Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:
08/09/2018		SWD	pMAM1822245838

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Geological & Engineering Bureau –
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: Rice Operating Company **OGRID Number:** 019174
Well Name: N-11 **API:**
Pool: San Andres **Pool Code:**

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD SWD-1754

B. Check one only for [I] or [II]
[I] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
A. ☒ Offset operators or lease holders
B. ☐ Royalty, overriding royalty owners, revenue owners
C. ☒ Application requires published notice
D. ☒ Notification and/or concurrent approval by SLO
E. ☐ Notification and/or concurrent approval by BLM
F. ☒ Surface owner
G. ☒ For all of the above, proof of notification or publication is attached, and/or,
H. ☐ No notice required

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Hayden Holub
Print or Type Name

Signature

8-6-18
Date

575-393-9174
Phone Number

hholub@riceswd.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance ___X___Disposal _____Storage
Application qualifies for administrative approval? _____Yes _____No

II. OPERATOR: Rice Operating Co.

ADDRESS: 112 W Taylor Hobbs, Nm 88240

CONTACT PARTY: Hayden Holub PHONE: 575-393-9174

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

IV. Is this an expansion of an existing project? _____Yes ___X___No
If yes, give the Division order number authorizing the project: _____

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

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

VII. Attach data on the proposed operation, including:

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

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic 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 sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

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

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

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources 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: Hayden Holub TITLE: Manager
SIGNATURE: _____ DATE: 08-06-2018

E-MAIL ADDRESS: hholub@riceswd.com

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

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

N-11

I. Disposal

II. Operator: Rice Operating Co. Address: 112 W Taylor, Hobbs, Nm 88240

Contact Party: Hayden Holub Phone: 575-393-9174

III. Attached

IV. No

V. Attached

VI. 3 wells penetrate inj. interval within .5 mi AoR. Well schematics attached.

VII.

1. Average rate is 1100 bbls/hr (26,400/day) Maximum rate 1875 bbls/hr (45K/day)
2. Closed
3. Average pressure 0, maximum pressure 1000 PSI or the max allowed by the OCD.
4. All fluid is oilfield produced water
5. No known disposal zone formation water available within the one mile of the proposed swd well. Attached is analysis of closest known formation water location approx. 4.6 mi ENE of swd well. The Rice Operating SWD well State E 27, located approx. 2 miles South East in UL-E - Sec 18 - 21S - 37E, has been disposing millions of barrels of produced water into the San Andres formation per year since the early 2000s without problems.

VIII. Lithology record attached. Disposal zone is San Andres (Top @3933', next formation top is Glorieta @ 5176'). Ogallala no deeper that 250'.
No known sources of drinking water underlying the injection zone

IX. Acidize w/5,000 gal HCL 15% NEFE as needed

X. New Drill

XI. Analysis attached for one well located within one mile AoR in Ul P Sec 11 T21S R36E.

Sample taken on 7-27-2018.

XII. I, Hayden Holub, have examined all available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zones and any underground source of drinking water pertaining to this well. Geologic study attached.

XIII. Attached

XIV. Name: Hayden Holub Title: Manager
Signature: Date: 8-6-18
Email: hholub@riceswd.com

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone (505) 334-6178 Fax: (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011

Submit one copy to appropriate District Office

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name

Property Code	Property Name	Well Number
	N-11	1

OGRID No.	Operator Name	Elevation
	RICE OPERATING COMPANY	3586'

Surface Location

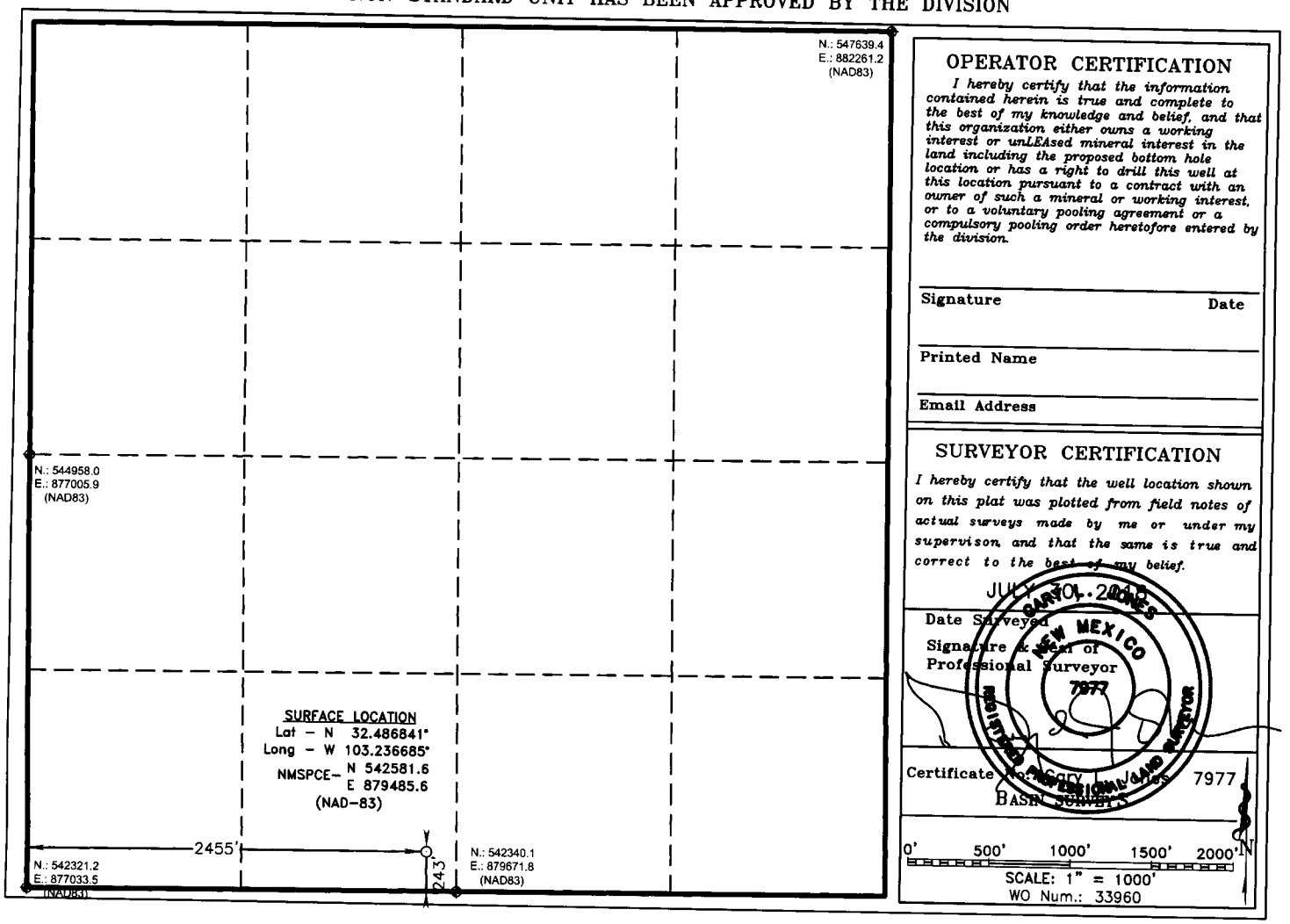
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	11	21 S	36 E		243	SOUTH	2455	WEST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unLEAsed mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

Email Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervison, and that the same is true and correct to the best of my belief.

JULY 30, 2018

Date Surveyed

Signature & Seal of Professional Surveyor

GARY L. JONES NEW MEXICO 7977 REGISTERED PROFESSIONAL LAND SURVEYOR

Certificate No. GARY L. JONES 7977

BASIN SURVEYS

0' 500' 1000' 1500' 2000' N

SCALE: 1" = 1000'

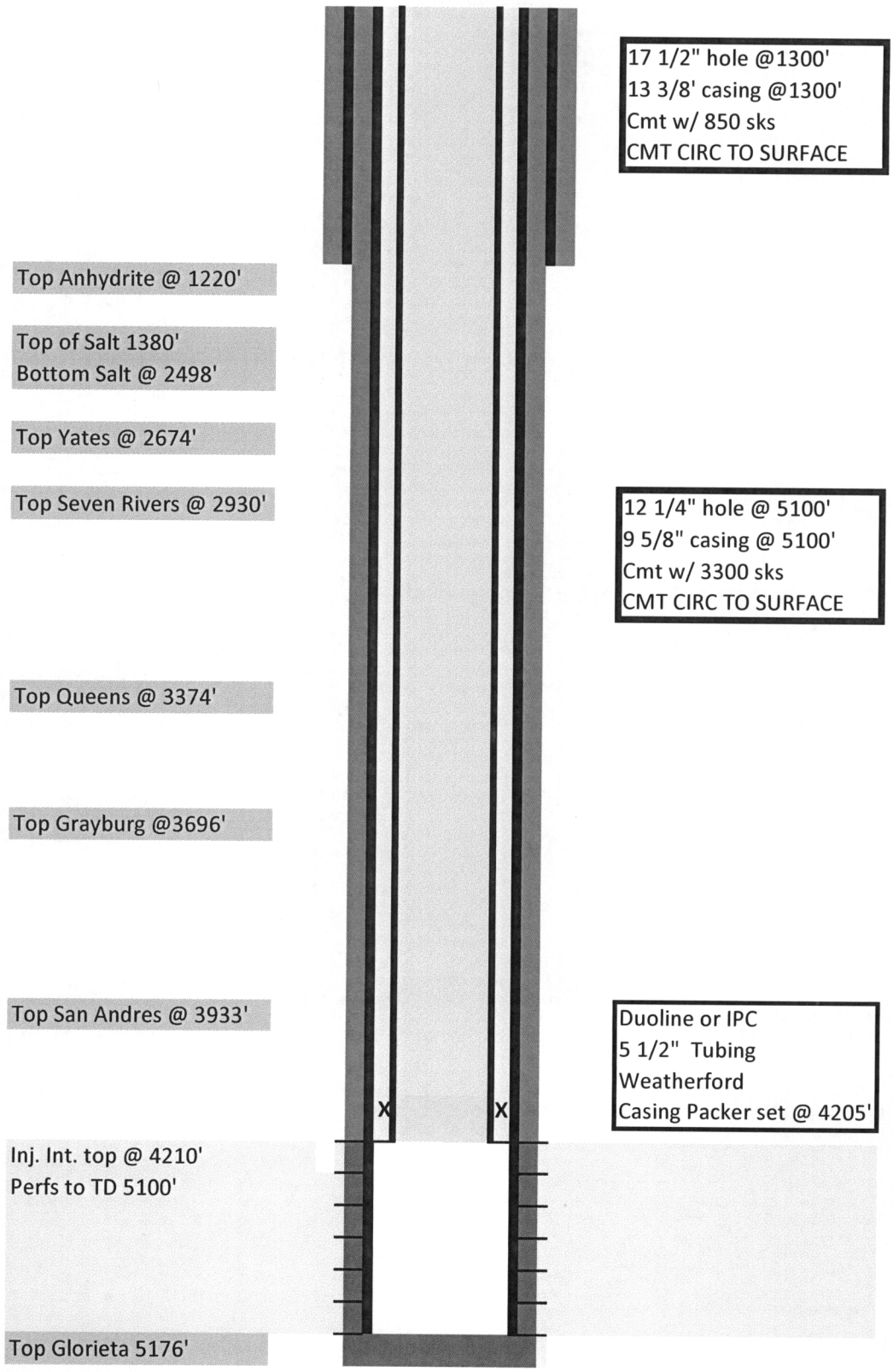
WO Num.: 33960

Rice Operating Co.

