additional injection well for the injection of water be of benefit in that regard?

A We believe it will. It will disburse the water injection, and we will be able to inject additional water, and attempt to

maintain reservoir pressures, and thereby arrest any increase in gas-oil ratios.

(Marked Lowry's Exhibit No. 4, for identification.)

Q Referring to Exhibit No. 4, Mr. Holland, what does that exhibit show?

A Exhibit No. 4 is a statement of the amounts of water that have been injected during the past three months period, to the South Blanco Project. Also attached is a graph showing the water injection operations in total, since inception of the pressure maintenance program.

Q Is that Exhibit based on the same information which you file regularly with the Commission?

A Yes. All of that information is filed monthly.

Q What does it show in regard to the water injection per day and the accumulative total?

A During the past three months an average of 1,718 barrels per day have been injected. Since inception, to May 31, 1955, 951,960 barrels of water has been injected in the pool.

(Marked Lowry's Exhibit No. 5, for identification.)

Q Do you have an exhibit which shows the affect of that water injection upon the reservoir voidage?

A Exhibit No. 5 shows the degree to which injection of water has balanced production from the reservoir. In summary, the materials were moved from the reservoir, have voided a space of approximately 4,000 barrels per day. Roughly, half of that has been replaced by injected water, leaving a balance of 2,000 barrels per day of reservoir voidage. Approximately half of the reservoir

voidage has been balanced by water injection.

(Marked Lowry's Exhibit No. 6, for identification.)

Q Referring to Exhibit No. 6, Mr. Holland, what is that designed to show?

A Exhibit No. 6 is a statement of the producing gas-oil ratios for the well operated by Lowry in the South Blanco-Tocito Pool. It divides the project into two areas; one which is an area surrounding the initial water injection well, T-134 which has approximately 20 months of water injection history. For those wells it shows in all cases that prior to water injection operations, the gas-oil ratios were high. The last three months or the past three months of this year, it shows that the gas-oil ratios for the same wells have been materially reduced. For most of the wells they are producing at solution gas-oil ratios values. ... One well, the gas-oil ratios has been decreased from 2,463 to 1, to 1479 to 1.

Q What well is that?

A T-109.

Q What has been the effect of the water flood program on Well T-182?

A It had a gas-oil ratio in excess of 5,000 cubic feet per barrel prior to the water injection operation. The well now with a ratio of 800 cubic feet per barrel, approximately solution gas.

Q What has been the effect on the wells more remotely located in the pool from your injection wells?

A All of the wells, with the exception of T-129 have increased in gas-oil ratios. The exhibit is self-explanatory. For instance, Well T-127 had a gas-oil ratio before the project was started, of

1,076 to 1. It now has a producing gas-oil ratio of 3,459 to 1, indicating that the well has not been influenced by water injection. Well T-129, which offsets the second water injection well added to the program, is now being influenced by water injection. The ratio of that well has decreased from 1,230 cubic feet per barrel to 800 cubic feet per barrel.

Q Does that reflect the need for increasing the water injection?

A It shows that wells that have not been influenced by water injection have increasing gas-oil ratios, resulting in low oil recovery efficiency. See, Exhibit No. 2, the contour map will reflect there is a gascap in existence for the pool, and it seemingly means that the gascap is expanding, is not being controlled as much as desirable, and is causing increasing gas-oil ratios.

(Marked Lowry's Exhibit No. 7, for identification.)

Q Have you prepared an exhibit to show bottomhole pressure tests?

A I would like to add to this, that wells in the area of the water injection wells, are showing decreased gas-oil ratios. The overall reservoir picture shows an increasing gas-oil ratio history. For that reason, we desire to influence more wells and maintain more gas-oil ratios on an overall reservoir basis.

Q How can that best be done?

A By additional water injection.

Q Would it be possible to increase the water injection in the present wells now used for injection purposes, and accomplish that result?

A We haven't so far. We have injected about all that they are

capable of taking.

Q Then, an additional well is needed?

A We will have to disperse the water injection in addition to that.

Q Have you prepared an Exhibit showing bottomhole pressure tests?

