

P O Box 728 Hobbs NM 88240 505 393 7191

December 19, 1986

State of New Mexico Department of Energy & Minerals Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87501

Attention: Mr. David Catanach

RE: Conversion to Water Injection

Skelly Unit Well No. 53 Eddy County, New Mexico

#### Gentlemen:

Attached is a list of all wells within the one-half mile radius of the referenced well with their casing and cementing records as requested in a telephone conversation with Mr. Larry Ridenour of this office on December 15, 1986.

Yours very truly,

J.J. Sseman

L. J. Seeman

District Petroleum Engineer

LDR:JRB

Attachments

## DATA FOR WELLS WITHIN 2640' OF PROPOSED INJECTION WELL SKELLY UNIT WELL NO. 53

| Well Name<br>& Number | <u> Hole Size</u> | Casing Size                  |                          | Cement (sxs) | TOC            | Determined<br>By         |
|-----------------------|-------------------|------------------------------|--------------------------|--------------|----------------|--------------------------|
| Skelly Ut             | •                 |                              |                          |              |                |                          |
| 2                     | 11-1/4"           | 8-5/8"                       | 619 <b>'</b>             | 100          | 329'           | 70% Fillup               |
|                       | 8-1/4"            | 7 <b>"</b>                   | 2101'                    | 100          | 1308'          | 70% Fillup               |
| 11                    | 18"               | 13-3/8"                      | 207 <b>'</b>             | 225          | Surf.          | Circulated               |
|                       | 11"               | 8-5/8"                       | 3605 <b>'</b>            | 1900         | Surf.          | Circulated               |
| 43                    | 10"               | 8-5/8"                       | 539 <b>'</b>             | 250          | Surf.          | Circulated               |
|                       | 7-7/8"            | 4-1/2"                       | 3757 <b>'</b>            | 425          | 1885'          | Temp Surv.               |
| 44                    | 10"               | 8-5/8"                       | 680'                     | 150          | Surf.          | Circulated               |
|                       | 7-7/8"            | 5-1/2"                       | 3472'                    | 360          | 1756'          | 70% Fillup               |
| 45                    | 10 "              | 8-5/8"                       | 603'                     | 150          | Surf.          | Circulated               |
|                       | 8"                | 5-1/2"                       | 3810'                    | 350          | 1720'          | CBL                      |
| 51                    | 18"               | 13-3/8"                      | 205'                     | 230          | Surf.          | Circulated               |
|                       | 11"               | 8-5/8"                       | 3620'                    | 2275         | Surf.          | Circulated               |
| 52                    | 11 "              | 8-5/8"                       | 655'                     | 100          | 136'           | Cal. 89%                 |
|                       | 9 "               | 7 <b>"</b>                   | 3130'                    | 150          | 1996'          | Cal. 89%                 |
| \                     | 9"                | 4-1/2°                       | (Liner)<br>3006-3870'    | 200          | 3006'          | Circulated               |
| 54                    | 10 n<br>8 n       | 8-5/8"<br>7"                 | 675'<br>3399'<br>(Liner) | 150<br>325   | Surf.<br>118'  | Circulated<br>70% Fillup |
|                       | 6-1/4"            | 4-1/2"                       | 3272-3801                | 100          | Top of         | Liner                    |
| 55                    | 10 <sup>n</sup>   | 8-5/8°                       | 711'                     | 150          | Surf.          | Circulated               |
|                       | 8 <sup>n</sup>    | 7°                           | 3474'                    | 345          | 1248'          | CBL                      |
| <sup>`</sup> 56       | 10 "<br>8"        | 8-5/8 <b>"</b><br>7 <b>"</b> | 729'<br>3523'<br>(Liner) | 150<br>475   | Surf.<br>1248' | Circulated<br>Temp Surv. |
| 1                     | 6-1/4"            | 4-1/2"                       | 3400-3710                | 100          | Top of         | Liner                    |
| 57                    | 10 "              | 8-5/8°                       | 751'                     | 150          | Surf.          | Circulated               |
|                       | 8"                | 5-1/2°                       | 3618'                    | 330          | 2138'          | 70% Fillup               |
| 86                    | 10"               | 8-5/8"                       | 743'                     | 150          | Surf.          | Circulated               |
|                       | 8-3/4"            | 7"                           | 3612'                    | 345          | 1717'          | 70% Fillup               |
| `87                   | 10 n              | 8-5/8"<br>7"                 | 728'<br>3461'<br>(Liner) | 175<br>310   | Surf.<br>1109' | Circulated<br>Temp Surv. |
|                       | 8 <sup>n</sup>    | 4-1/2"                       | 3393-3689                | 125          | Top of         | Liner                    |

