			. 1	$\langle \rangle$		
	- 2/8/08 SUSPEN	SE ENGINEER	LOGGED UN	SWD.	PKVR080Z	,948095
		NEW MEXICO OIL C - Engine	ABOVE THIS LINE FOR DIVISION USE ONLY CONSERVATION D Pering Bureau - is Drive, Santa Fe, NM	L'EEY		
		ADMINISTRATI		ON CHEC	KLIST	
1	THIS CHECKLIST IS M	ANDATORY FOR ALL ADMINISTR WHICH REQUIRE PRO	ATIVE APPLICATIONS FOR E			EGULATIONS
~ны	[DHC-Dow [PC-Po	ndard Location] [NSP-Nor nhole Commingling] [C ol Commingling] [OLS [WFX-Waterflood Expansi	TB-Lease Commingling - Off-Lease Storage] ion] [PMX-Pressure I sposa[] [IPI-Injection	I [PLC-Pool/I [OLM-Off-Lease Maintenance Ex Pressure Incre	.ease Commingl e Measurement] «pansion]	ing]
[1]	TYPE OF AF [A]	PLICATION - Check The Location - Spacing Unit		-		
	Check [B]	One Only for [B] or [C] Commingling - Storage - DHC CTB	- Measurement	OLS	OLM	
	[C]	Injection - Disposal - Pre	essure Increase - Enhand	ced Oil Recover	y PPR	FEB CE
	[D]	Other: Specify				
[2]	NOTIFICAT [A]	ION REQUIRED TO: - (	Check Those Which Ap or Overriding Royalty In		lot Apply	ED
	[B]	Offset Operators, L	easeholders or Surface (	Owner		
	[C]	Application is One	Which Requires Publish	ned Legal Notice	e	
	[D]	Notification and/or U.S. Bureau of Land Managerr	Concurrent Approval by nent - Commissioner of Public Lands	y BLM or SLO s, State Land Office		
	[E]	$\boxtimes$ For all of the above	, Proof of Notification c	or Publication is	Attached, and/or	,
	[F]	Waivers are Attache	ed			

## [3] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.

[4] **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.

Martha Howard	mosthal.	Howard Regulatory Analyst	2/6/2008
Print or Type Name	Signature	Title	Date

martha\_howard@swn.com

e-mail Address



Southwestern Energy Production Company

A subsidiary of Southwestern Energy Company

February 6, 2008

2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

Mr. William Jones Oil Conservation Division 1220 South St. Francis Drive Santa Fe, New Mexico 87505

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Mr. Jones:

Southwestern Energy Production Company is requesting that a permit be granted to use/drill the Karlsbad Corral SWD No. 2 as a water injection well. Enclosed please find the following information in support of this application:

- 1. Form C-108
- 2. Map identifying all wells within two (2) miles with a on-half (<sup>1</sup>/<sub>2</sub>) radius circle around proposed injection well
- 3. Table of wells within a one-half  $(\frac{1}{2})$  mile radius of subject well.
- 4. Injection well data sheet
- 5. Wellbore diagrams for all wells within a on-half  $(\frac{1}{2})$  mile radius
- 6. Water Analysis Report
- 7. Affidavit of publication and newspaper clipping Published December 12, 2007
- 8. Administrative Application Checklist
- 9. Letter attesting to the notification of the affected parties.

Thank you for your timely approval of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

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Martha C. Howard

Martha Howard Regulatory Analyst

Attachments CC: District 2

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

#### **APPLICATION FOR AUTHORIZATION TO INJECT**

I.	PURPOSE:      Secondary Recovery       Pressure Maintenance       XXDisposal      Storage         Application qualifies for administrative approval?      XXYes      No							
11.	OPERATOR: Southwestern Energy Production Company							
	ADDRESS: 2350 N. Sam Houston Parkway East, Suite 190 Houston, Texas 77032							
	CONTACT PARTY: Martha Howard PHONE: (281) 618-4887							
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?YesXXNo 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:							
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,</li> <li>If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).</li> </ol>							
*VIII.	Attach appropriate 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: TITLE: Regulatory Analyst							
	signature: Martha C. Howard Date: 2/6/2008							

- E-MAIL ADDRESS: <u>martha\_howard@swn.com</u> 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:

III. WELL DATA

- A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:
  - (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
  - (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
  - (3) A description of the tubing to be used including its size, lining material, and setting depth.

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(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

- B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.
  - (1) The name of the injection formation and, if applicable, the field or pool name.
  - (2) The injection interval and whether it is perforated or open-hole.
  - (3) State if the well was drilled for injection or, if not, the original purpose of the well.
  - (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
  - (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.
- XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

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

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

## NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

	А	ttachment A			
Side 1	INJECTION	WELL DATA	SHEET		
OPERATOR:	Southwestern Energy Pr	roduction Compa	iny		
WELL NAME & NUM	MBER: Karlsba	ad Corral SWD N	No. 2		
WELL LOCATION:	350' FSL & 350' FWL		11	25S	29E
		NIT LETTER			RANGE
<u>WELLBOR</u>	<u>E SCHEMATIC</u>		<u>WELL CON</u>	STRUCTION DA	<u>TA</u>
Southwestern Energy	Draduation Company		Surfa	ce Casing	
Southwestern Energy I Proposed Wel Karlsbad Corral SWD No. 2					0.5/01
				Casing Size:	
		Cemented with:	<u>    225    </u> sx	. <i></i>	<u> </u>
		Top of Cement:			ined: Circulation
			Intermed	liate Casing	
	8 5/8", 24#, K-55, @ 750'	Hole Size:		Casing Size:	
				. or	
		Top of Cement:		Method Determ	ined:
	2 7/8", 6.50 #, N-80, coated tubing		Product	ion Casing	
		Hole Size:	7-7/8"	Casing Size:	5-1/2"
		Cemented with:	<u>735</u> sx	or11	<u>68</u> ft
	Baker, 5 1/2", Loc-Set @ 3,175' Perforations (3,200' - 4,800')	Top of Cement:	Surface	Method Determ	ined: Circulation
	T is it is a	Depth: <u>4,800</u>	<u>)'</u>		
			Injectio	on Interval	
	5 1/2", 17#, N-80, @ 4,800'		<u>3,200'</u> fee	t to <u>4,800'</u>	<u></u> .
			(Per	forated)	

## **INJECTION WELL DATA SHEET**

Tubing Size:	2-7/8" Lining Material: Plastic Coated
Type of Packer	Baker 5-1/2" Loc-Set, internally plastic coated
Packer Setting	Depth: <u>3,175' MD</u>
Other Type of	Tubing/Casing Seal (if applicable):
	Additional Data
1.	Is this a new well drilled for injection? <u>XX</u> Yes <u>No</u>
	If no, for what purpose was the well originally drilled?
2.	Name of the Injection Formation: Delaware
3.	Name of Field or Pool (if applicable):
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. <u>New Drill</u>
	No other perforated intervals
5.	Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:
	Higher: Delaware (Lamar)
	Lower: Delaware (Cherry Canyon)
6.	The proposed well is not located in either a Potash area or WIPP site area.
7.	Estimated Formation Tops: Rustler 553' Salado 1,683'
	Base of Salado 2,903' Lamar 3,183'
	Bell Canyon 3,208'
8.	Production casing will be cemented to surface to isolate the salt section of the well

from the injection interval. A cement bond log will be run to verify cement placement..