Drilled for injection/SWD N-11

UL N Sec 11 T 21S R36E

243' FSL 2455' FWL



INJECTION WELL DATA SHEET

OPERATOR: RICE OPERATING COMPANY

WELL NAME & NUMBER: N-11

WELL LOCATION: 243' FSL 2455' FWL | N | 11 | 21S | 36E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

SURFACE CASING

Hole Size: 17 ½" Casing Size: 13 3/8"

Cemented with: 850 sx. **or** _____ ft3

Top of Cement: Circ. Method Determined: Sight

Intermediate Casing

Hole Size: _____ Casing Size: _____

Cemented with: _____ sx. **or** _____ ft3

Top of Cement: _____ Method Determined: _____

Production Casing

Hole Size: 12 1/4" Casing Size: 9 5/8"

Cemented with: 3300 sx. **or** _____ ft3

Top of Cement: Circ Method Determined: Sight

Total Depth: 5100'

Injection Interval

4210' feet to 5100' Perforated

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: 5 ½" Lining Material: IPC or Duoline

Type of Packer: Weatherford Casing Packer

Packer Setting Depth: 4205'

Other Type of Tubing/Casing Seal (if applicable): N/A

Additional Data

1. Is this a new well drilled for injection? X Yes _____ No

   If no, for what purpose was the well originally drilled? _____

2. Name of the Injection Formation: San Andres

3. Name of Field or Pool (if applicable): Eumont

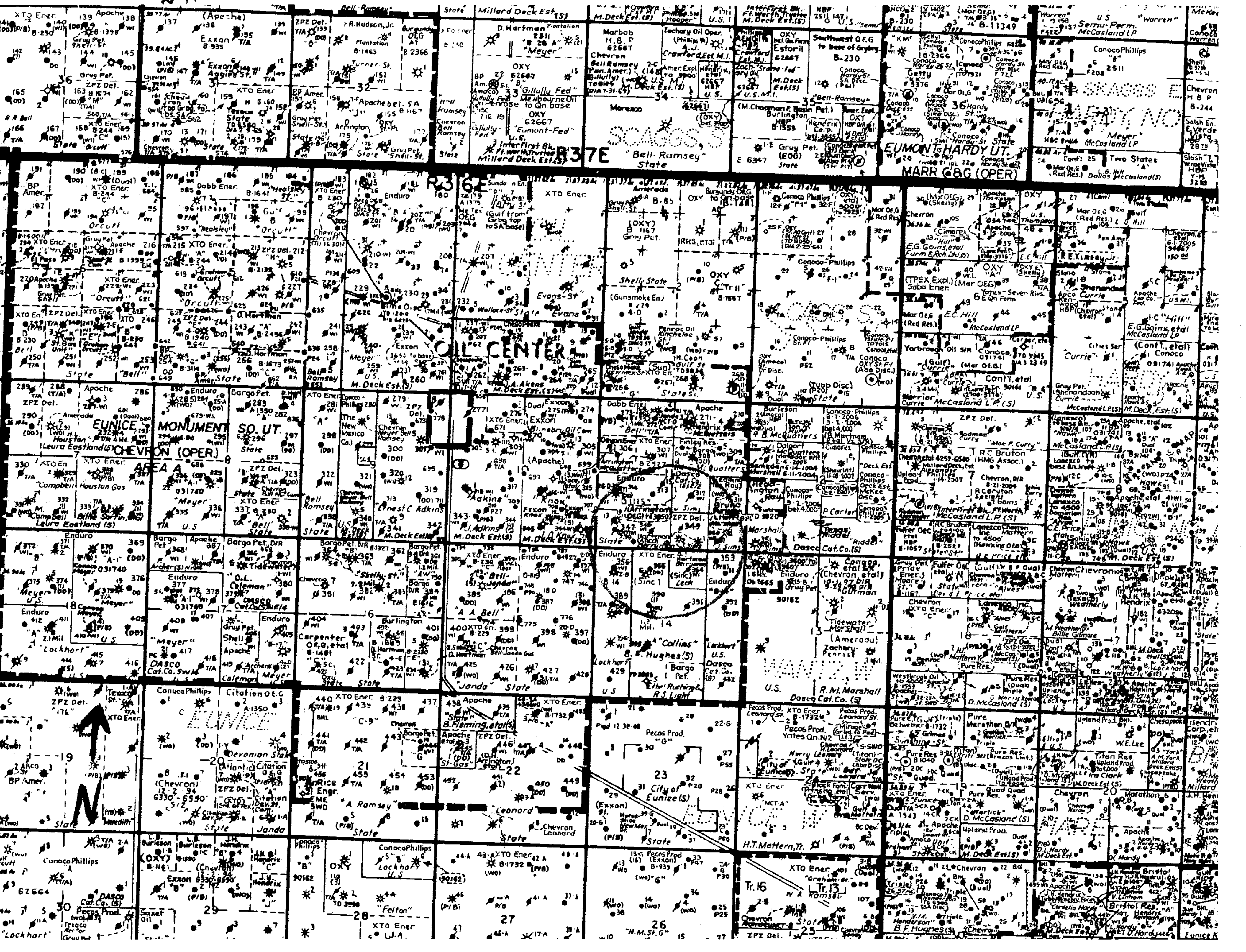
4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. N/A

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed

   Injection zone in this area:

   Grayburg 3696'

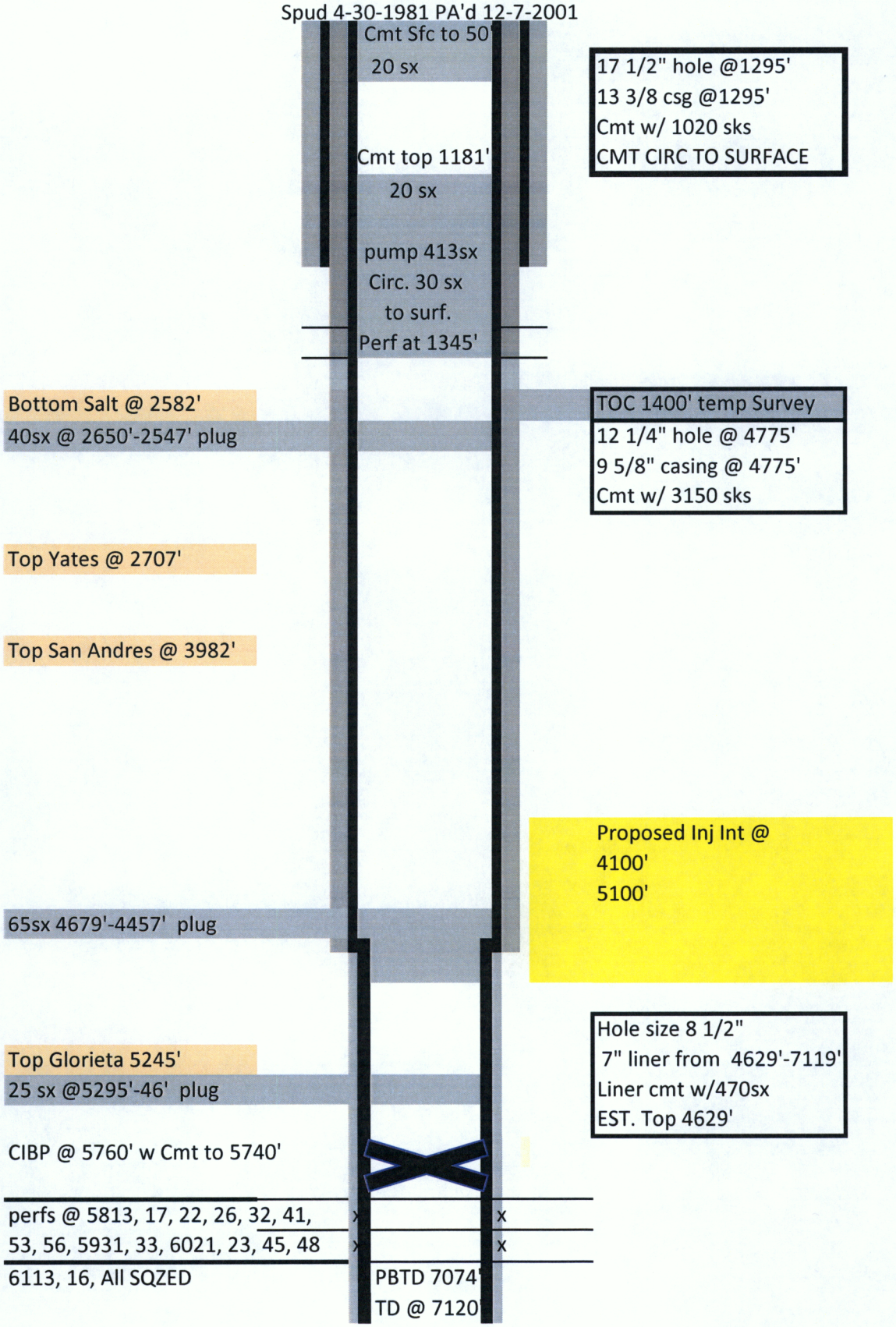
   Glorieta 5176'


