STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

19

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: Devon Energy Operating Corporation

Address: 20 N. Broadway, Suite 1500, Oklahoma City, OK 73102-8260

Contact party: Randy Jackson Phone: (405) 552-4560

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? [X] yes [ ] no
If yes, give the Division order number authorizing the project R-2268.

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. Refer to Attachment V

* 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. Refer to Attachment VI

VII. Attach data on the proposed operation, including: Refer to Attachment VII

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. Refer to Attachment VIII

IX. Describe the proposed stimulation program, if any. 15% NEFE acid will be used to open and clean perforations.

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

* 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. There are no known producing fresh water wells within one mile of the proposed injection well.

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. Refer to Attachment XII

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

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: Randy Jackson Title District Engineer

Signature: Randy Jackson Date: 11/18/94

* 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.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division

**ATTACHMENT III (tabular)**

WELL DATA

A. (1) H. E. West "A" #14
720' FSL & 1980' FEL
Section 4-T17S-R31E
Eddy County, NM

(2) Casing Data: Also see Attachment III (schematic).
Surface: 8 5/8" set @ 542' cem'd w/350 sx in a 12 1/2" hole. Circ to surface.
Production: 5 1/2" set @ 3935' cmt'd w/1900 sx in 7 7/8" hole. Circ 300 sx to surface.
Liners: None.

(3) Injection Tubing: 2 3/8", 4.7#, J-55, 8rd EUE plastic coated set at 3175'.

(4) Packer: Guiberson Unipkr or Baker, tension pkr (or equivalent) set @ 3175' in tension.

B. (1) Injection Formation: The injection formation will be the Grayburg San Andres.

(2) Injection Interval: The injection interval is to be from perforations @ 3134'-3935'.

(3) Original Purpose of Well: The well was originally drilled, completed and tested in the Grayburg San Andres as a producer from perforations 3214'-3863'.

(4) Added Perforated Intervals: Will drill out CIBP @ 3828' and clean out to 3935'.

(5) Higher/Lower Oil Zones: The top of the Seven Rivers is at +/- 2300' and there is no known lower oil zone.

Schematic: See Attachment III (schematic).

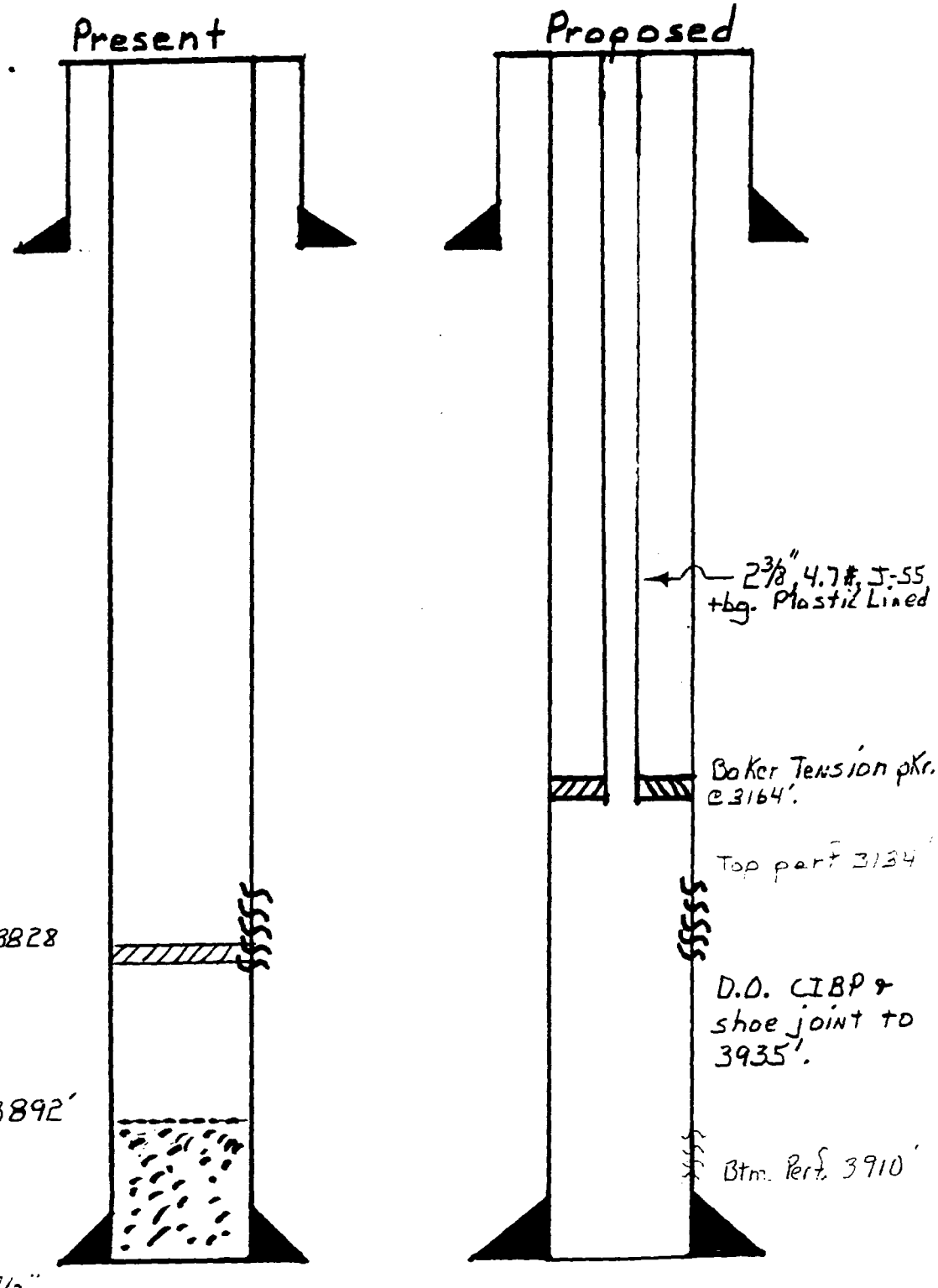
ATTACHMENT III (Schematic)