### C-108 Application for Authority to Inject Southwestern Energy Production Company Karlsbad Corral SWD No. 2 Eddy County, New Mexico

I. The purpose is to drill and complete a salt water disposal well for produced Delaware, Bone Springs, and other source water into the Delaware Sand formation.

Southwestern Energy Production Company plans to drill a new well into the Delaware Sand for the purpose of water disposal.

II.	Operator:	Southwestern Energy Production Company 2350 N. Sam Houston Parkway East				
		Suite 190				
		Houston, Texas 77032				
		Attn: Martha Howard (281-618-4887)				

III. Well Data: See Attachment A

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- IV. This is not an expansion of an existing project
- V. There are no active wells within the ½ mile area of review that penetrate the proposed injection zone. (See Attachment B)

Southwestern Energy Production Company operates a total of two (2) horizontal wells that are producing form the Cherry Canyon 4 Sand of the Delaware Formation Series. The horizontal laterals produce at depth of 5,300' TVD.

- VI. Attachment C is a tabulation of well data and wellbore schematics for all wells that fall within the <sup>1</sup>/<sub>2</sub> mile area of review.
- VII. 1. Proposed average daily injection volume is approximately 2,000 BWPD. Maximum daily injection volume is approximately 5,000 BWPD
  - 2. This will be a closed system
  - 3. Proposed Average Injection Pressure unknown Proposed maximum injection pressure – 1526 psig
  - 4. Sources of injected water would be produced water from the Delaware, Bone Springs, and other sources (Attachment D)
  - 5. There are no productive oil or gas wells in the Bell Canyon formation within 1 mile of the proposed injection well.

- VIII. The proposed injection interval is the portion of the Delaware Sand formation consisting of porous sandstone from estimated depths of 3,200' 4,800' (TD of proposed new well).
  - IX. The proposed disposal interval may be acidized with 10% HCL acid or proppant fracture.
  - X. Logs will be filed after the well is drilled.
  - XI. There are no windmills within a one mile radius of the well location.
- XII. Southwestern Energy Production Company has examined geological and engineering data and has found no evidence of faulting in the proposed interval. (Attachment E).
- XIII. Proof of notice

\*~~+ 4

- A. Certified letters sent to the surface owner and offset operators attached (Attachment F)
- B. Copy of legal advertisement attached (Attachment G)
- XIV. Certification is signed

## Attachment E

Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL Eddy County, New Mexico

Available engineering and geological data have been examined and no evidence of open faults of hydrologic connection between the disposal zone and underground sources of drinking water have been found.

Jim Denny

08 Date

Geologist Southwestern Energy Production Company

Showen lor

Toni Showan Engineer Southwestern Energy Production Company

2/6/2008 Date



## Attachment C

# The following is a tabulation on all wells of public record within the area of review. None of these wells penetrate the proposed injection formation within the area of review.

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Well Name	Operator	API #	Location	Date	Completion	Schematic
				Drilled	Date	Attached
Karlsbad Corral 11	Southwestern	30-015-33983	Surface Location:	5/6/2005	5/15/2005	Yes
State 1-H	Energy Production		330' FNL & 1980' FWL	(TD	1	
	Company		<b>Bottom Hole Location</b> : 713' FSL & 1986' FWL	Reached)		
Karlsbad Corral 11 State 2-H	Southwestern Energy Production Company	30-015-34942	Surface Location: 65' FNL & 660' FWL Bottom Hole Location: 2389' FNL & 683' FWL	9/8/2006 (TD Reached)	10/3/2006	Yes
			2389 TNL & 085 TWL			
<u> </u>					<u> </u>	
<u> </u>			· · · · · · · · · · · · · · · · · · ·			 

## Attachment C

#### Southwestern Energy Production Company Karlsbad Corral 11 # 1-H, Eddy County, N. M. Wellbore Diagram



## Attachment C

<u>ت</u>



End Hold/ Begin to 90 deg Inclination 5,518' MD, 5,259' TVD

TD: 7,400' MD / 5,301' TVD

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	thwestern End Isbad Corral 1 I Cherry Canyon 4	1 St.	Co.		Date Sampled Date Analyzed Lab ID Numbe Salesperson File Name : De	d: <b>12-D</b> er: <b>Dec</b> :	ecember- 1207.002-	2007		
1. Ph			1	5.640						
	ific Gravity 60/6	60 F.		1.218						
	D3 Saturation I		@ 80F		2.154	Seve	re			
			@140F		2.155	Seve	re			
	ed Gasses				<u>MG/L.</u>		<u>EQ. WT.</u>		*MEQ/L	
	ogen Sulfide				0					
	on Dioxide				Determined					
	olved Oxygen			Not	Determined					
<u>Cations</u>		$(\mathbf{O}_{\mathbf{F}})$			00 000		/ 00 1		4 400 50	•
7. Calci 8. Magi		(Ca++)			29,820 4,143		/ 20.1 = / 12.2 =		1,483.58 339.59	
9. Sodi	nesium Im	(Mg++) (Na+)	(Calculated	d)	77,933		/ 12.2 =		3,388.39	
10. Bariu		(Ba++)	(Oaloulato	,	ess than 10		/ 20.0 -		0,000.00	
Anions		(5411)		_						
11. Hydr	nxvl	(OH-)			0		/ 17.0 =		0.00	)
	onate	(CO3=)			ů 0		/ 30.0 =		0.00	
	bonate	(HCO3-)			23		/ 61.1 =		0.38	
14. Sulfa		(SO4=)			66		/ 48.8 =		1.35	5
15. Chlo		(CI-)			184,958		/ 35.5 =		5,210.08	3
16. Tota	Dissolved Soli	ds			296,943					
17. Tota		(Fe)			53.0	00	/ 18.2 =		2.91	1
	ganese	(Mn++)		Not	Determined					
19. Tota	Hardness as (	CaCO3			91,522					
20. Resi	stivity @ 75 F.	(Calculated	l)		0.0	001 Of	nm · meters	S		
1		ΝΔΤΕΒ ΡΔ	TTERN		PR		LE MINER		MPOSIT	ION
		eq / L.			COMPOL		*meg/L		EQ. WT.	
Na 🛲		┝╺┓╶╴ <u>╼</u> ╺ ┼─╂─┼┼┼╠╟╟─┼┼┼╟		CI	Ca(HCO3		0.38		81.04	31
					CaSO4	,	1.35		68.07	92
Ca ₩₩₩				HC03	CaCl2		1,481.85		55.50	82,243
N. 4		. Na mala a ma		004	Mg(HCO3	3)2	0.00		73.17	0
Mg ∰⊞∔∔		╞╺╏╱┊╎┼┊╢╢╣╴┼┼┼╫		SO4	MgSO4		0.00		60.19	0
Fe 🛲				СОЗ	MgCl2		339.59	·	47.62	16,171
	000 100 10			0000	NaHCO3 NaSO4		0.00 0.00		84.00 71.03	0
	alcium Sulfate	Solubility	Profile		NaCl		3,388.64		58.46	198,100
380 — 368 —					Naoi		nilliequivale	ents ne		150,100
<sup>m</sup> 356 —								p		
g 344 332										
/ 320 — . 308 —										
L 296 —										
284 — 272 —					Kevin Byrr	no An	alvet			
260 – Temp %	. 50 70 90	110 130	150 170		IVEALL DALL	ie, All	αιγοι			