N-11
OIL CENTER
EUNICE
MONUMENT SO. UT.
CHEVRON (OPER.)
AREA A
EUMONT HARDY UT.
MARR G&G (OPER)
R37E
R36E

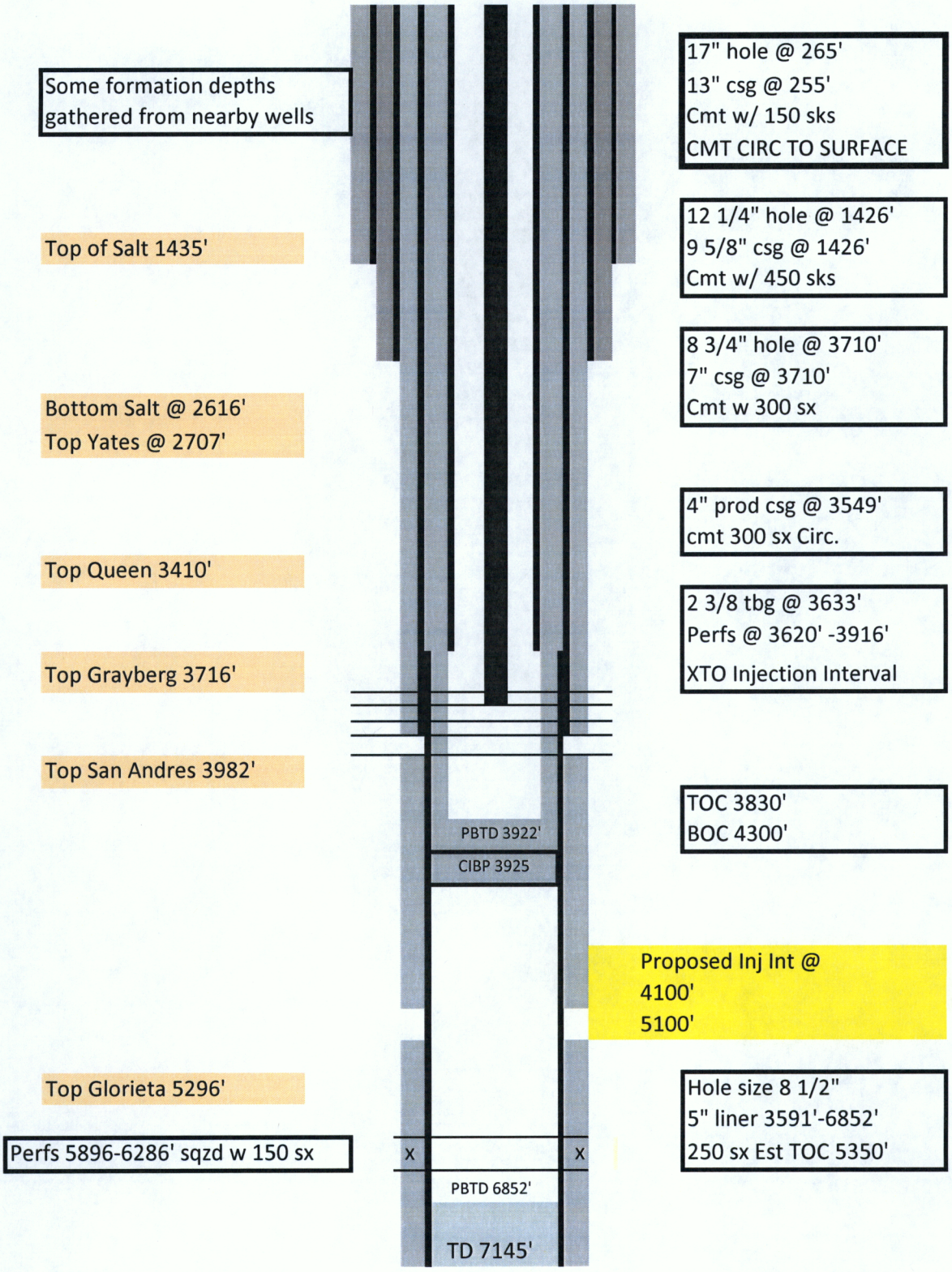
TABULATION OF WELLS
PENETRATING INJECTION INTERVAL

Operator	API Number	Well Name	Well #	Well Status	Well Type	Legal	Spud	PA/TA Date	Depth
Conoco Inc	3002527016	State D	15	PA	Oil	K-11-21-36	4/30/1981	12/7/2001	PBTD 7074' TD 7120
XTO Energy	3002504614	Eunice Monument South Unit	350	Active	Injection	P-11-21-36	6/17/1936	NA	PBTD 6852' TD 7145
Conoco Inc.	3002520662	State D	13	PA	Oil	M-11-21-36	8/28/1964	11/21/1990	TD 6000'

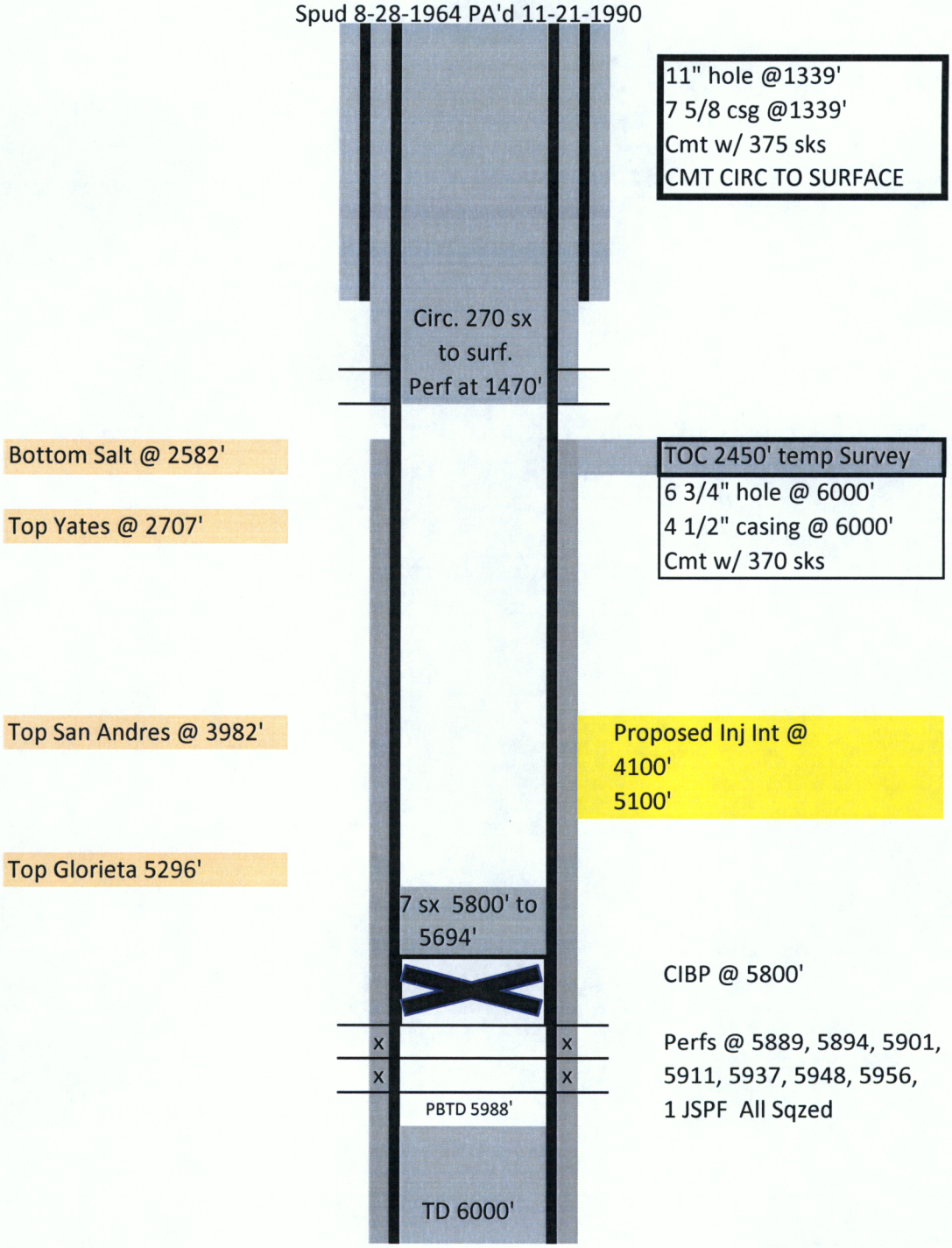
Conoco Inc.
State D # 15
API # 30-025-27016
2310'FSL 2310' FWL UL K Sec 11 T21S R36E
Spud 4-30-1981 PA'd 12-7-2001



XTO Energy Inc.
Eunice Monument South Unit #350
API # 30-025-04614
UL P 330 FSL 990 FEL Sec 11 T21S R36E
Spud 6-17-1936 Active Injection well



Conoco Inc.
State D #13
API #30-025-20662
990'FSL 660'FWL UL M Sec 11 T21S R36E
Spud 8-28-1964 PA'd 11-21-1990



Submit To Appropriate District Office
State Lease - 6 copies
Fee Lease - 5 copies
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-105
Revised June 10, 2003

WELL API NO. 30-025-37146

5. Indicate Type of Lease STATE [X] FEE [ ]

State Oil & Gas Lease No. B11349

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

1a. Type of Well: OIL WELL [X] GAS WELL [ ] DRY [ ] OTHER

b. Type of Completion: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER

7. Lease Name or Unit Agreement Name: STATE 10

2. Name of Operator: LEWIS B. BURLESON, INC.

8. Well No.: 4

3. Address of Operator: P.O. BOX 2479 MIDLAND, TEXAS 79702

9. Pool name or Wildcat: HARE (SAN ANDRES) EAST

4. Well Location

Unit Letter D : 467 Feet From The N Line and 467 Feet From The W Line

Section 10 Township 21S Range 37E NMPM LEA County

10. Date Spudded	11. Date T.D. Reached	12. Date Compl. (Ready to Prod.)	13. Elevations (DF& RKB, RT, GR, etc.)	14. Elev. Casinghead
05/25/2005	06/05/2005	10/01/2005	3469 GR	

15. Total Depth	16. Plug Back T.D.	17. If Multiple Compl. How Many Zones?	18. Intervals Drilled By	Rotary Tools	Cable Tools
5510	4325		CAP STAR	X	

