



# WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

## DESIGNATE TYPE OF COMPLETION

New Well  Temporary Abandon  Work-Over  Deepen  Plug Back  Same Reservoir  Different Reservoir  Oil  Gas  Dry

## DESCRIPTION OF WELL AND LEASE

Operator: El Paso Natural Gas Address & Phone No. 719-520-4533  
2 N Nevada Colo Spgs Co 80903  
 Federal, State or Indian Lease Number or name of lessor if fee lease: AGS - Owned Well Number: 1-21 Field & Reservoir: NA  
 Location: 1980' FNL + 660' FWL County: Pinal  
 Sec. Township-Range or Block & Survey: Sec 21, T7S, R8E

Date spudded: 7-31-2006 Date total depth reached: 10-15-2006 Date completed, ready to produce: NA Elevation (DF, KB, RT or Gr.): 1527' ± 1539' KB Elevation of casing head flange: 0 feet  
 Total depth: 8,784' P.B.T.D.: - Single, dual, or triple completion?: - If this is a dual or triple completion furnish separate report for each completion: -

Producing interval(s) for this completion: Open Hole 5,640' 8,784' Rotary tools used (interval): 0 - 8,784' Cable tools used (interval): -  
 Was this well directionally drilled?: No Was directional survey made?: Yes Was copy of directional survey filed?: Yes Date filed: 10-18-2006

Type of electric or other logs run (check logs filed with the Commission): Later log Array, Gamma Ray, Dipole Sonic, Density-Compensated Neutron, Elemental Capture, Cement Bond, CASING RECORD, Combustible Magnetic Resonance Date filed: 10-18-2006

Casing (report all strings set in well - conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb./ft.)	Depth set	Sacks cement	Amount pulled
Conductor	30"	20"		94'	14 yards	0
Surface	17 1/2"	13 3/8"	54.5 lb/ft	1610 KB	880 sx	0
Intermediate	12 1/4"	9 5/8"	48.40 - 40#	5840' KB	1725 sx	0

TUBING RECORD			LINER RECORD				
Size in.	Depth set ft.	Packer set at ft.	Size in.	Top ft.	Bottom ft.	Sacks cement	Screen (ft.)

PERFORATION RECORD			ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD		
Number per ft.	Size & type	Depth interval	Amount & kind of material used		Depth interval
NA					

**INITIAL PRODUCTION**

Date of first production: NA Producing method (indicate if flowing, gas lift or pumping - if pumping, show size & type of pump):

Date of test	Hours tested	Choke size	Oil prod. during test bbls.	Gas prod. during test MCF	Water prod. during test bbls.	Oil gravity *API

Disposition of gas (state whether vented, used for fuel or sold)

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Manager, Facility Planning of the El Paso Natural Gas (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date: 10-18-2006

Signature: [Signature]

Permit No. 933

Mail completed form to:  
 Oil and Gas Program Administrator  
 Arizona Geological Survey  
 416 W. Congress, #100  
 Tucson, AZ 85701

**STATE OF ARIZONA**  
**OIL & GAS CONSERVATION COMMISSION**  
 Well Completion or Recompletion Report and Well Log  
 File One Copy

Form No. 4

**DETAIL OF FORMATIONS PENETRATED**

FORMATION	TOP	BOTTOM	DESCRIPTION*
Upper Alluvial Unit	0' - Surface	1,590'	Interbedded silt, sand, gravel + clay
Upper Picacho Salt	1,590'	3,060'	Salt + claystone
Lower Unit Playa Facies	3,060'	3,708'	Anhydrite, claystone + salt
Lower Picacho Salt	3,708'	4,510'	Salt, claystone with minor anhydrite
Lower Unit Playa Facies	4,510'	5,630'	Anhydrite, claystone grading into siltstone at the base
Lower Unit Alluvial Facies	5,630'	8,784'	Siltstone + sandstone grading into arkosic granite wash conglomerate

\* Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

**INSTRUCTIONS:**

Attach drillers log or other acceptable log of well.

This Well Completion or Recompletion report and well log shall be filed with the Oil and Gas Program Administrator, Arizona Geological Survey, 416 W. Congress #100, Tucson, AZ 85701 not later than thirty days after completion pursuant to A.A.C. R12-7-121.

**SUNDRY NOTICES AND REPORTS ON WELLS**

1. Name of Operator El Paso Natural Gas Company  
 2. OIL WELL  GAS WELL  OTHER  (Specify) Stratigraphic Test  
 3. Well Name AGS #1-21  
 Location 1,980' FNL, 660' FWL  
 Sec. 21 Twp. 7S Rge. 8E County Pinal, Arizona  
 4. Federal, State, or Indian Lease Number, or lessor's name if fee lease  
Owned by El Paso  
 5. Field or Pool Name NA

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

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF  PULL OR ALTER CASING   
 FRACTURE TREAT  DIRECTIONAL DRILL   
 SHOOT OR ACIDIZE  PERFORATE CASING   
 REPAIR WELL  CHANGE PLANS   
 (OTHER) \_\_\_\_\_

SUBSEQUENT REPORT OF:

WATER SHUT-OFF  WEEKLY PROGRESS   
 FRACTURE TREATMENT  REPAIRING WELL   
 SHOOTING OR ACIDIZING  ALTER CASING   
TEMPORARY ABANDONMENT   
 (OTHER) \_\_\_\_\_

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log, Form 4)

1. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.

El Paso Natural Gas is requesting approval to temporarily abandon the AGS #1-21 for a period of up to three years. This period of temporary abandonment is necessary to allow for additional testing and to fully evaluate the options for converting this well to beneficial use in association with the potential development of a salt cavern gas storage facility at this site.

The wells casing integrity is evidenced by the presence of cement to surface on the surface and intermediate casing strings. The well has not been stimulated and no well tests been performed to date.

The well bore is full to the surface with 9.3 lb/gallon drilling mud containing at least 15 lb/barrel of bentonite with a viscosity of 53 seconds per quart. The well head has been secured with a casing head flange with side valve and bolted plate steel.

8. I hereby certify that the foregoing is true and correct.

Signed [Signature] Title Manager Date 11-10-2006

Permit No. 933

<p><b>STATE OF ARIZONA</b>  <b>OIL &amp; GAS CONSERVATION COMMISSION</b>                  Sundry Notice and Reports On Wells                  File One Copy</p>
Form No. 25

**SUNDRY NOTICES AND REPORTS ON WELLS**

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 FRACTURE TREAT  DIRECTIONAL DRILL   
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 REPAIR WELL  CHANGE PLANS   
 (OTHER) \_\_\_\_\_

SUBSEQUENT REPORT OF:

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 FRACTURE TREATMENT  REPAIRING WELL   
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 (OTHER) \_\_\_\_\_

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El Paso Natural Gas is requesting approval to temporarily abandon the AGS #1-21 for a period of up to three years. This period of temporary abandonment to allow for additional testing and for El Paso to fully evaluate our options for converting the well to other beneficial use in association with the potential development of a salt cavern gas storage facility at this site.

The well is full to the surface of 9.3 lb/gal drilling mud containing at least 15 lb /bbl of sodium bentonite with a viscosity of 53 seconds per quart. The well head has been secured with a casing head flange with side valve and bolted plate steel.

8. I hereby certify that the foregoing is true and correct.

Signed [Signature] Title Manager Date 10-18-2006

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**OIL & GAS CONSERVATION COMMISSION**  
 Sundry Notice and Reports On Wells  
 File One Copy

Form No. 25

**Core #1**                    *Above Upper Cavern Interval*  
 1700-1760                    Rec.                    58.25'

Salt & Salt/Clay chicken wire  
 more clay btm 30'

Box 1-1 to 1-20

above cavern interval

RESPEC		OMNI	
Box	FT.	Box	FT.
1.3	1752		
1.6	1744		
1.8	1736		
1.11	1727		
1.15	1717		
1.18	1709		

933

Balance of boxes to Casa Grande Turbine Sta.

**Core #2**                    *Above Upper Cavern Interval*  
 1860-1920                    Rec.                    60.55'

Salt & Clay higher % than core 1  
 50+% Clay 1874.5' -1879'  
 2' Clay/Anhy 1884'  
 1' Clay 1913'

Box 2-1 to 2-22

RESPEC		OMNI	
Box	FT.	Box	FT.
2.1	1917-1920		
2.4	1909-1911		
2.6	1903-1906		
2.11	1891-1893		
2.14	1883.5		
2.18	1872		
2.22	1861		

Balance of boxes to Casa Grande Turbine Sta.

**Core #3**                    *Above Upper Cavern Interval*  
 2020-2080                    Rec.                    59.5'

Salt & Clay, >15% Clay fraction

Box 3-1 to 3-21

RESPEC		OMNI	
Box	FT.	Box	FT.
3.1	2078		
3.4	2070		
3.7	2062		
3.9	2056		
3.12	2048		
3.16	2037		
3.17	2034		
3.19	2028		

Balance of boxes to Casa Grande Turbine Sta.

**Core #4** Above Upper Cavern Interval  
2180-2240 Rec. 61.1'

2' Clay 2181+/-  
1' Clay 2204-2205'  
1' Clay 2239.5-2240.5'  
Balance Salt w/ Clay fraction

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Box 4-1 to 4-25

RESPEC		OMNI	
Box	FT.	Box	FT.
4.1	2239	4.5	2234
4.4	2231	4.7	2223
4.8	2220	4.22	2188
4.10	2215		
4.14	2206		
4.18	2198		
4.23	2186		

Balance of boxes to Casa Grande Turbine Sta.

**Core #5** Upper Cavern Interval  
2340-2400 Rec. 60.1'

Box 5-1 to 5-24

RESPEC		OMNI	
Box	FT.	Box	FT.
5.2	2396	5.6	2386
5.4	2391		
5.7	2383		
5.9	2378		
5.11	2373		
5.12	2371		
5.14	2366		
5.17	2360		
5.21	2350		

Balance of boxes to Casa Grande Turbine Sta.

**Core #6** Upper Cavern Interval  
2500-2560 Rec. 57.95'

Largely Salt w/Clay fraction  
2518-2520.5' is Anhy

Box 6-1 to 6-23

RESPEC		OMNI	
Box	FT.	Box	FT.
6.2	2555		
6.7	2541		
6.12	2528		
6.15	2521		
6.19	2512		

Balance of boxes to Casa Grande Turbine Sta.

**Core #7** Upper Cavern Interval  
 2660-2720 Rec. 57.25' All salt w/Clay fraction  
 6" Clear salt @ 2690.3'

Box 7-1 to 7-22

933

RESPEC		OMNI	
Box	FT.	Box	FT.
7.2	2712		
7.5	2704		
7.8	2698		
7.12	2687		
7.14	2684		
7.18	2674		
7.21	2664		

Balance of boxes to Casa Grande Turbine Sta.

**Core #8** Anhy/Clay Interval above lower salt  
 3500-3560 Rec. 59.6' Mostly Anhy w/ some Clay

Box 8-1 to 8-25

RESPEC		OMNI	
Box	FT.	Box	FT.
8.1	3557	8.2	3555
8.10	3532	8.6	3533
8.13	3525	8.12	3525
8.17	3514	8.15	3514
8.21	3503	8.19	3508

Balance of boxes to Casa Grande Turbine Sta.

**Core #9** Lower Salt Interval  
 4088-4148 Rec. 57.85' Salt w/ Clay fraction but appears  
 cleaner than upper salt

Box 9-1 to 9-23

RESPEC		OMNI	
Box	FT.	Box	FT.
9.3	4140		
9.6	4133		
9.9	4125		
9.12	4117		
9.16	4109		
9.19	4100		
9.22	4093		

Balance of boxes to Casa Grande Turbine Sta.

**Core #10**

4251-4309 Rec. 58' Salt w/ Clay fraction

Box 10-1 to 10-23 Lower Salt Interval

RESPEC		OMNI	
Box	FT.	Box	FT.
10.1	4308		
10.5	4296		
10.8	4288		
10.10	4283		
10.13	4275		
10.16	4267		
10.19	4259		

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Balance of boxes to Casa Grande Turbine Sta.

**Core #11**

4251-4309 Rec. 58' Anhydrite interbedded with clay stone

RESPEC		OMNI	
Box	FT.	Box	FT.
		11.2	4699
		11.6	4668
		11.8	4661

Balance of boxes to Casa Grande Turbine Sta.

**Core #12**

6,122-6,182" Rec. 60' Conglomerate with red clays

RESPEC		OMNI	
Box	FT.	Box	FT.
		12.1	6182
		12.2	6179
		12.3	6176
		12.4	6173
		12.5	6170
		12.6	6167
		12.7	6164
		12.8	6161
		12.9	6158
		12.10	6155
		12.11	6152
		12.12	6149
		12.13	6146
		12.14	6143
		12.15	6140
		12.16	6137
		12.17	6134
		12.18	6131
		12.19	6128
		12.20	6125

Core #13  
6,122-6,182"

Rec. 60'

Conglomerate with red clays

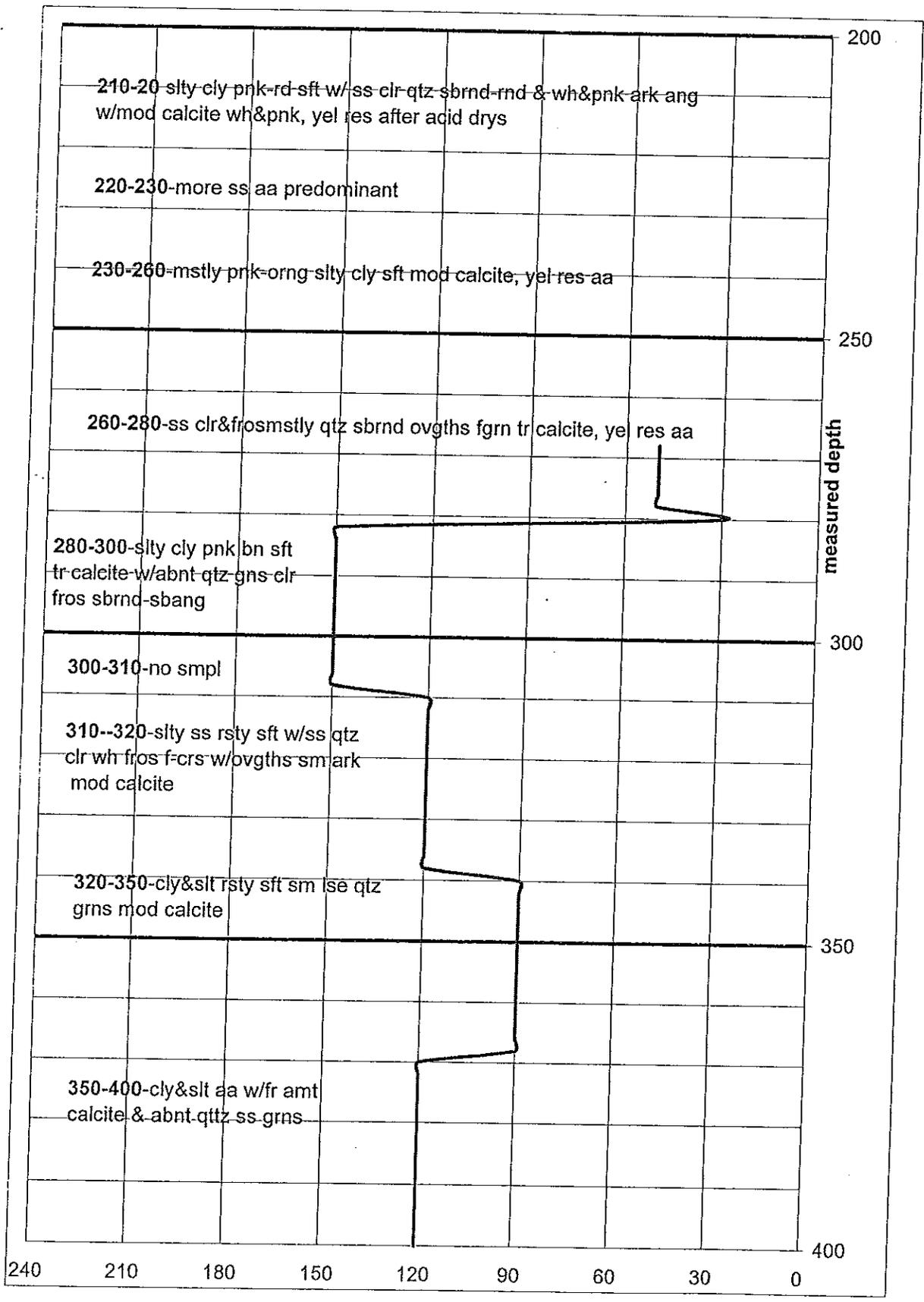
RESPEC		OMNI	
Box	FT.	Box	FT.
		13.1	6940
		13.2	6937
		13.3	6934
		13.4	6931
		13.5	6928
		13.6	6925
		13.7	6922
		13.8	6919
		13.9	6916
		13.10	6913

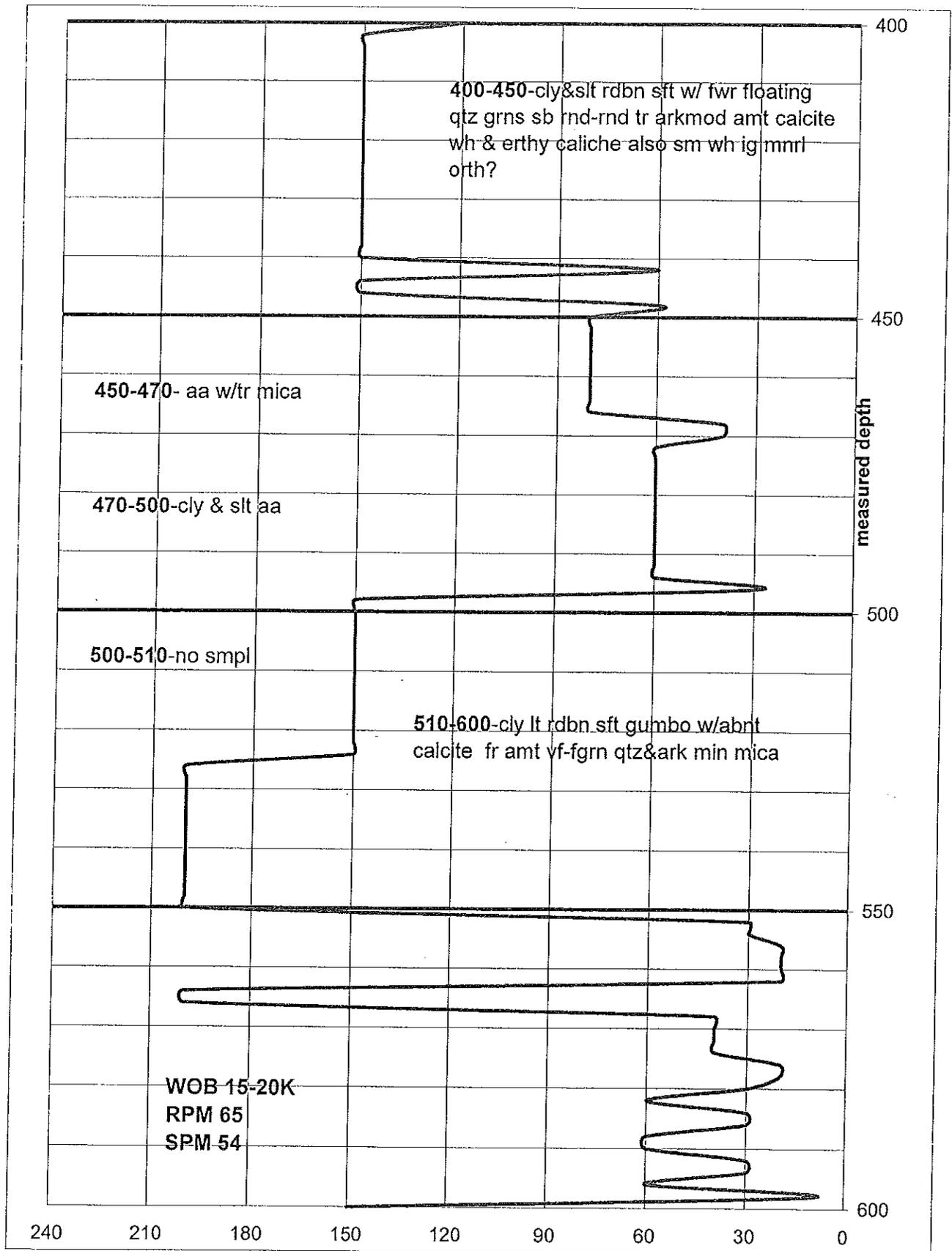
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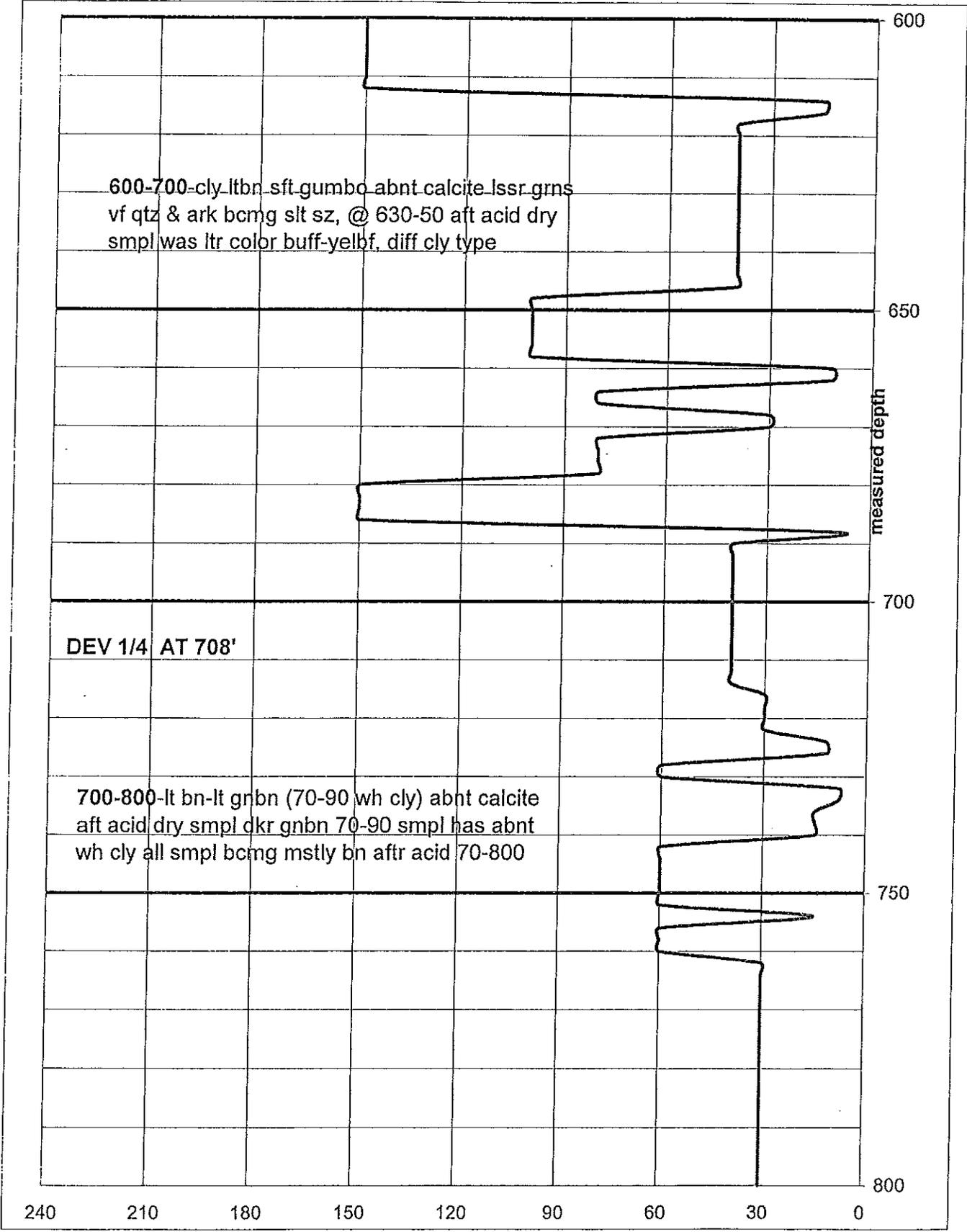
LENTZ SAMPLES

