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11/14/00

767

**Eastham
Johnson
Monnheimer
& Jontz, P.C.**

October 27, 2000

OCT 30 2000

ATTORNEYS AT LAW

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87102-5311

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505-247-2315

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505-764-5480

www.ejmj.com

**Michael E. Stogner
Chief Hearing Office/Engineer
Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505**

Re: Division Order Nos. R-2749 and R-2749-A

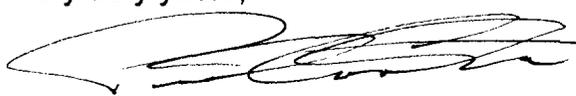
Dear Mr. Stogner:

Supplementing Order No. R-2749-A, dated September 8, 2000, enclosed are the original and one copy of the Division's Form C-108, being the Application of Shahara Oil Company for Administrative Approval to convert two wells to injection wells in what is now known as the Shahara Premier Sand Unit EOR.

As will be noted, copies of Shahara Oil's Application have been mailed to the surface owner, the grazing permittee and each leasehold operator within one-half mile of the proposed injection wells. Notice of the proposed operation has been forwarded to the Artesia Daily Press and its Affidavit of Publication will be forwarded to you as soon as it is received.

Should there be any questions, please contact either Perry Hughes in Carlsbad (whose address and telephone number are set forth on the Application) or the write.

Very truly yours,



Paul A. Cooter

PAC/smb
enclosure
cc: Shahara Oil LLC

JOHN P. EASTHAM
ROBERT A. JOHNSON
DONALD B. MONNHEIMER
DENNIS E. JONTZ
BRUCE E. CASTLE
JAMES L. RASMUSSEN
STEPHEN R. NELSON
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JEFFREY H. ALBRIGHT
TRACY T. HOWELL

THOMAS P. GULLEY, Of Counsel
PAUL A. COOTER, Of Counsel

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: Secondary Recovery Pressure Maintenance Disposal Storage
Application qualifies for administrative approval? yes no

II. Operator: Shahara Oil, LLC

Address: 207 W McKay, Carlsbad, NM 88220

Contact party: Perry L. Hughes Phone: 505-885-5433

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? yes no
If yes, give the Division order number authorizing the project R-2749 & R-2749-A

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Perry L. Hughes Title Executive Officer

Signature: Perry L. Hughes Date: 10/13/00

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

- (1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;
- (3) the formation name and depth with expected maximum injection rates and pressures; and
- (4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED:

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

ATTACHMENT TO OCD FORM C-108

SHAHARA OIL, LLC
GRAYBURG JACKSON PSU MB No. 6
GRAYBURG JACKSON PSU AD No. 11

- I. Purpose - Application is made for authorization to expand injection of water and to institute micro-emulsion flooding into the Premier Sand of the Grayburg formation underlying the Grayburg Jackson PSU MB No. 6 Well and Grayburg Jackson PSU AD No. 11 Well under Oil Conservation Division Order No's R-2749 & R-2749-A in Section 27, of Township 17 South, Range 30 East, Eddy County, New Mexico, as shown on the attached Exhibit "A". These wells are part of an enhanced recovery program designed to economically recover additional oil reserves to the benefit of all parties holding an interest in the Unit Area.
- II. Operator - Shahara Oil, LLC
207 W McKay, Carlsbad, NM 88220
- III. Injection Well Data - The required well data and schematic diagrams of Grayburg Jackson Premier Sand Unit MB No. 6 and Grayburg Jackson Premier Sand Unit AD No. 11 are enclosed as Exhibit "B".
- IV. Under the Grayburg Jackson Premier Sand Unit Enhanced Oil & Tertiary Recovery Project Division Order No. R-2749-A and Premier Sand Waterflood Project Order No.R-2749, injection of water and micro-organisms into the Premier Sand of the Grayburg formation has been authorized.
- V. Maps - The attached Exhibit "A" identifies the proposed injection well, the Area of Review within one-half mile of a proposed injection well, and all wells and leases within two miles of a proposed injection well.
- VI. Well Data - The well data for the wells within the Area of Review is attached as Exhibit "C" and the well data and schematic diagrams for all plugged and abandoned well bores within the Area of Review are attached as Exhibit "D".
- VII. Proposed Operations:
 1. Proposed average daily injection rate - 250 BWPD/well
Proposed maximum daily injection rate - 500 BWPD/well
 2. A closed injection system will be maintained.
 3. An average injection pressure of approximately 1800 psi is anticipated. The maximum injection pressure will be subject to the injection pressures authorized by the Oil Conservation Division.

4. The proposed injection fluid will consist of micro-organisms and water produced by wells in the Grayburg Jackson Premier Sand Unit, from Beeson "F" Federal wells operated by Shahara Oil, LLC and from produced water purchased from other operators in the immediate area.

- VIII. Geological Data - The injection interval is in the Premier Sand formation at a depth of approximately 3100 to 3300 feet. The Premier Sand is quartz sand with dolomitic cementation. The surface formation is Cretaceous and has no known sources of drinking water in this area.

- IX. Stimulation - Small acid treatments of about 2000 gallons per well have been sufficient to open the perforations for injection

- X. Logging Data - The available logs are those on file with the Oil Conservation Division from the original operators of the wells and those furnished the Oil Conservation Division and the Bureau of Land Management by Shahara Oil, LLC.

- XI. Fresh Water Wells - No fresh water wells are located in the area of review.

- XII. Not applicable.

- XIII. Proof of Notice - Copies of this C-108 Application have been mailed to the surface owner, the grazing permittee and to each leasehold operator within one-half mile of the proposed injection wells. An Affidavit of such notice is attached Exhibit "E". Copies of the return receipts will be furnished upon request.

Exhibit "B"

Well Data and
Schematic Diagrams of
Proposed Injection Wells

Shahara Oil, LLC
Attachment to OCD Form C-108

Grayburg Jackson PSU MB No. 6
1650' FSL & 1650' FEL, Unit J
Section 27-T17S-R30E
API: 30-015-04363

Completed

8 1/4" 2# SA 698 ~ 50 SY

4 1/2" 10.5# AD-1 PKR
(PLASTIC COATED) SA 3072

2 3/8" 4#7" NEW TBS COATED
W/TK70. PKR FLUID CIRC.
IN ANNULUS.

SHOT 3210'-34' W/120 QTS

7" 20# SA 3126 W/100 SY
OTD 3234' (1941)

PERF 3131-3516 (22 HOLES)
IN PREMIER SAND.

PBD 3543'
TD 3600' (2000)

4 1/2" 10.5# SA 3598
W/ 360 SY - CIRC CMT. TO SURFACE
ACID W/2500 GAL 15% NEEF

4/10/85 22

Grayburg Jackson PSU AD No. 11
 1310' FNL & 1310' FEL, Unit D
 Section 27-T17S-R30E
 API: 30-015-30008

Proposed

12 1/4" HOLE

3 5/8" 24" SA 523' W / 544' SW
 CIRC.

PROPOSED:

SET 5 1/2" 17" AD-1 PERL @
 3000' W / 2 3/8" 4.7" NEW
 COATED TBC (T-70). CIRC
 PERL FLUID IN ANNULUS

ACID. W / 1500 GAL
 15% NEFE

PERF GRAYBURG Premier SN
 3042' - 3199' (14 HOLES)

SET CIBP @ 3400' (PROPOSED)

ACID W / 3000 GAL
 15% NEFE

PERF SN ANDRES 3867' - 4068' (15)
 4402' - 4510' (9)

7 7/8" HOLE - TD 5002' (1998)

PBTD 4958' (ORIGINAL)
 5 1/2" 17" SA 5000' W / 1775' SW -
 CIRC. CMT.