19. Producing Interval(s), of this completion - Top, Bottom, Name: 4011-4113 SAN ANDRES Used for formation Sample

20. Was Directional Survey Made: YES

21. Type Electric and Other Logs Run: GRN

22. Was Well Cored

23. **CASING RECORD** (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8-5/8	24#	1284	12-1/4	595 C	
5-1/2	15.5#	5510	7-7/8	785 C	

Received OCD

24. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

25. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2-3/8	4150	

26. Perforation record (interval, size, and number): 4011-4113 21 HOLES

27. ACID, SHOT, FRACTURE, CEMENT, SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
4011-4113	10,000 GAL ACID

28. **PRODUCTION**

Date First Production	Production Method (Flowing, gas lift, pumping - Size and type pump)	Well Status (Prod. or Shut-in)
10/01/2005	PUMPING 2-1/2X2X16 RHBC	PROD

Date of Test	Hours Tested	Choke Size	Prod'n For Test Period	Oil - Bbl	Gas - MCF	Water - Bbl.	Gas - Oil Ratio
10/01/2005	24			10	40	285	4000:1

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API - (Corr.)
N/A	65		10	40	285	32

29. Disposition of Gas (Sold, used for fuel, vented, etc.): SOLD

Test Witnessed By: STEVEN L. BURLESON

30. List Attachments

31. I hereby certify that the information shown on both sides of this form as true and complete to the best of my knowledge and belief

Signature [signature] Printed Name STEVEN L. BURLESON Title VICE-PRESIDENT Date 10/20/2005

E-mail Address GEOTTECH@PRODIGY.NET

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

June 26, 2018

HAYDEN HOLUB

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: O-34 SWD WELL

Enclosed are the results of analyses for samples received by the laboratory on 06/20/18 15:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-17-10. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: O-34 SWD WELL Project Number: SEC. 34, T20S, R37E Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 26-Jun-18 11:00

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SAN ANDRES FORMATION WATER	H801687-01	Wastewater	19-Jun-18 17:30	20-Jun-18 15:20

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: O-34 SWD WELL Project Number: SEC. 34, T20S, R37E Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 26-Jun-18 11:00

SAN ANDRES FORMATION WATER

H801687-01 (Wastewater)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Alkalinity, Bicarbonate	**2760**		5.00	mg/L	1	8061805	AC	22-Jun-18	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	8061805	AC	22-Jun-18	310.1	
Chloride*	**9200**		4.00	mg/L	1	8062006	AC	21-Jun-18	4500-Cl-B	
Conductivity*	**26900**		1.00	uS/cm	1	8062108	AC	21-Jun-18	120.1	
pH*	**7.96**		0.100	pH Units	1	8062108	AC	21-Jun-18	150.1	
Resistivity	**0.372**			Ohms/m	1	8062108	AC	21-Jun-18	120.1	
Specific Gravity @ 60° F	**1.012**		0.000	[blank]	1	8062110	AC	22-Jun-18	SM 2710F	
Sulfate*	**55.0**		25.0	mg/L	2.5	8062112	AC	22-Jun-18	375.4	
TDS*	**17700**		5.00	mg/L	1	8062115	AC	25-Jun-18	160.1	
Alkalinity, Total*	**2270**		4.00	mg/L	1	8061805	AC	22-Jun-18	310.1	
Green Analytical Laboratories										
Total Recoverable Metals by ICP (E200.7)										
Barium*	**4.91**		2.50	mg/L	50	B806183	JDA	22-Jun-18	EPA200.7	
Calcium*	**561**		5.00	mg/L	50	B806183	JDA	22-Jun-18	EPA200.7	
Iron*	<2.50		2.50	mg/L	50	B806183	JDA	22-Jun-18	EPA200.7	
Magnesium*	**260**		5.00	mg/L	50	B806183	JDA	22-Jun-18	EPA200.7	
Potassium*	**271**		50.0	mg/L	50	B806183	JDA	22-Jun-18	EPA200.7	
Sodium*	**4950**		50.0	mg/L	50	B806183	JDA	22-Jun-18	EPA200.7	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: O-34 SWD WELL Project Number: SEC. 34, T20S, R37E Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 26-Jun-18 11:00

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8061805 - General Prep - Wet Chem										
Blank (8061805-BLK1)				Prepared: 18-Jun-18 Analyzed: 19-Jun-18						
Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	10.0	5.00	mg/L							
Alkalinity, Total	8.00	4.00	mg/L							
LCS (8061805-BS1)				Prepared: 18-Jun-18 Analyzed: 19-Jun-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	318	12.5	mg/L				80-120			
Alkalinity, Total	260	10.0	mg/L	250		104	80-120			
LCS Dup (8061805-BSD1)				Prepared: 18-Jun-18 Analyzed: 19-Jun-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	318	12.5	mg/L				80-120	0.00	20	
Alkalinity, Total	260	10.0	mg/L	250		104	80-120	0.00	20	
Batch 8062006 - General Prep - Wet Chem										
Blank (8062006-BLK1)				Prepared: 20-Jun-18 Analyzed: 21-Jun-18						
Chloride	ND	4.00	mg/L							
LCS (8062006-BS1)				Prepared: 20-Jun-18 Analyzed: 21-Jun-18						
Chloride	100	4.00	mg/L	100		100	80-120			
LCS Dup (8062006-BSD1)				Prepared: 20-Jun-18 Analyzed: 21-Jun-18						
Chloride	100	4.00	mg/L	100		100	80-120	0.00	20	
Batch 8062108 - General Prep - Wet Chem										
LCS (8062108-BS1)				Prepared & Analyzed: 21-Jun-18						
Conductivity	97300		uS/cm	100000		97.3	80-120			
pH	7.09		pH Units	7.00		101	90-110			

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: O-34 SWD WELL Project Number: SEC. 34, T20S, R37E Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 26-Jun-18 11:00

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8062108 - General Prep - Wet Chem										
Duplicate (8062108-DUP1)		**Source: H801687-01**		Prepared & Analyzed: 21-Jun-18						
pH	8.00	0.100	pH Units		7.96			0.501	20	
Conductivity	26800	1.00	uS/cm		26900			0.298	20	
Resistivity	0.373		Ohms/m		0.372			0.298	20	
Batch 8062110 - General Prep - Wet Chem										
Duplicate (8062110-DUP1)		**Source: H801687-01**		Prepared: 21-Jun-18 Analyzed: 22-Jun-18						
Specific Gravity @ 60° F	1.011	0.000	[blank]		1.012			0.131	20	
Batch 8062112 - General Prep - Wet Chem										
Blank (8062112-BLK1)				Prepared: 21-Jun-18 Analyzed: 22-Jun-18						
Sulfate	ND	10.0	mg/L							
LCS (8062112-BS1)				Prepared: 21-Jun-18 Analyzed: 22-Jun-18						
Sulfate	19.0	10.0	mg/L	20.0		95.2	80-120			
LCS Dup (8062112-BSD1)				Prepared: 21-Jun-18 Analyzed: 22-Jun-18						
Sulfate	19.4	10.0	mg/L	20.0		97.2	80-120	2.13	20	
Batch 8062115 - Filtration										
Blank (8062115-BLK1)				Prepared: 20-Jun-18 Analyzed: 21-Jun-18						
TDS	ND	5.00	mg/L							

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: O-34 SWD WELL Project Number: SEC. 34, T20S, R37E Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 26-Jun-18 11:00

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8062115 - Filtration										
LCS (8062115-BS1)				Prepared: 20-Jun-18 Analyzed: 21-Jun-18						
TDS	456	5.00	mg/L	527		86.5	80-120			
Duplicate (8062115-DUP1)	**Source: H801667-03**			Prepared: 20-Jun-18 Analyzed: 21-Jun-18						
TDS	938	5.00	mg/L		946			0.849	20	

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: O-34 SWD WELL Project Number: SEC. 34, T20S, R37E Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 26-Jun-18 11:00

Total Recoverable Metals by ICP (E200.7) - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B806183 - Total Rec. 200.7/200.8/200.2										
Blank (B806183-BLK1)				Prepared: 21-Jun-18 Analyzed: 22-Jun-18						
Iron	ND	0.050	mg/L							
Barium	ND	0.050	mg/L							
Potassium	ND	1.00	mg/L							
Magnesium	ND	0.100	mg/L							
Calcium	ND	0.100	mg/L							
Sodium	ND	1.00	mg/L							
LCS (B806183-BS1)				Prepared: 21-Jun-18 Analyzed: 22-Jun-18						
Sodium	3.22	1.00	mg/L	3.24		99.2	85-115			
Potassium	7.83	1.00	mg/L	8.00		97.8	85-115			
Magnesium	19.1	0.100	mg/L	20.0		95.6	85-115			
Iron	3.81	0.050	mg/L	4.00		95.2	85-115			
Calcium	3.83	0.100	mg/L	4.00		95.7	85-115			
Barium	2.01	0.050	mg/L	2.00		100	85-115			
LCS Dup (B806183-BSD1)				Prepared: 21-Jun-18 Analyzed: 22-Jun-18						
Magnesium	19.4	0.100	mg/L	20.0		96.8	85-115	1.30	20	
Barium	2.02	0.050	mg/L	2.00		101	85-115	0.698	20	
Potassium	7.85	1.00	mg/L	8.00		98.2	85-115	0.354	20	
Calcium	3.89	0.100	mg/L	4.00		97.1	85-115	1.50	20	
Sodium	3.23	1.00	mg/L	3.24		99.7	85-115	0.493	20	
Iron	3.82	0.050	mg/L	4.00		95.6	85-115	0.400	20	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

RUSH!!

