

RAILROAD COMMISSION OF TEXAS  
OIL AND GAS DIVISION

42003-05146

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.) Midland Farms, NE (Ellenburger)		2. RRC District 08
3. Operator Citation Oil & Gas Corp.	3a. Address 16800 Greenpoint Pk. Dr. #300 Houston, Texas 77060	4. County Andrews
5. Lease Name(s) and RRC Lease Number(s) University C (RRC # 04390)		6. Reservoir Discovery Date February 1954
7. Have any injection permits been granted previously to any operator in this reservoir? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If answer to this question is "NO", ALL OPERATORS IN THE RESERVOIR MUST BE NOTIFIED of this application, and copies of notification attached hereto.		
8. Check the Appropriate Block(s): <input type="checkbox"/> New Project or <input type="checkbox"/> Expansion of Previous Authority to Add Either: <input type="checkbox"/> New Lease(s) or <input type="checkbox"/> Additional Well(s) on Same Lease(s) Initial Authority Dated _____ by <input type="checkbox"/> Administrative Action or <input type="checkbox"/> Hearing, Special Order No. _____		

RESERVOIR AND FLUID DATA ON ENTIRE RESERVOIR

9. Name of Reservoir Ellenburger	10. Estimated Productive Area of Entire Reservoir (acres)
11. Composition (sand, limestone, dolomite, etc.) Dolomite	12. Type of Structure (Include cross-section and structural maps.) Anticline
13. Subsea Depth of Oil-Water Contact (ft.) ± 12,410'	14. Subsea Depth of Gas-Oil Contact (ft.) N/A
15. Original Bottom Hole Pressure (psig) ± 4800 psig	16. Current Bottom Hole Pressure (psig)
17. Was a Gas Cap Present Originally? No	18. Is a Gas Cap Present Now?
19. Ratio of Gas Cap Volume to Oil Zone Volume --	20. Saturation Pressure (psig)
21. Formation Volume Factor Original: 1.308 Current: _____	22. Type Drive During Primary Production Water Drive

RESERVOIR AND FLUID DATA

23. Number of Productive Acres in Lease(s) within Project Area 320	24. Average Depth to Top of Pay (ft.) 12,450'	25. Average Effective Pay Thickness (ft.) 20'
26. Average Horizontal Permeability (mds.) 5.5 md.	27. Range of Horizontal Permeability (mds.) .1 - 10 md.	28. Connate Water Saturation (% of pore space) 54%
29. Average Porosity (%) 4.1%	30. Gravity of Oil (deg. API) 38.1° API	31. Viscosity (cps. @ ° F) ± 3 cps

PRODUCTION HISTORY OF RESERVOIR

32. Date First Well Completed on Lease(s) 2/19/54	33. Stage of Primary Depletion of Project Area N/A
34. Current Average Gas-Oil Ratio (SCF/bbl.) 20	35. Current Water Production (% of total fluid production or bbls./day) 97% water cut
36. Current Number of Producing Wells on Each Lease in Project Area 1	37. Current Average Daily Oil Production per Well (bbls./day/well) -
38. Cumulative Oil Production to Date from Lease(s) (bbls.) 2,667,000 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.

TYPE OF INJECTION PROJECT AND RESULTS EXPECTED

40. Type of Injection Project (Check the appropriate block(s):) <input type="checkbox"/> Waterflood, <input type="checkbox"/> Miscible Displacement, <input type="checkbox"/> Thermal Recovery, <input type="checkbox"/> Pressure Maintenance, <input checked="" type="checkbox"/> Other	
41. Current Estimated Oil Saturation (% of pore space) N/A	42. Estimated Residual Oil Saturation at abandonment (% of pore space) N/A
43. Estimated Original Oil-In-Place (bbls.) N/A	44. Estimated Ultimate Additional Oil that will be Recovered as a Direct Result of Injection (bbls.) N/A