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	Southwestern Energy Prod. Karlsbad Corral 11 St. Cherry Canyon 4 Cherry Canyon 4	Co.	Date Analyzed:	: 07-December-2007 : 12-December-2007 :: Dec1207.002- 7 :c1207.002	
<u>ANALIO</u> 1.	Ph	5.560			
2.	Specific Gravity 60/60 F.	1.208			
3.	CACO3 Saturation Index	@ 80F	1.956	Severe	
		@140F		Severe	
Di	ssolved Gasses		<u>MG/L.</u>	EQ. WT.	*MEQ/L
4.	Hydrogen Sulfide		0		
5.	Carbon Dioxide	Not	Determined		
6.	Dissolved Oxygen	Not	t Determined		
Ca	ations				
7.	Calcium (Ca++)		28,569	/ 20.1 =	1,421.34
8.	Magnesium (Mg++)		4,084	/ 12.2 =	334.75
9.	Sodium (Na+)	(Calculated)	77,554	/ 23.0 =	3,371.91
10.	Barium (Ba++)	Ì	Less than 10		
	nions				
11.	Hydroxyl (OH-)		0	/ 17.0 =	0.00
12.	Carbonate (CO3=)		0	/ 30.0 =	0.00
13.	Bicarbonate (HCO3-)		23	/ 61.1 =	0.38
14.	Sulfate (SO4=)		105	/ 48.8 =	2.15
15.	Chloride (Cl-)		181,959	/ 35.5 =	5,125.61
16.	Total Dissolved Solids		292,294		
17.	Total Iron (Fe)		41.00	) / 18.2 =	2.25
18.	Manganese (Mn++)	Not	t Determined		
19.	Total Hardness as CaCO3		88,159		
20.	Resistivity @ 75 F. (Calculated	d)	0.00	01 Ohm · meters	
	LOGARITHMIC WATER PA	TTERN	PRO	BABLE MINERAL (	COMPOSITION
	*meq / L.		COMPOUN		EQ. WT. = $mg/L$ .
Na			Ca(HCO3)2	•	81.04 <b>31</b>
			CaSO4	2.15	68.07 <b>146</b>
Ca		₩-+++++ HC03	CaCl2	1,418.82	55.50 <b>78,744</b>
			Mg(HCO3)	2 <b>0.00</b>	73.17 <b>0</b>
Mg		# +!!!! SO4	MgSO4	0.00	60.19 <b>0</b>
Fo		#	MgCl2	334.75	47.62 <b>15,941</b>
Fe		100 1000 10000	NaHCO3	0.00	84.00 <b>0</b>
	Calcium Sulfate Solubility	Profile	NaSO4	0.00	71.03 <b>0</b>
	390		NaCl	3,372.04	58.46 <b>197,129</b>
m	378 366			* milliequivalents	ber Liter
g	354				
1	330				
L	318				
	294				
	282		Kevin Byrne	e, Analyst	
	Temp °F. 50 70 90 110 130	150 170	-		

#### SAMPLE Oil Co. : Southwestern Energy Prod. Co. Lease : Karlsbad Corral 11 Well No.: 3-H Location: Cherry Canyon 4 Attention: ANALYSIS 1. Ph

298

286 274 262

70

90

110

130

150

L

Date Sampled : 07-December-2007 Date Analyzed: 12-December-2007 Lab ID Number: Dec1207.003- 1 Salesperson : File Name : Dec1207.003

#### 1. 5.410 2. Specific Gravity 60/60 F. 1.216 CACO3 Saturation Index 3. @ 80F 1.835 Severe 1.836 Severe @140F **Dissolved Gasses** MG/L EQ. WT. \*MEQ/L Hydrogen Sulfide 4. 0 Carbon Dioxide 5. Not Determined **Dissolved** Oxvaen 6. Not Determined **Cations** 7. Calcium 30,685 / 20.1 = 1.526.62 (Ca++)Magnesium 3,676 / 12.2 =301.31 8. (Ma++) /23.0 =3.411.70 9. Sodium (Na+)(Calculated) 78,469 Barium / 68.7 = 10. 12 0.17 (Ba++) Anions 11. Hydroxyl (OH-) 0 / 17.0 = 0.00 / 30.0 =Carbonate (CO3=) 0 0.00 12. **Bicarbonate** 18 / 61.1 =0.29 13. (HCO3-) Sulfate (SO4=) 63 / 48.8 = 1.29 14. Chloride / 35.5 = 15. (Cl-) 185,958 5,238.25 **Total Dissolved Solids** 16. 298.881 17. Total Iron (Fe) 60.00 / 18.2 = 3.30 (Mn++)18. Manganese Not Determined Total Hardness as CaCO3 19. 91.762 20. Resistivity @ 75 F. (Calculated) 0.001 Ohm · meters **PROBABLE MINERAL COMPOSITION** LOGARITHMIC WATER PATTERN EQ. WT. =\*meg / L. COMPOUND \*mea/L Х Ca(HCO3)2 0.29 81.04 CaSO4 68.07 1.12 Ca 1,525.21 55.50 CaCl2 Ma(HCO3)2 73.17 0.00 Mg SO4 MgSO4 60.19 0.00 MqCl2 301.31 47.62 Fe Fe NaHCO3 84.00 0.00 NaSO4 0.00 71.03 Calcium Sulfate Solubility Profile NaCL 3,411.74 58.46 370 358 \* milliequivalents per Liter m 346 334 g 322 1 310

170

Kevin Byrne, Analyst

ma/L.

84,649

14,348

199,450

24

76

0

0

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	: Southwestern Energy Pro : Karlsbad Corral 2 o.: 1-H on: Cherry Canyon 4 on:	d. Co.	Date Analyzed:	07-December-200 12-December-200 Dec1207.002- 8 :1207.002	
1.	Ph	5.580			
2.	Specific Gravity 60/60 F.	1.209			
3.	CACO3 Saturation Index	@ 80F	1.805 \$	Severe	
		@140F		Severe	
	ssolved Gasses		<u>MG/L.</u>	<u>EQ. WT.</u>	<u>*MEQ/L</u>
4. 5.	Hydrogen Sulfide Carbon Dioxide	No	0 t Determined		
5. 6.	Dissolved Oxygen		t Determined		
	ations		Determined		
7.	Calcium (Ca++)		28,088	/ 20.1 =	1,397.41
8.	Magnesium (Mg++)		4,318	/ 12.2 =	353.93
9.	Sodium (Na+)	(Calculated)	76,988	/ 23.0 =	3,347.30
10.	Barium (Ba++)		12	/ 68.7 =	0.17
	nions		_		
11.	Hydroxyl (OH-)		0	/ 17.0 =	0.00
12.	Carbonate (CO3=)	)	0 35	/ 30.0 = / 61.1 =	0.00 0.57
13. 14.	Bicarbonate (HCO3- Sulfate (SO4=)	)	35 40	/ 48.8 =	0.82
15.	Chloride (CI-)		180,959	/ 35.5 =	5,097.44
16.	Total Dissolved Solids		290,440	/ 0010	0,001111
17.	Total Iron (Fe)		34.00	/ 18.2 =	1.87
18.	Manganese (Mn++)	No	t Determined		
19.	Total Hardness as CaCO3		87,918		
20.	Resistivity @ 75 F. (Calcula	ted)	0.00	1 Ohm · meters	
	LOGARITHMIC WATER	PATTERN	PRO	BABLE MINERAL	COMPOSITION
	*meq / L.	cound a cound a count	COMPOUN		
Na			Ca(HCO3)2		81.04
Ca			CaSO4 CaCl2	0.64 1,396.20	68.07 55.50 <b>77</b>
0a			Mg(HCO3)2		73.17
Mg		+++++ SO4	MgSO4	0.00	60.19
			MgCl2	353.93	47.62 16
Fe		100 1000 10000	NaHCO3	0.00	84.00
	Calcium Sulfate Solubili		NaSO4	0.00	71.03
	420 411		NaCl	3,347.31	58.46 <b>195</b>
m	402			* milliequivalents	sper Liter
g	393				
1	375				
L	357				
	348		Kevin Byrne	Analyst	
	330	30 150 170	Nevili Dyille,	, maiysi	

= mg/L.