A/10/25/00

Exhibit "C"

Well Data for
Wells Within the
Area of Review

Shahara Oil, LLC
Attachment to OCD Form C-108

Exhibit "C"

Area of Review Well Data

Attachment to Grayburg Jackson PSU MB No. 6 C-108
 Attachment to Grayburg Jackson PSU AD No. 11 C-108

Operator - Well Name Location	Completion Date	TD	PBTD	Casing Size	Casing Depth	Cement Sacks	Top of Cement	WIW Pkr @	Producing Interval	Stimulation	Current Status
Mack Energy Corporation Brigham B #2 330' FSL & 990' FWL, Unit M Section 22-T17S-R30E	07/12/62	1925'	N/A	8 5/8" 7"	450' 1916'	75sx 125sx	Circ		1916'-1925'	Frac open hole w/5,000gls oil & 4,000# sand	Producing
Mack Energy Corporation Brigham B #1 330' FSL & 2310' FWL, Unit N Section 22-T17S-R30E	06/02/54	1947'	N/A	8 5/8" 7"	464' 1938'	50sx 100sx	Circ		1938' - 1947'	N/A	Producing
MNA Enterprises LTD Co. Federal E #8 990' FSL & 2310' FEL, Unit O Section 22-T17S-R30E	01/18/54	1950'	N/A	8 5/8" 7"	428' 1875'	50sx 50sx	945'		1916'-1935'	Acid w/130qts Nitro.	Producing
MNA Enterprises LTD Co. Federal E #7 330' FSL & 2310' FEL, Unit O Section 22-T17S-R30E	05/31/50	1963'	N/A	8 5/8" 7"	495' 1825'	50sx 100sx	1724'		1901'-1952'	Acid w/212qts Nitro.	Producing
MNA Enterprises LTD Co. Federal E #6 660' FSL & 1980' FEL, Unit O Section 22-T17S-R30E	06/18/44	1950'	N/A	8 5/8" 7"	502' 1877'	50sx 100sx	Circ		1877' - 1950'	Acid w/180qts Nitro.	Producing
Nadel & Gussman Permian LLC Brown Crow Federal #2 330' FSL & 660' FEL, Unit P Section 21-T17S-R30E	10/16/85	3300'	3284'	8 5/8" 5 1/2"	448' 3300'	300sx 600sx	Circ		2579'-3056'	Acid w/3,000gls. Frac w/80,000 gls H2O & 148,000# sand	Producing
Mack Energy Corporation Federal "X" #4 330' FSL & 990' FWL, Unit M Section 21-T17S-R30E	09/07/52	1880'	N/A	8 5/8" 7"	525' 1774'	50sx 50sx	844'		1799'-1850'	Acid w/200qts Nitro.	Producing
Shahara Oil LLC Grayburg Jackson PSU AD #9 330' FNL & 640' FEL, Unit A Section 34-T17S-R30E	08/15/65	3332'	3300'	8 5/8" 5 1/2"	550' 3260'	100sx 150sx	2117'		3260'-3300'	Acid w/600gls 20% reg acid.	Producing
Shahara Oil LLC Madden "B" Federal #9 2310' FSL & 1660' FEL, Unit J Section 27-T17S-R30E	12/26/51	3192'	N/A	8 5/8" 7" 5 1/2"	544' 1917' 3164'	50sx 75sx 50sx	Circ 2783'		3164'-3192'	Acid w/280qts Nitro 500gls 15% acid Frac w/40,000#sand & 40,000gls H2O	Producing

Exhibit "C"
Area of Review Well Data
Attachment to Grayburg Jackson PSU MB No. 6 C-108
Attachment to Grayburg Jackson PSU AD No. 11 C-108

Operator - Well Name Location	Completion Date	TD	PBTD	Casing Size	Casing Depth	Cement Sacks	Top of Cement	WWV Pkr @	Producing Interval	Stimulation	Current Status
Shahara Oil LLC											
Grayburg Jackson PSU MB #12	10/30/69	3278'	3207'	8 5/8"	497'	100sx			3161'-3196'	Acid w/500gls pental 200 15% NEFE Frac w/30,000gls slick H2O & 30,000# 20/40 sand.	Producing
1815' FSL & 1295' FWL, Unit L				5 1/2"	3240'	200sx	1716'				
Section 27-177S-R30E											
Shahara Oil LLC											
Grayburg Jackson PSU MB #2	02/28/55	3258'	N/A	8 1/4"	525'	50sx			3024'-3258'	Acid w/1300gls Nitro, acid w/1000gls 15% NEFE, acid w/3,000gls 15% NEFE, Frac w/6bls crude, 23bls oil w/14,500# sand.	Producing
1650' FSL & 330' FWL, Unit L				5 3/8"	3024'	100sx	2262'				
Section 27-177S-R30E											
Shahara Oil LLC											
Grayburg Jackson PSU AD #10	09/24/75	3230'	3224'	8 5/8"	498'	100sx			3120'-3154'	Acid w/2,250gls Frac w/30,000gls H2O & 20,000# sand.	Producing
660' FNL & 990' FWL, Unit D				4 1/2"	3230'	600sx	Circ				
Section 27-177S-R30E											
Shahara Oil LLC											
Grayburg Jackson PSU AD #3	04/25/44	3210'	2000'	8 5/8"	529'	50sx			3151'-3210'	Acid w/1600gls Nitro.	Producing
660' FNL & 1980' FWL, Unit C				7"	3072'	100sx	1213'				
Section 27-177S-R30E											
Pendragon Energy Part Inc.											
Grayburg Jackson Tract 7B #2	04/18/57	3253'	N/A	8 5/8"	507'	50sx			3192'-3224'	Frac w/sand-oil, 5,000# sand & 5,000# gelled oil.	Producing
2310' FSL & 330' FEL, Unit I				5 1/2"	3253'	100sx	2491'				
Section 27-177S-R30E											
MNA Enterprises LTD. Co.											
Sergeant 4	01/11/51	2073'	2023	8 1/4"	505'	50sx			1950'-1995'	Acid w/1800gls Nitro.	Producing
330' FNL & 330' FEL, Unit A				7"	1900'	25sx	1435'				
Section 27-177S-R30E											
Shahara Oil LLC											
Grayburg Jackson PSU MB #3	03/29/54	3252	N/A	8 1/4"	660'	50sx			3235'-3252'	Acid w/1600gls Nitro	WWV
990' FSL & 1650' FWL, Unit N				7"	3169'	100sx	1310'	3100'		Frac w/24bls kero, 25bls crude 8,040gls refined oil w/10,600# sand flush w/506bls crude.	
Section 27-177S-R30E											
Pendragon Energy Part Inc.											
Grayburg Jackson Tract 6 #3	10/03/43	3190		8 1/4"	450'	275sx			3143'-3185'	Acid w/1300gls Nitro.	WWV
660' FNL & 1986' FEL, Unit B				7"	2971'	100sx	1112'				
Section 27-177S-R30E											
Shahara Oil LLC.											
Madden B Federal #15	04/21/98	3702'		8 5/8"	521'	310sx			2025'-2061'	Acidized w/1500 gals Fercheck w/ball sealers. Frac w/18,900 gals 20#	Producing
330' FSL & 1310' FEL, Unit P				5 1/2"	3699'	1092sx	Circ				
Section 27-177S-R30E										Delta w/19,000# 20/40 &	

Exhibit "D"

Well Data and
Schematic Diagrams of
Plugged and Abandoned
Well Bores Within the
Area of Review

Shahara Oil, LLC
Attachment to OCD Form C-108

Exhibit "D"

Plugged and Abandoned Well Data

Attachment to Grayburg Jackson PSU MB No. 6 C-108

Attachment to Grayburg Jackson PSU AD No. 11 C-108

Operator - Well Name Location	Plug Date	TD	Perfs	Casing Size	Casing Depth	Cement Sacks	Top of Cement
Phillips Petroleum Company							
Grayburg Jackson W/FU Tract BA #2	10/23/93	3200'	OH	10 3/4"	1251'	150sx	1500' (calc)
330' FNL & 330' FEL, Unit A				5 1/2"	3035'		
Section 28-117S-R30E							
Phillips Petroleum Company							
Maddren Deep Ut B #1	06/13/82	11574'	D & A	12 3/8"	352'	500sx	Circ
660' FSL & 2180' FEL, Unit O				8 5/8"	3685'	1825sx	Circ
Section 27-117S-R30E							
Phillips Petroleum Company							
Grayburg Jackson W/FU Tract MB#7	11/10/93	3254'	3131'-3254' (OH)	8 1/4"	670'	50sx	1841' (calc)
990' FSL & 990' FEL, Unit P				7"	3131'	100sx	
Section 27-117S-R30E							
Phillips Petroleum Company							
Grayburg Jackson W/FU Tract MB#4	12/07/93	3223'	3125'-3223' (OH)	8 1/4"	663'	70sx	1834' (calc)
1650' FSL & 2310' FWL, Unit K				7"	3125'	100sx	
Section 27-117S-R30E							
Phillips Petroleum Company							
Grayburg Jackson W/FU Tract AD#1	12/01/93	3522'	3063'-3210' (OH)	8 1/4"	520'	75sx	1772' (calc)
1980' FNL & 1980' FWL, Unit F				7"	3063'	100sx	
Section 27-117S-R30E							
Phillips Petroleum Company							
Arnold D Federal #4	10/25/88	2011'	1851'-2011' (OH)	8 5/8"	494'	75sx	
330' FNL & 2310' FWL, Unit C				7"	1851'	100sx	560' (calc)
Section 27-117S-R30E							
LBO New Mexico Inc.							
Grayburg Jackson Unit Tract 11 #1	04/16/87	3233'	3198'-3206'	8 1/4"	624'	50sx	
1980' FNL & 660' FEL, Unit H				7"	3047'	100sx	1756' (calc)
Section 27-117S-R30E				4 1/2"	3232'	700sx	Circ (calc)

