Case No. 2762

Application, Transcripts, Small Exhibits, Etc.

DRAFT

JMD/esr
2-25-63

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. 2762

Order No. R-2623

APPLICATION OF PAN AMERICAN PETROLEUM
CORPORATION FOR A DUAL COMPLETION (OIL
PRODUCTION AND SALT WATER DISPOSAL),
SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on February 21, 1963, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this _____ day of February, 1963, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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, Pan American Petroleum Corporation, is the owner and operator of the USG Section 19 Well No. 17, located in Unit I of Section 19, Township 29 North, Range 16 West, NMPM, Hogback-Pennsylvanian Pool, San Juan County, New Mexico.

(3) That the applicant seeks permission to dually complete its USG Section 19 Well No. 17 to produce oil through the tubing from the Pennsylvanian formation below a packer set at approximately 6612 feet and to inject produced salt water down the annulus between the 7-inch casing and the 4½ inch casing into a non-productive zone of the Chinle formation at an approximate depth of 2157 to 3100 feet.

(4) That the salt water will be produced from the applicant's USG Section 19 Well No. 13, located in Unit G, and applicant's USG Section 19 Well No. 17, located in Unit I, of Section 19, Township 29 North, Range 16 West, NMPM, Hogback-Pennsylvanian

Pool, San Juan County, New Mexico; that said salt water is unfit for domestic, stock, irrigation, or other general use; and that the proposed disposal interval is non-productive of oil, gas, or ~~usable~~ fresh water.

(5) That there is no vertical communication between the proposed injection zone and the proposed producing zone in applicant's USG Section 19 Well No. 17.

(6) That the mechanics of the proposed dual completion are feasible and in accord with good conservation practices.

(7) That approval of the subject application will neither waste nor impair correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Pan American Petroleum Corporation, is hereby authorized to dually complete its USG Section 19 Well No. 17, located in Unit I of Section 19, Township 29 North, Range 16 West, NMPM, Hogback-Pennsylvanian Pool, San Juan County, New Mexico, to produce oil through the tubing from the Pennsylvanian formation below a packer set at approximately 6612 feet and to inject produced salt water down the annulus between the 7-inch casing and the 9⅝ inch casing into a non-productive zone of the Chinle formation at an approximate depth of 2157 to 3100 feet.

PROVIDED HOWEVER, That the applicant shall complete, operate, and produce said well in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order.

PROVIDED FURTHER, That the applicant shall take packer-leakage tests upon completion and annually thereafter.

(2) 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

JACK M. CAMPBELL, Chairman

E. S. WALKER, Member

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

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 959
Farmington, New Mexico

December [illegible], 1968

Pan American Petroleum Corp.
P. O. Box 480
Farmington, New Mexico

Re: Navajo Tribal Lease I-49-Ind.-98

Gentlemen:

Your letter of Dec. [illegible] requests approval to dispose of salt water produced with Pennsylvanian oil from wells Nos. 17 and 19 [illegible], Sec. 12, located on the above referenced leasehold. You propose to dispose of the water behind the 7" casing in the Entrada-Chinle zone in well No. 17 [illegible] Sec. 12. From information furnished by your company this zone is not productive of oil, gas, or fresh water anywhere in the vicinity of the disposal well.

This office offers no objection to your proposed method of disposing of the salt water produced from the above mentioned wells.

Very truly yours,

P. T. McGrath
District Engineer

PTMcGrath:[illegible]

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

January 2[illegible], 1963

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, N. M.

Pan-American Petroleum Corporation
P. O. Box 480
Farmington, New Mexico

Attn: Mr. T. M. Curtis
District Superintendent

Dear Mr. Curtis:

Reference is made to my letter of January 11, 1963, and your reply dated January 16, 1963, concerning the disposal of salt water in the Entrada-Chinlee zone by using the USG Section 12 No. 17 Well.

This office has reviewed the analysis of Entrada water from the Navajo Tribal N. 1 well in Section 12, Township 29 North, Range 17 West and is inclined to agree with your statement that the Entrada water may have a total solids content in excess of 10,000 ppm in the subject field. Therefore, this office offers no objection to your proposal to inject salt water into the Entrada-Chinlee zone between the 2157 foot and 3130 foot interval by using Well No. 17.

Very truly yours,

S. E. Reynolds
State Engineer

By: D. E. Gray
D. E. Gray
Engineer
Water Rights Division

DEG/ma
cc-Mr. A. L. Porter, Jr.

FORM [illegible]

STANOLIND OIL AND GAS COMPANY

205.31

RESEARCH DEPARTMENT

WATER ANALYSIS

Upen 532.11

Lease	Navajo Tribal	Well No.	1	Lab. No.	T-11,537
Field	Wildcat	County	San Juan	State	New Mexico
Quarter or Survey		BB	Section 12	T. 29N	R. 17W
Exact Location	770' from [illegible] & 1090' from [illegible] lines			Sample Series No.	[illegible]70
Producing Strata	Entrada	PBTD		Total Depth	[illegible]190
Stratum Yielding Sample	Entrada	From		To	
Condition of Well					
Sample Collected From	Drill Pipe	Method Used	From Drill Pipe Breakout		
Collected By	[illegible] Rothe	Date Collected	4-[illegible]-54	Date Received	5-1[illegible]-54
Transmittal Letter By	[illegible] Speer, Jr.	Date	4-[illegible]-54	File	[illegible]-2033-[illegible]1.3

Radicle	Per Cent by Analysis	(a) P. P. M.	(b)	(a) X (b)	Per Cent Reacting Value	Calculated Compound	P. P. M.
Na	33.37	[illegible]010	.0435	1[illegible]0.7[illegible]	[illegible]	Na_2SO_4	6,503
Ca	.81	[illegible]3	.0499	3.[illegible]	1.5[illegible]	NaCl	2,221
Mg	.34	[illegible]	.0822	[illegible]	[illegible]	Na_2CO_3	69
Fe						$NaHCO_3$	
						$CaSO_4$	
						$CaCl_2$	
SO_4	4[illegible].75	[illegible]297	.0208	91.[illegible]	[illegible]76	$CaCO_3$	132
Cl	16.73	[illegible]347	.0282	37.9[illegible]	1[illegible]	$Ca(HCO_3)_2$	
CO_3	[illegible]	1[illegible]	.0333	5.99	2.21	$MgSO_4$	
HCO_3		0	.0164			$MgCl_2$	
H_2S						$MgCO_3$	45
						$Mg(HCO_3)_2$	

Total solids as [illegible] ... 9,[illegible] P.P.M.

Total solids by evaporation and ignition of residue at low red heat ... 10,050 P.P.M.

Sample [illegible] Resistivity [illegible] MM .210 at [illegible] °F pH Value 11.5[illegible] Specific Gravity 60°/60°F 1.0095

PROPERTIES OF REACTION IN PER CENT

PRIMARY SALINITY (SO_4 + Cl) with equal value Na (K) ... 9[illegible].52 %

SECONDARY SALINITY If SO_4 + Cl is greater than Na (K) ... %

Then SO_4 + Cl [illegible] with equal value of Ca + Mg ... 1.06 %

PRIMARY ALKALINITY Excess Na (K) over SO_4 + Cl with equal value [illegible] ... %

SECONDARY ALKALINITY Excess Ca + Mg over SO_4 + Cl with equal value [illegible] ... [illegible].42 %

CHLORIDE SALINITY Cl (SO₄ + Cl) X 100% ... .[illegible]

SULPHATE SALINITY SO_4 (SO_4 + Cl) X 100% ... .[illegible]

NOTE: Multiply Parts per Million by .0583 to obtain Grains per Gallon

REMARKS:

This analysis indicates contamination, probably from drilling fluid and is not considered representative of formation water.

cc: C. F. Bedford
[illegible]. L. Kelley
[illegible], Speer, Jr.