devon
OPERATING CORPORATION
20 North Broadway, Suite 1500
Oklahoma City, Oklahoma 73102-8260
Telephone: 405/235-3611
FAX: 405/552-4550

# WELLBORE SCHEMATIC

WELL: H. E. West "A" No. 14

LOCATION: 720' FSL & 1980 FEL
4-17S-31E
Eddy Co., N.M.



LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

# ATTACHMENT VI

| | | | | | | |
|---|---|---|---|---|---|---|
| H. E. West "B" #16 | 660' FSL & 660' FWL<br>Sec. 3-17S-31E | | 8/58 | Injection | TD 3978'<br>PBTD 3978' | 10 3/4" @ 765' w/100 sx.<br>5 1/2" @3673' w/100 sx. TOC @ 2660' (CBL).<br>Liner: 4" set from 3264'-3978' w/75 sx.<br>Completed in the Grayburg Sand Andres as a producer from perfs 3370'-3384' and 3570'-3578'. Added perfs from 3333'-3341', 3394'-3397', 3439'-3497', and 3501'-3520'. Deepeed to 3978' and ran 4" liner. Perf'd 3792'-3961', 3546'-3742' and 3333'-3523'. Converted well to injection. |
| H. E. West "A" #4 | 1980' FNL & 1980' FEL<br>Sec. 4-17S-31E | 8/54 | 9/54 | Injection | TD 3842'<br>PBTD 3841' | 5/8" @ 706' w/100 sx.<br>7" @ 3169' w/200 sx. TOC @ 2000' (calc.)<br>4 1/2" liner from 3068'-3841' cmt'd w/ 95 sx.<br>Completed in the Grayburg as a producer from open hole interval 3326'-3336'. Deepened to 3842'. Ran 4 1/2" liner 3068'-3841'. Converted to dual injector through perfs 3331'-3822'. Converted to triple injection through perfs 3242'-3398'. Returned to single injection through perfs 3242'-3822'. |
| H. E. West "B" #11 | 1980' FSL & 1980' FWL<br>Sec. 4-17S-31E | 1/54 | 2/54 | Injection | TD 3574'<br>PBTD 3574' | 8 5/8" @ 683' w/100 sx<br>7" @ 3146' w/200 sx. TOC @ 1000' (Calc.)<br>4 1/2" liner set from 3071'-3574' w/540 sx.<br>Completed in the Grayburg San Andres as an oil producer from open hole interval 3146'-3574'. Converted to injector through open hole. Ran liner and converted to dual injector with the addition of perfs from 3206'-3566'. Returned to single injector through existing perforations. |
| H. E. West "A" #9 | 1980' FSL & 660' FEL<br>Sec. 4-17S-31E | 10/19/55 | 12/1/55 | Injection<br>(Oil well converted) | TD 3856'<br>PBTD 3816' | 8 5/8" @ 719' w/100 sx.<br>7" @ 3198' w/200 sx. TOC @ 1684' (CBL)<br>4 1/2" liner from 2968'-3856', cmt'd w/175 sx.<br>Completed as an oil producer from 3196'-3650' open hole. Frac'd 3276'-81' w/1500 gals oil + 2000# sand. Frac'd 3383'-90' w/ 3000 gals oil + 4000# sand. Deepened to 3856' & 4 1/2" line ran to 3856' & cmt'd w/175 sx. Well was perf'd 3360'-75' and converted to injection. |