PHILLIPS PETROLEUM

GJWFLU TR "BA" #2

Unit "A" Sec. 28 T7S R230E

PHILLIPS PETROLEUM CONSULTANTS, INC.
10000 W. 10TH AVENUE, SUITE 1000, DENVER, CO 80202

PAGE NO. 1 OF 1
DATE 10/11/93

PEA 10/93

PERF. @ 500' - UNABLE
TO BREAK CIRC. SQ
175 SY THRU PERFS. -
TAG CMT @ 33' -
PUMP 15 SY TO FILL
CEG

10³/₄" SA 1251'

PERF. @ 1300' & 1175' -
CIRC W/ 50 SY CMT
1300-1175' W/ CIRC
@ 1200' DUMP 10 SY
ON TOP OF CIRC.

EST TOC @ 1500'

PERF @ 2342 - Pump 50 SY - TAG
TOC @ 2234'

PERF @ 2575 - ATTEMPT
TO SQ 50 SY -
SOME CMT THRU
PERFS & SOME IN
WORK STRING

SET 50 SY CMT PLUG FROM
2975 - 2600
SET CIBP @ 2975'

TD 3200' (EST.)

5¹/₂" 14# SA 3035 w/ 150 SY

H 7/1/00

PHILLIPS PETROLEUM Co.

MADDERO DEEP Unit "B" #1

Unit "O" SEC 27 T17S R30E

DEA 4/82

SET 10 SX SURFACE
PLUG

13³/₈" 48# SET IN 17¹/₂" HOLE @ 352'
w/ 500 SX - CIRC

SET 40 SX 3724-3524'

8⁵/₈" 32# SET IN 11" HOLE @ 368'
w/ 1825 SX - CIRC.

SET 67 SX 6320-6120'

SET 58 SX 8500'-7000'

SET 75 SX 9148'-8948'

SET 100 SX 10930'-10730'

7⁷/₈" HOLE TO 11,574'

4/7/7/00

PHILLIPS PETROLEUM Co.

GJWFL TR "MB" #7

AMERICAN PETROLEUM CONSULTANTS INC

FILE #

UNIT "P" SEC. 27 T175 R230E

PEA 10/93

Pump 655x-

FILCO 7" ANNULUS

SET 255x PLUG 409-280'

PERF @ 600 - Pump

1005x - TAG CMT @ 409

PERF @ 770 - Pump 200

5x - TAG CMT @ 638'

8 1/4" CSG SA 670' w/505x

SET CIRC @ 1270' - SQ

w/755x

CALC TDC @ 1841 (SF 1.25)

SET CIRC @ 2695' - SQ

w/1605x - TAG PLUG

@ 2136'

7" CSG SA 3131' w/1005x

TD 8" HOLE @ 3254'

7/6/00

PHILLIPS PETROLEUM Co.

GJWFL TR "MB" #4

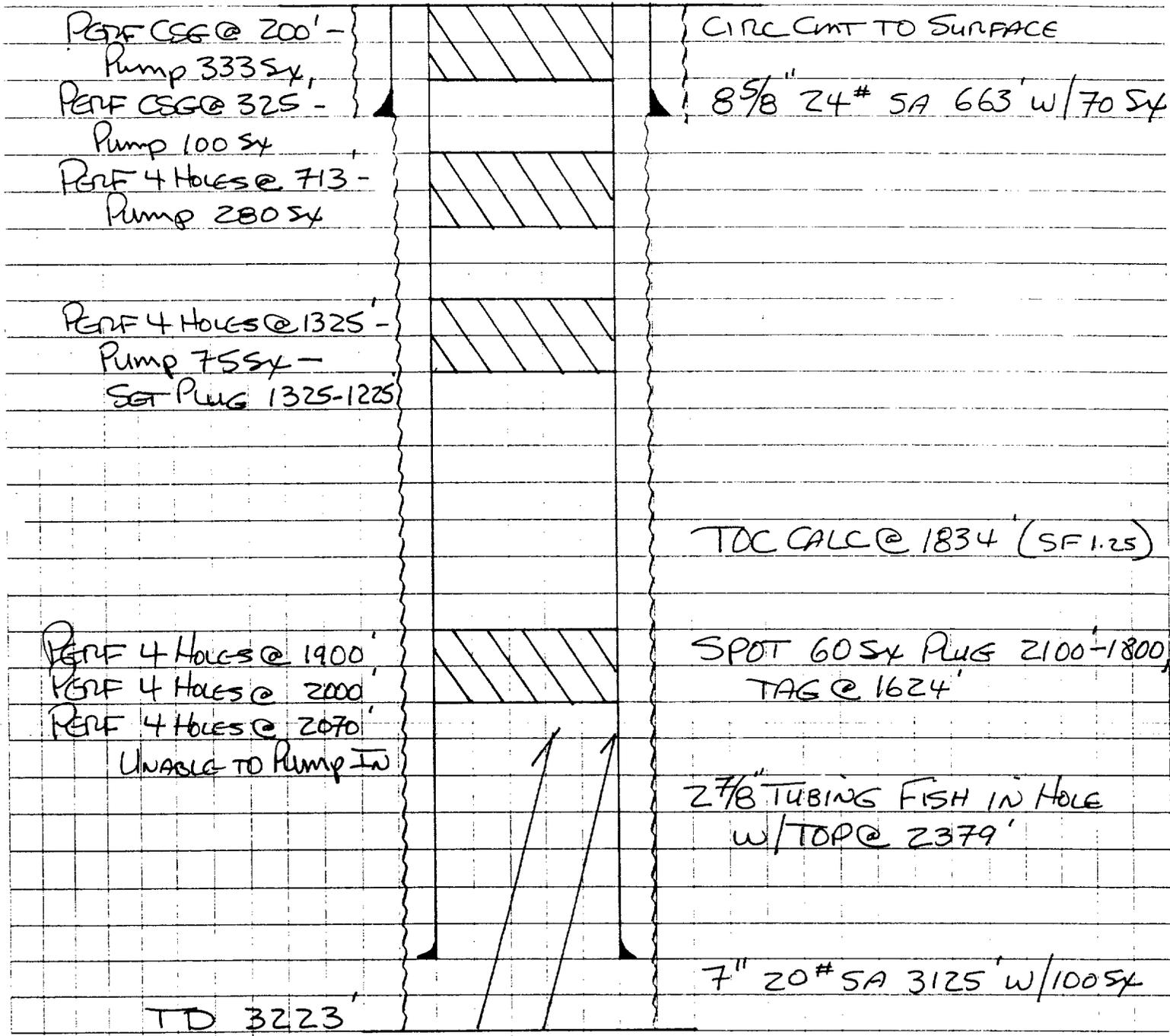
WILKINSON PETROLEUM CONSULTANTS, INC.

DATE: 12/12/93

Unit "K" Sec 27 T75 R30E

DRL 10/40

PEA 12/93



H 7/6/00

PHILLIPS PETROLEUM Co.

GJWFL TR AD #1

Unit "F" Sec 27 T17S R30E

WILLIAMSON PETROLEUM CONSULTANTS INC

DATE

BY

DRL 8/43

PEA 11/93

PERF @ 250' - Pump

275 SY - Circ.

PERF @ 350' - Pump

493 SY - TAG @ 260'

PERF @ 570' - Pump

100 SY - TAG @ 480'

FILLED ANNULUS w/CMT

8 5/8" CSG SA 520' w/75 SY

PERF CSG @ 1290' - SQ

w/75 SY. SET PLUG

1290' - 1190' TAG

@ 1160'

TOC CALC @ 1772' (1.25 SF)

SET CIRC @ 2290' -

SQ w/120 SY &

SET PLUG 2290-2200'

JUNK IN HOLE BELOW 2300'

7" SA 3063 w/100 SY

PBTD 3210'

TD 3522'

8" Hole

11/7/00

PHILLIPS PETROLEUM CO.