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name:	Rice Operating Company	**BILL TO** P.O. #:	
Project Manager:	Hayden Holub	Company:	
Address:	112 W. Taylor	Attn:	
City:	Hobbs State: NM Zip: 88240	Address:	
Phone #:	575-393-9174 Fax #: 575-393-1471	City:	
Project #:	Project Owner:	State: Zip:	
Project Name:	O-34 SWD Well	Phone #:	
Project Location:	Sec. 34, T20S, R37E	Fax #:	
Sampler Name:	Hayden Holub		

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: Complete Water Analysis scale
H801687 1	San Andres formation water												6/19	17:30	✓

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 6/20/18	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 13:20	Jodi Henson	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: Email results! kholub@riceswd.com scurtis@riceswd.com
	Time:		

Delivered By: (Circle One)
Sampler - UPS - Bus - Other: 30.1°C / 30.0S°C

Sample Condition: Cool ☐ Yes ☑ No; Intact ☑ Yes ☐ No

CHECKED BY: (Initials) HA

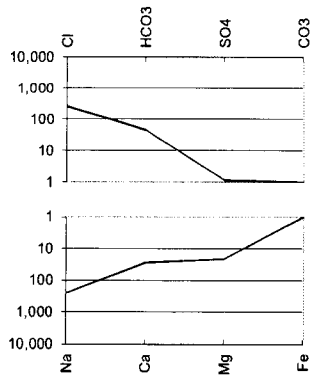
† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

CARDINAL LABORATORIES
SCALE INDEX WATER ANALYSIS REPORT

Company	: RICE OPERATING COMPANY	Date Sampled	: 06/19/18
Lease Name	: O-34 SWD WELL	Company Rep.	: HAYDEN HOLUB
Well Number	: SAN ANDRES FORMATION WATER (H801687-01)		
Location	: SEC 34, T20S, R37E		

	ANALYSIS					
1.	pH	7.96				
2.	Specific Gravity @ 60/60 F.	1.0120				
3.	CaCO3 Saturation Index @ 80 F.	+1.142	'Calcium Carbonate Scale Possible'			
	@ 140 F.	+2.012	'Calcium Carbonate Scale Possible'			
	Dissolved Gasses					
4.	Hydrogen Sulfide	ND	PPM			
5.	Carbon Dioxide	ND	PPM			
6.	Dissolved Oxygen	ND	PPM			
	Cations		/ Eq. Wt.	=	MEQ/L	
7.	Calcium (Ca++)	561.00	/ 20.1	=	27.91	
8.	Magnesium (Mg++)	260.00	/ 12.2	=	21.31	
9.	Sodium (Na+)	4,950	/ 23.0	=	256.23	
10.	Barium (Ba++)	4.910	/ 68.7	=	0.07	
	Anions					
11.	Hydroxyl (OH-)	0	/ 17.0	=	0.00	
12.	Carbonate (CO3=)	0	/ 30.0	=	0.00	
13.	Bicarbonate (HCO3-)	2,760	/ 61.1	=	45.17	
14.	Sulfate (SO4=)	55	/ 48.8	=	1.13	
15.	Chloride (Cl-)	9,200	/ 35.5	=	259.15	
	Other					
16.	Total Iron (Fe)	0.000	/ 18.2	=	0.00	
17.	Total Dissolved Solids	17,700				
18.	Total Hardness As CaCO3	2,471.0				
19.	Calcium Sulfate Solubility @ 90 F.	2,821				
20.	Resistivity (Measured)	0.372	Ohm/Meters	@ 77	Degrees (F)	

Logarithmic Water Pattern



PROBABLE MINERAL COMPOSITION

COMPOUND	Eq. Wt.	X	MEQ/L	=	mg/L
Ca(HCO3)2	81.04	X	27.91	=	2,262
CaSO4	68.07	X	0.00	=	0
CaCl2	55.50	X	0.00	=	0
Mg(HCO3)2	73.17	X	17.26	=	1,263
MgSO4	60.19	X	0.00	=	0
MgCl2	47.62	X	4.05	=	193
NaHCO3	84.00	X	0.00	=	0
NaSO4	71.03	X	1.13	=	80
NaCl	58.46	X	255.10	=	14,913

ND = Not Determined

CONOCO INC.
State D # 15 API# 30-025-27016 K-11-21S-36E

INSTRUCTIONS

This form is to be filed with the appropr[illegible] District Office of the Commission not later than [illegible] days after the completion of any **newly-drilled or** deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, Items 30 through 34 shall be reported for each zone. The form is to be filed in quintuplicate **except on** state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico		Northwestern New Mexico	
T. Anhy 1310	T. Canyon	T. Ojo Alamo	T. Penn. "B"
T. Salt 1400	T. Strawn	T. Kirtland-Fruitland	T. Penn. "C"
B. Salt 2550	T. Atoka	T. Pictured Cliffs	T. Penn. "D"
T. Yates 2656	T. Miss	T. Cliff House	T. Leadville
T. 7 Rivers 2937	T. Devonian	T. Menefee	T. Madison
T. Queen 3351	T. Silurian	T. Point Lookout	T. Elbert
T. Grayburg 3634	T. Montoya	T. Mancos	T. McCracken
T. San Andres 3935	T. Simpson	T. Gallup	T. Ignacio Qtzte
T. Glorieta 5245	T. McKee	Base Greenhorn	T. Granite
T. Paddock 5321	T. Ellenburger	T. Dakota	T.
T. Blinebry 5860	T. Gr. Wash	T. Morrison	T.
T. Tubb 6423	T. Granite	T. Todilto	T.
T. Drinkard 6720	T. Delaware Sand	T. Entrada	T.
T. Abo	T. Bone Springs	T. Wingate	T.
T. Wolfcamp	T.	T. Chinle	T.
T. Penn.	T.	T. Permian	T.
T Cisco (Bough C)	T.	T. Penn. "A"	T.

OIL OR GAS SANDS OR ZONES

No. 1, from 5813 to 6116 No. 4, from .... to ....

No. 2, from .... to .... No. 5, from .... to ....

No. 3, from .... to .... No. 6, from .... to ....

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from 160 to 250 feet.

No. 2, from .... to .... feet.

No. 3, from .... to .... feet.

No. 4, from .... to .... feet.

FORMATION RECORD (Attach additional sheets if necessary)

From	To	Thickness in Feet	Formation	From	To	Thickness in Feet	Formation
0	1310		Redbeds				
	1400		Anhy.				
	2550		" & Salt				
	2656		" & Dolo.				
	2937		SS. & "				
	3351		"				
	3634		" "				
	5245		"				
	5321		"				
	6423		"				[illegible]ED
	6720		" "				[illegible] 9 1981
	TD		"				[illegible]

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

August 06, 2018

HAYDEN HOLUB

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: N-11

Enclosed are the results of analyses for samples received by the laboratory on 07/27/18 16:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: N-11 Project Number: N-11 Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 06-Aug-18 12:38

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WATER WELL TEST - EAST OF N-11	H802057-01	Water	27-Jul-18 15:20	27-Jul-18 16:55

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: N-11 Project Number: N-11 Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 06-Aug-18 12:38

WATER WELL TEST - EAST OF N-11 (COW WELL)

H802057-01 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Alkalinity, Bicarbonate	**312**		5.00	mg/L	1	8071613	AC	30-Jul-18	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	8071613	AC	30-Jul-18	310.1	
Chloride*	**84.0**		4.00	mg/L	1	8073008	AC	30-Jul-18	4500-Cl-B	
Conductivity	**780**		1.00	uS/cm	1	8073011	AC	30-Jul-18	120.1	
pH*	**8.52**		0.100	pH Units	1	8073011	AC	30-Jul-18	9045	
Sulfate*	**81.8**		25.0	mg/L	2.5	8073014	AC	31-Jul-18	375.4	
TDS*	**508**		5.00	mg/L	1	8073010	AC	01-Aug-18	160.1	
Alkalinity, Total*	**256**		4.00	mg/L	1	8071613	AC	30-Jul-18	310.1	
Green Analytical Laboratories										
Total Recoverable Metals by ICP (E200.7)										
Calcium*	**41.6**		1.00	mg/L	10	B808003	AES	02-Aug-18	EPA200.7	
Magnesium*	**25.8**		1.00	mg/L	10	B808003	AES	02-Aug-18	EPA200.7	
Potassium*	<10.0		10.0	mg/L	10	B808003	AES	02-Aug-18	EPA200.7	
Sodium*	**85.1**		10.0	mg/L	10	B808003	AES	02-Aug-18	EPA200.7	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: N-11 Project Number: N-11 Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 06-Aug-18 12:38

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8071613 - General Prep - Wet Chem										
Blank (8071613-BLK1)				Prepared & Analyzed: 16-Jul-18						
Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	ND	5.00	mg/L							
Alkalinity, Total	ND	4.00	mg/L							
LCS (8071613-BS1)				Prepared & Analyzed: 16-Jul-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	355	12.5	mg/L				80-120			
Alkalinity, Total	290	10.0	mg/L	250		116	80-120			
LCS Dup (8071613-BSD1)				Prepared & Analyzed: 16-Jul-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	318	12.5	mg/L				80-120	11.2	20	
Alkalinity, Total	260	10.0	mg/L	250		104	80-120	10.9	20	
Batch 8073008 - General Prep - Wet Chem										
Blank (8073008-BLK1)				Prepared & Analyzed: 30-Jul-18						
Chloride	ND	4.00	mg/L							
LCS (8073008-BS1)				Prepared & Analyzed: 30-Jul-18						
Chloride	92.0	4.00	mg/L	100		92.0	80-120			
LCS Dup (8073008-BSD1)				Prepared & Analyzed: 30-Jul-18						
Chloride	100	4.00	mg/L	100		100	80-120	8.33	20	
Batch 8073010 - Filtration										
Blank (8073010-BLK1)				Prepared: 30-Jul-18 Analyzed: 01-Aug-18						
TDS	ND	5.00	mg/L							

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: N-11 Project Number: N-11 Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 06-Aug-18 12:38

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8073010 - Filtration										
LCS (8073010-BS1)				Prepared: 30-Jul-18 Analyzed: 01-Aug-18						
TDS	532	5.00	mg/L	527		101	80-120			
Duplicate (8073010-DUP1)	**Source: H802054-01**			Prepared: 30-Jul-18 Analyzed: 01-Aug-18						
TDS	11100	5.00	mg/L		10900			1.46	20	
Batch 8073011 - General Prep - Wet Chem										
LCS (8073011-BS1)				Prepared & Analyzed: 30-Jul-18						
Conductivity	484		uS/cm	500		96.8	80-120			
pH	7.07		pH Units	7.00		101	90-110			
Duplicate (8073011-DUP1)	**Source: H802054-01**			Prepared & Analyzed: 30-Jul-18						
pH	7.70	0.100	pH Units		7.65			0.651	20	
Conductivity	14700	1.00	uS/cm		14800			0.475	20	
Batch 8073014 - General Prep - Wet Chem										
Blank (8073014-BLK1)				Prepared: 30-Jul-18 Analyzed: 31-Jul-18						
Sulfate	ND	10.0	mg/L							
LCS (8073014-BS1)				Prepared & Analyzed: 31-Jul-18						
Sulfate	20.6	10.0	mg/L	20.0		103	80-120			
LCS Dup (8073014-BSD1)				Prepared: 30-Jul-18 Analyzed: 31-Jul-18						
Sulfate	20.7	10.0	mg/L	20.0		104	80-120	0.678	20	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company 112 W. Taylor Hobbs NM, 88240	Project: N-11 Project Number: N-11 Project Manager: HAYDEN HOLUB Fax To: (575) 397-1471	Reported: 06-Aug-18 12:38