RECEIVED
Roswell Dist. Office
JUN 18 1954

	DS
1	DE
	DC
2	[illegible]
3	[illegible] 6/18
4	[illegible]
5	FILE

Analyst [signature] Date 5-11-54

FORM 67 10-49

STANOLIND OIL AND GAS COMPANY

Farmington, New Mexico
April 30, 1954
DATE

RECEIVED
Roswell Dist. Office
MAY 7 1954

FILE: CCI-2[illegible]-3
SAMPLE NO.: [illegible]-70

	DS		
1	DE	[illegible]	12
	OC		
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3	[illegible]	[illegible]	
[illegible]	FRS	[illegible]	

STANOLIND OIL AND GAS COMPANY
1136 NORTH LEWIS AVENUE
TULSA, OKLAHOMA

ATTENTION: Mr. [illegible] Clarke

GENTLEMEN:

WE SHIPPED ON 4-30-54 (DATE) VIA Motor Freight

OF Water COLLECTED FROM Drill Pipe
(SEPARATOR, WELL HEAD, FORMATION)

DATA ON SAMPLE FOLLOW:

NAME OF COMPANY Stanolind Oil and Gas Company FIELD Wildcat PLANT -

LEASE Navajo Tribal WELL NO. 1

LOCATION 790' from N & 1090' from W lines, Sec. 12, 22-N, 31?W COUNTY San Juan STATE New Mexico

SIZE OF SAMPLE, IF FLUID 1 gallon NUMBER OF CORES -

PRODUCING STRATUM Entrada STRATUM YIELDING SAMPLE Entrada

TOTAL DEPTH 2190 METHOD OF COLLECTING SAMPLE from drill pipe [illegible]

GAS/OIL RATIO - PRESSURE Atmospheric

TEMPERATURES est. 70° F

SAMPLES COLLECTED BY A. W. Rothe DATE COLLECTED 4-30-54

SHIPPED BY L. C. Spear, Jr. DATE SHIPPED 4-30-54

PURPOSE OF TAKING SAMPLE For routine analysis - DST water analysis.

TESTS DESIRED Routine mineral analysis and restivity.

REMARKS: DST #4 taken 2165-2190.

Orig - Mr. [illegible] Elkins
cc - Mr. C. F. Bedford
cc - Mr. C. L. Kelley

YOURS VERY TRULY,

L. C. Spear, Jr.
by G. [illegible] Fuller, Jr.

Case 2762

January 11, 1963

Pan-American Petroleum Corp.
P. O. Box 480
Farmington, New Mexico

Attn. Mr. T. M. Curtis
District Superintendent

Dear Mr. Curtis:

Reference is made to your letter of December 18, 1962 requesting approval to inject salt water into the Estrada-Chinle zone by using the USG Section 19 No. 17 Well.

We feel that all zones through Triassic age rock should be protected if the water occurring in these zones contains less than 5,000 ppm dissolved solids. Since quality of water information is meager in this area we cannot consent to the disposal in these formations without the aid of a reliable analysis showing what the quality of water is in this proposed injection zone.

Very truly yours,

S. E. Reynolds
State Engineer

By: D. E. Gray
D. E. Gray
Engineer
Water Rights Division

DEG/ma
cc-A. L. Porter, Jr.

In answer to inquiry re State Engineer's plan for formal application not filed.

FORM 470 2-57

PAN AMERICAN PETROLEUM CORPORATION

MAIN OFFICE OCC
P. O. Box 480, Farmington, New Mexico
January 16, 1963
1963 JAN 18 PM 1:29

File: N-32-986.510.1

Subject: Disposal of Produced Salt Water
Hogback Pennsylvanian Pool
San Juan County, New Mexico

Mr. S. E. Reynolds
New Mexico State Engineer
Capitol Building
Santa Fe, New Mexico

Attention: Mr. D. E. Gray

Dear Sir:

This refers to your letter of January 11, 1963, concerning the quality of water present in the Entrada-Chinle zone into which we propose to dispose of produced Pennsylvanian salt water in the subject field.

Unfortunately, we are not able to find an analysis of any sample of water from the Entrada-Chinle zone on the two wells in the Hogback Pennsylvanian Pool. However, we do have an analysis of Entrada water recovered on a drill stem test from our Navajo Tribal No. 1 located in Section 12, T-29-N, R-17-W, San Juan County, New Mexico, approximately three miles northwest of the Hogback Pennsylvanian Pool. A copy of the sample data sheet and resulting analysis is attached. Referring to the attached analysis, you can see that the total solids content of this water was well in excess of 5,000 ppm.

As you may notice, there is a possibility that this sample was contaminated somewhat with drilling fluids; however, as the well was drilled with a fresh water based mud for this drill stem test, it is likely that the formation water was contaminated with mud filtrate fresher than formation water. Therefore, the Entrada water may possibly have a total solids content in excess of 10,000 ppm in the subject field. If you need any additional information on this matter, please feel free to contact us.

Yours very truly,

PAN AMERICAN PETROLEUM CORPORATION

Original Signed by
T. M. CURTIS

T. M. Curtis
District Superintendent

FHH:en
Attach.
cc: Mr. Phil McGrath - U.S.G.S.
Mr. A. L. Porter, Jr. - NMOCC

FORM 66 5-52

STANOLIND OIL AND GAS COMPANY

20?.31

RESEARCH DEPARTMENT

WATER ANALYSIS

Uran 535.11

Lease Navajo Tribal — Well No. 1 — Lab No. T-11,537

Field Wildcat — County San Juan — State New Mexico

Quarter or Survey — Blk. — Section 12 — T. 29N — R. 17W

Exact Location 790' From S & 1090' From W Lines — Sample Series No. 181-70

Producing Stratum Entrada — PBTD — Total Depth 2190

Stratum Yielding Sample Entrada — From — To

Condition of Well

Sample Collected From Drill Pipe — Method Used From Drill Pipe Breakout

Collected by A. W. Rothe — Date Collected 4-30-54 — Date Received 5-11-54

Transmittal Letter by L. ?. Speer, Jr. — Date 4-30-54 — File CSF-2?13-251.3

Radicle	Per Cent by Analysis	(a) P. P. M.	(b)	(a) X (b)	Per Cent Reacting Value	Calculated Compound	P. P. M.
Na	33.37	3,010	.0435	130.73	47.26	Na_2SO_4	6,503
Ca	.81	73	.0499	3.64	1.34	NaCl	2,221
Mg	.14	12	.0822	1.07	.40	Na_2CO_3	69
Fe						$NaHCO_3$	
						$CaSO_4$	
						$CaCl_2$	
SO_4	48.75	4,397	.0208	91.46	33.76	$CaCO_3$	132
Cl	14.93	1,347	.0282	37.93	14.03	$Ca(HCO_3)_2$	
CO_3	2.00	180	.0333	5.99	2.21	$MgSO_4$	
HCO_3		0	.0164			$MgCl_2$	
H_2S						$MgCO_3$	45
						$Mg(HCO_3)_2$	

Total solids as a summation of radicles 9,020 P.P.M.

Total solids by evaporation and ignition of residue at low red heat 10,950 P.P.M.

Sample as received: Resistivity ohms M.M. .210 at 77°F — pH Value 11.50 — Specific Gravity 60°/60°F 1.0095

PROPERTIES OF REACTION IN PER CENT

PRIMARY SALINITY: SO_4 + Cl with equal value Na (K) 95.52 %

SECONDARY SALINITY: If SO_4 + Cl is greater than Na (K) %

Then SO_4 + Cl = with equal value of Ca + Mg 1.06 %

PRIMARY ALKALINITY: Excess Na (K) over SO_4 + Cl = with equal value of CO_3 + S %

SECONDARY ALKALINITY: Excess Ca + Mg over SO_4 + Cl = with equal value of CO_3 = 4.42 %

CHLORIDE SALINITY: Cl ÷ (SO_4 + Cl) = X 100% 29.35

SULPHATE SALINITY: SO_4 ÷ (SO_4 + Cl) = X 100% .?4

NOTE: Multiply Parts per Million by .0583 to obtain Grains per Gallon.

REMARKS:

This analysis indicates contamination, probably from drilling fluid and is not considered representative of formation water.

cc: C. F. Bedford
C. L. Kelley
L. ?. Speer, Jr.