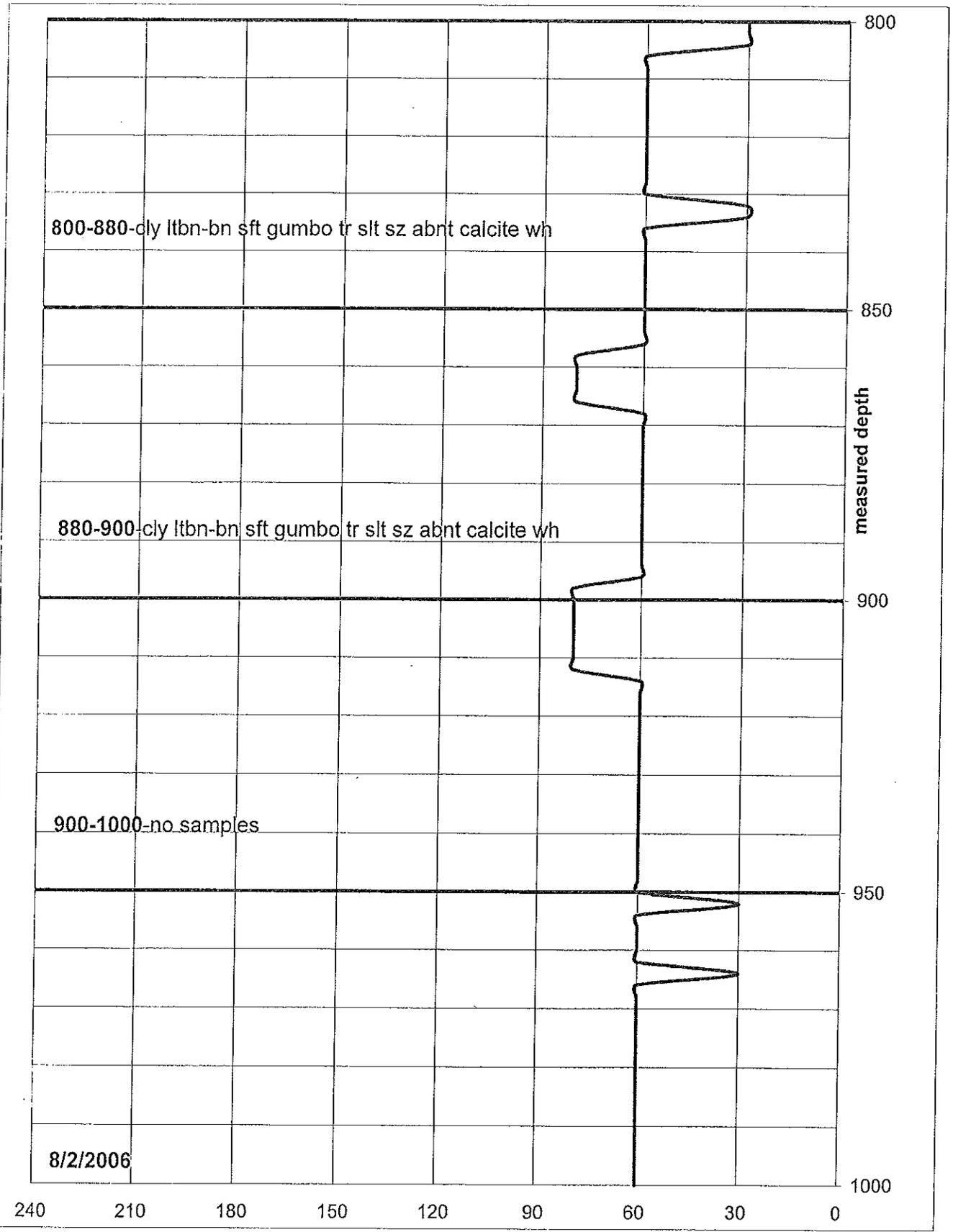
ZIA SAMPLES	BOX #1		
		2720	4000
		4000	5300
		5300	6400
		6400	7600
		7600	7922

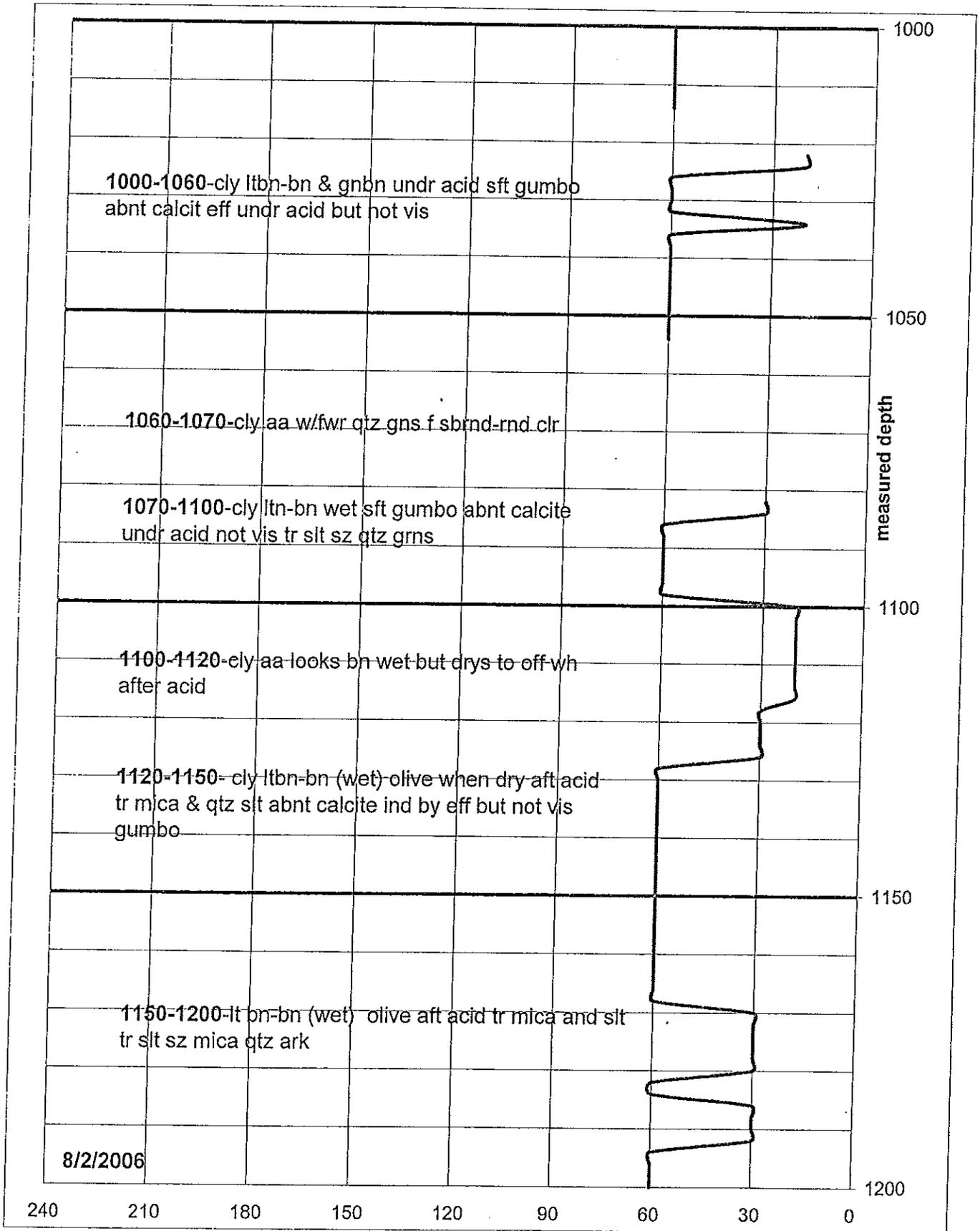


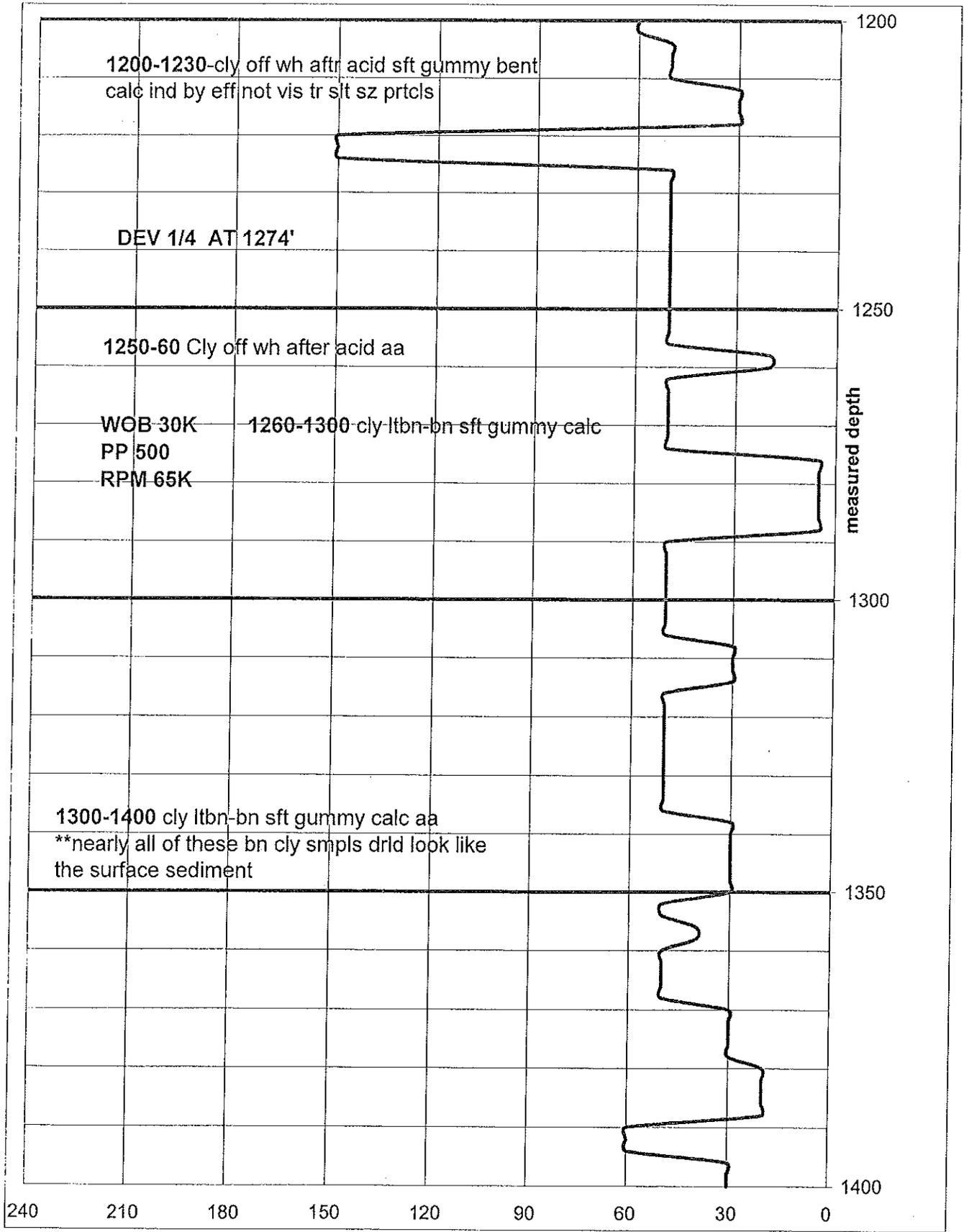


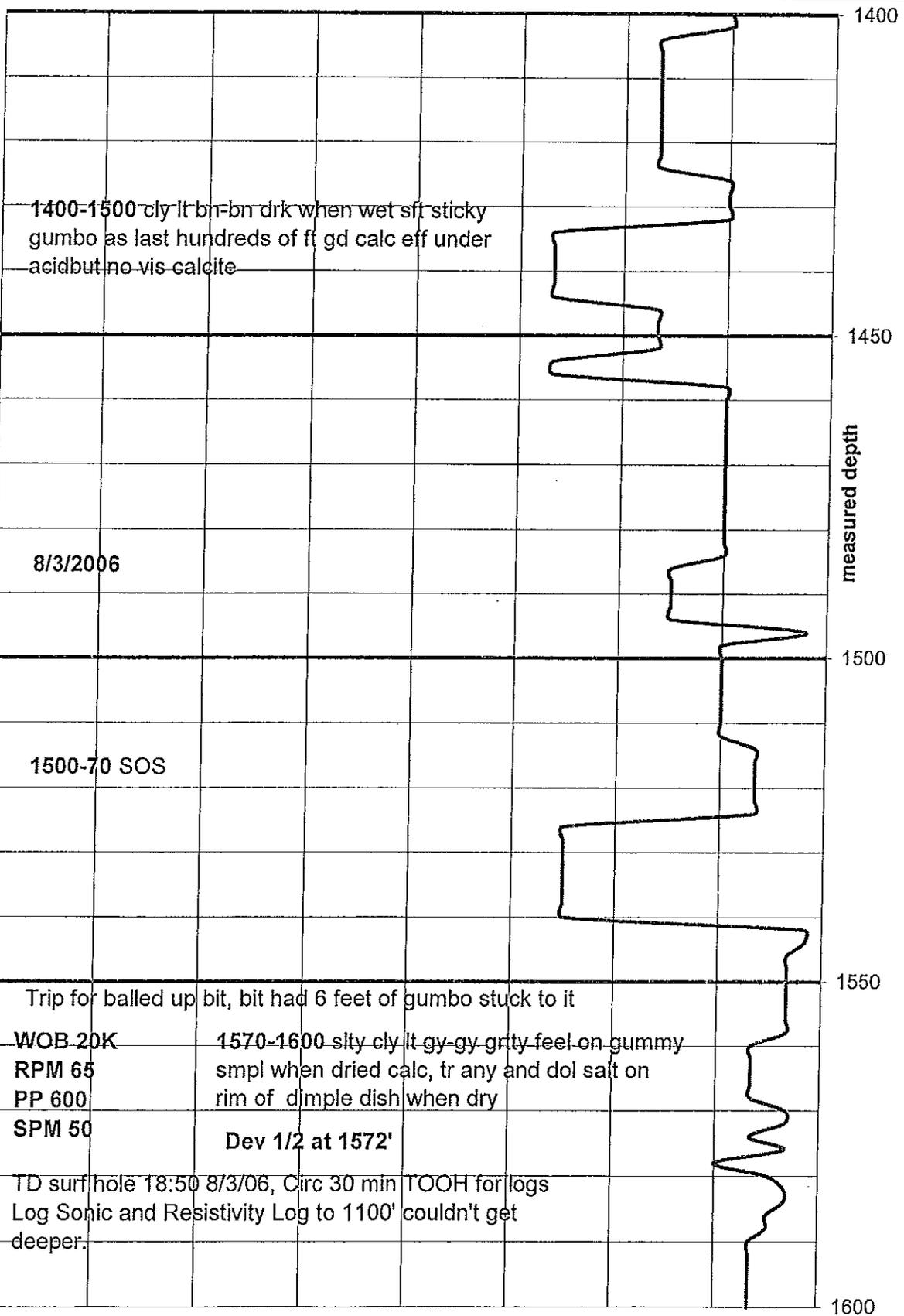












1400-1500 cly lt bn-bn drk when wet sft sticky gumbo as last hundreds of ft gd calc eff under acidbut no vis calcite

8/3/2006

1500-70 SOS

Trip for balled up bit, bit had 6 feet of gumbo stuck to it

WOB 20K  
RPM 65  
PP 600  
SPM 50

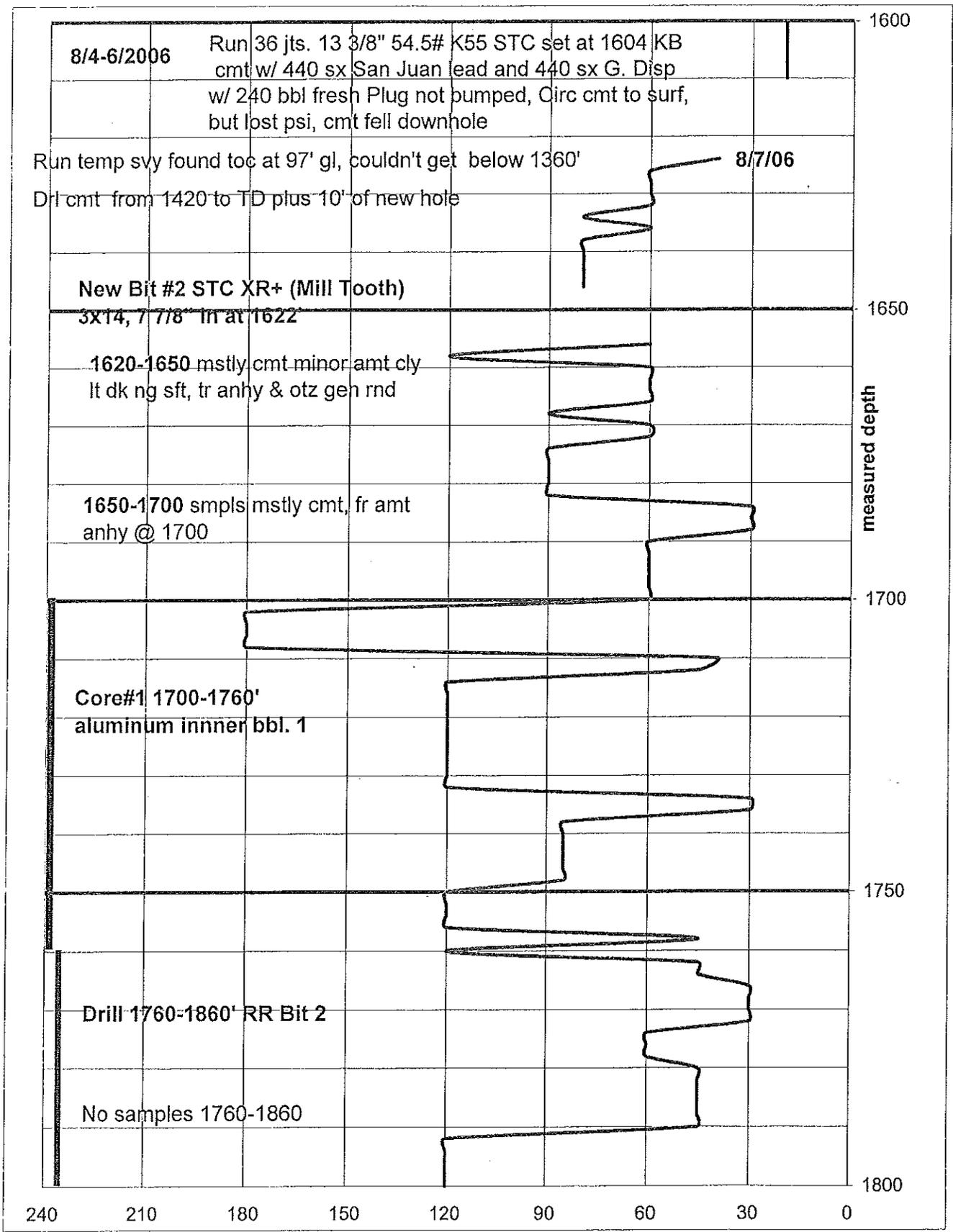
1570-1600 slty cly lt gy-gy grty feel on gummy smpl when dried calc, tr any and dol salt on rim of dimple dish when dry

Dev 1/2 at 1572'

TD surf hole 18:50 8/3/06, Circ 30 min TOOH for logs Log Sonic and Resistivity Log to 1100' couldn't get deeper.

