BW-28

Key Energy/Eunice
State Brine Well #1

Permit Renewal
11/8/13

Section VII.A.6-11 Appendix:

Includes:

1. Fig.1-Map of the Permian Basins.
2. Stratigraphic Chart of the Permian System and the Central Basin Platform.
3. Well records of Key Brine Well BW-28, Conoco Brine Well BW-1, the Key GP Sims BW-09, and the P&S Brine.
4. Recent well bore completion schematic.
5. Verification of Bond Approval letter.

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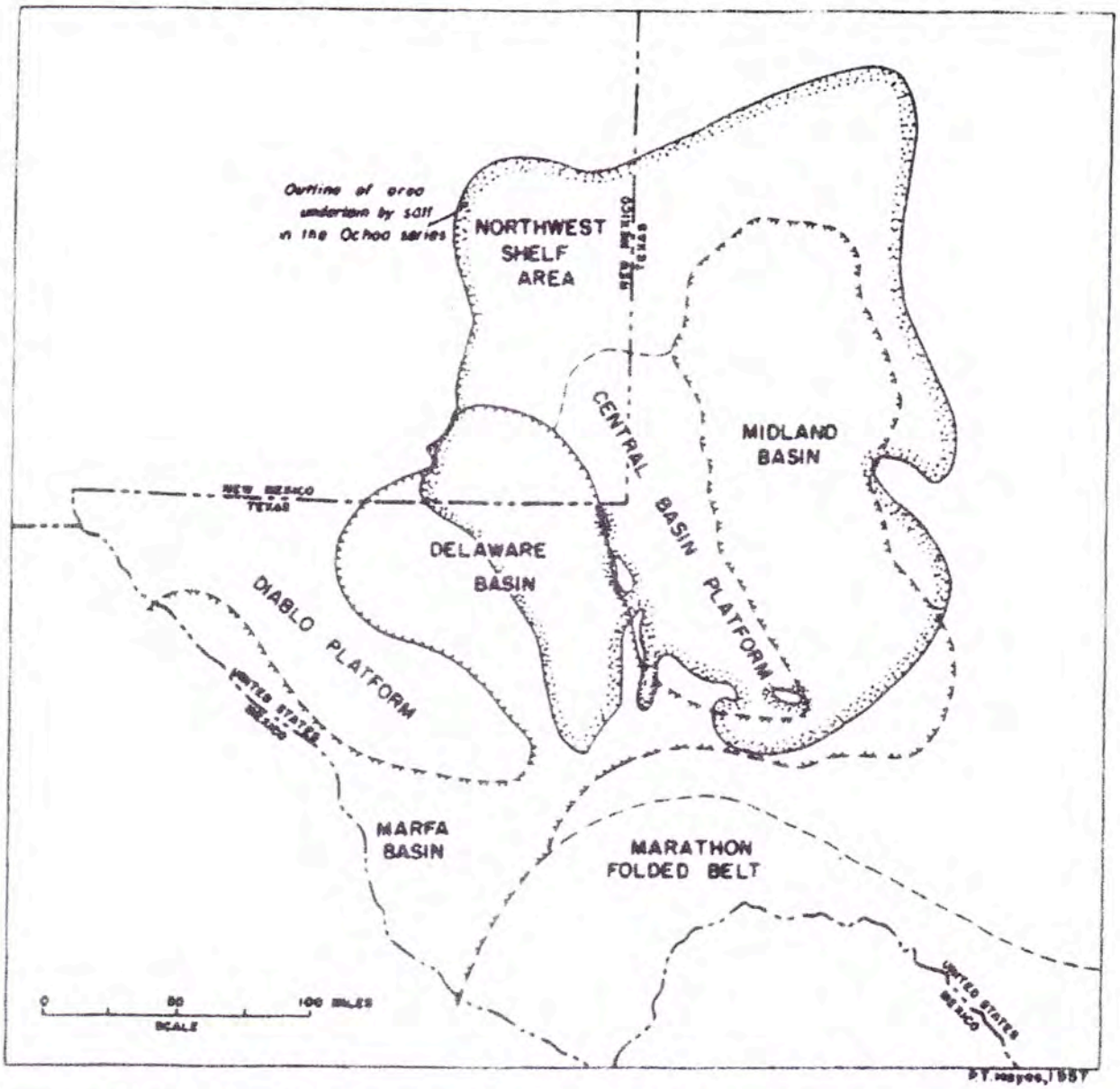


Fig. 1. Index map showing outline of area underlain by salt in the Ochoa series in relation to late Permian basins and shelf areas. (Adapted from King, 1948).

STRATIGRAPHIC CHART

SYSTEM	SERIES	DELAWARE BASIN		CENTRAL BASIN PLATFORM		NORTHWEST SHELF		MIDLAND BASIN	
PERMIAN	OCHOA	Dewey Lake		Dewey Lake		Dewey Lake		Dewey Lake	
		Rustler		Rustler		Rustler		Rustler	
		Salado		Salado		Salado		Salado	
		Castile							
	GUADALUPE	Delaware Mtn. Group	Lamar		Tansill	Whitehorse	Tansill	CAPITAN	Whitehorse	Tansill
			Bell Canyon		Yates		Yates			Yates
					Seven Rivers		Seven Rivers			Seven Rivers
			Cherry Canyon		Queen		Queen			Queen
					Grayburg		Grayburg			Grayburg
			Brushy Canyon	Word	San Andres	Word	San Andres	GOAT SEEP	Word	San Andres
					Glorieta		Glorieta			San Angelo

BW-28 KEY

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drille 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 speci tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, tr vertical depths shall also be reported. For multiple completions, Items 25 through 29 shall be reported for each zone. The form is to 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	T. Canyon	T. Ojo Alamo	T. Penn. "B"
T. Salt	T. Strawn	T. Kirtland-Fruitland	T. Penn. "C"
B. Salt	T. Atoka	T. Pictured Cliffs	T. Penn. "D"
T. Yates	T. Miss	T. Cliff House	T. Leadville
T. 7 Rivers	T. Devonian	T. Menefee	T. Madison
T. Queen	T. Silurian	T. Point Lookout	T. Elbert
T. Grayburg	T. Montoya	T. Mancos	T. McCracken
T. San Andres	T. Simpson	T. Gallup	T. Ignacio Otzte
T. Glorieta	T. McKee	Base Greenhorn	T. Granite
T. Paddock	T. Ellenberger	T. Dakota	T.
T. Blinebry	T. Gr. Wash	T. Morrison	T.
T. Tubb	T. Delaware Sand	T. Todilto	T.
T. Drinkard	T. Bone Springs	T. Entrada	T.
T. Abo	T.	T. Wingate	T.
T. Wolfcamp	T.	T. Chinle	T.
T. Penn	T.	T. Permain	T.
T. Cisco (Bough C)	T.	T. Penn "A"	T.

OIL OR GAS SANDS OR ZONES

No. 1, from ..... to ..... No. 3, from ..... to .....
No. 2, from ..... to ..... No. 4, from ..... to .....

IMPORTANT WATER SANDS

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

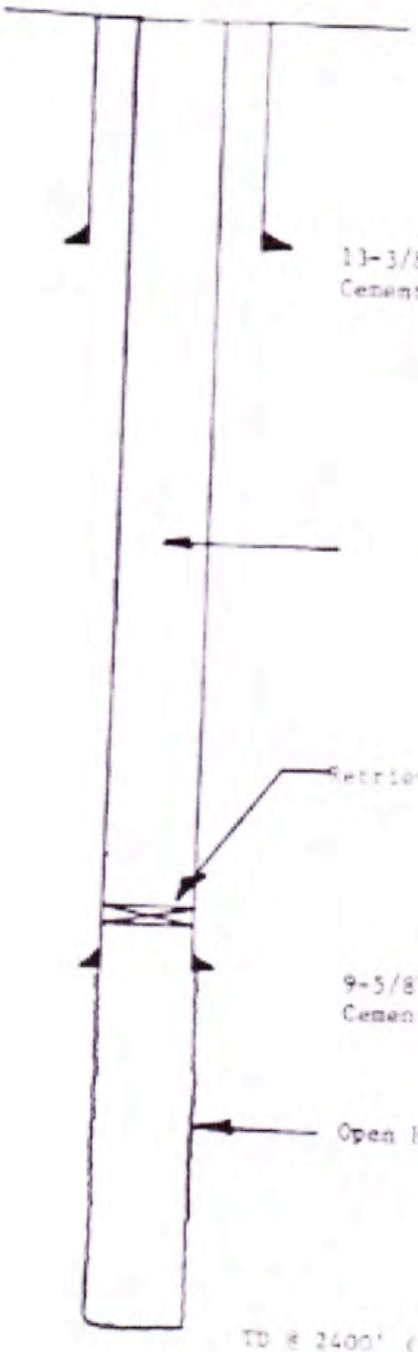
No. 1, from ..... to ..... feet .....
No. 2, from ..... to ..... feet .....
No. 3, from ..... to ..... feet .....

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	To	Thickness in Feet	Lithology	From	To	Thickness in Feet	Lithology
0	95	95	Caliche and Sand				
95	1262	1167	Red Bed				
1262	1390	128	Anhydrite				
1390	2200	810	Salt and Anhydrite				

Conoco, Inc.
Warren McKee Brine Well No. 1
710' FSL & 420' FWL, Section 2,
T-20S, R-38E, Lea County, NM

"Active/ TSI Wellbore Diagram"



11-3/8", 48 lb/ft, H-40 casing @ 250'
Cemented w/ 250 sx. (circulated to surface)

Packer fluid to surface

Conoco Packer Fluid No. 1 10 gal/100 bbl KCL
(inhibitor-bacteriacide-oxygen scavenger)
Conoco Packer Fluid No. 2 5 gal/100 bbl KCL
(potassium hydroxide)

Retrievable Bridge Plug @ 1405 w/ 2 sks sand

9-5/8", 36 lb/ft, H-40 casing @ 1456'
Cemented w/ 496 sx. (circulated to surface)

Open Hole

TD @ 2400' (PBTD @ 2340')

2/20/90 Loop

Key Energy Services
September 29, 2008
Current Wellbore

RKB
DF
GL

8 3/4" hole

7" 23# J-55 Casing
Set @ 1,204' 300 sx cmt
Circ. TOC at surface

7 7/8" open hole
1,234' 2,434'

PBTD
TD 2,434

Lease & Well No. **G.P. Sims # 2**

Well Category		Status	
Area	New Mexico		
Subarea	Eunice	Field	G.P. Sims
API Number	30-025-25525		
Legal Description	"A" 420' FNL & 210' FEL, Sec 32, T 21S, R 37E Lea County, New Mexico		
Spudded	05/02/1977		
Completed	05/05/1977		

Well History

5/77 Spud well on 5-2-77. TD 8 3/4" hole @ 1,204'
Ran 7" 23# K-55 casing to 1,204'. Cmt'd w/ 300 sks
Circulated 15 sks to pit
Drl. 7 7/8" hole to TD 2,434'
12/81 Pulled tubing out of well. Found tbg parted @ 1,243'
Ran bit and tubing to 1,441', though salt section
3/07 Pulled 1,229' of tubing from well. Ran 341' tubing in well

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-103
Revised 10-1-78

DISTRIBUTION
SANTA FE
FILE
U.S.G.S.
LAND OFFICE
OPERATOR

5a. Indicate Type of Lease: State ☐ Fee ☒
5. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS

Oil Well ☐ Gas Well ☐ Other: BRINE WELL
7. Unit Agreement Name: P+S BRINE Sales
Name of Operator: P+S BRINE SALES
8. Farm or Lease Name: EUNICE
Address of Operator: BOX 1075 EUNICE, N.M. 88231
9. Well No.: #1
Location of Well: Unit Letter O 630' feet from the South line and 2427' feet from the East line, section 34 township 21 range 37 NMPM.
10. Field and Pool, or Wildcat
15. Elevation (Show whether DF, RT, GR, etc.): 2426.5
12. County: LEA

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO: ☐ ☐ ☐ ☐ ☐ ☐ Other ☐

SUBSEQUENT REPORT OF: ☐ ☐ ☐ ☐ ☐ Other ☐

17. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

1. Riged up Drlg Rig.
2. Drlg to 1200' w/ 8 3/4 Bit - Run 7" CASING 1200'
3. Cemented CASING BACK to Surface.
4. Stood by 8 Hours for cement to set.
5. Drlg out w/ 6 1/4 Bit to 1816'
6. Laged down Drly Pipe Run Tubing to 1700'
7. Waiting on pump parts to Start inj. Water

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signed: Paul Prather Title: Partner Date: 7/17/80

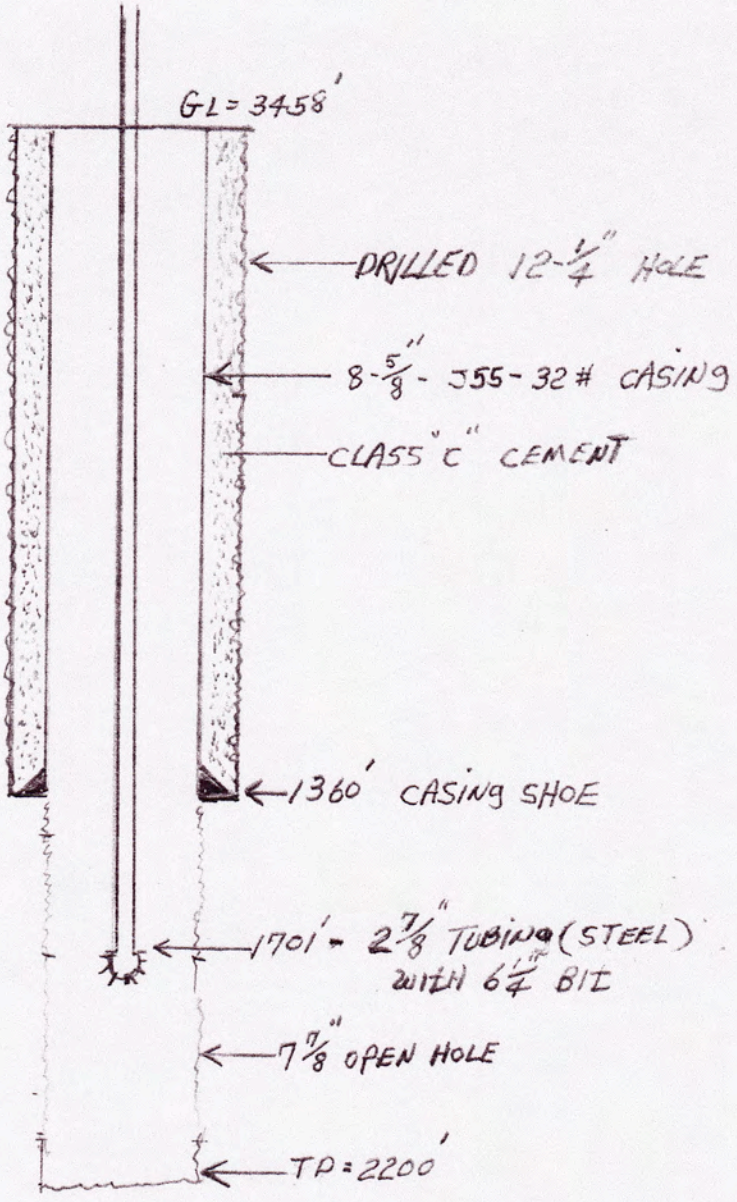
Orig. Signed by John Runyan

Approved by: Title: Date:

Conditions of approval, if any:

Wellbore Schematic Eunice Brine Well BW-28

Key Energy Services, LLC.



Lease:	Eunice State S
API#:	30-025-33547
Ogrid #:	19797
State:	NM
County:	Lea
Location	UL E Section 15-Ts 21s-R37e
Spud Date:	09-28-96
Up-dated:	Feb 21, 2011
By:	Wayne Price

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

August 14, 2007

Mr. Dan Gibson
Key Energy Services, LLC
6 Desta Drive, Suite 4400
Midland, Texas 79705

Re: Key Energy Services, LLC, Brine Well Discharge Plan (BW-028)
State Well #1 (API# 30-025-33547)
UL:E 15-21S-37E, Lea County

Dear Mr. Gibson:

The New Mexico Oil Conservation Division (OCD), Environmental Bureau (EB) has confirmed that your discharge plan is currently expired and without a permit. This is a violation of your discharge plan permit and is subject to penalties under 20.6.2 NMAC.

Therefore, the EB hereby requests that you submit a discharge plan renewal application with $100.00 filing fee (check made payable to the "Water Quality Management Fund") by September 17, 2007. Along with your application, you will need to address the attached 20.6.2.3108 NMAC Public Notice provisions for administrative completeness.

In addition, the OCD is upgrading the minimum bond amount to $50,000.00 for Class I and III Wells effective January 1, 2008. Our current bond record for your brine well indicates that you satisfy the $50,000.00 amount. Our bond record for your well currently indicates the following:

Bond: RLB0003249; $50,000.00; 6/01/01; RLI Insurance Company

Please contact me at (505-476-3491) or E-mail carlj.chavez@state.nm.us if you have questions. Thank you.

Sincerely,

Mr. Carl J. Chavez
UIC Quality Assurance/Quality Control Officer

xc: OCD District Office

Section VII.B-VII.C1-6 Appendix:

Includes:

1. Results of Injection Pressure Model Excel Spreadsheet.
2. Friction Charts.
3. Eaton Equation for Old Brine Well BW-19.

Maximum Injection Pressure Model

Pr (frac pressure gradient) = (S-Po)*(Y/(1-Y))+Po ----------

Overburden pressure gradient psi/ft	1	psi/ft	input
Pore pressure gradient	0.52	psi/ft	input
Brine water gradient	0.52	psi/ft	input
D = Depth to injection zone or casing shoe	1360	ft	input
Y = poissan's ratio	0.32		input
S (overburden pressure) = 1 psi/ft x depth to injection	1360	psi	formula
Po = pore pressure	707	psi	formula
Calculated Frac Gradient	0.745882353	psi/ft	formula
			formula
			formula
Frac Pressure at injection point	1014	psi	formula
Maximum Static Surface Pessure	307	psi	formula
***Friction Loss	80	psi	input
Maximum Injection Pressure	387	psi	formula

*** See friction charts attached
3-4 bbls/min - 3" pipe- 3000 ft pipe

Fig. 10-11

Pressure drop for flowing water

The laboratory Poissan's ratio for salt is 0.25. Using the equation below, the potential downhole fracture pressure at the top of the perforations for the two wells is calculated.

$$P_f = (S - P_o)\ (Y / 1 - Y) + P_o$$

P_f = fracture pressure (psi) at injection face
S = overburden pressure
P_o = pore pressure
Y = Poissan's ratio = 0.25
Brine gradient = 0.52 psi/ft.

City of Carlsbad #1	State #1
Top of perfs= 710 S = 1.0 x 710 P_o = 0.46 x 710 = 327 psi P_f = 455	Top of perfs = 1350 S = 1.0 x 1350 P_o = 0.46 x 1350 P_f = 864
Top Hole fracture pressure = 455 psi – (710 x 0.52 psi/ft) = 86 psi	Top Hole fracture pressure = 864 psi – (1350 x 0.52) = 162 psi
Total hole fracture pressure Friction loss = 62 psi	Total hole fracture pressure Friction loss = 118
Maximum Injection Pressure = 148 psi	Maximum Injection Pressure = 280 psi

Injection pressure at the surface on the City of Carlsbad #1 is 100 psi. Injection pressure at the surface on the State #1 is 220 #. Both wells are operating under the calculated maximum pressures.

Section VIII. Appendix:

Includes:

"Emergency Contingency Plan"

Emergency Contingency Plan

Key Energy Eunice Brine & Fresh Water Station

Location of Facility:

Approximately 2.5 miles north of Eunice, New Mexico, on North Loop 18 (State Hwy 248) in Lea County, New Mexico, approximately 400 feet east of the roadway. Legal location is defined as the SW/4 NW/4 of Section 15-Township 21 South- Range 37 East.

Latitude/Longitude: *Water Station* - (N 32°-29.011' W 103°-09.507') *Well Location-* (N 32°-28.941' W 103°-09.512')

See attached map for reference.

Local Key Energy Response Personnel:

Eunice Yard Office and Dispatcher.....575-394-2581
Bob Fisher-Yard Manager.....575-631-7431
John Sanders- Brine Well Supervisor.....575-631-7416

Local Mailing Address:
Key Energy Services, LLC.
2105 Ave. O (P.O. Box 99)
Eunice, NM 88231

Remote Key Energy Response Personnel:

Dan K. Gibson-Environmental Dir.....432-571-7536 office
432-638-6134 cell
Louis Sanchez-Environmental Spec.....432-571-7382 office
432-230-7926 cell

Remote Mailing Address:
Key Energy Services, LLC.
6 Desta Drive. Suite 4300
Midland, Texas 79705

Emergency Response Agencies:

Local Fire and Medical.....911
Lea County Sheriff Dept.....575-396-3611
Eunice Fire Department.....575-394-2112
Eunice Police department.....575-394-2112
New Mexico State Police.....575-392-5588

Reporting Agencies:

New Mexico Oil Conservation (Santa Fe).....505-476-3440
New Mexico Oil Conservation (Hobbs).....575-393-6161
National Response Center.....800-424-8802
EPA Region 6 Emergency Response.....214-665-6428
Chemtrec.....800-424-9300

Materials Stored or Transferred On Site:

>Fresh Water & Brine Water- (Non-Hazardous)>>>>>>>>>>>>>>>>>>>

>Contaminated Soil- (Non-Hazardous)>>>>>>>>>>>>>>>>>>>>>>>>>
>Common Trash- (Non-Hazardous)>>>>>>>>>>>>>>>>>>>>>>>>>>>>

General Location of anticipated Leaks/Spills:

>Water station inside lined-bermed tank battery, concrete loading pad and lines between pump house and brine well.

>Sealed bins or drums at water station.
>Trash bins at water station.

Prevention:

>Brine water storage tanks have impermeable containment and level controls.

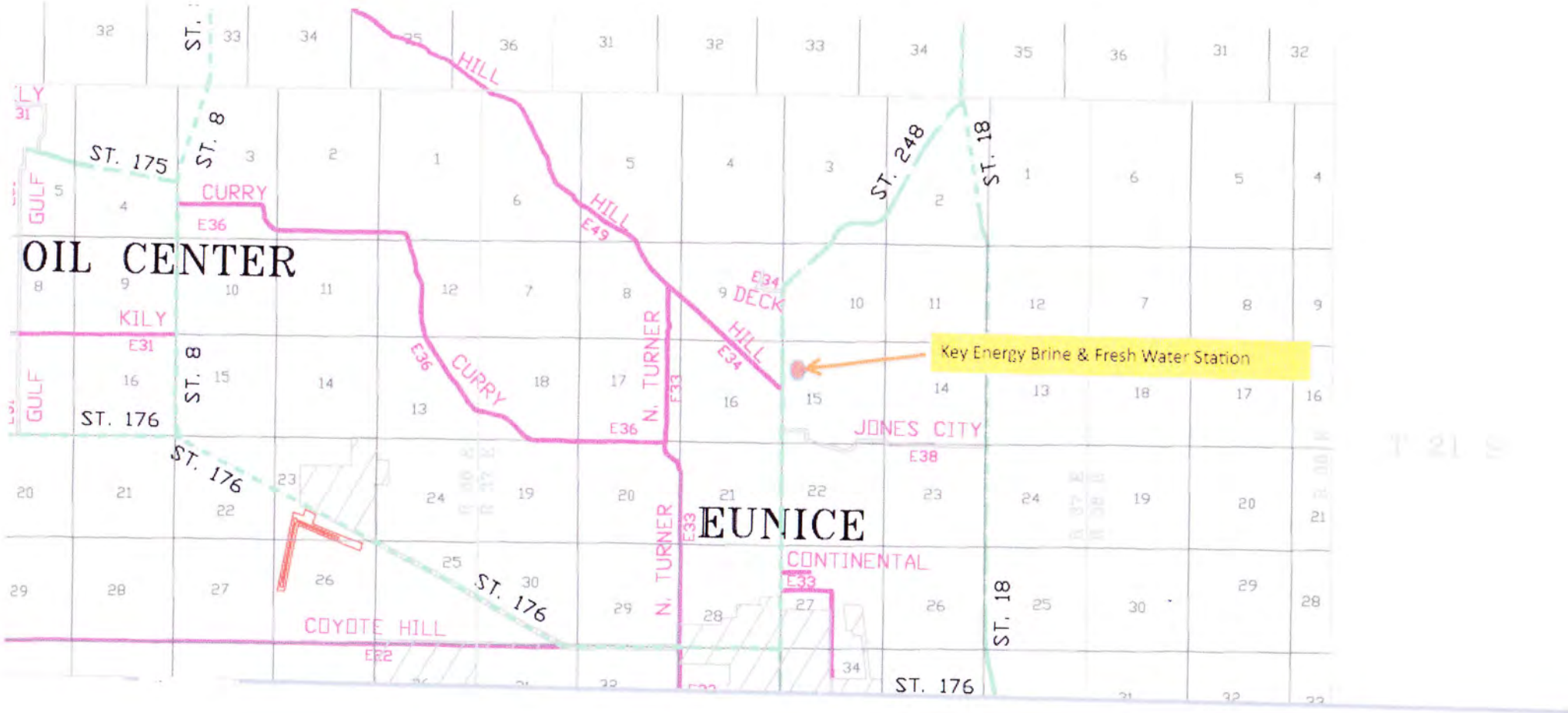
>Waste containers on pad & curb.
>Spills outside of containment areas will be contained with dirt berms.

Containment and Clean-up Actions:

>Incidental drips, leaks, and spills will be picked up routinely by on-site personnel and placed back into the system or in waste containers.
>Any release of brine water over 5 bbls; or 1 bbl of chemical or 1 bbl of waste; that is discharged out of the secondary containment will be handled pursuant to the Emergency Procedures and Notification below.

Emergency Procedures and Notification:

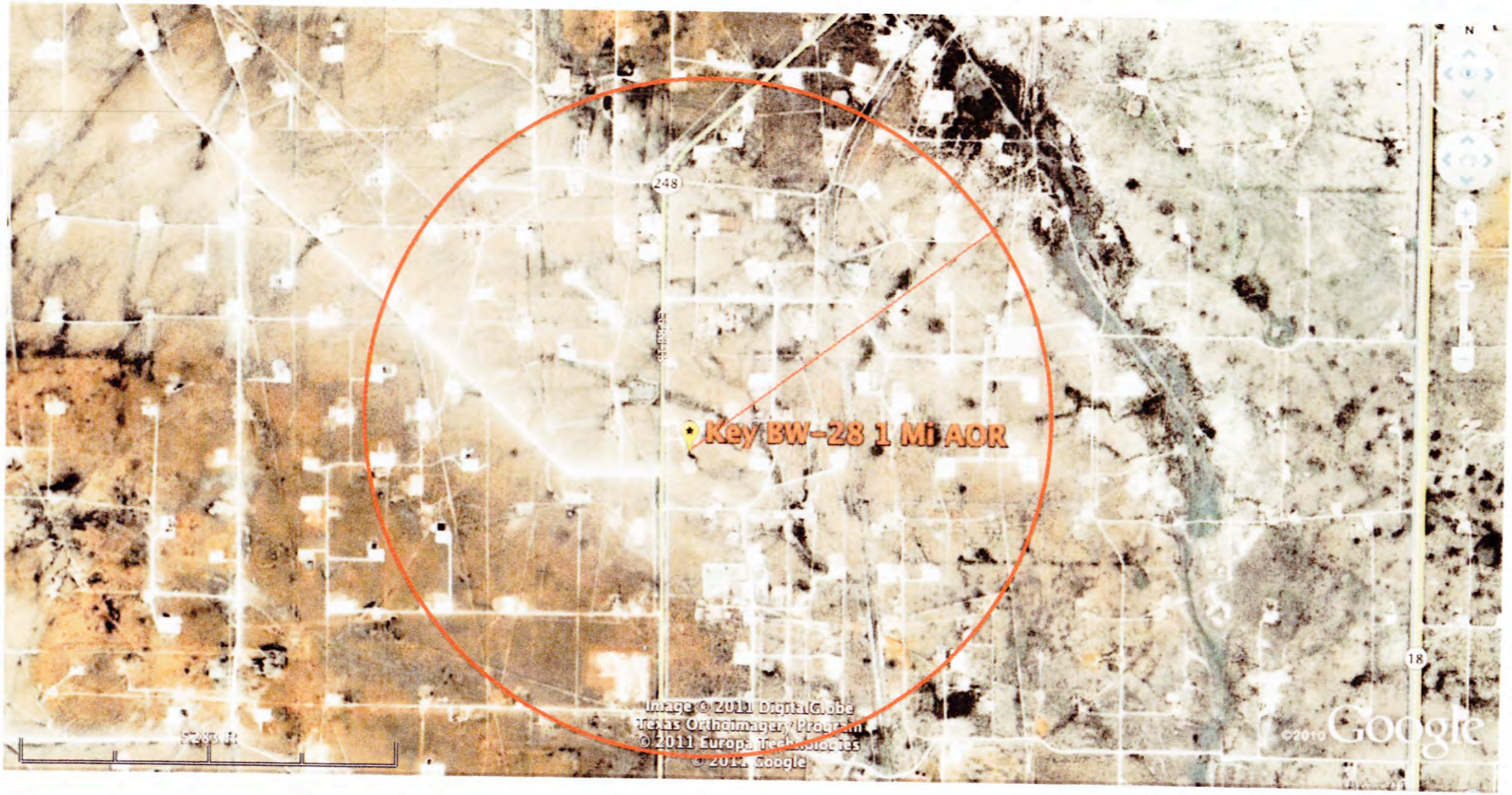
Step 1. "***Call Immediately***" ---Key Energy "***Dispatch Telephone Number***" listed above for all uncontrolled releases outside of a containment area; or for any fire, break, leak or spill that has caused, or may cause, a life-threatening situation.
Step 2. "***Call Immediately***" ---One of the ***Emergency Response Agencies*** listed above if there is a life-threatening situation.
Step 3. Provide assistance to "First Responders" as directed and allowed by Key Energy Supervisor.
Step 4. Stop the release, only if you have been trained or have experience in the operations of the site, and only if it can be done in a safe manner.
Step 5. Key Energy will use all available resources in the area to stop, contain and mitigate the emergency situation.
Step 6. During "***Emergency Response Conditions***"--- fluids, contaminated soils, or waste-like materials may be contained, temporarily stored, picked up, recycled or disposed of off-site at an approved facility.
Step 7. Key Supervisor shall "***Notify the Reporting Agencies***" as appropriate, listed above.
Step 8. ***Incident Command System (ICS)*** --If the emergency is series enough to have the Local or State police initiate the incident command system (ICS), then Key Energy will take an active roll as directed by the incident commander.


OIL CENTER
EUNICE
ST. 175
ST. 8
ST. 176
ST. 248
ST. 18
GULF
KILY
E31
CURRY
E36
HILL
E49
E34
DECK
N. TURNER
E33
JONES CITY
E38
CONTINENTAL
COYOTE HILL
E22
Key Energy Brine & Fresh Water Station

Section IX.A.1-4 Appendix:

Includes:

1. Aerial photo of surface water features-One-mile "area of review" (AOR).
2. Water Well Search Office of the State Engineers verification record search.
3. Plate 1 "Geologic Map of Southern Lea County, New Mexico"
4. Plate 2 "Ground-Water Map of Southern Lea County, New Mexico" shows the water table contours in the general area.
5. Aerial photo showing erosional features.


Key BW-28 1 Mi AOR
248
18
Image © 2011 DigitalGlobe
Texas Orthoimagery Program
© 2011 Europa Technologies
© 2011 Google
©2010 Google

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

No records found.

Basin/County Search:

Basin: Lea County

PLSS Search:

Section(s): 9, 10, 11, 14, 15, 16, 21, 22, 23 Township: 21S Range: 37E


Key Brine Well BW-28
248
Image © 2011 DigitalGlobe
US Census Bureau
© 2011 Google

Appendix for Public Notices:

Includes:

1. Copy of public notice letter to property owner of site. *
2. Copy of public notice of 3"x4" newspaper display ad. **

Notes:

- The property owner is the State of New Mexico-State Land Office.
- The display ad will be placed in the Hobbs News Sun Newspaper.

Public Notice Letter

Legal notification to property owner(s) of the site per Water Quality Control Commission Regulations 20.6.2.3.108.B.3 NMAC

Certified Mail Return Receipt Requested:

Property Owner of Record:

Name:

Address:

City/County:

State:

Public Notice

Key Energy Services LLC, 6 Desta Drive Suite 4300 Midland, TX 79705, Dan Gibson Corporate Environmental Director, has filed an application with the New Mexico Oil Conservation Division (OCD) to renew the operating permit for a class III brine well for its existing brine and fresh water station previously permitted by the OCD as BW-28.

This site is located approximately 2.5 miles north of Eunice, New Mexico, and 350 feet east, just off of the North Loop 18 (State Hwy 248) in Lea County, New Mexico, in SW/4 NW/4 UL E of Section 15-Township 21 South-Range 37 East. The site is located in a dense oilfield with many lease roads, pipelines and overhead electric utilities lines. Presently, there are no houses, schools, occupied buildings, or public parks, etc. with in one mile of the site.

The existing water station and brine well may be located within one-third mile (i.e. 1760 ft) from your property boundary or on your property. The site is located on State Trust Land administered by the New Mexico State Land Office and operates under a state mineral lease # MS 0004 0001.

Brine water is used in the Oil and Gas industry to supply a "heavy pure sodium chloride" concentrated salt water (i.e. brine water) with a total dissolved solids concentration of approximately 320,000 mg/l and a density that is 20% higher than fresh water. Heavy brine water is essential in preventing blow-outs in high pressure gas wells and prevents loss of circulation when drilling through salt zones typically found in the Permian Basin area.

Fresh water obtained from the City of Eunice, NM will be injected deep into the Salado salt formation at a depth ranging from 1300 to 1700 feet below the surface to produce brine water. The site will produce approximately 20,000-30,000 barrels of brine water per month.

An engineering model that included safety factors was developed to verify the long- term stability of the site. Ground water in this area is somewhat limited, with some dry holes being encountered while in other wells groundwater may be present, in shallow lenses 30-60 feet deep. The shallow groundwater in this area is typically not used for drinking water and when found is in very limited quantity. There are no wells located within the well's ¼ mile area of review, therefore no quality information is available at this time.

This facility will be designed and permitted to have no intentional water contaminants discharged to the surface or subsurface for the protection of possible groundwater. The system will have concrete and synthetic liners to prevent any spills or leaks from reaching the ground surface.

If you have any questions or concerns please do not hesitate to contact Key Energy at the address above or you may contact Wayne Price 505-715-2809 or E-mail [redacted]. Key welcomes your input.

The New Mexico Oil Conservation Division (OCD) will accept comments and statements of interest regarding this application and will create a facility-specific mailing list for persons who wish to receive future notices. Interested persons may contact Jim Griswold, Oil Conservation Division (OCD) 505-476-3465 or by writing 1220 South Saint Francis, Santa Fe, New Mexico, 87505.

Para obtener más información sobre esta solicitud en espanol, sirvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservacio´n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Dorothy Phillips, 505-476-3461)

Public Notice Display Ad

Legal notification for 3"x4" newspaper display add per Water Quality Control Commission Regulations 20.6.2.3.108.B.4 NMAC

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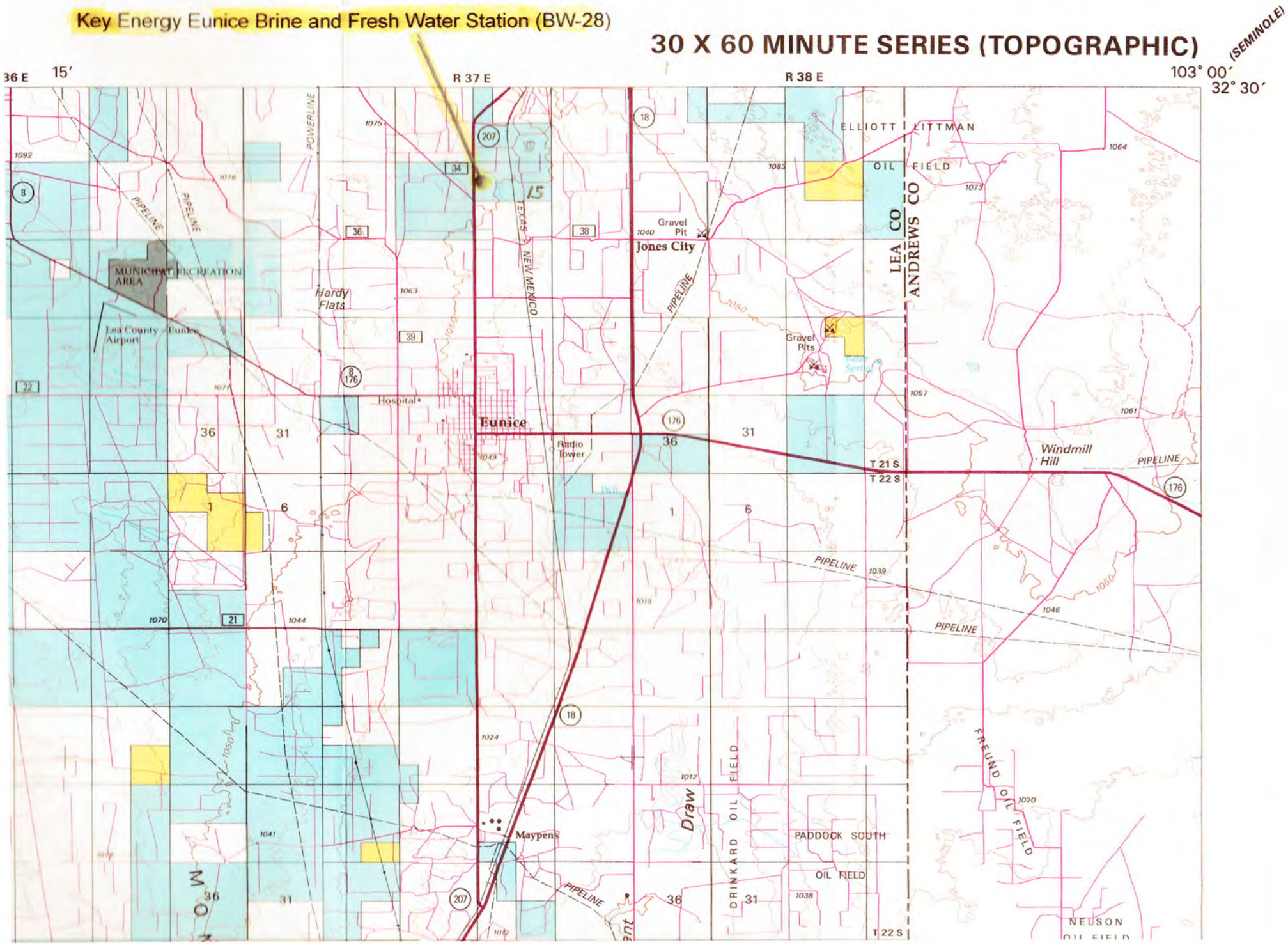
Section I-IV. Appendix:

Includes:

1. BLM Surface Management Status Topographic Map 1:100,000 scale with elevation contours, roads, water features and section, township and range lines (NGVD-1929) USGS and location of proposed site.