RECEIVED
Roswell Dist. Office
JUN 18 1954

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Analyst [signature] Date 5-11-54

FORM 9-330-49

ANOLIND OIL AND GAS COMPA

RECEIVED
Roswell Dist. Office
MAY 7 1954

STANOLIND OIL AND GAS COMPANY
1506 NORTH LEWIS AVENUE
TULSA, OKLAHOMA

ATTENTION:

GENTLEMEN:

WE SHIPPED ON VIA A SAMPLE

OF COLLECTED FROM
(SEPARATOR, WELL HEAD, FORMATION)

DATA ON SAMPLE FOLLOW:

NAME OF COMPANY FIELD PLANT

LEASE WELL NO.

LOCATION COUNTY STATE

SIZE OF SAMPLE, IF FLUID 1 gallon NUMBER OF CORES

PRODUCING STRATUM STRATUM YIELDING SAMPLE Entrada

TOTAL DEPTH METHOD OF COLLECTING SAMPLE

GAS/OIL RATIO PRESSURE

TEMPERATURES

SAMPLES COLLECTED BY DATE COLLECTED

SHIPPED BY DATE SHIPPED

PURPOSE OF TAKING SAMPLE

TESTS DESIRED

REMARKS:

Orig -
cc -
cc -

YOURS VERY TRULY,

L. C. Speer, Jr.
by C. C. Fuller, Jr.

FORM [illegible]

STANOLIND OIL AND GAS COMPANY

20[illegible].31

RESEARCH DEPARTMENT

WATER ANALYSIS

Upen 535.11

Lease	Navajo Tribal	Well No.	1	Lab No.	[illegible]-12,537
Field	Wildcat	County	San Juan	State	New Mexico
Quarter or Survey		BB	Section 12	T 29N	R 17W
Exact Location	790' From S & 1090' From W Lines			Sample Series No.	[illegible]-70
Producing Stratum	Entrada	PBTD		Total Depth	2190
Stratum Yielding Sample	Entrada	From		To	
Condition of Well					
Sample Collected From	Drill Pipe	Method Used	From Drill Pipe Breakout		
Collected by	A. W. Rothe	Date Collected	4-30-54	Date Received	5-12-54
Transmittal Letter by	L. O. Speer, Jr.	Date	4-30-54	File	[illegible]-2933-[illegible]1.3

Radicle	Per Cent by Analysis	(a) P. P. M.	(b)	(a) X (b)	Per Cent Reacting Value	Calculated Compound	P. P. M.
Na	33.37	[illegible],010	.0435	1[illegible].7[illegible]	4[illegible]	Na_2SO_4	6,503
Ca	.81	73	.0499	[illegible]	1.34	NaCl	2,221
Mg	.14	12	.0822	1.0[illegible]	[illegible]	Na_2CO_3	69
Fe						$NaHCO_3$	
						$CaSO_4$	
						$CaCl_2$	
SO_4	42.75	[illegible],397	.0208	91.[illegible]	3.76	$CaCO_3$	132
Cl	14.93	1,347	.0282	37.9[illegible]	14.[illegible]	$Ca(HCO_3)_2$	
CO_3	2.00	[illegible]1[illegible]	.0333	5.99	2.21	$MgSO_4$	
HCO_3		0	.0164			$MgCl_2$	
H_2S						$MgCO_3$	45
						$Mg(HCO_3)_2$	

Total solids as summation of radicles: 9,[illegible] P.P.M.

Total solids by evaporation and ignition of residue at low red heat: 1[illegible],050 P.P.M.

Sample as received: Resistivity ohms/MM .910 at 7[illegible]°F; pH Value 11.52; Specific Gravity at 60° 60°F 1.0095

PROPERTIES OF REACTION IN PER CENT

PRIMARY SALINITY: SO_4 + Cl with equal value Na (K) 94.52 %

SECONDARY SALINITY: If SO_4 + Cl is greater than Na (K) %

Then SO_4 + Cl = with equal value of Ca + Mg 1.06 %

PRIMARY ALKALINITY: Excess Na (K) over SO_4 + Cl = with equal value of CO_3 + S %

SECONDARY ALKALINITY: Excess Ca + Mg over SO_4 + Cl = with equal value of CO_3 + S [illegible].42 %

CHLORIDE SALINITY: Cl ÷ (SO_4 + Cl) X 100% [illegible]3[illegible]

SULPHATE SALINITY: SO_4 ÷ (SO_4 + Cl) X 100% [illegible]

NOTE: Multiply Parts per Million by .0583 to obtain Grains per Gallon.

REMARKS:

This analysis indicates contamination, probably from drilling fluid and is not considered representative of formation water.

cc: C. F. Bedford
C. L. Kelley
L. O. Speer, Jr.

RECEIVED
Roswell Dist. Office
JUN 18 1954

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6/18

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Pan Am EXHIBIT NO. 7
CASE NO. 2762

Analyst [signature] Date 5-11-54

OPEN

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 959
Farmington, New Mexico

RECEIVED
DEC 28 1962
AMERICAN PETROLEUM COMPANY
Farmington, New Mexico

FARMINGTON DISTRICT
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December 21, 1962

Pan American Petroleum Corp.
P. O. Box 480
Farmington, New Mexico

Re: Navajo Tribal lease I-89-Ind.-58

Gentlemen:

Your letter of Dec. 18 requests approvel to d spose of salt water produced with Pennsylvanian oil from wells Nos. 17 and 19 U.S.G. Sec. 19, located on the above referenced leasehold. You propose to dispose of this water behind the 7" casing in the Entrada-Chinle zone in well No. 17 U.S.G. Sec. 19. From information furnished by your company this zone is not productive of oil, gas, or fresh water anywhere in the vicinity of the disposal well.

This office offers no objection to your proposed method of disposing of the salt water produced from the above mentioned wells.

Very truly yours,

P. T. McGrath
District Engineer

PTMcGrath:st

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 2762

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

JAN 29 1963

S. E. REYNOLDS
STATE ENGINEER

ADDRESS CORRESPONDENCE TO
STATE CAPITOL
SANTA FE, N. M.

January 28, 1963

Pan-American Petroleum Corporation
P. O. Box 480
Farmington, New Mexico

Attn: Mr. T. M. Curtis
District Superintendent

Dear Mr. Curtis:

Reference is made to my letter of January 11, 1963, and your reply dated January 16, 1963, concerning the disposal of salt water in the Entrada-Chinlee zone by using the USG Section 19 No. 17 Well.

This office has reviewed the analysis of Entrada water from the Navajo Tribal No. 1 well in Section 12, Township 29 North, Range 17 West and is inclined to agree with your statement that the Entrada water may have a total solids content in excess of 10,000 ppm in the subject field. Therefore, this office offers no objection to your proposal to inject salt water into the Entrada-Chinlee zone between the 2157 foot and 3100 foot interval by using Well No. 17.

Very truly yours,

S. E. Reynolds
State Engineer

By: D. E. Gray
D. E. Gray
Engineer
Water Rights Division

DEG/ma
cc-Mr. A. L. Porter, Jr.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. 2762

No. 7-63

DOCKET: EXAMINER HEARING - THURSDAY - FEBRUARY 21, 1963

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter as Alternate Examiner:

CASE 2755: Application of General American Oil Company of Texas for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Queen formation, High Lonesome Pool, Eddy County, New Mexico, through 16 wells in Sections 11, 12, 13 and 14, Township 16 South, Range 29 East.

CASE 2756: Application of Humble Oil & Refining Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its State "S" Well No. 24, located in Unit J, Section 2, Township 22 South, Range 37 East, Lea County, New Mexico, as a triple completion (tubingless), to produce oil from the Blinebry and Drinkard Pools and from a third zone, either lower Drinkard or Abo, through parallel strings of 2 7/8-inch casing cemented in a common well bore.

CASE 2757: Application of Cabot Corporation for an unorthodox location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the unorthodox location of its New Mexico State L Well No. 1 at a point 1970 feet from the North line and 330 feet from the West line of Section 23, Township 11 South, Range 33 East, North Bagley-Wolfcamp Pool, Lea County, New Mexico.