240 210 180 150 120 90 60 30 0 1600

1400  
1450  
1500  
1550  
1600  
measured depth



8/4-6/2006

Run 36 jts. 13 3/8" 54.5# K55 STC set at 1604 KB  
 cmt w/ 440 sx San Juan lead and 440 sx G. Disp  
 w/ 240 bbl fresh Plug not pumped, Circ cmt to surf,  
 but lost psi, cmt fell downhole

Run temp svy found toc at 97' gl, couldn't get below 1360'  
 Dri cmt from 1420 to TD plus 10' of new hole

8/7/06

New Bit #2 STC XR+ (Mill Tooth)  
 3X14, 7 7/8" In at 1622'

1620-1650 mstly cmt minor amt cly  
 lt dk ng sft, tr anhy & otz gen rnd

1650-1700 smpls mstly cmt, fr amt  
 anhy @ 1700

Core#1 1700-1760'  
 aluminum innner bbl. 1

Drill 1760-1860' RR Bit 2

No samples 1760-1860

1600

1650

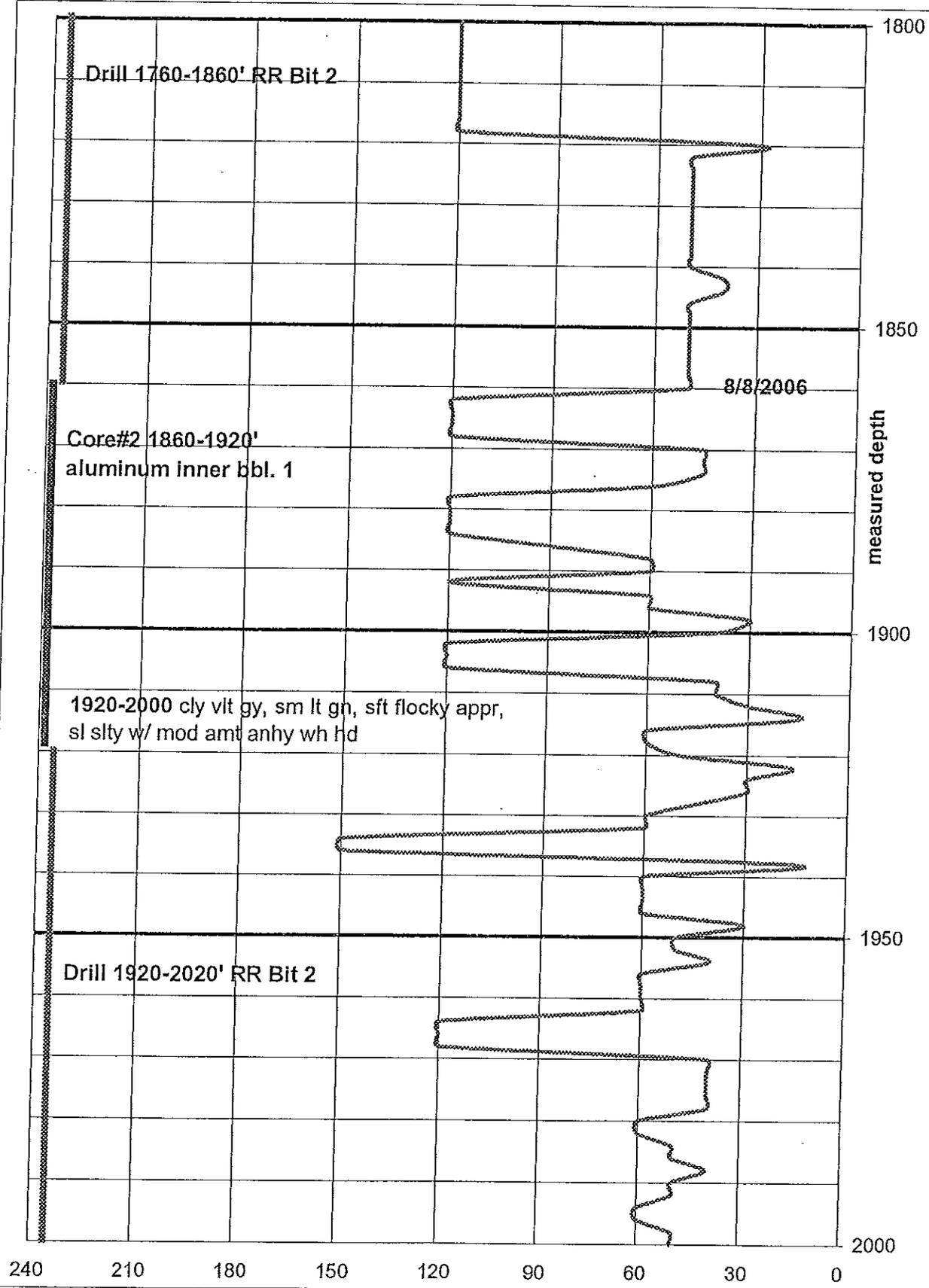
1700

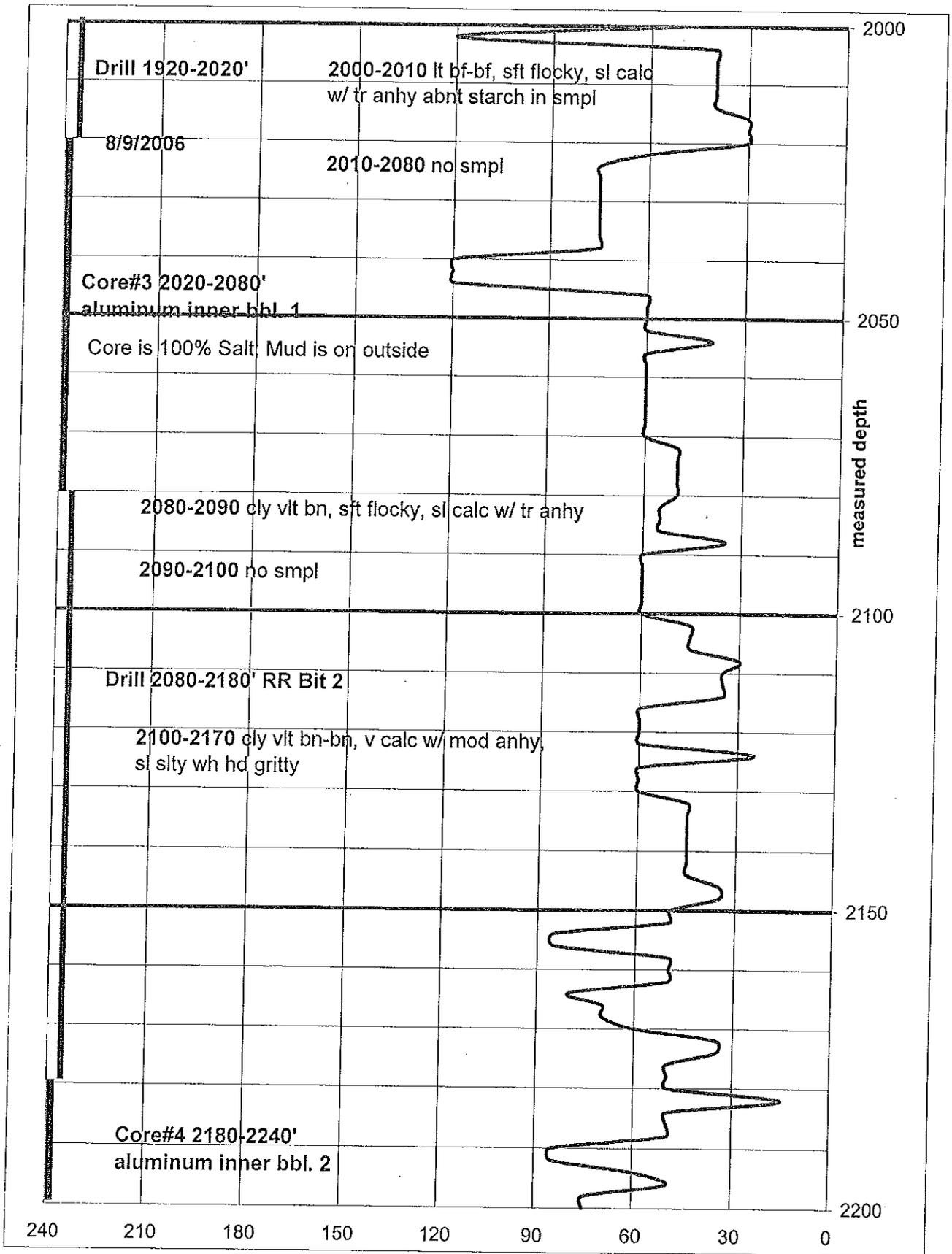
1750

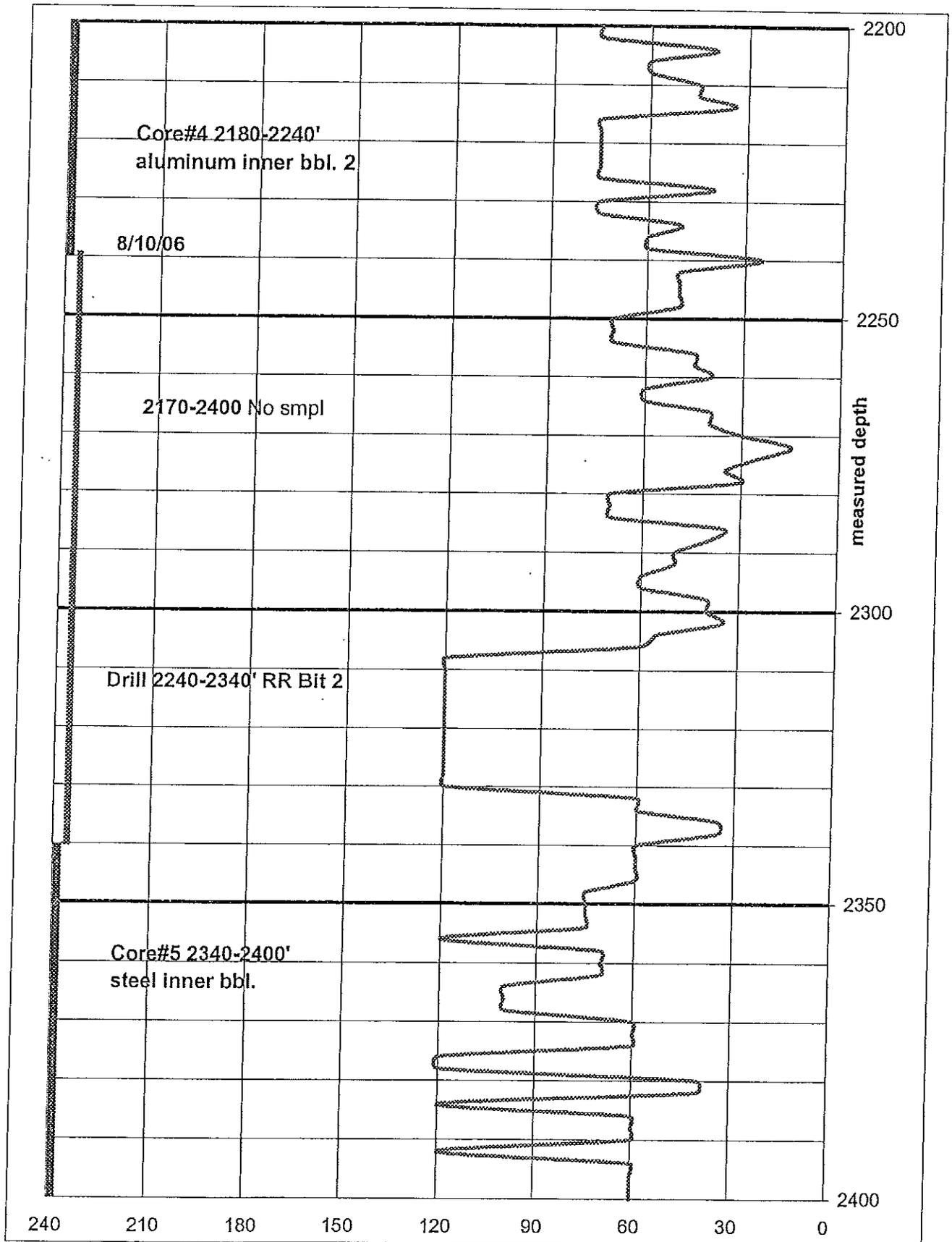
1800

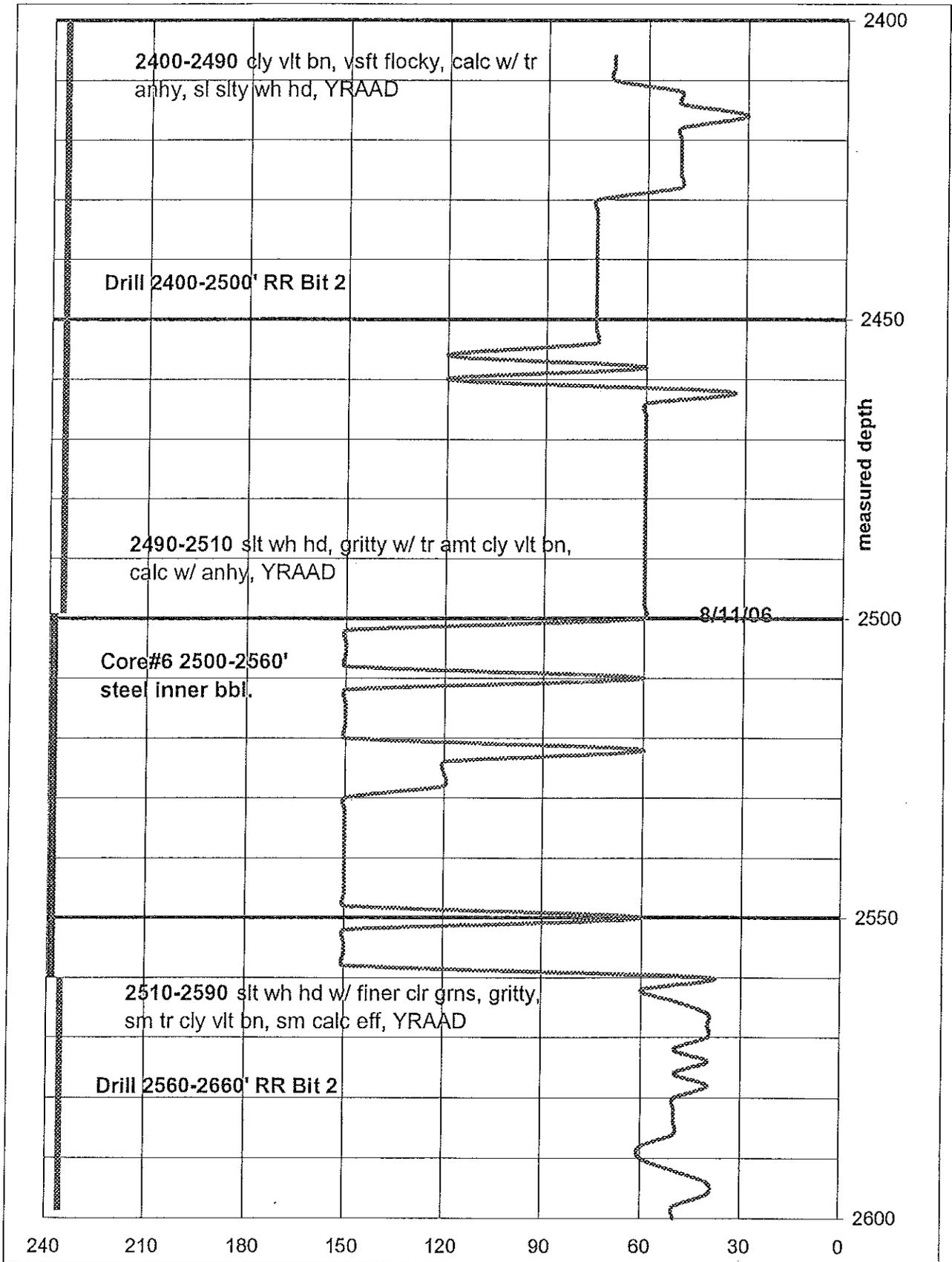
measured depth

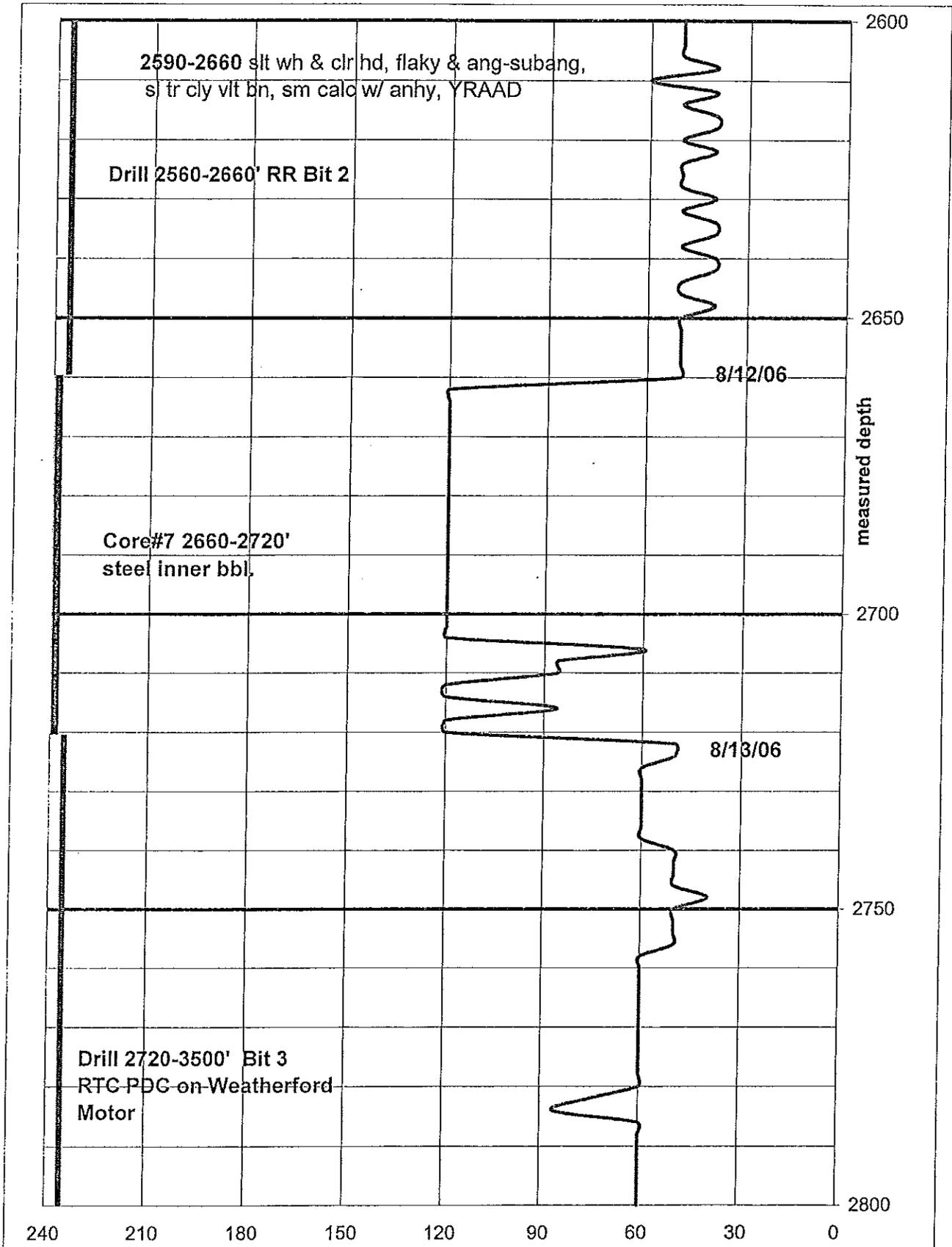
240 210 180 150 120 90 60 30 0





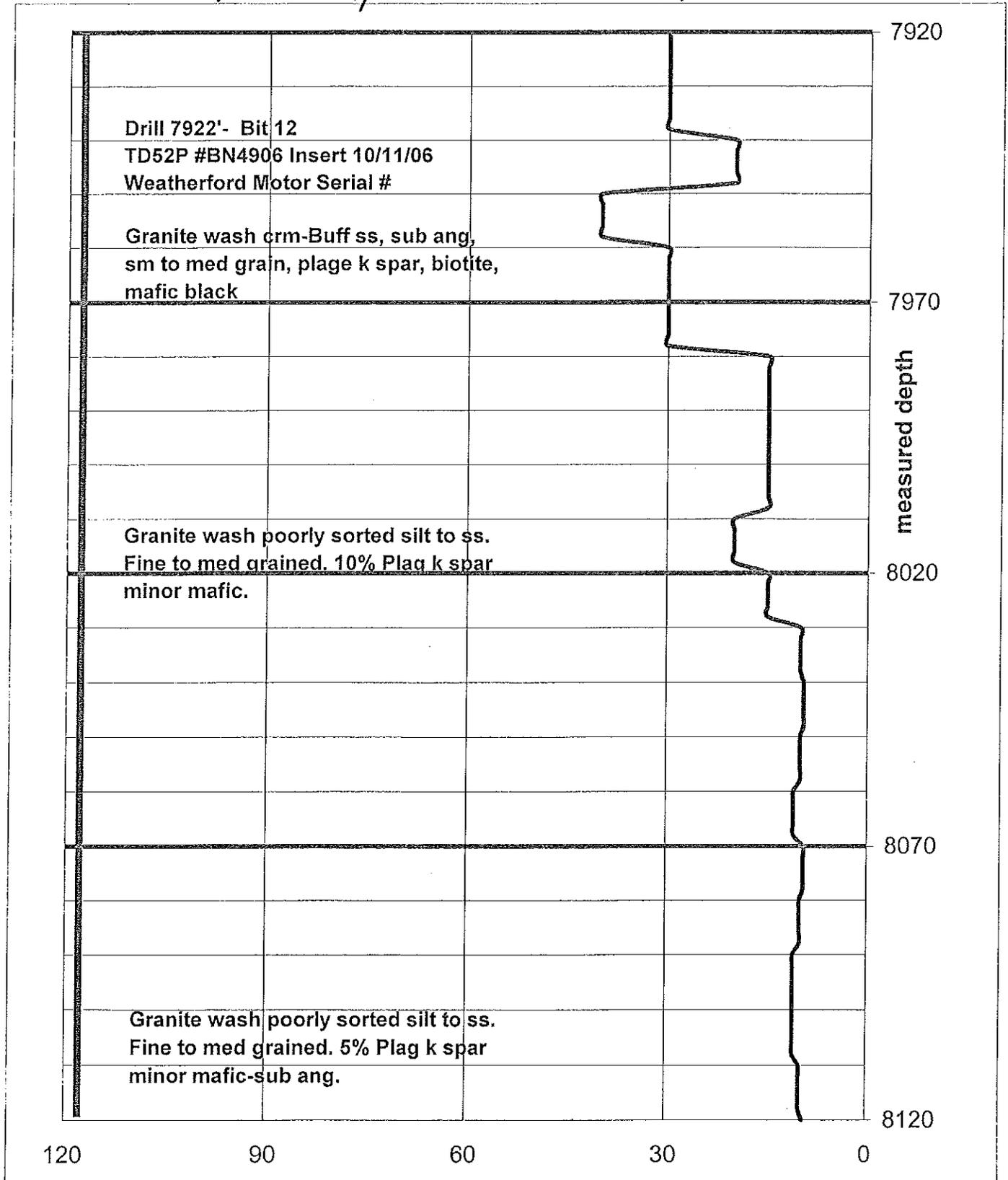






Jump to 7920 ft

Pick up from 2800 ft



Drill 7922'- Bit 12  
TD52P #BN4906 Insert 10/11/06  
Weatherford Motor Serial #

Granite wash poorly sorted silt to ss.  
Fine to med grained. 5-10% Plag k  
spar minor mafic-sub ang.

AA minerals. Granite wash poorly  
sorted silt to ss. Fine to med grained.  
5-10% Plag k spar minor mafic-sub  
ang to sub rounded. Biotite flakes  
present.