# DATA FOR WELLS WITHIN 2640' OF PROPOSED INJECTION WELL SKELLY UNIT WELL NO. 53

| Well Name<br><u>&amp; Number</u> | Hole Size       | Casing Size | Depth         | Cement<br><u>(sxs)</u> | TOC   | Determined<br>By |
|----------------------------------|-----------------|-------------|---------------|------------------------|-------|------------------|
| Skelly Ut                        | •               |             |               |                        |       |                  |
| 115                              | 12-1/4 <b>"</b> | 8-5/8"      | 666'          | 375                    | Surf. | Circulated       |
|                                  | 7-7/8 <b>"</b>  | 5-1/2"      | 3981'         | 1500                   | 200'  | Temp Surv.       |
| 116                              | 12-1/4"         | 8-5/8"      | 672 <b>'</b>  | 425                    | Surf. | Circulated       |
|                                  | 7-7/8"          | 5-1/2"      | 4000 <b>'</b> | 1100                   | Surf. | Circulated       |
| 149                              | 12-1/4"         | 8-5/8"      | 509'          | 400                    | Surf. | Circulated       |
|                                  | 7-7/8"          | 5-1/2"      | 3900'         | 1800                   | Surf. | Circulated       |
| 156                              | 12-1/4"         | 8-5/8"      | 511'          | 400                    | Surf. | Circulated       |
|                                  | 7-7/8"          | 5-1/2"      | 3685'         | 1650                   | Surf. | Brdnhd Sqz       |
| 157                              | 17-1/2"         | 13-3/8"     | 577'          | 700                    | Surf. | Circulated       |
|                                  | 12-1/4"         | 8-5/8"      | 1860'         | 900                    | Surf. | Circulated       |
|                                  | 7-7/8"          | 5-1/2"      | 3705'         | 875                    | Surf. | Circulated       |
| 158                              | 15"             | 11-3/4"     | 490'          | 500                    | Surf. | Circulated       |
|                                  | 11"             | 8-5/8"      | 1875'         | 900                    | Surf. | Circulated       |
|                                  | 7-7/8"          | 5-1/2"      | 4050'         | 900                    | 350'  | CBL              |
| 159                              | 15"             | 11-3/4"     | 500'          | 500                    | Surf. | Circulated       |
|                                  | 11"             | 8-5/8"      | 1888'         | 900                    | Surf. | Circulated       |
|                                  | 7-7/8"          | 5-1/2"      | 4050'         | 900                    | Surf. | Circulated       |
| 160                              | 15"             | 11-3/4"     | 487'          | 500                    | Surf. | Circulated       |
|                                  | 11"             | 8-5/8"      | 1920'         | 900                    | Surf. | Circulated       |
|                                  | 7-7/8"          | 5-1/2"      | 3900'         | 1100                   | Surf. | Circulated       |



Texaco USA

P O Box 728 Hobbs NM 88240 505 393 7191

November 20, 1986

State of New Mexico
Department of Energy & Minerals
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. David Catanach

RE: Conversion to Water Injection

Skelly Unit Well No. 53 Eddy County, New Mexico

#### Gentlemen:

Texaco Producing Inc. respectfully requests Administrative approval for expansion of waterflood injection well pattern, as provided by Order No. R-3214 for the Skelly Unit to convert Well No. 53 to water injection service.

The following data are submitted in support of this request:

- 1) A unit plat reflecting the respective injection well and its project area.
- 2) A diagrammatic sketch of the proposed well showing injection tubing, packer, and identifying the Grayburg-Jackson perforated and open hole injection intervals.
- 3) Ogallala fresh water will be used as the injectant into the Grayburg Jackson formation. This water has been successfully used as an injectant into the Grayburg Jackson pool for 18 years with no evidence of formation plugging, and therefore is considered to be compatible with the Grayburg Jackson formation. A water analysis of the Ogallala fresh water is attached.

- 4) The name of the injection formation is Grayburg San Andres with average injection to be from 3020' to 3800'. lithology of this formation is Dolomite and the geological The average pay thickness name is the Grayburg San Andres. is about 800. The geological name of the underground source of drinking water is the Ogallala at 300' maximum depth. The maximum anticipated injection pressure will be 2100 psi with a maximum daily volume anticipated at 300 barrels of water per day.
- Proposed stimulation will consist of 7,750 gallons of 15% 5) NEFE acid.
- A certified copy of Public Notice by the newspaper is 6) attached.
- 7) The address of the Surface Tenant is included. There are no Offset Operators within 1/2 mile of the subject well, therefore none were notified.
- 8) Attached is evidence that notice has been given to the surface tenant.

Your consideration and early approval will be appreciated.

Yours very truly,

L. J. Seeman

1. J. Suman

District Petroleum Engineer

LDR:JRB

Attachments

cc: Oil Conservation Division P. O. Drawer DD Artesia, New Mexico 88201

#### SURFACE TENANT

Charles R. Martin, Inc. c/o Albert Osborn Star Route East Maljamar, New Mexico 88264



P O Box 728 Hobbs NM 88240 505 393 7191

October 31, 1986

Charles R. Martin, Inc. c/o Albert Osborn Star Route East Maljamar, New Mexico 88264

RE: Conversion to Water Injection Skelly Unit Well No. 53 Eddy County, New Mexico

#### Gentlemen:

This is to notify you, as Surface Owner, that Texaco Producing Inc. is requesting the New Mexico Oil Conservation Division to approve injection of water into the Grayburg Jackson formation at a depth of 3041' - 3808' in the subject well. The well is located 1980' FSL & 1980' FWL of Section 22, T-17-S, R-31-E, Eddy County, New Mexico.

Only the surface area absolutely required will be used in operating the injection well. The well is cased and cemented in such a way that all surface and subsurface fresh waters will be protected.

Objections to this request or a request for hearing should be filed with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico, 87501, within fifteen (15) days following receipt of this letter.

If there are any questions, please do not hesitate to call this office.