ARNOLD "D" FEDERAL #4

Unit "C" Sec 27 T17S R230E

PETROLEUM CONSULTANTS, INC.

PAGE NO. 1 OF 1

DATE 10/1/88

DRL 5/46
PEA 10/88

PERF @ 443 Pump
65SY-CIRC-FILL 7"
SPOT 20SY PLUG
544-443'

8 5/8" 24# SA 494' w/75SY

TOC CALC @ 560' (SF 1.25)

SPOT 95 SY PLUG
From TD 2011'-1703'
(TAGGED)

7" 20# SA 1851' w/100SY
(7 RIVERS COMPLETION)
TD 2011' (6" HOLE)

7/6/00

LBO New Mexico Inc

6J Unit T2 11 #1

Unit "H" Sec 27 T7S R30E

WILSON, BOY, PETERSON & ASSOCIATES, INC.

DATE:

TIME:

BY:

DATE:

DRL 5/42
PEA 4/87

SET 10SY 110'-0'

SET 25SY 610'-335'

8 1/4" 28# SA 624' w/50SY

TOC 4 1/2" x 7" CSG CALC. CIRC

SET 25 SY 1252'-975'

TOC BEHIND 7" CSG CALC@
1756' (SF 1.25)

SET 25SY 2470'-2370'

SET 10SY 3050'-3000'

7" 20# SA 3047' w/100SY

PERFS 3198'-3206'

TD 3233'

4 1/2" 9.5# SA 3230' w/700SY

7/7/00

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6467

United State Department of the Interior
Bureau of Land Management
2909 W Second
Roswell, NM 88201

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

Enclosed is a copy of the New Mexico Oil Conservation Division's Form C-108, Application for Authorization to Inject into the referenced wells in Section 27, of Township 17S, Range 30E. Eddy County, New Mexico. Shahara Oil, LLC is submitting this Application as part of their ongoing redevelopment project in the Loco Hills Area. This copy is sent to you in compliance with OCD requirement to notify the surface owner.

Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH\tm

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6474

Williams & Son Cattle Co.
PO Box 30
Maljamar, NM 88264

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH\tn

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6481

Southwest Royalties Inc.
PO Drawer 11390
Midland, TX 79702

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH\tm

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6498

MNA Enterprises
106 W Alabama
Hobbs, NM 88242

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH\tm

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6504

Marbob Energy Corp.
PO Box 227
Artesia, NM 88210

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH\tm

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6511

GP II Energy, Inc.
PO Box 50682
Midland, TX 79710

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH/tn

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6528

Mack Energy Corporation
PO Box 960
Artesia, NM 88210

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH\tm

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6535

Enron Oil & Gas Corp.
PO Box 2267
Midland, TX 79702

RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLH\tm

Enclosure

Shahara Oil, LLC

207 W. McKay • Carlsbad, NM 88220 • 505-885-5433 • Fax 505-885-4989

October 25, 2000

CERTIFIED NO. 7000 0600 0027 2939 6542

Nadel and Gussman
601 N Marienfeld, Ste 508
Midland, TX 79701

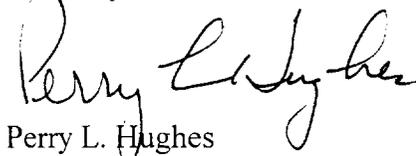
RE: Shahara Oil, LLC
Application for Authorization to Inject
Grayburg Jackson PSU MB No. 6
Grayburg Jackson PSU AD No. 11
Eddy County, New Mexico

Gentlemen:

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Should you have any questions regarding this Application, please contact me at 505-885-5433.

Sincerely,



Perry L. Hughes
Executive Officer
Shahara Oil, LLC

PLHtm

Enclosure

Exhibit "E"
AFFIDAVIT OF MAILING

STATE OF NEW MEXICO

: ss

COUNTY OF EDDY

I, Perry L. Hughes, do solemnly swear that a copy of this application has been mailed by certified mail, return receipt requested, to each of the following interested parties:

Surface Owner

United States Department of the Interior
Bureau of Land Management
2909 W Second
Roswell, NM 88201

Grazing Permittee

Williams & Son Cattle Co.
PO Box 30
Maljamar, NM 88264

Offset Operators:

Southwest Royalties Inc.
PO Drawer 11390
Midland, TX 79702

MNA Enterprises
106 W Alabama
Hobbs, NM 88242

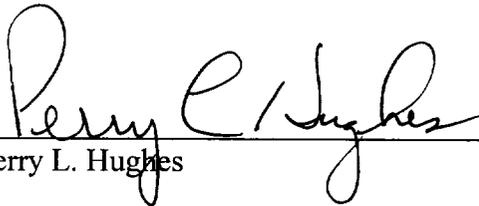
Nadel and Gussman
601 N Marienfield, Ste 508
Midland, TX 79701

Marbob Energy Corp.
PO Box 227
Artesia, NM 88210

GP II Energy, Inc.
PO Box 50682
Midland, TX 79710

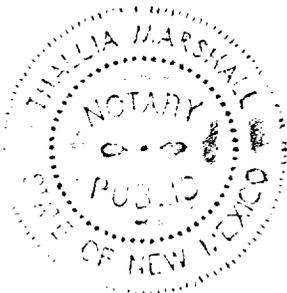
Enron Oil & Gas Corp.
PO Box 2267
Midland, TX 79702

Mack Energy Corporation
PO Box 960
Artesia, NM 88210



Perry L. Hughes

SWORN AND SUBSCRIBED TO before me this 25th day of October, 2000.





Notary Public

H7/15



InterChem, Inc.

(915) 550-7027 P. O. Box 13166 Odessa, Tx. 79768

Comparison Between Two Waters

06- July -1998

Permian Treating Chemicals
Shahara Oil, LLC - Mack Energy Co.

The samples from the above-cited location showed the following conclusions:

Topic:

Combination of the Shahara G.J.W.F.U. Water Flood Station water with the Mack Energy WD McIntyre E-4 water at various ratios:

Conclusions:

As the WD McIntyre E-4 water increases, the calcium carbonate scaling tendency (Stiff & Davis Saturation Index) increases to a severe level at 140° F and to a moderate level at 80° F. In addition, as the WD McIntyre E-4 water increases, the calcium sulfate scaling tendency decreases to a mild level.

Attachments:

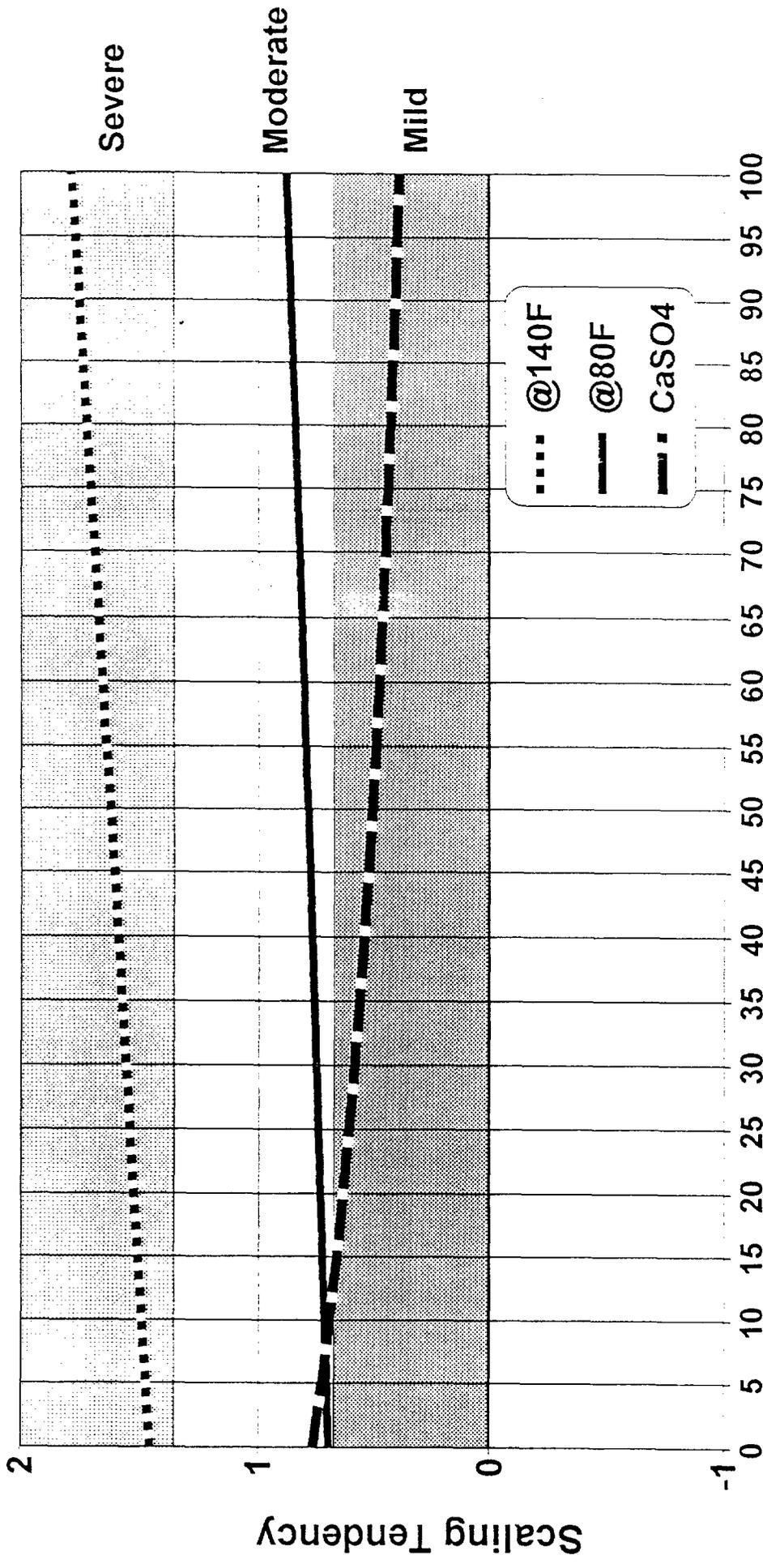
A graphical summary of the results is attached.

If we may further assist you in the interpretation of the above information, please call at your convenience.


Brad Mullins
Technical Services

Exhibit "F"
Shahara Oil, LLC
Attachment to OCD Form C-108
Water Compatibility Study

Mixture of Two Waters Shahara Oil, LLC - Mack Energy Co.



Percentage of WD McIntyre E-4 Water

Comparison Between Two Waters

06-July-1998

TO: Permian Treating Chemicals	Company : Shahara Oil & Mack Energy Co.
Sample # 1 G.J.W.F.U. - Water Flood Sta.	Sample # 2 WD McIntyre - E-4

Percent of #1 & #2	pH	TDS mg/L	SpGr	Saturation Index @80°F.	Saturation Index @140°F.	Calcium Sulfate Scaling Potential
100 - 0	7.050	73,794	1.048	+0.703	+1.455	Mild to Moderate
95 - 5	7.026	80,275	1.053	+0.712	+1.472	Mild to Moderate
90 - 10	7.001	86,756	1.057	+0.722	+1.489	Mild to Moderate
85 - 15	6.977	93,238	1.062	+0.731	+1.505	Mild to Moderate
80 - 20	6.952	99,719	1.066	+0.740	+1.522	Mild to Moderate
75 - 25	6.928	106200	1.071	+0.749	+1.538	Mild to Moderate
70 - 30	6.903	112681	1.075	+0.758	+1.555	Mild
65 - 35	6.879	119162	1.080	+0.767	+1.571	Mild
60 - 40	6.854	125644	1.084	+0.776	+1.587	Mild
55 - 45	6.830	132125	1.089	+0.785	+1.604	Mild
50 - 50	6.805	138606	1.093	+0.795	+1.620	Mild
45 - 55	6.781	145087	1.098	+0.804	+1.637	Mild
40 - 60	6.756	151568	1.102	+0.813	+1.653	Mild
35 - 65	6.732	158050	1.107	+0.821	+1.669	Mild
30 - 70	6.707	164531	1.111	+0.830	+1.685	Mild
25 - 75	6.683	171012	1.116	+0.839	+1.702	Mild
20 - 80	6.658	177493	1.120	+0.848	+1.718	Mild
15 - 85	6.634	183974	1.125	+0.857	+1.734	Mild
10 - 90	6.609	190456	1.129	+0.866	+1.750	Mild
5 - 95	6.585	196937	1.134	+0.875	+1.766	Mild
0 - 100	6.560	203418	1.138	+0.884	+1.783	Mild

Permian Treating Chemicals WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Shahara Oil, LLC
 Lease : G.J.W.F.U.
 Well No.: N/A
 Lab No. :

Sample Loc. : Water Flood Station
 Date Analyzed: 02-July-1998
 Date Sampled :

ANALYSIS

- | | |
|---|--------|
| 1. pH | 7.050 |
| 2. Specific Gravity 60/60 F. | 1.048 |
| 3. CaCO ₃ Saturation Index @ 80 F. | +0.669 |
| @ 140 F. | +1.587 |

Dissolved Gasses

- | | MG/L | EQ. WT. | *MEQ/L |
|---------------------|------|----------------|--------|
| 4. Hydrogen Sulfide | | Present | |
| 5. Carbon Dioxide | | Not Determined | |
| 6. Dissolved Oxygen | | Not Determined | |

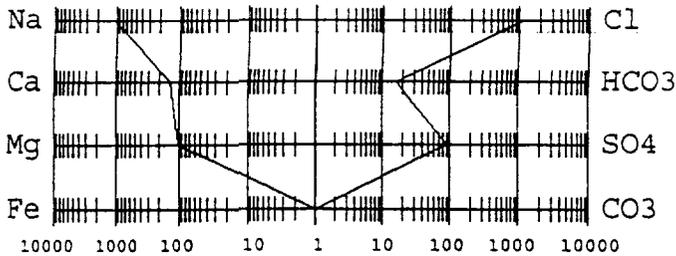
Cations

- | | | | |
|---|--------|----------------|----------|
| 7. Calcium (Ca ⁺⁺) | 2,605 | / 20.1 = | 129.60 |
| 8. Magnesium (Mg ⁺⁺) | 1,201 | / 12.2 = | 98.44 |
| 9. Sodium (Na ⁺) (Calculated) | 23,740 | / 23.0 = | 1,032.17 |
| 10. Barium (Ba ⁺⁺) | | Not Determined | |

Anions

- | | | | |
|--|------------|----------|----------|
| 11. Hydroxyl (OH ⁻) | 0 | / 17.0 = | 0.00 |
| 12. Carbonate (CO ₃ ⁼) | 0 | / 30.0 = | 0.00 |
| 13. Bicarbonate (HCO ₃ ⁻) | 957 | / 61.1 = | 15.66 |
| 14. Sulfate (SO ₄ ⁼) | 4,300 | / 48.8 = | 88.11 |
| 15. Chloride (Cl ⁻) | 40,991 | / 35.5 = | 1,154.68 |
| 16. Total Dissolved Solids | 73,794 | | |
| 17. Total Iron (Fe) | 7 | / 18.2 = | 0.38 |
| 18. Total Hardness As CaCO ₃ | 11,450 | | |
| 19. Resistivity @ 75 F. (Calculated) | 0.135 /cm. | | |

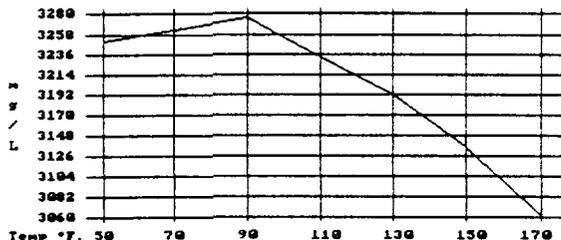
LOGARITHMIC WATER PATTERN *meq/L.



PROBABLE MINERAL COMPOSITION COMPOUND EQ. WT. X *meq/L = mg/L.

Ca (HCO ₃) ₂	81.04	15.66	1,269
CaSO ₄	68.07	88.11	5,998
CaCl ₂	55.50	25.82	1,433
Mg (HCO ₃) ₂	73.17	0.00	0
MgSO ₄	60.19	0.00	0
MgCl ₂	47.62	98.44	4,688
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.46	1,030.41	60,238

Calcium Sulfate Solubility Profile



*Milli Equivalents per Liter

This water is mildly corrosive due to the pH observed on analysis.
 The corrosivity is increased by the content of mineral salts, and the presence of H₂S in solution.