8120

8170

8220

8270

8320

measured depth

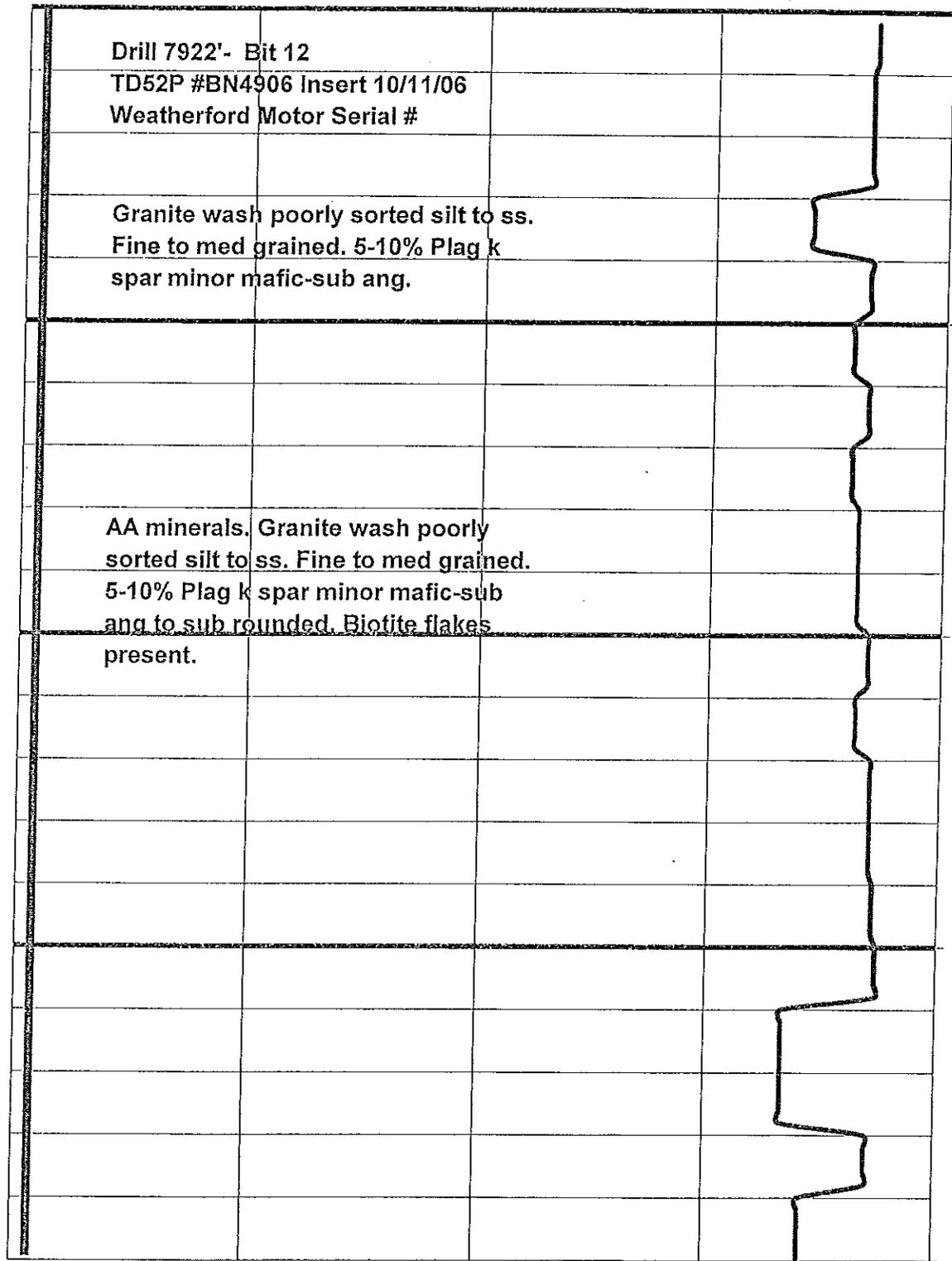
120

90

60

30

0



AA minerals. Granite wash poorly sorted silt to ss. Fine to med grained. 5-10% Plag k spar minor mafic-sub ang to sub rounded. Biotite flakes present.

8320

8370

8420

8470

8520

measured depth

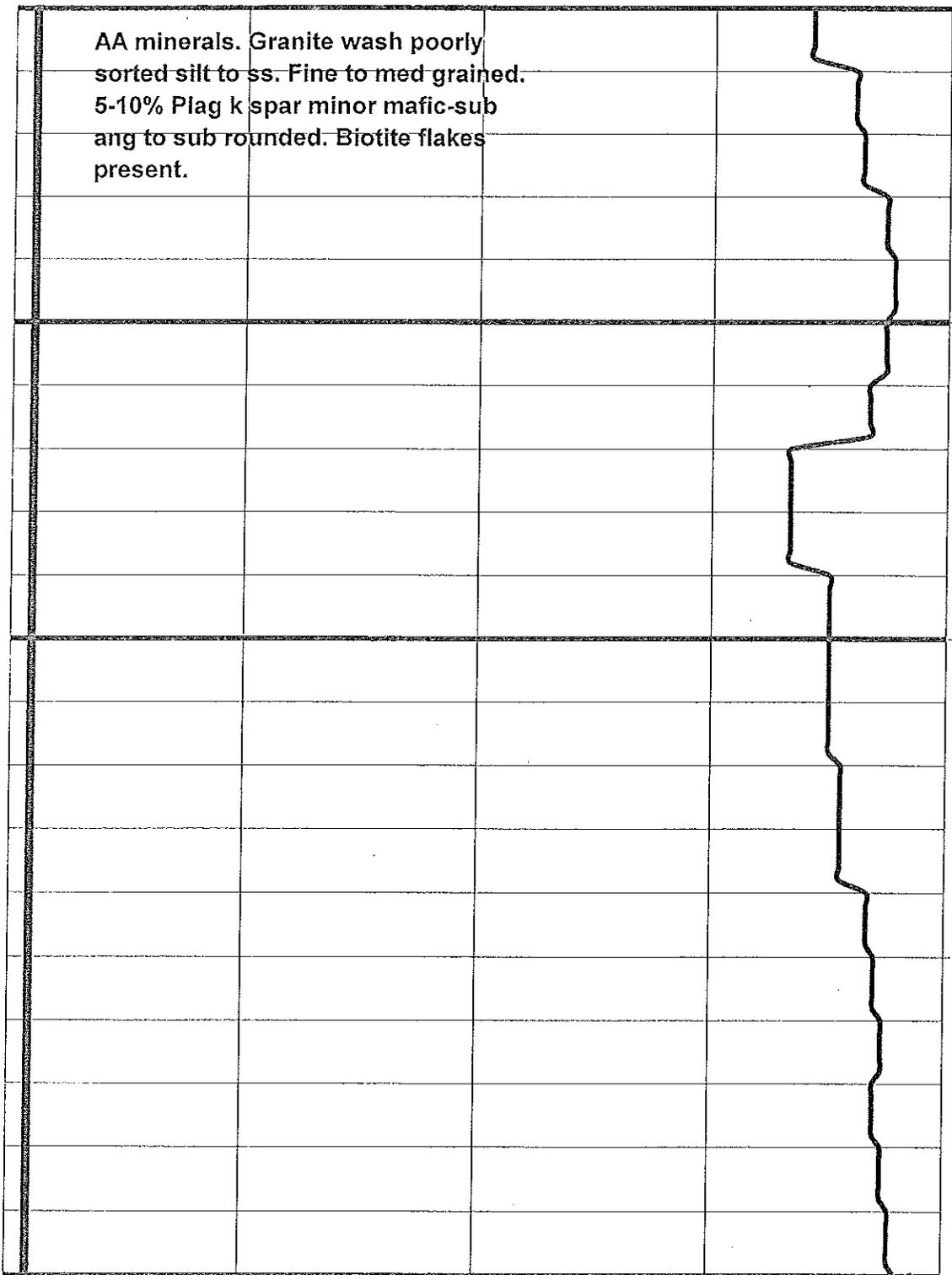
120

90

60

30

0



AA minerals. Granite wash poorly sorted silt to ss. Fine to med grained. 5-10% Plag k spar minor mafic-sub ang to sub rounded. Biotite flakes present.

8520

8570

8620

8670

8720

measured depth

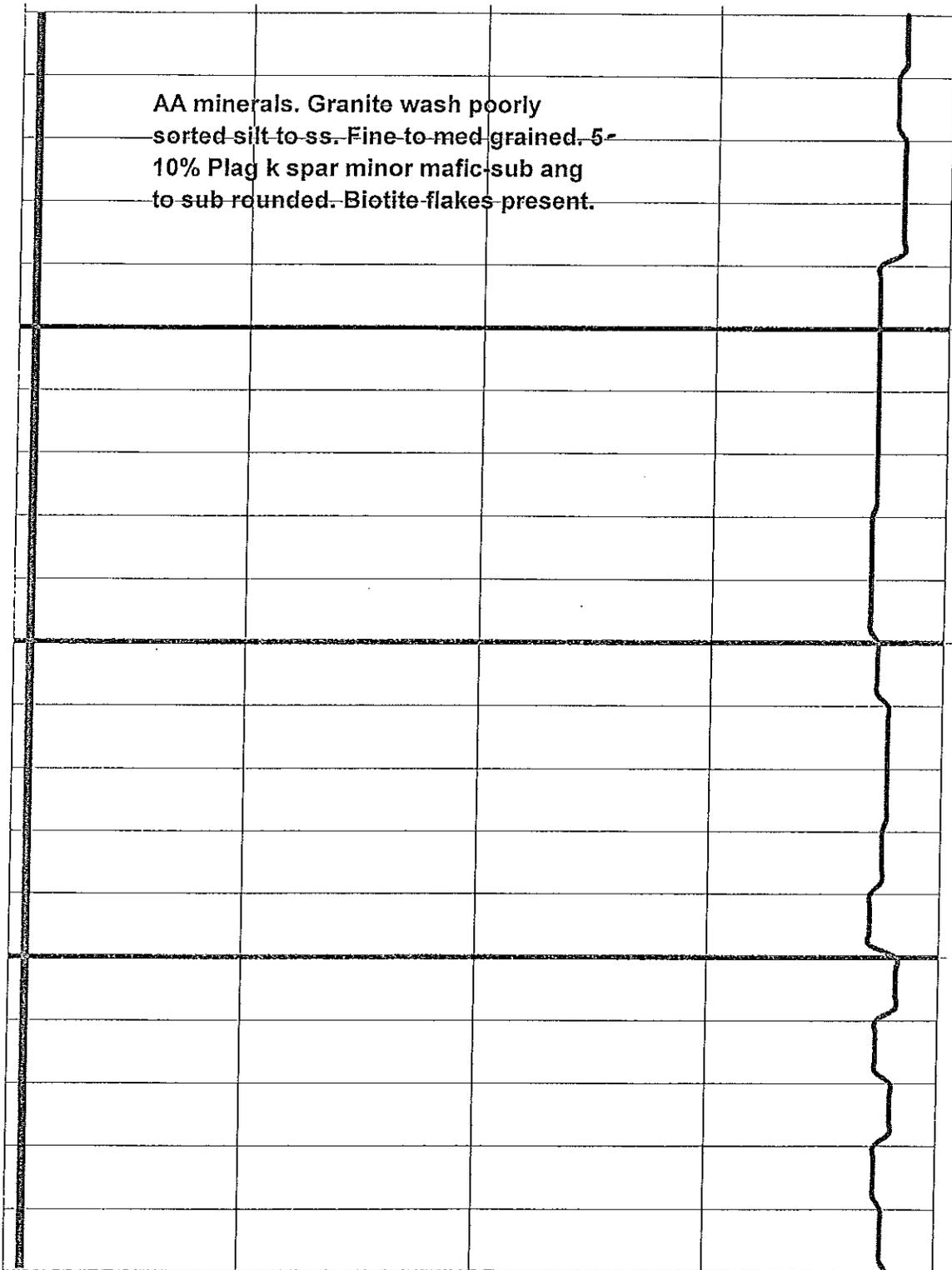
120

90

60

30

0



AA minerals. Granite wash poorly sorted silt to ss. Fine to med grained. 5-10% Plag k spar minor mafic-sub ang to sub rounded. Biotite flakes present.

8720

8770

8820

8870

8920

measured depth

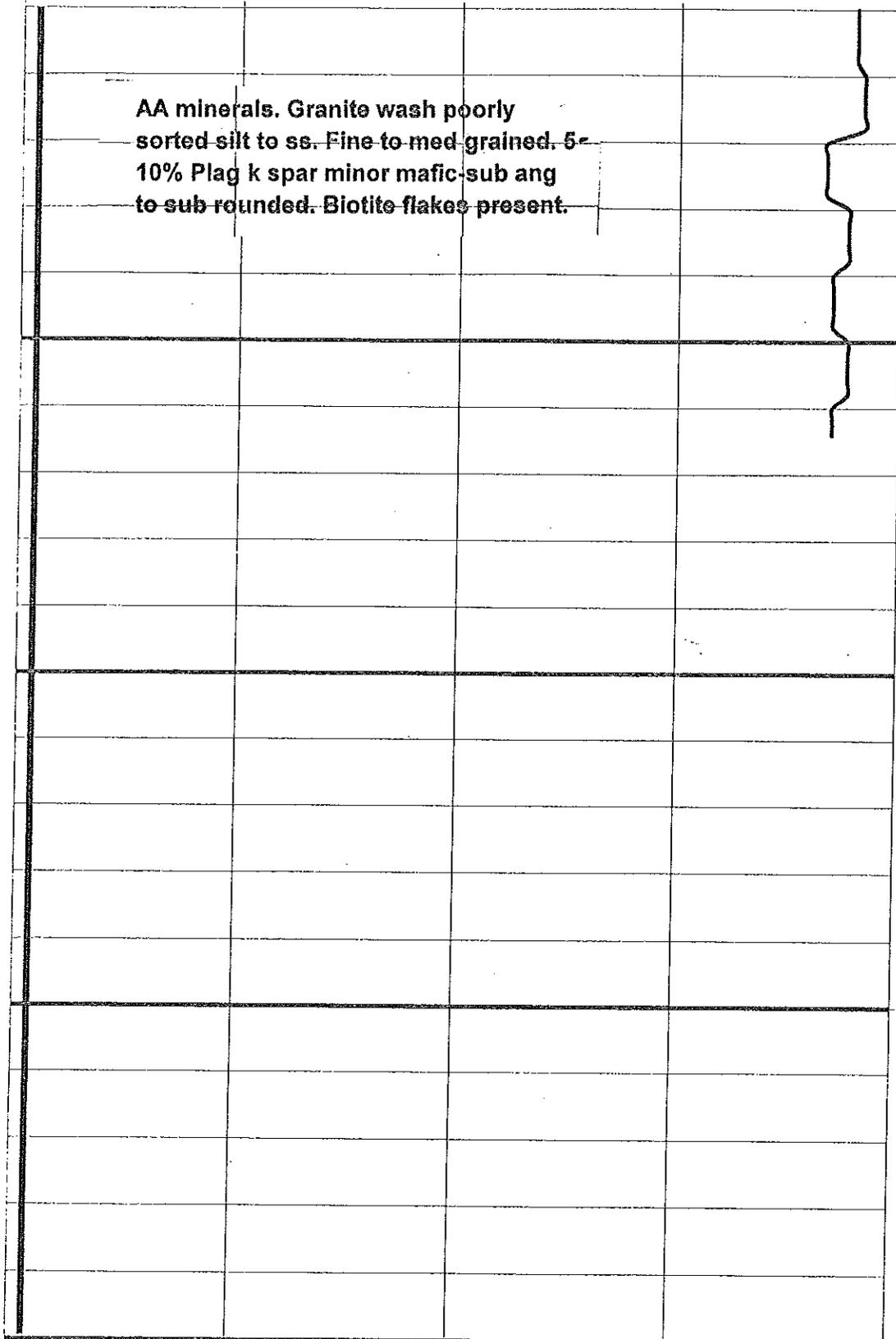
120

90

60

30

0

















**SUNDRY NOTICES AND REPORTS ON WELLS**

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 2. OIL WELL  GAS WELL  OTHER  (Specify) Stratigraphic Test  
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 5. Field or Pool Name NA

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

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	DIRECTIONAL DRILL	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	PERFORATE CASING	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	CHANGE PLANS	<input checked="" type="checkbox"/>
(OTHER)	<input type="checkbox"/>		<input type="checkbox"/>

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	<input type="checkbox"/>	WEEKLY PROGRESS	<input type="checkbox"/>
FRACTURE TREATMENT	<input type="checkbox"/>	REPAIRING WELL	<input type="checkbox"/>
SHOOTING OR ACIDIZING	<input type="checkbox"/>	ALTER CASING	<input type="checkbox"/>
(OTHER)	<input type="checkbox"/>	ABANDONMENT	<input type="checkbox"/>

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*Change Total Depth to 9,000'*

8. I hereby certify that the foregoing is true and correct.

Signed Doug Suttner Title Manager Date 10-11-2006

Permit No. 933

<p><b>STATE OF ARIZONA</b>  <b>OIL &amp; GAS CONSERVATION COMMISSION</b>                  Sundry Notice and Reports On Wells                  File One Copy</p>
Form No. 25



























# ***El Paso Natural Gas***

## **Arizona Gas Storage**

**#1 - 21**

**API Well No.:**

**Sec 21 / Twp 07 S / Rng 08 E**

**9/27/2006**

**Pinal  
County**

**9 5/8" 2 Stage Int.**

**Customer Representative:**

**Mike Haynes / Greg Gettman**

**Halliburton Operator:**

**Steve Stromberg**

**Ticket No.:**

**4629103**

# **Halliburton**

## Cement & Equipment Summary

**Job Type**

**9 5/8" 2 Stage Int.**

				<i>Measured</i>	
<i>Casing</i>	<i>Size</i>	<i>Weight</i>	<i>Grade</i>	<i>Depth</i>	Total Casing
<i>Surface</i>	13 3/8	54.5	J-55	1,604	
<i>Intermediate</i>	9 5/8	40	J-55	5,648	
<i>Production</i>	9 5/8	36	J-55	808	
<i>Tubing</i>					
<i>Drill Pipe</i>					
<i>Open Hole</i>	12 1/4			5,650	

## Cement Data

**Spacer** 50 Bbls KCI w/ LGC-36/ 20 H2O

**Cement 1** 50/50/G/Poz **120 Sacks**

**Additives** 1% Gel, 5# Gilsonite, 1/4# Flocele, .6% Halad 9, 15% Salt (BWOW)

Weight (lb/gal) 13.10

Yield (cuft/sk) 1.55

Water (gal/sk) 6.51

**Cement 2** HLC **1,255 Sacks**

**Additives** 6% Gel, 15% Salt, 10# Gilsonite, 1/4# Flocele

Weight (lb/gal) 12.30

Yield (cuft/sk) 2.32

Water (gal/sk) 11.56

**Cement 3** 50/50/G/Poz **200 Sacks**

**Additives** 1% Gel, 5# Gilsonite, 1/4# Flocele, .6% Halad 9, 15% Salt (BWOW)

Weight (lb/gal) 13.10

Yield (cuft/sk) 1.55

Water (gal/sk) 6.51

**Displacement** H2O 8.33 lb/gal 427 Bbls

## Cement Equipment

<b>Provider</b>	HES				
<b>Guide Shoe</b>		ea.	<b>Centralizers</b>	9 5/8 x 12 1/4	25 ea.
<b>Float Shoe</b>	1	ea.	<b>Plug Type</b>	9 5/8	1 ea.
<b>Float Collar</b>	1	ea.	<b>Packer</b>		ft.
<b>DV Tool</b>	5432'	ft.	<b>Retainer</b>		ft.

# Halliburton

## JOB SUMMARY

4629103 TICKET DATE  
September 27, 2006

NORTH AMERICA <small>NEBU ID / EMPL #</small> <b>217406</b>		ROCKY MOUNTAIN <small>HE'S EMPLOYEE NAME</small> <b>Steve Stromberg</b>		Arizona		Pinal	
FARMINGTON, NM <small>LOCATION</small>		El Paso Natural Gas <small>COMPANY</small>		ZONAL ISOLATION <small>PEL DEPARTMENT</small>			
Eloy, Arizona <small>WELL LOCATION</small>		ZONAL ISOLATION 10003 <small>DEPARTMENT</small>		Mike Haynes / Greg Gettman <small>CUSTOMER REP / PHONE</small>			
Arizona Gas Storage <small>LEASE NAME</small>		#1 - 21 <small>Well No.</small>		Sec 21 / Twp 07 S / Rng 08 E <small>SEC / TWP / RNG</small>		9 5/8" 2 Stage Int. <small>JOB TYPE</small>	

Steve Stromberg 217406	Harry Shoats 329013	24.0	Steve Huber 223473	24.0	David Core 335668	24.0
	Tate Hill 342673	24.0	John Ace 308040	24.0		
10829446	1050	10823383	1050	10195436/ 10025081	1050	10724579/ 10025039
		10759930	1050	10192900/ 10025061	1050	

Form. Name \_\_\_\_\_ Type: \_\_\_\_\_  
 Form. Thickness \_\_\_\_\_ From \_\_\_\_\_  
 Packer Type \_\_\_\_\_ Set At \_\_\_\_\_  
 Bottom Hole Temp. \_\_\_\_\_ Pressure \_\_\_\_\_  
 Retainer Depth \_\_\_\_\_ Total Depth \_\_\_\_\_

Date	Called Out	On Location	Job Started	Job Completed
	9/25/06	9/26/06	9/27/06	9/27/06
Time	17:00	13:30	01:42	13:37

Tools and Accessories			
Type and Size	Qty	Make	
Float Collar 9 5/8	1	Super Seal II	
Float Shoe 9 5/8	1	Super Seal II	
Centralizers			
Plug 9 5/8	1	2 Stage Set	
Limit Clamp			
Stage Tool 9 5/8	1	Type P	
Insert Float			
Guide Shoe			
Weld-A 9 5/8	4	Howco	

Well Data							
Casing	New/Used	Weight	Size	Grade	From	To	Total Casing
Surface	New	54.5		J-55		1,604	
Intermediate	New	40.0	9 5/8	J-55	808.22	5,648	
Intermediate	New	36.0	9 5/8	J-55	0	808	
Drill Pipe							
Tubing							
					Open Hole	12 1/4	5,650

Materials			
Mud Type	Salt Mud	Density	Lb/Gal
Disp. Fluid	H2O	8.33	Lb/Gal
Prop. Type	Size	Lb	
Acid Type	Gal.	%	
Surfactant	Gal.	In	
NE Agent	Gal.	In	
Fluid Loss	Gal/Lb	In	
Gelling Agent	Gal/Lb	In	
Breaker	Gal/Lb		
Blocking Agent	Gal/Lb		
Perfpac Balls	Qty.		
Other			
KCL substitute			
Other			
Other			

Perforations		Holes	
Perforations			
Perforations			

Hours On Location		Operating Hours		Discription Of Job
Date	Hours	Date	Hours	
9/26/06	9.50	9/26/06	1.50	PLEASE SEE JOB LOG
9/27/06	14.00	9/27/06	6.20	
Total 23.50		Total 7.70		

Ordered	Hydraulic Horsepower Avail.
Treating	Average Rates in BPM Disp. Overall
Feet 41.50	Cement Left in Pipe Reason
	Customer Request

Cement Data									
Stage	Sacks	Cement	Bulk/Sks	Additives	W/Rq.	Yield	Lbs/Gal	Bbls	
1	120	50/50/G/Poz	BULK	1% Gel, 5# Gilsonite, 1/4# Flocele, .6% Halad 9, 15% Salt (BWOW)	6.51	1.55	13.1	33	
2	1255	HLC	BULK	6% Gel, 15% Salt, 10# Gilsonite, 1/4# Flocele	11.56	2.32	12.3	519	
2	200	50/50/G/Poz	BULK	1% Gel, 5# Gilsonite, 1/4# Flocele, .6% Halad 9, 15% Salt (BWOW)	6.51	1.55	13.1	55	
			BULK						
			BULK						

Summary									
Circulating Breakdown	RIG	Displacement	HES PUMP	Fluid Ahead	Gal - bbl	50	Type:	KCl w/ LGC-36/ 20 H2O	
Lost Returns	NO	Maximum		Calc.Return/Pit Bbl			Calc.Disp Bbl	427	
Cmt Rtrn#Bbl	NO	Actual TOC	SURFACE	Calc Return/Pit Sks			Actual Disp.	427	
Cmt Rtrn#Sks		Calc. Tot	SURFACE	Cmnt Slurry bbls			607		
Average Rate		Frac. Gradient	N/A	Total Volume bbls			1526		
		Shut In Psi							

THE INFORMATION STATED HEREIN IS CORRECT  
 CUSTOMER REPRESENTATIVE

# Halliburton

## JOB LOG

TICKET #

4629103

TICKET DATE

9/27/2006

REGION

NORTH AMERICA LAND

NWA / COUNTRY

ROCKY MOUNTAIN

BDA / STATE

Arizona

COUNTY

Pinal

MBUID / ENPL #

217406

HES EMPLOYEE NAME

Steve Stromberg

PSL DEPARTMENT

ZONAL ISOLATION

LOCATION

FARMINGTON, NM

COMPANY

El Paso Natural Gas

CUSTOMER REP / PHONE

Mike Haynes / Greg Gettman

TICKET AMOUNT

WELL TYPE

02 GAS

API/WVI #

WELL LOCATION

Eloy, Arizona

DEPARTMENT

ZONAL ISOLATION 10003

JOB PURPOSE CODE

Description

9 5/8" 2 Stage Int.