Total Recoverable Metals by ICP (E200.7) - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B808003 - Total Rec. 200.7/200.8/200.2										
Blank (B808003-BLK1)				Prepared & Analyzed: 01-Aug-18						
Magnesium	ND	0.100	mg/L							
Sodium	ND	1.00	mg/L							
Calcium	ND	0.100	mg/L							
Potassium	ND	1.00	mg/L							
LCS (B808003-BS1)				Prepared: 01-Aug-18 Analyzed: 02-Aug-18						
Sodium	3.01	1.00	mg/L	3.24		93.0	85-115			
Potassium	8.31	1.00	mg/L	8.00		104	85-115			
Calcium	4.17	0.100	mg/L	4.00		104	85-115			
Magnesium	20.4	0.100	mg/L	20.0		102	85-115			
LCS Dup (B808003-BSD1)				Prepared: 01-Aug-18 Analyzed: 02-Aug-18						
Potassium	8.22	1.00	mg/L	8.00		103	85-115	1.12	20	
Calcium	4.14	0.100	mg/L	4.00		103	85-115	0.891	20	
Sodium	2.99	1.00	mg/L	3.24		92.2	85-115	0.902	20	
Magnesium	20.3	0.100	mg/L	20.0		102	85-115	0.634	20	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: Rice Operating Co.
Project Manager: Hayden Holub
Address: 112 W Taylor
City: Hobbs State: NM Zip: 88240
Phone #: 575-393-9174 Fax #: 575-393-1471
Project #: Project Owner:
Project Name: N-11
Project Location: N-11
Sampler Name: Hayden Holub

BILL TO
P.O. #:
Company:
Attn:
Address:
City:
State: Zip:
Phone #:
Fax #:

ANALYSIS REQUEST: Major anions + cations

Lab I.D. (FOR LAB USE ONLY)	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Major anions + cations
H802057 1	Water Well Trd East N-11 cow well	G	2	X									7-27	3:20	X

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: [signature] Date: 7-27-18 Time: 4:55 Received By: Tamara [signature]
Relinquished By: Date: Time: Received By:

Delivered By: (Circle One) 22.8°
Sampler - UPS - Bus - Other: Corrected 22.2°C

Sample Condition — Cool: ☐ Yes ☒ No; Intact: ☒ Yes ☐ No
CHECKED BY: (Initials) TC #25

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS: email results to hholub@ricesud.com scurtis@ricesud.com
Rush

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

TASMAN GEOSCIENCES

August 6, 2018

Scott Curtis
Rice Operating Company
122 W Taylor St.
Hobbs, New Mexico 88240

RE: Rice Operating Company N-11 SWD Well Permit

Mr. Curtis:

Tasman Geosciences, Inc. (Tasman) conducted a hydrogeologic investigation on behalf of Rice Operating Company (Rice) related to the proposed injection well N-11 SWD well permit located in Lea County, New Mexico (Site [Figure 1]). The scope of the investigation was to determine if there is a hydrologic connection between the proposed injection interval and local sources of underground drinking water. The basis of the investigation was in response to the well permit requirement that the applicant makes the following statement:

> *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 sources of drinking water.*

During the investigation Tasman utilized three main sources to determine if there was evidence of open faults or other hydrologic connection between the injection zone, which is between 4,100 and 5,100 feet below ground surface (bgs) in the Permian-Guadalupe San Andreas Formation, and local sources of drinking water estimated to be between 50 and 150 feet bgs within the Tertiary Ogallala Formation (High Plains aquifer).

The sources utilized in the investigation are listed below and are included as attachments:

- Geologic Map of New Mexico (Anderson et al., 1996);
- Regional Cross Sections – Central Basin Platform, West Texas (Bebout et al., 1985); and
- Geohydrology of the High Plains Aquifer in Southeastern New Mexico (Hart et al., 1985).

HYDROGEOLOGIC EVALUATION AND RESULTS

Based on a review of these sources and information provided by Rice, the following lines of evidence indicates that there is not a "hydrologic connection between the disposal zone and underground sources of drinking water".

- Approximately 4,000 feet of bedrock between the top of the injection interval and the base of the High Plains aquifer;

TASMAN GEOSCIENCES

- Geologic map of New Mexico illustrates no major regional faults or structural features indicating a connection between the San Andreas Formation and the Ogallala Formation (High Plains aquifer);
- Cross section B-B' at points 1, 2 and 3, which are near the injection Site, indicates there are no major faults that trend vertically between the Permian San Andreas Formation and the Tertiary Ogallala Formation; and
- Plate 1 – Geohydrology of the High Plains aquifer illustrates the contact between the base of the High Plains aquifer and the underlying bedrock is approximately 65 feet bgs in the location of the injection Site.

SUMMARY

Based on these lines of evidence and as a licensed Professional Geologist, I am confident that Rice Operating Company can provide the 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 sources of drinking water*".

Please feel free to contact me with any questions or comments at (970) 317-0130.

Sincerely,

Brent Everett, PG
Tasman Geosciences, Inc.

Enclosures:
- Figure 1 – Site Location Map
- Geologic Map of New Mexico
- Cross Section Overview – Central Basin Platform, West Texas
- Regional Cross Sections (B-B') – Central Basin Platform, West Texas
- Geohydrology of the High Plains Aquifer Southeast New Mexico

References:
Anderson, O.J., Jones, G.E., and Green, G.N., 1996, Geologic Map of New Mexico, Scale 1:500,000.

Bebout, D.G., and Meador, K.J., 1985, Regional Cross Sections – Central Basin Platform, West Texas: The University of Texas at Austin, Bureau of Economic Geology.

Hart, D.L., and McAda, D.P., 1985, Geohydrology of the High Plains Aquifer in Southeastern New Mexico, Hydrologic Atlas 679.

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
August 03, 2018
and ending with the issue dated
August 03, 2018.

Publisher

Sworn and subscribed to before me this
3rd day of August 2018.

Business Manager

My commission expires
January 29, 2019
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-19

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said

LEGAL NOTICE
August 3, 2018

Public Notice for State N-11 (API:--) Rice Operating Company, 122 West Taylor, Hobbs, NM 88240 (575) 393-9174 Contact Party: Hayden Holub (575) 393-9174. The intended purpose of this injection well is for disposal of produced water associated with oil and gas production activities. This well is a permitted disposal well into the San Andres formation. This application is made to utilize the well for commercial use. The location of the well is 243 feet from the South Line and 2455 feet from the West Line of Section 11, Township 21S, Range 36E, which is in the SE/4 of the SW/4 of the aforementioned section, Lea county. The formation name is the San Andres; injection intervals to be between a depth of 4,100' to 5,100'; a maximum injection rate of 45,000 barrels per day with maximum pressure of 1000 PSI, or maximum allowed by the NMOCD. Interested parties must file objections or request a hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days, by Friday the 17th of August.
#33069

01104367 00216025

BEGIE BONDS
RICE OPERATING COMPANY
112 WEST TAYLOR
HOBBS, NM 88240

SURFACE OWNER, GRAZING LESSEE, LEASE OWNER,

AND OFFSET OPERATORS

N-11 SWD

243' FSL AND 2,455' FWL, SEC. 11, T21S, R36E

LEA COUNTY, NM

Surface Owner of Well Site

State of New Mexico
Commissioner of Public Lands
Attention: Faith Crosby
PO Box 1148
Santa Fe, NM 87504

Dasco Cattle Co
PO Box 727
Hobbs, NM 88241

Grazing Lessee of Well Site

Lease #GT-2738-0000
Dasco Cattle Company
PO Box 727
Hobbs, NM 88241

Operators of Record

ConocoPhillips Company
Attention: Susan Maunder
600 N Dairy Ashford Rd.
Office EC3-10-W285
Houston, TX 77079

Chevron USA, Inc.
Attention: Linda McMurry
6301 Deauville Blvd.
Midland, TX 79706

Conoco, Inc.
PO Box 2197
Houston, TX 77252

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Attention: Linda McMurry
6301 Deauville Blvd.
Midland, TX 79706

ConocoPhillips Company
Attention: Susan Maunder
600 N Dairy Ashford Rd.
Office EC3-10-W285
Houston, TX 77079

XTO Energy, Inc.
Attention: DeeAnn Kemp
6401 Holiday Hill Rd., #5
Midland, TX 79707

Enervest Operating, LLC
Attention: Edgar Tovias
2700 Farmington Ave.
Bldg. K, STE. #1
Farmington, NM 87401

Breck Operating Corp.
Attention: Ernie Underwood
PO Box 911
Breckenridge, TX 76424

Penroc Oil Corp
Attention: Mohammed Merchant
PO Box 2769
Hobbs, NM 88241

Burleson Petroleum, Inc.
PO Box 2479
Midland, TX 79702

Oil & Gas Lessees of Record

Chevron USA, Inc.
Attention: Linda McMurry
6301 Deauville Blvd.
Midland, TX 79706

ConocoPhillips Co.
Attention: Susan Maunder
600 N Dairy Ashford Rd.
Office EC3-10-W285
Houston, TX 77079

ZPZ Delaware I, LLC
Attention: Peggy Clark
2000 Post Oak Blvd.
STE. #100
Houston, TX 77056

Two States Oil Company
4925 Greenville Ave.
STE. #940
Dallas, TX 75206

RICE Operating Company

112 West Taylor • Hobbs, New Mexico 88240
Phone: (575) 393-9174 • Fax (575) 397-1471

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State of New Mexico
Commissioner of Public Lands
Attention: Faith Crosby
PO Box 1148
Santa Fe, NM 87504

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State of New Mexico
Commissioner of Public Lands
PO Box 1148
Santa Fe, NM 87504

RE: N-11 SWD
U/L N, Section 11, T21S, R36E
243' FSL and 2,455' FWL
Lea County, NM

To Whom it May Concern:

In accordance with the Rules and Regulations of the Oil Conservation Division of the State of New Mexico, you are being provided a copy of the C-108 Application for Authorization to Inject into the above captioned well.