INJECTION DATA

45. Type of Injection Fluid (Check the appropriate block(s):) <input checked="" type="checkbox"/> Salt Water, <input type="checkbox"/> Brackish Water, <input type="checkbox"/> Fresh Water, <input type="checkbox"/> Gas, <input type="checkbox"/> Air, <input type="checkbox"/> LPG, <input type="checkbox"/> Other	
46. Source of Injected Fluid(s) (formation(s) and depth(s) in ft.) Penn @ 9000'±; Devonian @ 10,500'±; Ellenburger @ 12,400'	47. Injection Pattern and Spacing Single well
48. Total Number of Injection Wells to be Approved in this Application 1	49. Estimated Maximum Daily Rate of Injection per Well (bbls./day/well) 5000 BPD
50. Total Estimated Maximum Daily Rate of Injection for All Wells in this Application. (bbls./day) 5000 BPD	51. Maximum Injection Pressure to be Used. (psig) Avg 0 psi; Max 1000 psi

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

DATA ON PROPOSED PROJECT AREA

APPROVED FOR U.S.W.D.  
ANSWER TO LEASE TO READ AND RETURN  
OCT 11 1988

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

INSTRUCTIONS (H-1)

1. File the original application, including all attachments, with the Director of Underground Injection Control, Railroad Commission of Texas, P. O. Drawer 12967, Capitol Station, Austin, Texas 78711. File one copy of the application and its attachments with the appropriate District Office.
2. Attach complete electrical log or similar well log of one of the proposed injection wells. Attach any other logging and testing data available for the well such as cement bond logs.
3. (a) For a new project, attach a map with surveys marked showing the location and depth of all wells of public record within a one-quarter (1/4) mile radius of the project area.  
(b) For an expansion of a previous authority, attach a map with surveys marked showing the location and depth of all wells of public record within one-quarter (1/4) mile radius of the additional wells, unless such data previously has been submitted for the project.  
(c) For those wells in 3(a) or 3(b) that penetrate the top of the injection interval, attach a table of wells showing the dates drilled and their present status. Identify any abandoned well which available data indicate is unplugged or improperly plugged. The Director of Underground Injection Control may adjust or waive this data requirement in accordance with provision of the "Area of Review" section of Statewide Rule 46.
4. Attach a letter from the Texas Department of Water Resources for a well within the project area stating the depth to which usable quality ground water occurs.
5. Attach Form H-1A showing each injection well to be used in the project. Up to three wells can be listed on each H-1A Form.
6. Attach Form H-7, Fresh Water Data Form, for a new injection project that includes the use of fresh water. An updated H-7 must be attached to Form H-1 for an expansion of a previously authorized fresh water injection project unless the fresh water is purchased from a commercial supplier, public entity, or from another operator.
7. (a) Attach a plat of lease(s) showing producing wells, injection wells, offset wells, and identifying ownership of all surrounding leases.  
(b)(1) Send a copy of the application to the surface owner, the offset operators, and to the county and city clerk of the county and city in which the well is located. If this is the initial application for fluid injection authority for this reservoir, send copies of the application to all operators in the reservoir. Attach a signed statement indicating the date the copies of the application were mailed or delivered and the names and addresses of the persons to whom copies were sent.  
(2) Attach an affidavit of publication signed by the publisher that notice of the application has been published in a newspaper of general circulation in the county where the wells will be located. Notice instructions and forms may be obtained from the Commission's Austin Office or the District Offices.  
(c) No public hearing will be held on this application unless an affected person or local government requests a public hearing. Any such request for a public hearing shall be in writing and contain: (1) the name, mailing address, and phone number of the person making the request; and (2) a brief description of how the protestant would be adversely affected by the granting of the application. If the Commission determines that a valid protest has been received, or that a public hearing would be in the public interest, a hearing will be held after the issuance of proper and timely notice of the hearing by the Commission. If no protest is received within fifteen (15) days of publication or receipt in Austin of the application, the application may be processed administratively.