Yours very truly,

WB. Ch

W. B. Cade

District Operations Manager

LDR:JRB

| Odelli   |
|--|
| 8. Addressee's Address (ONLY If requested and fee paid)  |
| Date of Delivery   |
| 6. Signature – Agent /   |
| 5. Signature Addressee  X Met Colombia   |
| Always obtain signature of addressee or agent and DATE DELIVERED.  |
| □ Registered □ Insured □ COD □ P 65 6 275 33   □ Express Mail  |
| Maljamar, N.   |
| tes R  |
| 2. Restricted Delivery.  |
| 1. 🗌 Show to whom, date and eddress of delivery.   |
| Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested. |

DOMESTIC RETURN RECEIPT

# 1EE 522 931

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# RECEIPT FOR CERTIFIED MAIL

PS Form 3811, July 1983 447-845

NO INSURANCE COVERAGE PROVIDED NOT FOR INTERNATIONAL MAIL (See Reverse)

| PS Form 3800,    | Feb.                   | 1982  |   |                         |                      | * L           | J.S.G.     | P.O. 19                  | 983-40                         | 3-517                     |
|------------------|------------------------|---|---|-------------------------|----------------------|---------------|------------|--------------------------|--------------------------------|---------------------------|
| Postmark or Date | TOTAL Postage and Fees | Return receipt showing to whom, Date, and Address of Delivery | Return Receipt Showing to whom and Date Delivered | Restricted Delivery Fee | Special Delivery Fee | Certified Fee | Postage \$ | P.O., State and ZIP Code | Street and No.  Star Route Eas | Sent to Charles & martin, |
|                  |                        |   |   |                         |                      |               |            | 4 36 88                  |                                | 2 th                      |

of the earlier submittal.

#### CONSCHVATION DIVISION POST OFFICE BOX 20MB STATE LAND OFFICE MURCHG SANIA ST MEN MEXITY MODEL

FORM C-108 Revised 7-1-81

|             | PANIA PLANEW MEXICUS/201   |
|-------------|--|
| APPLICA     | ATION FOR AUTHORIZATION TO INJECT  |
| ı.          | Purpose: Secondary Recovery X Pressure Maintenance Disposal Storage Application qualifies for administrative approval? X yes no  |
| II.         | Operator: Texaco Producing Inc.  |
|             | Address: P. O. Box 728, Hobbs, New Mexico 88240  |
|             | Contact party: L. J. Seeman Phone: (505) 393-7191  |
| 111.        | 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? $\overline{X}$ yes $\overline{X}$ no If yes, give the Division order number authorizing the project $\underline{R-3214}$ .  |
| ٧.          | 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:  |
|             | <ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and</li> <li>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.).</li> </ol> |
| ·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.   |
| <b>*</b> 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: L. J. Seeman Title District Petroleum Enginee  |
|             | Signature: A.J. Seeman Date: November 20, 1986   |

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

٠.

#### III. HELL 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:
  - Lease name; Hell 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.

- 8. 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:

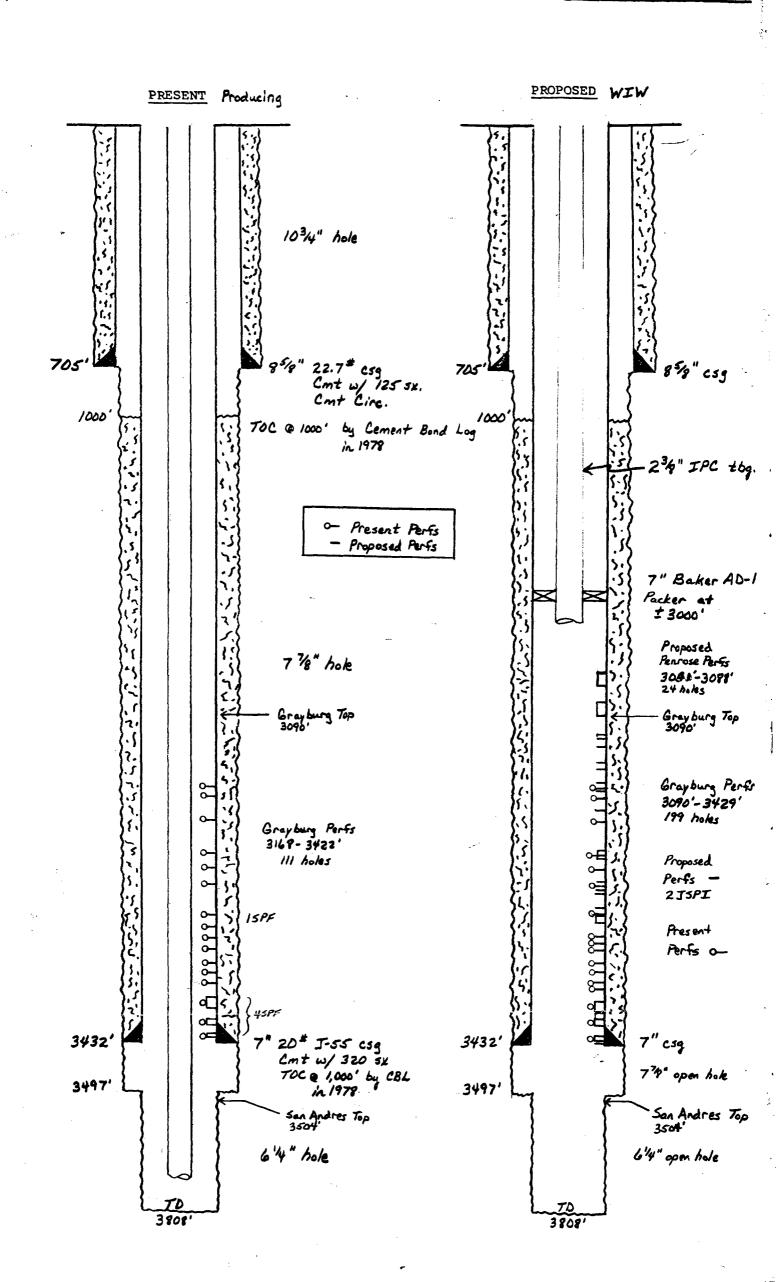
- (1) The name, address, phone number, and contact party for the applicant;
- (2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;
- (3) the formation name and depth with expected maximum injection rates 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.