CASE 2758: Application of Odessa Natural Gasoline Company for a unit agreement Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Getty Deep Unit Area comprising 1,680 acres, more or less, of Federal land in Township 20 South, Range 29 East, Eddy County, New Mexico.

CASE 2759: Application of Continental Oil Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the triple completion (conventional) of its Skaggs B-12, Well No. 5, located in Unit C of Section 12, Township 20 South, Range 37 East, Lea County, New Mexico, to produce oil from the Skaggs Glorieta, East Weir Blinebry, and Skaggs-Drinkard Pools through parallel strings of tubing.

CASE 2760: Application of Gulf Oil Corporation for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Scarborough Estate Well No. 7, located in Unit K of Section 31, Township 22 South, Range 38 East, Lea County, New Mexico, as a dual completion (conventional) to produce oil from the Blinebry Oil Pool and from the Ellenburger formation through parallel strings of tubing.

CASE 2761: Application of Compass Exploration, Inc. for the creation of a Gallup Gas Pool, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order deleting certain acreage from the South Blanco-Tocito Pool and redesignating portions of said acreage to comprise a new Gallup gas pool for its Northwest Lindrith Well No. 1-3, located in Unit K of Section 3, Township 26 North, Range 7 West, Rio Arriba County, New Mexico.

CASE 2314: (Reopened)
In the matter of the hearing called in accordance with Order No. R-2191, to permit Shell Oil Company to appear and show cause why its State Well No. 1-A, located in Unit D, Section 36, Township 24 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico should not be reclassified as an oil well in said pool.

CASE 2480: (Reopened & Continued)
In the matter of Case 2480 being reopened pursuant to the provisions of Order No. R-2182, which order established temporary 80-acre proration units for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2762: Application of Pan American Petroleum Corporation for a dual completion, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion of its USG Section 19 Well No. 17, located in Unit I of Section 19, Township 29 North, Range 16 West, San Juan County, New Mexico, to produce oil from the Hogback-Pennsylvanian Pool through tubing and to dispose of produced salt water into the Chinle formation through the intermediate casing annulus.

CASE 2763: Application of Sunray DX Oil Company for the creation of a Strawn Gas Pool and for Special Temporary Pool Rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Strawn Gas Pool for its New Mexico State "AH" Well No. 1, located in Unit K of Section 30, Township 18 South, Range 23 East, Eddy County, New Mexico, and the establishment of temporary pool rules therefor, including a provision for 640-acre proration units.

CASE 2764: Application of Skelly Oil Company for the creation of a Strawn Gas Pool and for Temporary Special Pool Rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Strawn Gas Pool for its West Jal Unit Well No. 1, located in Unit H, of Section 20, Township 25 South, Range 36 East, Lea County, New Mexico, and the establishment of temporary special pool rules therefor, including a provision for 640-acre proration units.

CASE 2746: (Continued)
In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Continental National Insurance Group and all other interested parties to appear and show cause why the Kenneth V. Barbee Well No. 1, located 1980 feet from the South line and 660 feet from the East line of Section 9, Township 11 South, Range 25 East, NMPM, Chaves County, New Mexico, should not be plugged in accordance with a Commission-approved plugging program.

CASE 2747: (Continued)
Application of El Paso Natural Gas Company for cancellation of a non-standard gas proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks cancellation of a non-standard gas proration unit comprising the SW/4 of Section 23 and the NW/4 of Section 26, Township 31 North, Range 7 West, Blanco-Mesaverde Gas Pool, San Juan County, New Mexico, said unit having been established and designated Block "N" by Order No. R-1066.

iqg/

No. 7-63

SUPPLEMENTAL DOCKET: EXAMINER HEARING - THURSDAY - FEBRUARY 21, 1963

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following case will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, as alternate examiner:

CASE 2765:

Application of Perry R. Bass for an unorthodox gas well location, Lea County, New Mexico.

Applicant, in the above-styled cause seeks an exception to the Special Rules and Regulations for the Lusk-Morrow gas pool to permit the drilling of a gas well 1980 feet from the North line and 660 feet from the West line of Section 28, Township 19 South, Range 32 East.

Case. 2762
Heard 2-21-63
Rec. 2-22-63

1. Grant Pan Am request for authority to inject salt Water into the Chinle formation thru their ~~Pan Am~~ N.S.L. #17 located in unit I sec 19. 29N-16W.

2. The injection is to be behind the ~~7" casing~~ between the 7" casing and the 4½ inch casing into the Chinle at approx. 2157 to 3100 ft.

3. The salt water to be injected is produced with oil from the Hogback Penn. Oil Pool.

4. Will not cause waste.

Thos. A. Dale.

FORM 470 7-57

Case 3762

PAN AMERICAN PETROLEUM CORPORATION

P. O. Box 480, Farmington, New Mexico
January 30, 1963

File: N-80-986.510.1

Subject: Application to Dispose of Salt Water in Pan American Petroleum Corporation's USG Section 19 Well No. 17 Hogback Pennsylvanian Pool San Juan County, New Mexico

Mr. A. L. Porter, Jr., Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Sir:

Pan American Petroleum Corporation hereby makes application under the Administrative Provisions of Rule 701 for permission to dispose of salt water produced from the Hogback Pennsylvanian Pool into the 7" - 9-5/8" casing annulus in its USG Section 19 Well No. 17, located in Unit I of Section 19, T-29-N, R-16-W, San Juan County, New Mexico. In connection with this application, attached are the following exhibits:

1. Three copies of NMOCC form entitled Application to Dispose of Salt Water by Injection into a Porous Formation Not Productive of Oil or Gas. A copy of this form is also being sent to the New Mexico State Engineer and to the U.S.G.S. as representatives of the Navajo Tribe of Indians, the surface owner. There are no offset operators to the USG Section 19 lease.

2. A map of the area showing the location of USG Section 19 Well No. 17 in the SE/4 of Section 19, T-29-N, R-16-W, and the location of the USG Section 19 Well No. 13 in the NE/4 of Section 19, T-29-N, R-16-W. These are the only two wells producing from the Hogback Pennsylvanian Pool.

3. A copy of the Electric Log on USG Section 19 Well No. 17 showing the 9-5/8" casing point at 2157', approximately 112' below the top of the Entrada formation, and the top of the cement behind the 7" casing at 3100' or about 330' below the top of the Chinle formation.

4. A Schematic Diagram showing the casing program which was employed on USG Section 19 Well No. 17 together with the approximate location of the various formation tops in

DOCKET MAILED
Date 2/8/63

this well. This diagram also shows the present completion zone in the Hogback Pennsylvanian Pool and the amount of cement used on each casing string. It is the interval 2157', the 9-5/8" casing seat, to 3100', the top of the cement behind the 7" casing, that is proposed for use as a salt water disposal interval.

5. A copy of a letter from Mr. P. T. McGrath, District Engineer for the U.S.G.S., dated December 21, 1962, which advises that the U.S.G.S. does not object to the use of the interval 2157' to 3100' for disposition of the produced Hogback Pennsylvanian Pool salt water.

6. A copy of a letter from the State Engineer's Office dated January 28, 1963, advising that that office has no objection to the use of this interval as a disposal zone.

7. A copy of a water analysis obtained on a drill stem test from the Entrada zone on Pan American's Navajo Tribal No. 1, a dry hole located 790' from the north line and 1090' from the west line of Section 12, T-29-N, R-17-W, which shows the Entrada water to contain in excess of 9,000 parts per million total solids. A notation on the analysis indicates that this sample was contaminated with drilling fluids, and since the well was drilled with a fresh water base mud, it is concluded that the formation water may have salinity in excess of that shown by the water analysis form.

With regard to the use of the Entrada-Chinle interval in USG Section 19 Well No. 17 as a salt water disposal zone, the following points are submitted:

1. The proposed disposal interval is not known to be productive of oil, gas or fresh water anywhere in the vicinity of the Hogback Pennsylvanian Pool.

2. The casing program used on this well adequately protects the known fresh or brackish water zones of the Dakota-Morrison formation from contamination by the injected water and also protects the Hogback Pennsylvanian Pool producing interval from the injected water.