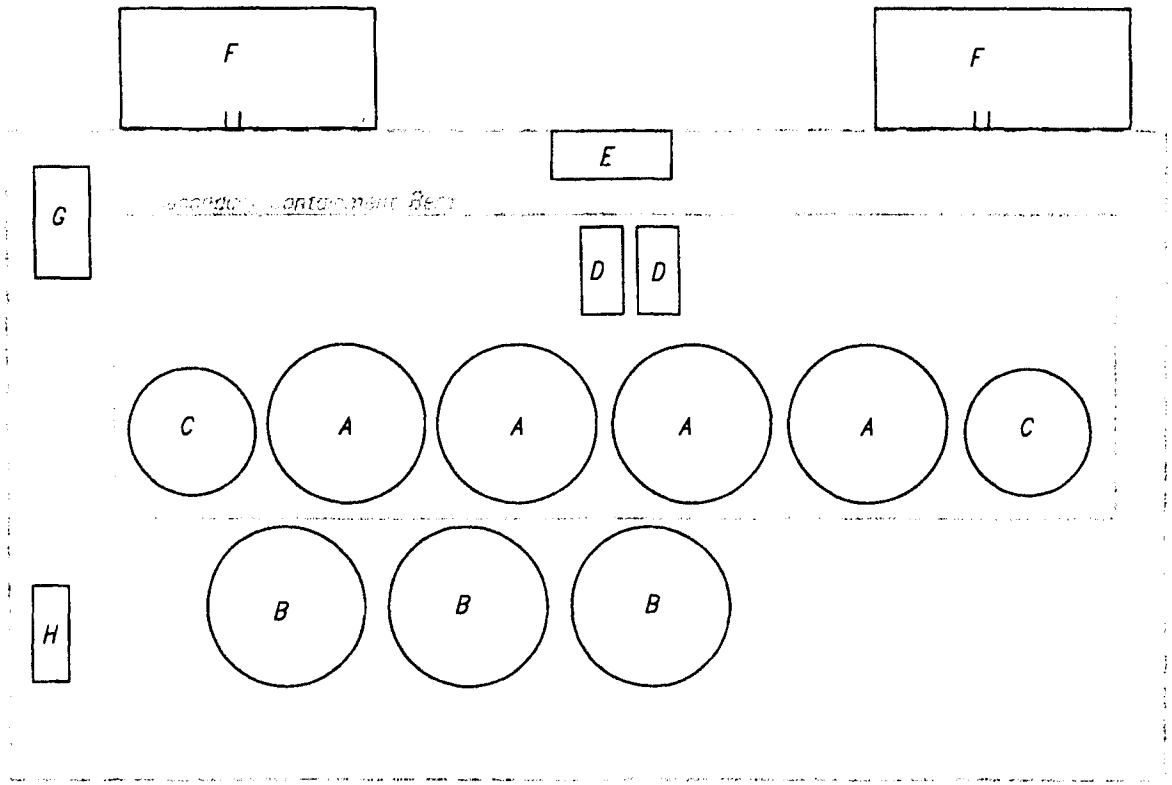
Key Energy Eunice Brine and Fresh Water Station (BW-28)



Section VI. Appendix:

Includes:

2. Facility Diagram
3. Fluid Flow Diagram
4. Recent photos of the water station.



N

Not to Scale

A Brine Water Storage Tank

B Freshwater Storage Tank

C Tank Pad Drain Storage Tank

D Brine Pump

E Card Reader

F Concrete Loading Dock with Loading Valves

G Freshwater Pump

H Electrical Panel

Facility Diagram
Key Energy Discharge Plan BW-028
Near Eunice, New Mexico

Figure 2

5317308
08-07

Revisions
By: _____ Date: _____ Descr.: _____
By: _____ Date: _____ Descr.: _____

Drawn MLV
Checked DJE
Approved DJE

SMA
401 North Seventeenth Street, Suite 4
Las Cruces, New Mexico 88005-8131
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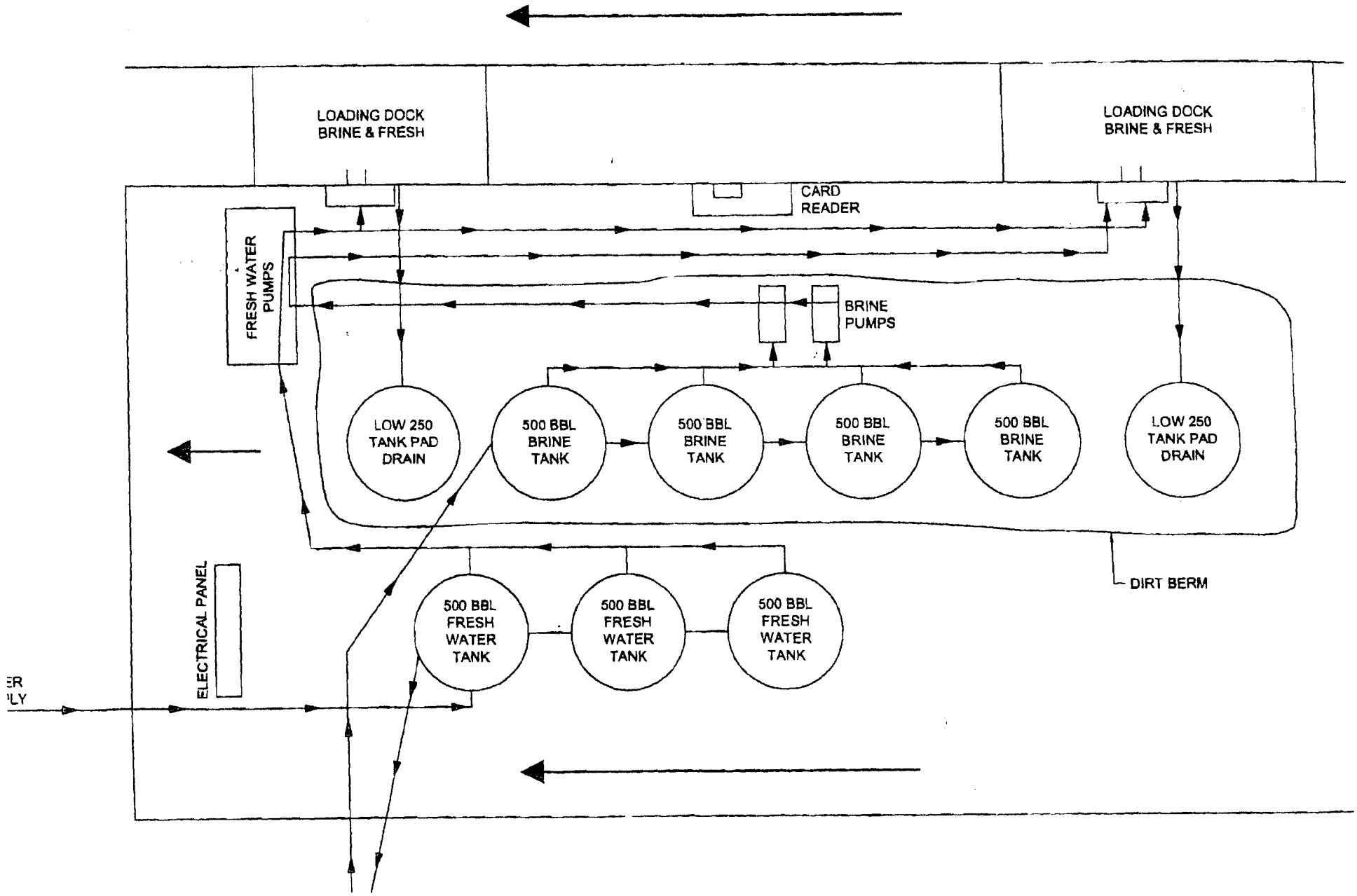

LOADING DOCK
BRINE & FRESH
LOADING DOCK
BRINE & FRESH
CARD
READER
FRESH WATER
PUMPS
BRINE
PUMPS
LOW 250
TANK PAD
DRAIN
500 BBL
BRINE
TANK
500 BBL
BRINE
TANK
500 BBL
BRINE
TANK
500 BBL
BRINE
TANK
LOW 250
TANK PAD
DRAIN
DIRT BERM
ELECTRICAL PANEL
500 BBL
FRESH
WATER
TANK
500 BBL
FRESH
WATER
TANK
500 BBL
FRESH
WATER
TANK

BW-28 Recent Photos

Sign At Entrance-Looking South

East Load Pad Driveway-Looking ESE

Brine Well Sign and Well House-Looking South

East Side Berm-Looking SE

Subsidence Monitor Stake-Looking SE

West Load Pad-Looking South

Loading Pad Sump-connected to line going to above ground tank.

Liner is under this area.

Section VII. Appendix:

Includes:

1. Steady-State Model: Brine Well Roof Stability Calculations Using Beam Theory (3 pgs).
2. Eunice Brine Well output results on Excel spreadsheet.

Brine Well Roof Stability Calculations Using Beam Theory. (Steady-State Model)

A steady state model was developed to calculate the stress(s) developed in a cantilever beam that is uniformly loaded. The maximum compressive, tensional and shear stress can be assessed using the general flexure bending formulas found in Civil Engineering Text Books.

Several similar studies have been conducted by various organizations such as SMRI, DOE (WIPP), and National labs. Most of these studies used complex finite-difference time dependant models with multiple variables. The roof designs varied from using a cohesive circular plate, strongest of the roof designs, a uniform loaded beam supported on two ends, to a uniformly loaded cantilever beam which would be the weakest of the roof configurations. This later approach provided the most conservative results.

The idea of using a cantilever beam may well be the most representative when manmade or natural stress fractures are considered. Referring to the figure "Fractured Anhydrite Circular Plate Over Brine Cavern", which can be found in this section VII appendix, represents a stiff anhydrite that has very cohesive connection points to the anhydrite layers outside of the cavern. This diagram shows how fractures may actually reduce the plate into several independent cantilever beams supported at the connection points.

The starting formulas were $\sigma = My/I$ for maximum flexure stress at the outer most (i.e. upper and lower) fibers of the beam, which are in compression and tension. The maximum shear stress formula is $\tau = VQ/It$, which gives the maximum shear stress, generally found in the center of the beam. Stress units are in pounds per square inch (psi), the first moment (M) is in inch-lbs, with second moment (I) is in $inch^4$, and (y) is the distance measured from the center of the beam to the outer fibers. All units designated in feet measurements are converted to inches for unit consistency.

Pure bending, neglecting longitudinal shear, with no axial or torsion effects is simulated. The beam is considered a stiff anhydrite material of homogenous and isotropic properties. When more than one beam (anhydrite layer) is present above the salt zone, then the overall beam thickness is set to the combined thickness. Since compressive strength properties of concrete type materials i.e. anhydrite, are substantially larger than the tensile strength, the tensional properties is used to allow the most conservative results.

Slippage due to shearing between the anhydrite beds is neglected. It should be pointed out that some error could be introduced by using this assumption.

Physical properties of anhydrite were obtained from various references and handbooks. Average figures for these properties are used in the calculations. The geometry of the beam was selected to be a rectangle with the length of the beam being considerably longer than the width. For simplicity, the beam width will always be 1 foot (12 inches wide) to allow for uniform loading, and the length and height (i.e. thickness) are input variables.

The weight on the beam shall be the overburden of the earth material including the beam. The density of the rocks and soils were generally set at 100 lbs/ft^3. For example, If the rocks and soil on top of the beam weights 100 lbs/ft^3, and if the distance from the surface to the top of the salt is 1000 feet, then the total weight on 1 ft^2 would be 100,000 lbs.

The model equations include the counter hydrostatic forces generated by the well bore hydrostatic head on the cavern formation. These forces actually push upward and help support the roof beam. The model output actually provides stresses on the beam with and without these hydrostatic forces.

The density of the fluid can be varied in the model between using fresh water and brine-water. While artificial forces, such as pump pressures, would also aid in supporting the roof, it was not included, so that the true static conditions could be represented at closure.

Formula details are, M is the moment at where the beam is attached to the cavern wall, Y is the distance from the centroid of the beam to the outer edges, and (I) is the second moment of inertia for the beam looking at the end view. V is the maximum weight on the beam, Q the first moment of the beam, I the second moment, and t = thickness of which the shear force will be distributed across.

Mohr's circle, a very simple standard civil engineering technique, was used to verify the interaction between the maximum tensional stresses (σ) and resulting shear stresses (τ). A general rule of thumb allows the maximum shear stresses to be estimated as one half of the difference between the maximum and minimum normal stresses $\tau = (\sigma max - \sigma min)/2$.

Since the maximum tensile strength of the anhydrite is used as the limiting property, the maximum shear force would be one-half of the normal stresses and generally neglected. As previously stated, this assumption could cause error in the analysis.

This approach presents a very simple and friendly method to the problem, albeit with some acceptable error. The outer fibers of the anhydrite are in pure bending under tension and the shear forces are zero. Where the fibers in the center of the beam have zero compressive and tensional stresses, but has the maximum shear force. The actual maximum stresses and resultant angles becomes a complex tri-axial study beyond the scope of this presentation.

An Excel spreadsheet was used to handle the equation and various input variables were manually inputted. **The input variables are:**

Input #1 - The length (ft) of the beam, (i.e. radius of the cavern).

Input #2 - Thickness (ft) of the roof beam (i.e. thickness of the anhydrite layers).

Input #3 - Depth of the overburden, measured in feet from the surface to top of the salt.

Input #4 - Thickness (ft) of the salt zone of interest.

The following output results are:

Output #1 gives the maximum tensional stress in the beam near its support. A value of 1200 psi was selected to be the maximum allowable stress in the beam. Any output numbers above this threshold were deemed unsafe and the beam would fail.

Output #2 gives the maximum tensional stress in the beam near its support without the hydrostatic counter forces of the well bore.

Output #3 gives the D/H ratio of the system. This ratio has been used as recent guidance for determining if a cavern is deemed unsafe. Ratios greater than .66 have been linked to collapsed wells. A threshold of .50 has been suggested to be the limit for brine wells. (Griswold OCD). D is defined as the Diameter of the cavern, where H is the depth between the surface and top of the salt.

Output #4 provides the maximum surface static or test pressure (psig) allowed.

Output #5 shows the maximum diameter of the cavern.

Output #6 is the estimated amount of brine that could be produced out of cavern with the inputted configuration. The equation used a right cylinder reduced by 25% to more closely simulate a flask looking cavern. This figure is included in section VII. appendix for review.

Output #7 provides a recommended safety factory of 2:1 derived from dividing the allowed tensile strength (1200 psi) by output #2.

Output #8 provides a simple "Yes" or "No" recommendation for the system. A truth table was set up to evaluate the seven parameters mentioned above. In order for the system to receive a "YES" recommendation it must pass all seven parameters. The output recommendation from a "Yes" to a "NO" for an existing well should be considered as a guide tool to raise the awareness that a determination of the well life should start being considered.

Eunice Brine Well Input Data:

The model was used to estimate the stresses in the Eunice State S BW-28 brine well with the following inputs:

Input #1- Estimated Cavern Radius = 66 ft or 132 ft diameter. (Current radius is calculated using a worst-case scenario of an inverted cone with total year to date brine production of approximately 4 million barrels.)

Input #2- Estimated 128 ft of anhydrite over the proposed salt zone. (obtained from drillers log)

Input #3- Estimated 1320 ft of overburden. (approximate depth of casing shoe).

Input #4- Estimated 400 ft of salt in Salado.

The Model Results for the Eunice Key Brine well are:

Output #1- Maximum stress = 184 psi (1200 psi allowed) with cavern filled with brine water and 1320 feet of hydrostatic head.

Output #2- Maximum stress = 731 psi (1200 psi allowed) with cavern filled with brine, but no hydrostatic head.

Output #3- D/H = 0.10

Output #4- 304 psig

Output #5- 132 foot diameter

Output #6- Brine production 4 million barrels

Output #7- 1.6 safety factor

Output #8- System Recommended "NO"

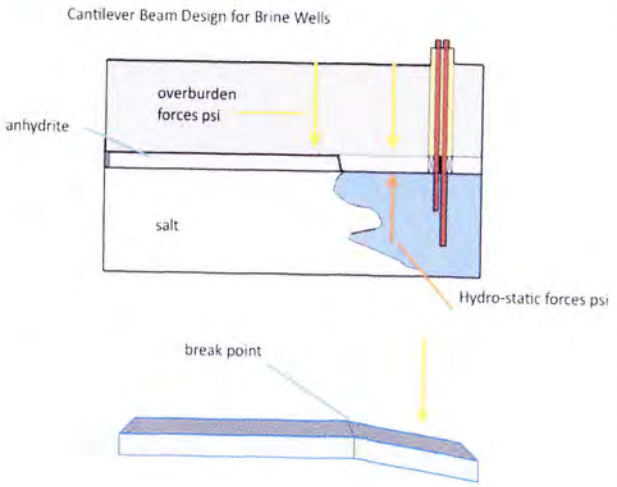
The results are included in the section VII. appendix for review.

Brine Well Roof Stability Steady State Model-

Cantilever Beam design when Anhydrite separtes from Casing.

Key Eunice Bell BW-28 State S

Inputs in green cells only

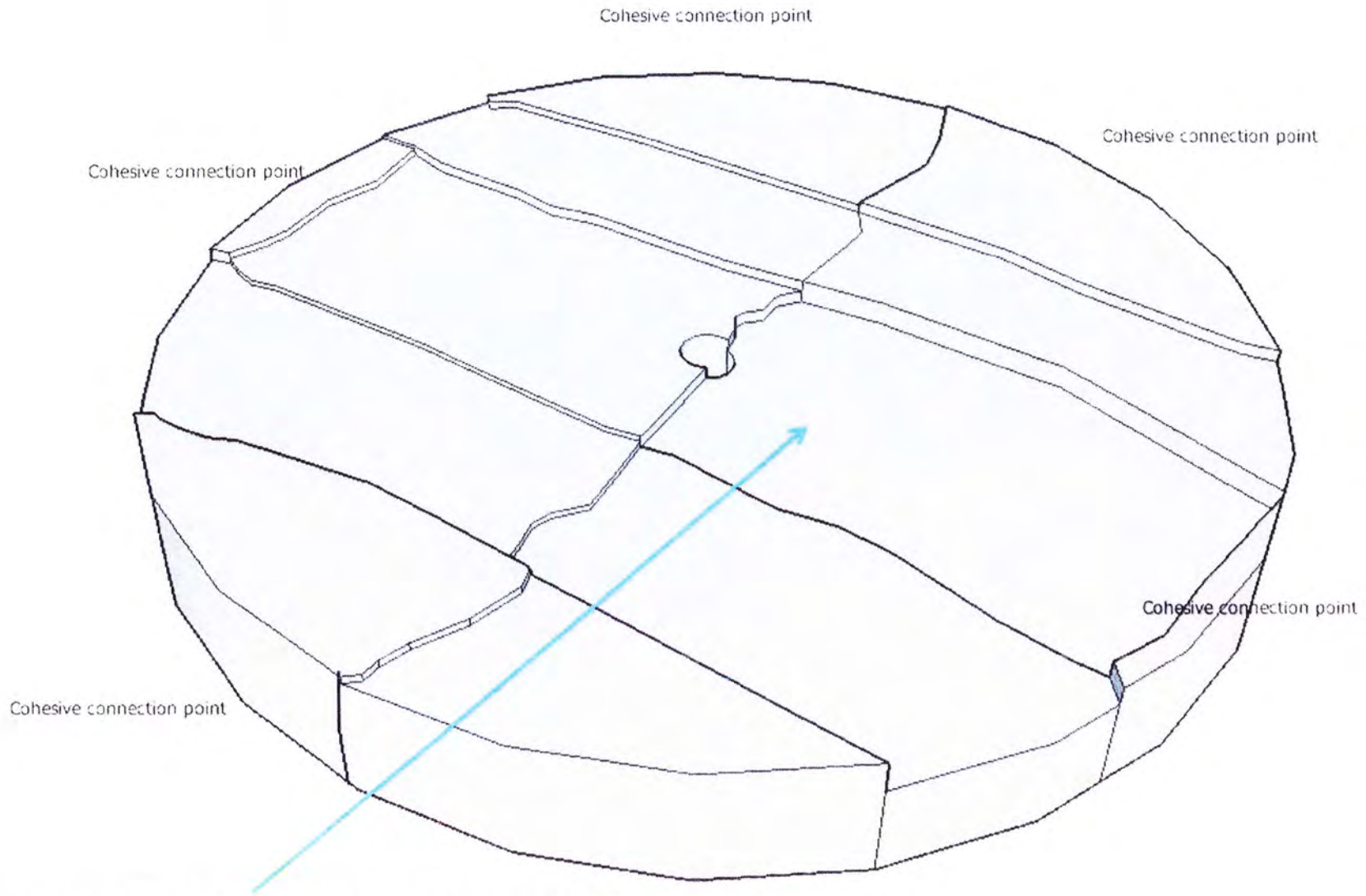


	Units			
σ = My/I (equation for flexure stress in a uniform loaded Cantilevel beam)	psi			
τ = VQ/It (equation for transverse shear stress in a uniform loaded Cantilevel beam)	psi			
σ = Normal Stress (tension or compression) psi	psi			
τ = Transverse Shear Stress psi	psi			
M = moment ft-lbs	ft-lbs	74407449.6	formula	
y = Distance of centroid to outer fibers inches	inches	768	formula	
I = second monment of inertia beam inches^4	inches^4	3623878656	formula	
w = Total uniform load of beam lbs/ft (Wob-Wc)	lbs/ft	34163.2	formula	
"-wc = counter uniform load generated by hydrostatic cavern pressure"	lbs/ft	101836.8	formula	
Wob = uniform load on beam from overburden lbs/ft (Wob-Wc)	lbs/ft	136000	formula	
Beam length in feet- Radius of Cavern	feet	66	Radius in (ft)	
Beam width in inches	inches	12	fixed	
Beam height in feet	feet	128	Anhydite Thickness (ft)	
V = Shear from total load at beam connection end	lbs		fixed	
Q = first moment of beam - end view center axis	inches		fixed	
t = thickness of beam or width in inches	inches		fixed	
P = Cavern hydrostatic pressure calculated directly below anhydrite or at casing shoe	psi	707.2	brine water	
Depth of casing shoe below ground surface	feet	1360	Depth to top of Salt (ft)	
Estimated thickness of Salt production zone	feet	400	Salt thickness (ft)	

Max Stress when the Cavern Pressure (psi) is maintained	>>>>>>>>	189	*Stable Roof*	Output #1	0
Max Stress when Cavern Pressure (psi) is not maintained	>>>>>>>>	753	*Stable Roof*	Output #2	0
Ratio of Cavern Diameter/Depth of Casing Shoe---(D/H <.50)	>>>>>>>>	0.10	*Within Limits*	Output #3	0
Max Surface Static or Test Pressure	>>>>>>>>	313	*PSIG*	Output #4	0
Max Cavern Diameter (Feet)	>>>>>>>>	132	*Feet*	Output #5	0
Estimated Brine Production Volume (Rgt cyclinder reduced by 25%)	>>>>>>>>	4	*Millon Barrels*	Output #6	0
Safety Factor (must be > 2.0)	>>>>>>>	1.6		Output #7	1
System Recommended	>>>>>>>	*NO*	<<<<<<<<<<	Output #8	1

Check shear stress	
τ = VQ/It (equation for transverse shear stress in a uniform loaded Cantilevel beam)	734
V = total load on beam (lbs) = depth ft x 100 lbs/ft2 x length ft	2254771.2
Q (first monment) = AD = Cross section area(BxH) x distance to the centroid= 1/2*H	14155776
I (second monment)= 1/12*base*height^3	3623878656
t (width of beam i.e. base) = 12 inches	12
Hydrostatic	6721228.8

Fractured Anhydrite Circular Plate Over Brine Cavern



Each plate becomes an independent cantilever beam

Section VII.A.1-4 Appendix:

Includes:

1. The complete copy of the brine well file. Includes original C-101, 102, 103's, formation records, C-105's, deviation report, casing and cementing records, and test results.

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

Form C-101
Revised October 18, 1994
Instructions on back
Submit to Appropriate District Office
State Lease - 6 Copies
Fee Lease - 5 Copies

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

[1] Operator Name and Address.	[2] OGRID Number
Gold Star SWD Ltd. Co. P.O. Box 1480 Eunice, N.M. 88231	148431
	[3] API Number 30 - 025-33547

[4] Property Code	[5] Property Name	[6] Well No.
19386	State	1

[7] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	15	21S	37E		1340	N	330	W	Lea

[8] Proposed 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

[9] Proposed Pool 1	[10] Proposed Pool 2
Salt (Brine Well)	

[11] Work Type Code	[12] Well Type Code	[13] Cable/Rotary	[14] Lease Type Code	[15] Ground Level Elevation
N	Brine	R	S	3458
[16] Multiple	**[17] Proposed Depth**	**[18] Formation**	**[19] Contractor**	**[20] Spud Date**
No	2200'	Salt	Capstar	9-5-96

[21] Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
12 1/4	8 5/8	28#	1350'	830	Circulate
7 7/8	Open Hole		2200'		

[22] Describe the proposed program. If this application is to DEEPEN or PLUG BACK give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

Drill 12 1/4" hole to 1350'. Run 8 5/8" casing, guide shoe, float collar, 5 centralizers. Cement with 150% excess 830 sx. WOC 18 hrs. Drill 7 7/8" hole to 2200', Run 2200' 2 7/8" fiberglass tubing.

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: Royce Crowell

Printed name: Royce Crowell

Title: Mgr-Member 505-394-2504

OIL CONSERVATION DIVISION

Approved by: ORIGINAL SIGNED BY JERRY SEXTON

Title: DISTRICT I SUPERVISOR

Approval Date: AUG 21 1996 Expiration Date:

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-33547	~~Salt (Brine Well)~~ 96173	~~Salt~~ BSW; Salado

Property Code	Property Name	Well Number
A386	STATE	1

OGRID No.	Operator Name	Elevation
148431	GOLD STAR SWD LTD. CO.	3458

Surface Location

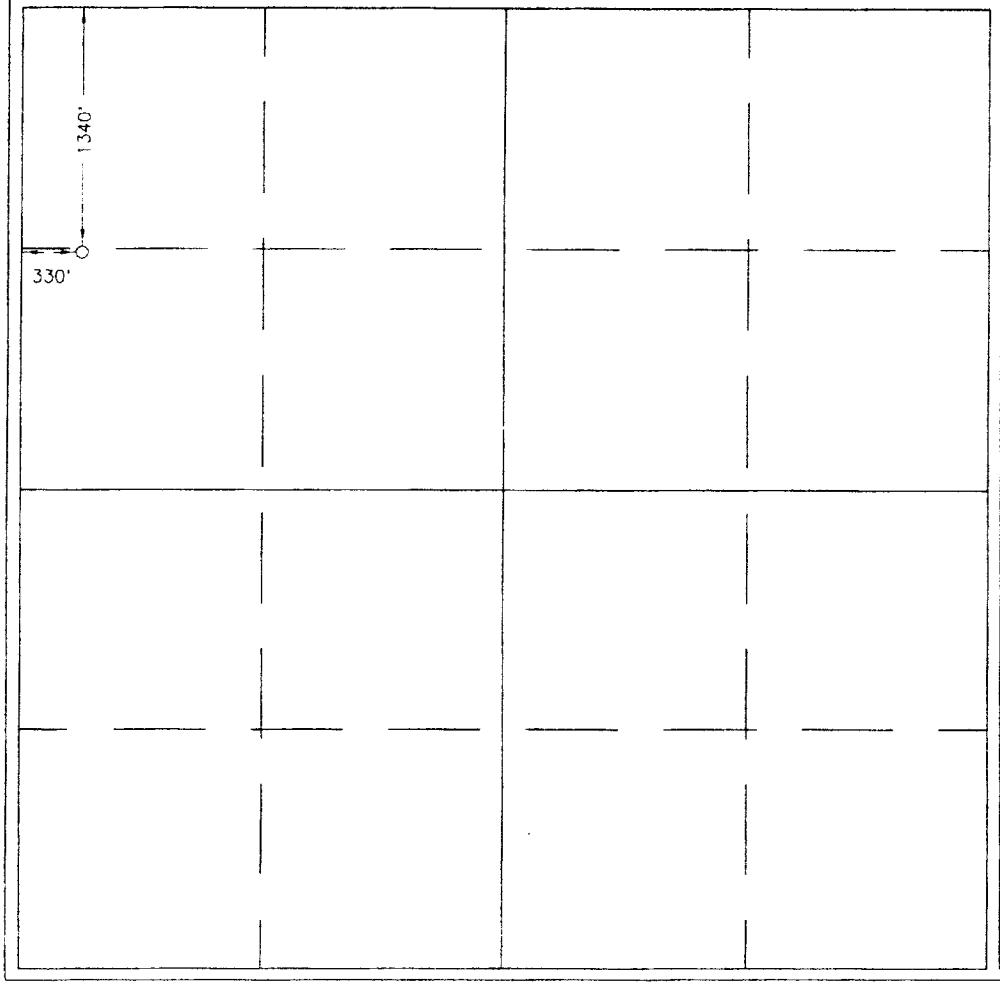
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	15	21 S	37 E		1340	NORTH	330	WEST	LEA

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 the the information contained herein is true and complete to the best of my knowledge and belief.

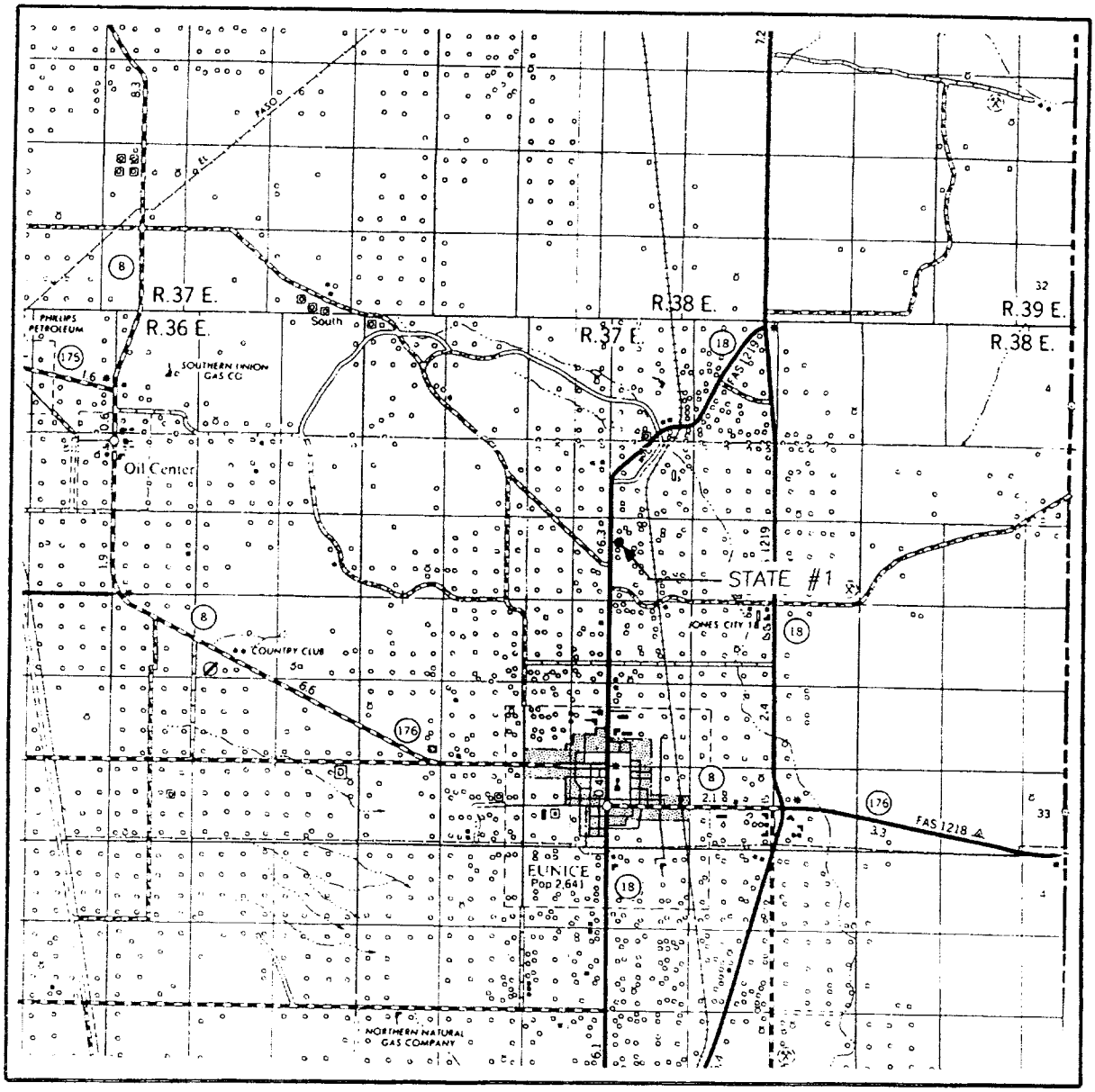
Signature
Royce Crowell
Printed Name
Mgr-Member
Title
Date

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.

AUG. 1, 1996
Date Surveyed DMCC
Signature & Seal of Professional Surveyor
8-02-96
96-11-094
Certificate No. JOHN W. WEST 676
RONALD J. EIDSON 3239
GARY EIDSON 12641

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 15 TWP. 21-S RGE. 37-E

SURVEY N.M.P.M.