| -  |                                       | نيا'<br>' . | <u>.</u> 1.  |   |                 |                       |                   | . E   | •                  |   | •  |  |   | -                          |  |             |
|--|---------------------------------------|-------------|--------------|---|-----------------|-----------------------|-------------------|---|--------------------|---|--|--|---|----------------------------|--|-------------|
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| PUEBLE<br>+  | HOBON B HUDBON                        | . *         |              |   |                 |                       | ·                 | HUDSON & HUDSON                                   | HUDSON & HUDSON    |   | 21 g   | NOSON 9 NOSON  | NOSON & HOSONH                          | ž.                         | E  | 2.          |
| ARWOOQ, LTD. KENNEDY   | 2.                                    | •.          | <b></b>      | υ.<br>Σ.                                | 117             | 011                   | LV 22 III.        | 35-0-147 36-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0 | 14 O. 31           |   | <b>1</b> 0.  |  | 69635<br>7. 69635                       | " <b>*</b>                 | *  |             |
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|  | , , , , , , , , , , , , , , , , , , , | ÷.          |              | 20 Reputio                              | <u> </u>        | 20<br>20<br>53<br>653 | 25.00.00          | 27.   | <b>1</b> €         |   | 25,  | Siza Mara  | 133684                                  | - ÷ 25 🐒                   | •  |             |
| ATLANTIC-RICI  | ATLANTIC-RICHFIELD                    | •           | <u>•</u>     | West                                    | ě.              |                       | <b>⊕</b> .        |   | 73617              | * * *                                   | 22 R   | ose ose  | 73617                                   | <b>5</b>                   | 27   | Cynch       |
| ATLANTIC-FICHFIELD   | 8. A                                  | °.          | <u>.</u>     | ~ ~ ~                                   | KERSEY KERSEY I | HANAGAN               |                   | n<br>•  | \$ 65 € 51         | S.                                      | · ·  | \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ | 130° EI                                 | 101                        | !<br>!<br>!  |             |
| ATLANICA ATLANI  | ATLANTIC-RCHFIELD                     |             | <b>&amp;</b> | 75 €\$<br>\$\$ 23.1                     | Rondle KERS     | MURCHISON-CLOSIT      | <u>.</u>          | WERSEY 2  | 73617              | 9 9 × × × × × × × × × × × × × × × × × × | 21<br>(©) (©) (O) (O) (O) (O) (O) (O) (O) (O) (O) (O | *(©) (©).  | 90<br>12                                |                            | 28   | Daw         |
| e si g   | RICHFIELD                             | . <u> </u>  | *            |   | WEIR<br>A.      | - N                   | MURCHISON         | - 66  | ATLANTIC-RICHFIELD | **************************************  | 2. <b>⊕</b> )<br>2. <b>⊕</b> )                       | ç⊚<br>*-<br>• 2.<br>• 2.<br>• 2.<br>• 2.<br>• 3.         | 52 € 52 € 5 € 5 € 5 € 5 € 5 € 5 € 5 € 5 | RICHFIELD 1                | , S.   | 7,          |
|  | ATLANTIC-RICHFIELD                    | `           | **           | `                                       | NAS.            | 1.                    | 3                 | ATLAN   | S ATLANTIC-        | o.<br>•€©                               | <b>*</b>   | \$<br>\$<br>\$   | 5.                                      | ATLANTIC-RICHFIELD 'B' '8' | 5  | 3.          |