3. NMOCC Order R-2341 granted Pan American permission to use a watered out Pennsylvanian gas zone from 6514-24' in USG Section 19 Well No. 13 as a salt water disposal zone. In attempting to dispose of salt water into this zone it was found that extremely high injection pressures

were necessary and, accordingly, the interval now proposed in USG Section 19 Well No. 17 was tested as a possible alternate salt water disposal zone. It was found that this interval would accept the volume of salt water being produced from the Hogback Pennsylvanian Pool at an injection pressure of about 350 psig.

It is therefore the purpose of this application to secure your approval for the use of the Entrada-Chinle zone of the Jurassic and Triassic age in USG Section 19 Well No. 17 as an alternate salt water disposal zone to that zone which was approved by Order R-2341.

Yours very truly,

PAN AMERICAN PETROLEUM CORPORATION

T. M. Curtis
District Superintendent

GWE:en

Attachments

Case 1762

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

APPLICATION
TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION
NOT PRODUCTIVE OF OIL OR GAS

Operator Pan American Petroleum Corporation Address Box 480, Farmington, New Mexico

Lease USG Section 19 Well No 17 County San Juan

Unit I Section 19 Township 29 Range 16

This is an application to dispose of salt water produced from the following pool(s):

Hogback Pennsylvanian

Name of Injection Formation(s): Entrada-Chinle

Top of injection zone: 2157' Bottom of injection zone: 3100'

Give operator, lease, well no., and location of any other well in this area using this same zone for disposal purposes: None

CASING PROGRAM

	Diameter	Setting Depth	Sacks Cement	Top of Cement
Surface	13-3/8"	251	250	Surface
Intermediate	9-5/8"	2157	625	772
Long String	7"	5613	475	3100

Will injection be through tubing, casing, or annulus? Annulus

Size tubing 2-3/8" Setting depth: 6645' Packer set at 6612'

Name and Model No. of packer: Lane Wells BOCL-4A

Will injection be through perforations or open hole? Open hole between 7" and 9-5/8" casing strings

Proposed interval(s) of injection: 2157-3100'

Well was originally drilled for what purpose? Gas Well

Has well ever been perforated in any zone other than the proposed injection zone? Yes, Still producing oil from casing perforations 6643-59'. Also originally completed in Pennsylvanian gas zone.
List all such perforated intervals and sacks of cement used to seal off or squeeze each: 6530-70' squeezed with 200 sacks. Re-perf and squeezed with 150 sacks. 6396-6426' squeezed with 200 sacks. 6350-70' squeezed with 150 sacks. 6045-80' squeezed with 200 sacks. Re-perf and squeezed with 200 sacks.

Give depth of bottom of next higher zone which produces oil or gas: 960'

Give depth of top of next lower zone which produces oil or gas: 6643'

Give depth of bottom of deepest fresh water zone in area: No fresh water in area. Morrison contains brackish water.

Expected volume of salt water to be injected daily (barrels): 750

Will injection be by gravity or pump pressure? Pump Estimated pressure: 350

Is system open or close type? Open Is filtration or chemical treatment necessary? No

Is the water to be disposed of mineralized to such a degree as to be unfit for domestic, stock, irrigation, and/or other general use? Yes

Is any water occurring naturally within the proposed disposal formation mineralized to such a degree as to be unfit for domestic, stock, irrigation, and/or other general use? Yes

List all offset operators to the lease on which this well is located and their mailing address

No offset operators

Name and address of surface owner Navajo Tribe of Indians, c/o U.S.G.S, P. O. Box 959, Farmington, New Mexico

Have copies of this application been sent by registered mail or given to all offset operators, surface owners, and to the New Mexico State Engineer? Yes

Is a complete electrical log of this well attached? Yes

Operator: PAN AMERICAN PETROLEUM CORPORATION

By: T. M. Curtis

Title: District Superintendent

STATE OF New Mexico)
) ss.
County of San Juan)

BEFORE ME, The undersigned authority, on this day personally appeared T. M. Curtis known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein and that said report is true and correct.

SUBSCRIBED AND SWORN TO before me this the 30th day of January, 1963.

Notary Public in and for the County of San Juan

February 27, 1965
My Commission Expires

NOTE: **Should waivers from all offset operators, the surface owner, and the State Engineer not accompany an application, the New Mexico Oil Conservation Commission will hold the application for a period of fifteen (15) days from date of receipt by the Commission's Santa Fe office. If at the end of said fifteen-day period, no protest nor request for hearing is received by the Santa Fe office, the application will then be processed.**

ir/

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

APPLICATION
TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION
NOT PRODUCTIVE OF OIL OR GAS

Operator Pan American Petroleum Corporation Address Box 480, Farmington, New Mexico

Lease USG Section 19 Well No. 17 County San Juan

Unit I Section 19 Township 29 Range 16

This is an application to dispose of salt water produced from the following pool(s):

Hogback Pennsylvanian

Name of Injection Formation(s): Entrada-Chinle

Top of injection zone: 2157' Bottom of injection zone: 3100'

Give operator, lease, well no., and location of any other well in this area using this same zone for disposal purposes: None

CASING PROGRAM

	Diameter	Setting Depth	Sacks Cement	Top of Cement
Surface	13-3/8"	251	250	Surface
Intermediate	9-5/8"	2157	625	772
Long String	7"	5613	475	3100

Will injection be through tubing, casing, or annulus? Annulus

Size tubing 2-3/8" Setting depth: 6645' Packer set at 6612'

Name and Model No. of packer: Lane Wells RDCL-4A

Will injection be through perforations or open hole? Open hole between 7" and 9-5/8" casing strings

Proposed interval(s) of injection. 2157-3100'

Well was originally drilled for what purpose? Gas Well

Has well ever been perforated in any zone other than the proposed injection zone? Yes. Still producing oil from casing perforations 6643-59'. Also originally completed in Pennsylvanian gas zone.
List all such perforated intervals and sacks of cement used to seal off or squeeze each:
6530-70' squeezed with 200 sacks. Re-perf and squeezed with 150 sacks. 6396-6456' squeezed with 200 sacks. 6350-70' squeezed with 150 sacks. 6045-85' squeezed with 200 sacks. Re-perf and squeezed with 200 sacks.

Give depth of bottom of next higher zone which produces oil or gas: 960'

Give depth of top of next lower zone which produces oil or gas: 6643'

Give depth of bottom of deepest fresh water zone in area: No fresh water in area. Horizon contains brackish water.

Expected volume of salt water to be injected daily (barrels): 750

Will injection be by gravity or pump pressure? Pump Estimated pressure: 350

Is system open or close type? Open Is filtration or chemical treatment necessary? No

Is the water to be disposed of mineralized to such a degree as to be unfit for domestic, stock, irrigation, and/or other general use? Yes

Is any water occurring naturally within the proposed disposal formation mineralized to such a degree as to be unfit for domestic, stock, irrigation, and/or other general use? Yes

List all offset operators to the lease on which this well is located and their mailing address

No offset operators

Name and address of surface owner Navajo Tribe of Indians, c/o U.S.G.S, P. O. Box 959, Farmington, New Mexico

Have copies of this application been sent by registered mail or given to all offset operators, surface owners, and to the New Mexico State Engineer? Yes

Is a complete electrical log of this well attached? Yes

Operator: PAN AMERICAN PETROLEUM CORPORATION

By: T. M. Curtis

Title: District Superintendent

STATE OF New Mexico)
) ss.
County of San Juan)

BEFORE ME, The undersigned authority, on this day personally appeared T. M. Curtis known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein and that said report is true and correct.

SUBSCRIBED AND SWORN TO before me this the 30th day of January, 19 63.