A Exhibit No. 7 is a record of bottomhole pressure tests, by individual wells, prior to the commencement of the pressure maintenance program and subsequent to the program. Page 1 of that Exhibit lists the wells in the area of the Pilot Program again, and it shows that in all cases that the oil production per change in bottomhole pressure has increased.

Q You mean per pound of change?

A Per pound of change.

Q Yes.

A Two wells have shown increases in pressure, therefore, their oil production per pound of change would be infinite, which is meaningless, but the other wells, for instance T-132 has increased from 374 barrels per pound drop to 1,141 barrels per pound drop. The other wells show like increases. Page 2 lists the wells that have not been influenced by water injection with the exception of Well T-129 again. This data reflects that the oil production per pound change in bottomhole pressure is relatively stable. Our conclusions from this are that water injection has benefitted a large number of wells of the pool, and is materially aiding in increasing ultimate oil recovery.

Q Are all these wells that you have referred to by number shown on Exhibit No. 1, Mr. Holland, so that the Commission could locate them?

A They are posted. Exhibit No. 1 is a plat showing all the producing wells of the South Blanco-Tocito Pool.

MR. KELLAHIN: At this time we offer Applicant's Exhibits 1 through 7, inclusive.

MR. MACEY: Without objection they will be received.

Q Mr. Holland, based on your study of the pressure maintenance program, do you consider it a successful program at this time?

A All of the information that we have been able to assemble to date indicates to us that it is a successful program, and that it will materially increase oil recoveries from the South Blanco-Tocito Pool. The exhibits reflect that without some artificial restoration of energy that recoveries from the field will be low. That is, gas-oil ratios, early in the depletion life of wells has increased to values in excess of five and ten thousand cubic feet per barrel, which indicate low gas recovery efficiency, and, therefore, it was necessary to do something to improve that situation. All of the information we have assembled to date indicates that the water injection operation is successful; for that reason we are asking to enlarge the program and inject more water.

Q In your opinion, is the approval of the enlargement of the program in the injection of more water necessary to the success of the program?

A We think so. We think it will enhance the oil recovery.

Q What is the royalty ownership under the land?

A It is common. That is, the working interest is unadvertised. There is a common working interest in all the leases delineated in the plat on Exhibit 1, that is, which have producing wells, all Federal acreage with producing wells.

Q Is it Federal acreage?

A All of the oil production to date is from Federal acreage.

Q Have you had approval of this proposal before the Commission today from the United States Geological Survey?

A The program was outlined to the United States Geological Survey and it has been approved by Mr. P. T. McGrath on June 15, 1955.

MR. KELLAHIN: That is all. Do you have anything further to add, Mr. Holland?

A I have nothing.

MR. MACEY: Any questions of the witness? Mr. Rhodes?

CROSS EXAMINATION

By MR. RHODES:

Q This proposed well will make your third injection well?

A That is correct. There are two wells now.

Q What is the relative success, let's say, of the other two? Are you able to inject sufficient water in either of the other two to conduct your program, or is one of the other two injection wells rather a poor one, for injection purposes that is?

A During the month of May some 600 barrels were injected in Well T-85, and some 1,500 barrels in Well T-184.

Q That would indicate then that the second of your two wells was the better of the two injection wells?

A Well, for the month of May the first injection well took more than twice the amount of water, see.

Q At the same pressure?

A At the same pressure.

MR. MACEY: Anyone else have a question of the witness? If no further questions the witness may be excused.

(Witness excused.)

MR. MACEY: Mr. Kellahin, I would like to ask a question for my own personal information. In your application, I believe you requested the use of the well as an injection well in the event it was not a commercial producer.

MR. KELLAHIN: That is correct. The well hasn't been completed, Mr. Macey. They are just now ready to core the formation. If there is any oil that is recoverable they want to produce it until such time as it seems wise to turn it into an injection well.

MR. MACEY: Anyone have anything further in this case? We will take the case under advisement.

STATE OF NEW MEXICO)
: SS.
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 7th day of July, 1955.