|  |  |  |                          |  | LEASE  |   |   |         |                          |
|--|--|--|--------------------------|--|--|---|---|---------|--------------------------|
| Texaco ELL NO.   | Produci<br>F00TA   | ng Ir                                      | nc.                      | ON   | SEC  | Skelly Unit   | TOWNSHIP  |         | RANGE                    |
|  |  |  |                          |  | FWL  |   | 17 <b>-</b> S                                   |         | 31-E                     |
|  |  |  |                          |  |  |   |   |         |                          |
| Sch  | ematic   |  |                          |  |  | Tabu  | lar Data  |         |                          |
|  |  |  |                          |  | Surface Ca   | sing  |   |         |                          |
| Attache  | đ  |  |                          |  | Size   | 8-5/8 "   | Cemente   | d with  | <u>125</u> sx            |
|  |  |  |                          |  | toc <u>Sur</u>   | face •  | <b>met</b> determin                             | ed by _ | Circulated               |
|  |  |  |                          |  | Hole size  | 10-   | 3/4"  |         |                          |
|  |  |  |                          |  | Intermedia   | te Casing   |   |         |                          |
|  |  |  |                          |  | Size   | u   | Cemente   | d with  | s                        |
|  |  |  |                          |  |  |   |   |         |                          |
|  |  |  |                          |  |  |   |   |         |                          |
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|  |  |  |                          |  |  | L000 fe   |   |         | СВП                      |
|  |  |  |                          |  |  | 7-<br>h 38  |   |         |                          |
|  |  |  |                          |  | rucai dept   |   | 00  |         |                          |
|  |  |  |                          |  | Injection  |   |   |         |                          |
|  |  |  |                          |  | 3041   | feet to   | 3   | 808     | feet                     |
|  |  |  |                          |  | 3041   | d or open-hole  ' - 3432'  3' - 3808'   | perforate                                       | :d      |                          |
|  |  |  |                          |  | 3041   | d or open-hole  | perforate                                       | :d      |                          |
| hina   | 2-3  | :/ <b>8"</b>                               |                          | 1:   | 3041<br>3433   | ed or open-hole  - 3432'  - 3808'   | perforate<br>open hole                          | ed      |                          |
|  |  |  |                          |  | 3041<br>3433<br>d with   | pla: (mater)  | perforate<br>open hole                          | d       | set in a                 |
|  |  |  |                          |  | 3041<br>3433<br>d with   | ed or open-hole  - 3432'  - 3808'   | perforate<br>open hole                          | d       | set in a                 |
| 7" Bakei<br>(bi  | r AD-l l   | [PC<br>nodel)                              |                          | <del>-</del>                                       | 3041<br>3433<br>d with   | pla: (mater)  | perforate<br>open hole                          | d       | set in a                 |
| 7" Baken<br>(br<br>or describ  | r AD-l l   | [PC<br>nodel)                              |                          | <del>-</del>                                       | 3041<br>3433<br>d with   | pla: (mater)  | perforate<br>open hole                          | d       | set in a                 |
| 7" Bakei<br>(br<br>or describ  | r AD-1 I   | [PC<br>nodel)<br>ner ca                    | isin                     | g-tubin  | 3041<br>3433<br>d with   | pla: (mater)  | perforate open hole                             | 0.0     | set in a                 |
| 7" Baken<br>(br<br>or describ<br>ther Data<br>. Name of                | r AD-1 I rand and m be any oth f the inje                    | IPC nodel) ner ca                          | isin                     | g-tubin  | 3041<br>3433<br>g seal).<br>Grayb  | pla<br>materical packer at  | perforate open hole stic al) 30                 | 0.0     | set in a                 |
| 7" Baken (br or describ ther Data Name of                              | r AD-1 I rand and m be any oth f the inje f Field of         | [PC<br>nodel)<br>ner ca<br>ection          | isin<br>n fo             | g-tubin<br>rmation<br>f appli                      | 3041<br>3433<br>g seal).<br>Grayb  | pla<br>materi<br>packer at  ourg San And  | perforate open hole stic al) 30                 | 0.0     | set in a                 |
| 7" Bakes (br or descrit ther Data Name of Name of                      | r AD-1 I rand and more any other field on sea a new we       | IPC nodel) ner ca ection r Pool            | isin<br>n fo<br>l (i     | g-tubin<br>rmation<br>f appli                      | 3041 3433 g seal).  Grayb cable) injection?                                  | pla<br>yeld or open-hole  yeld  materia  materia  packer at  ourg San And  Grayburg  /// Yes  /// Yes | stic al) 30 dres Jackson                        | 0.0     | set in a                 |
| 7" Bakes (br or describ ther Data . Name of . Name of . Is this If no, | r AD-1 I rand and more any other frield on a new we for what | IPC nodel) ner ca ection Pool ell dr purpo | isin<br>fo<br>(i<br>:ill | g-tubin<br>rmation<br>f appli<br>ed for<br>was the | 3041 3433  d with g seal).  Grayb cable) injection? well origin ed in any of | pla: (materi packer at  ourg San And Grayburg  /// Yes /// Yes pally drilled?                         | stic stic slic slic slic slic slic slic slic sl | noduci  | set in a                 |
| 7" Baken (br or describ ther Data . Name of . Name of . Is this If no, | r AD-1 I rand and more any other frield on a new we for what | IPC nodel) ner ca ection Pool ell dr purpo | isin<br>fo<br>(i<br>:ill | g-tubin<br>rmation<br>f appli<br>ed for<br>was the | 3041 3433  d with g seal).  Grayb cable) injection? well origin ed in any of | pla: (materi packer at  ourg San And Grayburg  /// Yes /// Yes pally drilled?                         | stic stic slic slic slic slic slic slic slic sl | noduci  | set in a<br>feet<br>tion |





NL Treating Chemicals/NL Industries, Inc. P.O. Box 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLOS UI