LEASE / WELL #

Arizona Gas Storage

Well No.

#1 - 21

SEC /

Sec 21 / Twp 07 S / Rng 08 E

RNG

Chart

Time

Rate

Volume

Pmps

Press.(PSI)

Job Description / Remarks

No.

(BPM)

(BBL)(GAL)

T C

Tbg Csg

25-Sep

16:30

Arrive on location w/ D.V. Tool and Plug Set.

Rig making wiper trip. Waiting.....

9/26/2006

08:40

Start Casing in the hole.

10:25

Make up D.V. Tool in casing string.

11:00

Circulate casing at Jt. # 6.

14:30

HES crew on Location.

14:35

Waiting on rig crew to finish running casing.

16:30

Hold Safety meeting, rig up HES as far as possible.

17:15

Wait on rig crew to finish running pipe.

21:55

Casing Landed. Swap out well head equipment. Set Slips.

22:15

Attempt to circulate w/ rig pump.

23:10

310

310 BBls away. No Circulation.

23:16

6

98

50

Attempt to break circulation w/ HES pump. Unsuccessful.

9/27/2006

00:50

20

210

Circulation established w/ rig pump. Turn over to HES.

00:55

6

190

Circulate w/ HES pump.

01:26

160

Shut down Circulation. Prepare for first stage.

01:43

Pressure test Pump/ Lines to 2000 psi. Test Good.

01:46

2

22.09

Start preflush down casing.

01:54

5.9

40

234.5

Start cement down casing @ 13.1#/ gal.

02:04

33

Shut down cement, release Bottom Shut Off Plug.

02:11

5.9

-6.5

Start H2O Displacement down casing.

02:17

5.9

20

260.3

Switch to Well fluid. (11.1#/Gal).

03:59

3

420

191

Slow Rate, Prepare to bump Plug.

04:01

426.1

580

Plug bumped @ 188 psi, Pressure up to 580 PSI.

04:02

Wait 1 min, test Floats. Test Good.

04:04

Drop Opening Plug. Waiting.... Wash up Pump to the Pit.

04:51

2.5

-4

Pressure up casing to Open DV Tool.

04:52

6

0.2

210

Tool opened @ 563 psi, Circulate 40 Bbbs w/ HES pump.

05:00

40

Shut down. Turn Well over to the rig for 4 Hrs.

05:10

Prepare for second stage.

10:15

Returned 5 BBls cement to surface from first stage.

10:39

5.2

-1.9

Hold PJSM w/ Co. Reps., Rig Crew.

10:51

5.8

40

48.9

Start Preflush down casing.

12:02

4.5

516.3

68.8

Start Lead cement down casing @ 12.3#/ gal.

12:14

55

-35.8

Switch to tail cement @ 13.1#/ gal.

12:15

7.5

24.4

Shut down cement, release top closing plug.

12:33

7

125.6

58.06

Start displacement down casing.

13:31

416

2402

Displacement reached cement, continue w/ Displacement.

13:32

Plug Bumped @ 1230 psi, Pressure up to 2402 psi.

13:45

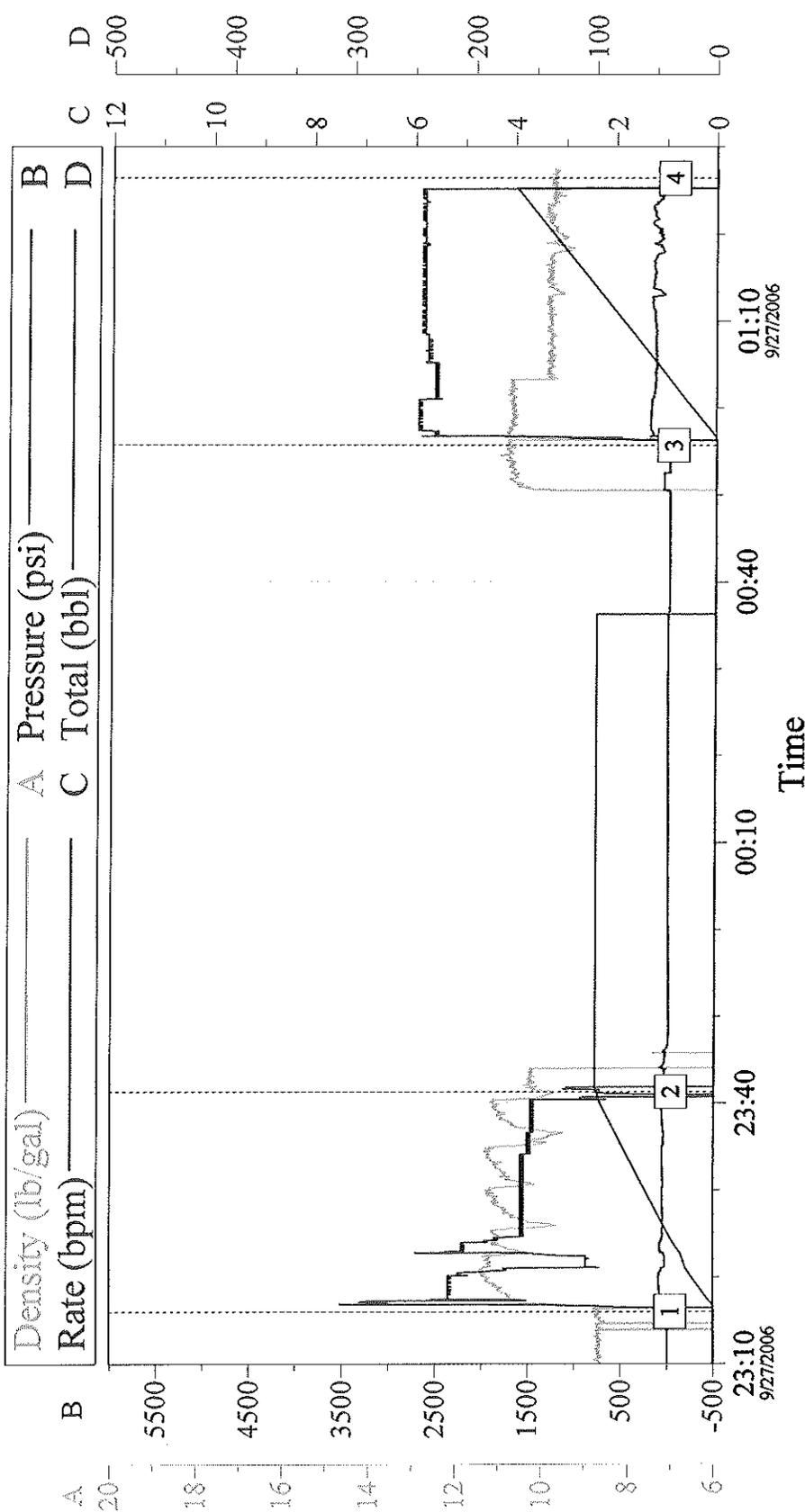
Test Tool. Tool closed.

15:00

Hold Safety meeting, rig down HES.

Hold Post Job Safety meeting.





Density (lb/gal) ——— A Pressure (psi) ——— B  
 Rate (bpm) ——— C Total (bbl) ——— D

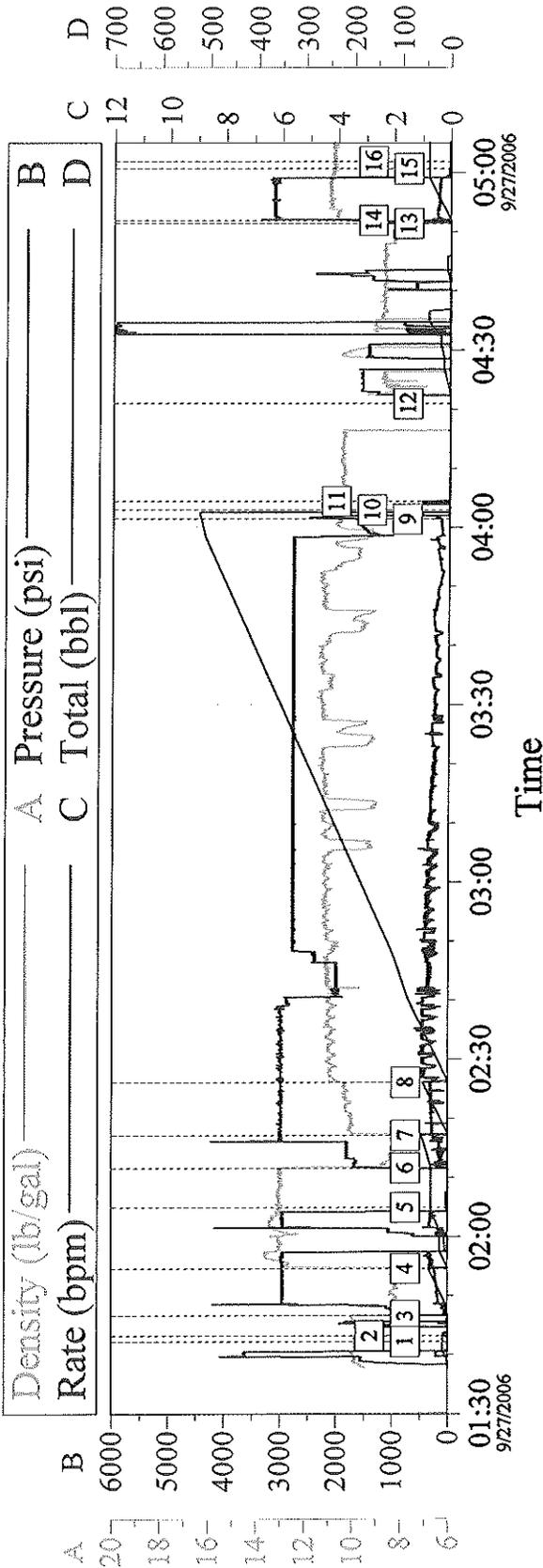
Event Log					
Intersection	PP	Intersection	PP		
1 Start Job	9/27/2006 23:16:02	-4.685	2 Circulate Well	9/27/2006 23:41:18	44.47
3 Circulate Well	9/27/2006 00:55:42	5.806	4 End Job	9/27/2006 01:26:25	76.45

Customer: El Paso Nat. Gas      Job Date: 9/26-27/06      Ticket #: 4629103  
 Well Desc: AGS #1-21      Job Type: 9 5/8" 2 Stage      Stromberg Shoats

# El Paso Natural Gas

## 9 5/8" 2 Stage Intermediate

First Stage



### Event Log

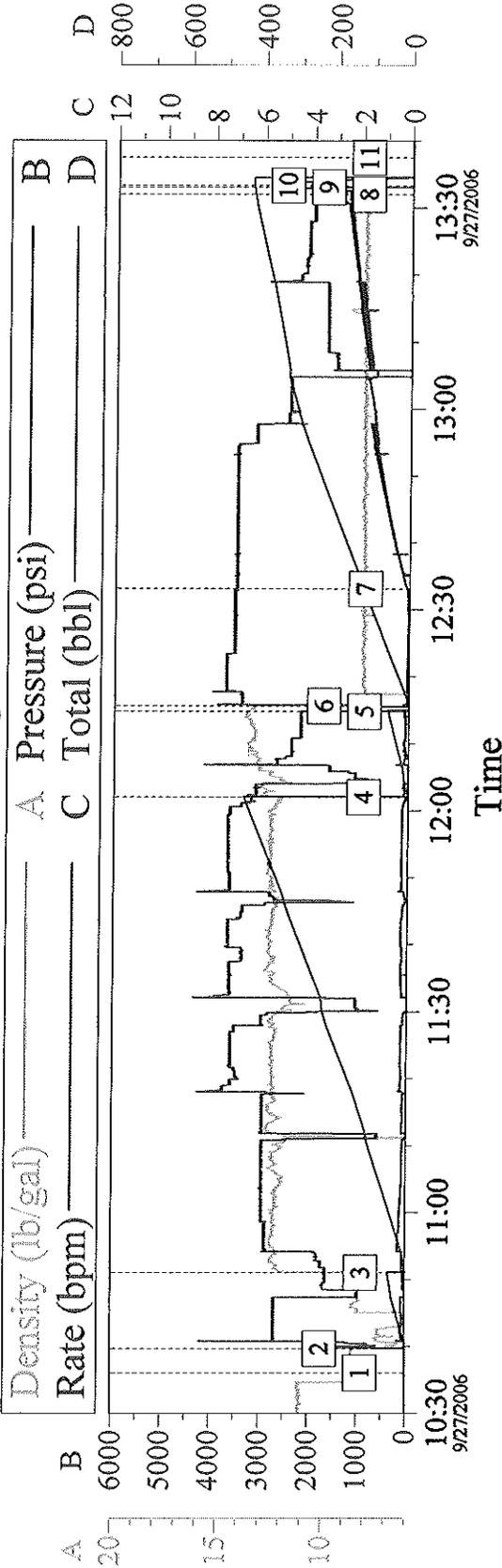
Intersection	PP	Intersection	PP	Intersection	PP
1 Start Job	01:42:12 -68.71	2 Test Lines	01:43:13 64.18	3 Pump Spacer 1	01:46:36 22.09
4 Pump Cement	01:54:35 234.4	5 Drop Shut Off Plug	02:04:57 29.03	6 Pump Displacement	02:11:37 -6.251
7 Pump Well Fluid	02:17:09 260.3	8 Unipro Event	02:26:05 266.9	9 Bump Plug	04:01:26 188.7
10 Test Floats	04:02:56 506.9	11 Drop Opening Plug	04:04:26 16.03	12 Wash Up Pump Truck	04:20:59 -17.42
13 Open MSC	04:51:23 -4.670	14 Circulate Well	04:51:54 66.80	15 Switch To Rig Pump	05:00:41 31.38
16 End Job	05:01:53 30.97				

Customer: El Paso	Job Date: 9/27/06	Ticket #: 4629103
Well Desc: AGS #1-21	Job Type: 9 5/8" 2 Stage	Stromberg Shoats

# El Paso Natural Gas

## 9 5/8" 2 Stage Intermediate

Second Stage



Event Log	
Intersection	PP
1 Start Job	10:36:02 -12.05
3 Pump Lead Cement	10:51:01 48.98
5 Drop Closing Plug	12:14:50 -35.85
7 Disp. Reached Cement	12:33:05 58.06
9 Close MSC	13:33:02 2408
11 End Job	13:37:31 -39.67
Intersection	Intersection
2 Pump Spacer 1	10:39:39 -1.935
4 Pump Tail Cement	12:02:02 68.84
6 Pump Displacement	12:15:39 24.44
8 Bump Plug	13:31:59 1276
10 Test DV Tool	13:33:18 2425

Customer: El Paso Nat. Gas	Job Date: 9/27/06	Ticket #: 4629301
Well Desc: AGS #1-21	Job Type: 9 5/8" 2 Stage Int.	Stromberg Shoats/Hill

# Cementing Calculations for Multistage Longstrings

NOTE: Only Green Highlighted Number Need Be Inputed

Customer: El Paso Natural Gas  
 Well Name: Arizona Gas Storage  
 Lease: #1 - 21  
 County: Pinal  
 SO #: 4829103  
 Cementer: Steve Stromberg

## Well Information

Hole Size	12 1/4	in
TD	5650	ft
Casing Length	5648	ft
Casing Size	9.625	in
Casing Weight	40	lbs/ft
1st Stage DV Tool	5432	ft
2nd Stage DV Tool	0	ft
Float Collar	5605	ft
Shoe Joint	40	ft
Wellbore Fluid	11	lbs/gal
Displacement Fluid	11	lbs/gal
Spacer Fluid	10.3	lbs/gal
Amount	60	bbls

### Reelbook Information

	gal/lin.ft	lin.ft/gal	bbls/lin.ft	lin.ft/bbl	cuft/lin.ft	lin.ft/cuft
Annulus	2.3428	0.4268	0.0558	17.9272	0.3132	3.193
Casing	3.1847	0.314	0.0758	13.19	0.4257	2.349

Mix H2O: 395.02 bbls  
 Plg Disp.: 839.00 bbls  
 Total H2O: 1234.02 bbls

## Cement Slurry and Job Information

First Stage Lead	20	# sks	BBLs Slurry	5.52		
Density	13.1	lbs/gal			Ht. of Cmt	72.82
Yield	1.55	cuft/sk	BBLs Water	3.10	TOC	5213.06 ft
Water Requirements	6.51	gal/sk	BBLs Spacer	60.00		ft
Excess	1	bbls			PSI TLP	13.99
First Stage Tail	100	# sks	BBLs Slurry	27.61		Plug Displacement
Density	13.1	lbs/gal			SH Slry	0.00
Yield	1.55	cuft/sk	BBLs Water	15.50	Ht of Cmt	364.12
Water Requirements	6.51	gal/sk	BBLs Spacer	0.00	TOC	5285.88 ft
Excess	10	bbls				ft

Second Stage Lead	1255	# sks	BBLs Slurry	518.56		
Density	12.3	lbs/gal			Ht. of Cmt	6839.75
Yield	2.32	cuft/sk	BBLs Water	345.42	TOC	0.00 ft
Water Requirements	11.56	gal/sk	BBLs Spacer	60.00		ft
Excess	40	bbls			PSI TLP	1763.03
Second Stage Tail	200	# sks	BBLs Slurry	55.21		Plug Displacement
Density	13.1	lbs/gal			Ht. of Cmt	728.23
Yield	1.55	cuft/sk	BBLs Water	31.00	TOC	4703.77 ft
Water Requirements	6.51	gal/sk				ft
Excess	12	bbls				

Third Stage Lead	0	# sks	BBLs Slurry	0.00		
Density	0	lbs/gal			Ht. of Cmt	0.00
Yield	0	cuft/sk	BBLs Water	0.00	TOC	0.00 ft
Water Requirements	0	gal/sk	BBLs Spacer	0.00		ft
Excess	0	bbls			PSI TLP	0.00
Third Stage Tail	0	# sks	BBLs Slurry	0.00		Plug Displacement
Density	0	lbs/gal			Ht. of Cmt	0.00
Yield	0	cuft/sk	BBLs Water	0.00	TOC	0.00 ft
Water Requirements	0	gal/sk	BBLs Spacer	0.00		ft
Excess	0	bbls				

Height of Wellbore Fluid in Annulus

Hydrostatic Values, psi

			lead	tail
1st Stage	4421.66 ft	335.16 bbls	49.59	217.30
2nd Stage	0.00 ft	0.00 bbls	4373.11	495.89
3rd Stage	0.00 ft	0.00 bbls	0.00	0.00
Amount of Spacer in Annulus			spacer	wb fluid
1st Stage	791.40 ft	59.99 bbls	423.72	2528.27
2nd Stage	0.00 ft	0.00 bbls	0.00	0.00
3rd Stage	0.00 ft	0.00 bbls	0.00	0.00

TOC 2nd Stg. 0.00  
TOC Lead 0.00

0 ft.

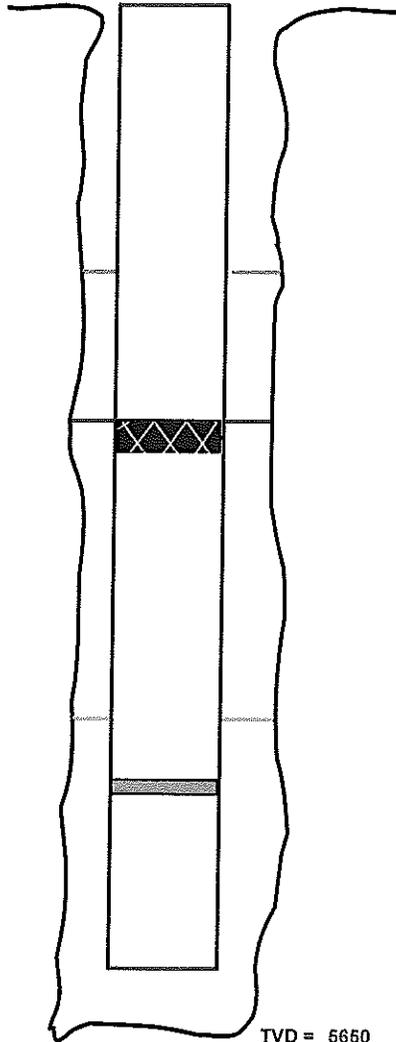
TOC Tail 4704

Stg. Tool @ 5432.0  
TOC 1st Stg 5432.0  
TOC Lead 5213.1

TOC Tail 5285.9

Flt. Collar @ 5605

Casing @ 5648



Casing size 9.625  
Hole size 12.25

TVD = 5650















933

Date: 9-21-06	Report No: 63	Reported by: Curtis Bagwell/Mike Haynes
Operator: El Paso Natural Gas Company	Well Name: Arizona Gas Storage # 1-21	
Contractor: United Drilling	Rig No: 22	County: Pinal State: Arizona
Depth: 5195'	Ft. Cut: 110'	Formation: Tops New Form:

Activity at Report Time -- Drilling (rotating)

Time Log		Elapsed	Details of Operation
From	To	Time	
0600			Waited on crossover sub.
	1100	5hrs	Serviced rig while waiting.
1100			Made up crossover sub. Finished in with BHA. Installed MWD tools.
	1300	2hrs	Broke circulation. Tested MWD tools. Adjusted tool face
1300	1700	4hrs	TIH.
1700	1800	1hr	Broke circulation and took survey.
1800	0600	12hrs	Slide and rotate drill 5085' to 5195'.