COUNTY LEA

DESCRIPTION 1340' FNL & 330' FWL

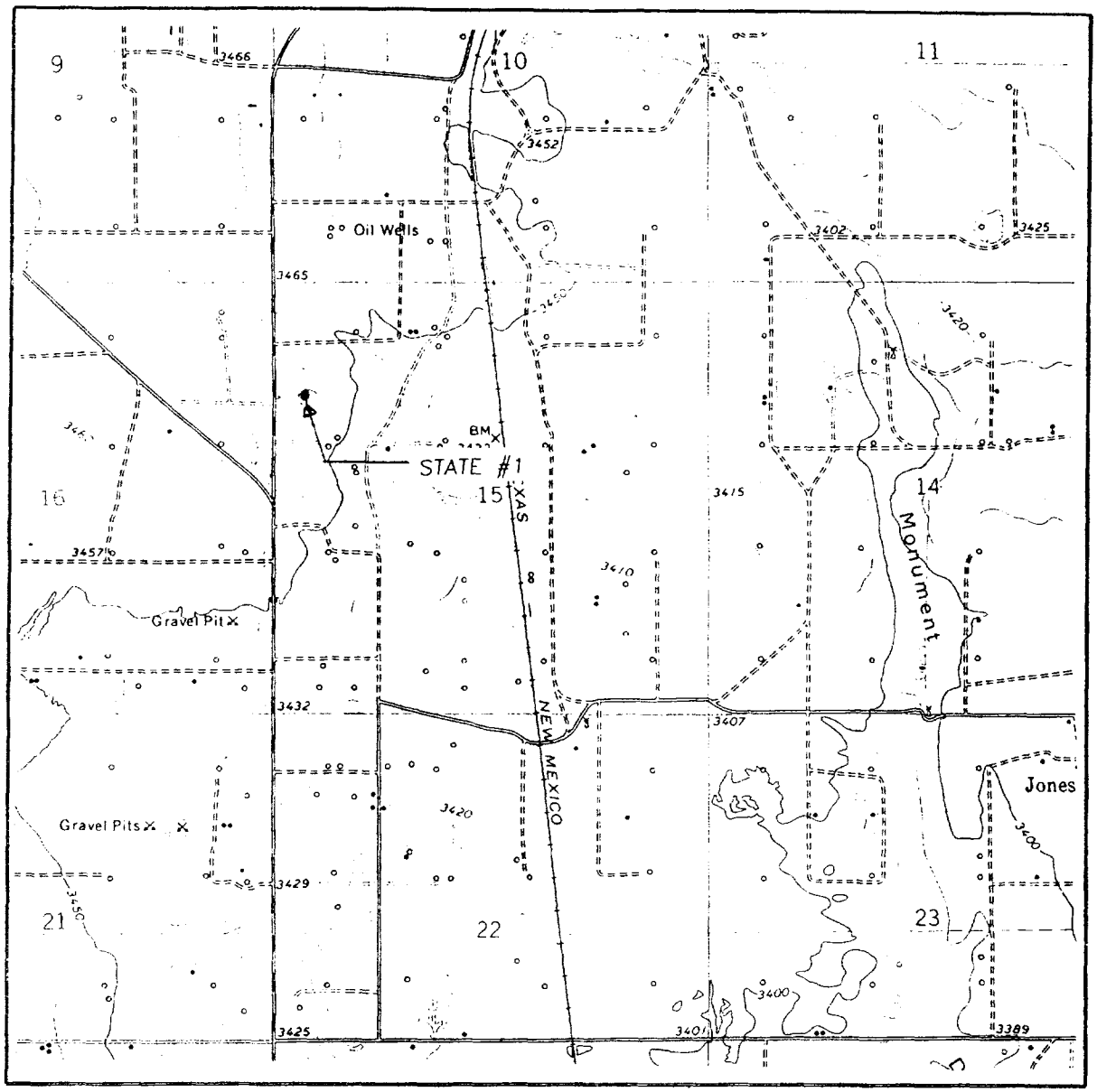
ELEVATION 3458

OPERATOR GOLD STAR SWD LTD, CO.

LEASE STATE

JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
(505) 393-3117

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
EUNICE - 10'

SEC. 15 TWP. 21-S RGE. 37-E

SURVEY N.M.P.M.

COUNTY LEA

DESCRIPTION 1340' FNL & 330' FWL

ELEVATION 3458

OPERATOR GOLD STAR SWD LTD, CO.

LEASE STATE

U.S.G.S. TOPOGRAPHIC MAP
EUNICE, N.M.

JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
(505) 393-3117

(E)-15-21s-37e 30-025-33547
State #1
LE

A
8/30/96

OPER. OGRID NO. 148431
PROPERTY NO. 19386
POOL CODE 96173
EFF. DATE 10-4-96
API NO. 25-33547

Submit 3 Copies to Appropriate District Office

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, ? rals and Natural Resources Department

Form C-103
Revised 1-1-89

OIL CONSERVATION DIVISION

2040 Pacheco St.
Santa Fe, NM 87505

WELL API NO. 30-025-33547

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

6. State Oil & Gas Lease No. MS 0004

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: State

1. Type of Well: OIL WELL [ ] GAS WELL [ ] OTHER Brine

2. Name of Operator: Gold Star SWD Ltd Company

8. Well No. 1

3. Address of Operator: Box 1480 Eunice, N.M. 88231

9. Pool name or Wildcat: BSW-Salado

4. Well Location
Unit Letter E : 1340 Feet From The N Line and 330 Feet From The W Line

Section 15 Township 21S Range 37E NMPM Lea County

10. Elevation (Show whether DF, RKB, RT, GR, etc.) DF 3469

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]	CHANGE PLANS [ ]	COMMENCE DRILLING OPNS. [X]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]		CASING TEST AND CEMENT JOB [X]	
OTHER: [ ]		OTHER: [ ]	

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

9-28-96 Spudded 4 Pm. Derrick Floor 11'. Drilled 12 1/4" hole.
9-29-96 TD 1360' at 4:30 Pm. Ran 1344' 8 5/8" new 32# J55 casing, Float collar and Float Shoe, 5 Centralizers. Cement with 500 sx class C Premium W/ 4% Gel Mix and 300 sx class C Premium W/2% Calcium Chloride.
9-29-96 Circulated 236 sx cement to pit.
9-30-96 Pump cement plug down 12:30 AM.
10-1-96 WOC 18 Hr. 7:30 PM. Start drilling 7 7/8" hole.
10-2-96 TD 2200' at 6:00 AM.
10-3-96 Move rig. Run 2074' 2 7/8" Fiberglass tubing.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Royce Crowell TITLE Mgr-Member DATE 10-4-96

TYPE OR PRINT NAME Royce Crowell TELEPHONE NO. 394250 4

(This space for State Use) [illegible] BY SEXTON [illegible]

APPROVED BY _____ TITLE _____ DATE OCT 11 1996

CONDITIONS OF APPROVAL, IF ANY:

Submit to Appropriate District Office
State Lease – 6 copies
Fee Lease – 5 copies
DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
2040 Pacheco St.
Santa Fe, NM 87505

Form C-105
Revised 1-1-89

WELL API NO. 30-025-33547

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

6. State Oil & Gas Lease No. MS0004

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

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

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

7. Lease Name or Unit Agreement Name: State

2. Name of Operator: Gold Star SWD Ltd Co.

8. Well No. 1

3. Address of Operator: Box 1480 Eunice, N.M. 88231

9. Pool name or Wildcat: BSW-Salado <96173>

4. Well Location
Unit Letter E : 1340 Feet From The North Line and 330 Feet From The West Line
Section 15 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
9-28-96	10-2-96	10-4-96	DF 3469	3458

15. Total Depth	16. Plug Back T.D.	17. If Multiple Compl. How Many Zones?	18. Intervals Drilled By	Rotary Tools	Cable Tools
2200'				x	

19. Producing Interval(s), of this completion - Top, Bottom, Name: Top 1390 Bottom 2445 BSW Salado

20. Was Directional Survey Made: Yes

21. Type Electric and Other Logs Run: N/A

22. Was Well Cored: no

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	32#	1360'	12 1/4	800 Sx.	
2 7/8	Fiberglass	2074	7 7/8		

24. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

25. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 7/8	2074	

26. Perforation record (interval, size, and number)
N/A

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

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
1360'	500 Sx Class C 4% Gel
	300 Sx Class C 2% Cal Cl

28. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping - Size and type pump)	Well Status (Prod. or Shut-in)

Date of Test	Hours Tested	Choke Size	Prod'n For Test Period	Oil - Bbl.	Gas - MCF	Water - Bbl.	Gas - Oil Ratio

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API - (Corr.)

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

Test Witnessed By

30. List Attachments

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

Signature Layce Crowell Printed Name Layce Crowell Title Mgr. Member Date 10-4-96

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drille 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 speci tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, tru vertical depths shall also be reported. For multiple completions, Items 25 through 29 shall be reported for each zone. The form is to b filed in quinnuplicate 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	T. Canyon	T. Ojo Alamo	T. Penn. "B"
T. Salt	T. Strawn	T. Kirtland-Fruitland	T. Penn. "C"
B. Salt	T. Atoka	T. Pictured Cliffs	T. Penn. "D"
T. Yates	T. Miss	T. Cliff House	T. Leadville
T. 7 Rivers	T. Devonian	T. Menefee	T. Madison
T. Queen	T. Silurian	T. Point Lookout	T. Elbert
T. Grayburg	T. Montoya	T. Mancos	T. McCracken
T. San Andres	T. Simpson	T. Gallup	T. Ignacio Otzte
T. Glorieta	T. McKee	Base Greenhorn	T. Granite
T. Paddock	T. Ellenburger	T. Dakota	T.
T. Blinebry	T. Gr. Wash	T. Morrison	T.
T. Tubb	T. Delaware Sand	T. Todilto	T.
T. Drinkard	T. Bone Springs	T. Entrada	T.
T. Abo	T.	T. Wingate	T.
T. Wolfcamp	T.	T. Chinle	T.
T. Penn	T.	T. Permain	T.
T. Cisco (Bough C)	T.	T. Penn "A"	T.

OIL OR GAS SANDS OR ZONES

No. 1, from.....to..... No. 3, from.....to.....
No. 2, from.....to..... No. 4, from.....to.....

IMPORTANT WATER SANDS

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

No. 1, from.....to.....feet.....
No. 2, from.....to.....feet.....
No. 3, from.....to.....feet.....

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	To	Thickness in Feet	Lithology	From	To	Thickness in Feet	Lithology
0	95	95	Caliche and Sand				
95	1262	1167	Red Bed				
1262	1390	128	Anhydrite				
1390	2200	810	Salt and Anhydrite				

GOLD STAR SWD LTD. CO

(505) 394-2504 FAX (505) 394-2560 801 MAIN P.O. BOX 1480
EUNICE, NEW MEXICO 88231

10-4-96

Well: State #1 E 15-21S-37E 30-025-33547
1340'/N + 330'/W
Unit E

Deviation Survey

	Degree
500'	3/4
1013'	1/4
1500'	1/2
1850'	1
2200'	1 3/4

Submit 3 Copies to Appropriate District Office

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-103
Revised 1-1-89

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

OIL CONSERVATION DIVISION

2040 Pacheco St.
Santa Fe, NM 87505

WELL API NO. 30-025-33547

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

6. State Oil & Gas Lease No. MS 0004

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: State

1. Type of Well: OIL WELL [ ] GAS WELL [ ] OTHER Brine

2. Name of Operator: Gold Star SWD Ltd. Co

8. Well No. 1

3. Address of Operator: Box 1480 Eunice NM 88231

9. Pool name or Wildcat: BSW - Salado

4. Well Location
Unit Letter E : 1340 Feet From The N Line and 330 Feet From The W Line
Section 15 Township 21S Range 37E NMPM Lea County

10. Elevation (Show whether DF, RKB, RT, GR, etc.)

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]	CHANGE PLANS [ ]	COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]		CASING TEST AND CEMENT JOB [X]	
OTHER: [ ]		OTHER: [ ]	

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

7-21-97
Pulled Tubing. Ran Tab And Packer.
Set Packer 1290' Test Csg 300# for
30 min. Held OK Chart Attached.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

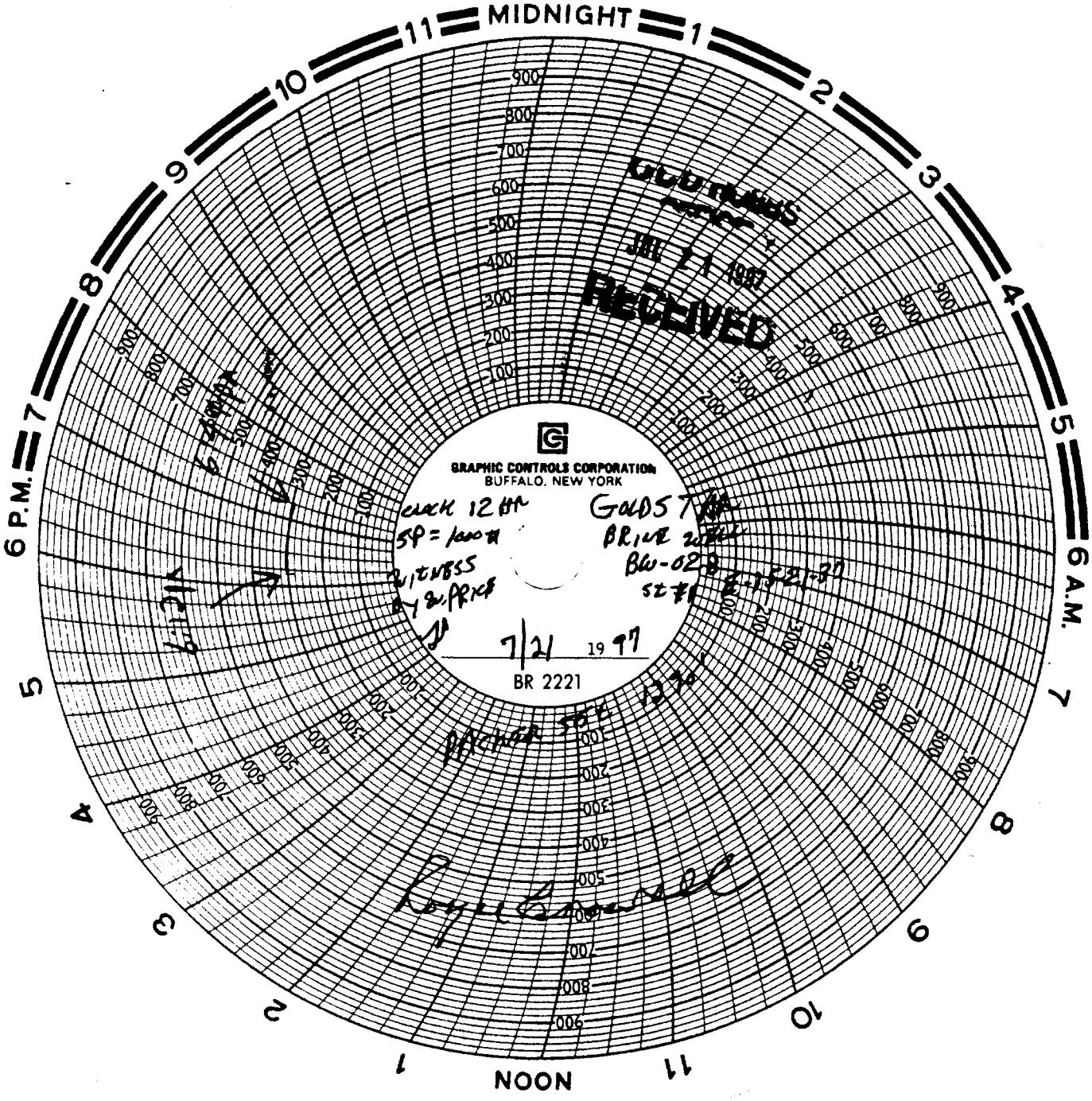
SIGNATURE Royce Crowell TITLE Mgr. DATE 7-30-97

TYPE OR PRINT NAME Royce Crowell TELEPHONE NO. 394-2564

(This space for State Use) ORIGINAL SIGNED BY CHRIS WILLIAMS
DISTRICT I SUPERVISOR

APPROVED BY _____ TITLE _____ DATE AUG 06 1997

CONDITIONS OF APPROVAL, IF ANY:


MIDNIGHT
NOON
6 P.M.
6 A.M.
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
7/21 19 97
BR 2221
RECEIVED
JUL 21 1997

3 Copies
Appropriate
Dist Office

State of New Mexico
Energy, [illegible] and Natural Resources Department

Form C-103
Revised 1-1-89

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

OIL CONSERVATION DIVISION

2040 Pacheco St.
Santa Fe, NM 87505

WELL API NO.
30-025-33547

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

6. State Oil & Gas Lease No.
MS-0004

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
STATE

1. Type of Well:
OIL WELL [ ] GAS WELL [ ] OTHER BRINE

2. Name of Operator
GOLD STAR SWD LTD. CO.

8. Well No.
1

3. Address of Operator
BOX 1480 EUNICE NM. 88231

9. Pool name or Wildcat
BSW- SALADO

4. Well Location
Unit Letter E : 1340 Feet From The N. Line and 330 Feet From The W. Line

Section 15 Township 21 S. Range 37 E. NMPM LEA. County

10. Elevation (Show whether DF, RKB, RT, GR, etc.)

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [X]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]	CHANGE PLANS [ ]	COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]		CASING TEST AND CEMENT JOB [ ]	
OTHER: [ ]		OTHER: [ ]	

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

7-6-98 RIG UP PULLING UNIT, PULLED TUBING, 46 JTS. + 8 FT. 1351 FT.
RUN SINKER BAR TO 1366 FT. .
7-7-98 RIG UP REVERS UNIT, RUN USED 7 5/8. BIT TO 1362 FT. . RETURNED METAL CUTTINGS.
PULLED BIT, BIT NO GOOD.
7-8-98 RUN NEW 7 5/8 BIT. TIGHT PLACE AT 1329 FT. DRILLED FROM 1353 TO 1363 FT. .
7-9-98 RUN 6 1/8 SHOE AND DRILLED TO 1371 FT. .
7-10-98 RUN 6 1/8 BIT AND DRILLED TO 1475 FT. .
7-11-98 RUN 1461 FT. OF 2 7/8 FIBER GLASS TUBING . RIGGED DOWN.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE [signature] TITLE MGR. DATE 7-25-98

TYPE OR PRINT NAME R.E. CROWELL TELEPHONE NO. 394-2504

(This space for State Use)

APPROVED BY [illegible] TITLE [illegible] DATE [illegible]

CONDITIONS OF APPROVAL, IF ANY:

Submit 3 Copies to Appropriate District Office

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-103
Revised 1-1-89

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

OIL CONSERVATION DIVISION
2040 Pacheco St.
Santa Fe, NM 87505

WELL API NO. 30-025-33547

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

6. State Oil & Gas Lease No. MS-0004

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: OIL WELL [ ] GAS WELL [ ] OTHER BRINE

7. Lease Name or Unit Agreement Name STATE

2. Name of Operator GOLD STAR SWD LTD. CO.

8. Well No. 1

3. Address of Operator BOX 1480 EUNICE NM 88231

9. Pool name or Wildcat BSW-SALADO

4. Well Location
Unit Letter E : 1340 Feet From The N. Line and 330 Feet From The W. Line
Section 15 Township 21 S. Range 37 E. NMPM LEA County

10. Elevation (Show whether DF, RKB, RT, GR, etc.)

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

PERFORM REMEDIAL WORK [ ] PLUG AND ABANDON [ ]
TEMPORARILY ABANDON [ ] CHANGE PLANS [ ]
PULL OR ALTER CASING [ ]
OTHER: [ ]

SUBSEQUENT REPORT OF:

REMEDIAL WORK [ ] ALTERING CASING [ ]
COMMENCE DRILLING OPNS. [ ] PLUG AND ABANDONMENT [ ]
CASING TEST AND CEMENT JOB [ ]
OTHER: [ ]

12. Describe Proposed or Completed Operations *(Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)* SEE RULE 1103.

03-17-00 PULL TUB. LOST 140' 2 7/8 FG. TUB.
03-18-00 RUN 7 1/2 OD CUT RITE SHOE TO 1357'
03-19-00 RUN SHOE TO 1361'
03-20-00 RUN 6 3/4 BIT TI 1375'
03-21-00 DRILL TO 1405'
03-22-00 SHUTDOWN
03-23-00 DRILL TO 1419'
03-24-00 DROP TUB AND FISHED
03-25-00 RUN 1402' 2 7/8 F.G. TUB. RIGDOWN.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE [signature] TITLE Mgr. DATE 5-20-00

TYPE OR PRINT NAME Royce Crowell TELEPHONE NO. 394-2304

(This space for State Use)

APPROVED BY ____ TITLE ____ DATE ____

CONDITIONS OF APPROVAL, IF ANY:

S
C

Submit 3 Copies to Appropriate District Office

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

STATE OF NEW MEXICO
Energy, Minerals and Natural Resources Department

Form C-103
Revised 1-1-89

OIL CONSERVATION DIVISION

2040 Pacheco St.
Santa Fe, NM 87505

WELL API NO.
30-025-33547

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

6. State Oil & Gas Lease No.
MS-0004

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
STATE

1. Type of Well:
OIL WELL [ ] GAS WELL [ ] OTHER BRINE

2. Name of Operator
GOLD STAR SWD LTD. CO.

8. Well No.
1

3. Address of Operator
BOX 1480 EUNICE NM 88231

9. Pool name or Wildcat
BSW-SALADO

4. Well Location
Unit Letter E : 1340 Feet From The N. Line and 330 Feet From The W. Line

Section 15 Township 21 S. Range 37 E. NMPM LEA County

10. Elevation (*Show whether DF, RKB, RT, GR, etc.*)

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	[ ]	PLUG AND ABANDON	[ ]	REMEDIAL WORK	[ ]	ALTERING CASING	[ ]
TEMPORARILY ABANDON	[ ]	CHANGE PLANS	[ ]	COMMENCE DRILLING OPNS.	[ ]	PLUG AND ABANDONMENT	[ ]
PULL OR ALTER CASING	[ ]			CASING TEST AND CEMENT JOB	[ ]		
OTHER:	[ ]			OTHER:	[ ]		

12. Describe Proposed or Completed Operations *(Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)* SEE RULE 1103.

04-10-00 PULL TUB. LOST 82' TUB
04-11-00 TRIED TO FISH TUB. RUN 6 1/8 CUT RITE SHOE.
04-12-00 MILL TO 1349.' RUN BIT & COLLARS
04-13-00 DRILL TO 1439'
04-14-00 RUN 1410' 2 7/8 FG TUB.
RIGDOWN

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Royce Crowell TITLE Mgr DATE 4-20-00

TYPE OR PRINT NAME Royce Crowell TELEPHONE NO. 394-3534

(This space for State Use)

ORIGINAL SIGNED BY
GARY WINK
FIELD REP II

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

5
C

Submit 3 Copies to Appropriate District Office

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-103
Revised 1-1-89

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

OIL CONSERVATION DIVISION

2040 Pacheco St.
Santa Fe, NM 87505

WELL API NO.
30-025-33547

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

6. State Oil & Gas Lease No.
MS-0004

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
STATE

1. Type of Well:
OIL WELL [ ] GAS WELL [ ] OTHER BRINE

2. Name of Operator
GOLD STAR SWD LTD. CO.

8. Well No.
1

3. Address of Operator
BOX 1480 EUNICE NM 88231

9. Pool name or Wildcat
BSW-SALADO

4. Well Location
Unit Letter E : 1340 Feet From The N. Line and 330 Feet From The W. Line

Section 15 Township 21 S. Range 37 E. NMPM LEA County

10. Elevation *(Show whether DF, RKB, RT, GR, etc.)*

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]	CHANGE PLANS [ ]	COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]		CASING TEST AND CEMENT JOB [ ]	
OTHER: [ ]		OTHER: [ ]	

12. Describe Proposed or Completed Operations *(Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)* SEE RULE 1103.

04-18-00 PULL TUB PARTED 21 JTS FROM TOP.
04-19-00 FISHED TUB AND PULLED. CHANGE OUT FIBERGLASS TUB AND REPLACED WITH 2 7/8 STELL IPC. SET AT 1410' RIGDOWN

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Layce Cornwell TITLE Agt. DATE 4-20-00

TYPE OR PRINT NAME Layce Cornwell TELEPHONE NO. 394-3504

(This space for State Use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

5
C

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mex
Energy Minerals and Natural Resources

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

Form C-10
March 19, 2

Submit 1 copy of the final affected we
list along with 1 copy of this form
number of wells on that list
appropriate District Off

Change of Operator

Previous Operator Information:		New Operator Information:	
		Effective Date:	04/20/01
OGRID:	148431	New Ogrid:	19797
Name:	Gold Star SWD Ltd. Co.	New Name:	Yale E. Key, Inc.
Address:	Box 1480	Address:	Box 2040
Address:		Address:	
City, State, Zip:	Eunice, NM, 88231	City, State, Zip:	Hobbs, NM 88241

I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information on this form and the attached list of wells is true and complete to the best of my knowledge and belief.

New Operator Signature: Royce Crowell

Printed name: Royce Crowell

Title: Compliance Specialist

Date: 07/11/01 Phone: (505) 393-9171

Previous operator complete below:

Previous Operator: Gold Star SWD Ltd. Co.

Previous OGRID: 148431

Signature: Royce Crowell

Printed Name: Royce Crowell

NMOCD Approval

Signature: Paul F Kautz

Printed Name: Paul F Kautz

District: Geologist

Date: JUL 26 2001

8

WELLS INVOLVED IN OPERATOR CHANGE
FINAL LIST WITH C-104A

APR 24, 2001

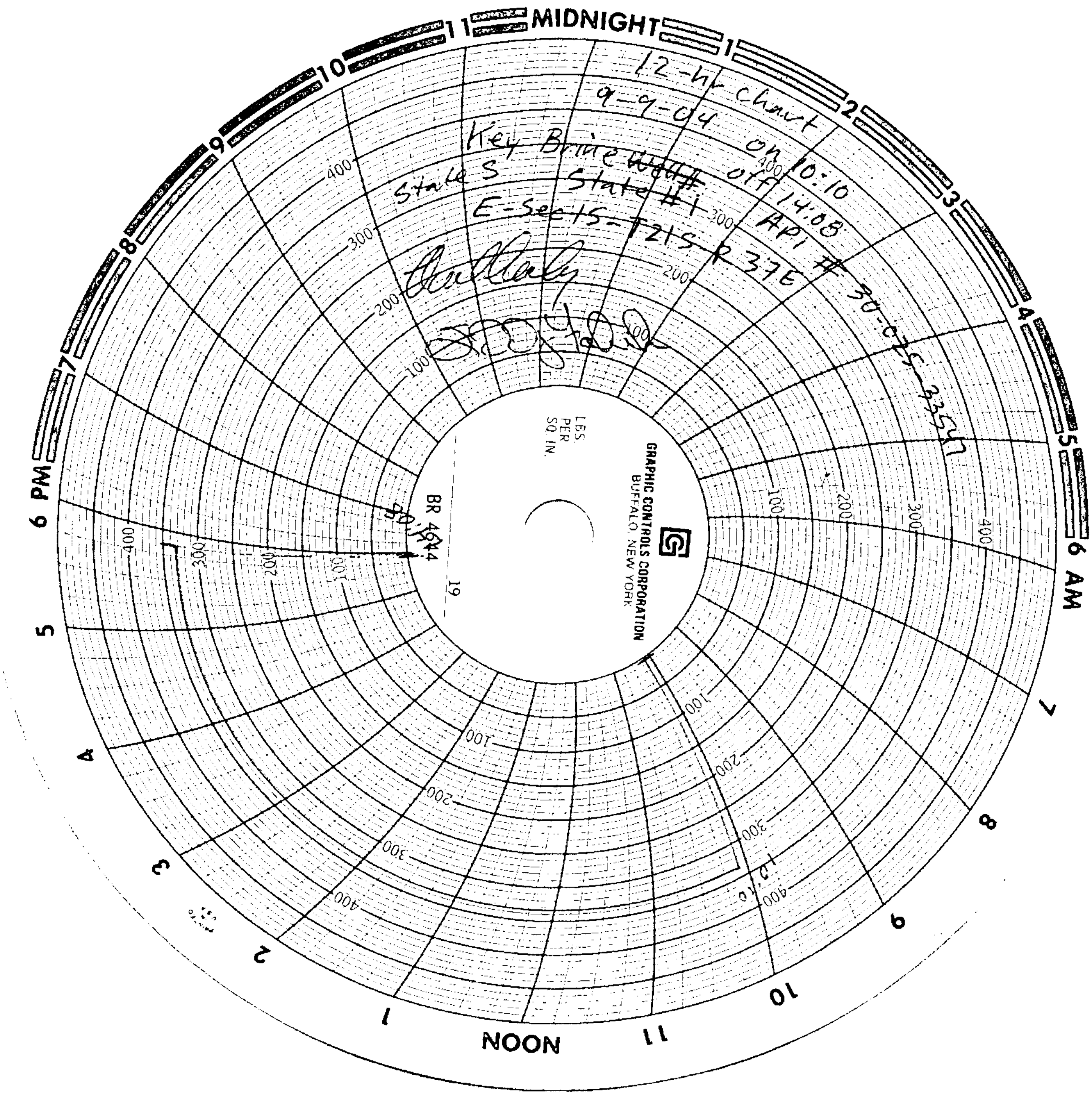
This is a final list of wells being transferred. If all bonding requirements are satisfied, submit this list to the OCD District with your C-104A.

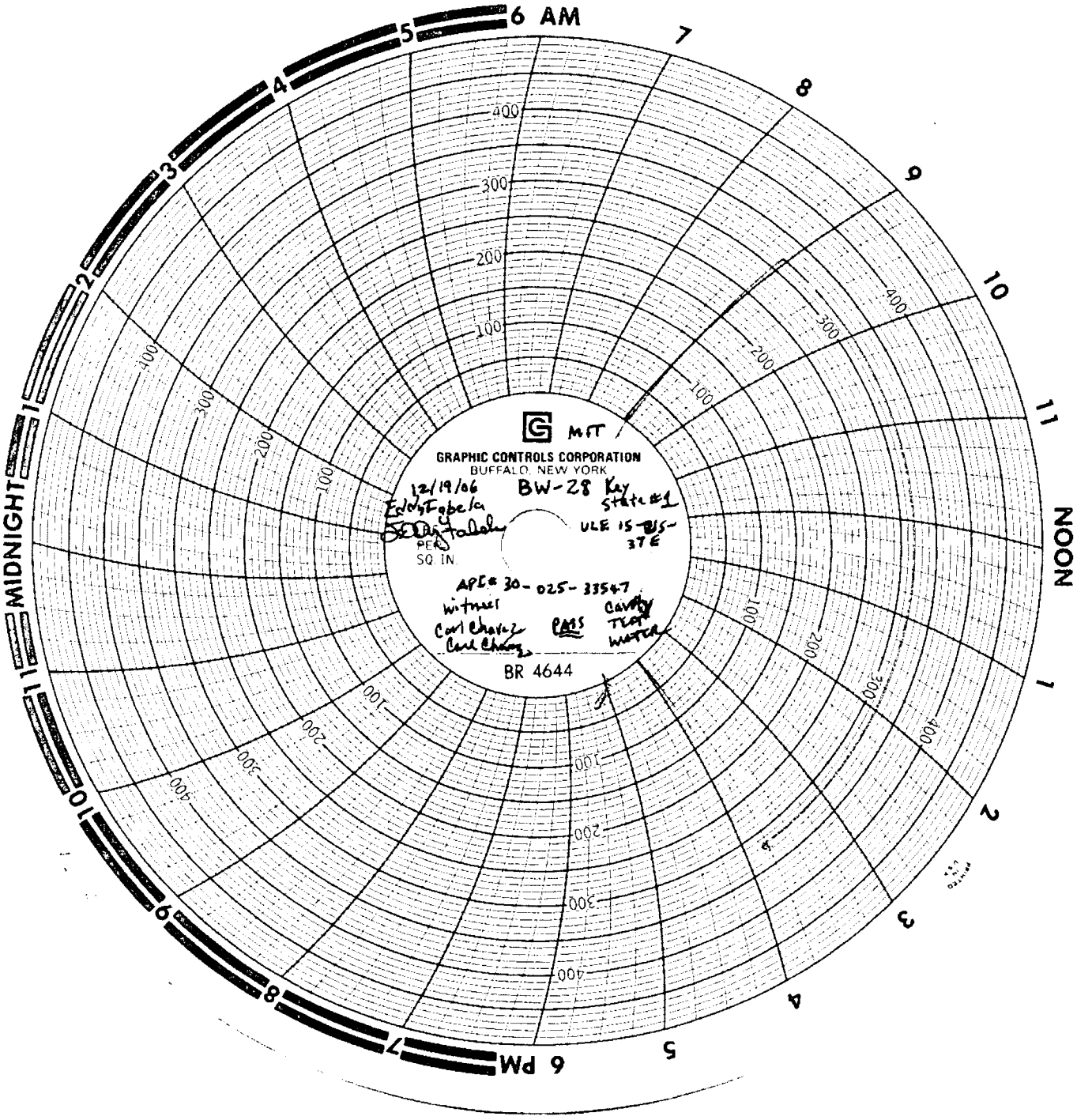
PREVIOUS OPERATOR: 148431 GOLD STAR SWD LTD CO. NEW OPERATOR: _____

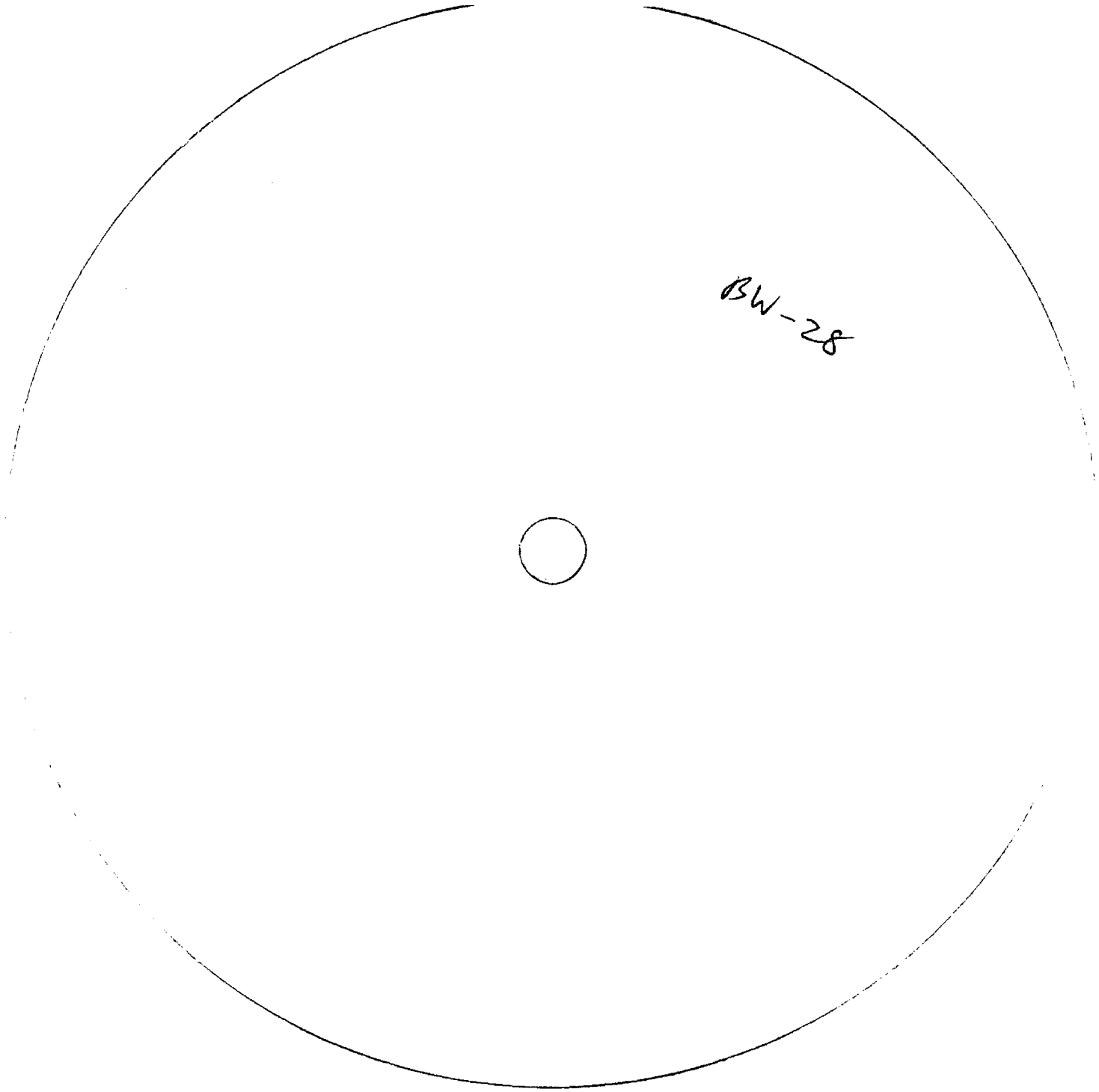
OCD DISTRICT: HOBBS

PROP-ERTY	WELL NAME	ULSTR	OCD UNIT LTR	API	WELL TYPE	POOL ID	POOL NAME	LAST PROD/INJ
~~19280~~ 28411	~~STATE~~ #001	E-15-21S-37E	E	30-025-33547	W	96173	BSW;SALADO	
~~17478~~ 28410	CHRISTMAS #003	B-28-22S-37E	B	30-025-10500	S	96121	SWD;SAN ANDRES	03-2001

B. Pod
2816488


MIDNIGHT
6 AM
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
LBS.
PER
SQ. IN.
BR 4014
19
12-hr chart
9-9-04
Key Brine Well #
State S
State #1
E-Sec 15-T21S-R37E
on 10:10
off 14:08
API # 30-025-33547
30.7


6 AM
NOON
MIDNIGHT
Wd 9
MIT
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
12/19/06
BW-28 Key State #1
ULE 15-35S-37E
PEN
SQ. IN.
API# 30-025-33547
Witness
Carl Chavez
Carl Chavez
PASS
Cavern Test Water
BR 4644


BW-28

Form C-
Permit 47021

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

Change of Operator Name

OGRID: 19797
Effective Date: 2/20/2007

Previous Operator Name and Information		New Operator Name and Information	
Name:	YALE E KEY, INC	Name:	KEY ENERGY SERVICES, LLC
Address:	~~PO BOX 2090~~ changed on-line	Address:	P.O. Box 99
Address:	~~2625 W MARLAND~~ "	Address:	2105 Avenue O
City, State, Zip:	~~HOBBS, NM 88241~~ "	City, State, Zip:	Eunice, NM 88231

I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given on this form and the certified list of wells is true to the best of my knowledge and belief.

Signature: Bob Patterson

Printed Name: Bob Patterson

Title: Area Manager

Date: 2-20-7 Phone: 505 394 3195

NMOCD Approval
Date: February 20, 2007

BW - 28

American Valve & Meter, Inc.