#### **Water Analysis Report**

| <del></del>                  |   |              |                    |         |                                       |             |   |                  |                  |       |                  | ŞH     | IEET NUM       | IBER              |
|------------------------------|---|--------------|--------------------|---------|---------------------------------------|-------------|---|------------------|------------------|-------|------------------|--------|----------------|-------------------|
| COMPANY                      |   |              |                    |         |                                       |             |   |                  |                  |       |                  | -      | TE.            |                   |
|                              | TEXACO PROD                                       | IICTNG '     | TNC                |         |                                       |             |   |                  |                  |       |                  | م ا    |                | 29/86             |
| FIELD                        | THIRTO THE  | OCINO        |                    |         |                                       | Cou         | INTY OR PARISH                                    |                  |                  |       |                  | ST     | ATE            | 23700             |
|                              |   |              |                    |         |                                       | LEA         |   |                  |                  |       |                  | MEXICO |                |                   |
| EASE OR UNIT                 |   | ··- <u>·</u> | SAMPLE SOURCE      |         |                                       |             |   |                  | WATER            | SOU   | RCE (FO          | RMATI  |                |                   |
|                              | SKELLY UNIT                                       |              | IN                 | JECT]   | ION PLAN                              |             |   |                  |                  |       |                  |        | •              |                   |
| DEPTH, FT.                   | BHT, °F   | SAMPLE S     | SOURCE             | $\top$  | TEMP, °F                              | WAT         | ER, BBL/DAY                                       | OIL, B           | BL/DAY           |       |                  | GA     | S, MMCF        | /DAY              |
|                              |   |              |                    |         |                                       |             |   |                  |                  |       |                  |        |                |                   |
| ATE SAMPLED                  |   | TYPE OF      | WATER: D PRODI     | JCED 3  | KOK SUPPLY                            | □ WA        | TERFLOOD []                                       | SALTW            | VATER D          | ISPOS | SAL              |        |                |                   |
|                              | 10/29/86  | TYPE OF      | PRODUCTION:        | PRIMAF  | ATAW KAX Y                            | RFLOO       | D CO2FLOO   | DD 🗆             | POLYM            | ER FI | LOOD             | STE    | AMFLOO         | D                 |
|                              |   |              |                    | NΔTF    | R ANALYS                              | IS PA       | ATTERN  |                  |                  |       |                  |        |                |                   |
|                              |   |              |                    |         |                                       |             | TES me/I SCALI                                    | E UNIT           | )                |       |                  |        |                |                   |
| . 20                         | 15  |              | 10 5               |         | 0                                     |             | 5   |                  | 10               |       | 15               |        |                | 20 -              |
| Na + 20                      | <del>, , , , , , , , , , , , , , , , , , , </del> | 111          | <del>;,,,,</del> , | 11      | $\neg \tau \check{\tau}$              |             | <del>, , , , , , , , , , , , , , , , , , , </del> | 11               | 10               | 1 1   | <del>- 1 1</del> | 1      | <del>-11</del> | 20 a              |
|                              |   |              |                    |         |                                       |             |   |                  |                  | •     |                  |        |                |                   |
| Ca++                         |   | +-+-+-       | ++++               | ++      |                                       |             | ++++  | 1-1              | 4-               | +-+   | -+-              | ++     | -+-            | _ HCO3            |
| } '                          | ' ' ' '   '                                       | 1 1 1        | 1,,,,              | 1 1     | '''                                   | 1           | '' ''   | 1 1              | 1'               | 1 1   | '                | 1 1    | 1 1            |                   |
| Mg <sup>+</sup> +            |   |              |                    |         |                                       |             |   |                  | 1.               |       | .                | 1 1    | 4 1            | - =               |
| м9                           | <del>                                     </del>  | +++          | ++++               | +-+     | +++                                   |             | <del>╿</del> ╸┩╶┩╶┪                               | ++               | +++              | +-+   | ++               | +-+    | ++             | so <sub>4</sub> = |
|                              |   |              |                    |         |                                       |             |   |                  |                  |       | İ                |        |                |                   |
| Fe <sup>+</sup> + +          |   | 111          | 1111               | لـلـ    |                                       | Ц.          |   | 44               |                  | 11    | 4                | 11     | 11             | _l co₃=           |
| DISSOLVED SO                 | IIDS  |              |                    |         | ······                                |             | DISSOLVED   | GAS              | FS               |       |                  |        |                | ·                 |
| 5,000212500                  | 2,50  |              |                    |         |                                       |             | D.000E1EE   | <i>-</i>         |                  |       |                  |        |                |                   |
| CATIONS                      |   |              | me/l               |         | mg/l                                  |             | Hydrogen Su                                       | lfide, H         | l <sub>2</sub> S |       |                  |        | m              | g/l               |
| Total Hardness               |   | _            | 3.6                | _       |                                       |             | Carbon Dioxi                                      | de, CO           | 2                |       |                  |        | m              | g/i               |
| Calcium, Ca + +              |   |              | 1.8                | _       | 36                                    |             | Oxygen, O <sub>2</sub>                            |                  |                  |       |                  |        | m              | g/l               |
| Magnesium, Mg <sup>+</sup>   |   | _            | 1.8                | _       | 21                                    |             |   |                  |                  |       |                  |        |                |                   |
| iron (Total) Fe + +          | + +   |              |                    | _       | 0                                     | .14         | PHYSICAL PI                                       | ROPER            | TIES             |       |                  |        |                |                   |
| Barium, Ba <sup>+</sup> +    |   |              |                    |         |                                       |             | pН  |                  |                  |       |                  | 6      | .0_            |                   |
| Sodium, Na <sup>+</sup> (Cal | lc.)  |              | 12.4               | _       | 285                                   | <u>. 2</u>  | Eh (Redox Po                                      | tential)         | )                |       |                  |        | М              | V                 |
|                              | <del></del>                                       | ·            |                    | _       |                                       |             | Specific Grav                                     | /ity             |                  |       |                  |        |                |                   |
| ANIONS                       |   |              | 44.0               |         | 400                                   |             | Turbidity, FT                                     |                  |                  |       |                  |        |                |                   |
| Chloride, Cl                 |   | _            | 11.3               | _       | 400                                   |             | Total Dissolve                                    | ed Solid         | ds (Calc         | .)    |                  | 988    | 8.3 m          | g/i               |
| Sulfate, SO <sub>4</sub> =   |   |              | 3.1                | _       | 147                                   | . 5         | Stability Inde                                    | x @.             | °                | F     |                  |        |                |                   |
| Carbonate, CO3 =             | :   |              |                    | _       |                                       |             |   | <b>@</b> .       | •                | F     |                  |        |                |                   |
| Bicarbonate, HCO             | 93  |              | 1.6                | _       | 97                                    | .6          |   | @.               | •                | F     |                  |        |                |                   |
| Hydroxyl, OH                 |   |              | <del></del>        | _       |                                       |             | CaSO <sub>4</sub> Solub                           | ility <b>@</b> . | °                | F     |                  |        | m              | g/l               |
| Sulfide, S =                 | 0   |              | <u></u>            | -       |                                       |             |   | @.               | •                | F     |                  |        | m              | g/l               |
| R = over 1                   | 1 @ 74  |              |                    | _       |                                       |             | Max. CaSO <sub>4</sub> l                          | Possibl          | le (Calc.        | )     |                  |        | m              | g/l               |
|                              |   |              |                    |         |                                       |             | Max. BaSO <sub>4</sub> I                          |                  |                  |       |                  |        | m              | g/l               |
| PO4                          | <del></del>                                       |              |                    |         | · · · · · · · · · · · · · · · · · · · | <u>. 25</u> | Residual Hyd                                      |                  |                  |       |                  |        |                | m(Vol/Vol)        |
|                              |   |              |                    |         |                                       |             |   |                  |                  |       |                  |        |                |                   |
|                              | OLIDS (QUALITA                                    |              |                    |         |                                       |             |   |                  |                  |       |                  |        |                |                   |
| ron Sulfide 🗆 🛭 II           | ron Oxide 🗆 🛮 Cald                                | ium Carbo    | onate 🗆 Calcium    | Sulfate | Acid Ins                              | soluble     |   |                  |                  |       |                  |        |                |                   |
| REMARKS AND                  | RECOMMENDA  | TIONS:       |                    |         |                                       |             |   |                  |                  |       |                  |        |                |                   |