Survey

MD	Inc.	AZI.	TVD	N.	E	V.Sec.	D.leg	Build	Turn
4958	6.10	346.00	4956.18	29.67	5.44	29.67	0.71	-0.63	-3.12
4989	5.60	347.40	4987.02	32.75	-6.16	32.75	1.68	-1.61	4.52
5012	5.20	348.90	5018.88	35.69	-6.78	35.69	1.33	-1.25	4.69
5021	5.20	348.90	5018.88	35.69	-6.78	35.69	1.33	-1.25	4.69
5052	4.90	346.70	5049.76	38.36	-7.36	38.36	1.15	-0.97	-7.10

Bottom Hole Closure 39.06ft Along Azimuth 349.14

Total 24

Pump Record		Hour Record		Bits		Mud		Drilling Assembly			Deviation	
Pump	No. 1	No. 2	Hrs Trip	Bit #	9	Wt	10.8	No	Description	Length	Depth	Dev.
Lin & St.	6X16	6X16	Hrs Drlg	Size	12 1/4"	Vis	35	1	12 1/4 Bit	1.0		
SPM	60		Hrs Misc	Mfg	Dowdco	WL	22	1	motor	26.58		
GPM	402		Hrs DW	Type	PDC	Gels	3-4	1	Float sub	3.90		
Press	1200		Hrs Drlg	Out		Oil		1	UBHO SUB	2.42		
				In	5013	Solid	19.25	1	NMDC	30.34		
				Ftg	44	PH	8.5	1	Shock sub	9.31		
				Bit Wt	5-8K			1	X-over sub	1.00		
				Ser/no.	D20958			18	6" DC's	520.02		
								1	Drill jar	32.30		
								2	6" DC's	57.78		



















933

Date 912-06	Report No 54	Reported by: Curtis Bagwell	
Operator: El Paso Natural Gas Company		Well Name Arizona Gas Storage # 1-21	
Contractor: United Drilling		Rig No: 22	County: Pinal State: Arizona
Depth 4857	Ft.Cut 92	Formation	Tops New Form:

Activity at Report Time : Drilling (Slide drill building curve for kick off)

Time Log		Elapsed	Details of Operation				
From	To	Time					
06:00	16:00	10.0	Drill / slide drill and rotate drill from 4765' to 4788' (slide drill no rotation of rotary table drill with Motor only to rotate bit)				
16:00	18:00	2.0	Drill Slide drill from 4788' to 4803'				
18:00	06:00	12.0	Drill slide and rotate drill from 4803' to 4857'				
			<b>Note: Inc. 4706 ft. 6.8 degree / 4738 ft. 6.9 degree / 4769 ft. 6.9 degree / 4801 ft. 7.3 degree</b>				
			<b>Azimuth</b>	<b>351.00</b>	<b>350.3</b>	<b>350.10</b>	<b>348.60</b>
			<b>Dog leg</b>	<b>00.0</b>	<b>0.41</b>	<b>0.08</b>	<b>1.38</b>
			<b>Bit # 7 has 32.5 hrs. / 101 ft.</b>				
<b>Total</b>		<b>24</b>					

Pump Record			Hour Record		Bits		Mud		Drilling Assembly			Deviation	
Pump	No. 1	No. 2	Hrs Trip		Bit #	7	Wt	10.8	No	Description	Length	Depth	Dev.
Lin & St.	6X16	6X16	Hrs Drlg		Size	12 1/4"	Vis	37	1	12 1/4 Bit	1.0	4706	6.8
SPM	60		Hrs Misc		Mfg	Reed	WL	19.6	1	motor	28.57	4738	6.9
GPM	423		Hrs DW		Type	Insert	Gels	2/3	1	Float sub	3.78	4769	6.9
Press	1200		Hrs Drlg		Out		Oil		1	UBHO SUB	2.42	4801	7.3
					In	4756	Solid	17.75	1	NMDC	30.34		
					Ftg	101	PH	9.0	1	Shock sub	9.31		
					Bit Wt				1	X-over sub	1.00		
					Ser/no.	PP332			18	6" DC's	596.44		
									1	Drill jar	32.30		
									2	6" DC's	57.78		
<b>Total</b>											<b>686.52</b>		

























**SUNDRY NOTICES AND REPORTS ON WELLS**

1. Name of Operator El Paso Natural Gas Company  
 2. OIL WELL  GAS WELL  OTHER  (Specify) Stratigraphic Test  
 3. Well Name AGS #1-21  
 Location 1,980' FNL, 660' FWL  
 Sec. 21 Twp. 7S Rge. 8E County Pinal, Arizona  
 4. Federal, State, or Indian Lease Number, or lessor's name if fee lease Owned by El Paso Natural Gas  
 5. Field or Pool Name NA

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

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF  PULL OR ALTER CASING   
 FRACTURE TREAT  DIRECTIONAL DRILL   
 SHOOT OR ACIDIZE  PERFORATE CASING   
 REPAIR WELL  CHANGE PLANS   
 (OTHER) \_\_\_\_\_

SUBSEQUENT REPORT OF:

WATER SHUT-OFF  WEEKLY PROGRESS   
 FRACTURE TREATMENT  REPAIRING WELL   
 SHOOTING OR ACIDIZING  ALTER CASING   
 ABANDONMENT   
 (OTHER) \_\_\_\_\_

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log, Form 4)

1. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.

On August 23<sup>rd</sup> while shut down for rig repairs at a depth of 5,935' we became stuck in the AGS #1-21. All attempts to free the pipe with lubricant, diesel, and the use of hydraulic jars have proved unsuccessful. Consequently, we backed off the drill string at a depth of 5,217' leaving the bit, mud motor, 20 drill collars and two joints of drill pipe in the hole.

In order to remedy the situation and take this well to its objective total depth, El Paso Natural Gas intends to ream the existing 7 7/8" hole to 12 1/4", directionally drill around the fish to the top of the siltstone/sandstone interval we had encountered at a depth of approximately 5,630'. At that point we intend to run 9 5/8" casing and cement to surface using approximately 1255 sacks of cement. Then we plan to switch back to fresh water based drilling fluids and proceed to drill out from casing and take this stratigraphic test to a total depth of approximately 8,000'.

8. I hereby certify that the foregoing is true and correct.

Signed [Signature] Title Manager, EPNG Date 8-30-2006

Permit No. 933

**STATE OF ARIZONA**  
**OIL & GAS CONSERVATION COMMISSION**  
 Sundry Notice and Reports On Wells  
 File One Copy  
 Form No. 25





















































# **EL Paso Natural Gas**

933

## **Ariz Gas Storage #1**

**API Well No.:**

**August 2, 2006  
Pima**

### **13 3/8 Surface**

**Customer Representative:**

Greg Gettman

**Halliburton Operator:**

Bruce Astley

**Ticket No.:**

4542513

# **HALLIBURTON**





## CEMENT JOB SUMMARY SHEET

**Job Type**

13 3/8 Surface

	Size	Weight	Grade	Measure d Depth
<b>Casing</b>				
<b>Surface</b>				
<b>Intermediate</b>				
<b>Production</b>				
<b>Tubing</b>				
<b>Drill Pipe</b>				
<b>Open Hole</b>				

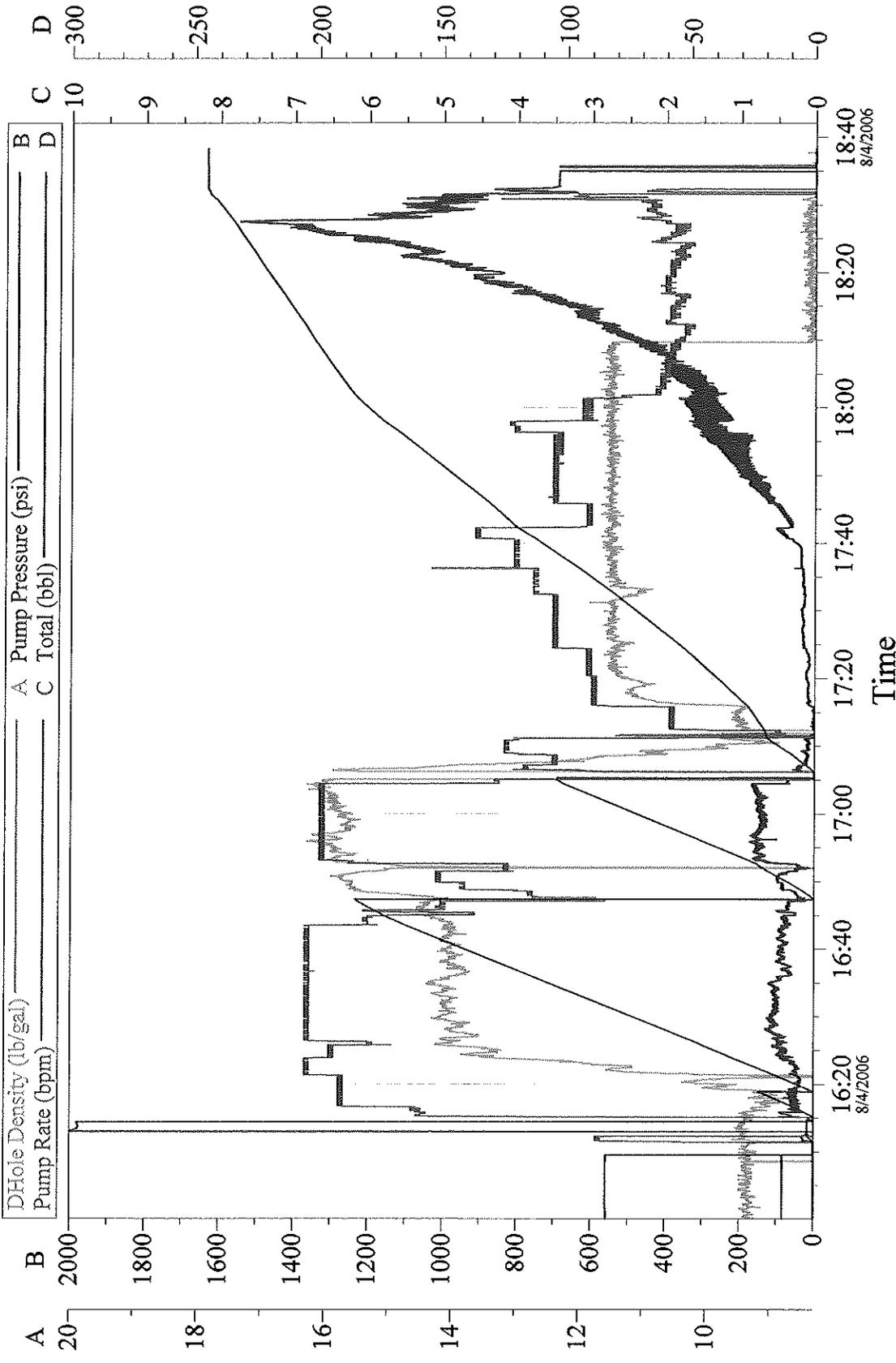
### CEMENT DATA

<b>Spacer</b>	20 Bbls H2O		
<b>Cement 1</b>	San Juan		440 Sacks
<b>Additives</b>			
	Weight (lb/gal) 12.10	Yield (cuft/sk) 2.24	Water (gal/sk) 12.50
<b>Cement 2</b>	G		440 Sacks
<b>Additives</b>			
	Weight (lb/gal) 5.80	Yield (cuft/sk) 1.27	Water (gal/sk) 15.20

<b>Displacement</b>	H2O	240.00	8.33 (lb/gal)
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### CEMENTING EQUIPMENT

<b>Provider</b>			
<b>Guide Shoe</b>	ea.	<b>Centralizers</b>	ea.
<b>Float Shoe</b>	ea.	<b>Plug Type</b>	ea.
<b>Float Collar</b>	ea.	<b>Packer</b>	ft.
<b>DV Tool</b>	ft.	<b>Retainer</b>	ft.



Customer: El Paso Nat Gas  
 Well Desc:  
 Job Date: Aug 4, 2006  
 Job Type: Surface  
 Ticket #: 4542513





























**Subject:** AGS #1-21 Monsoon Update and PBESS Daily Drilling Report

**From:** "Gettman, Greg W" <Greg.Gettman@EIPaso.com>

**Date:** Sat, 29 Jul 2006 11:54:22 -0600

933

7/21/2006 to 7/26/2006

Deliver drill rig and numerous loads of associated drilling equipment (substructure, drill pipe, collars, mud pumps, mud tanks, fork lifts, drilling mud, bits, trailers, etc.) to location.

7/27/2006

Set and level substructure. Reinstall mast on drilling rig and hook up hydraulic hoses and chains. Back unit on ramps to substructure. Had heavy rain during the night.

7/28/2006

Rigging up. Had heavy rain in morning. Shut down due to soft location. Held El Paso Natural Gas Safety Orientation. Got unit on ramps and raised derrick but did not scope out. Unload drill pipe. Finish hooking up hydraulic lines to mast. Place anchors in holes, will need to cement in place. Water rising on rig road due to run-off from surrounding area down the McClellan wash. May block road tonight. Had light rain.

7/29/2006

The runoff from heavy rains in the Picacho Mountains on Thursday July 28<sup>th</sup> made its way down the down local drainages to the McClellan wash and our job site cresting at approximately 2 PM on July 29<sup>th</sup>. The McClellan wash, which is just west of our site, overflowed its banks partially washing out our rig road and overflowed La Palma Road on the opposite bank. The water has receded and the rig road has been repaired to the point to the point we can resume rigging up. Rig up details are included in the attached PBESS Daily Drilling Report.

The magnitude of this Monsoon storm is evidenced by the news report that Union Pacific's rail road tracks were washed out or damaged by high water at 16 locations along the Picacho mountain front. Hopefully, this is the last Monsoon storm of this intensity we see on this job.



# PERMIT TO DRILL

This constitutes the permission and authority from the

OIL AND GAS CONSERVATION COMMISSION,  
STATE OF ARIZONA,

To: EL PASO NATURAL GAS  
(OPERATOR)

to drill a well to be known as

ARIZONA GAS STORAGE #1-21  
(WELL NAME)

located 1980' PNL & 660' FWL

Section 21 Township 7S Range 8E, PINAL County, Arizona.

The N/A of said  
Section, Township and Range is dedicated to this well.

Said well is to be drilled substantially as outlined in the attached Application and must be drilled in full compliance with all applicable laws, statutes, rules and regulations of the State of Arizona.

Issued this 21 day of MARCH, 2006, 19.

OIL AND GAS CONSERVATION COMMISSION

By 56 Rainz

EXECUTIVE DIRECTOR

OIL & GAS PROGRAM ADMINISTRATOR

PERMIT 00933

RECEIPT NO. 3139

A.P.I. NO. 02-021-20009

State of Arizona  
Oil & Gas Conservation Commission  
Permit to Drill

FORM NO. 27

**APPLICATION FOR PERMIT TO DRILL OR RE-ENTER**

AMENDED

APPLICATION TO DRILL

RE-ENTER OLD WELL

NAME OF COMPANY OR OPERATOR

**El Paso Natural Gas Company**

Address

City

State

Phone Number

**2 North Nevada Ave**

**Colorado Springs**

**CO 80903 719.520.4533**

Drilling Contractor

**United Drilling Inc**

Address **P O Box 2488 Roswell, NM 88202**

DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor

**Owned by El Paso Natural Gas**

Well number

**1-21**

Elevation (ground)

**1527'**

Nearest distance from proposed location to property or lease line:

**660' FWL**

feet

Distance from proposed location to nearest drilling, completed or applied-for well on the same lease:

**none**

feet

Number of acres in lease

**234**

Number of wells on lease, including this well, completed in or drilling to this reservoir:

**none**

If lease purchased with one or more wells drilled, from whom purchased.

Name

Address

**N/A**

Well location (give footage from section lines)

**1980' FNL and 660' FWL**

Section - Township - Range or Block and Survey

**21-7S-8E, G. & S. R. B. & M.**

Dedication per A.A.C. R12-7-104(A)(3)

**N/A**

Field and reservoir (if wildcat, so state)

**Stratigraphic Test**

County

**Pinal**

Distance in miles and direction from nearest town or post office

**3 miles north east of Eloy Arizona, 1/8 mile east of incorporated city limit**

Proposed depth:

**8,000'**

Rotary or cable tools

**Rotary**

Approximate date work will start

**April 2006**

Bond status

**filed 03/02/05**

Organization Report

On file

**X**

Or attached

Filing Fee of \$25.00

Attached

**X**

Remarks

**Stratigraphic test per Arizona Administrative Code, Title 12, Chapter R12-7-128 Amended Drilling Procedure is Attached**

**API # 02-021-20009**

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the:

**Manager, Facility Planning**

of the

**El Paso Natural Gas Company**

(company), and that I am authorized by said company to make this report; and that this

report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

*originally approved 3-21-2006*

Signature

*[Signature]*  
**3/6/2006**

Date

Mail completed form to:  
Oil and Gas Program Administrator  
Arizona Geological Survey  
418 W. Congress, #100  
Tucson, AZ 85701-1315

Permit Number:

**933**

Approval Date:

**4-10-2006**

Approved By:

*[Signature]*

NOTICE: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

**STATE OF ARIZONA  
OIL & GAS CONSERVATION COMMISSION**

Application to Drill or Re-enter  
File Two Copies

Form No. 3

1. Operator shall outline on the plat the acreage dedicated to the well in compliance with A.A.C. R12-7-107.
2. A registered surveyor shall show on the plat the location of the well and certify this information in the space provided.
3. ALL DISTANCES SHOWN ON THE PLAT MUST BE FROM THE OUTER BOUNDARIES OF THE SECTION.
4. Is the operator the only owner in the dedicated acreage outlined on the plat below? YES \_\_\_\_\_ NO X
5. If the answer to question four is no, have the interests of all owners been consolidated by communitization agreement or otherwise? YES \_\_\_\_\_ NO X If answer is yes, give type of consolidation \_\_\_\_\_
6. If the answer to question four is no, list all the owners and their respective interests below: Operator (EPNG) is the owner of 100% of the surface acreage. Ownership of a portion of underlying mineral interests is uncertain. EPNG intends to acquire 100% of the underlying mineral interests.

<p>Owner <b>El Paso Natural Gas Company</b></p>	<p>Land Description <b>NW 1/4 + N 1/4 SW 1/4 Sec 21, T7S, R8E</b></p>
<p><b>G.&amp;S.R.B&amp;M Survey Pinal Co. AZ</b></p>	
	<p style="text-align: center;"><b>CERTIFICATION</b></p> <p>I hereby certify that the information above is true and complete to the best of my knowledge and belief.</p> <p style="text-align: center;"><i>Greg Gettman</i></p> <p>Name <b>Greg Gettman</b></p> <p>Position <b>Manager, Facility Planning</b></p> <p>Company <b>El Paso Natural Gas</b></p> <p>Date <b>3/6/2006</b></p> <p>I hereby certify that the well location shown on the plat was plotted from field notes of actual survey and that the same is true and correct to the best of my knowledge and belief.</p> <div style="text-align: center;"> </div> <p>Date Signed <b>01/05/06</b></p> <p>Registered Land Surveyor <i>Ronald J. Eidson</i></p> <p>Certificate No. <b>8118</b></p>

**PROPOSED CASING PROGRAM**

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depth	Sacks Cement	Type
<b>20"</b>	<b>104#</b>	<b>Grade B</b>	<b>0</b>	<b>120'</b>	<b>120'</b>	<b>145 sacks</b>	<b>Class A</b>
<b>13 3/8"</b>	<b>54.5#</b>	<b>K-55</b>	<b>0</b>	<b>1600'</b>	<b>1600'</b>	<b>885 sacks</b>	<b>Std Lite &amp; Class A</b>

**EL PASO NATURAL GAS COMPANY  
ARIZONA GAS STORAGE #1-21  
DRILLING PROGRAM**

(933)

1. Prepare the location
2. Drill 24 - 26" conductor hole to approx. 80 ft. ground level (GL). Run 20" conductor casing and cement to surface. Construct cellar. (Gills Drilling)
3. Drill rat hole, and mouse hole according to rig contractor's specs. (Gills Drilling)
4. Conduct El Paso Natural Gas safety orientation
5. Move in and rig up drilling rig.
6. Nipple up (NU) flow line from conductor pipe to rig tanks.
7. Fill rig tanks with water. Make up (MU) spud mud.
8. Pick up (PU) 17-1/2" bit and run in the hole (RIH) to approx. 80 ft GL.
9. Drill 17-1/2" hole to approx. 1,600 ft. GL, surveying approx. every 150 feet. Monitor the chloride content of the drilling fluid returns. Stop drilling at the earlier of: 1) the chloride levels in the drilling fluid exceed 30,000 mg/l or 2) upon reaching a depth of 1,600 feet.
10. Conduct a wiper trip and circulate the well clean. Circulate and condition mud for logging.
11. Pull out of hole (POOH) laying down the bottom hole assembly (BHA).
12. Rig up (RU) logging company, and log well per attached logging program.
13. RIH and circulate and condition mud to run casing. POOH
14. RU casing crews. Run approx. 40 joints of 13-3/8", 54.5 Lb/ft, ST&C surface casing to approx. 1600 ft GL. Float shoe and float collar (stinger type) will be bucked onto first joint of 13-3/8" casing. Fill each joint of casing with drilling fluid as it is being run in. The centralizers will be placed as per the attached casing program.
15. MU 13-3/8" ST&C cementing head and circulate well till cementing units are rigged up. Circulate the well with the rig pumps until the cementing units are rigged up.
16. RU cementing company. Pressures test all cementing lines. Cement the 13-3/8" surface casing to surface per the cementing program.

Note: From information gathered during the drilling of the surface hole, it may become necessary to run a cementing diverter tool and cement in two stages.