195,684

## SAMPLE

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Lease	. : Southwestern End : Karlsbad Corral 2 No.: 3-H on: Cherry Canyon 4	2 St.	Co.		Date Analyzed			
ANALYS 1. 2. 3. 4. 5. 6.	SIS Ph Specific Gravity 60/6 CACO3 Saturation I Dissolved Gasses Hydrogen Sulfide Carbon Dioxide Dissolved Oxygen		@ 80F @140F		1.495 2.195 <u>MG/L.</u> 0 Determined Determined	Severe Severe EQ. WT.	*MEQ/L	
	Calcium Magnesium Sodium Barium	(Ca++) (Mg++) (Na+) (Ba++)	(Calculate	:d)	27,415 4,726 73,747 13	/ 20.1 = / 12.2 = / 23.0 = / 68.7 =	1,363.93 387.38 3,206.39 0.19	
<b>A</b> 11. 12. 13. 14. 15. 16. 17. 18. 19.	Mions Hydroxyl Carbonate Bicarbonate Sulfate Chloride Total Dissolved Soli Total Iron Manganese Total Hardness as (	(OH-) (CO3=) (HCO3-) (SO4=) (CI-) ids (Fe) (Mn++) CaCO3	4)	Not	0 29 46 175,960 281,936 33.5 t Determined 87,918		0.00 0.00 0.47 0.94 4,956.62 1.84	
C: M(	a $\begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	WATER PA eq / L.		НС03		)2 0.47 0.75 1,362.70	EQ. WT. = 81.04 68.07 55.50 73.17 60.19 47.62 84.00 71.03 58.46	N mg/L. 38 51 75,630 0 18,447 0 18,447 0
	349 340 Temp ºF. 50 70 90	110 130	150 170		Kevin Byrr	ne, Analyst		

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SAMPLE Oil Co. : Southwestern Energy Prod Lease : Karlsbad Corral 2 Well No.: 4-H Location: Cherry Canyon 4 Attention:	. Co.			
ANALYSIS				
<ol> <li>Ph</li> <li>Specific Gravity 60/60 F.</li> </ol>	5.600 1.215			
<ol> <li>Specific Gravity 60/60 F.</li> <li>CACO3 Saturation Index</li> </ol>	@ 80F	1.387 S	evere	
	@140F		evere	
<b>Dissolved Gasses</b>		<u>MG/L.</u>	EQ. WT.	<u>*MEQ/L</u>
4. Hydrogen Sulfide	<b>A I</b>	0		
<ol> <li>Carbon Dioxide</li> <li>Dissolved Oxygen</li> </ol>		t Determined t Determined		
Cations		Determined		
7. Calcium $(Ca++)$		27,992	/ 20.1 =	1,392.64
8. Magnesium (Mg++)		4,143	/ 12.2 =	<b>´</b> 339.59
9. Sodium (Na+)	(Calculated)	74,843	/ 23.0 =	3,254.04
10. Barium (Ba++)		Less than 10		
Anions		0	/ 17.0 =	0.00
11. Hydroxyl (OH-) 12. Carbonate (CO3=)		0 0	/ 30.0 =	0.00
13. Bicarbonate (HCO3-)		23	/ 61.1 =	0.38
14. Sulfate (SO4=)		65	/ 48.8 =	1.33
15. Chloride (CI-)		176,960	/ 35.5 =	4,984.79
16. Total Dissolved Solids		284,026		
17. Total Iron (Fe)		35.00	/ 18.2 =	1.92
18. Manganese (Mn++) 19. Total Hardness as CaCO3	No	t Determined		
19. Total Hardness as CaCO3 20. Resistivity @ 75 F. (Calculate	d)	86,958 0 001	Ohm · meters	
	ATTERN	COMPOUNI	<b>ABLE MINERAL</b> ( D *meq/L X	
*meq/L. Na ### <u>{  ###!  #</u> ##!!! ####!!	IIII	Ca(HCO3)2	0.38	EQ. WT. = mg/L. 81.04 <b>31</b>
		CaSO4	1.33	68.07 <b>91</b>
	HI +++++ HO3	CaCl2	1,390.93	55.50 <b>77,197</b>
		Mg(HCO3)2	0.00	73.17 <b>0</b>
Mg ####################################	+##_+++##++### SO4	MgSO4	0.00	60.19 <b>0</b>
Fe ####################################	CO3	MgCl2 NaHCO3	339.59 0.00	47.62 <b>16,171</b> 84.00 <b>0</b>
		NaSO4	0.00	71.03 <b>0</b>
Calcium Sulfate Solubility		NaCl	3,254.27	58.46 <b>190,245</b>
411 m 402			* milliequivalents	per Liter
g 393 384				
/ 375				
L 366				
348		Kovin Durne	Applyat	
330 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	150 170	Kevin Byrne,	πηαιγοι	

SAMPLE

260 Temp ºF. 50

70

90

110

130

150

170

Oil Co. : Southwestern Energy Prod. Co. Date Sampled : 07-December-2007 Lease : Karlsbad Corral 2 Date Analyzed: 12-December-2007 Well No.: 6-H Lab ID Number: Dec1207.002- 3 Location: Cherry Canvon 4 Salesperson : Attention: File Name : Dec1207.002 **ANALYSIS** 1. Ph 5.730 Specific Gravity 60/60 F. 2. 1.212 CACO3 Saturation Index 3. @ 80F 2.242 Severe @140F Severe 2.342 **Dissolved Gasses** MG/L EQ. WT. \*MEQ/L 4. Hydrogen Sulfide ۵ 5. Carbon Dioxide Not Determined **Dissolved** Oxvaen 6. Not Determined Cations 7. Calcium (Ca++) 29,820 / 20.1 =1,483.58 Magnesium 8. (Mq++) 4,493 / 12.2 =368.28 9. Sodium (Na+)(Calculated) / 23.0 =74.027 3.218.57 10. Barium (Ba++) 11 / 68.7 =0.16 Anions 11. Hvdroxvl (OH-) 0 / 17.0 =0.00 Carbonate 12. (CO3=)0 / 30.0 =0.00 13. **Bicarbonate** (HCO3-) 29 / 61.1 = 0.47 14. Sulfate (SO4=) 56 / 48.8 = 1.15 15. Chloride (CI-) 179,959 / 35.5 = 5.069.27 16. **Total Dissolved Solids** 288,395 17. Total Iron (Fe) 33.50 / 18.2 = 1.84 Manganese 18. (Mn++) Not Determined Total Hardness as CaCO3 19. 92.963 20. Resistivity @ 75 F. (Calculated) 0.001 Ohm · meters LOGARITHMIC WATER PATTERN **PROBABLE MINERAL COMPOSITION** \*mea / L. COMPOUND \*mea/L Х EQ. WT. =Na ₩₩ +++++ CI Ca(HCO3)2 0.47 81.04 CaSO4 0.99 68.07 Ca CaCl2 1,482.12 55.50 82,258 Mg(HCO3)2 0.00 73.17 Mq -----SO4 MgSO4 0.00 60.19 MaCl2 47.62 368.28 17,537 Fe #### ----| | | ||||| ++++++ CO3 NaHCO3 0.00 84.00 10000 10 100 1000 NaSO4 0.00 71.03 **Calcium Sulfate Solubility Profile** NaCl 3.218.87 58.46 188,175 380 368 \* milliequivalents per Liter m 356 344 g 332 1 320 308 I. 296 284 272

Kevin Byrne, Analyst

ma/L.