NLTC ENGINEER DIST. NO. ADDRESS OFFICE PHONE HOME PHONE 821 HOBBS, NM CRIS LOVE P O BOX 1697 392-1518 392-6100 DISTRIBUTION | CUSTOMER ANALYZED BY DATE □ DISTRICT ☐ REGION DETTMEIER/CRUM 10/31/86 ☐ NLTC SALES ENGINEER □.

Complete H2O analysis plus Fe & PO4 background.

#### NL TREATING CHEMICALS NL INDUSTRIES, INC.

#### SCALING TENDENCIES OF WATERS

COMPANY: TEXACO, INC.
SAMPLE POINT: INJECTION PLANT #1
LOCATION: SKELLY UNIT
DATE: OCTOBER 29, 1986

#### WATER ANALYSIS (MG/L):

| SODIUM      | 285.2 |
|-------------|-------|
| CALCIUM     | 36.0  |
| MAGNESIUM   | 21.9  |
| CHLORIDE    | 400.0 |
| SULFATE     | 147.5 |
| BICARBONATE | 97.6  |
| IRON        | Ø. 1  |
| BARIUM      | 0.0   |
| STRONTIUM   | 0.0   |
|             |       |

PH: 6.0 IONIC STRENGTH = 0.0193

INDEX VALUES GREATER THAN ZERO INDICATE SCALING CONDITIONS INDEX VALUES OF ZERO OR LESS INDICATE A STABLE WATER

|       | CALCITE | GYPSUM         | ANHYDRITE | BARITE          | STRONTIUM |
|-------|---------|----------------|-----------|-----------------|-----------|
| TEMP. | INDEX   | INDEX          | INDEX     | INDEX           | INDEX     |
| 60    | -2.24   | -1.87          | -2.12     | -40.57          | -1.00     |
| 80    | -2.12   | -1.92          | -2.06     | -40.71          | -1.00     |
| 100   | -2.01   | -1.94          | -1.99     | -40.B3          | -1.00     |
| 120   | -1.89   | -1.94          | -1.90     | -4 <b>0.</b> 92 | -1.00     |
| 140   | -1.78   | -1.92          | -1.80     | -40.99          | -1.00     |
| 160   | -1.66   | -1.90          | -1.68     | -41.03          | -1.00     |
| 180   | -1.53   | <b>-1.8</b> 5  | -1.56     | -41.06          | -1.00     |
| 200   | -1.40   | -1. <b>8</b> 2 | -1.42     | -41.07          | -1.00     |
| 220   | -1.27   | -1.78          | -1.27     | -41.08          | -1.00     |
| 240   | -1.12   | -1.73          | -1.11     | -41.07          | -1.00     |
| 260   | -0.98   | -1.68          | -0.94     | -41.06          | -1.00     |