Notary Public in and for the County of San Juan

February 27, 1965
My Commission Expires

NOTE: Should waivers from all offset operators, the surface owner, and the State Engineer not accompany an application, the New Mexico Oil Conservation Commission will hold the application for a period of fifteen (15) days from date of receipt by the Commission's Santa Fe office. If at the end of said fifteen-day period, no protest nor request for hearing is received by the Santa Fe office, the application will then be processed.

ir/

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

APPLICATION
TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION
NOT PRODUCTIVE OF OIL OR GAS

Operator Pan American Petroleum Corporation Address Box 480, Farmington, New Mexico

Lease USG Section 19 Well No. 17 County San Juan

Unit I Section 19 Township 29 Range 16

This is an application to dispose of salt water produced from the following pool(s):

Hogback Pennsylvanian

Name of Injection Formation(s): Entrada-Chinle

Top of injection zone: 2157' Bottom of injection zone: 3100'

Give operator, lease, well no., and location of any other well in this area using this same zone for disposal purposes: None

CASING PROGRAM

	Diameter	Setting Depth	Sacks Cement	Top of Cement
Surface	13-3/8"	251	250	Surface
Intermediate	9-5/8"	2157	625	772
Long String	7"	5613	475	3100

Will injection be through tubing, casing, or annulus? Annulus

Size tubing 2-3/8" Setting depth: 6643' Packer set at. 6612'

Name and Model No. of packer: Lane Wells RDCL-4A

Will injection be through perforations or open hole? Open hole between 7" and 9-5/8" casing strings

Proposed interval(s) of injection: 2157-3100'

Well was originally drilled for what purpose? Gas Well

Has well ever been perforated in any zone other than the proposed injection zone? Yes. Still producing oil from casing perforations 6643-59'. Also originally completed in Pennsylvanian gas zone.

List all such perforated intervals and sacks of cement used to seal off or squeeze each: 6556-70' squeezed with 200 sacks. Re-perf and squeezed with 150 sacks. 6396-6426' squeezed with 300 sacks. 6350-70' squeezed with 150 sacks. 6065-80' squeezed with 200 sacks. Re-perf and squeezed with 200 sacks.

Give depth of bottom of next higher zone which produces oil or gas: 960'

Give depth of top of next lower zone which produces oil or gas: 6643'

Give depth of bottom of deepest fresh water zone in area: No fresh water in area. Horizon contains brackish water.

Expected volume of salt water to be injected daily (barrels): 750

Will injection be by gravity or pump pressure? Pump Estimated pressure: 350

Is system open or close type? Open Is filtration or chemical treatment necessary? No

Is the water to be disposed of mineralized to such a degree as to be unfit for domestic, stock, irrigation, and/or other general use? Yes

Is any water occurring naturally within the proposed disposal formation mineralized to such a degree as to be unfit for domestic, stock, irrigation, and/or other general use? Yes

List all offset operators to the lease on which this well is located and their mailing address

No offset operators

Name and address of surface owner Navajo Tribe of Indians, c/o U.S.G.S, P. O. Box 959, Farmington, New Mexico

Have copies of this application been sent by registered mail or given to all offset operators, surface owners, and to the New Mexico State Engineer? Yes

Is a complete electrical log of this well attached? Yes

Operator: PAN AMERICAN PETROLEUM CORPORATION

By: T. M. Curtis

Title: District Superintendent

STATE OF New Mexico)
) ss.
County of San Juan)

BEFORE ME, The undersigned authority, on this day personally appeared T. M. Curtis known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein and that said report is true and correct.

SUBSCRIBED AND SWORN TO before me this the 30th day of January, 19 63.

Notary Public in and for the County of San Juan

February 27, 1965
My Commission Expires

NOTE: Should waivers from all offset operators, the surface owner, and the State Engineer not accompany an application, the New Mexico Oil Conservation Commission will hold the application for a period of fifteen (15) days from date of receipt by the Commission's Santa Fe office. If at the end of said fifteen-day period, no protest nor request for hearing is received by the Santa Fe office, the application will then be processed.

ir/

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. 2762
Order No. R-2638

APPLICATION OF PAN AMERICAN PETROLEUM
CORPORATION FOR A DUAL COMPLETION (OIL
PRODUCTION AND SALT WATER DISPOSAL),
SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on February 21, 1963, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 27th day of February, 1963, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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, Pan American Petroleum Corporation, is the owner and operator of the USG Section 19 Well No. 17, located in Unit I of Section 19, Township 29 North, Range 16 West, NMPM, Hogback-Pennsylvanian Pool, San Juan County, New Mexico.

(3) That the applicant seeks permission to dually complete its USG Section 19 Well No. 17 to produce oil through the tubing from the Pennsylvanian formation below a packer set at approximately 6612 feet and to inject produced salt water down the annulus between the 7-inch casing and the 9 5/8-inch casing into a non-productive zone of the Chinle formation at an approximate depth of 2157 to 3100 feet.

(4) That the salt water will be produced from the applicant's USG Section 19 Well No. 13, located in Unit G, and applicant's USG Section 19 Well No. 17, located in Unit I, of Section 19, Township 29 North, Range 16 West, NMPM, Hogback-Pennsylvanian Pool, San Juan County, New Mexico; that said salt water is unfit for domestic, stock, irrigation, or other general use; and that the proposed disposal interval is non-productive of oil, gas, or fresh water.

(5) That there is no vertical communication between the proposed injection zone and the proposed producing zone in applicant's USG Section 19 Well No. 17.

(6) That the mechanics of the proposed dual completion are feasible and in accord with good conservation practices.

(7) That approval of the subject application will neither cause waste nor impair correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Pan American Petroleum Corporation, is hereby authorized to dually complete its USG Section 19 Well No. 17, located in Unit I of Section 19, Township 29 North, Range 16 West, NMPM, Hogback-Pennsylvanian Pool, San Juan County, New Mexico, to produce oil through the tubing from the Pennsylvanian formation below a packer set at approximately 6612 feet and to inject produced salt water down the annulus between the 7-inch casing and the 9 5/8-inch casing into a non-productive zone of the Chinle formation at an approximate depth of 2157 to 3100 feet.

PROVIDED HOWEVER, That the applicant shall complete, operate, and produce said well in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order.

PROVIDED FURTHER, That the applicant shall take packer-leakage tests upon completion and annually thereafter.

(2) 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

Jack M Campbell

JACK M. CAMPBELL, Chairman

E. S. Walker

E. S. WALKER, Member

A. L. Porter, Jr.

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

esr/

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

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

February 27, 1963

Mr. Charles Malone
Atwood & Malone
Post Office Box 700
Roswell, New Mexico

Re: Case No. 2762
Order No. R-2438
Applicant:
Pan American Petroleum Corporation

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x
OTHER Mr. Guy Buell

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

May 22, 1970

Pan American Petroleum Corporation
Security Life Building
Denver, Colorado 80202

Attention: Mr. R. B. Giles

Re: Salt Water Disposal
USG Section 19 Well No. 17
Hogback Field
San Juan County, New Mexico

Gentlemen:

I have reviewed Order No. R-2438 which authorized Pan American Petroleum Corporation to utilize the above-described well for salt water disposal and it is my opinion that no further action by the Commission is necessary in order to permit Pan American Petroleum Corporation to continue to utilize the well for the disposal of water produced from the Dakota formation as proposed in your letter of May 1, 1970.

Very truly yours,

GEORGE M. HATCH
Attorney

GMH/esr

cc: Oil Conservation Commission
1000 Rio Brazos Road
Aztec, New Mexico 87410

PAN AMERICAN PETROLEUM CORPORATION

SECURITY LIFE BUILDING
DENVER, COLORADO 80202

May 1, 1970

File: AMR-959-986.511

Re: Salt Water Disposal
USG Section 19 Well No. 17
Hogback Field
San Juan County, New Mexico

Mr. A. L. Porter, Jr. (3)
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Sir:

Under Order No. R-2438 dated February 27, 1963, Pan American Petroleum Corporation dually completed the subject well as a producer from the Pennsylvanian Formation, and a water disposal well in a non-productive zone of the Chinle Formation. The attached field map and wellbore diagram show the location and present completion status of Well No. 17. The Pennsylvanian zone has been shut-in since January, 1965, due to uneconomical production and we now plan to permanently abandon that formation. We wish to retain that portion of the hole above 3,100' for continued water disposal, and the planned abandonment will in no way change the established injection method which has been down the annulus between the 7 inch and 9-5/8 inch casing strings, as specified in Order R-2438.