CERTIFICATE

I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this report, that this report was prepared by me or under my supervision and direction, and that data and facts stated therein are true, correct, and complete, to the best of my knowledge.

  
\_\_\_\_\_  
Signature  
Carole Favro      Production Admin. Manager  
Name of Person (type or print)      Title  
Telephone (713) 874-9877      Date 7-6-88  
Area Code      Number

**RAILROAD COMMISSION OF TEXAS  
OIL AND GAS DIVISION**

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

1. Operator Name <b>Citation Oil &amp; Gas Corp.</b>		2. Lease Name <b>University C</b>		3. RRC Lease/ID No. <b>04390</b>		
4. Field Name <b>Midland Farms NE (Ellenburger)</b>		5. RRC Field No. <b>61121666</b>		6. Depth to Base of Deepest Fresh Water Zone <b>1,550'</b>		
7a. Location (Sec.-Twp. or Block and Survey) <b>Sec. 21 Blk 1 ULS Survey</b>		7b. County <b>Andrews</b>		8. This lease is located <b>8</b> miles <b>SE</b> direction from <b>Andrews, Texas</b> , (nearest post office or town.)		
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.	13-3/8"	422'	400sx	surface	circulated	17" 48#
11. Intermediate	8-5/8"	4712'	2100sx	surface	circulated	11" 32#
12. Long String	5-1/2"	12,552'	650sx	5200'	Free Point	7-7/8" 15.5; 17; 20#
13. Tubing (Size and Depth) <b>2 7/8" (6.5#) @ 12,450'</b>		14. Name, Model and Depth of Tubing Packer <b>Baker Lok-set @ 12,450'</b>				
15. Total Depth of Well <b>12,585'</b>		16. Date Well Drilled <b>3-1-55</b>		17. API No. <b>42-003-05176</b>		
				18. Ground Surface Elevation <b>3128'</b>		
				19. Perforation or Open Hole <input type="checkbox"/> <input checked="" type="checkbox"/>		
20. List All Cement Squeeze Operations, Giving Interval and Sacks of Cement <b>[9885'- 11,005' 375sx "H" ] [11,135' - 12,585' 25sx]</b>						
21. Injection Interval Top <b>12,552'</b> Bottom <b>12,585'</b>		22. Name of Reservoir <b>Ellenburger</b>		23. Injection System Open or Closed <input type="checkbox"/> <input checked="" type="checkbox"/>		
24. Anticipated Daily Injection Volume (Bbls) Average <b>2500</b> Maximum <b>5000</b>		25. Injection Pressure (Psi) Average <b>50</b> Maximum <b>1000</b>		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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 Top Bottom		22. Name of Reservoir		23. Injection System Open or Closed <input type="checkbox"/> <input type="checkbox"/>		
24. Anticipated Daily Injection Volume (Bbls) Average Maximum		25. Injection Pressure (Psi) Average Maximum		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone? <input type="checkbox"/> Yes <input type="checkbox"/> 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 Top Bottom		22. Name of Reservoir		23. Injection System Open or Closed <input type="checkbox"/> <input type="checkbox"/>		
24. Anticipated Daily Injection Volume (Bbls) Average Maximum		25. Injection Pressure (Psi) Average Maximum		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone? <input type="checkbox"/> Yes <input type="checkbox"/> No		