38

67

0

0

0

0

SAMPLE Oil Co. : Southwestern Energy Prod. Co. Lease : Karlsbad Corral 2 Well No.: 7-H Cherry Canyon 4 Location: Attention: ANALYSIS 1. Ph 2. Specific Gravity 60/60 F. CACO3 Saturation Index 3. **Dissolved Gasses** Hydrogen Sulfide 4. 5. Carbon Dioxide **Dissolved Oxygen** 6. Cations 7. Calcium (Ca++) (Mg++) 8. Magnesium 9. Sodium (Na+) Barium (Ba++)

10.

11.

12. 13.

14.

15.

16. 17.

18.

19.

20.

Anions

Hydroxyl

Sulfate

Chloride

Total Iron

Manganese

Carbonate

Bicarbonate

**Total Dissolved Solids** 

Total Hardness as CaCO3

Resistivity @ 75 F. (Calculated)

60 F. ndex		1.982 2.422 <u>MG/L.</u> 0 ot Determined ot Determined	Severe Severe EQ. WT.	*MEQ/L
(Ca++) (Mg++) (Na+) (Ba++)	(Calculated)	28,088 5,485 73,487 Less than 10	/ 20.1 = / 12.2 = / 23.0 =	1,397.41 449.59 3,195.09
(OH-) (CO3=) (HCO3-) (SO4=) (CI-) ds		0 41 40 178,960 286,101	/ 17.0 = / 30.0 = / 61.1 = / 48.8 = / 35.5 =	0.00 0.00 0.67 0.82 5,041.13
(Fe)		43.0	0 / 18.2 =	2.36

Date Sampled : 07-December-2007

Date Analyzed: 12-December-2007

Lab ID Number: Dec1207.002- 4

File Name : Dec1207.002

Salesperson :

**Not Determined** 

92.723

0.001 Ohm · meters

#### LOGARITHMIC WATER PATTERN \*mea / L.

(Mn++)



#### **Calcium Sulfate Solubility Profile**



PRODABLE MINERAL COMPOSITION								
COMPOUNE	) *meq/L	Х	EQ. WT.	= mg/L.				
Ca(HCO3)2	0.67		81.04	54				
CaSO4	0.82		68.07	56				
CaCl2	1,395.92		55.50	77,474				
Mg(HCO3)2	0.00		73.17	0				
MgSO4	0.00		60.19	0				
MgCl2	449.59		47.62	21,409				
NaHCO3	0.00		84.00	0				
NaSO4	0.00		71.03	0				
NaCl	3,195.61		58.46	186,816				
* milliequivalents per Liter								

DROBARI E MINERAL COMPOSITION

Kevin Byrne, Analyst

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Lease Well N Locatic Attentic	Southwestern End Karlsbad Corral 2 0.: 8-H 0n: Cherry Canyon 4 0n:	2	Co.	Date Analyzed		
ANALYS 1.	Ph		5.730			
2.	Specific Gravity 60/6	60 F.	1.212			
3.	CACO3 Saturation I		@ 80F	2.314	Severe	
			@140F	2.414	Severe	
	<u>ssolved Gasses</u> Hydrogen Sulfide			<u>MG/L.</u> 0	EQ. WT.	*MEQ/L
4. 5.	Carbon Dioxide		Ν	lot Determined		
6.	Dissolved Oxygen			lot Determined		
<u>Ca</u>	ations					
7.	Calcium	(Ca++)		29,339	/ 20.1 =	1,459.65
8.	Magnesium	(Mg++)		4,785	/ 12.2 = / 23.0 =	392.21
9 <i>.</i> 10.	Sodium Barium	(Na+) (Ba++)	(Calculated)	75,323 10	/ 23.0 = / 68.7 =	3,274.91 0.15
	nions	(Da++)		10	/ 00./ =	0.10
11.	Hydroxyl	(OH-)		0	/ 17.0 =	0.00
12.	Carbonate	(CO3=)		Ō	/ 30.0 =	0.00
13.	Bicarbonate	(HCO3-)		35	/ 61.1 =	0.57
14.	Sulfate	(SO4=)		50	/ 48.8 =	1.02
15.	Chloride	(Cl-)		181,959	/ 35.5 =	5,125.61
16.	Total Dissolved Soli			291,501	<b>a</b> (100	0.04
17. 18.	Total Iron Manganese	(Fe) (Mn++)	N	47.5 Iot Determined	0 / 18.2 =	2.61
10.	Total Hardness as (			92,963		
20.	Resistivity @ 75 F.		d)	•	001 Ohm · meters	
			TTERN	PR	OBABLE MINERAL	COMPOSITION
	*me	eq / L.		COMPOU		
Na				Ca(HCO3)		81.04
0.0				CaSO4	0.88	68.07
Ca		╞╌┠╾╃╀ТĨ╢╟═╌╿┼╽╽		)3 CaCl2 Mg(HCO3	<b>1,458.20</b>	55.50 <b>80</b> 73.17
Mg			++++++ SO4	MgSO4	0.00	60.19
				MaCI2	392.21	47.62 18
⊢e	10000 1000 100 10			14411000	0.00	84.00
	Calcium Sulfate	Solubility	Profile	NaSO4	0.00	71.03
	380			NaCl	<b>3,275.19</b> * milliequivalents	58.46 <b>191</b>
m	356				minoquivalents	
g /	332					
, L	320					
-	296					
	272			Kevin Byrn	ne, Analyst	
	Temp °F. 50 70 90	110 130	150 170	-	-	

= mg/L.

191,468

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Lease Well N Locatic Attentic	: Southwestern Energy Prod. : Corral Fly Fed. 10 o.: 1-H on: Cherry Canyon 7 on:	Co.	Date Analyzed:	: 07-December-2007 : 12-December-2007 :: Dec1207.003- 3 c1207.003	
ANALYS 1. 2. 3. 3. <u>Di</u> 4. 5. 6.	Ph Specific Gravity 60/60 F. CACO3 Saturation Index ssolved Gasses Hydrogen Sulfide Carbon Dioxide Dissolved Oxygen			Moderate Severe EQ. WT.	*MEQ/L
	ationsCalcium(Ca++)Magnesium(Mg++)Sodium(Na+)Barium(Ba++)	(Calculated)	23,663 3,968 73,133 t Determined	/ 20.1 = / 12.2 = / 23.0 =	1,177.26 325.25 3,179.70
Δι 11. 12. 13. 14. 15. 16. 17. 18. 19.	nionsHydroxyl(OH-)Carbonate(CO3=)Bicarbonate(HCO3-)Sulfate(SO4=)Chloride(CI-)Total Dissolved SolidsTotal Iron(Fe)Manganese(Mn++)Total Hardness as CaCO3	Νο	0 41 310 165,963 267,078 23.00 t Determined 75,427		0.00 0.00 0.67 6.35 4,675.01 1.26
Ca Mg	Image: Constraint of the second sec	ATTERN CI HC03 HC03 HC03 HC03 HC03 HC03 CO3 HC03 HC03		2 0.67 6.35 1,170.24	EQ. WT.=mg/L.81.045468.0743255.5064,94873.17060.19047.6215,48884.00071.03058.46185,875
	497 490 Temp °F. 50 70 90 110 130	150 170	Kevin Byrne	e, Analyst	