Since the Pennsylvanian Formation in Well No. 17 will be abandoned, and the only other Pennsylvanian completion in the field (USG Section 19 Well No. 13) has been shut-in since May, 1968 due to uneconomical production, only Dakota water will now be disposed of at Well No. 17. Dakota water is also being disposed of into USG Section 19 Well No. 24, as authorized under Order R-3419 dated May 29, 1968. With water production from the Hogback Dakota Pool having continued to increase, averaging 3,700 BWPD during March, 1970, the use of Well No. 17 is considered essential to the salt water disposal program in this field.

Well No. 17 was originally completed as a disposal well to handle produced Pennsylvanian water. We therefore respectfully request your approval to dispose of Dakota water into the same zones, as described herein. A Form C-103 setting out our specific plans for abandonment of the Pennsylvanian will be submitted for your approval by our Farmington Office. We are writing at this time to be certain you are fully informed of our plans to continue the use of Well No. 17 for salt water disposal after the deeper horizons are abandoned.

Yours very truly,

R. B. Giles

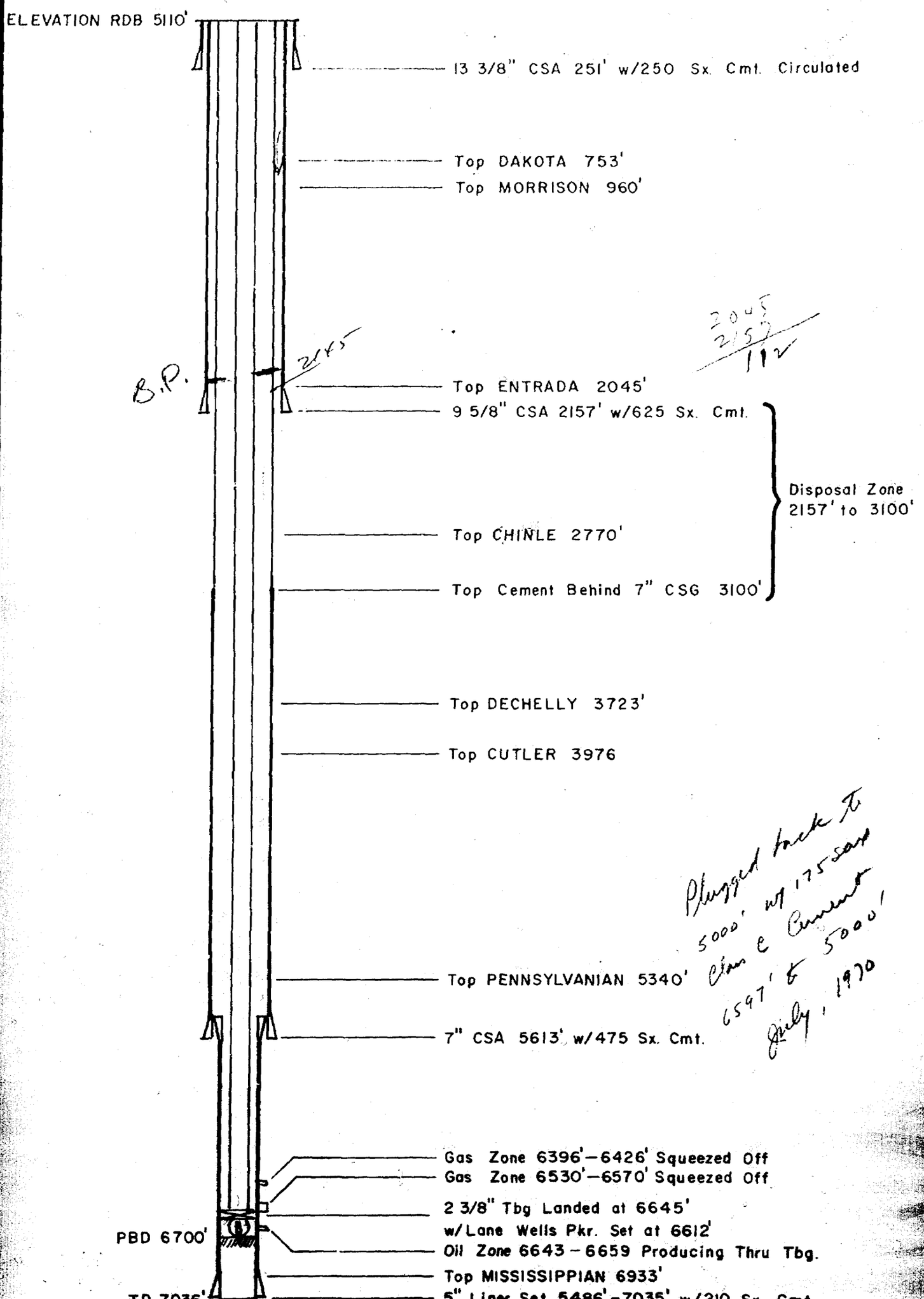
Attachments

cc: Mr. E. C. Arnold
New Mexico Oil Conservation Commission,
1000 Rio Brazos Road
Aztec, New Mexico

U. S. Geological Survey
P. O. Box 965
Farmington, New Mexico

and Drawer 1857
Roswell, New Mexico

PAN AMERICAN
No. 17 USG Section 19



BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 21, 1963

EXAMINER HEARING

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for a dual completion, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion of its USG Section 19 Well No. 17, located in Unit I of Section 19, Township 29 North, Range 16 West, San Juan County, New Mexico, to produce oil from the Hogback-Pennsylvanian Pool through tubing and to dispose of produced salt water into the Chinle formation through the intermediate casing annulus. Case 2762

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 2762.

MR. DURRETT: Application of Pan American Petroleum Corporation for a dual completion, San Juan County, New Mexico.

MR. MALONE: Charlie Malone of Atwood and Malone for the applicant. We have one witness and six exhibits.

(Witness sworn.)

GEORGE W. EATON, JR.

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

follows:

DIRECT EXAMINATION

BY MR. MALONE:

Q For the record, would you please state your name and position with the applicant?

A George W. Eaton, Junior, Senior Petroleum Engineer for Pan American Petroleum Corporation, Farmington, New Mexico.

Q Mr. Eaton, have you previously testified before this Commission and were your qualifications accepted?

A Yes, they were.

MR. MALONE: Would the qualifications of this witness be acceptable?

MR. UTZ: Yes, they are.

Q Would you briefly describe the nature of your application, please?

A This application is for permission to use the Entrada-Chinle interval in USG Section 19, Well No. 17, Hogback-Pennsylvanian Pool. In that connection I would like to refer the Examiner to Order R-2341, dated October 22, 1962 in Case 2644. In this order the interval 6514 to 6524 feet in USG Section 19, Well No. 13 was authorized as a disposal interval for the produced water from the Hogback-Pennsylvanian Pool. Actually this application in Case 2762 involves the same water production as

was involved in Case 2644, Order R-2341.

I would also like to call attention to the application of Pan American dated January 30, 1963, to which is attached the completed unnumbered form entitled "Application to Dispose of Salt Water by Injection into a Porous Formation not Productive of Oil or Gas."

Q Will you state the reason for this application?

A Yes, sir. While we were able to use the interval 6514 to 6524 in the Pennsylvanian formation of USG 19, Well No. 13, as a disposal interval, extremely high injection pressures were required to dispose of the produced salt water into that interval. As an alternate zone it is the purpose of the present application to seek another zone for approval in the Hogback-Pennsylvanian Pool area which can be used for disposition of at least a portion of the produced water.

Q In effect, then, the present application is supplemental to the prior authority which was granted rather than as a substitute for the prior order?

A Yes, sir, that is correct. We intend, or would prefer to leave Order R-2341 still in effect but add the Entrada-Chinle interval in the Well No. 17 as an alternative injection zone.

(Whereupon, Applicant's Exhibits Nos. 1 through 6 were marked for identification.)

Q Going now to your exhibits, would you state what Exhibit No. 1 shows, please?

A Yes, sir, Exhibit No. 1 is a map of the Hogback-Pennsylvanian Pool area showing thereon the location of the two wells in the pool which are colored in red and the fact that Pan American Petroleum Corporation is the sole owner of working interest in the general area of the pool and that the Navajo Tribe of Indians is the lessor in this entire general area.