Permian Treating Chemicals WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Mack Energy Co.
Lease : WD McIntyre
Well No.: E-4
Lab No. :

Sample Loc. :
Date Analyzed: 02-July-1998
Date Sampled :

ANALYSIS

1. pH 6.560
2. Specific Gravity 60/60 F. 1.138
3. CaCO₃ Saturation Index @ 80 F. +0.908
@ 140 F. +2.018

Dissolved Gasses MG/L EQ. WT. *MEQ/L

- | | | | |
|----|------------------|----------------|--|
| 4. | Hydrogen Sulfide | Present | |
| 5. | Carbon Dioxide | Not Determined | |
| 6. | Dissolved Oxygen | Not Determined | |

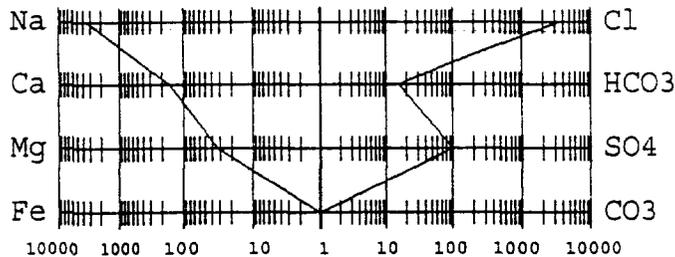
Cations

- | | | | | | | |
|-----|-------------------------------|---------------------|---|------|---|----------|
| 7. | Calcium (Ca ⁺⁺) | 3,022 | / | 20.1 | = | 150.35 |
| 8. | Magnesium (Mg ⁺⁺) | 379 | / | 12.2 | = | 31.07 |
| 9. | Sodium (Na ⁺) | (Calculated) 75,517 | / | 23.0 | = | 3,283.35 |
| 10. | Barium (Ba ⁺⁺) | Not Determined | | | | |

Anions

- | | | | | | | |
|-----|--|------------|---|------|---|----------|
| 11. | Hydroxyl (OH ⁻) | 0 | / | 17.0 | = | 0.00 |
| 12. | Carbonate (CO ₃ ⁼) | 0 | / | 30.0 | = | 0.00 |
| 13. | Bicarbonate (HCO ₃ ⁻) | 927 | / | 61.1 | = | 15.17 |
| 14. | Sulfate (SO ₄ ⁼) | 4,600 | / | 48.8 | = | 94.26 |
| 15. | Chloride (Cl ⁻) | 118,973 | / | 35.5 | = | 3,351.35 |
| 16. | Total Dissolved Solids | 203,418 | | | | |
| 17. | Total Iron (Fe) | 5 | / | 18.2 | = | 0.27 |
| 18. | Total Hardness As CaCO ₃ | 9,108 | | | | |
| 19. | Resistivity @ 75 F. (Calculated) | 0.001 /cm. | | | | |

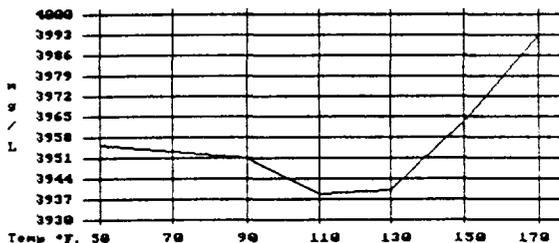
LOGARITHMIC WATER PATTERN
*meq/L.



PROBABLE MINERAL COMPOSITION
COMPOUND EQ. WT. X *meq/L = mg/L.

Na	Cl	Ca (HCO ₃) ₂	81.04	15.17	1,230
Ca	HCO ₃	CaSO ₄	68.07	94.26	6,416
Mg	SO ₄	CaCl ₂	55.50	40.91	2,271
Fe	CO ₃	Mg (HCO ₃) ₂	73.17	0.00	0
		MgSO ₄	60.19	0.00	0
		MgCl ₂	47.62	31.07	1,479
		NaHCO ₃	84.00	0.00	0
		NaSO ₄	71.03	0.00	0
		NaCl	58.46	3,279.37	191,712

Calcium Sulfate Solubility Profile



*Milli Equivalents per Liter

This water is slightly corrosive due to the pH observed on analysis. The corrosivity is increased by the content of mineral salts, and the presence of H₂S in solution.

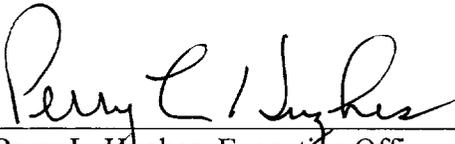
AFFIDAVIT

STATE OF NEW MEXICO
COUNTY OF EDDY

Perry L. Hughes, Affiant, being first duly sworn upon his oath, deposes and states that I graduated from West Virginia University in 1965 with a B.S. degree in Petroleum Engineering and since that time I have been associated with the oil industry in various capacities, both within the United States and overseas. For the last 15 years, I have been a consulting petroleum engineer and an independent producer in West Texas and Southeastern New Mexico.

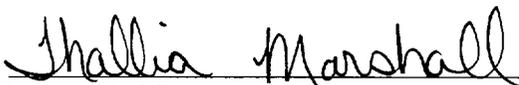
I am familiar with the land on which the proposed water injection well is situate and have examined the available geologic and engineering data there for. I have found no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

Further, Affiant says not.

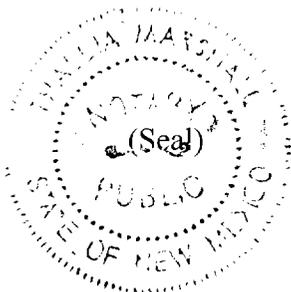


Perry L. Hughes, Executive Officer

This instrument was sworn and subscribed to before me on October 25, 2000 by Perry L. Hughes, Executive Officer of Shahara Oil, LLC.



Notary Public



My commission expires: 11/06/00

Shahara Oil, LLC

207 W. McKay
Carlsbad, NM 88220
505-885-5433
Fax: 505-885-4989

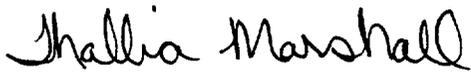
FAX TRANSMISSION COVER SHEET

Date: October 26, 2000
To: Artesia Daily Press
Fax: 505-746-8795
Subject: Publication of Legal Notice
Sender: Thallia Marshall

YOU SHOULD RECEIVE 2 PAGE(S), INCLUDING THIS COVER SHEET. IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CALL 505-885-5433.

Please publish this notice as soon as possible. Please fax a copy of the Affidavit of Publication to 505-885-4989 and mail the original to: Shahara Oil LLC, 207 W McKay, Carlsbad, NM 88220. If you have any questions please give us a call at 505-885-5433.

Thank you for your prompt attention to this matter.


Thallia Marshall

FAXED
10:49 AM
10-26-00
522

**NOTICE OF FILING APPLICATION
FOR AUTHORIZATION TO INJECT**

Shahara Oil, LLC, 207 W. McKay, Carlsbad, NM 88220, Executive Officer Mr. Perry L. Hughes, 505-885-5433, is seeking approval from the New Mexico Oil Conservation Division to inject into its Grayburg Jackson PSU MB No. 6 and Grayburg Jackson PSU AD No. 11, located in Section 27 of Township 17 South Range 30 East, Eddy County, New Mexico for waterflood operations and tertiary recovery operations using micro-organisms in the Premier Sand of the Grayburg formation. Shahara Oil, LLC intends to inject a maximum of 500 BWPD as a maximum injection pressure of 1800 psi.

Interested parties must file objections or requests for hearing with the Oil Conservation Division 2040 South Pacheco, Santa Fe, NM 87505, within 15 days.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

See Also Order No. R-279

CASE NO. 12440
ORDER NO. R-2749-A

APPLICATION OF SHAHARA OIL, L.L.C. FOR APPROVAL OF A TERTIARY RECOVERY PROJECT, TO QUALIFY THIS PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE "NEW MEXICO OIL RECOVERY ACT," AND FOR TWO UNORTHODOX WELL LOCATIONS, EDDY COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on June 29, 2000, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 5th day of September, 2000, the Division Director, having considered the record and the recommendations of the Examiner,

FINDS THAT:

(1) Due public notice has been given and the Division has jurisdiction of this case and its subject matter.