1113 W. BROADWAY
P.O. BOX 166
HOBBS, NM 88240

TO: Key **DATE:** 8/21/07

This is to certify that:

I, Brad Collins **, Technician for American Valve & Meter, Inc., has checked the calibration of the following instrument.**

8" Pressure recorder **Serial No:** P385

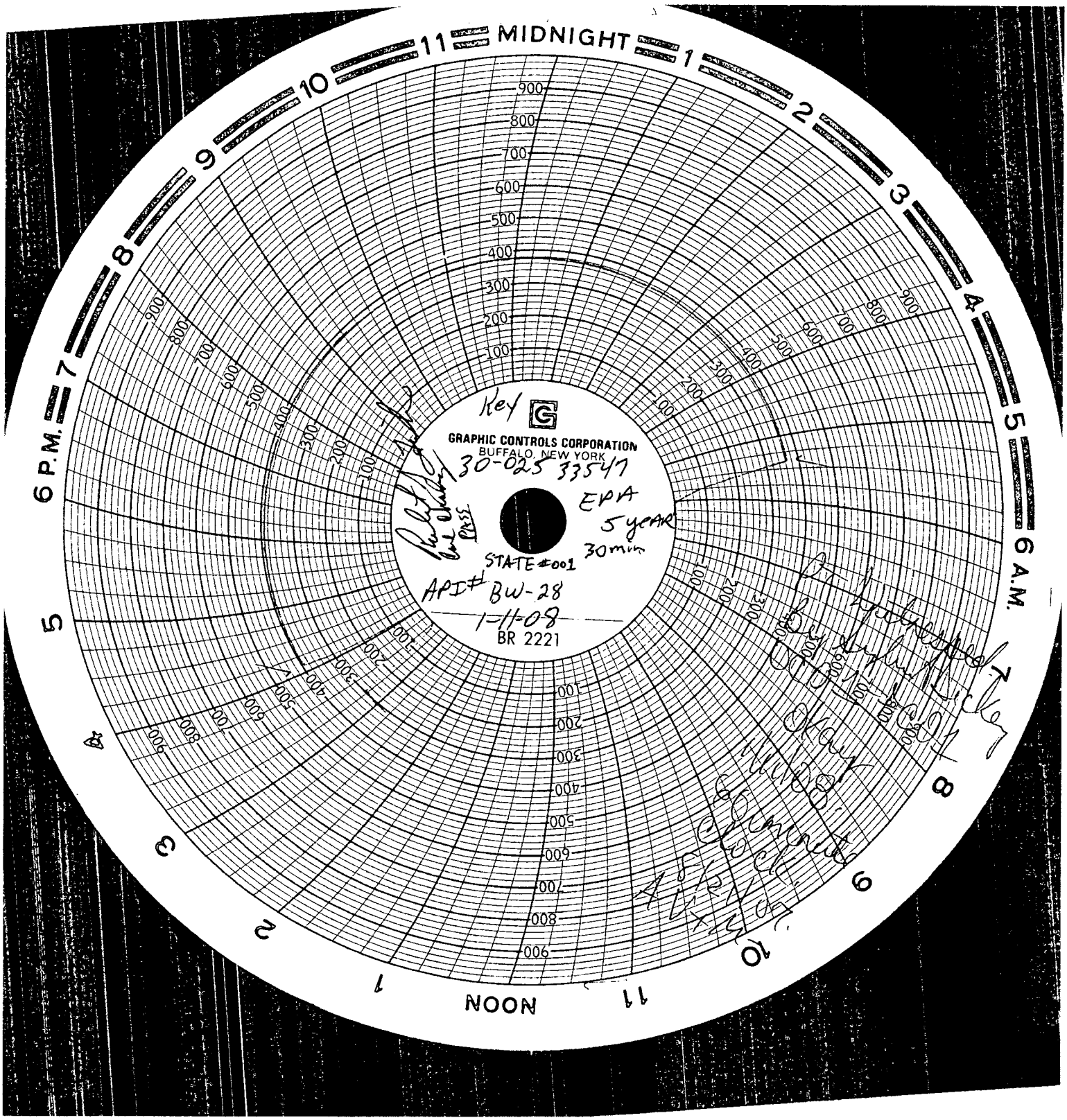
at these points.

Pressure 0 - 1000 **Temperature** _____

Test	Found	Left	Test	Found	Left
0	0	0	—	—	—
500	500	500	—	—	—
1000	1000	1000	—	—	—
700	700	700	—	—	—
200	200	200	—	—	—
0	—	0	—	—	—

Remarks: _____

Signature Brad Collins


MIDNIGHT
NOON
6 P.M.
6 A.M.
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
Key
30-025 33547
EPA
5 year
30 min
STATE #001
API# BW-28
1-11-08
BR 2221

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., 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-103
May 27, 2004

WELL API NO.
30-025-33547

5. Indicate Type of Lease
STATE X FEE

6. State Oil & Gas Lease No.
MS-0004

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
State

1. Type of Well: Oil Well ☐ Gas Well ☐ Other Brine

8. Well Number # 1

2. Name of Operator
Key Energy Services

9. OGRID Number
19797

3. Address of Operator
PO Box 99 Eunice NM

10. Pool name or Wildcat
BSW-SALADO

4. Well Location
Unit Letter E : 1340 feet from the N line and 330 feet from the W line
Section 15 Township 21S Range 37 E NMPM LEA County

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*

Pit or Below-grade Tank Application ☐ or Closure ☐

Pit type Depth to Groundwater Distance from nearest fresh water well Distance from nearest surface water

Pit Liner Thickness: mil Below-Grade Tank: Volume bbls: Construction Material

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
OTHER:	☐			OTHER:	☐		

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

1-8-2008 Rig up Pulling Unit, SION
1-10-2008 Intall BOP 2 7/8 6" 900 , Pull tbg from well
1-11-2008 Run in hole with Bridge Plug , Test Casing, Casing Held, Carl Chavaz W/OCD took Chart
1/11/2008 Pull out of hole with Plug and lay work string down, Shut in over weekend.
1-14-2008 Run in Hole with production string, 2 7/8 PCP Set @ 1445'
1-15-2008 Rig Reverse unit and Pulling Unit Down.
1/16/2008 Return well back to production

RECEIVED
JAN 22 2008
HOBBS OCD

I hereby certify that the information above is true and complete to the best of my knowledge and belief. **I further certify that any pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☐, a general permit ☐ or an (attached) alternative OCD-approved plan ☐.**

SIGNATURE Sam Blair TITLE District Manager DATE 1-17-2008

Type or print name E-mail address: Telephone No.

For State Use Only

APPROVED BY: Gary W. Wink TITLE OC FIELD REPRESENTATIVE II/STAFF MANAGER DATE FEB 12 2008

Conditions of Approval (if any):

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., 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

RECEIVED
MAY 26 2009
HOBBSOCD

Form C-103
5/25/2009

WELL API NO. 30-025-33547	
5. Indicate Type of Lease STATE X FEE	
6. State Oil & Gas Lease No. MS-0004	
SUNDRY NOTICES AND REPORTS ON WELLS (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS)	7. Lease Name or Unit Agreement Name State
1. Type of Well: Oil Well / Gas Well Other X Brine Well	8. Well Number # 1
2. Name of Operator Key Energy Services	9. OGRID Number 19797
3. Address of Operator P.O Box 99 Eunice NM 88231	10. Pool name or Wildcat BSW-SALADO
4. Well Location Unit Letter E : 1340 feet from the North line and 330 feet from the West line Section 15 Township 21S Range 37E NMPM County Lea	
	11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
Pit or Below-grade Tank Application or Closure Pit type Depth to Groundwater Distance from nearest fresh water well Distance from nearest surface water Pit Liner Thickness: mil Below-Grade Tank: Volume bbls: Construction Material	

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
OTHER: Sonor Test & MIT ☐		OTHER: ☒	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

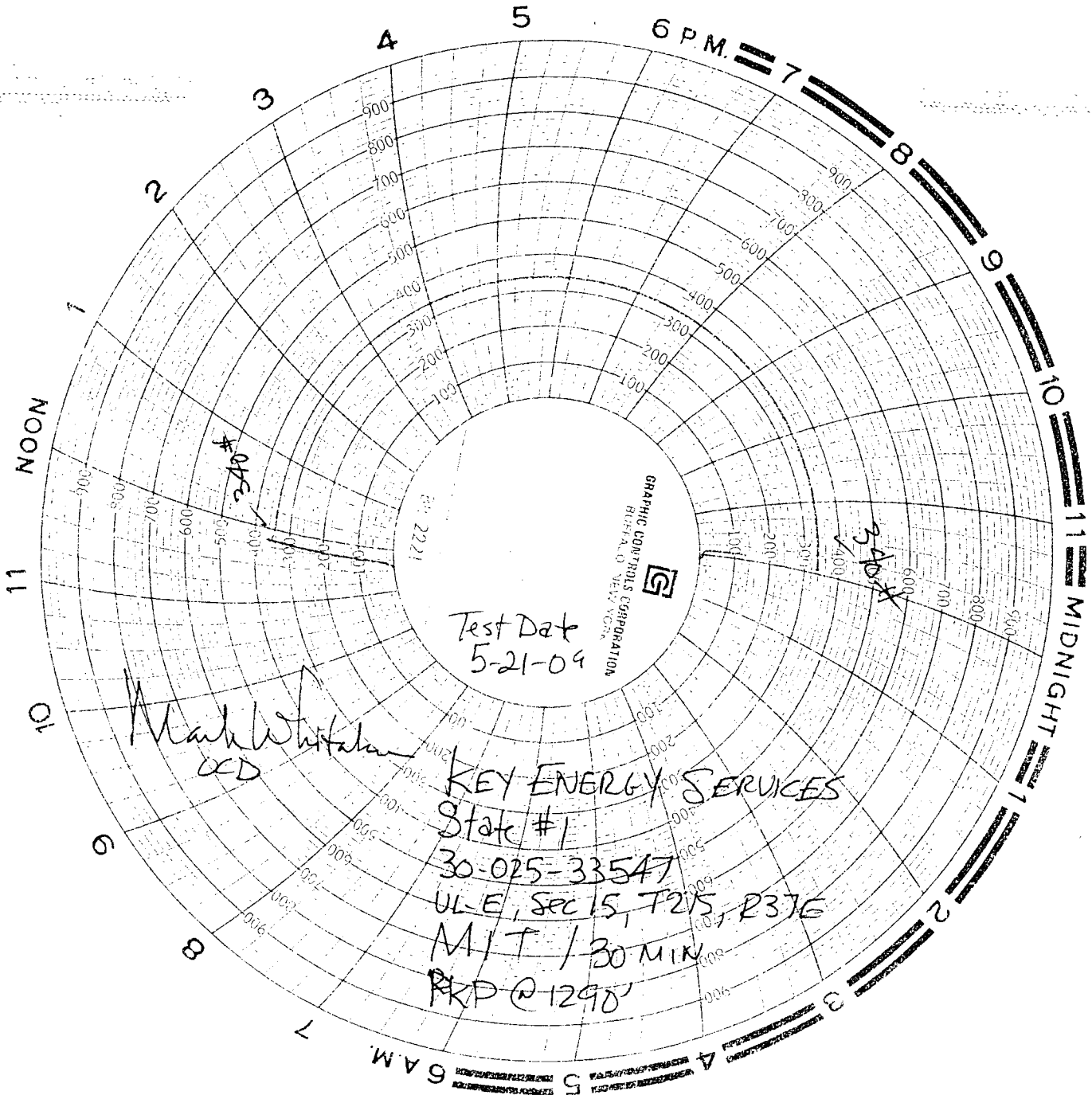
5-19-2009 MI- RUPU Install BOP, POH with 2 7/8 Tbg and 6 ¼ Bit
5-19-2010 SION
5-20-2009 RU Key Wire Line and Sonor Tool, Run Sonor test on Brine Well, POH with sonor tool.
5-20-2010 SION
5-21-2009 RIH with Packer and 2 7/8 Tbg and 6 ¼ bit to 1300' , Pressure test to 300# , Pressure Test leaked 30# in 20 minutes. OCD Rep on location advised to Pull up to 1290' and Retest. Pull up to 1290' with Packer and Tbg. Retest to 340# , Test held good for 30 minutes. POH with packer and tbg. RIH with 6 ¼ Bit and tbg to 1300' And SION.
5/22/2009 RU Reverse and power swivel and drill to 1701', Circulate will for 30 minutes. SION
5/23/2009 Pull BOP and flange will head back up & return to production.

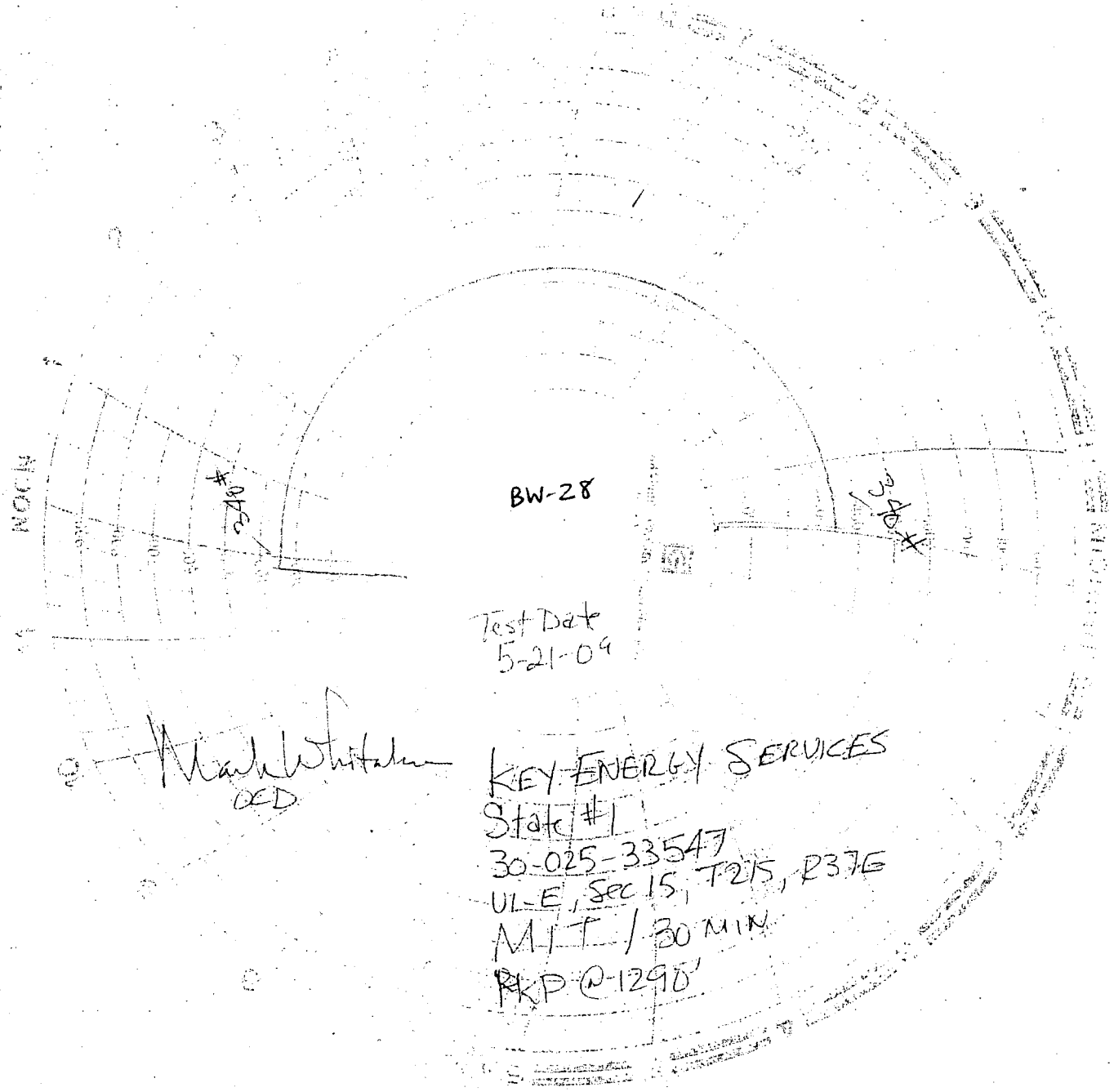
I hereby certify that the information above is true and complete to the best of my knowledge and belief. **I further certify that any pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☐, a general permit ☐ or an (attached) alternative OCD-approved plan ☐.**

SIGNATURE Sam Blinn TITLE MANAGER DATE 5-25-09

Type or print name E-mail address: Telephone

For state use only
APPROVEDBY: Terry W. Hill TITLE DISTRICT 1 SUPERVISOR DATE MAY 27 2009
Conditions of Approval (if Any):


6 P.M.
MIDNIGHT
6 A.M.
NOON
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
Test Dat
5-21-09
Mark Whitaker
OCD
KEY ENERGY SERVICES
State #1
30-025-33547
UL-E, Sec 15, T21S, R37E
MIT / 30 MIN
PKR @ 1290'
340#
345#



Test Date
5-21-09

Mark Whitaker
OCD

KEY ENERGY SERVICES
State #1
30-025-33547
UL-E, Sec 15, T21S, R37E
MIT / 30 MIN
RKP @ 1290'

American Valve & Meter, Inc.

1113 W. BROADWAY
P.O. BOX 166
HOBBS, NM 88240

TO: Key **DATE:** 5-3-09

This is to certify that:

I, Bud Collins, **Technician for American Valve & Meter, Inc., has checked the calibration of the following instrument.**

"Pressure recorder **Serial No:** 8351

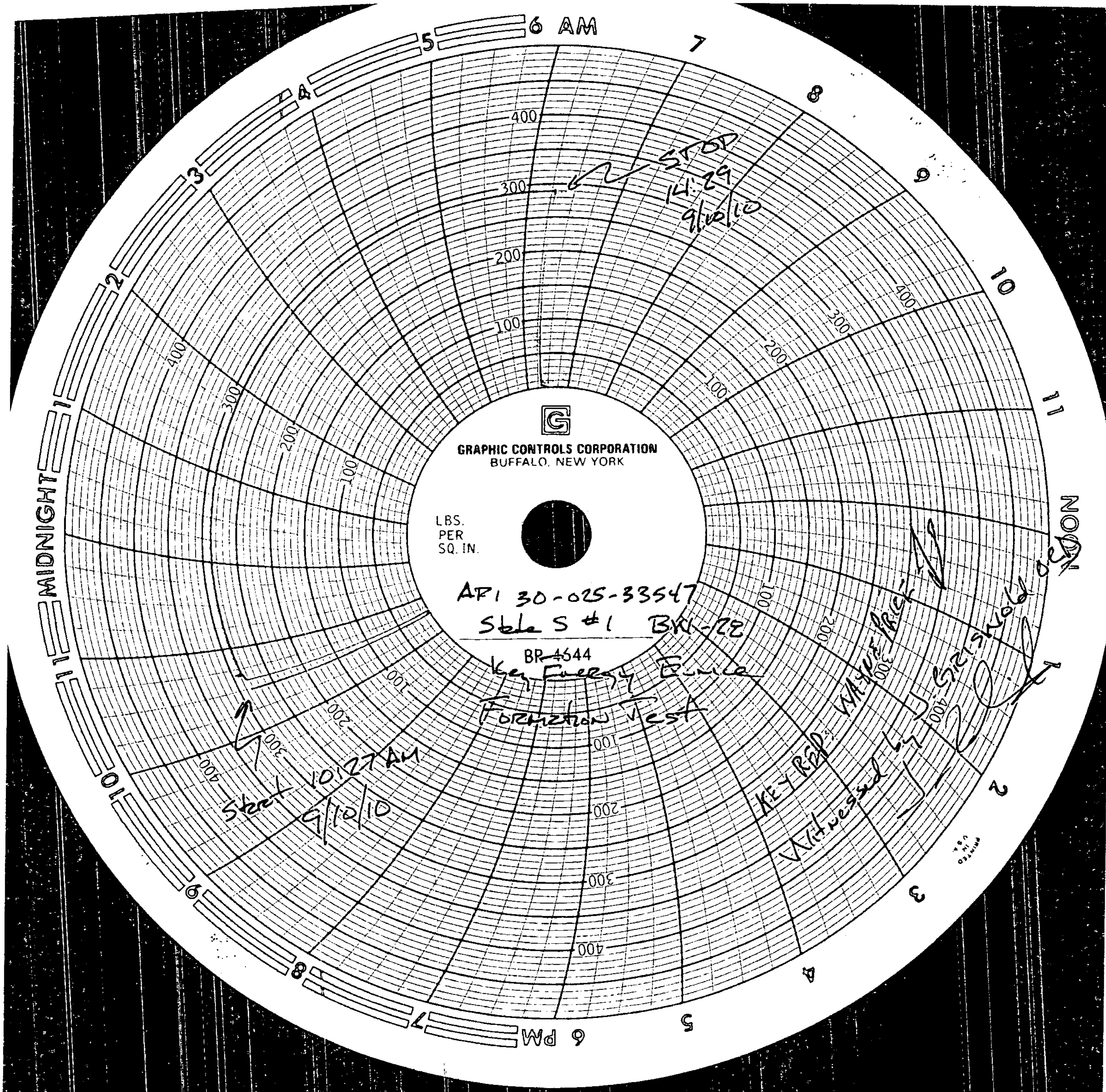
at these points.

Pressure 0 - 1000 **Temperature** _____

Test	Found	Left	Test	Found	Left
0	___	0	___	___	___
500	___	500	___	___	___
1000	___	1000	___	___	___
700	___	700	___	___	___
200	___	200	___	___	___
0	___	0	___	___	___

Remarks: _____

Signature Bud Collins


6 AM
NOON
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
LBS.
PER
SQ. IN.
BR 4644
API 30-025-33547
Key Energy Eunice
Formation Test
STOP
14:29
9/10/10
Start 10:27 AM
9/10/10
KEY REP: WAYNE PRICE
Witnessed by

American Valve & Meter, Inc.

1113 W. BROADWAY
P.O. BOX 166
HOBBS, NM 88240

TO: Key Energy **DATE:** 09-08-10

This is to certify that:

I, Bud Collins, **Technician for American Valve & Meter, Inc., has checked the calibration of the following instrument.**

8" Pressure recorder **Serial No:** 8131

at these points.

Pressure 0-3500 **Temperature** _____

Test	Found	Left	Test	Found	Left
0	___	0	___	___	___
250	___	250	___	___	___
500	___	500	___	___	___
350	___	350	___	___	___
100	___	100	___	___	___
0	___	0	___	___	___

Remarks: _____

Signature Bud Collins

TUESDAY
NOON
MONDAY
NOON
SUNDAY
NOON
WEDNESDAY
NOON
THURSDAY
NOON
FRIDAY
NOON
SATURDAY
NOON
A.M.
P.M.
BR 4685
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
POUNDS PER SQUARE INCH
PRINTED IN U.S.A.

Section VII.5.A. Appendix:

Includes:

1. 2010 BW-28 AOR Review-Well Status List. "Update in Feb 2011"
2. 2009-2010 BW-28 Annual Review-Unit Plot Plan. "Updated in Feb 2011"
3. 2010 Well File Downloads-36 pages. "Updated in Feb 2011"

2010 BW-28 AOR Review-- Well Status List

up-dated Feb 2011

	API#	Well Name	UL	Sectior	Ts	Rg	Footage	Within 1/4 mi AOR * within 660 ft			Casing Program Checked	Cased/Cemented across salt section	Corrective Action Required
1	***30-025-33547***	***Key-State no.001***	***E***	***15***	***21s***	***37e***	***1340 FNL & 330 FWL***	NA			NA		
1	30-025-06591	Apache NEDU 604	E	15	21s	37e	2310 FNL & 990 FWL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-09913	Shell NEDU 603	E	15	21s	37e	3390 FSL & 4520 FEL	yes*	1	1	yes	yes	no
1	30-025-09914	Apache NEDU 602	E	15	21s	37e	1980 FNL & 660 FWL	yes*	1	1	yes	yes	no
1	30-025-35271	Apache NEDU 602625	E	15	21s	37e	2580 FNL & 1300 FWL	no			na	na	na
0	30-025-37223**	Apache NEDU 628	E	15	21s	37e	1410 FNL & 380 FWL	(Not Drilled)	0	0	na	na	na
1	30-025-06609	Chevron St. 002	C	15	21s	37e	660 FNL & 1980 FWL	no			na	na	na
1	30-025-06611	Chevron St. 004	C	15	21s	37e	660 FNL & 2080 FWL	no			na	na	na
1	30-025-06613	Apache NEDU 605	C	15	21s	37e	760 FNL & 1980 FWL	no			na	na	na
1	30-025-34649	Apache NEDU 622	C	15	21s	37e	1229 FNL & 2498 FWL	no			na	na	na
1	30-025-34886	Apache NEDU 524	C	15	21s	37e	160 FNL & 1350 FWL	no			na	na	na
1	30-025-39831(added 2010)	Chevron State S no. 2	C	15	21s	37e	990 FNL & 1330 FWL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-34887	Apache NEDU 624	C	15	21s	37e	1250 FNL & 1368 FWL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-06586	Chevron St. 001	D	15	21s	37e	660 FNL & 660 FWL	yes*(changed in 2010)	1	1	will be checked	in 2010 annual report due 3-31-11	in 2010 annual report due 3-31-11
1	30-025-06612	Chevron St. 005	D	15	21s	37e	660 FNL & 990 FWL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-06614	Apache NEDU 601	D	15	21s	37e	600 FNL & 990 FWL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-36809	Apache NEDU 526	D	15	21s	37e	130 FNL & 330 FWL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-06585	Apache St. 002	F	15	21s	37e	1980 FNL & 1980 FWL	no			na	na	na
1	30-025-06587	Apache NEDU 606	F	15	21s	37e	3375 FSL & 3225 FEL	no			na	na	na
1	30-025-06590	Apache NEDU 608	F	15	21s	37e	1980 FNL & 1880 FWL	no			na	na	na
1	30-025-06603	Apache Argo 006	K	15	21s	37e	1650 FSL & 2310 FWL	no			na	na	na
1	30-025-06607(added 2010)	Apache Argo 011	K	15	21s	37e	2080 FSL & 1650 FWL	no			na	na	na
1	30-025-09918	Apache NEDU 703	K	15	21s	37e	1980 FSL & 1980 FWL	no			na	na	na
1	30-025-39828	Apache Argo 14	K	15	21s	37e	2190 FSL & 2130 FWL	no			na	na	na
1	30-025-34657	Apache NEDU 623	K	15	21s	37e	2540 FSL & 2482 FWL	no			na	na	na
1	30-025-06606	Apache Argo 010	L	15	21s	37e	1880 FSL & 760 FWL	no			na	na	na
1	30-025-09915	Apache Argo 007	L	15	21s	37e	2310 FSL & 990 FWL	no			na	na	na
1	30-025-09916	Apache NEDU 701	L	15	21s	37e	1980 FSL & 660 FWL	no			na	na	na
1	30-025-34888	Apache NEDU 713	L	15	21s	37e	1330 FSL & 1142 FWL	no			na	na	na
1	30-025-37238	Apache NEDU 629	L	15	21s	37e	2630 FSL & 330 FWL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-06623	Apache WBDU 057	A	16	21s	37e	660 FNL & 660 FEL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-25198	Chevron HLNCT 006	A	16	21s	37e	330 FNL & 600 FEL	no			no	na	na
1	30-025-39277***	Apache WBDU 113	A	16	21s	37e	1290 FNL & 330 FEL	yes*	1	1	yes	yes	will report in 2011
1	30-025-06621	Apache WBDU 056	H	16	21s	37e	1980 FNL & 660 FEL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-06624	Chevron HLNCT 005	H	16	21s	37e	2310 FNL & 330 FEL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-36741	Chevron HLNCT 007	H	16	21s	37e	1330 FNL & 1070 FEL	no			na	na	na
1	30-025-37834	Chevron HLNCT 008	H	16	21s	37e	2310 FNL & 030 FEL	yes		1	no	check again 2011 report	check again 2011 report
1	30-025-06617	Apache St. DA 005	I	16	21s	37e	1980 FSL & 330 FEL	no			na	na	na
1	30-025-06619	Apache WBDU078	I	16	21s	37e	1980 FSL & 660 FEL	no			na	na	na
1	30-025-37916	Apache St. DA 013	I	16	21s	37e	1650 FSL & 780 FEL	no			na	na	na
									4	15			

39 Total # of wells in adjacent quarter-sections
15 Total # of wells in 1/4 mile AOR
4 Total # of wells that are or have become within 660 ft of the outside radius of the brine well and casing program will be checked and reported in the next annual report.

Notes:

* **Means the well is within 660 ft of the outside radius of the brine well and casing program will be checked and reported in the next annual report.**

** API # 30-025-37223 not drilled

*** **API# 30-025-39277 will investiagate high cement usuage during drilling and report in 2011.**

From: "Corbell, Randy" <rcorbell@keyenergy.com>
Subject: **RE: AOR**
Date: June 11, 2010 4:19:59 PM MDT
To: <wayneprice77@earthlink.net>
Cc: "Patterson, Bob" <bpatterson@keyenergy.com>

The NEDU #628 was never drilled and location was taken back up and leveled and all other locations are correct.

-----Original Message-----
From: Patterson, Bob
Sent: Friday, June 11, 2010 4:05 PM
To: Corbell, Randy
Subject: Fw: AOR

B Patterson

Sent from my BlackBerry Wireless Handheld

----- Original Message -----
From: wayne price <wayneprice77@earthlink.net>
To: Fisher, Robert
Cc: Patterson, Bob
Sent: Fri Jun 11 16:35:36 2010
Subject: AOR

Bob & Bob,

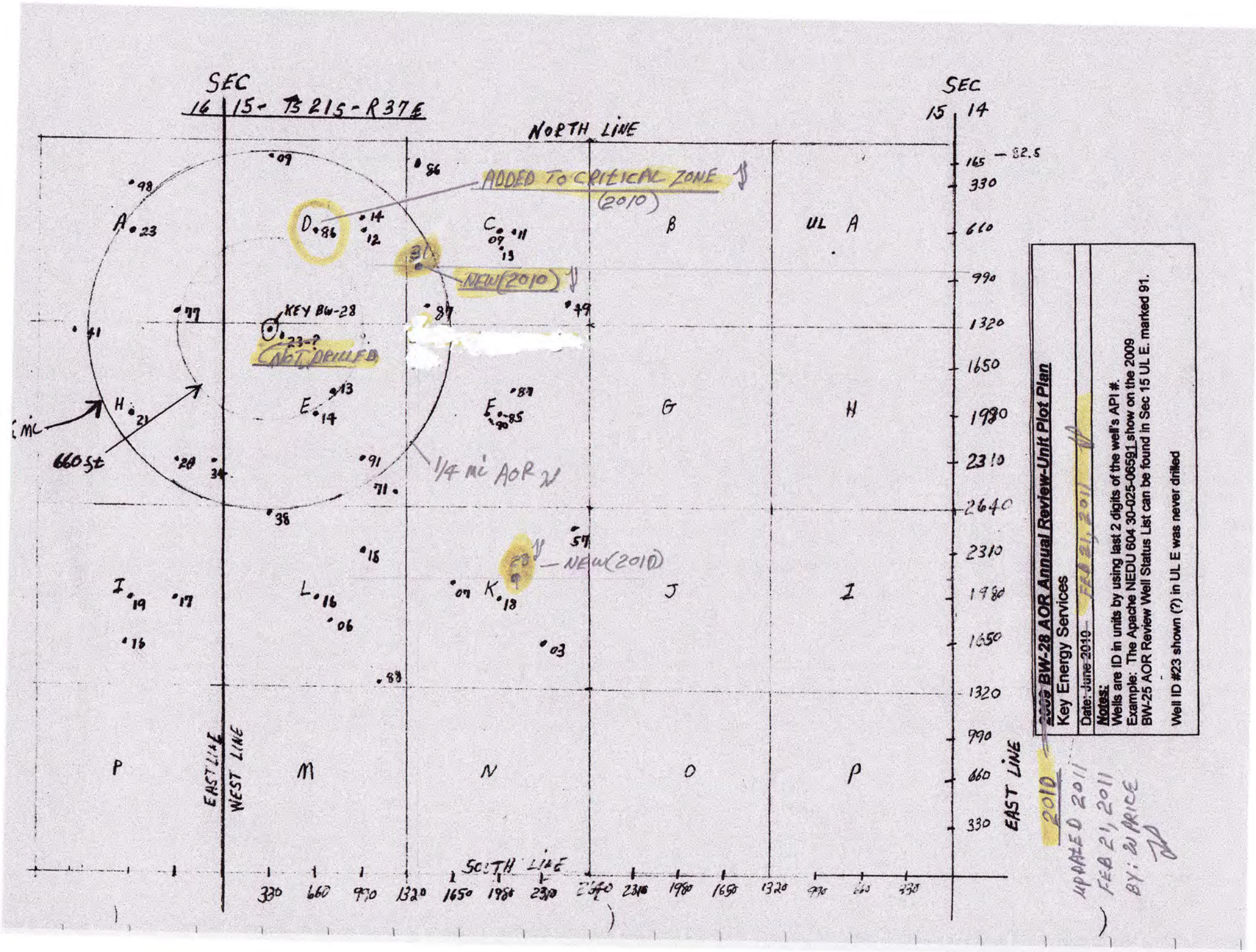
Sorry to bother you, but I need the information on the closest wells to the brine well.

Here is what I have, would you please field verify this info.

API 30-025-09913 Shell NEDU 603 3390 FSL & 4520 FEL. I am showing this well to be located about 500 ft to the SSE from our brine well.
API 30-025-09914 Apache NEDU 602 1980 FNL & 660 FWL. I am showing this well to be located about 600-700 ft to the SSE from our brine well.
API 30-025-39277 Apache WBDU 113 1290 FNL & 330 FEL. I am showing this well to be located about 500-600 ft to the NW from our brine well.
API 30-025-37223 Apache NEDU 628 1410 FNL & 380 FWL. I am showing this well to be located about 86 ft to the SE from our brine well. I am sure this is not correct from the pictures I took.

Bob, this may be the well you mentioned that was staked close to our brine well. I am showing it was drilled 2006-2007?

Please verify these findings and if there are any other wells that are within 660 ft (best guess) of our brine well please let me know.
I need this ASAP! Sorry!


SEC 16 15-T21S-R37E
SEC 15 14
NORTH LINE
EAST LINE
WEST LINE
SOUTH LINE
ADDED TO CRITICAL ZONE (2010)
NEW (2010)
KEY BW-28
23-?
NOT DRILLED
1/4 mi AOR
660 ft
NEW (2010)
2010 BW-28 AOR Annual Review-Unit Plot Plan
Key Energy Services
Date: June 2010
FEB 21, 2011
Notes:
Wells are ID in units by using last 2 digits of the well's API #.
Example: The Apache NEDU 604 30-025-06591 show on the 2009
BW-25 AOR Review Well Status List can be found in Sec 15 UL E. marked 91.
Well ID #23 shown (?) in UL E was never drilled
UPDATED 2011
FEB 21, 2011
BY: BJ PRICE

Well File Search - *Select Documents to View*

Please click on any thumbnail below in order to view the document. Access to the OCD internet images does not grant permission to reproduce, disseminate, disclose, or otherwise utilize materials subject to protection of United States copyright or trademark laws. Contact the copyright owner for specific permission to utilize any such materials. Image size and approximate download times are shown below each thumbnail. Download times are based upon a 28.8Kb modem speed.

Clicking the "View All" button below will download a single file containing all documents. "View All" will select only those thumbnails shown in the currently selected API Number. If you wish to select a different API Number, please use the "Go Back" button.

