RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

PERMIT TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL AND GAS

PROJECT NO. F 4259

PHILLIPS PETROLEUM COMPANY
4001 PENBROOK ST
ODESSA TX 79762

Based on information contained in your application (Forms H-1 and H-1A) dated February 13, 1997, you are hereby authorized to use the following well to inject fluid into the Ellenburger Formation:

University Andrews Lease, (01268), Well No. 116, Embar (Ellenburger) Field, Andrews County, RRC District 08

Authority is granted to inject in accordance with Statewide Rule 46 of the Railroad Commission of Texas and subject to the following special and standard conditions:

SPECIAL CONDITIONS:

1. Fluid shall only be injected into strata in the subsurface depth interval from 7700 feet to 8200 feet.

2. The injection volume of salt water shall not exceed 10,000 barrels per day.

3. The maximum operating surface injection pressure shall not exceed 3850 psig.

4. The authority to inject fluid is limited to the injection of salt water.

STANDARD CONDITIONS:

1. Injection must be through tubing set on a packer.

2. The District Office must be notified 48 hours prior to:
   a. running tubing and setting packer;
   b. beginning any workover or remedial operation;
   c. conducting any required pressure tests or surveys.

3. The wellhead must be equipped with a pressure observation valve on the tubing and for each annulus.

4. Prior to beginning injection and subsequently after any workover, an annulus pressure test must be performed. The test pressure must equal the maximum authorized injection pressure or 500 psig, whichever is less, but must be at least 200 psig. The test must be performed and the results submitted in accordance with the instructions of Form H-5.

5. The injection pressure and injection volume must be monitored at least monthly and reported annually on Form H-10 to the Commission's Austin office.

6. Within 30 days after completion, conversion to fluid injection, or any workover which results in a change in well completion, a new Form W-2 or G-1 must be filed in duplicate with the District Office to show the current completion status of the well. The date of the injection permit and the project number must be included on the new Form W-2 or G-1.

7. Written notice of intent to transfer the permit to another operator must be submitted to the Commission at least 15 days prior to the date the transfer will occur by filing Form P-4.

8. A well herein authorized cannot be converted to a producing well and have an allowable assigned without filing an amended Form W-1 and receiving Commission approval.

9. Unless other wise required by conditions of the permit, completion and operation of the well shall be in accordance with the information represented on the application (Forms H-1 and H-1A).

Provided further that, should it be determined that such injection fluid is not confined to the approved strata, then the permission given herein is suspended and the fluid injection must be stopped until the fluid migration from such strata is eliminated.

APPROVED AND ISSUED ON March 12, 1997.

Richard F. Ginn, Deputy Assistant Director
for Underground Injection Control

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

Form H - 1
(Rev. 4-82)

APPLICATION TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS

1. Field Name (as per current proration schedule - including reservoir, if applicable.)		2. RRC District
EMBAR (ELLENBURGER)		08
3. Operator	3a. Address	4. County
Phillips Petroleum Company	4001 Penbrook Street, Odessa, TX 79762	ANDREWS
5. Lease Name(s) and RRC Lease Number(s)		6. Reservoir Discovery Date
UNIVERSITY ANDREWS	01268	05-01-42

7. **Have any injection permits been granted previously to any operator in this reservoir?** [X] Yes [ ] No
If answer to this question is "NO", ALL OPERATORS ON THE RESERVOIR MUST BE NOTIFIED of this application, and copies of notification attached hereto.

8. Check the Appropriate Block(s):

[ ] **New Project** or [X] **Expansion of Previous Authority** to Add Either: [ ] New Lease(s) or [X] Additional Well(s) on Same Lease(s)
Initial Authority Dated 08-17-64 by [ ] Administrative Action or [ ] Hearing, Special Order No. F-4259

RESERVOIR AND FLUID DATA ON ENTIRE RESERVOIR

9. Name of Reservoir	10. Estimated Productive Area of Entire Reservoir (acres)
ELLENBURGER	2050
11. Composition (sand, limestone, dolomite, etc.)	12. Type of Structure (Include cross-section and structural maps.)
DOLOMITE	TRUNCATED HORST
13. Subsea Depth of Oil-Water Contact (ft.)	14. Subsea Depth of Gas-Oil Contact (ft.)
-7900 ORIGINALLY	NA
15. Original Bottom Hole Pressure (psig)	16. Current Bottom Hole Pressure (psig)
3271	1500 PSI
17. Was a Gas Cap Present Originally?	18. Is a Gas Cap Present Now?
NO	NO
19. Ratio of Gas Cap Volume to Oil Zone Volume	20. Saturation Pressure (psig)
NA	970 PSI
21. Formation Volume Factor Original: 1.356 Current: 1.3	22. Type Drive During Primary Production
	WATER DRIVE

RESERVOIR AND FLUID DATA

23. Number of Productive Acres in Lease(s) within Project Area 2050	24. Average Depth to Top of Pay (ft.)	25. Average Effective Pay Thickness (ft.)
	7740	195
26. Average Horizontal Permeability (mds.)	27. Range of Horizontal Permeability (mds.)	28. Connate Water Saturation (% of pore space)
4.0 MD	.1 - 1000 MD	25% ESTIMATED
29. Average Porosity (%)	30. Gravity of Oil (deg. API)	31. Viscosity (cps. @ •F)
4.6	41.0 DEGREES	.59 @970 PSI