Ada Dearnley
Notary Public, Court Reporter

My Commission Expires:

June 19, 1959

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

file case no. 927

November 27, 1957

COPY

Caulkins Oil Company
720 NW 50th Street
Oklahoma City 18, Oklahoma

Attention: Mr. A. F. Holland

Re: South Blanco Tocito Oil Pool
Rio Arriba County, New Mexico
Administrative Approval For
Conversion of Producing Well
to Water Injection Well

Gentlemen:

Reference is made to your letter of October 30, 1957, wherein you requested administrative approval to convert your Federal T-157 Well in the Pressure Maintenance Project authorized for the subject pool by Commission Order R-349, dated July 27, 1953, and expanded under authority of Commission Orders R-532 and R-664, dated October 4, 1954, and July 14, 1955 , respectively.

By authority of Commission Order R-664, whereby administrative approval of conversion for water injection purposes of additional wells may be granted, you are hereby authorized to convert your Federal T-157 Well, located in the SW/4 NW/4 of Section 10, Township 26 North, Range 6 West, NMPM, Rio Arriba County, New Mexico, to a water injection well for pressure maintenance purposes, subject to the requirements of Paragraph (4) of Commission Order R-664 and the approval of said Commission Order R-664 and the approval of said conversion by the United States Geological Survey.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

DSN:omg
cc: Oil Conservation Commission - Aztec
U. S. Geological Survey - Farmington

Tocito water flood 24t.
due 11/11/57 25

CAULKINS OIL COMPANY
720 N.W. 50TH STREET
OKLAHOMA CITY 18, OKLAHOMA
TELEPHONE VI 2-3356

file
case 922

October 30, 1957

New Mexico Oil Conservation Commission
P. O. Box 881
Santa Fe, New Mexico

Attention: A. L. Porter, Jr.
Member and Secretary

Re: South Blanco Pool
Pressure Maintenance Project
Rio Arriba County, New Mexico

Gentlemen:

Since October 7, 1953, Caulkins Oil Company (Lowry Oil Company) has conducted a pressure maintenance project for the Tocito sand zone occurring at an approximate depth of 6700'. From inception through September 30, 1957, 3,224,231 barrels of water have been injected and results achieved indicate that ultimate oil recovery will be increased from this water injection program.

Case No. 922, Order No. R664, dated July 14, 1955, provides in part as follows regarding the above captioned pressure maintenance project:

> "That petitioner may, as abandonment of producing wells is necessitated by water encroachment, utilize such wells as additional water injection wells upon submitting proper notice to the Commission, and thereafter reporting operations affecting such wells as hereinabove provided; provided however, notice of such proposed utilization shall also be given to all parties at interest, and in the event a protest is filed with the Commission within 20 days after the date such notice is served, the Commission may, in its discretion, set the matter for hearing."

It is proposed that well T-157 be converted into a water injection well. Production information and electric log data indicate the well to have a good Tocito sand section, and it is believed that the well will be a desirable water injection well. As the well is no longer economic to produce, no loss in oil production will occur as a result of using this well for water injection.

As the attached plat indicates, Caulkins Oil Company operations offset well T-157 in all directions. There are no other interested operators who will be affected by the use of this well for water injection. As this well is on federal acreage, approval of the USGS is being secured, and such approval will be furnished to the New Mexico Conservation Commission.

We respectfully request that approval be given to use T-157 as a water injection well.

Yours very truly,

CAULKINS OIL COMPANY

BY: A. F. Holland
A. F. Holland

AFH:dm
att

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 922
Order No. R-664

THE APPLICATION OF LOWRY ET AL OPERATING ACCOUNT FOR THE APPROVAL OF AN EXTENSION OF ITS PRESSURE MAINTENANCE PROGRAM IN THE SOUTH BLANCO-TOCITO POOL, RIO ARRIBA COUNTY, NEW MEXICO AND TO PERMIT THE DRILLING OF AN ADDITIONAL WELL IN SAID PROGRAM TO BE USED AS AN INJECTION WELL IF NOT A COMMERCIAL PRODUCER IN THE TOCITO FORMATION.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a. m., on June 28, 1955, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this 14th day of July, 1955, the Commission, a quorum being present, having considered the testimony and exhibits offered therein, and the record pertaining to geological and engineering testimony received in Commission Cases Nos. 537, 555, 607 and 697, received in this case, and testimony and evidence presented at a prior hearing in this cause on July 21, 1954, and being fully advised in the premises,

FINDS:

(1) That due notice of the time and place of hearing and the purpose thereof having been given as required by law, the Commission has jurisdiction of this case and the subject matter thereof.