(2) By Division Order No. R-2749, issued in Case No. 3083 on July 29, 1964, the Division authorized General American Oil Company of Texas ("General American") to institute a waterflood project on the Grayburg-Jackson Premier Sand Unit ("Premier Sand Waterflood Project") comprising the following 960.00 acres, more or less, of federal lands in Eddy County, New Mexico, by the injection of water into the Premier Sand of the Grayburg Jackson Pool:

(GENERAL AMERICAN - PREMIER SAND WATERFLOOD PROJECT)

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM

Section 27: W/2, W/2 SE/4, SE/4 SE/4

Section 28: E/2 NE/4, SE/4

Section 33: N/2 NE/4
Section 34: N/2 N/2
Section 35: NW/4 NW/4.

(3) The "Unitized Formation" as defined within the Grayburg-Jackson Premier Sand Unit Agreement is that portion of the Grayburg Jackson Pool that extends from a depth of 3,230 feet to 3,243 feet as found on the Schlumberger Electric Log dated February 17, 1963, of the Pendragon Energy Partners, Inc. Grayburg Jackson Unit Tract 2 Well No. 8 (API No. 30-015-04342), formerly the General American Oil Company of Texas Maddren "B" Well No. 8, located 1980 feet from the South line and 660 feet from the West line (Unit L) of Section 26, Township 17 South, Range 30 East, NMPM, Eddy County, New Mexico.

(4) By Division Administrative Order WFX-363, dated December 31, 1971, General American was granted the authority to expand its Premier Sand Waterflood Project with two additional water injection wells.

(5) The applicant in this matter, Shahara Oil, L.L.C. ("Shahara"), seeks the following:

(a) to amend the injection authority under Division Order No. R-2749 and WFX-363 to authorize the injection of microorganisms and water into the Grayburg-Jackson Premier Sand Unit through the 14 wells described in the attached Exhibit "A";

(b) exceptions to Division Rules 104.B (1) and 104.F (1) for two wells within the Grayburg-Jackson Premier Sand Unit Area; and

(c) to qualify this tertiary recovery project for the recovered oil tax rate pursuant to the "New Mexico Enhanced Oil Recovery Act" ("EOR"), Sections 7-29A-1 through 7-29A-5, NMSA 1978.

(6) Shahara, as the operator of the Grayburg-Jackson Premier Sand Unit, intends to recover additional oil from the Premier Sand of the Grayburg Jackson Pool within the unit area by the injection into the 14 wells described on Exhibit "A" of this order of water with microorganisms.

(7) The proposed Grayburg Jackson PSU "MA" Well No. 7 is to be drilled along the western edge of the EOR Project Area at a location 1330 feet from the North line and 1310 feet from the East line (Unit H) of Section 28, Township 17 South, Range 30 East, NMPM, Eddy County, New Mexico. Further, the existing Grayburg Jackson PSU "MA" Well No. 2, located 2615 feet from the North line and 1295 feet from the East line (Unit H) of Section 28, a plugged and abandoned well to be re-entered and utilized as an injection well, is also located on the western edge of the EOR project area. Both well locations are unorthodox pursuant to Division Rules 104.B (1) and 104.F (1); however, the owners of the operating rights to the Premier Sand underlying the W/2 NE/4 of Section 28 adjacent to these two unorthodox locations are the same as in the Grayburg-Jackson Premier Sand Unit.

(8) Within the Grayburg-Jackson Premier Sand Unit Shahara intends to drill 11 new producing infill wells and one new injection well and re-enter, convert, or work over 10 currently existing well bores as injection wells.

(9) Shahara seeks to institute tertiary recovery operations within the Grayburg-Jackson Premier Sand Unit, which is the "EOR Project Area", by injecting microorganisms along with water as the carrier fluid to: (i) remove scale, which should result in better sweep efficiency; and (ii) serve as a surfactant, which should reduce residual oil saturation. As proposed by Shahara, the initial 450,000 barrels of water to be injected into this tertiary project will contain 2,800 gallons of these microorganisms. Thereafter normal waterflood operations are to be restored.

(10) Testimony presented by Shahara indicates that, as of December 1999, cumulative production from the Grayburg-Jackson Premier Sand Unit has been 2.3 million barrels of oil. The projected increase in recovery from the unit area is an additional 1,530,000 barrels of oil and 256,320 MCF of gas over the life of the project that is estimated to be 15 years. Approximately 1.17 million barrels of this increased recovery should be attributed to infill drilling and restored waterflood operations and 360,000 barrels to the microorganism treatment.

(11) The estimated initial cost to institute this tertiary recovery project is \$2,960,000.00.

(12) The proposed tertiary recovery operations should result in the recovery of otherwise unrecoverable oil thereby preventing waste, exhibits sound engineering practices, is in the best interest of conservation, and will not impair correlative rights.

(13) Subsequent to the hearing the applicant submitted the required Division Form C-108 and supplemental data on all wells (including plugged wells) that penetrate the zone of interest within the 2-mile "area-of-review" of the 14 injection wells within this project area. These data show that wells in the area are cased and plugged so as to protect fresh water and prevent fluid migration from the injection zone, and includes testimony indicating no evidence of open faults or any other hydrologic connection between the injection zone and the fresh water resources in the area has been discovered.

(14) The operator should take all steps necessary to ensure that the injected fluid enters and remains confined to the proposed injection interval and is not permitted to escape from the interval and migrate into other formations or onto the surface from injection, production or plugged and abandoned wells.

(15) Injection into each of the 14 wells described in Exhibit "A" should be accomplished through 2-3/8 inch internally plastic-lined tubing installed in a packer set no higher than 100 feet above the top of the uppermost perforation or open hole interval, whichever is applicable; the casing-tubing annulus in each well should be filled with an inert fluid and equipped with an approved gauge or leak detection device.

(16) Before commencing tertiary recovery operations, each of the 14 injection wells should be pressure tested throughout the interval from the surface down to the proposed packer-setting depth to ensure the mechanical integrity of each well bore.

(17) No evidence or testimony was presented concerning injection pressure into the proposed tertiary project; therefore, each injection well or pressurization system for each well should be initially equipped with a pressure control device or acceptable substitute that will limit the surface injection pressure at the wellhead to no more than 580 psi; however, the Division Director should have the authority to administratively authorize a pressure limitation in excess of the pressure limitation described above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(18) The operator should give advance notification to the supervisor of the Division's Artesia District Office of the date and time of the installation of any new injection equipment and of the mechanical integrity pressure tests in order that the same may be witnessed.

(19) This application should be approved and the project should be governed by the provisions of Division Rules 701 through 708.

(20) The approved EOR Project Area should be re-designated the "*Shahara Premier Sand Unit EOR Project*" and is to comprise the 960.00 acres described in Finding Paragraph No. (2) above.

(21) Evidence presented by Shahara indicated that the proposed EOR Project Area meets all the criteria for certification by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the EOR Act.

(22) To be eligible for this EOR tax rate, prior to commencing tertiary recovery operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed EOR Project Area described above.

(23) At such time as a positive production response occurs from the injection of water and microorganisms and within five years from the date of the Certificate of Qualification, the operator must apply to the Division for certification of positive production response, which application is to identify the area actually benefiting from enhanced recovery operations and identify the specific wells the operator believes are eligible for the EOR tax rate. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Taxation and Revenue Department those lands and wells that are eligible for the EOR tax rate.

(24) The injection authority granted herein for any of the 14 individual injection wells described in Exhibit "A" should terminate one year after the effective date of this order if the operator has not commenced injection operations into the well; provided, however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(25) Since approval of this application serves to significantly change the injection pattern, profile, and substance of the General American's original Premier Sand Waterflood Project, this order should supersede the previous orders granting injection authority in the Grayburg-Jackson Premier Sand Unit (Division Order No. R-2749 and Administrative Order WFX-363).

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Shahara Oil, L.L.C. ("Shahara"), is hereby authorized to institute tertiary recovery operations on its Grayburg-Jackson Premier Sand Unit by the injection of water and microorganisms into the unitized interval that is the Premier Sand of the Grayburg Jackson Pool through the 14 wells described in the attached Exhibit "A".