**Note: Notify Steve Rauzi (520-770-3500) with the Arizona Geological Survey (Oil and Gas Administrator) 48 hours prior to cementing.**

17. Wait on cement (WOC) approx. 24 hours. After 6 hours of WOC, test the float equipment. Remove the cementing head. Top off cement in the 13-3/8" x 17-1/2" annulus if necessary. After 18 hours of WOC, remove the flow line and cut off the 20" conductor pipe. Cut (at a pre-determined elevation) and lay down the 13-3/8" surface casing.
18. Weld on a temporary 13-5/8" 3M flange. Nipple up a 13-5/8" 3M by 13-5/8" 3M drilling spool with two 4" 5M outlets. On one outlet, install a 4" HCR valve and pipe to the rig's choke manifold. On the other outlet, install a 4" 5M by 2" 5M DSA and a bull plugged 2" 5M Halliburton valve. Nipple up a 13-5/8" 3M annular BOP and a 13-3/8" 3M bell-nipple. Nipple up a fill-up line and a 8" flow-line. Function-test the annular BOP.
19. PU 12-1/4" x 8-1/2" center punch assembly and RIH to the float collar at approx. 1560 ft. GL. Drill out the float collar from the 13-3/8" surface casing.



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20. Pressure test the 13-3/8" casing (2486-psi Internal Yield Resistance) to 850-psi – 1 psi/ft gradient (assuming 9.0 lb/gal mud, 1600' casing shoe (750-psi hydrostatic head) gives 1600-psi bottom hole test pressure. Confirm that bottomhole pressure does not exceed 70% of 2486 (1740-psi)) and hold for 30 minutes. Use a chart recorder to record the test results. There shall not be more than a 10% drop in pressure. If so, then test must be repeated.
21. Clean surface tanks and fill with salt saturated mud.
22. Drill out cement, float shoe and 10 ft – 15 ft of new formation. Circulate and condition the drilling fluid. POOH.
23. PU 8-1/2" pilot bit and RIH to approx. 1610 ft. GL.
24. Drill 8-1/2" hole to a total depth of approx. 1700 ft. GL or to a depth where the chloride levels in the drilling fluid exceed 200,000 mg/l. Circulate and condition mud for coring. POOH and rack back the BHA.
25. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
26. Cut a 60 ft., 4" non-oriented core from 1700 ft. to 1760 ft. GL. POOH and lay out core #1 (Cut in 3 ft sections. Pack up cores). Lay down (LD) coring assembly.
27. PU 8-1/2" bit assembly and RIH to approx. 1760 ft. GL. Drill 8-1/2" hole to a total depth of approx. 1860 ft. GL. Circulate and condition mud for coring. POOH and rack back the BHA.
28. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
29. Cut a 60 ft., 4" non-oriented core from 1860 ft. to 1920 ft. GL. POOH and lay out core #2 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
30. PU 8-1/2" bit assembly and RIH to approx. 1920 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2020 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Circulate and condition mud for coring. POOH and rack back the BHA.
31. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
32. Cut a 60 ft., 4" non-oriented core from 2020 ft. to 2080 ft. GL. POOH and lay out core #3 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
33. PU 8-1/2" bit assembly and RIH to approx. 2080 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2180 ft. GL. Circulate and condition mud for coring. POOH and rack back the BHA.
34. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
35. Cut a 60 ft., 4" non-oriented core from 2180 ft. to 2240 ft. GL. POOH and lay out core #4 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
36. PU 8-1/2" bit assembly and RIH to approx. 2240 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2340 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Circulate and condition mud for coring. POOH and rack back the BHA.
37. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
38. Cut a 60 ft., 4" non-oriented core from 2340 ft. to 2400 ft. GL. POOH and lay out core #5 (Cut in 3 ft sections. Pack up cores). LD coring assembly.

39. PU 8-1/2" bit assembly and RIH to approx. 2400 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2500 ft. GL. Mud logger to take samples every 10 ft from 2400 ft to 2500 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
40. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
41. Cut a 60 ft., 4" non-oriented core from 2500 ft. to 2560 ft. GL. POOH and lay out core #6 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
42. PU 8-1/2" bit assembly and RIH to approx. 2560 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2660 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Circulate and condition mud for coring. POOH and rack back the BHA.
43. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
44. Cut a 60 ft., 4" non-oriented core from 2660 ft. to 2720 ft. GL. POOH and lay out core #7 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
45. Rig up mud logger.
46. PU 8-1/2" bit assembly and RIH to approx. 2720 ft. GL. Drill 8-1/2" hole to a total depth of approx. 3,500 ft. GL (anhydrite above claystone). Mud logger to take samples every 10 ft from 2720 ft to 3,500 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
47. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
48. Cut a 60 ft., 4" non-oriented core from 3,500 ft. to 3,560 ft. GL. POOH and lay out core #8 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
49. PU 8-1/2" bit assembly and RIH to approx. 3,560 ft. GL. Drill 8-1/2" hole to a total depth of approx. 4300 ft. GL (claystone directly above the Lower Aquifer Unit). Mud logger to take samples every 10 ft from 3,560 ft to 4300 ft (samples should be watched to ensure that the evaporates have been fully penetrated). Circulate and condition mud for coring. POOH and rack back the BHA.
50. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
51. Cut a 60 ft., 4" non-oriented core from 4300 ft. to 4360 ft. GL. POOH and lay out core #9 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
52. PU 8-1/2" bit assembly and RIH to approx. 4360 ft. GL. Drill 8-1/2" hole to a total depth of approx. 4500 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Mud logger to take samples every 10 ft from 4360 ft to 4970 ft. Circulate and condition mud for logging. POOH and rack back the BHA.
53. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
54. Cut a 60 ft., 4" non-oriented core from 4970 ft. to 5030 ft. GL. POOH and lay out core #10 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
55. PU 8-1/2" pilot bit assembly and RIH to approx. 4970 ft. GL. Drill 8-1/2" hole to a total depth of approx. 5920 ft. GL. Run a deviation survey (TOTCO) every 250 feet. The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Mud logger to take samples every 10 ft from 5030 ft to 5920 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
56. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.



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57. Cut a 60 ft., 4" non-oriented core from 5920 ft. to 5980 ft. GL. POOH and lay out core #11 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
58. PU 8-1/2" pilot bit assembly and RIH to approx. 5920 ft. GL. Drill 8-1/2" hole to a total depth of approx. 7500 ft. GL. Run a deviation survey (TOTCO) every 500 feet. The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Mud logger to take samples every 10 ft from 5980 ft to 7500 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
59. Circulate and condition mud for logging. POOH and rack back the BHA.
60. RU logging company, and log well per attached logging program.
61. Conduct multiple micro-fracture testing at intervals determined from the open hole logs.
62. Rig up & run Drill stem tests if indicated by open hole logs
63. RIH and circulate out the drilling fluid with salt blended water.
64. Pull the work string up to 1650 ft. GL.
65. Rig up cementing unit and spot a 200 ft cement plug from 1650 ft to 1450 ft.
66. Pull the work string up to 100 ft. GL.
67. Spot a 100 ft cement plug from 100 ft to surface.
68. POOH and lay down the work string.
69. Nipple down the well control equipment.
70. Rig down and move out the drilling rig.
71. Remove the temporary flange from the 13-3/8" casing. Cut the 20" conductor and 13-3/8" surface casing approx. 3 ft below ground level. Weld on isolation cap/plate steel. Fill cellar and cover casing stubs to grade.

All Depth from GL

26" - 30" Bore Hole

80 ft - 120 ft

17-1/2" Bore Hole

Approx. Base of Useable Water 1500 ft.

Approx. Top of Salt 1570 ft.  
1600 ft.

20" 0.500" Wall, 104.13 lb/ft, 5L-Gr.B Line Pipe  
Cemented to Surface

13-3/8", 0.380" Wall, 54.5 lb/ft, K-55, ST&C  
Cemented to Surface

8-1/2" Bore Hole

Approx. Base of Salt 3050 ft.

8-1/2" Bore Hole

Estimated Formations

Surface - 1600'	-	Clay/Claystone/Sand
1600' - 3050'	-	Salt
3050' - 3600'	-	Anhydrite/Claystone
3600' - 4500'	-	Clay/Claystone
4500' - 5100'	-	Unconsolidated Sandstone/ Siltstone
5100' - 7100'	-	Unconsolidated Conglomerate
7100' - 7500'	-	Shist

TD - 7500 ft.



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## MUD PROGRAM

### 1. Spud / Freshwater Mud: Depth 0 ft. to approx 1,600 ft.

Mud Weight	8.8 – 9.2 lbs/gal
Viscosity	35 – 45 sec/qt.
Filtrate Control	< 25 cc
pH	< 9
% Solids	< 10%

Freshwater mud will consist mainly of freshwater mix with bentonite drilling clay. The mud weight and % solids can be controlled by application of good surface solids control equipment (i.e. shale shakers, desander, desilter and/or mud cleaner). The viscosity will be regulated with water, bentonite and sodium bicarbonate (soda ash). A polyanionic cellulose additive (DRISPAC) will be used to control the filtrate loss of the filter cake.

### 2. Saltwater Mud: Depth approx. 1,600 ft. to 7,500 ft.

Mud Weight	10.0 – 10.4 lbs/gal
Viscosity	35 – 45 sec/qt.
Filtrate Control	< 25 cc
pH	< 9
% Solids	< 10%

Saltwater mud will consist mainly of make-up brine mixed with attapulgite clay. The mud weight and % solids can be controlled by application of good surface solids control equipment (i.e. shale shakers, desander, desilter and/or mud cleaner). The viscosity will be regulated with water saturated with salt and attapulgite. A pregelatinized starch additive (IMPERMEX) will be used to control the filtrate loss of the filter cake.

To counter any potential drilling problems such as abnormal formation pressures and lost circulation, a supply of barite and loss circulation materials (LCM) will be kept on site.

The drilling fluid properties will be checked and recorded periodically during each 12-hour tower (shift). A drilling fluids engineer from a third party (Baker Inteq, Bariod, etc) will set up each of the drilling mud (freshwater and saltwater) systems and check the drilling fluid properties daily. The mud engineer will also be used as needed to deal with any problems encountered during drilling.

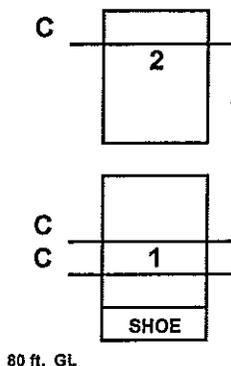
## LOGGING PROGRAM

1. Surface Hole: Surface to Approx. 1,600 ft. - Welenco  
Electric Line Logging: Dual Induction Resistivity Log w/SP  
Gamma Ray  
Combined Caliper Log  
Mud Logging: None
2. Interval of Interest: 1,600 ft to Approx. 7,500 ft. - Schlumberger  
Electric Line Logging: Dual Laterolog Resistivity Log  
Compensated Neutron (Porosity Logging)  
Litho Density (Bulk Density Logging)  
Elemental Capture Spectroscopy  
Combinable Magnetic Resonance CMR  
Sonic Scanner  
Combined Caliper Log  
Formation Evaluation ELAN  
Mud Logging: 10 ft Samples from 4,500 ft to 7,500 ft.

## CASING PROGRAM

1. Conductor Casing:  
24 - 26" Borehole  
Surface to Approx. 80 ft.  
20" - 0.500" Wall, 106.5 lb/ft, J/K-55, BT&C

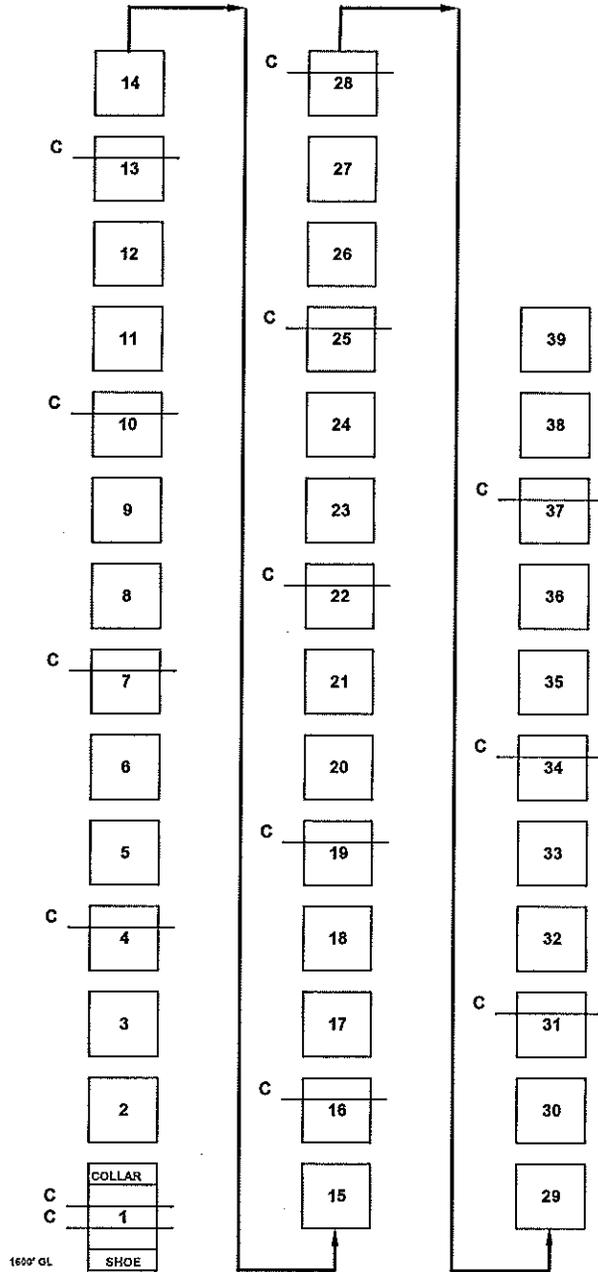
El Paso Natural Gas Company  
Picacho Storage Project  
Strat Well  
20" Conductor Casing & Cementing Hardware Program



C - 20" x 26" Bow Type Centralizers

2. Surface Casing:  
 17-1/2" Borehole  
 Surface to Approx. 1,600 ft.  
 13-3/8" - 0.380" Wall, 54.5 lb/ft, J/K-55, ST&C

El Paso Natural Gas Company  
 Picacho Storage Project  
 Strat Well  
 13-3/8" Casing & Cementing Hardware Program



C - 13-3/8" x 17-1/2" Bow Type Centralizers



**PB Energy  
 Storage  
 Services, Inc.**  
 ENGINEERS - CONSTRUCTORS - OPERATIONS - MAINTENANCE

A Parsons Brinckerhoff Company

## CEMENTING PROGRAM

### 1. Conductor Casing:

26" x 20" Borehole - Surface to Approx. 80 ft.

$$(26^2 - 20^2) \times \pi/4 \times 1/144 = 1.5053 \text{ ft}^3/\text{ft}$$

$$80 \text{ ft} \times 1.5053 \text{ ft}^3/\text{ft} = 120 \text{ ft}^3$$

Excess: 50% of Open Hole Volume

145 sacks Standard/Class A Cement + 0.25 lbs/sack Cello Flake + 2% Calcium Chloride

Slurry Weight (lb/gal)	15.20
Slurry Yield (ft <sup>3</sup> /sack)	1.27
Amount of Mix Water (gal/sk)	5.75
Estimated Pumping Time	2:23
Compressive Strength	
24 hrs @ 80 ° F (psi)	3000

### 2. Surface Casing:

17-1/2" x 13-3/8" Borehole - Surface to Approx. 1,600 ft.

$$(19^2 - 13.375^2) \times \pi/4 \times 1/144 = 0.9933 \text{ ft}^3/\text{ft}$$

$$80 \text{ ft} \times 0.9933 \text{ ft}^3/\text{ft} = 79.5 \text{ ft}^3$$

$$(17.5^2 - 13.375^2) \times \pi/4 \times 1/144 = 0.9757 \text{ ft}^3/\text{ft}$$

$$1020 \text{ ft} \times 0.9757 \text{ ft}^3/\text{ft} = 975.7 \text{ ft}^3$$

$$500 \text{ ft} \times 0.9757 \text{ ft}^3/\text{ft} = 487.8 \text{ ft}^3$$

Excess: 50% of Open Hole Volume or 15% over caliper

Lead Slurry: 500 sacks Standard Lite Cement + 0.25 lbs/sack Cello Flake + 2% Calcium Chloride

Tail Slurry: 385 sacks Standard/Class A Cement + 0.25 lbs/sack Cello Flake + 2% Calcium Chloride

	Lead Slurry	Tail Slurry
Slurry Weight (lb/gal)	12.00	15.20
Slurry Yield (ft <sup>3</sup> /sack)	2.12	1.27
Amount of Mix Water (gal/sk)	12.11	5.75
Estimated Pumping Time	5:00	2:30
Compressive Strength		
24 hrs @ 80 ° F (psi)	340	3000

## APPLICATION FOR PERMIT TO DRILL OR RE-ENTER

APPLICATION TO DRILL

RE-ENTER OLD WELL

NAME OF COMPANY OR OPERATOR

**El Paso Natural Gas Company**

Address

City

State

Phone Number

**2 North Nevada Ave**

**Colorado Springs**

**CO 80903**

**719.520.4533**

Drilling Contractor

**United Drilling Inc**

Address **P O Box 2488 Roswell, NM 88202**

### DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor

**Owned by El Paso Natural Gas**

Well number

**1-21**

Elevation (ground)

**1527'**

Nearest distance from proposed location to property or lease line:

**660' FWL**

feet

Distance from proposed location to nearest drilling, completed or applied-for well on the same lease:

**none**

feet

Number of acres in lease

**234**

Number of wells on lease, including this well, completed in or drilling to this reservoir:

**none**

If lease purchased with one or more wells drilled, from whom purchased.

Name

Address

**N/A**

Well location (give footage from section lines)

**1980' FNL and 660' FWL**

Section - Township - Range or Block and Survey

**21-7S-8E, G. & S. R. B. & M.**

Dedication per A.A.C. R12-7-104(A)(3)

**N/A**

Field and reservoir (if wildcat, so state)

**Stratigraphic Test**

County

**Pinal**

Distance in miles and direction from nearest town or post office

**7 miles north east of Eloy Arizona**

Proposed depth:

**8,000'**

Rotary or cable tools

**Rotary**

Approximate date work will start

**April 2006**

Bond status

**filed 03/02/05**

Organization Report

On file

**X**

Or attached

Filing Fee of \$25.00

Attached

**X**

Remarks

**Stratigraphic test per Arizona Administrative Code, Title 12, Chapter R12-7-128**

**API # 02-021-20009**

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the:

**Manager, Facility Planning**

of the

**El Paso Natural Gas Company**

(company), and that I am authorized by said company to make this report; and that this

report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Signature

Date

Mail completed form to:  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W. Congress, #100  
Tucson, AZ 85701-1315

Permit Number:

**933**

Approval Date:

**3-21-2006**

Approved By:

**SL Rainey**

NOTICE: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

**STATE OF ARIZONA  
OIL & GAS CONSERVATION COMMISSION**

Application to Drill or Re-enter

File Two Copies

Form No. 3

(Complete Reverse Side)

5/96

fc'd 3-15-06

- Operator shall outline on the plat the acreage dedicated to the well in compliance with A.A.C. R12-7-107.
- A registered surveyor shall show on the plat the location of the well and certify this information in the space provided.
- ALL DISTANCES SHOWN ON THE PLAT MUST BE FROM THE OUTER BOUNDARIES OF THE SECTION.
- Is the operator the only owner in the dedicated acreage outlined on the plat below? YES \_\_\_\_\_ NO X
- If the answer to question four is no, have the interests of all owners been consolidated by communitization agreement or otherwise? YES \_\_\_\_\_ NO X If answer is yes, give type of consolidation \_\_\_\_\_

6. If the answer to question four is no, list all the owners and their respective interests below: Operator (EPNG) is the owner of 100% of the surface acreage. Ownership of a portion of underlying mineral interests is uncertain. EPNG intends to acquire 100% of the underlying mineral interests.

Owner <b>El Paso Natural Gas Company</b>	Land Description <b>NW 1/4 + N 1/2 SW 1/4 Sec 21, T7S, R8E</b>
<b>G.&amp;S.R.B&amp;M Survey Pinal Co. AZ</b>	
	<p style="text-align: center;"><b>CERTIFICATION</b></p> <p>I hereby certify that the information above is true and complete to the best of my knowledge and belief.</p> <p style="text-align: center;"><i>Greg Gettman</i></p> <p>Name <b>Greg Gettman</b></p> <p>Position <b>Manager, Facility Planning</b></p> <p>Company <b>El Paso Natural Gas</b></p> <p>Date <b>02/22/2006</b></p> <p>I hereby certify that the well location shown on the 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.</p> <div style="text-align: center;"> </div> <p>Date Signed <b>01/05/06</b></p> <p>Registered Land Surveyor <i>Ronald J. Eidson</i></p> <p>Certificate No. <b>8118</b></p>

**PROPOSED CASING PROGRAM**

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement	Type
20"	104#	Grade B	0	120'	120'	145 sacks	Class A
13 3/8"	54.5#	K-55	0	1600'	1600'	885 sacks	Std Lite &
9 5/8"	40#	K-55	0	4500'	4500'	1520 sacks	Class A Std Cement + 35% salt

(933)

**EL PASO NATURAL GAS COMPANY  
ARIZONA GAS STORAGE #1-21  
DRILLING PROGRAM (Revised 3/15/06)**

1. Prepare the location
2. Drill 24 - 26" conductor hole to approx. 80 ft. ground level (GL). Run 20" 104 lb./ft. conductor casing and cement to surface. Construct cellar. (Gills Drilling)
3. Drill rat hole, and mouse hole according to rig contractor's specs. (Gills Drilling)
4. Conduct El Paso Natural Gas safety orientation
5. Move in and rig up drilling rig.
6. Nipple up (NU) flow line from conductor pipe to rig tanks.
7. Fill rig tanks with water. Make up (MU) spud mud.
8. Pick up (PU) 17-1/2" bit and run in the hole (RIH) to approx. 80 ft GL.
9. Drill 17-1/2" hole to approx. 1,600 ft. GL, run TOTCO survey approx. every 150 feet. Monitor the chloride content of the drilling fluid returns. Stop drilling at the earlier of: 1) the chloride levels in the drilling fluid exceed 30,000 mg/l or 2) upon reaching a depth of 1,600 feet.
10. Conduct a wiper trip and circulate the well clean. Circulate and condition mud for logging.
11. Pull out of hole (POOH) laying down the bottom hole assembly (BHA).
12. Rig up (RU) logging company, and log well per attached logging program.
13. RIH and circulate and condition mud to run casing. POOH
14. RU casing crews. Run approx. 40 joints of 13-3/8", 54.5 Lb/ft, ST&C surface casing to approx. 1600 ft GL. Float shoe and float collar (stinger type) will be bucked onto first joint of 13-3/8" casing. Fill each joint of casing with drilling fluid as it is being run in. The centralizers will be placed as per the attached casing program.
15. MU 13-3/8" ST&C cementing head and circulate well till cementing units are rigged up. Circulate the well with the rig pumps until the cementing units are rigged up.
16. RU cementing company. Pressures test all cementing lines. Cement the 13-3/8" surface casing to surface per the cementing program.