(2) That petitioner has operated a pressure maintenance program in the South Blanco-Tocito Pool, Rio Arriba County, New Mexico, under authority of Commission Order Nos. R-349 and R-532, and has made regular reports as required by said orders.

(3) That evidence was introduced at this hearing to show that the pressure maintenance program has been successful in maintaining pressures in the South Blanco-Tocito Pool, will result in a greater ultimate recovery of oil with reduced waste of gas, and will protect and utilize reservoir energy to the best advantage.

(4) That for successful operation of the pressure maintenance project, said project should be expanded by the addition of other injection wells, as hereinafter provided, and water injection may be increased.

(5) That applicant seeks approval to drill an additional well to be located in NW/4 SE/4 Section 4, Township 26 North, Range 6 West, and to use said well for an injection well if it is not a commercial producer in the Tocito formation.

(6) That extension of the pressure maintenance program is in the interests of conservation, will prevent waste, result in an increased ultimate recovery of oil, and that correlative rights will be protected.

IT IS THEREFORE ORDERED:

(1) That the application of Lowry et al Operating Account for permission to extend its pressure maintenance program in the South Blanco-Tocito Pool be and hereby is approved.

(2) That petitioner be authorized to drill an additional well to be located in the NW/4 SE/4 Section 4, Township 26 North, Range 6 West, NMPM, Rio Arriba County, New Mexico, said well to be used as an injection well in the event it is not a commercial producer in the Tocito formation of said pool.

(3) That in the event proration of oil is instituted in the South Blanco-Tocito Pool, suitable provision shall be made for the transfer of allowables from injection wells to other producing wells.

(4) That petitioner, as operator, shall continue to submit monthly reports to the Commission showing the monthly oil production, monthly water production, the amount of water injected into each well bore, and such other information as the Commission may from time to time require for the purpose of keeping fully informed as to the progress of operations under the terms of this order.

(5) That petitioner may, as abandonment of producing wells is necessitated by water encroachment, utilize such wells as additional water injection wells upon submitting proper notice to the Commission, and thereafter reporting operations affecting such wells as hereinabove provided; provided however, notice of such proposed utilization shall also be given to all parties at interest, and in the event a protest is filed with the Commission within 20 days after the date such notice is served, the Commission may, in its discretion, set the matter for hearing.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JOHN F. SIMMS, Chairman

E. S. WALKER, Member

W. B. MACEY, Member and Secretary

ir

Lowry et al
Ext no. 7
Case 922

LOWRY OPERATIONS - SOUTH BLANCO TOCITO POOL

Bottomhole Pressure - Oil Production Data

(1) Wells in Pilot Pressure Maintenance Area

Before Pressure Maintenance						After Pressure Maintenance					
Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production, Bbls.	Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production. Bbls.
T-109	5/1/52	2103	1,642	128	35,086	T-109	10/5/53	1828	36,728		
	10/5/53	1828	36,728				4/4/55	1831	Pressure Increased 77,037		
T-132	12/17/51	2125	4,120	374	79,741	T-132	10/5/53	1912	83,861	1,141	67,319
	10/5/53	1912	83,861				4/4/55	1853	151,180		
T-157	3/20/52	2123	497	475	114,029	T-157	10/5/53	1883	114,526		
	10/5/53	1883	114,526				10/27/54	1975	Pressure Increased 146,211		31,685
T-182	6/5/52	2108	697	400	74,469	T-182	10/7/53	1922	75,166	642	13,483
	10/7/53	1922	75,166				10/27/54	1901	88,649		
T-207	8/2/52	2111	239	405	83,036	T-207	10/7/53	1906	83,275	1,491	92,449
	10/7/53	1906	83,275				4/4/55	1844	175,724		

LOWRY OPERATIONS - SOUTH BLANCO TOCITO POOL (cont.)