# ATTACHMENT VI

| | | | | | | |
|---|---|---|---|---|---|---|
| H. E. West "A" #17 | 660' FSL & 660' FEL<br>Sec. 4-17S-31E | 12/12/89 | 1/6/90 | Producing Oil | TD 3954'<br>PBTD 3906' | 8 5/8" @ 575' w/350 sx cmt. Circ. to surface.<br>5 1/2" @ 3948' w/1150 sx cmt. Circ. to surface.<br>Completed as a producer from the Grayburg San Andres formation thru perfs 3273'-3839'. |
| H. E. West "B" #27 | 660' FSL & 1980' FWL<br>Sec. 4-17S-31E | 5/3/61 | 2/6/64 | Producting Oil | TD 12,860'<br>PBTD 3922' | 13 3/8" @ 650' w/740 sx cmt. Circ to surface.<br>9 5/8" @ 3800' w/1450 sx cmt. Circ to surface<br>Well drilled to a TD of 12,860'. The well was plugged back to 3922'. Completed in the Grayburg San Andres thru perfs 3180'-3546' & open hole interval 3800'-3885'. |
| H. E. West "B" #28 | 660' FNL & 660 FEL<br>Sec. 9-17S-31E | | 12/63 | Injection | TD 3850'<br>PBTD 3850' | 8 5/8" @ 550' w/240 sx.<br>5 1/2" @ 3850' w/300 sx. TOC @ 1600' (calc).<br>Completed in the Grayburg San Andres as an injector thru perfs 3289'-3849'. Added new perfs from 3270'-3823'. |
| H. E. West "B" #29 | 660' FNL & 1980' FWL<br>Sec. 9-17S-31E | 12/11/63 | 1/22/64 | Injection | TD 3810'<br>PBTD 3810' | 8 5/8" @ 559' w/240 sx cmt. Circ to surface.<br>5 1/2" @ 3810' w/300 sx cmt.<br>Completed as producing oil well thru perfs 3232'-3804' (98 holes). Acidized w/3000 gals 15% acid. Reperf'd 3224'-3800' w/118 shots. Acidized w/16,000 gals 15% FENE. |
| H. E. West "B" #54 | 75' FNL & 1370' FEL<br>Sec. 9-17S-31E | 3/10/93 | 5/11/93 | Producing Oil | TD 4310'<br>PBTD 4256' | 8 5/8" @ 618' w/300 sx cmt. Circ. to surface<br>5 1/2: @ 4310' w/1850 sx cmt. Circ. to surface.<br>Completed as a Grayburg San Andres producer thru perfs 4031'-4132' (63 holes). Additional perfs: 3230'-3520', 3766'-3871', and 4048'-4250'. Acidized w/3000 gals 15% NEFE. Acid frac'd w/15,000 gals gelled Super X emulsified acid. |

# ATTACHMENT VI

| WELL NAME | LOCATION | SPUD DATE | COMPLETION DATE | TYPE OF WELL | DEPTH/PBTD | COMPLETION RECORD |
|---|---|---|---|---|---|---|
| H. E. West "A" #22 | 1345' FSL & 35' FEL<br>Sec. 4-17S-31E | 2/3/93 | 3/31/93 | Producing Oil | TD 5022'<br>PBTD 3560' | 13 3/8" @ 604' w/350 sx cmt.<br>8 5/8" @ 1815' w/750 sx cmt.<br>5 1/2" @ 5022' w/1222 sx cmt.<br>Completed in Grayburg San Andres through perfs 3278'-3522'. |
| H. E. West "A" #5 | 660' FNL & 660' FWL<br>Sec. 4-17S-31E | 10/20/54 | 12/14/54 | Producing Oil | TD 3650'<br>PBTD 3650' | 8 5/8" @ 695' w/100 sx reg. cmt.<br>7" @ 3196' w/200 sx. Est. TOC @ 1130'.<br>Perf'd 695' and circ cmt out 7" and 8 5/8" annulus. Shut BH valve and sqz'd 15 sx in formation @ 695'. Completed as a producer from the Grayburg San Andres thru open hole 3196'-3650'. |
| H. E. West "A" #23 | 140' FSL & 35' FEL<br>Sec. 4-17S-31E | 3/1/93 | 9/8/93 | Producing Oil | TD 4308'<br>PBTD 4287' | 13 3/8" @ 595' w/ 250 sx. Circ. to surface.<br>5 1/2" @ 4308' w/ 1600 sx cmt. Circ. to surface.<br>Completed as an oil producer in the Grayburg San Andres from perfs 3259'-3530' (48 holes). |
| H. E. West "B" #9 | 660' FSL & 660' FWL<br>Sec. 4-17S-31E | 4/29/52 | 6/11/52 | Injection | TD 3780'<br>PBTD 3749' | 8 5/8" @ 678' w/100 sx.<br>7" @ 3089' w/200 sx .<br>5" liner from 3000'-3780'<br>Perfs: 3158'-3729' (22 holes). Acidized w/1000 gals mud acid. Converted to injection after swab tests. |
| H. E. West "B" #53 | 1350' FNL & 1250' FEL<br>Sec. 9-17S-31E | 9/20/93 | 12/7/93 | Producing Oil | TD 4310'<br>PBTD 4152' | 8 5/8" @ 584' w/300 sx . Circ to surface.<br>5 1/2" @ 4310' w/1300 sx. Circ. to surface.<br>Perfs: 3228'-3438' (192 holes).<br>Acidized w/5250 gals 7 1/2% NEFE. Frac'd w/ 48,000 gals gelled water containing 85,931# 16/30 sand. |
| H. E. West "B" #47 | 890' FNL & 1980' FEL<br>Sec. 9-17S-31E | 12/2/89 | 12/11/89 | Producing Oil | TD 3922'<br>PBTD 3905' | 8 5/8" @ 539' w/350 sx. Circ.<br>5 1/2" @ 3922' w/1400 sx. TOC @ 875' from CBL.<br>Completed as a producer from Grayburg San Andres thru perfs 3265'-3859'. |