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	: Southwestern Ene : Corral Fly Fed. 10 o.: 3-H on: Cherry Canyon 3 on:		Co.	Date Analyzed	d : 07-December-200 d: 12-December-200 er: Dec1207.003- 2 : ec1207.003	
1.	no Ph		5.43	0		
2.	Specific Gravity 60/6		1.20	9		
3.	CACO3 Saturation In	ndex	@ 80F @140F	1.330 2.250	Severe Severe	
Di	ssolved Gasses		@1401	2.250 MG/L.	EQ. WT.	*MEQ/L
4.	Hydrogen Sulfide		_	0		
5. 6.	Carbon Dioxide Dissolved Oxygen			Not Determined Not Determined		
	ations					
7.	Calcium	(Ca++)		26,741	/ 20.1 =	1,330.40
8.	Magnesium	(Mg++)	(Coloulated)	4,610	/ 12.2 =	377.87
9. 10.	Sodium Barium	(Na+) (Ba++)	(Calculated)	73,468 10	/ 23.0 = / 68.7 =	3,194 <i>.</i> 26 0.15
	nions	(Da++)		10	/ 00.7 =	0.15
11.	Hydroxyl	(OH-)		0	/ 17.0 =	0.00
12.	Carbonate	(CO3=)		Ō	/ 30.0 =	0.00
13.	Bicarbonate	(HCO3-)		53	/ 61.1 =	0.87
14.	Sulfate	(SO4=)		78	/ 48.8 =	1.60
15.	Chloride	(CI-)		173,961	/ 35.5 =	4,900.31
16.	Total Dissolved Solid			278,921		
17.	Total Iron	(Fe)		29.5	<b>50</b> / 18.2 =	1.62
18.	0	(Mn++)		Not Determined		
19. 20.	Total Hardness as C Resistivity @ 75 F.		4)	85,757	001 Ohm · meters	
20.		,				
			TTERN			
Na		q / L. ∔ ⊹⊹⊮⊯⊮ + ⊦≀⊮		COMPOL Ca(HCO3	•	EQ. WT. = r 81.04
114				CaSO4	1.45	68.07
Ca				03 CaCl2	1,328.08	55.50 <b>73</b>
				Mg(HCO3	B)2 <b>0.00</b>	73.17
Mg				ingeo i	0.00	60.19
Fe				MgCl2	377.87	47.62 <b>17</b>
	10000 1000 100 10	1 10	100 1000 10000	<sup>3</sup> NaHCO3 NaSO4	0.00 0.00	84.00 71.03
	Calcium Sulfate	Solubility	Profile	NaCl	3,194.36	58.46 <b>186</b>
	431	$ \rightarrow $			* milliequivalents	
m g	422 413				•	
9	404					
L	386					
	368					
	359			Kevin Byrn	ne, Analyst	
	Temp ºF. 50 70 90	110 130	150 170		-	

•

= mg/L.

186,742

368.28

0.19

0.00

0.00

0.77

2.83

1.92

mg/L.

62

0

0

0

0

180

74.711

17,537

191,186

4,984.79

e

Temp ºF. 50

70

90

110

130

150

170

#### SAMPLE Date Sampled : 07-December-2007 Oil Co. : Southwestern Energy Prod. Co. Date Analyzed: 12-December-2007 Lease : Pickett Draw '16' Lab ID Number: Dec1207.003- 4 Well No.: 1-H Cherry Canyon 3 Location: Salesperson : File Name : Dec1207.003 Attention: ANALYSIS 1. Ph 5.480 2. Specific Gravity 60/60 F. 1.203 **CACO3** Saturation Index Severe 3. @ 80F 1.555 @140F 2.255 Severe \*MEQ/L **Dissolved Gasses** MG/L EQ. WT. Hydrogen Sulfide 0 4. 5. Carbon Dioxide Not Determined 6. **Dissolved Oxygen Not Determined** Cations 7. 27,126 / 20.1 = 1,349.55 Calcium (Ca++) Magnesium 4.493 / 12.2 = 8. (Mq++)9. Sodium (Na+)75.219 / 23.0 =3,270.39 (Calculated) 10. Barium (Ba++) 13 / 68.7 = Anions / 17.0 = Hydroxyl 0 11. (OH-) / 30.0 =12. Carbonate (CO3=)0 Bicarbonate (HCO3-) 47 / 61.1 = 13. 14. Sulfate (SO4=)138 / 48.8 = / 35.5 = 15. Chloride (CI-) 176.960 16. **Total Dissolved Solids** 283.996 17. Total Iron 35.00 / 18.2 = (Fe) 18. Manganese Not Determined (Mn++)19. Total Hardness as CaCO3 86,237 20. Resistivity @ 75 F. (Calculated) 0.001 Ohm · meters **PROBABLE MINERAL COMPOSITION** LOGARITHMIC WATER PATTERN COMPOUND \*meq/L Х EQ. WT. = \*meg / L. Na IIII -----CI Ca(HCO3)2 0.77 81.04 CaSO4 2.64 68.07 Ca -77]|| CaCl2 1.346.14 55.50 Mg(HCO3)2 0.00 73.17 1111 ╟╢┼┼ +++++++ SO4 Mg MqSO4 0.00 60.19 47.62 MaCl2 368.28 Fe ##### -----+++++++ CO3 NaHCO3 84.00 0.00 10000 1000 100 10 10 100 1000 10000 NaSO4 0.00 71.03 **Calcium Sulfate Solubility Profile** 3.270.37 58.46 NaCl 440 430 \* milliequivalents per Liter m 420 410 g 400 1 390 380 L 370 360 350 Kevin Byrne, Analyst 340



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## Attachment F

Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FEL Eddy County, New Mexico

### Offset Operators

EOG Resources P.O. Box 2267 Midland, Texas 79702

Bettis Brothers, Inc. 500 W. Wall, Suite 312 Midland, Texas 79701

Yates Petroleum Corporation 105 South 4<sup>th</sup> Street Artesia, New Mexico 88210

B.A.G.A.M., Ltd. P.O. Box 37 Graham, Texas 76046

7 لمسلح The South 4<sup>th</sup> Street Artesia, New Mexico 88210

J. Guinn Family Trust 500 E. Border Street, Suite 885 Arlington, Texas 76010 OXY USA WTP Limited Partnership P.O. Box 50250 Midland, Texas 79710

Norman D. Stovall, Jr P.O. Box 10 Graham, Texas 76046 76450

James R. Guinn 201 E. Abram, Suite 650 Arlington, Texas 76010

Pogo Producing Company P.O. Box 2504 Houston, Texas 77252

> J. Guinn Family Trust A 500 E. Border Street, Suite 885 Arlington, Texas 76010

Dominion Exploration & Production Co 1450 Poydras Street New Orleans, La. 70112

Sonic Oil & Gas LP P.O. Box 1240 Graham, Texas 76450

H. M. Bettis P.O. Box 1240 Graham, Texas <del>76046</del> 76450

The Allar Company P.O. Box 630 Graham, Texas 26046 76450

ABO Petroleum Corp. 105 S. 4<sup>th</sup> Street Artesia, New Mexico

### Surface/Mineral Owner and Lessees

New Mexico State Land Office Oil, Gas and Minerals Division P.O. Box 1148 Santa Fe, NM 87504-1148

Rustlers Breaks Ranch Attn: Mr. Tran King 64 North 5050 East Ririe, Idaho 83443 Bureau of Land Management Carlsbad Field Office 620 E. Greene Street Carlsbad, NM 88220

JR Engineering and Construction Co. P.O. Box 487 Carlsbad, New Mexico 88220

#### Affidavit of Publication

State of New Mexico, County of Eddy, ss.