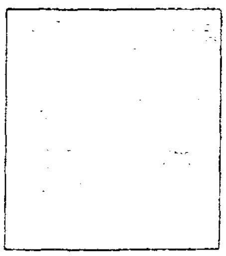
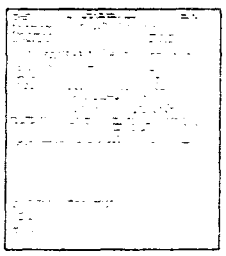
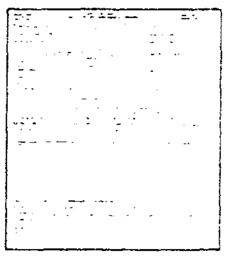
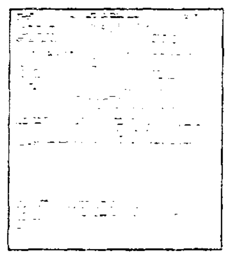
Sort Order: (•) Ascending ( ) Descending

API Number	ULSTR	Footages
3002533547	E-15-21S-37E	1340 FNL & 330 FWL

Well Name & Number: STATE No. 001

Operator: KEY ENERGY SERVICES, LLC

Note: If you are using Microsoft Internet Explorer and your system does not allow you to open TIFF images from the Internet without saving them first, please contact your administrator. You may be experiencing a problem with the Internet Explorer Cumulative Patch. Please refer to the Microsoft Knowledge Base Article [illegible] - Cannot Open a Tagged Information File Format [illegible] located here

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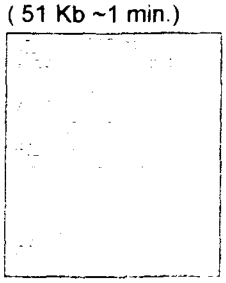
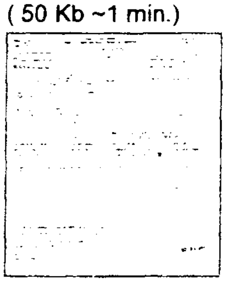
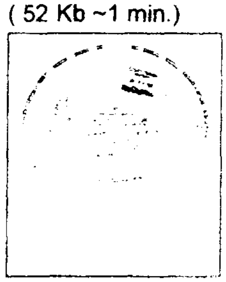
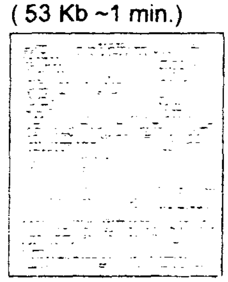

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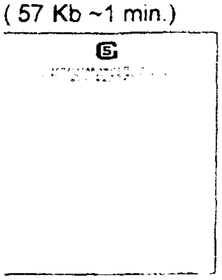
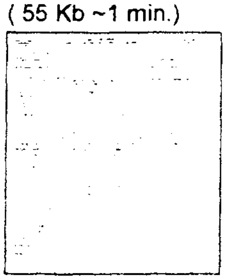
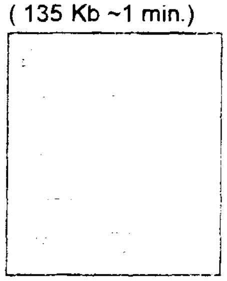
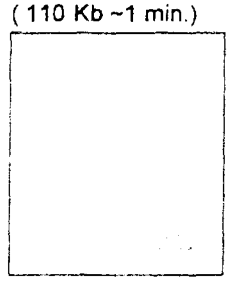

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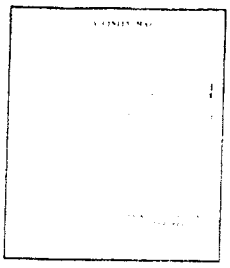

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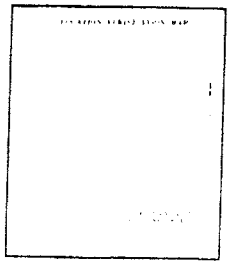

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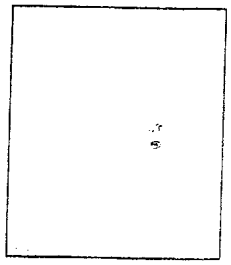
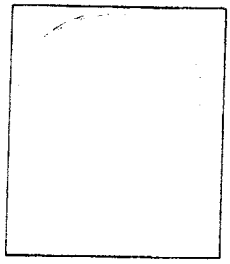


(15 Kb ~1 min.)



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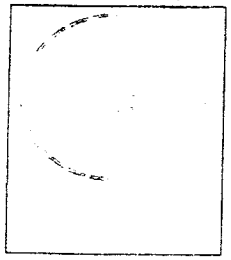

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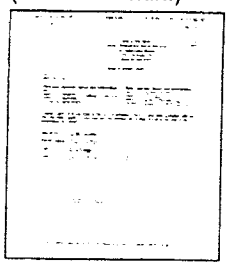

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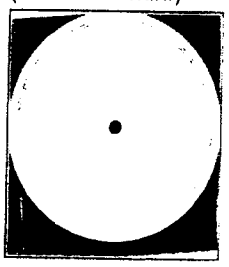
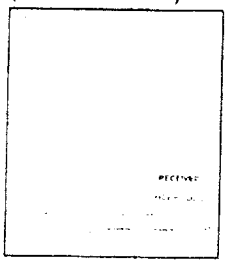
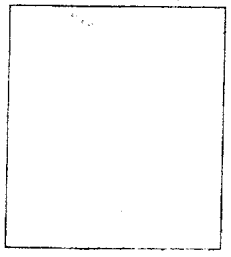


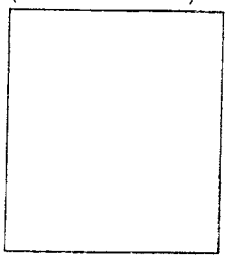
(230 Kb ~1 min.)



(99 Kb ~1 min.)



(178 Kb ~1 min.)



(73 Kb ~1 min.)

View All Go Back

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-33547	~~Salt (Brine Well)~~ 96173	~~Salt~~ BSW; Salado

Property Code	Property Name	Well Number
A386	STATE	1

OGRID No.	Operator Name	Elevation
148431	GOLD STAR SWD LTD. CO.	3458

Surface Location

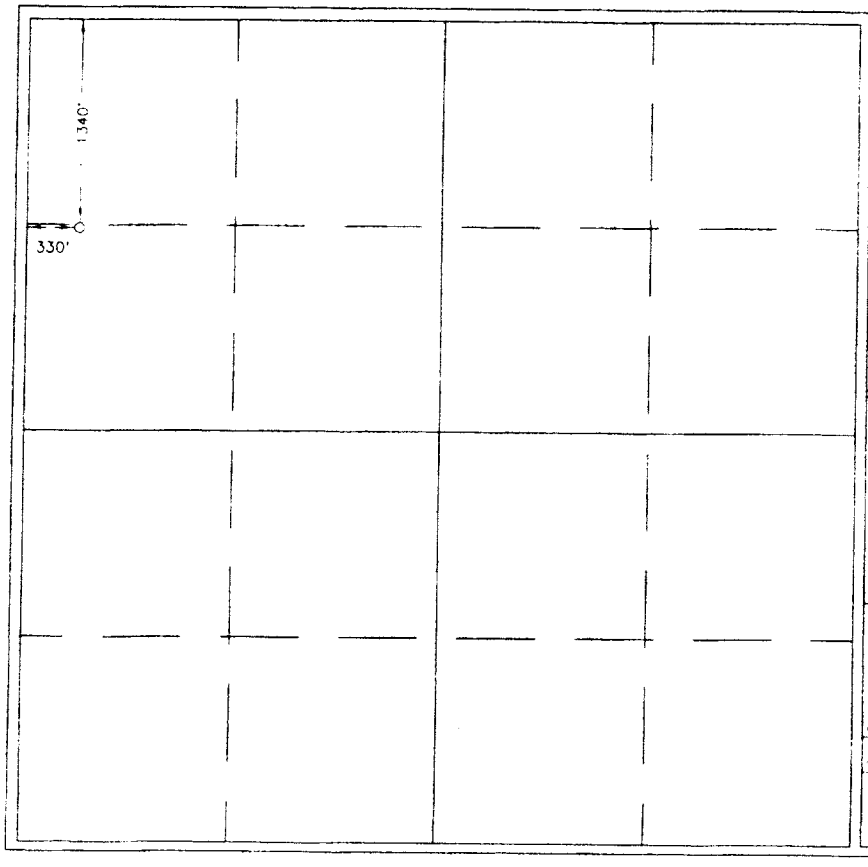
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	15	21 S	37 E		1340	NORTH	330	WEST	LEA

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 the the information contained herein is true and complete to the best of my knowledge and belief.

Signature: Royce Crowell
Printed Name: Mgr-Member
Title:
Date:

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.

AUG 1996

Date Surveyed: DMCC
Signature & Seal of Professional Surveyor:

8-02-96

Certificate No. JOHN W. WEST 676
RONALD J. EIDSON 3239
GARY EIDSON 12641

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., 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

RECEIVED
MAY 26 2009
HOBBSOCD

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
5/25/2009

WELL API NO. 30-025-33547	
5. Indicate Type of Lease STATE X FEE	
6. State Oil & Gas Lease No. MS-0004	
7. Lease Name or Unit Agreement Name State	
8. Well Number # 1	
9. OGRID Number 19787	
10. Pool name or Wildcat BSW-SALADO	

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well ☐ / Gas Well ☐ Other X Brine Well
2. Name of Operator: Key Energy Services
3. Address of Operator: P.O Box 99 Eunice NM 88231
4. Well Location
Unit Letter E : 1340 feet from the North line and 330 feet from the West line
Section 15 Township 21S Range 37E NMPM County Lea

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*

Pit or Below-grade Tank Application ☐ or Closure ☐
Pit type ____ Depth to Groundwater ____ Distance from nearest fresh water well ____ Distance from nearest surface water ____
Pit Liner Thickness: ____ mil Below-Grade Tank: Volume ____ bbls: Construction Material ____

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
OTHER Sonor Test & MIT ☐		OTHER: ☒	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

5-19-2009 MI- RUPU Install BOP, POH with 2 7/8 Tbg and 6 ¼ Bit
5-19-2010 SION
5-20-2009 RU Key Wire Line and Sonor Tool, Run Sonor test on Brine Well, POH with sonor tool.
5-20-2010 SION
5-21-2009 RIH with Packer and 2 7/8 Tbg and 6 ¼ bit to 1300', Pressure test to 300#, Pressure Test leaked 30# in 20 minutes. OCD Rep on location advised to Pull up to 1290' and Retest. Pull up to 1290' with Packer and Tbg. Retest to 340#, Test held good for 30 minutes. POH with packer and tbg. RIH with 6 ¼ Bit and tbg to 1300' And SION.
5/22/2009 RU Reverse and power swivel and drill to 1701', Circulate will for 30 minutes. SION
5/23/2009 Pull BOP and flange will head back up & return to production.

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that any pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☐, a general permit ☐ or an (attached) alternative OCD-approved plan ☐.

SIGNATURE Sam Blair TITLE MANAGER DATE 5-25-09

Type or print name E-mail address: Telephone
For state use only
APPROVEDBY: Terry W. Gil TITLE DISTRICT 1 SUPERVISOR DATE MAY 27 2009
Conditions of Approval (if any):

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mex
Energy Minerals and Natural Resources

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

Form C-10
March 19, 2

Submit 1 copy of the final affected we list along with 1 copy of this form, number of wells on that list appropriate District Off

Change of Operator

Previous Operator Information:		New Operator Information:	
OGRID:	148431	Effective Date:	04/20/01
Name:	Gold Star SWD Ltd. Co.	New Ogrid:	19797
Address:	Box 1480	New Name:	Yale E. Key, Inc.
Address:		Address:	Box 2040
City, State, Zip:	Eunice, NM, 88231	Address:	
		City, State, Zip:	Hobbs, NM 88241

I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information on this form and the attached list of wells is true and complete to the best of my knowledge and belief.

New Operator Signature: Royce Crowell

Printed name: Royce Crowell

Title: Compliance Specialist

Date: 07/11/01 Phone: (505) 393-9171

Previous operator complete below:

Previous Operator: Gold Star SWD Ltd. Co.

Previous OGRID: 148431

Signature: Royce Crowell

Printed Name: Royce Crowell

NMOCD Approval

Signature: Paul F Kautz

Printed Name: Paul F Kautz

District: Geologist

Date: JUL 26 2001

Submit to Appropriate District Office
State Lease – 6 copies
Fee Lease – 5 copies
DISTRICT I
P.O. Box 1980, Hobbs, NM 88240
DISTRICT II
P.O. Drawer DD, Artesia, NM 88210
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-105
Revised 1-1-89

OIL CONSERVATION DIVISION

2040 Pacheco St.
Santa Fe, NM 87505

WELL API NO. 30-025-33547
5. Indicate Type of Lease STATE [X] FEE [ ]
6. State Oil & Gas Lease No. MS0004

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

1a. Type of Well: OIL WELL [ ] GAS WELL [ ] DRY [X] OTHER Brine
b. Type of Completion: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF RESVR [ ] OTHER
7. Lease Name or Unit Agreement Name: State
2. Name of Operator: Gold Star SWD Ltd Co.
8. Well No. 1
3. Address of Operator: Box 1480 Eunice, N.M. 88231
9. Pool name or Wildcat: BSW-Salado <96173>
4. Well Location
Unit Letter E : 1340 Feet From The North Line and 330 Feet From The West Line
Section 15 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
9-28-96	10-2-96	10-4-96	DF 3469	3458

15. Total Depth	16. Plug Back T.D.	17. If Multiple Compl. How Many Zones?	18. Intervals Drilled By	Rotary Tools	Cable Tools
2200'				X	

19. Producing Interval(s), of this completion - Top, Bottom, Name: Top 1390 Bottom 1445 BSW Salado
20. Was Directional Survey Made: Yes
21. Type Electric and Other Logs Run: N/A
22. Was Well Cored: no

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	32#	1360'	12 1/4	800 Sx.	
2 7/8	Fiberglass	2074	7 7/8		

24. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

25. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 7/8	2074	

26. Perforation record (interval, size, and number)
N/A

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

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
1360'	500 Sx Class C 4% Gel
	300 Sx Class C 2% Cal Cl

PRODUCTION

28.

Date First Production	Production Method (Flowing, gas lift, pumping - Size and type pump)	Well Status (Prod. or Shut-in)

Date of Test	Hours Tested	Choke Size	Prod'n For Test Period	Oil - Bbl.	Gas - MCF	Water - Bbl.	Gas - Oil Ratio

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API - (Corr.)

29. Disposition of Gas (Sold, used for fuel, vented, etc.)
Test Witnessed By

30. List Attachments

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

Signature Loyce Crowell Printed Name Loyce Crowell Title Mgr. Member Date 10-4-96

FEB 201

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506609	C -15-21S-37E	660 FNL & 1980 FWL
Well Name & Number: STATE S No. 002		
Operator: CHEVRON U S A INC		
3002506611	C -15-21S-37E	660 FNL & 2080 FWL
Well Name & Number: STATE S No. 004		
Operator: CHEVRON U S A INC		
3002506613	C -15-21S-37E	760 FNL & 1980 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 605		
Operator: APACHE CORP		
3002534649	C -15-21S-37E	1229 FNL & 2498 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 622		
Operator: APACHE CORP		
3002534886	C -15-21S-37E	160 FNL & 1350 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 524		
Operator: APACHE CORP		
3002534887	C -15-21S-37E	1250 FNL & 1368 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 624		
Operator: APACHE CORP		
3002539831	C -15-21S-37E	990 FNL & 1330 FWL
Well Name & Number: STATE S No. 012		
Operator: CHEVRON U S A INC		

NEW
IN ¼ mi AOR

Continue **Go Back**

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506603	K -15-21S-37E	1650 FSL & 2310 FWL
Well Name & Number: ARGO No. 006		
Operator: APACHE CORP		
3002506607	K -15-21S-37E	2080 FSL & 1650 FWL
Well Name & Number: ARGO No. 011		
Operator: APACHE CORP		
3002509918	K -15-21S-37E	1980 FSL & 1980 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 703		
Operator: APACHE CORP		
3002534657	K -15-21S-37E	2540 FSL & 2482 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 623		
Operator: APACHE CORP		
3002539828	K -15-21S-37E	2190 FSL & 2130 FWL
Well Name & Number: ARGO No. 014		
Operator: APACHE CORP		

Continue **Go Back**

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506591	E -15-21S-37E	2310 FNL & 990 FWL

Well Name & Number: NORTHEAST DRINKARD UNIT No. 604

Operator: APACHE CORP

3002509913	E -15-21S-37E	3390 FSL & 4520 FEL

Well Name & Number: NORTHEAST DRINKARD UNIT No. 603

Operator: SHELL WESTERN E & P INC

3002509914	E -15-21S-37E	1980 FNL & 660 FWL

Well Name & Number: NORTHEAST DRINKARD UNIT No. 602

Operator: APACHE CORP

3002533547	E -15-21S-37E	1340 FNL & 330 FWL

Well Name & Number: STATE No. 001

Operator: KEY ENERGY SERVICES, LLC

3002535271	E -15-21S-37E	2580 FNL & 1300 FWL

Well Name & Number: NORTHEAST DRINKARD UNIT No. 625

Operator: APACHE CORP

3002537223	E -15-21S-37E	1410 FNL & 380 FWL

Well Name & Number: NORTHEAST DRINKARD UNIT No. 628

Operator: APACHE CORP

Continue **Go Back**

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506586	D -15-21S-37E	660 FNL & 660 FWL
Well Name & Number: STATE S No. 001		
Operator: CHEVRON U S A INC		
3002506612	D -15-21S-37E	660 FNL & 990 FWL
Well Name & Number: STATE S No. 005		
Operator: CHEVRON U S A INC		
3002506614	D -15-21S-37E	600 FNL & 990 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 601		
Operator: APACHE CORP		
3002536809	D -15-21S-37E	130 FNL & 330 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 526		
Operator: APACHE CORP		

Continue **Go Back**

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506585	F -15-21S-37E	1980 FNL & 1980 FWL
Well Name & Number: CITIES S STATE No. 002		
Operator: APACHE CORP		
3002506587	F -15-21S-37E	3375 FSL & 3225 FEL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 606		
Operator: APACHE CORP		
3002506590	F -15-21S-37E	1980 FNL & 1880 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 608		
Operator: APACHE CORP		

Continue **Go Back**

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506606	L -15-21S-37E	1880 FSL & 760 FWL
Well Name & Number: ARGO No. 010		
Operator: APACHE CORP		
3002509915	L -15-21S-37E	2310 FSL & 990 FWL
Well Name & Number: ARGO No. 007		
Operator: APACHE CORP		
3002509916	L -15-21S-37E	1980 FSL & 660 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 701		
Operator: APACHE CORP		
3002534888	L -15-21S-37E	1330 FSL & 1142 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 713		
Operator: APACHE CORP		
3002537238	L -15-21S-37E	2630 FSL & 330 FWL
Well Name & Number: NORTHEAST DRINKARD UNIT No. 629		
Operator: APACHE CORP		

Continue **Go Back**

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506623	A -16-21S-37E	660 FNL & 660 FEL

Well Name & Number: WEST BLINEBRY DRINKARD UNIT No. 057

Operator: APACHE CORP

3002525198	A -16-21S-37E	330 FNL & 600 FEL

Well Name & Number: HARRY LEONARD NCT E No. 006

Operator: CHEVRON U S A INC

3002539277	A -16-21S-37E	1290 FNL & 330 FEL

Well Name & Number: WEST BLINEBRY DRINKARD UNIT No. 113

Operator: APACHE CORP

Continue **Go Back**

Well File Search - *Select API Number to View*

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506621	H -16-21S-37E	1980 FNL & 660 FEL
Well Name & Number: WEST BLINEBRY DRINKARD UNIT No. 056		
Operator: APACHE CORP		
3002506624	H -16-21S-37E	2310 FNL & 330 FEL
Well Name & Number: HARRY LEONARD NCT E No. 005		
Operator: CHEVRON U S A INC		
3002536741	H -16-21S-37E	1330 FNL & 1070 FEL
Well Name & Number: HARRY LEONARD NCT E No. 007		
Operator: CHEVRON U S A INC		
3002537834	H -16-21S-37E	2310 FNL & 1030 FEL
Well Name & Number: HARRY LEONARD NCT E No. 008		
Operator: CHEVRON U S A INC		

Continue **Go Back**

Well File Search - *Select API Number to View*

FEB 20

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

API Number	ULSTR	Footages
3002506617	I -16-21S-37E	1980 FSL & 330 FEL
Well Name & Number: STATE DA No. 005		
Operator: APACHE CORP		
3002506619	I -16-21S-37E	1980 FSL & 660 FEL
Well Name & Number: WEST BLINEBRY DRINKARD UNIT No. 078		
Operator: APACHE CORP		
3002537916	I -16-21S-37E	1650 FSL & 780 FEL
Well Name & Number: STATE DA No. 013		
Operator: APACHE CORP		

Continue **Go Back**

1951

Submit 3 Copies to Appropriate District Office

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-103
Revised 1-1-89

WELL API NO. 30-025-09913

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

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: NORTHEAST DRINKARD UNIT

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

2. Name of Operator: Shell Western E&P Inc.

8. Well No. 603

3. Address of Operator: P.O. Box 576 Houston, TX 77001-0576 (WCK 5237)

9. Pool name or Wildcat: N. EUNICE BLINEBRY-DRINKARD-TUBB

4. Well Location
Unit Letter E : 3390 Feet From The SOUTH Line and 4520 Feet From The EAST Line

Section 15 Township 21S Range 37E NMPM LEA County

10. Elevation (Show whether DF, RKB, RT, GR, etc.) 3445' GR

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [X]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]	CHANGE PLANS [ ]	COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [X]
PULL OR ALTER CASING [ ]		CASING TEST AND CEMENT JOB [ ]	
OTHER: [ ]		OTHER: [ ]	

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

11-13 TO 11-22-93:

DMPD 35' CLS C CMT ON TOP OF CIBP @ 6696'. SET CICR @ 5651'. SQZD BLINEBRY PERFS 5715' - 6682' W/250 SX CLS C NEAT CMT. STUNG OUT OF CICR. LEFT 185' OF CMT ON TOP OF CICR (TOC @ 5466'). CIRC INHIB FL. ISOLATED CSG LK BTW 4934' - 4965'. SET CICR @ 4841'. SQZD CSG LK W/ 200 SX CLS C NEAT. STUNG OUT OF CICR. LEFT 126' CMT ON TOP OF CICR. (TOC @ 4715'.) CIRC INHIB FL. PERF 4-WAY SHOT @ 2875'. SET CICR @ 2802'. ESTAB CIRC DWN TBG & OUT 5-1/2 X 8-5/8 ANN. PMPD 400 SX CLS C CMT, UNABLE TO CIRC TO SURF. STUNG OUT OF CICR. LEFT 63' CMT ON TOP OF CICR. CIRC CLN. WOC 8 HRS. RUN TEMP SURVEY & FOUND TOC @ 850'. PERF @ 800'. SET CICR @ 750'. CIRC CLS C CMT TO SURF BTW 5-1/2 X 8-5/8 ANN. STUNG OUT OF CICR. CMT TO SURF IN 5-1/2 PROD CSG. CUT OFF 5-1/2 IN. WELLHEAD. WLD 4 IN. MARKER 3' BELOW GL W/4' ABV GL. BACKFILL PIT & CELLAR. CUT OFF DEADMAN BELOW GL. WELL IS P&A'D.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE J. Marcus Windes TITLE TECH. MGR. - ASSET ADMIN. DATE 1/07/94

TYPE OR PRINT NAME A. J. DURRANI TELEPHONE NO. 713/544-3797

(This space for State Use)

APPROVED BY Charles Gholson TITLE OIL [illegible] DATE FEB 15 1995

CONDITIONS OF APPROVAL, IF ANY:

Submit 3 Copies to Appropriate District Office

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-103
Revised 1-1-89

WELL API NO. 30-025-09913

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

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
NORTHEAST DRINKARD UNIT

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

2. Name of Operator
Shell Western E&P Inc.

8. Well No.
603

3. Address of Operator
P.O. Box 576 Houston, TX 77001-0576 (WCK 4465)

9. Pool name or Wildcat
N. EUNICE BLINEBRY-DRINKARD-TUBB (O) + GAS

4. Well Location
Unit Letter E : 3390 Feet From The SOUTH Line and 4520 Feet From The EAST Line

Section 15 Township 21S Range 37E NMPM LEA County

10. Elevation (Show whether DF, RKB, RT, GR, etc.)
3445' GR

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	[ ]	PLUG AND ABANDON	[X]	REMEDIAL WORK	[ ]	ALTERING CASING	[ ]
TEMPORARILY ABANDON	[ ]	CHANGE PLANS	[ ]	COMMENCE DRILLING OPNS.	[ ]	PLUG AND ABANDONMENT	[ ]
PULL OR ALTER CASING	[ ]			CASING TEST AND CEMENT JOB	[ ]		
OTHER:	[ ]			OTHER:	[ ]		

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

1. NOTIFY NMOCD AT LEAST 24 HRS PRIOR TO COMMENCING P&A OPERATIONS.
2. DMP 35' CMT ON TOP OF CICR @ 5896'.
3. SET CICR @ 5650'. SQZ BLINEBRY/TUBB 5715' - 6682' W/150 SX CLS C CMT. DMP 100' CMT ON TOP OF CICR. CIRC HOLE W/10# BRINE.
4. TIH W/PKR TO ISOLATE CSG LK. POH W/PKR. IF CSG LK IS IN SAN ANDRES AS ANTICIPATED, PROCEED TO STEP 5. IF CSG LK IS NOT SAN ANDRES, CONTACT ENGR PRIOR TO PROCEEDING.
5. SET CICR +/-75' ABV CSG LK. SQZ CSG LK W/100 SX CLS C NEAT CMT BELOW CICR. DMP 35' CMT ON TOP OF CICR.
6. PT CSG TO 500#. CIRC HOLE W/10# BRINE.
7. PERF 4-WAY SHOT @ 2875'.
8. SET CICR @ 2800'. ESTAB INJ RT. PMP CLS C CMT + 4% GEL + 2% CACL2 UNTIL CMT CIRC TO SURF. (APPROX. 300-350 SX CMT WILL BE REQUIRED FOR CIRC.) DMP 35' CMT ON TOP OF CICR. CIRC HOLE W/10# BRINE.
9. IF SUCCESSFUL IN CIRC CMT TO SURF, PROCEED TO STEP 10. IF UNSUCCESSFUL, RUN TEMP SURVEY TO

(CONT'D ON REVERSE SIDE)

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE J. Marcus Winter TITLE TECH. MGR. - ASSET ADMIN. DATE 9/30/93

TYPE OR PRINT NAME J. L. MORRIS TELEPHONE NO. 713/544-3797

(This space for State Use)

APPROVED BY ORIGINAL SIGNED BY JERRY SEXTON DISTRICT I SUPERVISOR TITLE DATE OCT 07 1993

CONDITIONS OF APPROVAL, IF ANY:

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
SHELL WESTERN E&P INC.	NORTHEAST DRINKARD UNIT	603

Unit Letter	Section	Township	Range	County
E	15	21S	37E	LEA

Actual Footage Location of Well:
3390 feet from the SOUTH line and 4520 feet from the EAST line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3445'	BLINEBRY/TUBB/DRINKARD	NORTH EUNICE BLINEBRY-TUBB-DRINKARD OIL & GAS	40 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

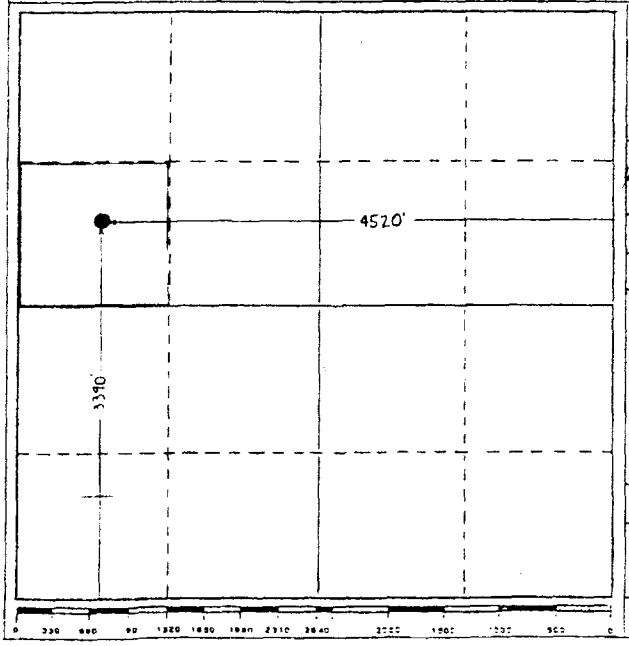
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

[X] Yes [ ] No If answer is "yes," type of consolidation UNITIZATION

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name A. J. FORE
Position SUPERVISOR REG. & PERMITTING
Company SHELL WESTERN E&P INC.
Date 8-05-88

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 supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed

Registered Professional Engineer and/or Land Surveyor

Certificate No.

DUPLICATE

CONSERVATION COMMISSION
Santa Fe, New Mexico

RECEIVED APR 30 1951

REQUEST FOR (OIL)-(GAS) ALLOWABLE

It is necessary that this form be submitted by the operator before an initial allowable will be assigned to any completed oil or gas well. Form C-110 (Certificate of Compliance and Authorization to Transport Oil) will not be approved until Form C-104 is filed with the Commission. Form C-104 is to be submitted in triplicate to the office to which Form C-101 was sent. Two copies will be retained there and the other submitted to the Proration Office, Hobbs, New Mexico. The allowable will be assigned effective 7:00 a.m. on date of completion, provided completion report is filed during month of completion. The completion date shall be that date in the case of an oil well when oil is delivered into the stock tanks. Gas must be reported on 15.025 P.B. at 60° Fahrenheit.

Hobbs, New Mexico (Place) April 30, 1951 (Date)

WE ARE HEREBY REQUESTING AN ALLOWABLE FOR A WELL KNOWN AS:

Cities Service Oil Company (Company or Operator) State "S" (Lease) Well No. 4 in [illegible]

Section 15, T. 21S, R. 37E, N.M.P.M. Simpson Pool Lea County

Please indicate location:

Elevation 3463(DF) Spudded 2-16-51 Completed 4-15-51

Total Depth 8182' P.B.

Top Oil/Gas Pay 8030' Top Water Pay –

Initial Production Test: Pump ___ Flow 204.87

Based on 204.87 Bbls. Oil in 7 Hrs. – Mins.

Method of Test (Pitot, gauge, prover, meter run): Prover

Size of choke in inches: 25/64"

Tubing (Size) 2" OD 8176.02

Pressures: Tubing 450# Casing 1010 (packer)

Gas/Oil Ratio 975 Gravity 41.4

Unit letter: [illegible]

Casing Perforations: Producing from open hole

Casing & Cementing Record

Size	Feet	Sax
13-3/8"	255.63'	325
8-5/8"	2805'	500
5"	[illegible]017'	400

Acid Record:

– Gals	–	to
– Gals	–	to
– Gals	–	to

Shooting Record:

Qts		to
Qts		to
Qts		to

Show of Oil, Gas and Water:

Natural Production Test: – Pumping 204.87 (7 hrs) Flowing

Test after acid or shot: – Pumping – Flowing

Please indicate below Formation Tops (in conformance with geographical section of state)

Southeastern New Mexico				Northwestern New Mexico	
T. Anhy		T. Devonian		T. Ojo Alamo	
T. Salt		T. Silurian		T. Kirtland-Fruitland	
B. Salt		T. Montoya		T. Farmington	
T. Yates		T. Simpson	7395'	T. Pictured Cliffs	
T. 7 Rivers		T. McKee	7650'	T. Cliff House	
T. Queen		T. Ellenburger	8030'	T. Menefee	
T. Grayburg		T. Gr. Wash		T. Point Lookout	
T. San Andres		T. Granite		T. Mancos	
T. Glorieta		T.		T. Dakota	
T. Drinkard		T.		T. Morrison	
T. Tubbs		T.		T. Penn	
T. Abo		T.		T.	
T. Penn		T.		T.	
T. Miss		T.		T.	

(Please supply required information on reverse side of form)

DUPLICATE

FORM C-105

N

NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

WELL RECORD

RECEIVED
APR 30 1951
OIL CONSERVATION COMMISSION
HOBBS OFFICE

Mail to Oil Conservation Commission, Santa Fe, New Mexico, or agent not more than twenty days after completion of well. Follow instructions in the Rules and Regulations of the Commission. Indicate questionable data by following it with (?). SUBMIT IN TRIPLICATE.

AREA 640 ACRES
LOCATE WELL CORRECTLY

Cities Service Oil Company — State "S"
(Company or Operator) (Lease)

Well No. 4 in SW NW of Sec. 15, T. 21S

R. 37E, N. M. P. M., Eunice Field, Lea County.

Well is 1390 feet North of the North line and 4520 feet west of the East line of Sec. 15-21S-37E

If State land the oil and gas lease is No. B-1481 Assignment No. -

If patented land the owner is - Address -

If Government land the permittee is - Address -

The Lessee is Cities Service Oil Company Address Bartlesville, Oklahoma

Drilling commenced February 18, 19 51. Drilling was completed April 15, 19 51

Name of drilling contractor Two-States Drilling Co. Address Dallas, Texas

Elevation above sea level at top of casing 3463 (DF) feet.

The information given is to be kept confidential until - 19 -

OIL SANDS OR ZONES

No. 1, from 8030' to 8182' 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 - to - feet. -

No. 2, from - to - feet. -

No. 3, from - to - feet. -

No. 4, from - to - feet. -

CASING RECORD

SIZE	WEIGHT PER FOOT	THREADS PER INCH	MAKE	AMOUNT	KIND OF SHOE	CUT & FILLED FROM	PERFORATED FROM	PERFORATED TO	PURPOSE
13-3/8"	36#	8R	SW	295.68'					
8-5/8"	24#	8R	J-55	2805'	Baker				
5½"	17#&15.5#	8R	J-55	8017'	Larkin				

MUDDING AND CEMENTING RECORD

SIZE OF HOLE	SIZE OF CASING	WHERE SET	NO. SACKS OF CEMENT	METHOD USED	MUD GRAVITY	AMOUNT OF MUD USED
17¼"	13-3/8"	211.68'	325	Plug		
11¼"	8-5/8"	2818'	500	Plug		
7-7/8"	5½"	8030'	400	Plug		

PLUGS AND ADAPTERS

Heaving plug—Material - Length - Depth Set -

Adapters—Material - Size -

RECORD OF SHOOTING OR CHEMICAL TREATMENT

SIZE	SHELL USED	EXPLOSIVE OR CHEMICAL USED	QUANTITY	DATE	DEPTH SHOT OR TREATED	DEPTH CLEANED OUT

Results of shooting or chemical treatment This well was neither shot nor acidized

RECORD OF DRILL-STEM AND SPECIAL TESTS

If drill-stem or other special tests or deviation surveys were made, submit report on separate sheet and attach hereto.

TOOLS USED

Rotary tools were used from 0' feet to 8182' feet, and from ______ feet to ______ feet.

Cable tools were used from ______ feet to ______ feet, and from ______ feet to ______ feet.

PRODUCTION

Put to producing April 17, 19 51

The production of the first 7 hours was 204.87 barrels of fluid of which 99.7 % was oil; 0.3 %

emulsion; ___ % water, and ___ % sediment. Gravity, Be ___ 41.4

If gas well, cu. ft. per 24 hours ___ Gallons gasoline per 1,000 cu. ft. of gas ___

Rock pressure, lbs. per sq. in. ___

EMPLOYEES

___ Driller ___ Driller

___ Driller ___ Driller

FORMATION RECORD ON OTHER SIDE

I hereby swear or affirm that the information given herewith is a complete and correct record of the well and all work done on it so far as can be determined from available records.

Subscribed and sworn to before me this 30 th day of April, 19 51

Fred Lawson
Notary Public

My Commission expires February 8, 1954

Hobbs, New Mexico (Place) April 30, 1951 (Date)

Name H. E. Massey

Position District Engineer

Representing Cities Service Oil Company (Company or Operator)

Address Drawer C, Hobbs, New Mexico

District I
P.O. Box 1980, Hobbs, NM 88241-1980
District II
P.O Drawer DD, Artesia, NM 88211-0719
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
P.O. Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088

Form C-104
Revised February 10, 1994
Instructions on back
Submit to Appropriate District Office
5 Copies

☐ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

1 Operator name and Address	2 OGRID Number
Apache Corporation 2000 Post Oak Blvd, Suite 100 Houston, TX 77056-4400	000873
	3 Reason for Filing Code CG effective 8/1/1998

4 API Number	5 Pool Name	6 Pool Code
30-025-09914	Eunice Blinebry-Tubb-Drinkard-North	22900
7 Property Code	**8 Property Name**	**9**
22503	Northeast Drinkard Unit	602

II. 10 Surface Location

Ul or lot no	Section	Township	Range	Lot. Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	15	21S	37E		1980	N	660	W	Lea

11 Bottom Hole Location

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

12 Lse Code	13 Producing Method Code	14 Gas Connection Date	15 C-129 Permit Number	16 29 Effective Date	17 C-129 Expiration Date
S	P	1/19/90			

III.

18 Transporter OGRID	19 Transporter Name and Address	20 POD	21 O/G	22 POD ULSTR Location and Description
037480	EOTT Energy Pipeline LP P O Box 4666 Houston, TX 77210-4666	2264710	O	A, Sec 2, T21S-R37E NEDU Central Battery
024650	Warren Petroleum P O Box 1589 Tulsa, OK 74102	2264730	G	
022628	Texas-New Mexico Pipeline Co P O Box 5568 TA Denver, CO 80217-5578	2264710	O	
020809	Sid Richardson Gasoline Co. 201 Main St., Suite 3000 Ft Worth, TX 76102	2264730	G	

IV Produced Water

23 POD	24 POD ULSTR Location and Description
2264750	A, Sec 2, T21S-R37E

V. Well Completion Data

25 Spud Date	26 Ready Date	27 TD	28 PBTD	29 Perforations

30 Hole Size	31 Casing & Tubing Size	32 Depth Set	33 Sacks Cement

VI Well Test Data

34 Date New Oil	35 Gas Delivery Date	36 Test Date	37 Test Length	38 Tbg. Pressure	39 Csg. Pressure
				-	-

40 Choke Size	41 Oil	42 Water	43 Gas	44 AOF	45 Test Method
					P

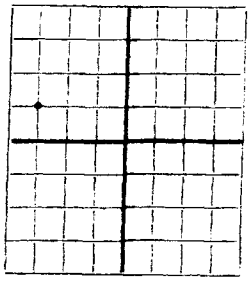
40 I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.	OIL CONSERVATION DIVISION
Signature: Pamela M. Leighton	Approved by: ORIGINAL SIGNED BY
Printed Name: Pamela M. Leighton	Title: DISTRICT SUPERVISOR FIELD REP. II
Title: Regulatory Analyst	Approval Date: SEP 24 1998
Date: Phone: 713-296-7120	

41 If this is a change of operator fill in the OGRID number and name of the previous operator

Previous Operator Signature	Printed Name	Title	Date

DUPLICATE

FORM C-105



AREA 640 ACRES
LOCATE WELL CORRECTLY

NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

WELL RECORD

Mail to Oil Conservation Commission, Santa Fe, New Mexico, or its proper agent not more than twenty days after completion of well. Follow instructions in the Rules and Regulations of the Commission. Indicate questionable data by following it with (?). SUBMIT IN TRIPLICATE. FORM C-110 WILL NOT BE APPROVED UNTIL FORM C-105 IS PROPERLY FILLED OUT.