#### DATA FOR WELLS WITHIN 2640' OF PROPOSED INJECTION WELL SKELLY UNIT WELL NO. 53

| Well Name<br>& Number | Formation                            | Total<br><u>Depth</u> | Date<br><u>Drilled</u> | Current<br>Status |
|-----------------------|--------------------------------------|-----------------------|------------------------|-------------------|
| Skelly Unit           |                                      |                       |                        |                   |
| 2                     | Fren 7 Rivers                        | 3768                  | 8/15/44                | Oil-Active        |
| 11                    | Grayburg<br>Jackson Fren<br>7 Rivers | 11,963                | 9/23/54                | Oil-Active        |
| 43                    | Grayburg<br>Jackson                  | 3757                  | 5/25/65                | Oil-Active        |
| 44                    | Grayburg<br>Jackson Fren<br>7 Rivers | 3 80 8                | 3/13/59                | Inj-Active        |
| 45                    | Grayburg<br>Jackson                  | 5040                  | 2/13/51                | Oil-Active        |
| 51                    | Grayburg<br>Jackson                  | 12,275                | 1/16/55                | Oil-Active        |
| 52                    | Grayburg<br>Jackson Fren<br>7 Rivers | 3872                  | 2/10/46                | Inj-Active        |
| 54                    | Grayburg<br>Jackson Fren<br>7 Rivers | 3802                  | 10/09/58               | Inj-Active        |
| 55                    | Grayburg<br>Jackson                  | 3687                  | 7/12/58                | Oil-Active        |
| 56                    | Grayburg<br>Jackson Fren<br>7 Rivers | 3580                  | 8/23/58                | Inj-Active        |
| 57                    | Grayburg<br>Jackson                  | 3710                  | 2/02/59                | Oil-Active        |
| 86                    | Grayburg<br>Jackson                  | 3900                  | 7/09/58                | Oil-Active        |
| 87                    | Fren 7 Rivers                        | 3800                  | 11/30/57               | Oil-Active        |

| Well Name<br>& Number | Formation                            | Total<br><u>Depth</u> | Date<br><u>Drilled</u> | Current<br>Status |
|-----------------------|--------------------------------------|-----------------------|------------------------|-------------------|
| Skelly Unit           |                                      |                       |                        |                   |
| 115                   | Grayburg<br>Jackson Fren<br>7 Rivers | 3981                  | 3/10/74                | Oil-Active        |
| 116                   | Grayburg<br>Jackson Fren<br>7 Rivers | 4000                  | 4/27/74                | Oil-Active        |
| 149                   | Grayburg<br>Jackson Fren<br>7 Rivers | 3900                  | 2/07/85                | Oil-Active        |
| 156                   | Grayburg<br>Jackson Fren<br>7 Rivers | 3685                  | 12/24/84               | Oil-Active        |
| 157                   | Grayburg<br>Jackson Fren<br>7 Rivers | 3705                  | 1/05/85                | Oil-Active        |
| 158                   | Grayburg<br>Jackson Fren<br>7 Rivers | 4050                  | 9/05/85                | Oil-Active        |
| 159                   | Grayburg<br>Jackson Fren<br>7 Rivers | 4050                  | 10/23/85               | Oil-Active        |
| 160                   | Grayburg<br>Jackson Fren<br>7 Rivers | 3900                  | 10/01/85               | Oil-Active        |

### Affidavit of Publication

No. 11732

| STATE OF NEW MEXICO, County of Eddy:                             |
|--|
| Gary D. Scott being duly   |
| sworn, says: That he is the Publisher of The                     |
| Artesia Daily Press, a daily newspaper of general circulation,   |
| published in English at Artesia, said county and state, and that |
| the hereto attached <u>Legal Notice</u>                          |
| was published in a regular and entire issue of the said Artesia  |
| Daily Press, a daily newspaper duly qualified for that purpose   |
| within the meaning of Chapter 167 of the 1937 Session Laws of    |
| days the State of New Mexico for1 consecutive weeks on           |
| the same day as follows:   |
| First Publication November 5, 1986                               |
| Second Publication   |
| Third Publication  |
| Fourth Publication   |
| and that payment therefore in the amount of \$                   |
| has been made  |
| Subscribed and sworn to before me this                           |
| Notary Public, Eddy County, New Mexico                           |
| My Commission expires September 23, 1987                         |

#### Copy of Publication

#### **LEGAL NOTICE**

Notice is hereby given of the application of Texaco Inc., Attention: L.J. Seeman, District Petroleum Engineer, P.O. Box 728, Hobbs, New Mexico 88240, Telephone (505) 393-7191, to the Oil Conservation Division, New Mexico Energy & Minerals Department, for approval of the following injection well(s) for the purpose of pressure maintenance.

Well(s) No(s).: 53
Lease/Unit Name: Skelly
Unit

Location: Unit Letter K, Section 22, T-17-S, R-31-E, in Eddy County, New Mexico. The injection formation is Grayburg Jackson at a depth of 3808 feet below the surface of the ground. Expected maximum injection rate is 300 barrels per day, and expected mmaximum injection pressure is 2100 pounds per square inch. Interested parties must file objections or requests for hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501, within fifteen (15) days of this publication.

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Legal No. 11732.