APPROVED UNIVERSITY LANDS  
ANSWERED  
REC'D  
REFER TO JUL 11 1958  
PLEASE ANSWER AND RETURN  
FILE

# RAILROAD COMMISSION OF TEXAS

## OIL AND GAS DIVISION

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

1. Operator Name <b>Shell Western E&amp;P Inc.</b>		2. Lease Name <b>University -C-</b>			3. RRC Lease/ID No. <b>04390</b>		
4. Field Name <b>Midland, Farms, NE. (Ellenburger)</b>				5. RRC Field No. <b>--</b>	6. Depth to Base of Deepest Fresh Water Zone <b>250'</b> & <b>1100 to 1550'</b>		
7a. Location (Sec.-Twp. or Block and Survey) <b>Sec. 21, Blk. 1, ULS Survey</b>		7b. County <b>Andrews</b>		8. This lease is located <b>8</b> miles <b>southeast</b> direction from <b>Andrews, TX</b> , (nearest post office or town.)			
9. WELL NO. <b>5</b>	WELL CASING AND TUBING						
	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY	HOLE SIZE	CASING WEIGHT
10. Surface Casing.	<b>13 3/8"</b>	<b>422'</b>	<b>400</b>	<b>surface</b>	<b>circulated</b>	<b>17"</b>	<b>48#</b>
11. Intermediate	<b>8 5/8"</b>	<b>4712'</b>	<b>2100</b>	<b>surface</b>	<b>circulated</b>	<b>11"</b>	<b>32#</b>
12. Long String	<b>5 1/2"</b>	<b>12,552'</b>	<b>650</b>	<b>5200'</b>	<b>Free Point</b>	<b>7 7/8"</b>	<b>15.5,17,20#</b>
13. Tubing (Size and Depth) <b>2 7/8" (6.5#) @ 12,450'</b>		14. Name, Model and Depth of Tubing Packer <b>Baker Lok-Set @ 12,450'</b>					
15. Total Depth of Well <b>12,585'</b>		16. Date Well Drilled <b>March 1955</b>		17. API No. <b>42-003-05176</b>		18. Ground Surface Elevation <b>3128'</b>	19. Perforation or Open Hole <input type="checkbox"/> <input checked="" type="checkbox"/>
20. List All Cement Squeeze Operations, Giving Interval and Sacks of Cement <b>(9885-9890' w/25 sx &amp; 10,839-11,005' w/50 sx Sqz'd csg leak @ 6000' w/890 sx(10-7-73); will be squeezed upon SWD approval)</b>							
21. Injection Interval Top <b>12,552'</b> Bottom <b>12,585'</b>		22. Name of Reservoir <b>Ellenburger</b>			23. Injection System Open or Closed <input type="checkbox"/> <input checked="" type="checkbox"/>		
24. Anticipated Daily Injection Volume (Bbls) Average <b>4000</b> Maximum <b>5000</b>		25. Injection Pressure (Psi) Average <b>0</b> Maximum <b>1000</b>		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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 Top Bottom		22. Name of Reservoir			23. Injection System Open or Closed <input type="checkbox"/> <input type="checkbox"/>		
24. Anticipated Daily Injection Volume (Bbls) Average Maximum		25. Injection Pressure (Psi) Average Maximum		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone? <input type="checkbox"/> Yes <input type="checkbox"/> 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 Top Bottom		22. Name of Reservoir			23. Injection System Open or Closed		
24. Anticipated Daily Injection Volume (Bbls) Average Maximum		25. Injection Pressure (Psi) Average Maximum		26. Is this well so cased and completed that water can enter no other formation than the above set out injection zone? <input type="checkbox"/> Yes <input type="checkbox"/> No			

SHELL WESTERN E&P INC.  
UNIVERSITY -C- WELL NO. 5  
MIDLAND FARMS, NE. (ELLENBURGER) FIELD  
ANDREWS COUNTY, TEXAS

1/4 MILE RADIUS - - AREA OF REVIEW

<u>OPERATOR</u>	<u>TD</u>	<u>DATE DRILLED</u>	<u>PRESENT STATUS</u>
<u>Shell Western E&amp;P Inc.</u>			
University -C- No. 2	12,544'	5/54	Devonian Producer
University -E- No. 3	11,093'	10/57	Penn/Wolfcamp Producer
University -C- No. 8	9,100'	12/55	Penn/Wolfcamp Producer
University -C- No. 7	9,092'	5/54	Penn Producer
<u>Edmiston Drilling</u>			
Well No. 1	5,110'	7/47	P&A'd 7-14-47

MIDLAND FARMS, NE (ELLENBURGER)  
UNIVERSITY -C- (RRC # 04390)