Cities Service Oil Company Drawer G., Hobbs, New Mexico
Company or Operator Address

State "SC" Well No. 1 in C S. NW of Sec. 15, T. 21S
Lease

R. 37E, N. M. P. M., Drinkard Field, Lea County.

Well is 1980' feet south of the North line and 660' (4620') feet west of the East line of SEC-15-21S-37E

If State land the oil and gas lease is No. Assignment No.

If patented land the owner is -- Address --

If Government land the permittee is -- Address --

The Lessee is Cities Service Oil Company Address Bartlesville, Oklahoma

Drilling commenced April 11 19 48 Drilling was completed May 16 19 48

Name of drilling contractor Two States Drilling Company Address Dalles 1, Texas

Elevation above sea level at top of casing 3462' feet.

The information given is to be kept confidential until -- 19 --

OIL SANDS OR ZONES

No. 1, from 6510' to 6567' No. 4, from 6624' to 6669'

No. 2, from 6572' to 6597' No. 5, from to

No. 3, from 6606' to 6541' 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 -- to -- feet. --

No. 2, from to feet.

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

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

CASING RECORD

SIZE	WEIGHT PER FOOT	THREADS PER INCH	MAKE	AMOUNT	KIND OF SHOE	CUT & FILLED FROM	PERFORATED FROM	PERFORATED TO	PURPOSE
13 3/8"	36#	8 R	?	280'	-	-	-	-	-
8 5/8"	28#	8 RT	Ky	2788'	-	-	-	-	-
5 1/2"	15.5#	8 RT	J-55	6612'	Flout	collar and	guide shoe		
2"	4.7	EUE T	J-55	6553.78'	-	-	-	-	-

MUDDING AND CEMENTING RECORD

SIZE OF HOLE	SIZE OF CASING	WHERE SET	NO. SACKS OF CEMENT	METHODS USED	MUD GRAVITY	AMOUNT OF MUD USED
17"	13 3/8"	287'	300	Plug	--	--
11"	8 5/8"	2799'	800	Plug	--	--
7 7/8"	5 1/2"	6625'	350	Plug	--	--

PLUGS AND ADAPTERS

Heaving plug—Material -- Length -- Depth Set --

Adapters—Material -- Size --

RECORD OF SHOOTING OR CHEMICAL TREATMENT

SIZE	SHELL USED	EXPLOSIVE OR CHEMICAL USED	QUANTITY	DATE	DEPTH SHOT OR TREATED	DEPTH CLEANED OUT
		15% Acid	1000 Gallons	5-21-48	6625 to	--
					6669'	

Results of shooting or chemical treatment well flowed 742 barrels of oil in 20 hours after recovering 200 barrel load used in acidizing. Rubing choke 23/32". GOR 792

RECORD OF DRILL-STEM AND SPECIAL TESTS

If drill-stem or other special tests or deviation surveys were made, submit report on separate sheet and attach hereto.

TOOLS USED

Rotary tools were used from 0 feet to 6669 feet, and from -- feet to -- feet

Cable tools were used from -- feet to -- feet, and from -- feet to -- feet

PRODUCTION

Put to producing May 21, 1948

The production of the first 24 hours was 742 barrels of fluid of which 100 % was oil; -- % emulsion; -- % water; and -- % sediment. Gravity, Be. 40°

If gas well, cu. ft. per 24 hours -- Gallons gasoline per 1,000 cu. ft. of gas --

Rock pressure, lbs. per sq. in. --

EMPLOYEES

--, Driller --, Driller

-- , Driller -- , Driller

FORMATION RECORD ON OTHER SIDE

I hereby swear or affirm that the information given herewith is a complete and correct record of the well and all work done on it so far as can be determined from available records.

Subscribed and sworn to before me this 27 th day of May, 1948

Notary Public

My Commission expires March 12, 1951

Hobbs, New Mexico (Place) May 27, 1948 (Date)

Name

Position District Superintendent

Representing Cities Service Oil Company (Company or Operator)

Address Drawer D, Hobbs, New Mexico

Form C-101 NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

NOTICE OF INTENTION TO DRILL

Notice must be given to the Oil Conservation Commission or its proper agent and approval obtained before drilling begins. If changes in the proposed plan are considered advisable, a copy of this notice showing such changes will be returned to the sender. Submit this notice in triplicate. One copy will be returned following approval. See additional instructions in Rules and Regulations of the Commission.

Hobbs, New Mexico (Place) April 2, 1948 (Date)

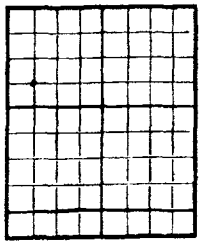
OIL CONSERVATION COMMISSION,
Santa Fe, New Mexico,

Gentlemen:

You are hereby notified that it is our intention to commence the drilling of a well to be known as

Cities Service Oil Company (Company or Operator) State "S" (Lease) Well No. 1 in C SW NW

of Sec. 15, T. 21S, R. 37E, N. M. P. M., Drinkard Field, Lea County.



AREA 640 ACRES
LOCATE WELL CORRECTLY

The well is 1980 feet (N.) (S.) of the N line and 660 feet (E.) (W.) of the W line of Sec. 15-21S-37E

(Give location from section or other legal subdivision lines. Cross out wrong directions.)

If state land the oil and gas lease is No. Not known Assignment No. Not Known

If patented land the owner is --

Address --

If government land the permittee is --

Address --

The lessee is Cities Service Oil Company

Address Empire - Masonic Building, Bartlesville, Oklahoma

We propose to drill well with drilling equipment as follows: Rotary all the way.

The status of a bond for this well in conformance with Rule 39 of the General Rules and Regulations of the Commission is as follows: Approved

We propose to use the following strings of casing and to land or cement them as indicated:

Size of Hole	Size of Casing	Weight Per Foot	New or Second Hand	Depth	Landed or Cemented	Sacks Cement
17 1/4"	13 3/8"	48#	New	500'	Cemented	To Surface
11 1/4"	8 5/8"	28#	New	2800'	Cemented	500
7 7/8"	5 1/2"	15 1/2#	New	6640'	Cemented	350

If changes in the above plan become advisable we will notify you before cementing or landing casing. We estimate that the first productive oil or gas sand should occur at a depth of about 6640 feet.

Additional information:

Approved ____, 19____
except as follows:

OIL CONSERVATION COMMISSION,

By ____

Title ____

Sincerely yours,

Cities Service Oil Company
(Company or Operator)

By [signature]

Position District Superintendent

Send communications regarding well to

Name R. M. Ely

Address Drawer G., Hobbs, New Mexico

Submit to Appropriate
District Office
State Lease - 4 copies
Fee Lease - 3 copies

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised 1-1-89

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator	Lease	Well No.
SHELL WESTERN E&P INC.	NORTHEAST DRINKARD UNIT	602

Unit Letter	Section	Township	Range	County
E	15	21S	37E NMPM	LEA

Actual Footage Location of Well:
1980 feet from the NORTH line and 660 feet from the WEST line

Ground level Elev.	Producing Formation	Pool	Dedicated Acreage:
3462	TUBB	NORTH EUNICE BLINEBRY-TUBB-DRINKARD	40 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

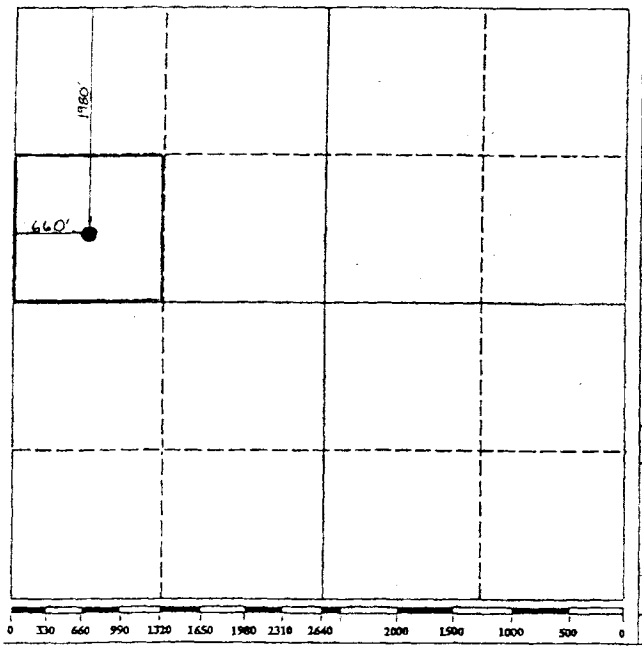
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.?

[X] Yes [ ] No If answer is "yes" type of consolidation UNITIZATION

If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary. _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interest, 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.

Signature: J. H. Smitherman

Printed Name: J. H. SMITHERMAN

Position: REGULATORY SUPV.

Company: SHELL WESTERN E&P INC.

Date: 10-22-90

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 supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed

Signature & Seal of Professional Surveyor

Certificate No.

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., 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
1625 N. French Drive
Hobbs, NM 88240

Form C-103
Revised March 25, 1999

WELL API NO. 30-025-37223

5. Indicate Type of Lease STATE ☒ FEE ☒

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well ☒ Gas Well ☐ Other

7. Lease Name or Unit Agreement Name: NORTHEAST DRINKARD UNIT

2. Name of Operator: APACHE CORPORATION

8. Well No. 628

3. Address of Operator: 6120 South Yale, Suite 1500 Tulsa, OK 74136

9. Pool name or Wildcat: EUNICE; BLI-TU-DR,NORTH (22900)

4. Well Location
Unit Letter E : ~~2480~~ 1410 feet from the NORTH line and ~~330~~ 380 feet from the WEST line
Bottom Hole D 1310 FNL 330 FWL
Section: 15 Township: 21S Range: 37E NMPM County: LEA

10. Elevation (*Show whether DR, RKB, RT, GR, etc.*) 3458 GR

11. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPLETION	☐	CASING TEST AND CEMENT JOB	☐		
OTHER:	☐			OTHER: SPUD, SURF. CSG., TD, LOG, PROD. CSG.	☒		

12. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompilation.

12/30/05 SPUD

12/31/05 SET SURFACE CASING STRING @ 1,198', HOLE SIZE 12.25, STRING SIZE 8.625, TYPE J-55, WEIGHT 24.0, 575 SACKS OF CEMENT, CLASS C, CIRCULATE TO SURFACE.

* THIS WELL WAS NOT LOGGED

1/14/06 SET PROD. CASING @ 7,80', HOLE SIZE 7.825, STRING SIZE 5.5, TYPE J-55/L-80, WEIGHT 17.0, 1,450 SACKS OF CEMENT, CLASS C, CIRCULATE TO SURFACE. 7018 MD

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Lana Williams TITLE Sr. Dept. Clerk DATE 1/26/06

Type or print name Lana Williams Telephone No. 918-491-4980

(This space for State use)

APPPROVED BY [signature] TITLE PETROLEUM ENGINEER DATE MAR 0 9 2006

Conditions of approval, if any:

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., 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 S. St Francis Dr.
Santa Fe, NM 87505

Form C-102
Permit 10883

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Name	Pool Code
30-025-37223	EUNICE,BLI-TU-DR, NORTH	22900

Property Code	Property Name	Well No.
22503	NORTHEAST DRINKARD UNIT	628

OGRID No.	Operator Name	Elevation
873	APACHE CORP	3458

Surface And Bottom Hole Location

UL or Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
E	15	21S	37E	E	1410	N	380	W	Lea

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
40			

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Electronically Signed By: Lana Williams

Title: Drilling Clerk

Date: 05/09/2005

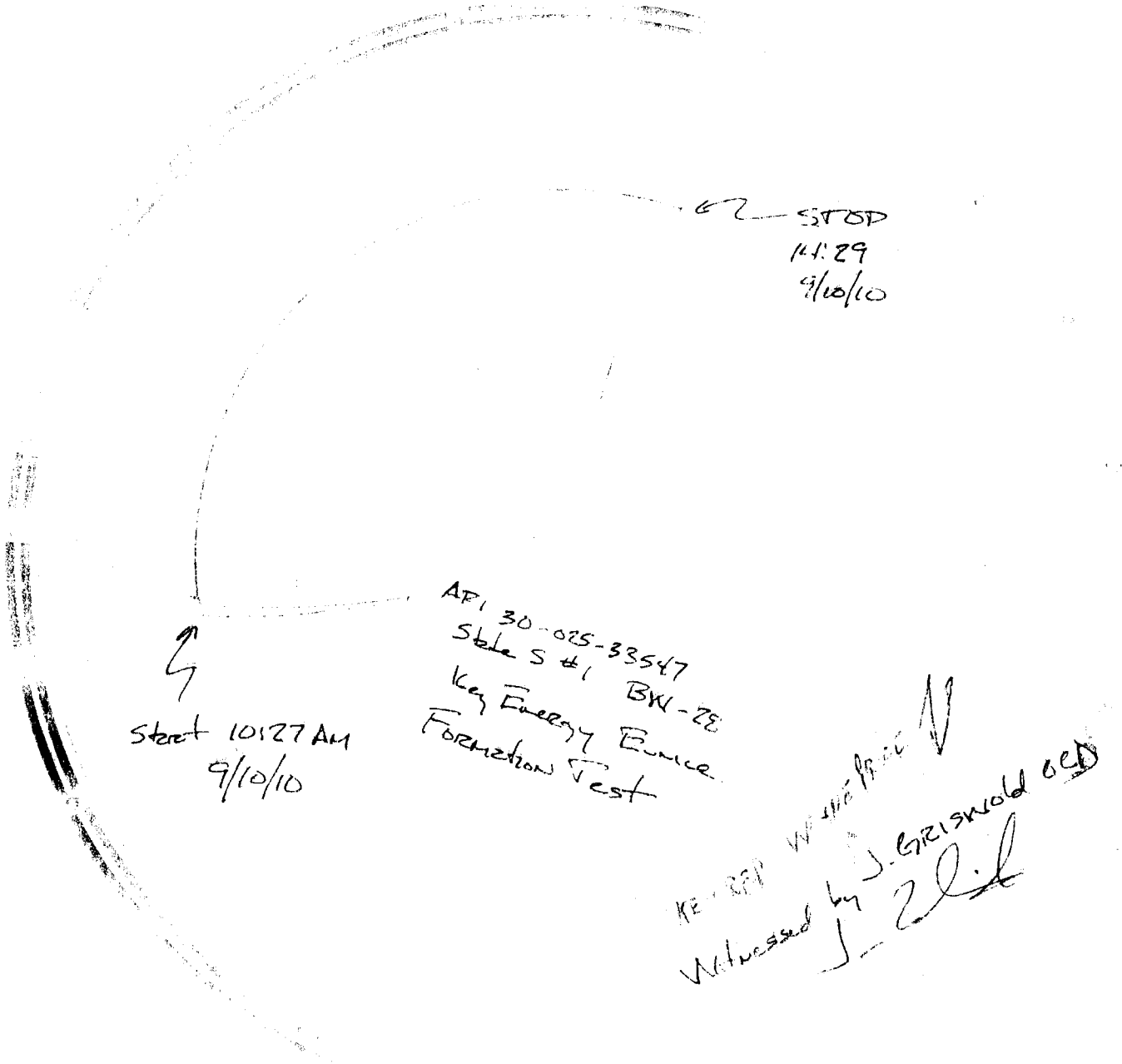
SURVEYOR CERTIFICATION

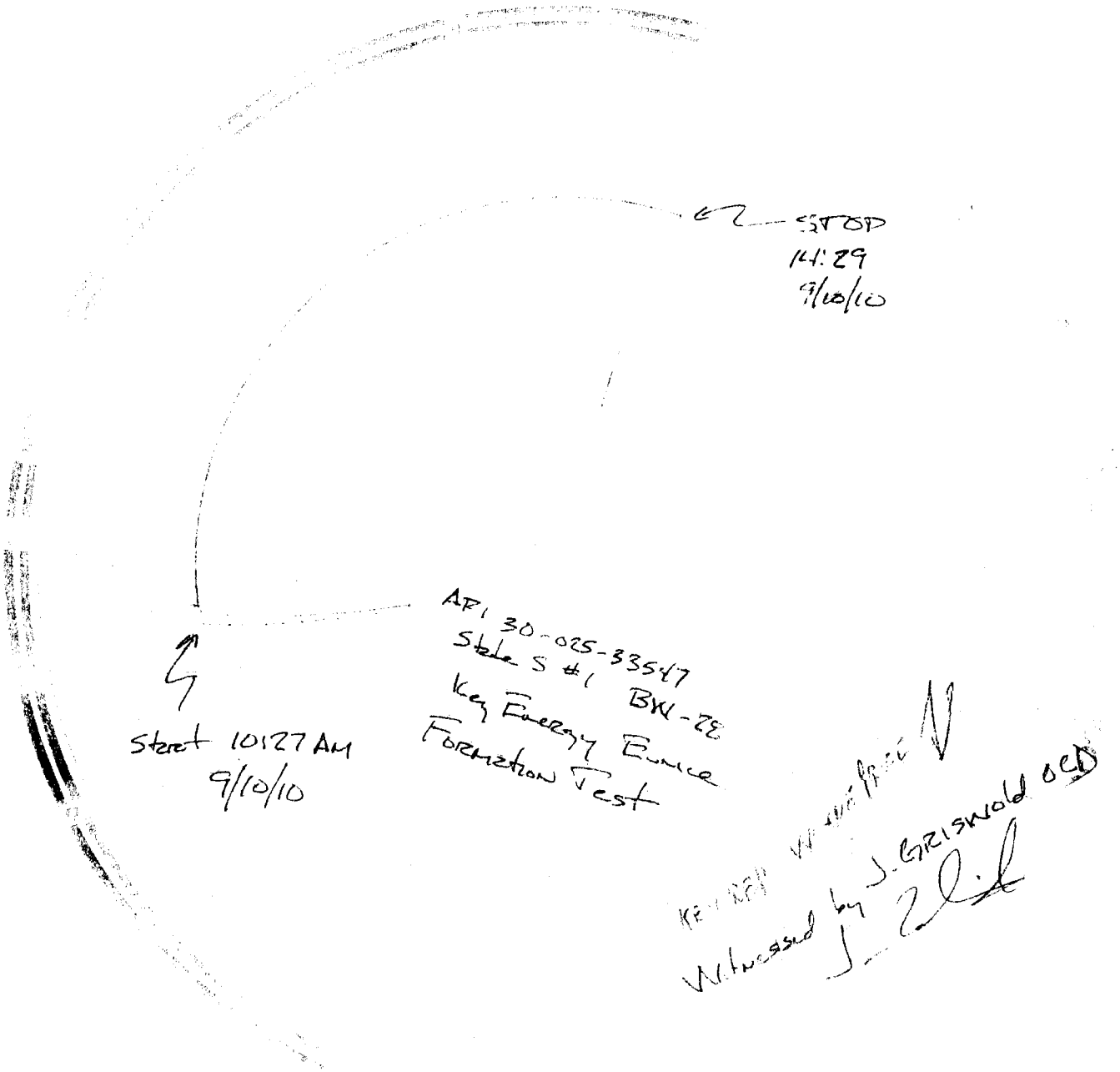
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Surveyed By: GARY EIDSON

Date of Survey: 03/31/2005

Certificate Number: 12641


STOP
14:29
9/10/10
API 30-025-33547
State S #1 BW-28
Key Energy Service
Formation Test
Start 10:27 AM
9/10/10
Witnessed by J. Griswold OCD


STOP
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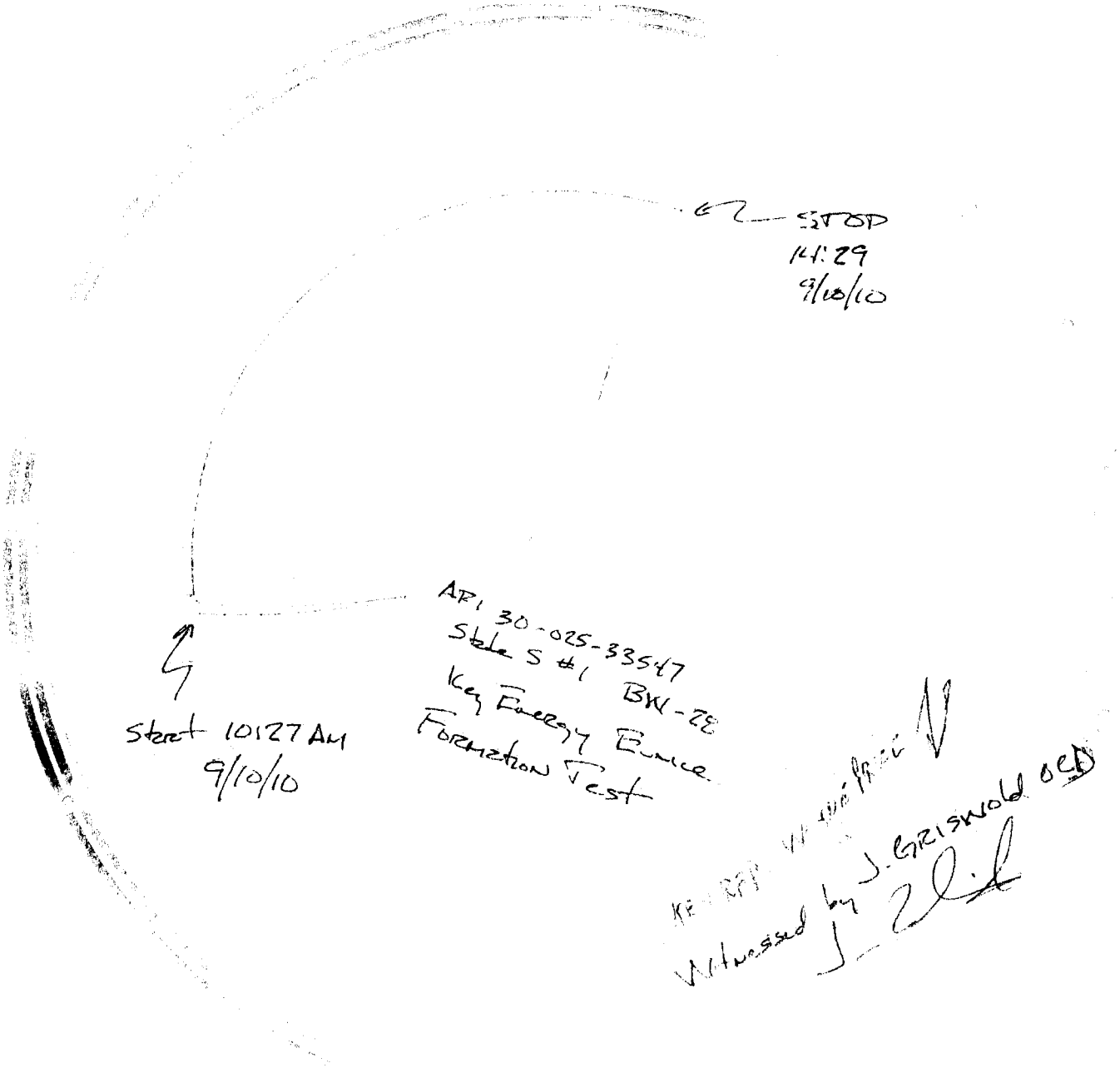
9/10/10
API 30-025-33547
State S #1 BW-28
Key Energy Eunice
Formation Test
Start 10:27 AM
9/10/10
Witnessed by J. GRISWOLD OCD


STOP
14:29
9/10/10
API 30-025-33547
State S #1 BW-22
Key Energy Eunice
Formation Test
Start 10:27 AM
9/10/10
Witnessed by J. Griswold OCD

AC
2009

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

RECEIVED
OCT 26 2009
HOBBSOCD

State of New Mexico
Energy, Minerals & Natural Resources

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

Form C-104
Revised Feb. 26, 2007

Submit to Appropriate District Office
5 Copies

☐ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

[1] Operator name and Address	[2] OGRID Number
Apache Corporation 6120 S Yale Ave, Suite 1500 Tulsa, OK 74136	873
	[3] Reason for Filing Code/ Effective Date NC / 10/07/2009

[4] API Number	[5] Pool Name	[6] Pool Code
30 - 0 25-39277	Eunice; Blinebry-Tubb-Drinkard, North	22900

[7] Property Code	[8] Property Name	[9] Well Number
37346	West Blinebry Drinkard Unit	113

II. [10] Surface Location

Ul or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	16	21S	37E		1290	North	330	East	Lea

[11] Bottom Hole Location

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

[12] Lse Code	[13] Producing Method Code	[14] Gas Connection Date	[15] C-129 Permit Number	[16] C-129 Effective Date	[17] C-129 Expiration Date
S	10/7/2009	10/07/2009			

III. Oil and Gas Transporters

[18] Transporter OGRID	[19] Transporter Name and Address	[20] O/G/W
24650	Targa Midstream Services LP 1000 Louisianam Suite 4700 Houston, TX 77262	G
214984	Plains Marketing, LP PO Box 4648 Houston, TX 77210	O

IV. Well Completion Data

[21] Spud Date	[22] Ready Date	[23] TD	[24] PBTD	[25] Perforations	[26] DHC, MC
09/15/2009	10/07/2009	6912'	6853'	5635'-6712'	

[27] Hole Size	[28] Casing & Tubing Size	[29] Depth Set	[30] Sacks Cement
12-1/4"	8-5/8"	1342'	650 sx, circ
7-7/8"	5-1/2"	6912'	1000 sx, circ

V. Well Test Data

[31] Date New Oil	[32] Gas Delivery Date	[33] Test Date	[34] Test Length	[35] Tbg. Pressure	[36] Csg. Pressure
10/07/2009	10/07/2009	10/19/2009	24 hours		
[37] Choke Size	**[38] Oil**	**[39] Water**	**[40] Gas**		**[41] Test Method**
	61	81	268		Pumping

[42] I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.
Signature:

OIL CONSERVATION DIVISION
Approved by:

Printed name: Amber Cooke	Title: PETROLEUM ENGINEER
Title: Production Engineering Tech	Approval Date: NOV 06 2009
E-mail Address: amber.cooke@apachecorp.com	
Date: 10/22/2009 / Phone: 918.491.4968	

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

RECEIVED
OCT 26 2009
HOBBSOCD

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 October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
30-025-39277	22900	Eunice; Blinebry-Tubb-Drinkard, North

Property Code	Property Name	Well Number
37346	WEST BLINEBRY DRINKARD UNIT	113

OGRID No.	Operator Name	Elevation
873	APACHE CORPORATION	3467'

Surface Location

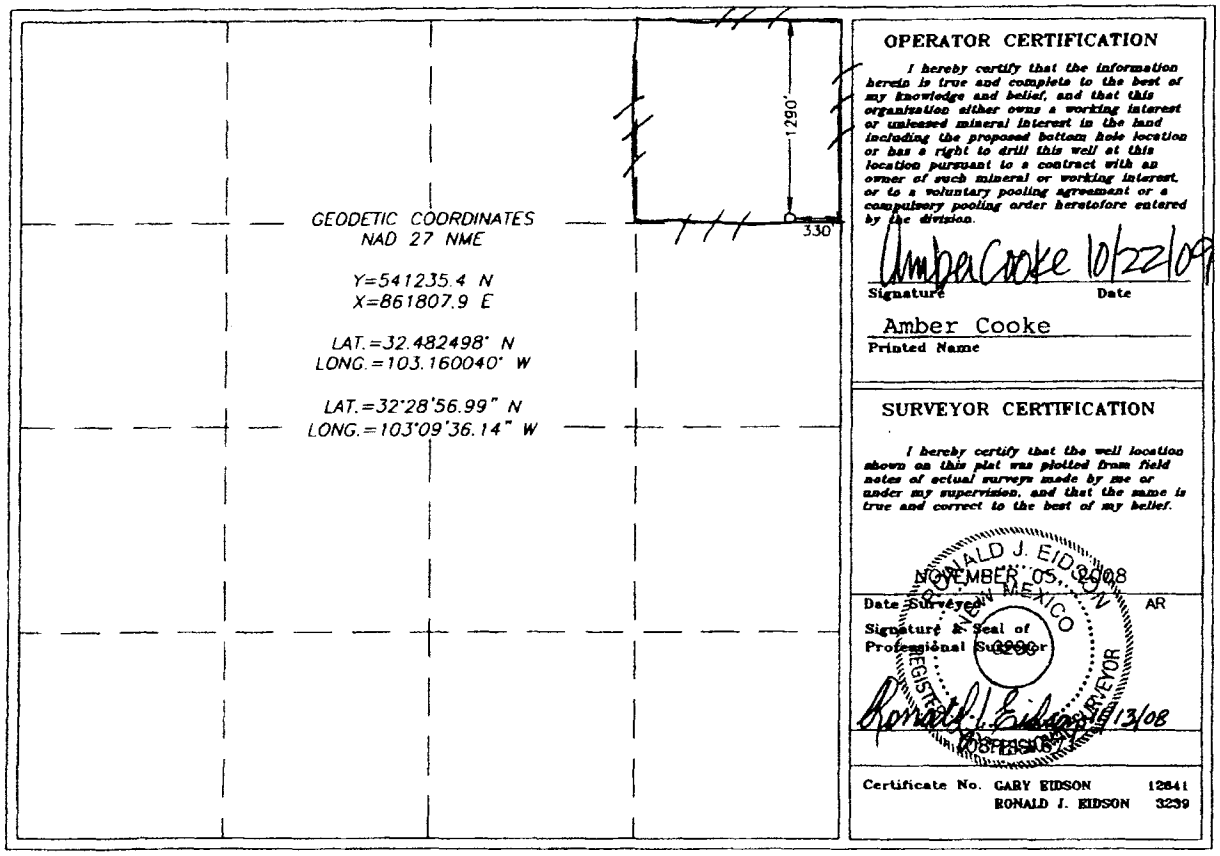
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	16	21-S	37-E		1290	NORTH	330	EAST	LEA

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.
40			

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 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Amber Cooke 10/22/09
Signature Date

Amber Cooke
Printed Name

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 supervision, and that the same is true and correct to the best of my belief.

RONALD J. EIDSON
NOVEMBER 05, 2008
NEW MEXICO
REGISTERED PROFESSIONAL SURVEYOR

Date Surveyed AR

Signature & Seal of Professional Surveyor

Ronald J. Eidson 10/13/08

Certificate No. GARY EIDSON 12641
RONALD J. EIDSON 3239

EXPLANATION

$\frac{150}{252}$° Water well

Upper figure is depth to water; lower figure is depth of well. Open circles are wells finished in Tertiary or Quaternary rocks; solid circles are wells finished in Triassic rocks

F = Flowing
R = Reported
P = Water level measured while pumping
D = Dry
? = Uncertainty as to aquifer
> = More than
< = Less than

(See tables 6 and 7 for detailed well data.)

3925 Water-table contour in Tertiary or Quaternary rocks

Dashed where inferred or uncertain. Contour interval 25 feet. Datum mean sea level

3500 Water-table or piezometric contour on water body in Triassic aquifers

Dashed where inferred or uncertain. Contour interval 100 feet. Datum mean sea level

Approximate position of boundary between Triassic rocks and saturated Tertiary and Quaternary rocks

Base adapted from New Mexico State Highway Department, general highway map, 1941.

Compiled by Alfred Clebsch, Jr., 1960, using data collected mainly by Alexander Nicholson, Jr., in 1953 and 1954.

PLATE 2. GROUND-WATER MAP OF SOUTHERN LEA COUNTY, NEW MEXICO

Public Notice Display Ad

Legal notification for 3"x4" newspaper display add per Water Quality Control Commission Regulations 20.6.2.3.108.B.4 NMAC

Key Energy Services LLC, 6 Desta Drive Suite 4300 Midland, TX 79705, Dan Gibson Corporate Environmental Director, has filed an application with the New Mexico Oil Conservation Division (OCD) to renew the operating permit for a class III brine well for its existing brine and fresh water station previously permitted by the OCD as BW-28.

This site is located approximately 2.5 miles north of Eunice, New Mexico, and 350 feet east, just off of the North Loop 18 (State Hwy 248) in Lea County, New Mexico, in SW/4 NW/4 UL E of Section 15-Township 21 South-Range 37 East. The site is located in a dense oilfield with many lease roads, pipelines and overhead electric utilities lines. Presently, there are no houses, schools, occupied buildings, or public parks, etc. with in one mile of the site.

The site is located on State Trust Land administered by the New Mexico State Land Office and operates under a state mineral lease # MS 0004 0001.

Brine water is used in the Oil and Gas industry to supply a "heavy pure sodium chloride" concentrated salt water (i.e. brine water) with a total dissolved solids concentration of approximately 320,000 mg/l and a density that is 20% higher than fresh water. Heavy brine water is essential in preventing blow-outs in high pressure gas wells and prevents loss of circulation when drilling through salt zones typically found in the Permian Basin area.

Fresh water obtained from the City of Eunice, NM will be injected deep into the Salado salt formation at a depth ranging from 1300 to 1700 feet below the surface to produce brine water. The site will produce approximately 20,000-30,000 barrels of brine water per month.

An engineering model that included safety factors was developed to verify the long- term stability of the site. Ground water in this area is somewhat limited, with some dry holes being encountered while in other wells groundwater may be present, in shallow lenses 30-60 feet deep. The shallow groundwater in this area is typically not used for drinking water and when found is in very limited quantity. There are no wells located within the well's ¼ mile area of review, therefore no quality information is available at this time.

This facility will be designed and permitted to have no intentional water contaminants discharged to the surface or subsurface for the protection of possible groundwater. The system will have concrete and synthetic liners to prevent any spills or leaks from reaching the ground surface.

If you have any questions or concerns please do not hesitate to contact Key Energy at the address above or you may contact Wayne Price 505-715-2809 or E-mail wayneprice77@earthlink.net. Key welcomes your input.

The New Mexico Oil Conservation Division (OCD) will accept comments and statements of interest regarding this application and will create a facility-specific mailing list for persons who wish to receive future notices. Interested persons may contact Jim Griswold, Oil Conservation Division (OCD) 505-476-3465 or by writing 1220 South Saint Francis, Santa Fe, New Mexico, 87505.

Para obtener más información sobre esta solicitud en espanol, sirvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservacio´n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Dorothy Phillips, 505-476-3461)

Public Notice Letter

Legal notification to property owner(s) of the site per Water Quality Control Commission Regulations 20.6.2.3.108.B.3 NMAC

Certified Mail Return Receipt Requested:

Property Owner of Record:

Name:

Address:

City/County:

State:

Public Notice

Key Energy Services LLC, 6 Desta Drive Suite 4300 Midland, TX 79705, Dan Gibson Corporate Environmental Director, has filed an application with the New Mexico Oil Conservation Division (OCD) to renew the operating permit for a class III brine well for its existing brine and fresh water station previously permitted by the OCD as BW-28.

This site is located approximately 2.5 miles north of Eunice, New Mexico, and 350 feet east, just off of the North Loop 18 (State Hwy 248) in Lea County, New Mexico, in SW/4 NW/4 UL E of Section 15-Township 21 South-Range 37 East. The site is located in a dense oilfield with many lease roads, pipelines and overhead electric utilities lines. Presently, there are no houses, schools, occupied buildings, or public parks, etc. with in one mile of the site.

The existing water station and brine well may be located within one-third mile (i.e. 1760 ft) from your property boundary or on your property. The site is located on State Trust Land administered by the New Mexico State Land Office and operates under a state mineral lease # MS 0004 0001.

Brine water is used in the Oil and Gas industry to supply a “heavy pure sodium chloride” concentrated salt water (i.e. brine water) with a total dissolved solids concentration of approximately 320,000 mg/l and a density that is 20% higher than fresh water. Heavy brine water is essential in preventing blow-outs in high pressure gas wells and prevents loss of circulation when drilling through salt zones typically found in the Permian Basin area.

Fresh water obtained from the City of Eunice, NM will be injected deep into the Salado salt formation at a depth ranging from 1300 to 1700 feet below the surface to produce brine water. The site will produce approximately 20,000-30,000 barrels of brine water per month.

An engineering model that included safety factors was developed to verify the long- term stability of the site. Ground water in this area is somewhat limited, with some dry holes being encountered while in other wells groundwater may be present, in shallow lenses 30-60 feet deep. The shallow groundwater in this area is typically not used for drinking water and when found is in very limited quantity. There are no wells located within the well's ¼ mile area of review, therefore no quality information is available at this time.

This facility will be designed and permitted to have no intentional water contaminants discharged to the surface or subsurface for the protection of possible groundwater. The system will have concrete and synthetic liners to prevent any spills or leaks from reaching the ground surface.