PRODUCTION HISTORY OF RESERVOIR

32. Date First Well Completed on Lease(s)	33. Stage of Primary Depletion Of Project Area
5-1-42	90%
34. Current Average Gas-Oil Ratio (SCF/bbl.)	35. Current Water Production (% of total fluid production or bbls./day)
2479/1	93%
36. Current Number of Producing Wells on Each Lease in Project Area	37. Current Average Daily Oil Production per Well (bbls./day/well)
7	38 BOPD
38. Cumulative Oil Production to Date from Lease(s) (bbls.)	39. SUBMIT ATTACHED SHEET(S) GIVING THE OIL, GAS, & WATER PRODUCTION BY YEARS SINCE DISCOVERY & TOTALS. FOR THE LAST 3 YEARS, GIVE THESE FIGURES BY MONTHS.
21,25,551 AS OF 12/1/96	

TYPE OF INJECTION PROJECT AND RESULTS EXPECTED

40. Type of Injection Project (Check the appropriate block(s):)
[ ] Waterflood, [ ] Miscible Displacement, [ ] Thermal Recovery, [X] Pressure Maintenance, [X] Other SALT WATER DISPOSAL (specify)

41. Current Estimated Oil Saturation (% of pore space)	42. Estimated Residual Oil Saturation at Abandonment (% of pore space)
60%	60%
43. Estimated Original Oil-In-Place (bbls.)	44. Estimated Ultimate Additional Oil that will be Recovered as a Direct Result of Injection (bbls.)
35,000,000	NA

INJECTION DATA

45. Type of Injection Fluid (Check the appropriate block(s):)
[X] Salt Water, [ ] Brackish Water, [ ] Fresh Water, [ ] Gas, [ ] Air, [ ] LPG, [ ] Other (specify)

46. Source of Injected Fluid(s) (formation(s) and depth(s) in ft.)	47. Injection Pattern and Spacing
ELLENBURGER-7700'; PERMIAN 6100'	NA
48. Total Number of Injection Wells to be Approved in this Application	49. Estimated Maximum Daily Rate of Injection per Well (bbls./day/well)
1	10,000
50. Total Estimated Maximum Daily Rate of Injection for All Wells in this Application. (bbls./day) 10,000	51. Maximum Injection Pressure to be Used. (psig)
	2,000#

52. LIST COMPLETE INJECTION WELL DATA ON FORM H-1A AND ATTACH.

DATA ON PROPOSED PROJECT AREA

APPLICANT MUST COMPLY WITH THE INSTRUCTIONS AND SIGN CERTIFICATION ON REVERSE SIDE

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

FORM H-1A
4-82
INJECTION WELL DATA
(Attach to Form H-1)

1. Operator Name	2. Lease Name	3. RRC Lease/ID No.
Phillips Petroleum Company	UNIVERSITY ANDREWS	01268

4. Field Name	5. RRC Field No.	6. Depth to Base of Deepest Fresh Water Zone
EMBAR (ELLENBURGER)	28843222	1200'

7a. Location (Sec.-Twp. or Block and Survey)	7b. County	8. This lease is located
SEC. 30 BLK. 10 ULS	ANDREWS	12 miles SW direction from ANDREWS, TX, (nearest post office or town.)

9. WELL NO.	WELL CASING AND TUBING						
116	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY	HOLE SIZE	CASING WEIGHT
10. Surface Casing	13-3/8"	308'	450	SURFACE	CIRC.	17-1/2"	48#
11. Intermediate	8-5/8"	3800'	1250	SURFACE	CIRC.	11"	24#
12. Long String	5-1/2"	8537'	542	2025'	TEMP SURVEY	7-7/8"	15.5#&17#

13. Tubing (Size and Depth)	14. Name, Model and Depth of Tubing Packer
2-7/8" IPC @ 7650'	BAKER LOC-SET @ 7600'

15. Total Depth of Well	16. Date Well Drilled	17. API No.	18. Ground Surface Elevation	19. Perforation or Open Hole
9736'	8-31-89	42-003-36454	3247'	[X]

20. List All Cement Squeeze Operations, Giving Interval and Sacks of Cement
7706'-7116' W/250 SACKS

21. Injection Interval	22. Name of Reservoir	23. Injection System Open or Closed
Top 7700' Bottom 8200'	ELLENBURGER	[ ] [X]

24. Anticipated Daily Injection Volume (Bbls)		25. Injection Pressure(Psi)		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone?
Average 2000	Maximum 10,000	Average 2000	Maximum 5000	[X] Yes [ ] No

9. WELL NO.	WELL CASING AND TUBING						
	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY	HOLE SIZE	CASING WEIGHT
10. Surface Casing							
11. Intermediate							
12. Long String							

13. Tubing (Size and Depth)	14. Name, Model and Depth of Tubing Packer

15. Total Depth of Well	16. Date Well Drilled	17. API No.	18. Ground Surface Elevation	19. Perforation or Open Hole
				[ ]

20. List All Cement Squeeze Operations, Giving Interval and Sacks of Cement

21. Injection Interval	22. Name of Reservoir	23. Injection System Open or Closed
Top Bottom		[ ] [ ]

24. Anticipated Daily Injection Volume (Bbls)		25. Injection Pressure(Psi)		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone?
Average	Maximum	Average	Maximum	[ ] Yes [ ] No

9. WELL NO.	WELL CASING AND TUBING						
	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY	HOLE SIZE	CASING WEIGHT
10. Surface Casing							
11. Intermediate							
12. Long String							

13. Tubing (Size and Depth)	14. Name, Model and Depth of Tubing Packer

15. Total Depth of Well	16. Date Well Drilled	17. API No.	18. Ground Surface Elevation	19. Perforation or Open Hole
				[ ]

20. List All Cement Squeeze Operations, Giving Interval and Sacks of Cement

21. Injection Interval	22. Name of Reservoir	23. Injection System Open or Closed
Top Bottom		[ ] [ ]

24. Anticipated Daily Injection Volume (Bbls)		25. Injection Pressure(Psi)		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone?
Average	Maximum	Average	Maximum	[ ] Yes [ ] No