YEAR	OIL BBLs/YR	GAS MCF/YR	WTR BBLs/YR
70	54284	24970	507282
71	42231	19343	174158
72	31182	12463	118513
73	31736	14516	125644
74	32958	14057	126617
75	31731	14012	132923
76	25841	18271	128021
77	25861	22065	217200
78	17788	14308	223246
79	27773	13413	208289
80	17865	11384	211747
81	17754	14897	180859
82	16780	2314	208211
83	20939	405	508748

MIDLAND FARMS, NE (ELLENBURGER)  
UNIVERSITY -C- (RRC # 04390)

MO	YR	OIL BBLs/MO	GAS MCF/MO	WTR BBLs/MO	GOR (CF/B)
01	84	1377	29	47801	21.1
02	84	1350	33	43650	24.4
03	84	1271	37	41095	29.1
04	84	1457	62	47109	42.6
05	84	1476	107	47724	72.5
06	84	1494	102	48306	68.3
07	84	1195	9	37170	7.5
08	84	1496	0	51309	0.0
09	84	1536	0	49770	0.0
10	84	1681	5	51801	3.0
11	84	1529	25	50034	16.4
12	84	1603	43	51207	26.8
*TOTAL 84		17465	452	566976	
01	85	1599	39	51119	24.4
02	85	1338	34	46192	25.4
03	85	1393	46	51088	33.0
04	85	1192	4	46125	3.4
05	85	1466	30	51130	20.5
06	85	899	29	37331	32.3
07	85	1309	0	47932	0.0
08	85	1240	0	51203	0.0
09	85	1391	0	49491	0.0
10	85	1393	0	51150	0.0
11	85	1281	0	48968	0.0
12	85	1431	25	49427	17.5
*TOTAL 85		15932	207	581156	
01	86	1510	35	51522	23.2
02	86	1422	38	49143	26.7
03	86	1741	54	53966	31.0
*TOTAL 86		4673	127	154631	

4/10/86

STATE OF TEXAS

COUNTY OF Andrews

Before me, the undersigned authority, on this day personally appeared James Roberts, the Publisher of the Andrews County News, a newspaper having general circulation in \_\_\_\_\_ County, Texas, who being by me duly sworn, deposes and says that the foregoing attached notice was published in said newspaper on the following date(s), to wit: April 27, 1986.

**NOTICE OF APPLICATION  
FOR FLUID INJECTION**

**WELL PERMIT**

Shell Western E&P Inc., P.O. Box 576, Houston, TX 77001 has applied to the Railroad Commission of Texas for a permit to inject fluid into a formation which is productive of oil or gas. The applicant proposes to inject fluid into the Ellenburger University - C, Well Number 51986 located 8 miles southeast of Andrews, TX in the Midland Farms, NE (Ellenburger) Field, in Andrews County. Fluid will be injected into strata in the subsurface depth interval from 12,550 to 12,600 feet.

**LEGAL AUTHORITY:** Chapter 27 of the Texas Water Code, as amended, Title 3 of the Natural Resources Code, as amended, and the Statewide Rules of the Oil and Gas Division of the Railroad Commission of Texas.