**April Hernandez**, being first duly sworn, on oath says:

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

December 12

2007

That the cost of publication is \$ 54.39 that Payment Thereof has been made and will be assessed as court costs.

Cipie Harnandoe

Subscribed and sworn to before me this

لہ day of My commission Expires on

**Notary Public** 

OFFICIAL SEAL STEPHANIE DOBSON Notary Public State of New Mexicop My Comm. Expires

December 12, 2007 Southwestern Energy Production Company, 2350 N. Sam Hous ton Parkway East, Suite 125, Houston, Texos 77032, will be filing Form C-108 (A pplication for Authori pplication for Authori zation to Inject), with the New Mexico Oil Conservation Divi sion, seeking admi nistrative approval for nistrative approval for an injection well. The proposed well, the Karlsbad Corral SWD No. 2, located 350' FSL & 350' FWL, Sec tion 11, Township 25 South, Range 29 East of Eddy County, New Mexico will be used for a saltwater dis posal Disposal wa ters from the Dela ware formation, ware formation, Cherry Canyon sand will be re-injected into the Delaware tormation, Bell Can yon sand, and Cherry Canyon sand, at a depth: of 3,200' -4,800', with a maxi mum injection pres sure of 1,500 psi maximum, at a rate of 2500 BWPD. All interested parties opposing the afore mentioned must file objections of requests for a hearing with the Oil Conservation Divi Sion: 1220 South Saint Francis Drive, Santa Fe New Mexico, 87505-5472, within 15 days. Additional informa tion can be obtained by contacting C. Howard at 618 - 4887. Martha (281) -Published by the Garlsbad Current Ar gus: Carlsbad N.M., December 12, 2007. UNE P

Legal Notice Number

### Jones, William V., EMNRD

From:	Martha Howard [Martha_Howard@SWN.COM]
Sent:	Tuesday, March 04, 2008 10:59 AM
To:	Jones, William V., EMNRD
Cc:	Drew Stephenson; Jeff Kallmeyer; Jim Denney
Subject:	RE: SWD Application from Southwestern Energy Production Company: Karlsbad Corral SWD #2 API No. 30- 015-NA Unit M Sec 11 T25S R29E

#### Importance: High

Will.

- State of New Mexico is the surface owner 1)
- The drilling engineer confirmed that his request to the landman was in compliance with 701B.(2). I have copied the 2) green cards. Those copies will be going out to you via overnight mail. There was only one card not returned. I have attached a copy of the tracking from the USPS for that card. none 3/10/08
- 3) Estimated Tops: Rustler 533
  - Salado 1683 Base Salado 2903 Lamar 3183 3208 Bell Canyon Cherry Canyon 4050 Brushy Canyon 5672

I have applied for the permit to drill on line (03/04/2008) and will forward API No. once in receipt. 4)

Thank you for your time in approving our application for the Karlsbad Corral SWD No. 2. Hopefully, on the next application all of these answers will be provided in the initial filing.

Martha C. Howard Staff Regulatory Analyst 281-618-4887 direct 281-618-4758 fax Martha Howard@SWN.com

From: Jones, William V., EMNRD [mailto:William.V.Jones@state.nm.us] Sent: Friday, February 29, 2008 6:11 PM To: Martha Howard Cc: Ezeanyim, Richard, EMNRD; Bratcher, Mike, EMNRD Subject: SWD Application from Southwestern Energy Production Company: Karlsbad Corral SWD #2 API No. 30-015-NA Unit M Sec 11 T25S R29E

Hello Martha:

I have this permit ready to release to Mark Fesmire but have the following questions and requests:

Please tell me who is the surface owner at the proposed wellsite.... Your application lists many different surface owners. 1)

2) You gave a list of parties to notify, but sent no proof of notification. Would you please copy the green cards and send these or just send another spreadsheet with the names and the certified receipt numbers. Please read Division Rule 701B.(2) and let me know if this was followed in deciding whom to notify.

3) Please ask your geologist to pick the approximate tops of the Bell Canyon, the Cherry Canyon and the Brushy Canyon at this well location.

4) Our database is keyed on API numbers and we do not like to issue permits without these if at all possible. Unless this is Federal, it should not take long to get the well permitted to drill and get an API number. Today, I checked our database and did not see where this well had been permitted. Please obtain the API number for this well at this proposed location and send it to me by email.

30-015-36167

## Attachment F

Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FEL Eddy County, New Mexico

### Offset Operators

EOG Resources P.O. Box 2267 Midland, Texas 79702

Bettis Brothers, Inc. 500 W. Wall, Suite 312 Midland, Texas 79701

Yates Petroleum Corporation 105 South 4<sup>th</sup> Street Artesia, New Mexico 88210

B.A.G.A.M., Ltd. P.O. Box 37 Graham, Texas 76046

Yates Drilling Co. 105 South 4<sup>th</sup> Street Artesia, New Mexico 88210

J. Guinn Family Trust AM 500 E. Border Street, Suite 885 Arlington, Texas 76010

OXY USA WTP Limited Partnership P.O. Box 50250 / Midland, Texas 79710

Norman D. Stovall, Jr P.Q. Box 10 Graham, Texas-76046 76450

James R. Guinn 201 E. Abram, Suite 650 Arlington, Texas 76010

Pogo-Producing-Company P.O. Box 2504 Houston, Texas 77252

> J. Guinn Family Trust A 500 E. Border Street, Suite 885 Arlington, Texas 76010

Dominion Exploration & Production Co 1450 Poydras Street New Orleans, La. 70112

Sonic Oil & Gas LP P.O. Box 1240 Graham, Texas 76450

H. M. Bettis P.O. Box 1240 Graham, Texas <del>76046</del> 76450

The Allar Company P.O. Box 630 Graham, Texas 76046 76450

ABO Petroleum Corp. 105 S. 4<sup>th</sup> Street Artesia, New Mexico

## Surface/Mineral Owner and Lessees

New Mexico State Land Office Oil, Gas and Minerals Division P.O. Box 1148 Santa Fe, NM 87504-1148

Rustlers Breaks Ranch Attn: Mr. Tran King 64 North 5050 East Ririe, Idaho 83443



Bureau of Land Management Carlsbad Field Office 620 E. Greene Street Carlsbad, NM 88220

JR Engineering and Construction Co. P.O. Box 487 Carlsbad, New Mexico 88220





2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

February 6, 2008

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7476

### OXY USA WTP Limited Partnership P.O. Box 50250 Midland, Texas 79710

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

'n.