If you have any questions or concerns please do not hesitate to contact Key Energy at the address above or you may contact Wayne Price 505-715-2809 or E-mail wayneprice77@earthlink.net. Key welcomes your input.

The New Mexico Oil Conservation Division (OCD) will accept comments and statements of interest regarding this application and will create a facility-specific mailing list for persons who wish to receive future notices. Interested persons may contact Jim Griswold, Oil Conservation Division (OCD) 505-476-3465 or by writing 1220 South Saint Francis, Santa Fe, New Mexico, 87505.

Para obtener más información sobre esta solicitud en espanol, sirvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservacio´n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Dorothy Phillips, 505-476-3461)

EXPLANATION

Pleistocene and Recent — QUATERNARY

Qal — Alluvium

Sand and gravel along dry washes; silt and sand in lake beds; includes some wind-deposited sand around depressions

Pliocene — TERTIARY

To — Ogallala formation

Chiefly sand, poorly to well-cemented with calcium carbonate; contains some clay, silt, and gravel; capped in most places by caliche

Upper Triassic — TRIASSIC

Rc, Rs, Rd — Dockum group

Rc – Chinle formation, red and green claystone, minor siltstone, and fine-grained sandstone; Rs – Santa Rosa sandstone, red to white poorly sorted, coarse-grained, crossbedded sandstone; Rd – rocks of the Dockum group, undifferentiated

CRETACEOUS

Ku — Cretaceous rocks, undifferentiated

Slumped blocks of buff, tan, or white fossiliferous limestone

3500 — Contours on the red-bed surface

Dashed where approximate or inferred. Contour interval 50 feet. Datum mean sea level

Base adapted from New Mexico State Highway Department, general highway map, 1941.

Geology by Alexander Nicholson, Jr., 1953–4. Contours on buried red-bed surface compiled by Alexander Nicholson, Jr., Alfred Clebsch, Jr., and S. R. Ash from shothole logs, 1960.

PLATE 1. GEOLOGIC MAP OF SOUTHERN LEA COUNTY, NEW MEXICO

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Revised June 10, 2003

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR BRINE EXTRACTION FACILITES

(Refer to the OCD Guidelines for assistance in completing the application)

New **XX Renewal**

I. Facility Name: ***Key Energy Services LLC – Eunice Fresh and Brine Water Station***

II. Operator: ***Key Energy Services LLC.***

Address: ***6 Desta Drive Suite 4300 Midland, TX 79705*** ***Local: 2105 Ave. O (P.O. Box 99) Eunice, NM 88231***

Contact Person: ***Dan Gibson Corporate Environmental Manager (Midland TX permit issues) 432-571-7536***
Bob Fisher- Eunice Yard Manager- 575-394-2581 cell# 575-631-7431

III. Location: Submit large scale topographic map showing exact location.- ***Maps Located in attached report.***

Existing Water Station Location: SW/4 NW/4 UL E of Section 15 - Township 21 South - Range 37 East.

IV. Attach the name and address of the landowner of the facility site.

New Mexico State Land Office 310 Old Santa Fe Trail Santa Fe, NM 87504

V. Attach a description of the types and quantities of fluids at the facility.
see attachments.

VI. Attach a description of all fluid transfer and storage and fluid and solid disposal facilities.
see attachments.

VII. Attach a description of underground facilities (i.e. brine extraction well).
There are no underground facilities, tanks or piping.

VIII. Attach a contingency plan for reporting and clean-up of spills or releases.
see attachments.

IX. Attach geological/hydrological evidence demonstrating that brine extraction operations will not adversely impact fresh water.
see attachments.

X. Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.
see attachments.

XI. CERTIFICATION:

I hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Name: *Daniel K. Gibson* Title: *Corporate Environmental Director*

Signature: Dan K Gibson Date: March 11, 2011

E-mail Address: *dgibson@keyenergy.com*

DISCHARGE PLAN GUIDELINES – "Questions" and Answers:

I. Name of Facility- Provide complete name, Indicate whether this is a new or renewal application.

Answer: Key Energy Services LLC, Eunice Fresh and Brine Water Station, is an existing facility that was permitted previously under brine well permit BW-28 issued by the Oil Conservation Division. This is a permit renewal application.

II. Name of Operator or Legally Responsible Party and Local Representative Include address and telephone number.

Answer:
Key Energy Services, LLC.
Address: 6 Desta Drive Suite 4300 Midland, TX 79705
Local: 2105 Avenue O Eunice, NM 88231 Mail (P.O. Box 99)

Contact Persons:
Daniel K. Gibson Corporate Environmental Director (Midland TX permit issues) phone # 432-571-7536
Eunice Yard Dispatcher- Phone # 575-394-2581
Bob Fisher-Yard Manager Cell # 575-631-7431
John Sanders - Brine Well Supervisor Cell # 575-631-7416

III. Location of Facility- Give a legal description of the location (i.e. 1/4. 1/4, Section, Township, Range) and county. Use state coordinates or latitude/longitude on unsurveyed land. Submit a large scale topographic map, facility site plan, or detailed aerial photograph for use in conjunction with the written material. It should depict the location of the injection well, storage tanks and/or ponds, process equipment, relevant objects, facility property boundaries, and other site information required in Sections V through IX below. If within an incorporated city, town or village provide a street location and map.

Answer: Key Energy Services LLC, 6 Desta Drive Suite 4300 Midland, TX 79705, Daniel K. Gibson, Corporate Environmental Director, has filed a permit renewal application with the New Mexico Oil Conservation Division (OCD) to continue the operation of the existing brine and fresh water station previously permitted by the OCD as BW-28.

This site is located approximately 2.5 miles north of Eunice, New Mexico, and 350 feet east, just off of the North Loop 18 (State Hwy 248) in Lea County, New Mexico, in SW/4 NW/4 UL E of Section 15-Township 21 South-Range 37 East. The site is located in a dense oilfield with many lease roads, pipelines and overhead electric utilities lines. Presently, there are no houses, schools, occupied buildings, or public parks, etc. with in one mile of the site.

The following referenced material is enclosed in Section I-IV Appendix, found immediately behind this section IV: 1. BLM Surface Management Status Topographic Map 1:100,000 scale with elevation contours, roads, water features and section, township and range lines (NGVD-1929) USGS and location of proposed site.

IV. Landowners-Attach the name and address of the landowner(s) of record of the facility site.

Answer:

Land Owner is the State of New Mexico State Land office. The Mineral Owner is the State of New Mexico Lease # MS 0004 0001.

Section I-IV. Appendix:

Includes:

1. BLM Surface Management Status Topographic Map 1:100,000 scale with elevation contours, roads, water features and section, township and range lines (NGVD-1929) USGS and location of proposed site.

Key Energy Services
1301 McKinney
Suite 1800
Houston, Texas 77010

Telephone: 713.651.4300
Facsimile: 713.652.4005
www.keyenergy.com

March 11, 2011

Glenn vonGonten- Acting Environmental Bureau Chief
Jim Griswold- Senior Hydrologist
1220 South St. Francis
Santa Fe, New Mexico 87505

Subject: ***Permit Renewal Application for the Eunice Brine Well BW-28 and Water Station***

Dear Mr. vonGonten and Griswold:

Key Energy Services LLC, is submitting to the Oil Conservation Division (OCD) an application to renew the Eunice Brine and Fresh water station previously permitted as BW-28, located near Eunice, New Mexico.

Please find enclosed for your review and approval the following:

1. Signed brine well permit application form with one complete hard copy of the guidance document "Questions and Answers" and a flash drive with complete PDF version.
2. Copy of the "Public Notice" requirements pursuant to Water Quality Control Commission regulations (WQCC) 20.6.2.3108 NMAC that includes all of the basic elements of 3108.A, 3108.C for renewals, and 3108.F.1-5, including the newspapers to be used for the display add.
3. A $100.00 check made out to the "New Mexico Water Quality Management Fund" for the required filing fee.

If OCD requires additional information concerning this application please do not hesitate to call me at 432-571-7536 or Wayne Price at 505-715-2809, or E-mail wayneprice77@earthlink.net.

Sincerely,

Daniel K. Gibson, P.G.
Corporate Environmental Director

Attachments-2

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Revised June 10, 2003

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR BRINE EXTRACTION FACILITES

(Refer to the OCD Guidelines for assistance in completing the application)

New **XX Renewal**

I. Facility Name: ***Key Energy Services LLC – Eunice Fresh and Brine Water Station***

II. Operator: ***Key Energy Services LLC.***

Address: ***6 Desta Drive Suite 4300 Midland, TX 79705*** ***Local: 2105 Ave. O (P.O. Box 99) Eunice, NM 88231***

Contact Person: ***Dan Gibson Corporate Environmental Manager (Midland TX permit issues) 432-571-7536***
Bob Fisher- Eunice Yard Manager- 575-394-2581 cell# 575-631-7431

III. Location: Submit large scale topographic map showing exact location.- ***Maps Located in attached report.***

Existing Water Station Location: SW/4 NW/4 UL E of Section 15 - Township 21 South - Range 37 East.

IV. Attach the name and address of the landowner of the facility site.

New Mexico State Land Office 310 Old Santa Fe Trail Santa Fe, NM 87504

V. Attach a description of the types and quantities of fluids at the facility.
see attachments.

VI. Attach a description of all fluid transfer and storage and fluid and solid disposal facilities.
see attachments.

VII. Attach a description of underground facilities (i.e. brine extraction well).
There are no underground facilities, tanks or piping.

VIII. Attach a contingency plan for reporting and clean-up of spills or releases.
see attachments.

IX. Attach geological/hydrological evidence demonstrating that brine extraction operations will not adversely impact fresh water.
see attachments.

X. Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.
see attachments.

XI. CERTIFICATION:

I hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Name: *Daniel K. Gibson* Title: *Corporate Environmental Director*

Signature: Daniel K. Gibson Date: March 11, 2011

E-mail Address: *dgibson@keyenergy.com*

Discharge Plan Permit Renewal Application
for
Key Energy Services, LLC.
Eunice Brine Well
API No. 30-025-33547
State S Brine Station Permit # BW-28
Eunice, New Mexico

Submitted to:
New Mexico Oil Conservation Division
March 11, 2011

by:

Daniel K. Gibson, P.G.
Corporate Environmental Director
Key Energy Services, LLC.
6 Desta Drive Suite 4300
Midland, Texas 79705
(432)-571-7536 ph
(432)-571-7173 fax

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V. Type and Quantities of Fluids Stored or Used at the Facility -List all fluids stored or used at the facility (e.g. High TDS salt water, hydrocarbons, etc.). Include source, average daily volume produced, estimated volume stored, location, and type of containers.

Answer: The existing water station can store approximately 2,000 barrels of concentrated salt water (i.e. 10 lb/gal brine water) in four (4) above ground fiberglass tanks; and store 1,500 barrels of fresh water in three (3) 500 barrel bolted galvanized steel above ground tanks; and store 500 barrels of rainwater-brine water mix, generated from rainfall events and deminimis drips from the concrete loading pad area, in two (2) above ground fiberglass catch-tanks.

Fresh water is obtained from the City of Eunice and brine water is generated from the brine well, which is located approximately 350 feet south of the storage tanks. The anticipated brine water production will have an estimated Instantaneous flow rate of 3-5 barrels per minute. Estimated monthly totals could vary from 0-50,000 barrels per month or 0-1,666 barrels per day depending upon on usage demand. The usage over the past 15 years has averaged approximately 21,000 bbl's per month.

Key Eunice Water Station

VI. Transfer, Storage and Disposal of Fluids and Solids

VI.A.- Provide sufficient information to determine what water contaminants may be discharged to the surface and subsurface within the facility. Information desired includes whether tanks, piping, and pipelines are pressurized, above ground or buried. If fluids are drained to surface impoundments, skimmer pits, emergency pits, sumps, etc. for further transfer and processing, provide size and show if these units are lined or unlined. Provide fluid flow schematics with sufficient detail to show individual units.

Answer: The City of Eunice has a buried fresh water line that supplies the water station with fresh water. The fresh water line has an installed air-break, and automatic level control valve to prevent back flow into the city line.

There are three 500-barrel fresh water tanks that are manifolded together with an automatic level control. Each tank has isolation valves for maintenance. The output of the tanks feed a fresh water load pump, which is control by the sales management system. A submersible brine well charge pump is mounted inside of the west fresh water tank and supplies fresh water to the brine well located approximately 350 feet south of the water station via an underground 4" black PE fast. The exposed portions of this line are insulated for freeze protection.

The brine well will is located in a well house and has a well head piping manifold with isolation valves, pressure gauges, and braden-head outlets. There is a 4" above ground pressured rated PE fast line from the well head to the brine well tanks inlet manifold. There are isolation valves on both ends.

There are four 500-barrel brine water storage tanks (2000 bbl's total) connected to a common header that is connected to the suction side of an electric driven load pump. The load pump is controlled by an automatic sales management system. Trucks are loaded on two concrete loading pads. All tanks, headers, and pumps have manual isolation valves. The brine well charge pump will be cycled off and on, depending upon the level in the brine tanks. There is a fail-safe, hi-level shut-off with alarm.

As mentioned, there are two concrete loading pads with gravity drains located near the load lines that collect deminimis leaks and drips from the pad. This water drains to two 250 barrel above ground fiberglass catch-tanks. Key is planning on coating the loading pads with either a fiberglass or salt resistant epoxy coating for added protection.

A brine well piping schematic, facility diagram and facility-fluid flow diagrams are included in Section VI Appendix for reference. The water station will have the same basic configuration as the previously permitted site.

VI.A.*1. Tankage and Chemical Storage Areas - Storage tanks for fluids other than fresh water must be bermed to contain a volume one-third more than the largest tank. If tanks are interconnected, the berm must be designed to contain a volume one-third more than the total volume of the interconnected tanks. Chemical and drum storage areas must be paved, curbed and drained such than spills or leaks from drums are contained on the pads or in lined sumps.*

Answer: The brine water tanks, load pumps, and catch-tanks are located on an existing sand-gravel pad underlain by an impervious 60 mil HDPE black liner and bermed to sufficiently maintain one and one-third volume of the total interconnected tanks. The size of the bermed area is approximately 170 feet by 60 feet and 3.5 feet high. Based on these figures, the secondary containment can contain approximately 6,363 barrels of fluid. This facility has been previously approved by OCD under discharge permit BW-28. Enclosed in Section VI Appendix, are recent photos of the water station.

VI.A.*2. Surface impoundments-Date built, use, type and volume of materials stored, area, volume, depth, slope of pond sides, sub-grade description, liner type and thickness, compatibility of liner and stored materials, installation methods, leak detection methods, freeboard, runoff/runon protection.*

Answer: There are no surface impoundments at this facility.

VI.A.*3. Leach fields-Type and volume of effluents, leach field area and design layout. If non-sewage or mixed flow from any process units or internal drains is, or has been, sent to the leach fields, include dates of use and disposition of septic tank sludges.*

Answer: There are no leach fields at this facility.

VI.A.*4. Solids disposal-Describe types, volumes, frequency and location of on-site solids dried disposal. Typical solids include sands, sludges, filters, containers, cans and drums.*

Answer: Routine domestic household type trash, or other similar non-domestic waste pursuant to 19.15.35.8 NMAC, generated from on-site activities, will be stored in common trash cans and/or bins that are supplied and picked up routinely by the local waste management trucking company and disposed of at a New Mexico Environment Department permitted solid waste transfer or disposal facility.

Liquid and solid waste generated from the clean-up of deminimis leaks, drips, spills of oilfield non-domestic waste, resulting from routine operations, will be stored in tanks, sealed drums, bins or other containers in a bermed secondary containment area for liquids, or for solids, on an impermeable pad and curd. This waste material may be stored up to 180 days before being, recycled, or disposed of off-site pursuant to section VI.C below.

The 180-day time period will not start until the on-site liquid volume exceeds 500 barrels, which is the volume of the two catch-tanks, or when the solid waste container(s) are filled to capacity. Each container will be properly labeled with type of contents, RCRA classification, and dated.

Deminimis volumes of liquids contained in secondary containment devices or sumps, that do not interfere with normal operations, or has a minimal chance of being released to the environment, will be allowed to evaporate.

Non-contaminated liquids, i.e. rainwater, may be recycled, disposed of off-site (per section VI.C below), or discharged on site as irrigation water for native vegetation or wildlife. If discharged on site, Key will verify that the water is clean, clear, and contains chlorides no greater than 250 mg/l, TDS < 1000 mg/l and that no oil sheen is present. Samples will be retained for one year. The events and results will be included in the annual report.

All other oilfield non-domestic liquid and solid waste generated as a result of unintentional releases of water contaminants to the ground will be reported and corrective actions taken pursuant to OCD Rule 19.15.29 NMAC. The events and results will be included in the annual report.

VI.B. For each of the transfer/storage/disposal methods listed above:

VI.B.1. Describe the existing and proposed measures to prevent or retard seepage such that ground water at any place of present or future use will meet the WQCC Standards of Section 3-103, and not contain any toxic pollutant as defined in Section 1-101.UU.

Answer: All tanks, drums, bins, etc., containing anything other than fresh water, will have impervious secondary containment or pad and curb, as described above. All unloading valves will have encapsulating

containers to prevent miscellaneous drips, leaks or spills. All loading areas will have concrete loading ramps that are sloped to prevent brine water run-off.

The concrete loading pads will have integral sumps to allow deminimis leaks, spills and rainwater to be collected and placed in the above ground catch tanks with secondary containment. Key Plans to coat these sumps with an epoxy.

All process piping, other than fresh water, will be above ground, unless install in an appropriate secondary containing device with leak detection.

VI.B.*2. Provide the location and design of site(s) and method(s) to be available for sampling, and for measurement or calculation of flow.*

Answer: Both brine and fresh water samples will be collected from the load lines. Fresh and brine water will be monitored, both in the pump house, located south of the fresh water tanks, and with the sales delivery system. Electronic accumulating flow meters, with an accuracy of ±1% are be utilized.

A continuous pressure chart recorder will be installed and maintained. A minimum of two pressure gauges will be installed to verify recording pressures. The system will include a high-pressure cut-off relay and alarm for formation protection, except if the selected pump cannot exert sufficient pressure to cause harm.

VI.B.*3. Describe the monitoring system existing or proposed in the plan to detect leakage or failure of any discharge system. If ground water monitoring exists or is proposed, provide information on the number, location, design, and installation of monitoring wells.*

Answer: The water station has an automatic electronic sales management system with overflow shut-down systems incorporated in the design. The system tanks have low, normal and high-level control devices.

Groundwater monitoring is not being proposed at this time. However, if Key Energy experiences problems that warrant monitoring, then a minimum of three groundwater monitoring wells will initially be installed with details on the depths, locations, design and construction submitted for OCD approval.

Subsidence monitoring are being installed at this time. Key plans on installing a minimum of three subsidence monitors similar in installation and construction as the existing monitors currently installed on the former brine well BW-19. Key Energy will submit the installation plans and monitoring results in the first annual report.

VI.C. Off-Site Disposal

If wastewaters, sludges, solids etc. are pumped or shipped off-site, indicate general composition (e.g. waste oils), method of shipment (e.g. pipeline, trucked), and final disposition (e.g. recycling plant, OCD-permitted or domestic landfill, Class II disposal well). Include name, address, and location of receiving facility. If receiving facility is a sanitary or modified domestic landfill show operator approval for disposal of the shipped wastes.

Answer: Routine domestic household type trash, or other similar non-domestic waste pursuant to 19.15.35.8, generated from on-site activities, will be stored in common trash cans and/or bins that are supplied and picked up routinely by the local waste management trucking company and disposed of at a New Mexico Environment Department Permitted Solid Waste Transfer or Disposal facility.

Waste generated on site will either be recycled or shipped off site by trucks owned or operated by Key Energy, or by other commercial trucking companies. Liquid waste from the sump catch-tank will either be recycled or shipped off-site to a Class II SWD well permitted by OCD, or to an OCD permitted surface waste management facility.

Key is requesting that any commercial OCD solid waste management facility, permitted pursuant to 19.15.36 NMAC, be incorporated as an approved disposal site. In addition, Key is requesting that any New Mexico Environment Department commercial permitted facility be incorporated as an approved disposal site pursuant to 19.15.35.8 type waste. Key will have the responsible to ensure that all waste is properly stored, transported, classified, tested, manifested and the receiving facility is approved to take the waste type.

Key is also requesting that any Class **II** SWD type well permitted by the OCD for commercial disposal or any Class **II** well owned and operated by Key Energy, or another company by written agreement, be incorporated as an approved disposal site. Key will have the responsible to ensure that all waste is properly stored, transported, classified, tested, manifested and the receiving facility is approved to take the waste type.

All waste shipped off-site, will be summarized and reported in an annual report due March 31 of each year. The report will indicate general composition (e.g. brine water, soil contaminated with brine water, etc.), method of shipment (e.g. trucked), and final disposition (e.g. recycling plant, OCD-permitted or domestic landfill, Class II disposal well). The report will include the name, address, and location of receiving facility. All manifest, test results, etc. and any other pertinent information will be included in the report.

VI.D. Proposed Modifications

VI.D.1. If protection of ground water cannot be demonstrated pursuant to Section B.1. above, describe what modification (including closure) is proposed to meet the requirements of the Regulations. Describe in detail the proposed changes. Provide the information requested in A. and B. above for the proposed modified facility and a proposed time schedule for construction and completion. (Note: OCD has developed specific guidelines for lined surface impoundments that are available on request.)

Answer: There are no major modifications anticipated at this time. If permit conditions require modifications then they will be properly addressed after permit is issued within appropriate time lines

VI.D.2. For ponds, pits, leach fields, etc. where protection of ground water cannot be demonstrated, describe the proposed closure of such units so that existing fluids are removed, and emplacement of additional fluids and runoff/runon of precipitation are prevented. Provide a proposed time schedule for closure.

Answer: There are no ponds, pits, or leach fields at this site. There are no designed discharges to the surface or sub-surface that would impact ground or surface water.

VI.E. If the facility contains underground piping, the age and specification (i.e., wall thickness, fabrication material, etc.) of said piping should be submitted. Upon evaluation of such information, mechanical integrity testing of piping may be necessary as a condition for discharge plan approval. If such testing (e.g. hydrostatic tests) has already been conducted, details of the program should be submitted.

Answer: This facility will not contain any underground piping other than fresh water lines. There are two loading pad sump short drain lines that are covered, but are still above grade and underlain by a liner.

VI.F. Inspection, Maintenance and Reporting

VI.F.1. Describe proposed routine inspection procedures for surface impoundments and other transfer, storage, or disposal units including leak detection systems. Include frequency of inspection, how records are to be maintained and OCD notification in the event of leaks.

Answer: The facility will be inspected on a daily basis by drivers and supervisors. A safety supervisor will perform weekly inspections, with the results recorded on a log sheet. Deficiencies will be addressed and maintained on file for a minimum of five years. Inspection report forms will be developed and supplied in the annual report with a summary of corrective actions.

Releases will be reported and corrective actions taken pursuant to OCD Rule 19.15.29 NMAC and noted in the weekly and annual reports.

VI.F.2. If ground water monitoring is used to detect leakage or failure of the surface impoundments, leach fields, or other approved transfer/storage/disposal systems provide:

Answer: All groundwater, subsidence, level controls, flow controls, pressure charts, gauges, valves, electric monitors, housekeeping issues, leaks/spills, inoperative equipment, and any special observations will be incorporated in the inspection reports and reported in the annual reports.

VI.F.2.a. The frequency of sampling, and constituents to be analyzed.

Answer: As indicated in VI.B.3 above, Key Energy does not plan on installing groundwater monitoring wells at this time. However, subsidence devices are being installed.

VI.F.2.b. The proposed periodic reporting of the results of the monitoring and sampling.

Answer: Once Key and the agency agree on sampling points, analysis, and frequency, then the results will be included in an annual report submitted to the agency by March 31, of each year after operations began.

VI.F.2.c. The proposed actions and procedures (including OCD notification) to be undertaken by the discharger in the event of detecting leaks or failure of the discharge system.

Answer: Key understands special permit conditions may be imposed when monitoring indicates a problem.

VI.F.3. Discuss general procedures for containment of precipitation and runoff such that water in contact with process areas does not leave the facility, or is released only after testing for hazardous constituents. Include information on curbings, drainage, disposition, notification, etc.

***Answer**:* The current water station system is currently designed to hold a large amount of rainfall. All brine water tanks are surrounded by an impermeable 3.5-foot high berm. The concrete loading pads rainwater drains directly into the two 250-barrel catch tanks that are located inside of the lined bermed area. Key Energy will remove all fluids during or after significant rainfall events within one week. These fluids will be recycled or properly disposed of as indicated in sections VI.A.4 and VI.C above.

Special attention will be given to make sure no standing water from either leaks or spills, or rainfall events remain over the anticipated brine well cavern located approximately 350 feet to the south. The system is

being designed to allow normal sheet flow off of the site. A berm has been installed completely around the water station to ensure that run-off will not leave the site.

Any leaks or spills of brine or fresh water around the wellhead will be immediately picked up and disposed of properly.

VI.F.4. Describe methods used to detect leaks and ensure integrity of above and below ground tanks, and piping. Discuss frequency of inspection and procedures to be undertaken if significant leaks are detected.

Answer: As mentioned in VI.F.1 above, the system will be observed daily with routine inspections documented. Emergencies will be handled pursuant to a site-specific contingency plan included in section VIII below.

VI.F.5. Submit a general closure plan describing what actions are to be taken when the facility discontinues operations. These actions must include:

VI.F.5.a. Removal of all fluids, contaminants and equipment.

Answer*:* All products, equipment, and materials may be sold, recycled or disposed of in a legal manner; or left on site, if Key Energy adequately demonstrates it has a future beneficial use by remaining on-site, and will not be a threat to public health, fresh water or the environment.

Water contaminants remaining on site, which will cause surface or groundwater exceedance, or is a significant threat to public health or the environment, will be remediated to safe acceptable levels.

VI.F.5.b. Grading of facility to as close to the original contour as is practical.

Answer: The facility will be restored to its original contour that was found when permitted, unless it has a future beneficial use as is, and will not adversary impact the environment.

VI.F.5.c. Proper disposal of fluids, sludges and solids pursuant to rules and regulations in effect at the time of closure.

Answer: Inheritably waste-like materials, such as fluids, sludges, and solids, may be sold, recycled or disposed of in a legal manner; or left on site, if Key Energy adequately demonstrates it has a future beneficial use by remaining on-site, and will not be a threat to public health, fresh water or the environment.

Section VI. Appendix:

Includes:

1. Brine well piping schematic
2. Facility Diagram
3. Fluid Flow Diagram
4. Recent photos of the water station.

VII. Brine Extraction Well(s)- In-situ brine extraction wells must meet the requirements of Part 5 of the Water Quality Control Commission Regulations in addition to other applicable requirements of WQCC and Oil Conservation Division Rules and Regulations.

Answer and Description for Existing Brine Well(s):

Brine Well Construction, Operating Practices, Cavern Size and Design Limits:

Goldstar, a small oilfield service company located in Eunice, NM, originally drilled the brine well in 1996. The OCD District office approved the original well design and the OCD Santa Fe office issued the BW-28 permit. In April 2001, Yale A. Key (now Key Energy Services), a medium to large size integrated oilfield service company, purchased Goldstar and the brine well operations. As of to date, the well has produced approximately 3.81 million barrels of brine over an approximate 15-year time frame. This well has operated mostly trouble free during this time.

The well bore originally consisted of 12-1/4 drilled hole, 8-5/8" 32 lb/ft steel casing set at approximately 1,360 feet below grade level (bgl) and cemented to surface with 800 sacks. A 7-7/8 hole was drilled to a total depth (TD) of 2,200' feet and 2-7/8" fiberglass tubing was installed open hole down to approximately 2,074 ft. The casing appeared to have been set in the first anhydrite-salt interface layer overlying the Salado salt formation, but no open hole electric well logs were provided to confirm this. The tubing was set well into the bedded salt section.

The fiberglass tubing was initially chosen for cost effectiveness and to within stand the down-hole corrosion effects. However, the tubing did not hold up to formation and testing conditions and was replaced in April 2002 with steel 2-7/8 conventional tubing. At that time, only 1,410' feet of tubing was re-installed. Since then, the tubing has been re-set at a depth of 1,701' feet bgl. An updated well bore schematic is included in the Section VII.A.6-11 Appendix:

In May of 2009, a sonar test was conducted and results submitted to OCD in the 2009 annual report. As of to date, the system has passed all formation and casing tests conducted.

The last cavern survey did not provide adequate information pertaining to the size of the cavern. This has been an issue with several brine wells and until the validity of using sonar test is resolved, an alternate method will be employed.

This alternate method has been discussed with Jim Griswold-OCD, and it was mutually decided that an estimated worst-case diameter was to be determined in order to provide maximum protection and ensure the permit conditions are being met.

The Solution Mining Research Institute (SMRI), other state agencies, OCD work-group, along with various studies conducted during the permitting of the WIPP site, has concluded that failures, such as "catastrophic collapses", have a higher probability when the roof diameter of the cavern exceeds a certain value compared to the actual depth of the cavern. This number is typically called D/H where "D" is the diameter of the cavity and "H" is the depth from surface to the casing shoe. Various reports seem to conclude that when a ratio of D/H reaches or exceeds .66 then the probably of collapse increases to a point that the well may be considered un-safe, thus closing procedures, such as proper plugging and abandonment, and possible long term subsidence monitoring should be instituted.

The alternate method mentioned above, involves calculating the maximum diameter of the cavern by using a worst-case scenario of an "***upright cone".*** The volume of the cavern is calculated using the

lifetime brine production volumes and using a *"rule of thumb"* conversion factor to determine the volumetric size of the cavern. The rule of thumb conversion factor was taken from the 1982 Wilson Report and equates that every barrel of brine produced will create approximately one cubic foot of cavity.

The past operating practices required by the permit conditions of reverse flow (i.e. pumping fresh water down the annulus) has most likely caused dissolution of the salt near the top of the cavern which most likely has caused the top of the cavern to be larger than the bottom. In June of 2009, flow was put back to the normal flow configuration of a conventional brine well.

The Eunice Brine Well cavern size has been calculated to be approximately 3.8 million cubic feet with a maximum radius of 66 feet using a worst-case scenario, configuration of an upright cone with the top having the largest span. In order to provide a guide tool to determine the safety of the cavern roof system rocks, Key Energy has developed a roof stability model to make logical decisions concerning the safety and life of a brine well. Enclosed in Section VII appendix, is the rational and results of the model for the Eunice Brine Well BW-28.

The model is most conservative and employed an arbitrary safety factor of 2:1. The results of the model show that the roof cavern is very stable and is presently not approaching a level of concern. While the system received a recommendation of a "NO", it merely points out that the cavern safety factory has dropped below the 2:1 figure used in the model, and is now currently at 1.6, still considered a safe number.

Now that conventional flow has been re-employed, the cavern roof span should not increase in the same proportion as in the past. This will extend the life of the system considerably.

Key Energy will continue to monitor the results and notify the OCD in each annual report. A working copy of the model and training on its usage is available upon request from Key Energy.

Section VII. Appendix:

Includes:

1. Steady-State Model: Brine Well Roof Stability Calculations Using Beam Theory (3 pgs).
2. Eunice Brine Well output results on Excel spreadsheet.

VII.A.1-4. Drilling, Deepening, or Plug Back Operations

Before drilling, deepening, or plug back operations, the operator of the well must file the following plans, specifications, and pertinent documents with the Oil Conservation Division 90 days prior to start-up of the planned operation.

VII.A.1.- Form C-101 "Application for Permit to Drill, Deepen, or Plug Back" (OCD Rule 1101).

Answer: The complete well file history and all associated submitted forms, charts, etc., is included in Section VII.A.1-4 Appendix.

VII.A.2.- A "Notice of Intent to Discharge" in accordance with WQCC regulation 1-201 (New facilities only).

Answer: This is a permit renewal and notice of intent will be this application.

VII.A.3.- A map showing the number, name, and location of all producing oil and gas wells, injection wells, abandoned holes, surface bodies of water, watercourses, springs, mines, quarries, water wells, and other pertinent surface features within 1/4 mile from the wellbore(s).

Answer: This Information is provided below in detail, in section VII.A.5-Oil & Gas Wells Area of Review (AOR).

VII.A.4.- Maps and cross-sections indicating the general vertical and lateral limits of all ground water having 10,000 mg/l or less TDS within one mile of the site. Show the position of such ground water within this area relative to the injection formation. Indicate the direction of water movement, where known, for each zone of ground water.

Answer: This information is provided below in detail, in Section IX.A. *Site Characteristics*.

Section VII.A.1-4 Appendix:

Includes:

1. The complete copy of the brine well file. Includes original C-101, 102, 103's, formation records, C-105's, deviation report, casing and cementing records, and test results.

VII.A.5-11- List all abandoned wells/shafts or other conduits in the area of review which penetrate the injection zone. Identify those which may provide a pathway for migration of contaminant through being Improperly sealed, completed or abandoned. Detail what corrective action will be taken prior to start up of operations to prevent any movement of contaminants into ground water of less than/equal to 10,000 mg/l TDS through such conduits due to the proposed injection activity (e.g. plugging open holes). Include completion and plugging records. If information becomes available after operations have begun, which indicates the presence of a conduit that will require plugging then the injection pressure will be limited to avoid movement of contaminants through such a conduit into protected groundwater.

VII.A.5- Answer: Oil & Gas Wells Area of Review (AOR)

An extensive AOR review was conducted for the Key Eunice "Old GoldStar" brine well, OCD permit # BW-28, located in UL E (1340 FNL & 330 FWL) of Section 15-Ts21S-R37E in June 2010 and reported in the 2009 annual report. Key used OCD records and field verification to confirm wells in the AOR.

Using OCD on-line downloads, a well status list was constructed listing all wells within adjacent quarter sections of the BW-28 location. The list shows API#, Operator well name, UL, Section, Township and Range, footages, wells within 660 ft and ¼ mile, casing program checked status, casing/cementing status, and corrective action required status. In addition an Area of Review map (labeled 2009 BW-28 AOR Annual Review-Unit Plot Plan) was constructed.

These downloads, well status list and plot plan have been updated for the anticipated 2010 annual report due March 31, 2011. and included in the Section VII.A.5 Appendix.

As of Feb of 2011, there were 39 wells located within these adjacent units. Within a ¼ miles radius of the brine well there were 15 wells found. Within 660 feet of the brine well there were 4 wells found. The AOR has been checked for 2010 and one new well has been installed in the ¼ mile AOR, and one new well was installed in an adjacent quarter section out of the AOR.

This comprehensive list was formulated to provide a baseline for future AOR studies. Since any future brine well will certainly be limited in size, a critical AOR of 660 feet was established and all wells within that radius will be researched in greater detail.

The rational of this approach is the fact that brine wells are non-static in terms of size and configuration and the fact that Key has no direct control on wells drilled in close proximity. By just initially focusing on the current wells in the ¼ mile AOR and assuming the status of these wells will remain the same, may be a mistake. Therefore, Key is taking a more dynamic approach and will study wells as the brine well grows, especially wells in the critical zone. We used the current estimated diameter of the brine well i.e. 132 ft (radius = 66 ft) generated from the 2010 annual report, and added a 10:1 safety factor, which equates to about 660 ft. As the brine well grows, the critical AOR will be expanded.

The Findings are as follows:

API # 30-025-09913: Shell NEDU 603, according to OCD records, is located 3,390 FSL & 4,520 FEL of Section 15-Ts21s-R37e. It is shown to be located approximately 500 ft to the SE of the BW-28 well. This well was drilled in 1951 with surface casing set at 211.68 ft and cemented with 325 sacks. Intermediate casing was set at 2818 feet and cemented with 500 sacks. A long string was ran and set at 8,030 feet and cemented with 400 sacks.

It was plugged and abandoned in 1994 with substantial remedial work required. The plugging was approved by OCD at the time. The well reports and plugging procedure is attached for review.

Conclusions: The OCD reports indicate that the salt section was properly plugged off inside and outside of all casing strings. The salt section (Salado formation) appears to start at about 1,360 ft bgl and ends above 2,800 ft bgl. There have been no reported or noted issues concerning this well in reference to the BW-28 brine well.

Corrective actions: No actions recommended at this time.

API # 30-025-9914: Apache NEDU 602, according to OCD records, is located 1,980 FNL & 660 FWL of Section 15-Ts21s-R37e. It is shown to be located approximately 600 ft to the SSE of the BW-28 well. This well was drilled in 1990 with surface casing set at 237 feet bgl and cemented with 300 sacks. Intermediate casing was set at 2,799 feet and cemented with 800 sacks. A long string was ran and set at 6,625 feet and cemented with 350 sacks. The well is an active producer. The well reports are attached for review.

Conclusions: The OCD reports indicate that the casing strings were properly sealed above and below the salt section. The salt section appears to start at about 1,360 ft bgl and ends slightly above 2,800 ft bgl. There have been no reported or noted issues concerning this well in reference to the BW-28 brine well.

Corrective actions: No actions recommended at this time.

API # 30-025-37223: Apache NEDU 628, according to OCD records, is shown to be located 1,410 FNL & 380 FWL of Section 15-Ts21s-R37e which would be approximately 86 ft to the SE of the BW-28 well. This well was suppose to have been drilled in 2006 with surface casing set at 1,198 feet bgl and cemented circulated to the surface. Production casing set at 7,018 feet bgl and cemented to the surface. The well records are attached for review.