## ATTACHMENT VII

PROPOSED OPERATION

1. Average daily injection rate - 500 BWPD.
   Maximum daily injection rate - 600 BWPD.

2. Type of system - closed.

3. Average injection pressure - 1900 psi.
   Maximum injection pressure - 2500 psi.

4. Source of injection water - Produced water from the Keel West plus make up water from Keel West fresh water system.

5. N. A.

## ATTACHMENT VIII

GEOLOGY AND LITHOLOGY

The proposed injection zone is in the Greyburg San Andres from 3134' to 3935'. The Greyburg formation consists primarily of quartz sand with cementation. The San Andres formation consists primarily of dolomite with intermingled stringers of quartz sand with dolomite cementation.

Surface formation is cretaceous and has no known source of drinking water. Also, there are no known sources of drinking water overlying or underlying the proposed injection zone.

## ATTACHMENT XII

Upon examination of the available geologic and engineering data, no evidence of open faults or any other hydrologic connection between the injection zone and any underground source of drinking water was found.

## ATTACHMENT XIV

PROOF OF NOTICE

Devon Energy Operating Corporation (applicant) is the operator of all wells within the area of review. The Bureau of Land Management is the surface owner. They have been notified by BLM Sundry Notice.

PROOF OF PUBLICATION

Proof of publication from the Carlsbad Current-Argus is enclosed.

# Affidavit of Publication

№ 16139

State of New Mexico,
County of Eddy, ss.

Amy McKay,
being first duly sworn, on oath says:

That she is Business Manager of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the state wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

November 15, 1994
_____, 19____
_____, 19____
_____, 19____
_____, 19____
_____, 19____
_____, 19____

That the cost of publication is $ 25.70, and that payment thereof has been made and will be assessed as court costs.

Amy McKay

Subscribed and sworn to before me this
16th day of November, 1994

Donna Camp

My commission expires 8/01/98
Notary Public

*November 15, 1994*

**Legal Advertisement**

Notice is hereby given that Devon Energy Operating Corporation is applying to the New Mexico Oil Conservation Division to convert the following well to an injection well for secondary recovery purposes:

H.E. West "A" #14
720' FSL & 1980' FEL
Section 4-T17S-R31E
Eddy County, NM

The intended purpose of this well is to inject produced waters into the Grayburg-San Andres formations to enhance oil production through secondary recovery. Maximum injection rates of 600 bwpd and a maximum pressure of 2500 psig are expected.

Interested parties must file objections or requests for hearing within 15 days to the following commission:

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87501

Randy Jackson
District Engineer
Devon Energy Operating Corporation
20 North Broadway, Suite 1500
Oklahoma City, OK
(405) 552-4560

WEST A 5, 14, 17 WEST B 16+33 AAI Package

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Bureau of Land Management
P.O. Box 1778
Carlsbad, NM 88221-1778

4a. Article Number
P 080 276 170

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
11-21-94

5. Signature (Addressee)

6. Signature (Agent)
Betty Hill

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, November 1990 *U.S. GPO: 1991—287-006 **DOMESTIC RETURN RECEIPT**

PS Form 3800

Postmark or Date
WEST A 5, 14, 17
B 16+33
AAI Package