Q There are no offset operators to Section 19 other than Pan American?

A That is correct.

Q What does Exhibit No. 2 show, please?

A Exhibit No. 2 is a copy of the electric log on USG 19, Well No. 17. It also shows the present completion interval of the well in the Pennsylvanian zone between the intervals of 6643 to 6659 feet. It also shows that the well is completed with tubing set on a packer and is actually producing from below this packer set in the casing string.

Moving up the hole from the present completion interval you will note that there are a number of perforated intervals which have been squeezed off in this well. These are former gas-producing intervals which produced helium-bearing gas at the time the Hogback-Pennsylvanian Pool was a gas pool.

Further, the log shows the various casing seats of the USG 19, 17 Well; again commencing at the bottom there is a 5" liner, the bottom of which is at 7035 feet. Moving up the hole there is a 7" casing string set at 5613 feet, the top of the cement behind the 7" casing string is shown to be at approximately 3100 feet. The next string of casing is a 9-5/8" string set at 2157 feet, approximately a hundred feet below the top of the Entrada formation. The surface casing in this well is a 13-3/8" string set at 251 feet.

Q Please go now to Exhibit No. 3 and discuss briefly what it shows.

A Exhibit No. 3 is a diagrammatic sketch of the USG 19 No. 17 Well completion showing the various casing strings again, together with the important cement tops and the relevant formation tops that were encountered during the drilling of this well. Particular attention is called to that interval on the sketch between the 9-5/8" casing set at 2157 feet and the top of cement behind the 7" casing which is estimated at 3100 feet. This interval includes the lower portion of the Entrada formation and the upper portion of the Chinle formation.

Q Is this the injection interval?

A Yes, sir, it is this interval which we're seeking approval for use as a disposal zone.

Q The dark lines on Exhibit 3 represent what?

A With the exception of one of these dark lines, the dark lines depict the portion of the casing which has cement behind it.

Q And the light lines are the casing strings and the tubing?

A That is correct, yes.

Q Going now to Exhibit No. 4, would you describe what it is, please?

A Yes. Exhibit No. 4 is a water analysis on the water recovered from a drill stem test in Pan American's Navajo Tribal No. 1 located 790 from the North line and 1,090 from the West line of Section 12, 29, 17. That location can be seen on Exhibit No. 1 and it's approximately two and a half miles northwest of the two producing wells in the Hogback-Pennsylvanian Pool. This analysis shows that the solids content of this water is in excess of 10,000 parts per million. There's a notation on the bottom part of the analysis that says that this analysis indicates contamination, probably from drilling fluids, and is not considered representative of formation water.

We were drilling the Navajo Tribal No. 1 with a fresh mud, so this simply means that the actual formation water content of the Entrada formation is likely to be considerably in excess of

10,000 parts per million. Unfortunately we do not have an analysis of the Entrada water from either of the two Hogback-Pennsylvanian Pool wells, but because of the proximity of the Navajo Tribal No. 1, I feel confident that the water in the Entrada zone in the Hogback-Pennsylvanian Pool is substantially identical to that encountered in the Navajo Tribal No. 1.

Q For the record, the water which was analyzed and the analysis shown on this report is the water from the same interval in which you request the right to inject and dispose of salt water?

A Yes, sir. With the exception that more than the Entrada is exposed in this particular annular space in the USG 19, 17. That interval also includes the upper portion of the Chinle formation.

The drill stem test recovery was from the upper portion of the Entrada, since it shows a high solid content, it's safe to presume that the formations lying underneath the Entrada also have high solids content in them too.

Q In your opinion, waters in the top of the Chinle would be as bad or worse than waters which were analyzed for Exhibit No. 4, is that correct?

A That is correct, if there, in truth, is any water in the top of the Chinle. The log on this well actually shows that

there's not much porosity in the Chinle. The fact is, in this entire interval that is proposed for use as injection there's not much porosity shown on the log.

Q Ten thousand parts per million means that the water is not potable and non-useable for irrigation, is that correct?

A That is correct.

Q What is Exhibit No. 5, please?

A Exhibit No. 5 is a copy of a letter from Mr. P. T. McGrath, District Engineer for the United States Geological Survey in Farmington, in which he states that the United States Geological Survey offers no objection to the use of the Entrada-Chinle zone in this well as a disposal zone.

Q And Exhibit No. 6, please?

A Exhibit No. 6 is a copy of a letter from the New Mexico State Engineer's office in which he states that that office has no objection to the use of the Entrada-Chinle zone as a disposal zone.

Q Which of those exhibits were prepared either by you or under your direct supervision and control?

A Exhibits 1 and 3 were prepared by me or under my direct supervision and control.

MR. MALONE: We offer in evidence Exhibits Nos. 1 through 6.

MR. UTZ: Without objection Exhibits 1 through 6 will be entered into the record of this case.

(Whereupon, Applicant's Exhibits Nos. 1 through 6 were offered and admitted in evidence.)

Q Mr. Eaton, are either correlative rights or waste involved in this application, in your opinion?

A There would be no question of violation of correlative rights involved since we have the approval of the two agencies who are most concerned with protection of those rights concurrence already. With regard to waste, approval of this zone could result in the prevention of waste through the operation of the remaining two wells in the Hogback-Pennsylvanian Pool for a longer period of time than would otherwise be possible.

Our concern is that the high injection pressures that are necessary for continued use of this volume of water to be disposed of into the Pennsylvanian interval might cause some damage to equipment both in the well and on the surface as regards the injection pump and thereby cause increased operating costs and eventually possible abandonment of the two wells sooner than might otherwise be necessary.

Q Approximately what pressure is necessary to inject in the Chinle and Entrada?

A Approximately 350 pounds, based on the test which we've

run on that zone.

Q Is the required injection pressure in the Pennsylvanian zone higher than that?

A Yes, sir, it's much higher. It required close to 2,000 psig. to inject into the Pennsylvanian zone.

Q Do you have anything further to add to your testimony in this case?

A I don't believe so, thank you.

MR. MALONE: We have no further questions, Mr. Examiner.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Eaton, how old is the 7" casing in this well?

A It's approximately five years old.

Q It should be in pretty good shape then?

A Should be, yes, sir. One thing we haven't been bothered with in the Hogback-Pennsylvanian area is severe corrosion, and certainly the steel in these wells has been exposed to plenty of opportunities for it having produced large quantities of this rugged, saline water, both at the time the wells were gas wells, and here in the last year since they've started making water as oil wells. Apparently it isn't too corrosive.

Q Where would you say the top of the cement was behind

the 9-5/8ths?

A That top of the cement behind that 9-5/8" is somewhere between 345 feet and 772 feet. The reason I give you that range is that we attempted to run a temperature survey on that particular string but the top, as defined by that survey, was not very conclusive. So in order to determine if they had a suitable cement job, we ran a free point survey. That free point survey showed that the pipe was completely free at 345 feet but it wasn't completely stuck until down to 772 feet. I suspect that that's the reason the temperature survey was inconclusive.

What this means is that there is some cement behind the casing in that 345 to 772 feet interval, but it isn't solid cement.

Q So you would actually have around thirteen, fourteen hundred foot of cement there?

A Yes, sir, at least.

Q How about your temperature survey, or did you run one for the cement behind the 7"?

A Yes, sir.

Q The top on that?

A The 3100 feet, which is the estimated top of the cement behind the 7", was picked from a temperature survey. Again, as you know, the exact top is a little difficult to tell on most

temperature surveys, but that's the approximate top of it, which means that there's about 2500 feet of cement behind the 7" casing.

Q You feel that these two cement jobs are adequate to hold any pressure that would be exerted on them by the injection of salt water in the Chinle?

A Yes, sir, I certainly do.

MR. UTZ: Are there any further questions of the witness? He may be excused.

(Witness excused.)

MR. UTZ: Are there any statements in this case? The case will be taken 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 30th day of April, 1963.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2762, heard by me on Feb. 21, 1963.

Examiner
New Mexico Oil Conservation Commission

CASE 2762: Application of PAN AM. for the dual completion of its USG SECTION 19 WELL NO. 17.