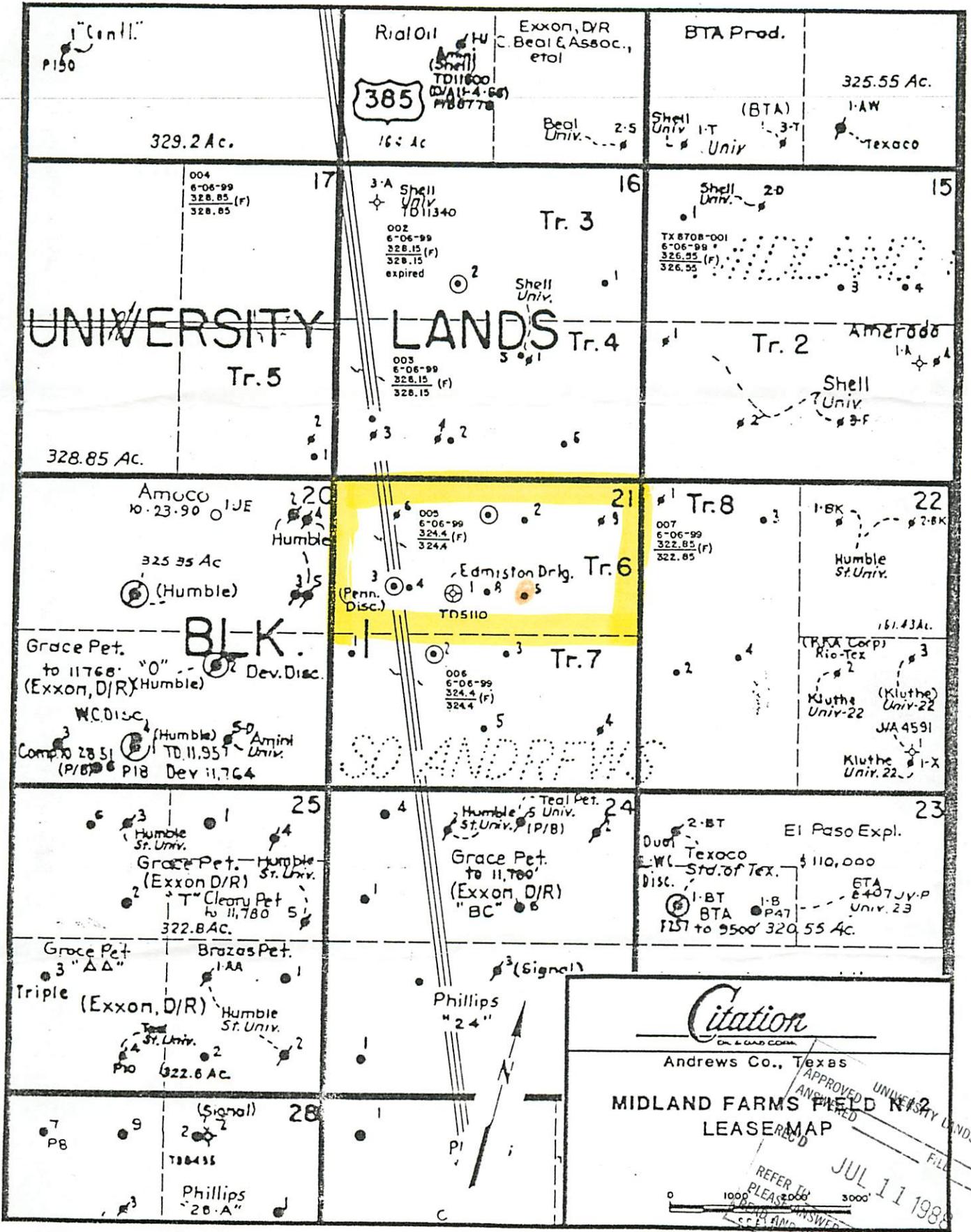
Requests for a public hearing from persons who can show they are adversely affected, or requests for further information concerning any aspect of the application should be submitted in writing, within fifteen days of publication, to the Underground Injection Control Section, Oil and Gas Division, Railroad Commission of Texas, Drawer 12967, Capitol Station, Austin, Texas 78711 (Telephone 512/445-1373).

James Roberts

scribed and sworn to before me this the 6 day of 19 86 to certify which witness my hand and seal of office.

Louise Huxley  
Notary Public in and for

Andrews County, Texas.



*Citation*  
Oil & Gas Corp.

Andrews Co., Texas

**MIDLAND FARMS FIELD #12**  
LEASE MAP

APPROVED UNIVERSITY LANDS  
ANSWERED  
REC'D

REFER TO  
PLEASE ANSWER  
SECTION AND RETURN

JUL 11 1988

0 1000 2000 3000