Bottomhole Pressure - Oil Production Data

(2) Wells Remote to Pilot Pressure Maintenance Area

Before Pressure Maintenance						After Pressure Maintenance					
Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production, Bbls.	Well No.	Date	B.H.P. P.S.I.	Cumulative Production, Bbls.	Bbls. Produced Per P.S.I. Change	Incremental Production, Bbls.
T-125						T-125	10/19/53	2108	153	373	57,404
							4/ 5/55	1954	57,557		
T-127	4/28/53	2108	771	683	25,940	T-127	10/5 /53	2070	26,711	685	102,000
	10/ 5/53	2070	26,711				4/ 5/55	1921	128,611		
T-129	1/12/53	2111	107	371	45,276	T-129	10/ 7/53	1989	45,383	1,028	117,184
	10/ 7/53	1989	45,383				4/ 5/55	1875	162,567		
T-177	3/15/53	2091	466	357	30,594	T-177	10/ 7/53	2004	31,060	** 72	6,633
	10/ 7/53	2004	31,060				4/ 4/55	1912	37,693		
T-179	7/26/51	2197	3,924	879	205,569	T-179	10/19/53	1963	209,493	940	62,994
	10/19/53	1963	209,493				4/ 5/55	1896	272,487		

** Well has been shut in because of high GOR. Last oil production February, 1954.

922

BEFORE THE
OIL CONSERVATION COMMISSION OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF LOWRY, ET AL., OPERATING ACCOUNT
FOR APPROVAL OF WATER INJECTION IN
A WELL LOCATED IN NW/4 SE/4, SEC. 4,
TWP. 26 N., RGE. 6 W., N.M.P.M.,
RIO ARRIBA COUNTY, NEW MEXICO

No. _____

Comes now Lowry, Et Al., Operating Account, and petitions the Oil Conservation Commission of the State of New Mexico for an order approving water injection as an extension of its Pressure Maintenance Program in the South Blanco-Tocito Oil Pool, Rio Arriba County, New Mexico, in a well to be drilled in the NW/4 SE/4 Section 4, Township 26 North, Range 6 West, N.M.P.M., and in support of said application would show:

1. That the Commission has heretofore approved pressure maintenance in the South Blanco-Tocito Oil Pool by its Order No. R-349 as a conservation measure.

2. That geological and engineering information has heretofore been presented to the Commission in Cases Nos. 537, 555, and 697, which information Petitioner respectfully requests the Commission to take notice of in connection with this petition; and that further information and testimony will be offered in connection with this petition.

3. That Petitioner has projected a well, to be located in the NW/4 SE/4 of Section 4, Township 26 North, Range 6 West, N.M.P.M., in conformity with the requirements of Order No. R-326, which well will be drilled to the Tocito formation and will endeavor to complete said well as a producer from the Tocito formation, South Blanco-Tocito Oil Pool, Rio Arriba County, New Mexico.

4. That, due to the geological structure in the area, Petitioner may not be able to complete said well as a commercial producer, in which event, it may be necessary and desirable, in

the interests of conservation and to prevent waste, to utilize said well as an additional water injection well as a part of the pressure maintenance program underway in the South Blanco-Tocito Oil Pool.

WHEREFORE Petitioner requests the Commission, after notice and hearing as required by law and the Rules and Regulations of the Commission, to enter its order approving extension of the pressure maintenance program heretofore approved by the Commission in Orders Nos. R-349 and R-532, to allow the injection of water in a well, to be located in the NW/4 SE/4, Section 4, Township 26 North, Range 6 West, N.M.P.M., Rio Arriba County, New Mexico, together with such other provisions as in the judgment of the Commission may be deemed proper.

Respectfully submitted,

LOWRY, ET AL., OPERATING ACCOUNT

By Jason W. Kellahin
Attorney

Jason W. Kellahin
P. O. Box 597
Santa Fe, New Mexico

Case 922

BEFORE THE
OIL CONSERVATION COMMISSION OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF LOWRY, ET AL., OPERATING ACCOUNT
FOR APPROVAL OF WATER INJECTION IN
A WELL LOCATED IN NW/4 SE/4, SEC. 4,
TWP. 26 N., RGE. 6 W., N.M.P.M.,
RIO ARRIBA COUNTY, NEW MEXICO

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Respectfully submitted,
LOWRY, ET AL., OPERATING ACCOUNT

By Jason W. Kellahin
Attorney

Jason W. Kellahin
P. O. Box 597
Santa Fe, New Mexico