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Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887. Or Alan Grimsler @ 281.618.4068

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2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

February 6, 2008

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7483

Sonic Oil & Gas LP P.O. Box 1240 Graham, Texas 76450

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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To: Martha Howard Southwestern Energy Production Company 2350 North Sam Houston Parkway East Houston, Texas 77032

From: Bettis Brothers, Inc. 830 500 W. Wall, Suite 312 Midland, Texas 79701

Re: Karlsbad Corral SWD No. 2 (Delaware) Section 2, T25S R29E 350' FSL & 350' FWL

This is to advise that the undersigned has been given due notice of Southwestern Energy Production Company's intent to apply for a SWD permit regarding their proposed injection into subject well and reservoir. Bettis Brothers, Inc. has no objection to the granting of approval for this application, and hereby waives protest.

Please indicate your waiver of no objection for the referenced well in the space provided below, then return in the enclosed. addressed and stamped envelope.

Thank you for your kind assistance on this matter and your prompt attention will be greatly appreciated.

Agreed to an accepted this //\_\_\_\_dav.of\_ Feb SENDER: COMPLETE THIS SECTION COMPLETE THIS SECTION ON DELIVER Complete items 1, 2, and 3. Also complete Bettis Brothers, Inc. L. H Agonted Ma item 4 if Restricted Delivery is desired. AddroLing rec Print your name and address on the reverse so that we can return the card to you. C. Date of Dullique ide Attach this card to the back of the mailpiece, ord of (Individual Name or Compan ' *0* S or on the front if space permits. ant R Is delivery address different from item 1? D Yos tified 1. Article Addressed to: D No If YES, enter delivery address below: tified Bettis Brothevs 500 W. WALL , Buile 132 INS FU. Name: Title: Midland TX -1970 Service Type 3. au Certified Mail Express Mail Registered D Return Receipt for Merchandi Insured Mail C.O.D. en lf C 4. Restricted Delivery? (Extra Fee) C Yes 2. Article Number 7006 3450 0000 6005 7490 (Transfer from service label) PS Form 3811, February 2004 Domestic Return Receipt 102595-0:2-M-1:140



February 6, 2008

2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6006 0018

H. M. Bettis P.O. Box 1240 Graham, Texas 76046 7 6 450

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887. Or  $\beta_{1}$  Or  $\beta_{2}$  Or  $\beta_{3}$  Or  $\beta_{4}$  Or  $\beta_{5}$ 

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February 6, 2008

2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7513

Yates Petroleum Corporation 105 South 4th Street Artesia, New Mexico 88210

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

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Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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• Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887. Or Alan Grimsley C281-618-4068.

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2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

via Certified Mail Receipt # 7006 3450 0000 6005 7582

J Guinn Family Trust A 500 E. Border Street, Suite 885 Arlington, Texas 76010

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887. Or Alan Grun C. 281-618-4068.

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2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

via Certified Mail Receipt # 7006 3450 0000 6005 7599

J. Guinn Family Trust M 500 E. Border Street, suit 885 Arlington, Texas 76010

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

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To: Martha Howard Southwestern Energy Production Company 2350 North Sam Houston Parkway East Houston, Texas 77032

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- From: Norman D. Stovall, Jr P.O. Box 10 Graham, Texas 76046
- Re: Karlsbad Corral SWD No. 2 (Delaware) Section 2, T25S R29E 350' FSL & 350' FWL

This is to advise that the undersigned has been given due notice of Southwestern Energy Production Company's intent to apply for a SWD permit regarding their proposed injection into subject well and reservoir. Norman D. Stovall, Jr has no objection to the granting of approval for this application, and hereby waives protest.

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Please indicate your waiver of no objection for the referenced well in the space provided below, then return in the enclosed. addressed and stamped envelope.

Thank you for your kind assistance on this matter and your prompt attention will be greatly appreciated.

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February 6, 2008

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7544

B.A.G.A.M., Ltd. P.O. Box 37 Graham, Texas 76046 7 & 450

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Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

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February 6, 2008

via Certified Mail Receipt # 7006 3450 0000 6005 7551

Yates Drilling Co. 105 South 4th Street Artesia, New Mexico 88210

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

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Dear Sir:

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2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7568

Pogo Producing Company P.O. Box 2504 Houston, Texas 77252

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

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2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7575

ABO Petroleum Corporation 105 South 4th Street Artesia, New Mexico 88210

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7605

Dominion Exploration & Production Co. 1450 Poydras Street New Orleans, Louisiana 70112

.....

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887. On Alan Grinsley @ 1101-281-618.488.

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February 6, 2008

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7636

Rustlers Breaks Ranch Attn: Mr Tran King 64 North 5050 East Ririe, Idaho 83443

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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		rm 3800; August 2006



February 6, 2008

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7681

JR Engineering and Construction Co. P.O. Box 487 Carlsbad, New Mexico 88220

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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February 6, 2008

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7469

EOG Resources P.O. Box 2267 Midland, Texas 79702

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

Southwestern Energy Production Company is making and application to the New Mexico oil conservation Division to drill the Karlsbad Corral SWD No. 2 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

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February 6, 2008

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7537

The Allar Company P.O. Box 630 Graham, Texas 76046 7 6 450

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

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2350 N. Sam Houston Parkway East Suite 300 Houston, Texas 77032 (281) 618-4700 FAX: (281) 618-4757

<u>via Certified Mail</u> Receipt # 7006 3450 0000 6005 7520

James R. Guinn 201 E. Abram, Suite 650 Arlington, Texas 76010

Re: Karlsbad Corral SWD No. 2 Section 11, T25S R29E 350' FSL & 350' FWL

Dear Sir:

12 STORES & PORTSAND

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		ection Permit C	necklist 2/8/07					
SWD Order Number _		s: Division Approved		Approved				
Well Name/Num: Kandral Coursel, Swp # 2 Date Spudded: New Well								
API Num: (30-) County: County:								
Footages 350 FSL/350 Ful Sec 11 TSP 255 Rge 29E								
Footages 350 FSL/350 Ful Sec 11 TSP 255 Rge 29E Operator Name: Scutinizettem Energy Prel. Co. Contact Months Howard								
Operator Address: 2350 N. SAM ACUSTON PKWY EAST, SINTE 190, HOUSTON TX 77032 Current Status of Well: Not Intel Planned Work: Inj. Tubing Size: 27/80								
Current Status of Well: 10	the part of the pa	27/80						
Current Status of Well:			Cement	Top/Method				
Surface	Hole/Pipe Sizes	Depths 750	225					
Intermediate	H 0	1,800						
Production	7/13 5/2	8175	735					
Last DV Tool								
Open Hole/Liner	/	480'TP						
Plug Back Depth	(							
	efore Conversion	After Conversio	in V					
Diagrams Included (Y/N): Before Conversion After Conversion Checks (Y/N): Well File Reviewed								
Intervals:	Depths	Formation	Producing (Yes/No)	]				
Salit/Potash)	<del></del>		= 2-903					
Capitan Reef	JNO NO		······································					
Cliff House, Etc.								
Formation Above	3208	3 ele Compon	h	2				
Top Inj Interval		Derector		64-0 PSI Max. WHIP				
Bottom Inj Interval	4800	Del		XC Open Hole (Y/N)				
Formation Below	7	Vec		Deviated Hole (Y/N)				
		<u></u>	I					
Fresh Water: Depths:	Wells	s(Y/N) Analy	sis Included (Y/N):	Affirmative Statement				
Salt Water Analysis: Injection Zone (Y/N/NA) DispWaters (Y/N/NA) Types: BS out Notice: Newspaper(Y/N) & Surface Owner Mineral Owner(s)								
Other Affected Parties:								
AOR/Repairs: NumActiveWells O Repairs? Producing in Injection Interval in AOR								
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