Conclusions: Field verification (E-mail attached) revealed this well was never drilled. Key notified both OCD and Apache that due to the close proximately to the brine well it would be a detriment to the brine well operations and Apache would experience lost circulation.

Corrective actions: Key herby notifies OCD it should correct this record.

API # 30-025-39277: Apache WBDU 113, according to OCD records, is located 1,290 FNL & 330 FEL of Section 16-Ts21s-R37e. It is located approximately 660 ft to the NE of the BW-28 well. This well was drilled in 2009 with surface casing set at 1,342 feet bgl and cemented with 650 sacks circulated to the surface. Production casing was set at 6,912 feet bgl and cemented with 1,000 sacks circulated to the surface. The well is an active producer. The well reports are attached for review.

Conclusions: The OCD reports indicate that the casing strings are properly sealed above and below the salt section. The salt section appears to start at about 1,360 ft bgl and ends slightly above 2,800 ft bgl. The amount of cement used during completion seems unusually high and may indicate lost circulation during the drilling operations. There have been no reported or noted issues concerning this well in reference to the BW-28 brine well.

Corrective actions: Investigate unusually high cement usage and how it may relate to the BW-28 operations. Key Energy is planning on keeping this well on a priority watch list. In 2011 Key will contact the operator for additional information and report in the 2011 annual report.

NEW-API # 30-025-06586: Chevron St. 01, located in UL D (660 FNL & 660 FWL) of Section 15-Ts 21s-R37e has become within 660 feet of the brine well, so it has been added to the critical zone. This well will be investigated and reported in the 2010 annual report due March 31, 2011.

Copies of the 2010 well status list, AOR Unit Plot Plan, and well file downloads are attached in this Section VII.5.A appendix.

Section VII.5.A. Appendix:

Includes:

1. 2010 BW-28 AOR Review-Well Status List. "Update in Feb 2011"
2. 2009-2010 BW-28 Annual Review-Unit Plot Plan. "Updated in Feb 2011"
3. 2010 Well File Downloads-36 pages. "Updated in Feb 2011"

VII.A.6.- Maps and cross-sections detailing the geology and geologic structure of the local area.

Answer: The Eunice Brine Well is located on the Central Basin Platform of the Permian Basin where the Salado salt in the Ochoa series is generally found throughout. Fig.1 in the Section VII.A.6-11 Appendix, shows the map of the Permian basins. A Stratigraphic chart is also included for general reference. The Salado salt is overlain by the Rustler formation, which contains anhydrite layers that act as a roof support over the salt caverns generated from brine well solution mining. Overlying the Rustler formation are the Dewey lake red beds that generally act as a confining barrier for groundwater found above in the Teritary Ogallala and Quaternary Alluvium formations.

The depth of the top of the salt is generally found from approximately 1200 feet (bgl) and the thickness ranges from 1,000 to 1,500 feet. The Salado is inter-bedded with anhydrite layers, thus receiving the name bedded salt. Included in Section VII.6-11 Appendix, are well records from four different brine wells in the area. They are, the Key Brine Well BW-28, Conoco Brine Well BW-1, the Key GP Sims BW-09, and the P&S Brine Well BW-2. These records verify the general depth and thickness of the Salado Salt underlying the area.

VII.A.7.- A proposed formation testing program to obtain an analysis or description of fluids in the receiving formation.

Answer: Included in Section VII.C.4 below.

VII.A.8.- Schematic drawings of the surface and subsurface construction details.

Answer: Included in this Section VII.A.6-11 is a recent copy of the schematic of the well bore.

VII.A.9.- The proposed drilling, evaluation, and testing, programs. Include logging procedures, coring program, and deviation checks.

Answer: The complete copy of the existing brine well file is included in Section VII.A.1-4 Appendix. It includes the original C-101, 102, 103's, formation records, C-105's, deviation report, casing and cementing records, and test results.

VII.A.10.- The proposed stimulation, injection, and operation procedures (Note WQCC 5-206 limitations).

Answer: There is no proposed stimulation at this time other than circulating fresh water down the tubing and producing up the annulus. Reverse flow will occur occasionally for maintenance reasons.

VII.A.11.- A plan for plugging and abandonment of the well that meets the requirements of WQCC regulations section 5-209. A plugging bond pursuant to OCD Rule 101 is required prior to commencement of any new well drilling operations.

Answer: Key Energy proposes the following plugging procedure of the brine well. Remove the water from the well bore and a minimum of one foot from the formation, then set a cast iron bridge plug at 10 feet above the casing shoe and fill the well bore with a Class C high strength salt resistant cement.

Over time the salt will creep and fill in the void without fracturing the formation. Subsidence will be monitored for a minimum of five years after closure, unless issues occur.

An option that Key would like OCD to consider is the filling in of the cavern with oilfield non-hazardous solid waste. Key understands OCD does not have current guidance on this issue and therefore would like to work with OCD in developing this procedure and possibly even a new rule.

Answer: (Bonding and Financial Assurances per 20.6.2.3107.11 NMAC)

Key Energy currently has an approved existing $50,000 bond, No. RLB0003249. Verification of bond approval is included in the Section VII.A.6-11 Appendix.

Section VII.A.6-11 Appendix:

Includes:

1. Fig.1-Map of the Permian Basins.
2. Stratigraphic Chart of the Permian System and the Central Basin Platform.
3. Well records of Key Brine Well BW-28, Conoco Brine Well BW-1, the Key GP Sims BW-09, and the P&S Brine.
4. Recent well bore completion schematic.
5. Verification of Bond Approval letter.

VII.B.- Workover Operations -Before performing remedial work, altering or pulling casing, plugging or abandonment, or any other workover, approval of OCD must be obtained. Approval should be requested on OCD Form C-103 "Sundry Notices and Reports on Wells" (OCD Rule 1103-A).

Answer: Key Energy acknowledges the requirement that any subsequent workovers after permit approval will be approved by OCD using the C-103 process. Key Energy will use the local districts guidance on when a C-103 requires submittal. In absent of OCD's guidance, Key will submit a C-103 for approval anytime the packer or tubing strings are unseated. Routine well-head piping maintenance or pressure testing will not be reported on a C-103 but a summary will be included in the annual report.

VII.C. Additional Information Required with Discharge Plan- In addition to all of the information required above in Part VII.A. (Drilling, Deepening, or Plug Back Operations), include the following with your discharge plan application.

VII.C.1. Provide evaluation, completion and well workover information. Include all logs, test results, completion reports and workover descriptions.

Answer: This information will be provided with the normal requirements of a C-103 and C-105 Sundry Notice and Well Completion reports respectfully, after well operations have been completed and will also be included in the annual reports.

VII.C.2. Provide the proposed maximum and average injection pressures and injection volume. If one well is to be used for injection and extraction, fresh water must be injected down the annulus and brine must be recovered up the tubing. Reverse flow will be allowed for up to once a month for 24 hours for clean out. If an alternative operating method is desired then a written request must be submitted to the OCD which describes the proposed operating procedures and how the mechanical integrity of the casing will be guaranteed.

Answer-Maximum Static, Dynamic and Average Injection Pressures and Estimated Flow Rates:

The maximum pressure exerted on the formation will be limited to prevent formation fracturing. The emphasis will be to make sure the salt formation at or near the casing shoe will not be fractured under static or dynamic operating conditions.

Currently, the Oil Conservation Division does not have guidance concerning this issue. Therefore, Key Energy will use the Kansas guidance for maximum fracture gradient of 0.75 psi/ft. (per Mike Cochran-Kansas UIC Department).

In addition, Key used one of the noted fracture pressure calculation determinations by Willis, Kelly and Eaton. The Eaton equation provides the most conservative number for Fracture Gradients.

Key utilized the Eaton equation in an excel spreadsheet model to determine if these results are comparable to Kansas' 0.75 psi/ft rule of thumb fracture gradient.

The Eaton equation provides a conservative fracture gradient of 0.68 psi/ft when the Poisson ratio was set at the lower limit of 0.25 for Salt (WIPP site ref.) Other salt zones can have Poisson ratios of 0.37 on the high side, which gives a fracture gradient of 0.80 psi/ft. The average of 0.68 psi/ft and 0.80 psi/ft calculates to be 0.74 psi/ft. Therefore, Key Energy will use a 0.75 psi/ft fracture gradient for determining maximum pressures.

A depth of 1,360 feet was used in the fracture calculation to determine the fracture pressure at the casing shoe. In addition, the model also calculated the allowable static surface pressure (i.e. pump not running)

and the maximum allowable injection pressure, taking into account friction pressure losses in the tubing with a maximum flow of 5 bbl/min.

The maximum surface injection pressure was calculated to be 387 psig (pump running) and the maximum static pressure (pump not running) was 307 psig. The existing permit conditions allowed a maximum of 405 psig injected or static.

The 307 pounds cannot be exceeded because of pump limitations. The pump is a submersible centrifugal pump, with a pump curve shut in pressure of 300 psig, plus or minus the water tank head pressure of 4 psig. The average measured or observed injection pressure is noted by Key's personal ranges from 50 psig to 150 psig. This reading is taken from a pressure gauge mounted on the well inlet.

For this reason, permit condition 21.D. *Well Pressure Limits: "The operator shall have a working pressure limiting device or controls to prevent overpressure."* is conditionally met.

The results of the model are located in Section VII.B.-VII.C1-6 Appendix.

Answer: Key Energy understands OCD's position has changed on the issue of injecting fresh water down the annulus (i.e. reverse flow) since it causes a cavern to be formed at the top of the salt formation thus over time causes an inheritably unstable roof condition. On June 1, 2009 Key followed OCD instructions and change the flow pattern. It should be noted that it took over a month in order to obtain 10# brine.

VII.C.3. Submit a proposed mechanical integrity testing program. OCD requires a casing pressure test isolating the casing from the formation using either a bridge plug or packer prior to start of operation, and repeated at least once every five years or during well work over. In addition, OCD requires an open hole pressure test to 500 PSI for 4 hours on an annual basis.

Answer: An annual casing pressure test shall be ran for 30 minutes at a minimum of 350 psig using a pressure chart recorder with a maximum of 500 lb range and 4 hour (complete revolution) chart. OCD will be notified in ample time so they may witness the test. The tubing will be pulled and a packer set so the casing may be isolated from the cavern during the test.

Key Energy **does not agree** with the current guidance of pressuring testing the formation to 500 psi for 4 hours. This pressure exceeds the formation fracture pressure and recommends OCD changes this guidance. Key Energy will strive to maintain surface pressure at all times on the formation. Several SMRI and other reports have shown that sudden releases and inadvertent pressure surges during testing may be causing extensive damage in the formation. Therefore, Key is proposing that no annual formation test be performed per se.

Key intends to maintain a continuous pressure chart recorder on the formation. The pressure recorder will have a 30-day clock and all charts will be maintained for a minimum of 5 years. All charts will be submitted in an annual report due on March 31 of each year.

VII.C.4. Provide an analysis of the injection fluid and brine. Include location and design of site(s) and method(s) of sampling. Analysis will be for concentrations of Total Dissolved Solids, Sodium, Calcium, Potassium, Magnesium, Bromide, Carbonate/Bicarbonate, Chloride and Sulfate.

Answer: Fresh water and brine water samples will be collected at the load line area of the facility or taken directly from sample ports at the well-head. Key believes OCD's guidance does not adequately sample for all of the important parameters and hereby proposes to sample for the following constituents:

Key Energy will sample annually for the following chemical constituents: All WQCC metals, general chemistry (major cations and anions with a calculated balance), total dissolved solids (TDS), total

suspended solids (TSS), density, and Ph. All sample and analysis will be pursuant to EPA methods and reported in the annual report due on March 31 of each year.

VII.C.5. Compare volumes of fresh water injected to volume of brine to detect underground losses and specify method by which volumes are determined. After approval, submittal of a quarterly report listing, by month, the volume of fluids injected and produced will be required.

Answer: Key Energy presently monitors both fresh water and brine water by individual flow meters on the inlet and outlet brine well lines. The meters will have totalizers and will be read and recorded monthly. These readings will be evaluated monthly to determine if they remain within a 15% tolerance, with the fresh water generally being greater that the brine water produced. Any monthly reading out of limits will be investigated. The results will be reported in the annual report.

VII.C.6. For renewal application for facilities in operation in excess of 15 years, provide information on the size and extent of the solution cavern and geologic/engineering data demonstrating that continued brine extraction will not cause surface subsidence of catastrophic collapse.

Answer: Key Energy believes this guidance is out dated and should require this information every year in the annual report. Key Energy proposes to provide an annual cavity size, D/H ratio, estimated radius, and configuration. Key also has developed a model to determine the roof stability and will provide the results of the model annually.

Key is currently in the process of installing subsidence monitors and will include the information in each annual report.

Section VII.B-VII.C1-6 Appendix:

Includes:

1. Results of Injection Pressure Model Excel Spreadsheet.
2. Friction Charts.
3. Eaton Equation for Old Brine Well BW-19.

VIII. Spill/Leak Prevention and Reporting Procedures (Contingency Plans)- *It is necessary to include in the discharge plan submittal a contingency plan that anticipates where any leaks or spills might occur. It must describe how the discharger proposes to guard against such accidents and detect them when they have occurred. The contingency plan also must describe the steps proposed to contain and remove the spilled substance or mitigate the damage caused by the discharge such that ground water is protected, or movement into surface waters is prevented. The discharger will be required to notify the OCD Director in the event of significant leaks and spills. This commitment and proposed notification threshold levels must be included in the contingency plan.*

VIII.A. Prevention- Describe how spills and leaks will be prevented at the facility. Include specifically how spillage/leakage will be prevented during truck loading and at major transfer points within the facility. Discuss general "housekeeping" procedures for areas not directly associated with the above major processes.

VIII.B. Containment and Cleanup-Describe procedures for containment and cleanup of major and minor spills at the facility. Include information as to whether areas are curbed, paved, and drained to sumps; final disposition of spill materials; etc.

VIII.C. Notification-Propose a schedule for OCD notification of spills. The OCD requires the discharger to notify the director within 48 hours of the detection or suspected detection of a spill, and provide subsequent reports as required.

VIII. (A-C) Answer: Please find enclosed in the appendix for this section VIII a site "Emergency Contingency Plan" that addresses this section.

Section VIII. Appendix:

Includes:

“Emergency Contingency Plan”

IX. Site Characteristics

IX.A. The following hydrologic/geologic information is required to be submitted with all discharge plan applications. Some information already may be included in this application or may be on file with OCD and can be provided to the applicant on request.

A.1.A. Provide the name, description, and location of any bodies of water, streams (indicate perennial or intermittent), or other watercourses (arroyos, canals, drains, etc.); and ground water discharges sites (seeps, springs, marshes, swamps) within one mile of the outside perimeter of the facility; A.1.B. For water wells, locate wells within one-quarter mile and specify use of water (e.g. public supply, domestic, stock, etc.).

Answer Part A.- Surface water one-mile "area of review" (AOR): There are no bodies of water, such as lakes, streams, or seeps, springs, marshes, swamps within the area of review. The closest major drainage feature is Monument draw located about 1.5 miles to the northeast and east. Monument draw east and south of the site has generally been filled in with alluvium, dune and vegetation. It is very subdued in this area and is not considered a major stormwater drainage feature. There is one ephemeral drainage feature located to the north and skirts the site on the east side. Located just east of the site there are two small drainage channels that connect to this feature. Section IX.A.1-4 Appendix contains an aerial photo showing these features.

Answer Part B.- Water well ¼ mile "area of review" (AOR): There are no water wells located within the area of review. Records from the Office of the State Engineers office were reviewed and no new wells were found in any of the adjacent sections around the brine well site. The verification of the record search is included in the Section IX.A.1-4 Appendix.

A.2. Provide the depth to and total dissolved solids (TDS) concentration (in mg/l) of the ground water most likely to be affected by any discharge (planned or unplanned). Include the source of the information and how it was determined. Provide a recent water quality analysis of the ground water, if available, including name of analyzing laboratory and sample date.

Answer- Ground water depth and quality information: There are no groundwater wells to sample in the area of review, therefore no data is available.

A.3. Provide the following information and attach or reference source information as available (e.g. driller's logs): a. Soil type(s) (sand, clay, loam, caliche); b. Name of aquifer(s); c. Composition of aquifer material (e.g. alluvium, sandstone, basalt, etc.); and d. Depth to rock at base of alluvium (if available).

Answer A.3.(a-d)- Soils types, aquifer(s) name, composition, and depth. The local geography of the brine well area (Section 15-Ts 21s-R 37e) is located in the Eunice Plain in the far southeastern part of the Pecos Valley section of the Great Plains physographic province. In the area of the brine well, the Eunice Plain is underlain by hard caliche and is almost entirely covered by reddish-brown dune sand. It has a general southeast slope to Monument draw, one of the few major drainage features in the area.

The major aquifers in the area are found in the Ogallala formation and in the Quaternary alluvium. Plate 1 "Geologic Map of Southern Lea County, New Mexico" is included in the Section IX.A.1-4 Appendix for reference. The site is located near the boundary of the Ogallala formation and the Alluvium found in Monument draw. For the most part the two aquifers are considered one under most of the Eunice Plain.

The Ogallala formation, in this area consists of white sandy caliche, calcareous tan sandstone, unconsolidated sand with silt, clay and gravel. The alluvium is for the most part is sand, gravel and

reworked caliche. The thickness of the Ogallala formation at the brine well site is approximately 100 feet and underlain by Triassic red beds consisting of red clay, siltstone, and calcareous sandstones. In the vicinity of the brine well, the formation is mostly unsaturated. Included in the Section IX.A.1-4 Appendix is a copy of Plate 2 "Ground-Water Map of Southern Lea County, New Mexico" shows the water table contours in the general area.

It should be pointed out that historic windmill water used for stock watering is found in Monument Draw. The depth to this water is usually shallow, 25-40 feet and produces small quantities. These wells go dry during drought years. (This information is verified by this writer who has spent many years in the area working, and bird hunting at these locations-WPrice). Reference the Ground-Water Report 6-Geology and Groundwater conditions in Southern Lea County, New Mexico (Nicholson and Clebsch).

A.4. Provide information on: a. The flooding potential at the discharge site with respect to major precipitation and/or run-off events; and b. Flood protection measures (berms, channels, etc.), if applicable.

Answers IX.4.a-b.- Flooding potential and protection measures: The site does not have a history of flooding, even though the surface gradient in the area is quite flat, the site drains as sheet flow generally to the southeast. There are two small erosional channels that dip to the east, one located east of the water station, and the other located southeast of the brine well. Both of these connect to another drainage feature that fans out southeast of the site and is cutoff from Monument draw by a set of railroad tracks. The water station is completely surrounded with by a stormwater run-on and run-off dirt berm. Included in the Section IX.A.1-4 Appendix is an aerial photo showing erosional features.

Section IX.A.1-4 Appendix:

Includes:

1. Aerial photo of surface water features-One-mile “area of review” (AOR).
2. Water Well Search Office of the State Engineers verification record search.
3. Plate 1 “Geologic Map of Southern Lea County, New Mexico”
4. Plate 2 “Ground-Water Map of Southern Lea County, New Mexico” shows the water table contours in the general area.
5. Aerial photo showing erosional features.

IX.B. Additional Information

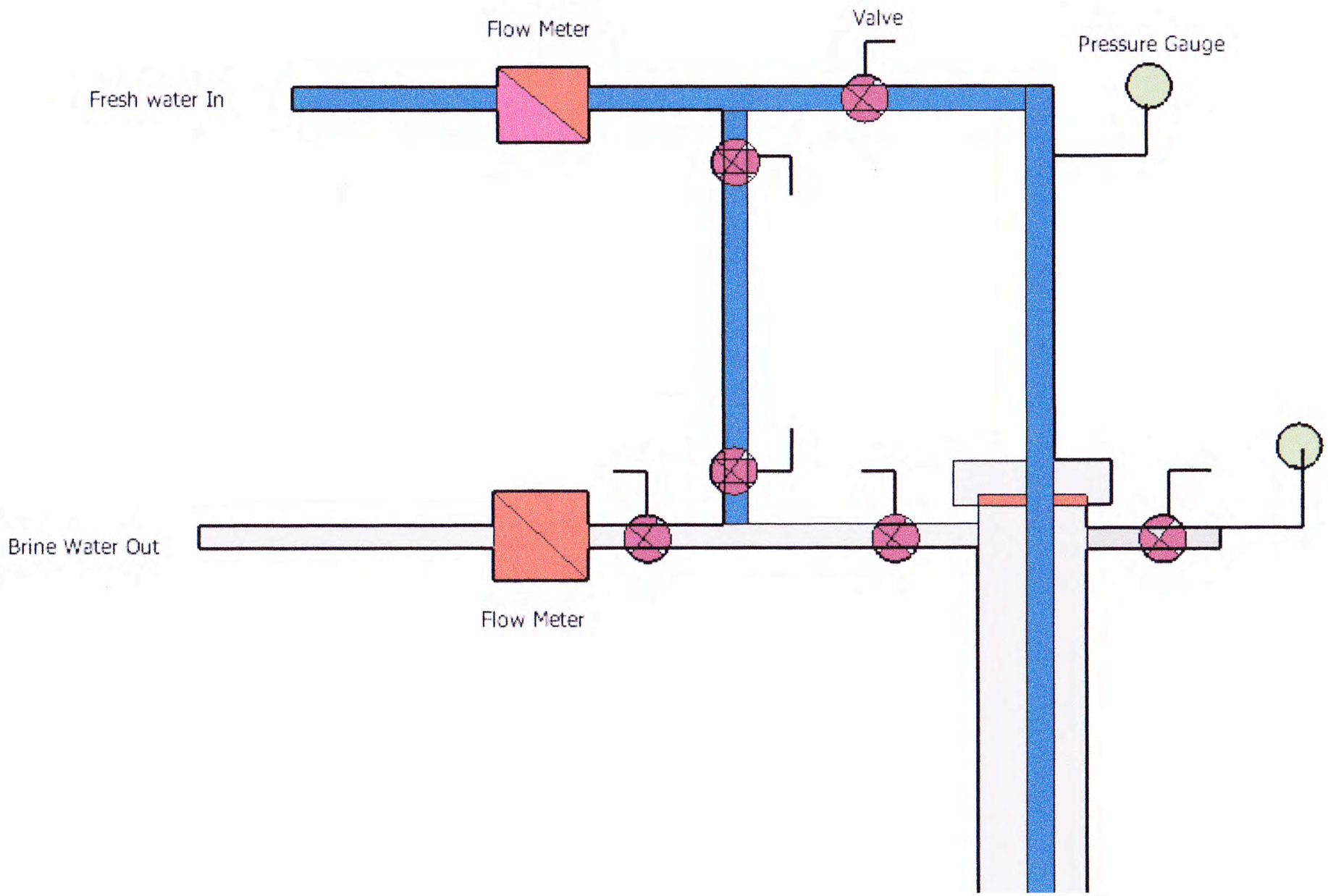
Provide any additional information necessary to demonstrate that approval of the discharge plan will not result in concentrations in excess of the standards of WQCC Section 3-103 or the presence of any toxic pollutant (Section 1-101.UU.) at any place of withdrawal of water for present or reasonably foreseeable future use. Depending on the method and location of discharge, detailed technical information on site hydrologic and geologic conditions may be required to be submitted for discharge plan evaluation. This material is most likely to be required for unlined surface impoundments and pits, and leach fields. Check with OCD before providing this information. However, if required it could include but not be limited to:

B.1. Stratigraphic information including formation and member names, thickness, lithologies, lateral extent, etc. B.2. Generalized maps and cross-sections; B.3. Potentiometric maps for aquifers potentially affected; B.4. Porosity, hydraulic conductivity, storactivity and other hydrologic parameters of the aquifer; B.5. Specific information on the water quality of the receiving aquifer; B.6. Information on expected alteration of contaminants due to sorption, precipitation or chemical reaction in the unsaturated zone, and expected reactions and/or dilution in the aquifer.

Answer to B.1-B.5: Since *this information is most likely to be required for unlined surface impoundments and pits, and leach fields, Key Energy is requesting that this section be waived. In addition, most of the information requested as been addressed above.*

Answer to B.6: Key Energy does not anticipate an alteration of contaminants since salts generally have an extended bioavailability in the environment. For this reason every attempt will be made to prevent the release of contaminants, and in the case of releases, an appropriate response shall be conducted to minimize or eliminate this effect.

Brine Well-Head Piping Diagram



State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey
Division Director
Oil Conservation Division

November 8, 2013

Dan Gibson
Key Energy Services, LLC.
6 Desta Drive, Suite 4300
Midland, Texas 79705

RE: Renewal of Discharge Permit BW-28 for the State Brine Well #1 in Unit E of Section 15, Township 21 South, Range 37 East NMPM; Lea County, New Mexico

Dear Mr. Gibson,

Pursuant to all applicable parts of the Water Quality Control Commission regulations 20.6.2 NMAC and more specifically 20.6.2.3104 thru.3999 discharge permit, and 20.6.2.5000 thru .5299 Underground Injection Control, the Oil Conservation Division hereby renews the discharge permit and authorizes operation and injection for the Key Energy Services, LLC (owner/operator) brine well associated with BW-28 (API# 30-025-33547) at the location described above and under the conditions specified in the attached Discharge Permit Approval Conditions.

Be advised that approval of this permit does not relieve the owner/operator of responsibility should operations result in pollution of surface water, groundwater, or the environment. Nor does this permit relieve the owner/operator of any responsibility or consequences associated with subsidence or cavern failure. This permit does not relieve the owner/operator of its responsibility to comply with any other applicable governmental rules or regulations.

If you have any questions, please contact Jim Griswold of my staff at (505) 476-3465 or by email at *jim.griswold@state.nm.us*. On behalf of the Oil Conservation Division, I wish to thank you and your staff for your cooperation and patience during this renewal application review.

Respectfully,

Jami Bailey
Director

JB/JG/jg
Attachment – Discharge Permit Approval Conditions

cc: Michael Mariano, State Land Office

DISCHARGE PERMIT BW-28

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY: The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department renews Discharge Permit BW-28 (Discharge Permit) to Key Energy Services, LLC. (Permittee) to operate its Underground Injection Control (UIC) Class III wells for the in situ extraction of salt (State Brine Well #1 – API No. 30-025-33547) located 1340 FNL and 330 FWL (SW/4 NW/4, Unit Letter E) in Section 15, Township 21 South, Range 37 East, NMPM, Lea County, New Mexico at its Brine Production Facility (Facility). The Facility is located approximately two miles north of Eunice, New Mexico along the east side of NM 207/CR 18.

The Permittee is permitted to inject water into the subsurface salt layers and produce brine for use in the oil and gas industry. Ground water that may be affected by a spill, leak, or accidental discharge occurs at a depth of approximately 60 feet below ground surface and has a total dissolved solids concentration of approximately 1,200 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class III wells associated with the oil and gas industry (See Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (See 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5299 NMAC).

This Discharge Permit for a Class III well is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or on-site disposal of, any materials, product, by-product, or oil-field waste.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.

2. The injection of fluids into a large capacity cesspool is prohibited.

3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.

4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.

5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a hazard to public health, (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified of 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5299 NMAC) for Class III wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5299 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified at 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (See Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT RENEWAL: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required $100.00 filing fee. The Permittee is now required to submit the $1,700.00 permit fee for a Class III well. Please remit payment made payable to the Water Quality Management Fund in care of OCD at 1220 South St. Francis Drive in Santa Fe, New Mexico 87505.

1.F. EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT: This Discharge Permit becomes effective 30 days from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on **November 8, 2018.** The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (See Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

1.G. MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD Director and OCD's Environmental Bureau of any Facility expansion or process modification (See 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class III well that was approved pursuant to the requirements of 20.6.2.5000 through 20.6.2.5299 NMAC for the following causes:

a. Noncompliance by Permittee with any condition of this Discharge Permit; or,

b. The Permittee's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

c. A determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge permit modification or termination (See Section 75-6-6 NMSA 1978; 20.6.2.5101I NMAC; and, 20.6.2.3109E NMAC).

2. This Discharge Permit may also be modified or terminated for any of the following causes:

a. Violation of any provisions of the Water Quality Act or any applicable regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (See Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS III WELL DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class III well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class III well discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and,

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgement that the succeeding Permittee shall be responsible for compliance with the Class III well discharge permit upon taking possession of the facility; and

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance immediately or within a specified time period, or assess a civil penalty, or both (See Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (See Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (See Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. QUARTERLY MONITORING REQUIREMENTS FOR CLASS III WELLS: The Permittee may use either or both fresh water or water from otherwise non-potable sources. Pursuant to 20.6.2.5207C, the Permittee shall provide analysis of the injected fluids at least quarterly to yield data representative of their characteristics. The Permittee shall analyze the injected fluids for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids; and,
- chloride concentration.

The Permittee shall also provide analysis of the produced brine on a quarterly basis. The Permittee shall analyze the produced brine for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids;
- chloride concentration; and,
- sodium concentration.

2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. Surface Subsidence Monitoring Plan: The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective data of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually.

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well . If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

2. Solution Cavern Characterization Program: The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.

a. The Permittee shall provide an estimate of the size and shape of the solution cavern at least annually, based on fluid injection and brine production data.

b. The Permit shall compare the ratio of the volume of injected fluids to the volume of produced brine monthly. If the average ratio of injected fluid to produced brine varies is less than 90% or greater than 110%, the Permittee shall report this to OCD and cease injection and production operations of its Class III well within 24 hours. The Permittee shall begin an investigation to determine the cause of this abnormal ratio within 72 hours. The Permittee shall submit to OCD a report of its investigation within 15 days of cessation of injection and production operations of its Class III well.

3. Annual Certification: The Permittee shall certify annually that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.

If the solution cavern is determined by either OCD or the Permittee to be potentially unstable by either direct or indirect means, then the Permittee shall cease all fluid injection and brine production within 24 hours. If the Permittee ceases operations because it or OCD has determined that the solution cavern is unstable, then it shall submit a plan to stabilize the solution cavern within 30 days. OCD may require the Permittee to implement additional subsidence monitoring and to conduct additional corrective action.

2.C. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its Permit Renewal Application to cope with failure of a system(s) in the Discharge Permit.

2.D. CLOSURE: Prior to closure of the facility, the Permittee shall submit for OCD's approval, a closure plan including a completed form C-103 for plugging and abandonment of the Class III well. The Permittee shall plug and abandon its well pursuant to 20.6.2.5209 NMAC and as specified in Permit Condition 2.D.

1. Pre-Closure Notification: Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of its Class III well. Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau must approve all proposed well closure activities before Permittee may implement its proposed closure plan.

2. Required Information: The Permittee shall provide OCD's Environmental Bureau with the following information:

- Name of facility;
- Address of facility;
- Name of Permittee (and owner or operator, if appropriate);
- Address of Permittee (and owner or operator, if appropriate);
- Contact person;
- Phone number;
- Number and type of well(s);

- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (*e.g.*, sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation, other);
- Proposed date of well closure;
- Name of Preparer; and,
- Date.

2.E. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class III well, it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.F RECORD KEEPING: The Permittee shall maintain records of all inspections, surveys, investigations, *etc.*, required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection by OCD.

2.G. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified at 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. Oral Notification: As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

- The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
- The name and location of the facility;
- The date, time, location, and duration of the discharge;
- The source and cause of discharge;
- A description of the discharge, including its chemical composition;
- The estimated volume of the discharge; and,

- Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. Written Notification: Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

The Permittee shall provide subsequent written reports as required by OCD's Environmental Bureau.

2.H. OTHER REQUIREMENTS:

1. Inspection and Entry: Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

- Upon the presentation of proper credentials, enter the premises at reasonable times;
- Inspect and copy records required by this Discharge Permit;
- Inspect any treatment works, monitoring, and analytical equipment;
- Sample any injection fluid or produced brine; and,
- Use the Permittee's monitoring systems and wells in order to collect samples.

2. Advance Notice: The Permittee shall provide OCD's Environmental Bureau and Hobbs District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class III well.

3. Environmental Monitoring: The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit data summary tables, all raw analytical data, and laboratory QA/QC.

2.I. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a single well plugging bond in the amount that it shall determine, in accordance with Permit Condition 5.B, to cover potential costs associated with plugging and abandonment of the Class III well, surface restoration, and post-operational monitoring, as may be needed. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a

non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required hereinabove.

2.J. ANNUAL REPORT: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by **June 1**st of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class III Well Report, Name of Permittee, Discharge Permit Number, API number of well(s), date of report, and person submitting report;
- Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103;
- Monthly fluid injection and brine production volume, including the cumulative total carried over each year;
- Injection pressure data;
- A copy of the quarterly chemical analyses shall be included with data summary and all QA/QC information;
- Copy of any mechanical integrity test chart, including the type of test, *i.e.*, duration, gauge pressure, etc.;
- Brief explanation describing deviations from the normal operations;
- Results of any leaks and spill reports;
- An Area of Review (AOR) update summary;
- A summary with interpretation of MITs, surface subsidence surveys, cavern volume and geometry measurements with conclusion(s) and recommendation(s);
- A summary of the ratio of the volume of injected fluids to the volume of produced brine;
- A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- Annual Certification in accordance with Permit Condition 2.B.3.
- A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken; and,
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS III WELL OPERATIONS:

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206A NMAC to ensure that:

1. Injection will occur through the innermost tubing string and brine production through the annulus between the casing and tubing string to promote cavern development at depth. Injection and production flow can be reversed as required to achieve optimal cavern shaping, mine salt most efficiently, and to periodically clean the tubing and annulus. Injection must only occur in the intended solution mining interval.

2. Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that its Class III well is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1., then the Permittee shall within 24 hours notify OCD's Environmental Bureau and Hobbs District Office of the circumstances and action(s) taken. The Permittee shall cease operations until proper repairs are made and it has received approval from OCD to re-start injection operations.

3.B. INJECTION OPERATIONS:

1. Well Injection Pressure Limit: The Permittee shall ensure that the maximum wellhead or surface injection pressure on its Class III well shall not exceed the fracture pressure of the injection salt formation and will not cause new fractures or propagate any existing fractures of cause damage to the system.

2. Pressure Limiting Device: The Permittee shall equip and operate its Class III well or system with a pressure limiting device which shall, at all times, limit surface injection pressure to the maximum allowable pressure for its Class III well. The Permittee shall monitor the pressure-limiting device daily and shall report all pressure exceedances within 24 hours of detecting an exceedance to OCD's Environmental Bureau.

The Permittee shall take all steps necessary to ensure that the injected fluids enter only the proposed injection interval and is not permitted to escape to other formations or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated, or that damage to the well, the injection zone, or formation has occurred.

3.C. CONTINUOUS MONITORING DEVICES: The Permittee shall use continuous monitoring devices to provide a record of injection pressure, flow rate, flow volume, and pressure on the annulus between the tubing and the long string of casing.

3.D. MECHANICAL INTEGRITY FOR CLASS III WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall demonstrate mechanical integrity for its Class III well at least once every five years or more frequently as the OCD

Director may require for good cause during the life of the well. The Permittee shall demonstrate mechanical integrity for its Class III well every time it performs a well workover, including when it pulls the tubing. A Class III well has mechanical integrity if there is no detectable leak in the casing or tubing which OCD considers to be significant at maximum operating temperature and pressure; and no detectable conduit for fluid movement out of the injection zone through the well bore or vertical channels adjacent to the well bore which the OCD Director considers to be significant. The Permittee shall conduct a casing Mechanical Integrity Test (MIT) from the surface to the approved injection depth to assess casing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 300 psig measured at the surface.

The Permittee shall notify OCD's Environmental Bureau 5 days prior to conducting any MIT to allow OCD the opportunity to witness the MIT.

2. The following criteria will determine if the Class III well has passed the MIT:

a. Passes MIT if zero bleed-off during the test;

b. Passes MIT if final test pressure is within ± 10% of starting pressure, if approved by OCD;

c. When the MIT is not witnessed by OCD and fails, the Permittee shall notify OCD within 24 hours of the failure of the MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use by the Permittee of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

3.E. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's District Office in Hobbs and the Environmental Bureau in Santa Fe prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Hobbs District Office. Properly completed Forms C-103 and/or C-105 must be filed with OCD upon completion of workover activities and copies included in that year's Annual Report.

3.K. FLUIDS INJECTION AND BRINE PRODUCTION VOLUMES AND PRESSURES: The Permittee shall continuously monitor the volumes of water injected and brine production . The Permittee shall submit monthly reports of its injection and production volumes on or before the 10th day of the following month. The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours.

3.L. AREA OF REVIEW (AOR): The Permittee shall report within 72 hours of discovery any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class III well.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (*e.g.*, septic systems, leach fields, dry wells, *etc*.) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. ANNUAL REPORT: The Permittee shall submit its annual report to OCD by June 1st of each year.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class III well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC). The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.

5.C. **SURFACE SUBSIDENCE MONITORING PLAN:** The Permittee shall submit the Surface Subsidence Monitoring Plan required in accordance with Permit Condition 2.B.1 within 180 days of permit issuance.

5.D. SOLUTION CAVERN CHARACTERIZATION PLAN: The Permittee shall submit the Solution Cavern Characterization Plan required in accordance with Permit Condition 2.B.2 within 180 days of permit issuance.