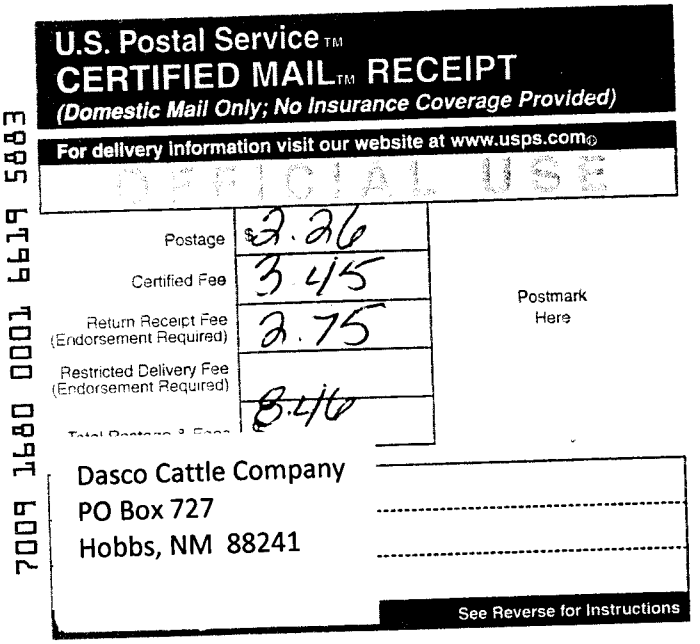
Any questions about the permit can be directed to Hayden Holub at 575-393-9174. Any objections or request for hearing must be filed with the Oil Conservation Division within fifteen (15) days from the date received. The OCD address is 1220 S. St. Francis Dr., Santa Fe, NM 87505.

Thank You,

Hayden Holub
Manager
Rice Operating Company

RICE Operating Company

112 West Taylor • Hobbs, New Mexico 88240
Phone: (575) 393-9174 • Fax (575) 397-1471



AUGUST 6, 2018

Dasco Cattle Company
PO Box 727
Hobbs, NM 88241

RE: N-11 SWD
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Hayden Holub
Manager
Rice Operating Company

RICE Operating Company

112 West Taylor • Hobbs, New Mexico 88240
Phone: (575) 393-9174 • Fax (575) 397-1471

AUGUST 6, 2018

Chevron USA, Inc.
Attention: Linda McMurry
6301 Deauville Blvd.
Midland, TX 79706

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600 N Dairy Ashford Rd.
Office EC3-10-W285
Houston, TX 77079

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Attention: Susan Maunder
600 N Dairy Ashford Rd.
Office EC3-10-W285
Houston, TX 77079

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XTO Energy, Inc.
Attention: DeeAnn Kemp
6401 Holiday Hill Rd.
Building #5
Midland, TX 79707

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6401 Holiday Hill Rd., Bldg. #5
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Enervest Operating, LLC
Attention: Edgar Tovias
2700 Farmington Ave.
Bldg. K, STE. #1
Farmington, NM 87401

See Reverse for Instructions

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2700 Farmington Ave.
Bldg. K, STE. #1
Farmington, NM 87401

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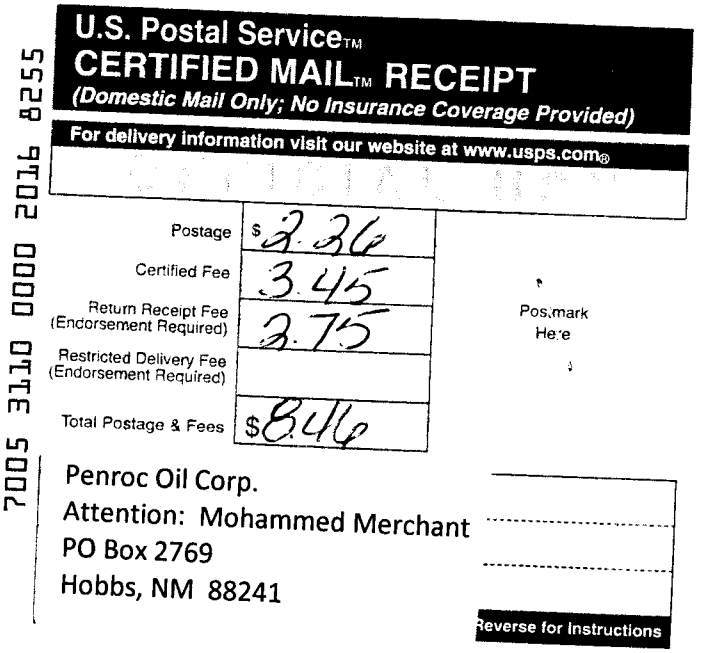
AUGUST 6, 2018



Penroc Oil Corp.
Attention: Mohammed Merchant
PO Box 2769
Hobbs, NM 88241

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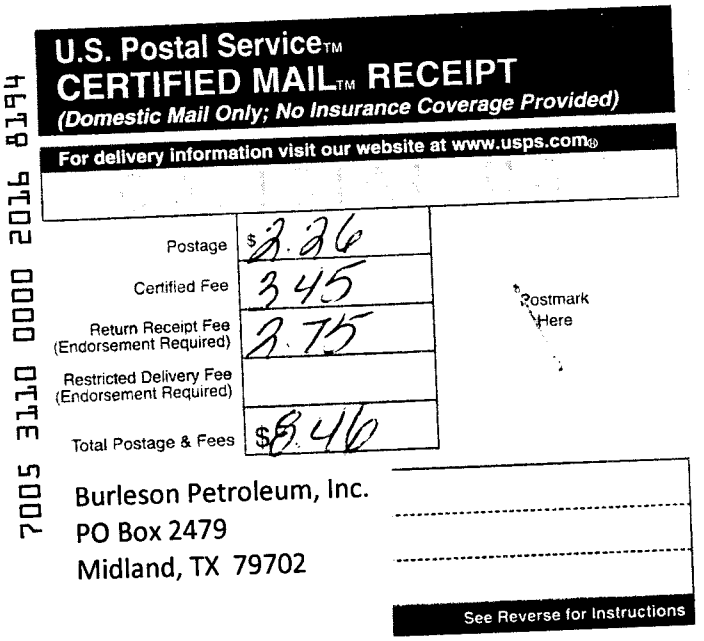

Burleson Petroleum, Inc.
PO Box 2479
Midland, TX 79702

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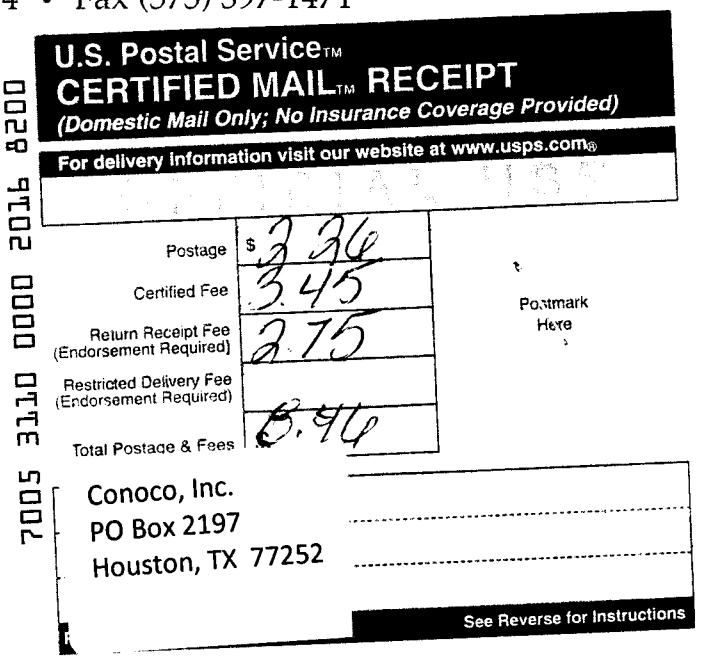
Conoco, Inc.
PO Box 2197
Houston, TX 77252



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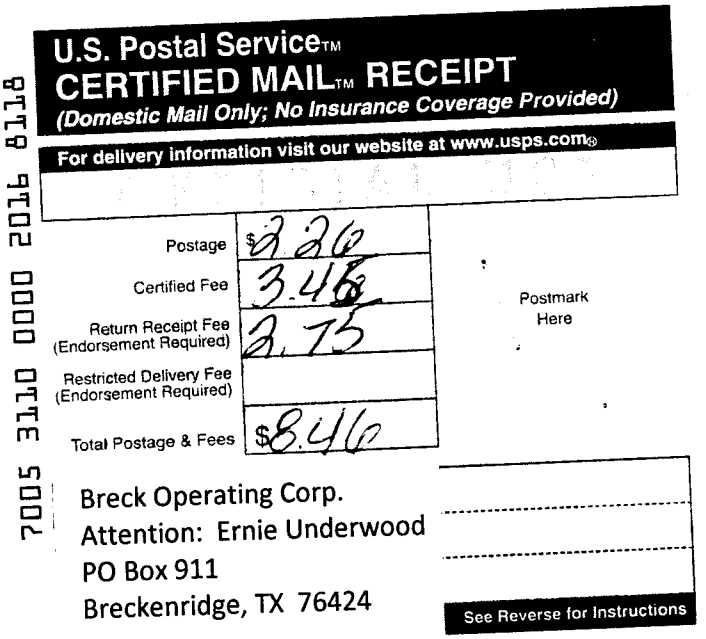
AUGUST 6, 2018

RICE Operating Company
112 West Taylor • Hobbs, New Mexico 88240
Phone: (575) 393-9174 • Fax (575) 397-1471

AUGUST 6, 2018

Breck Operating, Corp.
Attention: Ernie Underwood
PO Box 911
Breckenridge, TX 76424