(2) The subject tertiary recovery project area ("EOR Project Area") shall henceforth be designated the "*Shahara Premier Sand Unit EOR Project*" and shall coincide with the boundary established for the Grayburg-Jackson Premier Sand Unit in Eddy County, New Mexico, comprising the following described 960.00 acres, more or less:

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM

Section 27: W/2, W/2 SE/4, SE/4 SE/4
Section 28: E/2 NE/4, SE/4
Section 33: N/2 NE/4
Section 34: N/2 N/2
Section 35: NW/4 NW/4.

(3) Shahara, as operator of the Grayburg-Jackson Premier Sand Unit, shall take all steps necessary to ensure that the injected fluid enters and remains confined to the unitized interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(4) Injection into each of the 14 injection wells shall be accomplished through 2-3/8 inch internally plastic-lined tubing installed in a packer set within approximately 100 feet of the uppermost injection perforation or open hole interval, whichever is applicable; the casing-tubing annulus in each well shall be filled with an inert fluid and equipped with an approved gauge or pressure leak detection device.

(5) The 14 injection wells herein authorized and/or the injection pressurization system shall be equipped with a pressure-limiting switch or other acceptable device that will limit the surface injection pressure at the wellhead to no more than 580 psi.

(6) Prior to the commencement of tertiary recovery operations, the casing in each of the 14 injection wells shall be pressure-tested throughout the interval from the surface down to the proposed packer setting depth to ensure the integrity of such casing in a manner that is satisfactory to the supervisor of the Division's Artesia District Office.

(7) The operator shall immediately notify the supervisor of the Division's Artesia District Office of the failure of the tubing, casing or packer in any of the EOR Project Area injection wells; the leakage of water, natural gas, or oil from or around any producing well within the EOR Project Area; or the leakage of water, natural gas, or oil from any plugged and abandoned well within the EOR Project Area. The operator shall take such steps as may be necessary to correct such failure or leakage.

(8) The Division Director has the authority to authorize an increase in the injection pressure limitation on any well upon a proper showing by the operator that such higher pressure will not result in the migration of the injected fluid from its respective interval or fracture the confining strata.

(9) The operator of the Sahara Premier Sand Unit EOR Project shall conduct injection operations in accordance with all applicable Division rules including Division Rules 701 through 708. Further, the Unit operator shall submit monthly progress reports in accordance with Rules 706 and 1115.

IT IS FURTHER ORDERED THAT:

(10) The Sahara Premier Sand Unit EOR Project is hereby certified as a qualified "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery ("EOR") Act," Sections 7-29A-1 through 7-29A-5, NMSA 1978 and shall comprise the 960.00 acres described above in Ordering Paragraph No. (2).

(11) To be eligible for the EOR tax rate, prior to commencing injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed EOR Project Area described above.

(12) At such time as a positive production response occurs from the injection of water and microorganisms and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefiting from tertiary recovery operations. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Taxation and Revenue Department those lands eligible for the EOR tax rate.

(13) The injection authority for any of the 14 injection wells described in Exhibit "A" shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the well; provided, however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

IT IS FURTHER ORDERED THAT:

(14) The following two wells, located at unorthodox locations along the west edge of the EOR Project Area, are hereby approved:

(a) the proposed Grayburg Jackson PSU "MA" Well No. 7 to be drilled along the western edge of the EOR Project Area at a location 1330 feet from the North line and 1310 feet from the East line (Unit H) of Section 28, Township 17 South, Range 30 East, NMPM, Eddy County, New Mexico; and

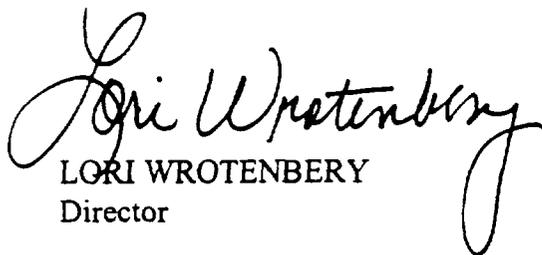
(b) the existing Grayburg Jackson PSU "MA" Well No. 2, located 2615 feet from the North line and 1295 feet from the East line (Unit H) of Section 28, Township 17 South, Range 30 East, NMPM, Eddy County, New Mexico.

(15) This order shall supersede Division Order No. R-2749, issued in Case No. 3083 and dated July 29, 1964, and Division Administrative Order WFX-363, dated December 31, 1971.

(16) Jurisdiction of this case is hereby retained for the entry of such further orders as the Division may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION


LORI WROTENBERY
Director

S E A L

Exhibit "A"
Case No. 12440
Order No. R-2749-A

Shahara Oil, L.L.C.
Microorganism/Water Injection Wells
Shahara Premier Sand Unit EOR Project Area
Sections 27, 28, 33, 34, and 35, Township 17 South, Range 30 East, NMPM, Premier Sand (Grayburg Jackson Pool), Eddy County, New Mexico.

Well Name and Number (Former Well Name and No.)	API Number	Footage Location (Unit)	Section	Injection Interval	Current Status
Grayburg Jackson - PSU "AD" Well No. 12	30-015-30342	330' FN & WL (D)	27	3050' - 3200' (Perforations)	New Drill
Grayburg Jackson - WFU "FG" Well No. 1 (Federal "G" Well No. 1)	30-015-04445	330' FN & WL (D)	34	2947' - 3305' (Open hole)	Active Injector (Under the authority of R-2749)
Grayburg Jackson - WFU "ME" Well No. 1 (Maddren "E" Well No. 1)	30-015-04377	990' FSL & 1650' FEL (O)	28	3171' - 3196' (Open hole)	Active Injector (Under the authority of R-2749)
Grayburg Jackson - WFU "MB" Well No. 3 (Maddren "B" Well No. 3)	30-015-04358	990' FSL & 1650' FWL (N)	27	3169' - 3252" (Open hole)	Active Injector (Under the authority of WFX-363)
Maddren "B" Federal Well No. 1 (to be redesignated the Grayburg Jackson - PSU "MB" Well No. 1)	30-015-04359	990' FSL & 330' FWL (M)	27	2900' 3265" (Open hole)	Producing from the Fren-Seven Rivers Pool (to be converted)
Grayburg Jackson - WFU "MB" Well No. 5 (Maddren "B" Well No. 5)	30-015-01433	990' FSL & 2310' FEL (O) (resurveyed location is 978' FSL & 2323' FEL)	27	3142' - 3250' (Perforations)	P & A'ed Producing Well (to be re-entered and converted).
Grayburg Jackson - WFU "BB" Well No. 1 (Beeson "B" Well No. 1)	30-015-04443	330' FNL & 990' FEL (A)	33	3160' - 3280' (Open hole)	Producing Grayburg Jackson Well (Injection well from 1964 to 1974 under R-2749)
Grayburg Jackson WFU "FG" Well No. 2 (Federal "G" Well No. 2)	30-015-04446	330' FNL & 1650' FWL (C) (resurveyed location is 332' FNL & 1666' FWL)	34	3160' - 3268' (Perforations)	P&A'ed Water Injection Well (previously authorized by R-2749. Recently re-entered.)
Arnold "D" Federal Well No. 8 (to be redesignated the Grayburg Jackson PSU "AD" Well No. 8)	30-015-10611	330' FNL & 2140' FEL (B)	34	3241' - 3281' (Open hole)	Shut-in Seven Rivers Producing Well (to be converted.)
Grayburg Jackson WFU "AD" Well No. 9 (Arnold "D" Well No. 9)	30-015-10612	330' FNL & 640' FEL (A)	34	3260' 3300' (Open hole)	Active Unit Producing Well (to be converted.)
Grayburg Jackson WFU "AD" Well No. 1	30-015-04365	1980' FN & EL (F)	27	3050' - 3200' (Perforations)	P & A'ed Well (to be converted.)
Grayburg Jackson WFU "AD" Well No. 3 (Arnold "D" Well No. 3)	30-015-04366	660' FNL & 1980' FWL (C)	27	3072' - 3182' (Open hole)	Active Unit Producing Well (to be converted.)
Grayburg Jackson WFU "AD" Well No. 6 (Arnold "D" Well No. 6)	30-015-10463	2310' FNL - 330' FWL (E)	27	3087' - 3171' (Perforations/ Open hole)	Active Unit Producing Well (to be converted.)
Grayburg Jackson PSU "MA" Well No. 2 (Maddren "A" Well No. 2)	N/A	2615' FNL & 1295' FEL (H)	28	3010' - 3135' (Perforations/ Open hole)	P&A'ed Water Injection Well (previously authorized by R-2749. To be re-entered.)