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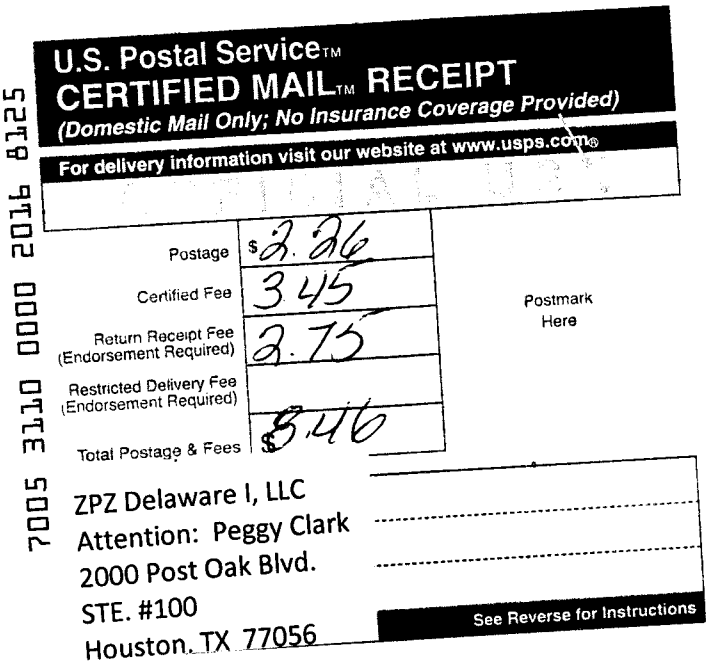

AUGUST 6, 2018

ZPZ Delaware I, LLC
Attention: Peggy Clark
2000 Post Oak Blvd.
STE. #100
Houston, TX 77056

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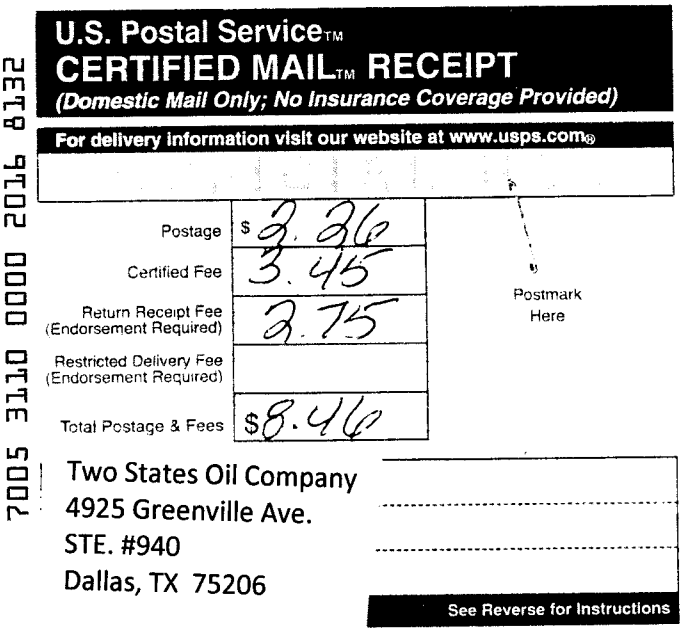
AUGUST 6, 2018

Two State Oil Company
4925 Greenville Ave.
STE. #940
Dallas, TX 75206



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Thank You,

Hayden Holub
Manager
Rice Operating Company

Goetze, Phillip, EMNRD

From: Holm, Anchor <aholm@slo.state.nm.us>
Sent: Wednesday, September 5, 2018 11:35 AM
To: Goetze, Phillip, EMNRD
Cc: Martin, Ed; Khalsa, Niranjan K.
Subject: RICE Operating Company - N-11 SWD#1 Application

Phil,

The State Land Office (SLO) has reviewed the application of RICE Operating Company to drill the N-1 SWD#1 well to be located 433' FSL, 2,455' FWL, Section 11, Township 21 South, Range 36 East, in Lea County, New Mexico. The proposed saltwater disposal (SWD) injection interval is 4,100' to 5,100' into the San Andres formation.

After review of the application and surrounding oil and gas wells and nearby SWD wells, there are some concerns.

1. An oil well (30-025-04607) is located approximately ¼ mile to the Northwest of the proposed wellsite. This well has produced oil and gas from 3,621' to **3,905'**. The State Land Office recommends that the top of the SWD injection interval be lowered to a depth of **4,205'**. Also, this well was converted to a water injection well (WIW) in 1986', and is waterflooding in an interval from 3,183' to 3,932'.
2. The SWD well within 2 miles of the proposed wellsite are perforated from **4,379' to 4,714' (PMX-086); 4,220'-4,600' (SWD-985); 4,329'-4,675' (SWD-1500)**; and **4,414'-4,490' (SWD-311)**. Some of these San Andres SWD wells are currently at or near the well head injection pressure limit set by the latest order of OCD.
3. The wellsite is located within the area flushing of the Capitan Reef Aquifer (back reef portion) which contains protectable ground water of the State of New Mexico. Thus, injection of saltwater which is significantly higher than 10,000 mg/L T.D.S. may degrade the water quality within the Queen, Grayburg and upper San Andres.
4. Injection interval summary: the SLO recommends the SWD injection interval be limited to **4,205' to 5,100'** in the lower San Andres formation.

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nmstatelands.org

For more information please visit http://www.symanteccloud.com

wellname	api	township	range	formation	tds_mgL
EUNICE MONUMENT SOUTH UNIT #260	3002504463	21S	36E	GRAYBURG/SAN ANDRES	13534
A J ADKINS #008	3002520700	21S	36E	BLINEBRY	147118
ANTELOPE RIDGE UNIT #003	3002521082	23S	34E	DEVONIAN	80187
BELL LAKE UNIT #009	3002520261	23S	34E	BONE SPRING	204652
NORTHEAST DRINKARD UNIT #306	3002506507	21S	37E	BLINEBRY/TUBB/DRINKARD	19094.4
BELLOQ 2 STATE #002H	3001542895	23S	31E	WOLFCAMP	119471.8
NORTH PURE GOLD 5 FEDERAL #003H	3001535892	23S	31E	DELAWARE-BRUSHY CANYON	278201.6
WASHINGTON 33 STATE #024	3001530334	17S	28E	GLORIETA/YESO	206471

FORM C-108 Technical Review Summary [Prepared by reviewer and included with application; V16.2]

STATE OF NEW MEXICO · OIL CONSERVATION DIVISION

DATE RECORD: First Rec:________ **Admin Complete:** ________ **or Suspended:** ________ Add. Request/Reply:________

ORDER TYPE: WFX / PMX / SWD Number: __________ Order Date: __________ Legacy Permits/Orders: __________

Well No. 1 Well Name(s): N-11 SWD

API : 30-0 25-Pending Spud Date: TBD New or Old (EPA): N (UIC Class II Primacy 03/07/1982)

Footages 243 FSL 2455 FWL Lot____ or Unit N Sec 11 Tsp 21S Rge 36E County Lea

General Location: 2.5 miles NW/Eunice Pool:________________ Pool No.:________

BLM 100K Map: JAL Operator: Rice Operating Company OGRID: 19174 Contact: Hayden Haug; Ops Mgr

COMPLIANCE RULE 5.9: Total Wells:________ Inactive:________ **Fincl Assur:**________ Compl. Order?________ **IS 5.9 OK?**____ **Date:**________

WELL FILE REVIEWED ◯ Current Status: Proposed

WELL DIAGRAMS: NEW: Proposed ◯ or **RE-ENTER:** Before Conv. ◯ After Conv. ◯ Logs in Imaging: N/A

Planned Rehab Work to Well: ______________________________

Well Construction Details	Sizes (in) Borehole / Pipe	Setting Depths (ft)	Stage Tool	Cement (Sx) or Cf	Cement Top and Determination Method
Planned __or Existing __Surface	17½"/13⅜"	1308' 810		850	Surface/Visual
Planned__or Existing __ Interm/Prod	12¼"/9⅝				
Planned__or Existing __Interm/Prod					
Planned__or Existing __ Prod/Liner					
Planned__or Existing __ Liner					
Planned__or Existing __ OH / PERF			Inj Length		

Injection Lithostratigraphic Units:	Depths (ft)	Injection or Confining Units	Tops
Adjacent Unit: Litho. Struc. Por.		SA	3933
Confining Unit: Litho. Struc. Por.		G-1	5176
Proposed Inj Interval TOP:			
Proposed Inj Interval BOTTOM:			
Confining Unit: Litho. Struc. Por.			
Adjacent Unit: Litho. Struc. Por.			

Completion/Operation Details:

Drilled TD ________ PBTD ________

NEW TD ________ NEW PBTD ________

NEW Open Hole ◯ or NEW Perfs ◯

Tubing Size ______ in. Inter Coated? ______

Proposed Packer Depth ________ ft

Min. Packer Depth ________ (100-ft limit)

Proposed Max. Surface Press. ________ psi

Admin. Inj. Press. ________ (0.2 psi per ft)

AOR: Hydrologic and Geologic Information

POTASH: R-111-P N/A *Noticed?*____ **BLM Sec Ord** ◯ **WIPP** ◯ *Noticed?*____ **Salt/Salado** T: 1425 B: 2571 **NW: Cliff House fm**____

FRESH WATER: Aquifer Ogallala Max Depth 200' **HYDRO AFFIRM STATEMENT By Qualified Person** ◯

NMOSE Basin: Capitan **CAPITAN REEF:** thru____ adj____ NA **No. GW Wells in 1-Mile Radius?** 1 FW Analysis? Y

Disposal Fluid: Formation Source(s) ________________ Analysis? ________ On Lease ◯ Operator Only ◯ or Commercial ◯

Disposal Interval: Inject Rate (Avg/Max BWPD): 26.4K/45K Protectable Waters? N/A Source:________ System: Closed or Open

HC Potential: Producing Interval? N/A Formerly Producing?______ Method: Logs/DST/P&A/Other________ 2-Mi Radius Pool Map ◯

AOR Wells: 1/2-M Radius Map and Well List?______ **No. Penetrating Wells:** 3 [AOR Horizontals: ______ AOR SWDs:______]

Penetrating Wells: No. Active Wells 1 Num Repairs?____ on which well(s)?________________ Diagrams? Y

Penetrating Wells: No. P&A Wells 2 Num Repairs?____ on which well(s)?________________ Diagrams? Y

NOTICE: Newspaper Date 8-03-2018 Mineral Owner NMSLO Surface Owner NMSLO N. Date 8-06-2018

RULE 26.7(A): Identified Tracts? ______ Affected Persons: Encana, Burleson, Devon, ConocoPhillips, Chevron, Breen N. Date 8-06-2018

Order Conditions: Issues: Limit injection I/W 4205'-5100'

Additonal COAs: Run cement b/h casing - Surface