Note: From information gathered during the drilling of the surface hole, it may become necessary to run a cementing diverter tool and cement in two stages.

**Note: Notify Steven Rauzi (520-770-3500) with the Arizona Geological Survey (Oil and Gas Administrator) and Nancy Rumrill (415-972-3293 with the EPA 48 hours prior to cementing.**

17. Wait on cement (WOC) approx. 24 hours. After 6 hours of WOC, test the float equipment. Remove the cementing head. Top off cement in the 13-3/8" x 17-1/2" annulus if necessary. After 18 hours of WOC, remove the flow line and cut off the 20" conductor pipe. Cut (at a pre-determined elevation) and lay down the 13-3/8" surface casing.
18. Weld on a temporary 13-5/8" 3M flange. Nipple up a 13-5/8" 3M by 13-5/8" 3M drilling spool with two 4" 5M outlets. On one outlet, install a 4" HCR valve and pipe to the rig's choke manifold. On the other outlet, install a 4" 5M by 2" 5M DSA and a bull plugged 2" 5M Halliburton valve. Nipple up a 13-5/8" 3M annular BOP and a 13-3/8" 3M bell-nipple. Nipple up a fill-up line and a 8" flow-line. Function-test the annular BOP.

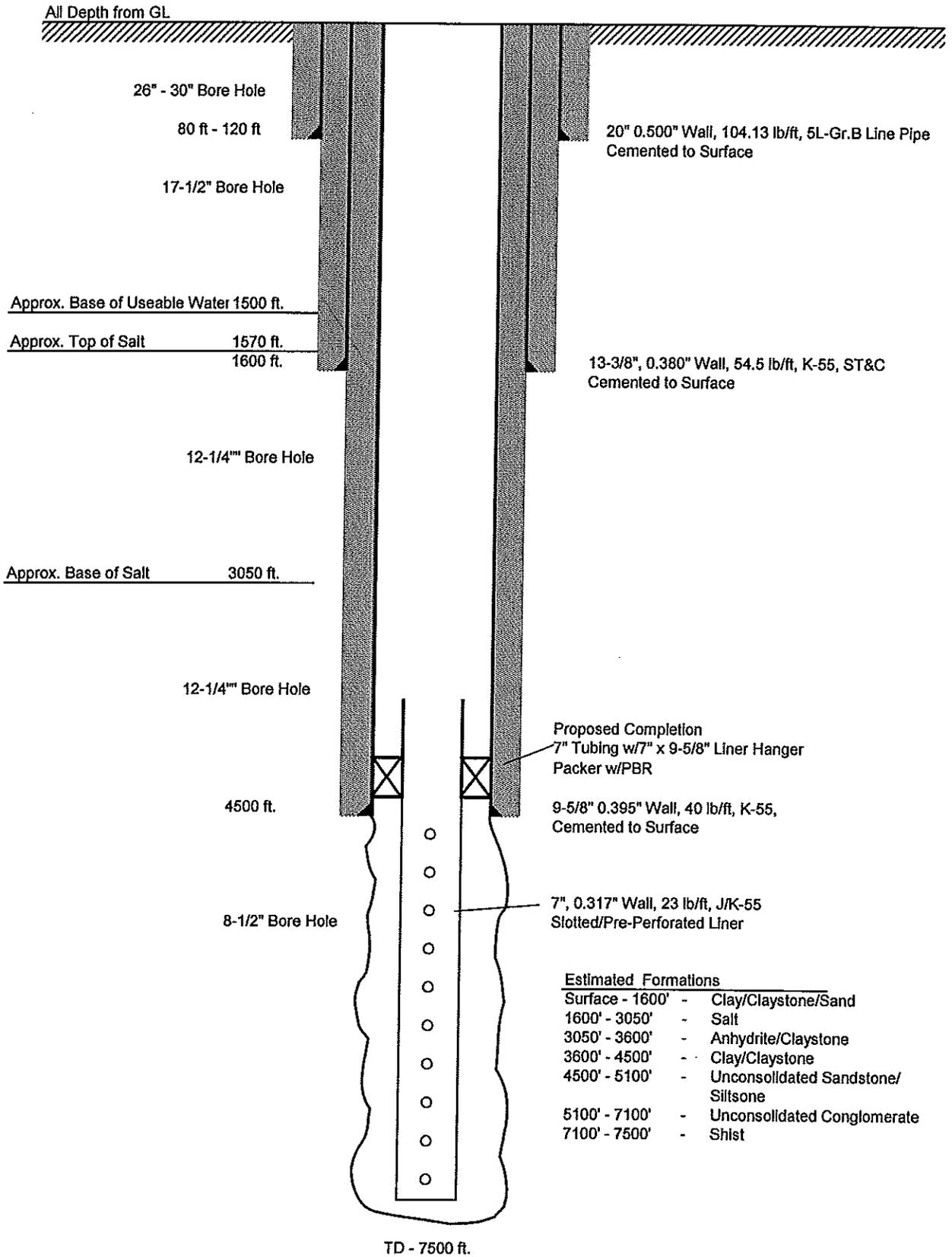
19. PU 12-1/4" x 8-1/2" center punch assembly and RIH to the float collar at approx. 1560 ft. GL. Drill out the float collar from the 13-3/8" surface casing.
20. Pressure test the 13-3/8" casing (2486-psi Internal Yield Resistance) to 850-psi – 1 psi/ft gradient (assuming 9.0 lb/gal mud, 1600' casing shoe (750-psi hydrostatic head) gives 1600-psi bottom hole test pressure. Confirm that bottomhole pressure does not exceed 70% of 2486 (1740-psi)) and hold for 30 minutes. Use a chart recorder to record the test results. There shall not be more than a 10% drop in pressure. If so, then test must be repeated.
21. Clean surface tanks and fill with salt saturated mud.
22. Drill out cement, float shoe and 10 ft – 15 ft of new formation. Circulate and condition the drilling fluid. POOH.
23. PU 8-1/2" pilot bit and RIH to approx. 1610 ft. GL.
24. Drill 8-1/2" hole to a total depth of approx. 1700 ft. GL or to a depth where the chloride levels in the drilling fluid exceed 200,000 mg/l. Circulate and condition mud for coring. POOH and rack back the BHA.
25. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
26. Cut a 60 ft., 4" non-oriented core from 1700 ft. to 1760 ft. GL. POOH and lay out core #1 (Cut in 3 ft sections. Pack up cores). Lay down (LD) coring assembly.
27. PU 8-1/2" bit assembly and RIH to approx. 1760 ft. GL. Drill 8-1/2" hole to a total depth of approx. 1860 ft. GL. Circulate and condition mud for coring. POOH and rack back the BHA.
28. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
29. Cut a 60 ft., 4" non-oriented core from 1860 ft. to 1920 ft. GL. POOH and lay out core #2 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
30. PU 8-1/2" bit assembly and RIH to approx. 1920 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2020 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Circulate and condition mud for coring. POOH and rack back the BHA.
31. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
32. Cut a 60 ft., 4" non-oriented core from 2020 ft. to 2080 ft. GL. POOH and lay out core #3 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
33. PU 8-1/2" bit assembly and RIH to approx. 2080 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2180 ft. GL. Circulate and condition mud for coring. POOH and rack back the BHA.
34. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
35. Cut a 60 ft., 4" non-oriented core from 2180 ft. to 2240 ft. GL. POOH and lay out core #4 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
36. PU 8-1/2" bit assembly and RIH to approx. 2240 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2340 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Circulate and condition mud for coring. POOH and rack back the BHA.
37. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
38. Cut a 60 ft., 4" non-oriented core from 2340 ft. to 2400 ft. GL. POOH and lay out core #5 (Cut in 3 ft sections. Pack up cores). LD coring assembly.

39. PU 8-1/2" bit assembly and RIH to approx. 2400 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2500 ft. GL. Mud logger to take samples every 10 ft from 2400 ft to 2500 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
40. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
41. Cut a 60 ft., 4" non-oriented core from 2500 ft. to 2560 ft. GL. POOH and lay out core #6 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
42. PU 8-1/2" bit assembly and RIH to approx. 2560 ft. GL. Drill 8-1/2" hole to a total depth of approx. 2660 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Circulate and condition mud for coring. POOH and rack back the BHA.
43. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
44. Cut a 60 ft., 4" non-oriented core from 2660 ft. to 2720 ft. GL. POOH and lay out core #7 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
45. Rig up mud logger.
46. PU 8-1/2" bit assembly and RIH to approx. 2720 ft. GL. Drill 8-1/2" hole to a total depth of approx. 3,500 ft. GL (anhydrite above claystone). Mud logger to take samples every 10 ft from 2720 ft to 3,500 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
47. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
48. Cut a 60 ft., 4" non-oriented core from 3,500 ft. to 3,560 ft. GL. POOH and lay out core #8 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
49. PU 8-1/2" bit assembly and RIH to approx. 3,560 ft. GL. Drill 8-1/2" hole to a total depth of approx. 4300 ft. GL (claystone directly above the Lower Aquifer Unit). Mud logger to take samples every 10 ft from 3,560 ft to 4300 ft (samples should be watched to ensure that the evaporates have been fully penetrated). Circulate and condition mud for coring. POOH and rack back the BHA.
50. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
51. Cut a 60 ft., 4" non-oriented core from 4300 ft. to 4360 ft. GL. POOH and lay out core #9 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
52. PU 8-1/2" bit assembly and RIH to approx. 4360 ft. GL. Drill 8-1/2" hole to a total depth of approx. 4500 ft. GL. Run a deviation survey (TOTCO). The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Mud logger to take samples every 10 ft from 4360 ft to 4500 ft. Circulate and condition mud for logging. POOH and rack back the BHA.
53. Conduct a wiper trip and circulate the well clean. Circulate and condition mud for logging.
54. POOH laying down the BHA.
55. RU logging company, and log well per attached logging program.
56. Conduct multiple micro-fracture testing at intervals determined from the open hole logs.
57. PU 12-1/4" rock bit assembly and RIH to approx. 1600 ft. GL. Open the 8-1/2" pilot hole to 12-1/4" from 1600 ft to a total depth of approx. 4500 ft. GL.
58. Circulate and condition mud to run casing. POOH.
59. RD well control equipment. Install bradenhead/starting head and wellhead spool.

60. RU casing crews. Run approx. 112 joints of 9-5/8", 40 Lb/ft, LT&C casing to approx. 4500 ft GL. Float shoe and float collar will be bucked onto first joint of 9-5/8" casing. Fill each joint of casing with drilling fluid as it is being run in. The centralizers will be placed as per the attached casing program.
61. MU 9-5/8" LT&C cementing head and circulate well till cementing units are rigged up. Circulate the well with the rig pumps until the cementing units are rigged up.
62. RU cementing company. Pressures test all cementing lines. Cement the 9-5/8" surface casing to surface per the cementing program.  
 Note: From information gathered during the drilling of the intermediate hole, it may become necessary to run a cementing diverter tool and cement in two stages.  
**Note: Notify Steven Rauzi (520-770-3500) with the Arizona Geological Survey (Oil and Gas Administrator) and Nancy Rumrill (415-972-3293 with the EPA 48 hours prior to cementing.**
63. Wait on cement (WOC) approx. 72 hours. After 12 hours of WOC, test the float equipment. Remove the cementing head. Top off cement in the 9-5/8" x 13-3/8" annulus, if necessary. After 48 hours of WOC, remove the flow line and cut off the 13-3/8" pipe. Cut (at a pre-determined elevation) and lay down the 13-3/8" surface casing. Clean surface tanks and fill with fresh water "drill in" mud.
64. PU 8-1/2" bit and RIH to the float collar at approx. 4460 ft. GL.
65. Displace salt saturated mud from the well with fresh water "drill in" mud and dispose.
66. Drill out the float collar from the 9-5/8" casing.
67. Pressure test the 9-5/8" casing (3590-psi Internal Yield Resistance) to 520-psi – (assuming 8.5 lb/gal mud, 4500' casing shoe (1990-psi hydrostatic head) gives 2510-psi bottom hole test pressure, which is 70% of 3590 (2510-psi). 1 psi/ft gradient (4500-psi bottom hole test pressure would exceed the burst of the 9-5/8" casing)). Hold test pressure for 30 minutes. Use a chart recorder to record the test results. There shall not be more than a 10% drop in pressure. If so, then test must be repeated.
68. Drill out cement, float shoe, wellbore cement and drill approx. 10 feet of new formation. Circulate and condition the drilling fluid.
69. Drill an 8-1/2" hole to a depth of approx. 4970 ft. GL. Run a deviation survey (TOTCO). Mud logger to take samples every 10 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
70. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
71. Cut a 60 ft., 4" non-oriented core from 4970 ft. to 5030 ft. GL. POOH and lay out core #10 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
72. PU 8-1/2" pilot bit assembly and RIH to approx. 4970 ft. GL. Drill 8-1/2" hole to a total depth of approx. 5920 ft. GL. Run a deviation survey (TOTCO) every 250 feet. The deviation shall be kept at a minimum and should be controlled using the BHA (stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Mud logger to take samples every 10 ft from 5030 ft to 5920 ft. Circulate and condition mud for coring. POOH and rack back the BHA.
73. PU coring assembly (8-1/2" x 4", 60 ft. conventional core barrel) and RIH.
74. Cut a 60 ft., 4" non-oriented core from 5920 ft. to 5980 ft. GL. POOH and lay out core #11 (Cut in 3 ft sections. Pack up cores). LD coring assembly.
75. PU 8-1/2" pilot bit assembly and RIH to approx. 5920 ft. GL. Drill 8-1/2" hole to a total depth of approx. 7500 ft. GL. Run a deviation survey (TOTCO) every 500 feet. The deviation shall be kept at a minimum and should be controlled using the BHA

(stabilizer/reamer placement) and operating parameters (weight on bit (WOB) and rotary speed). Mud logger to take samples every 10 ft from 5980 ft to 7500 ft. Circulate and condition mud for coring. POOH and rack back the BHA.

76. Circulate and condition mud for logging. POOH and rack back the BHA.
77. Rig up & run open-hole logs per logging program.
78. Rig up & run micro fracture tests and collect formation fluid samples as indicated by open hole logs
79. RIH and circulate out the drilling fluid with salt blended water. POOH.
80. RU pumping and transport units and spot mud flush/mud acid (210 bbls) across the open hole section. POOH. Let acid work on filter cake.
81. RIH with work string. Circulate out spent acid and dispose.
82. RU casing crews. Run approx. 75 joints of 7", 23 lb/ft, LT&C, slotted/pre-perforated casing.
83. Prepare 7" x 9-5/8" packer with a "polished bore receptacle" (PBR).
84. RIH and set the packer in the bottom 50" of the 9-5/8" casing (approx. 4450'). Set packer according to manufacturer's instructions.
85. POOH and lay down the work string.
86. Nipple up the remainder of the wellhead.
87. Rig down and move out the drilling rig.



## MUD PROGRAM

### 1. Spud / Freshwater Mud: Depth 0 ft. to approx 1,600 ft.

Mud Weight	8.8 – 9.2 lbs/gal
Viscosity	35 – 45 sec/qt.
Filtrate Control	< 25 cc
pH	< 9
% Solids	< 10%

Freshwater mud will consist mainly of freshwater mix with bentonite drilling clay. The mud weight and % solids can be controlled by application of good surface solids control equipment (i.e. shale shakers, desander, desilter and/or mud cleaner). The viscosity will be regulated with water, bentonite and sodium bicarbonate (soda ash). A polyanionic cellulose additive (DRISPAC) will be used to control the filtrate loss of the filter cake.

### 2. Saltwater Mud: Depth approx. 1,600 ft. to 4,500 ft.

Mud Weight	10.0 – 10.4 lbs/gal
Viscosity	35 – 45 sec/qt.
Filtrate Control	< 25 cc
pH	< 9
% Solids	< 10%

Saltwater mud will consist mainly of make-up brine mixed with attapulgite clay. The mud weight and % solids can be controlled by application of good surface solids control equipment (i.e. shale shakers, desander, desilter and/or mud cleaner). The viscosity will be regulated with water saturated with salt and attapulgite. A pregelatinized starch additive (IMPERMEX) will be used to control the filtrate loss of the filter cake.

### 3. Light Brine Mud: Depth 4,500 ft. to approx 7,500 ft.

Mud Weight	9.0 – 9.4 lbs/gal
Viscosity	35 – 45 sec/qt.
Filtrate Control	< 10 cc
pH	< 9
% Solids	< 10%

Light Brine mud will consist mainly of a brine/freshwater mix with xanthan gum and minimal amount of bentonite drilling clay. The mud weight and % solids can be controlled by application of good surface solids control equipment (i.e. shale shakers, desander, desilter and/or mud cleaner). The viscosity will be regulated with water, xanthan gum. A polyanionic cellulose additive (DRISPAC) will be used to control the filtrate loss of the filter cake.

To counter any potential drilling problems such as abnormal formation pressures and lost circulation, a supply of barite and loss circulation materials (LCM) will be kept on site.

The drilling fluid properties will be checked and recorded periodically during each 12-hour tower (shift). A drilling fluids engineer from a third party (Baker Inteq, Bariod, etc) will set up each of the drilling mud (freshwater and saltwater) systems and check the drilling fluid properties daily. The mud engineer will also be used as needed to deal with any problems encountered during drilling.

## LOGGING PROGRAM

1. Surface Hole: Surface to Approx. 1,600 ft. - Welenco

Electric Line Logging: Dual Induction Resistivity Log w/SP  
Gamma Ray  
Combined Caliper Log  
Directional Survey

Mud Logging: 10' Samples from 0' to 1,600'

2. Production Hole: 9-5/8" casing to Approx. 4,500 ft. - Schlumberger

Electric Line Logging: Dual Laterolog (Resistivity & Spontaneous Potential Log)  
Compensated Neutron (Porosity Logging)  
Litho Density (Bulk Density & Porosity Logging)  
Elemental Capture Spectroscopy (Mineralogical Identification)  
Sonic Scanner (Rock Properties and Fracture Identification)  
Combined Caliper Log (Hole Size)  
Formation Evaluation ELAN (Computer Processed Log)

Cement Bond and Variable Density Log -0 to 1,600'

Directional Survey if in question

Mud Logging: 10 ft Samples from 1,600 ft to 4,500 ft

3. Interval of Interest: 4,500 ft to Approx. 7,500 ft. - Schlumberger

Electric Line Logging: Dual Laterolog (Resistivity & Spontaneous Potential Log)  
Compensated Neutron (Porosity Logging)  
Litho Density (Bulk Density & Porosity Logging)  
Elemental Capture Spectroscopy (Mineralogical Identification)  
Combinable Magnetic Resonance CMR (Permeability Identification)  
Sonic Scanner (Rock Properties and Fracture Identification)  
Combined Caliper Log (Hole Size)  
Formation Evaluation ELAN (Computer Processed Log)

Temperature Log

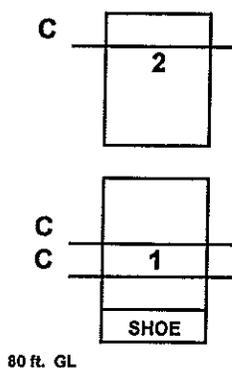
Cement Bond and Variable Density Log CBL - 0 ft. to 4,500 ft.

Mud Logging: 10 ft Samples from 4,500 ft to 7,500 ft.

## CASING PROGRAM

1. Conductor Casing:  
24 - 26" Borehole  
Surface to Approx. 80 ft.  
20" - 0.500" Wall, J/K-55, BT&C

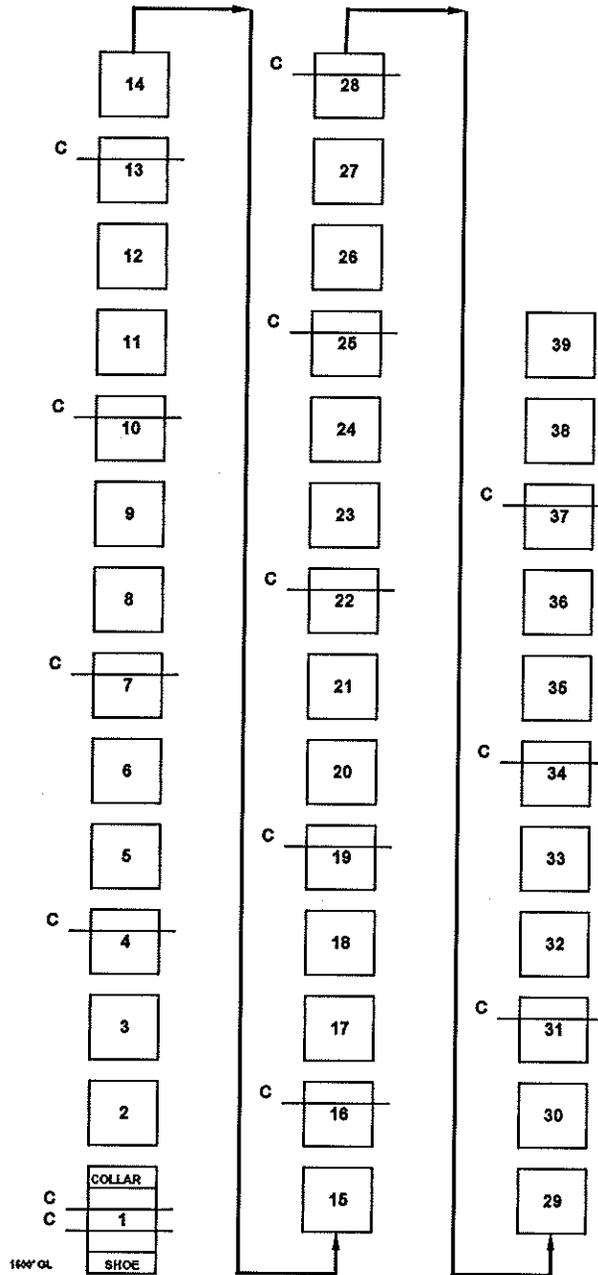
El Paso Natural Gas Company  
Picacho Storage Project  
Strat Well  
20" Conductor Casing & Cementing Hardware Program



C - 20" x 26" Bow Type Centralizers

2. Surface Casing:  
 17-1/2" Borehole  
 Surface to Approx. 1,600 ft.  
 13-3/8" - 0.380" Wall, J/K-55, ST&C

El Paso Natural Gas Company  
 Picacho Storage Project  
 Strat Well  
 13-3/8" Casing & Cementing Hardware Program



C - 13-3/8" x 17-1/2" Bow Type Centralizers

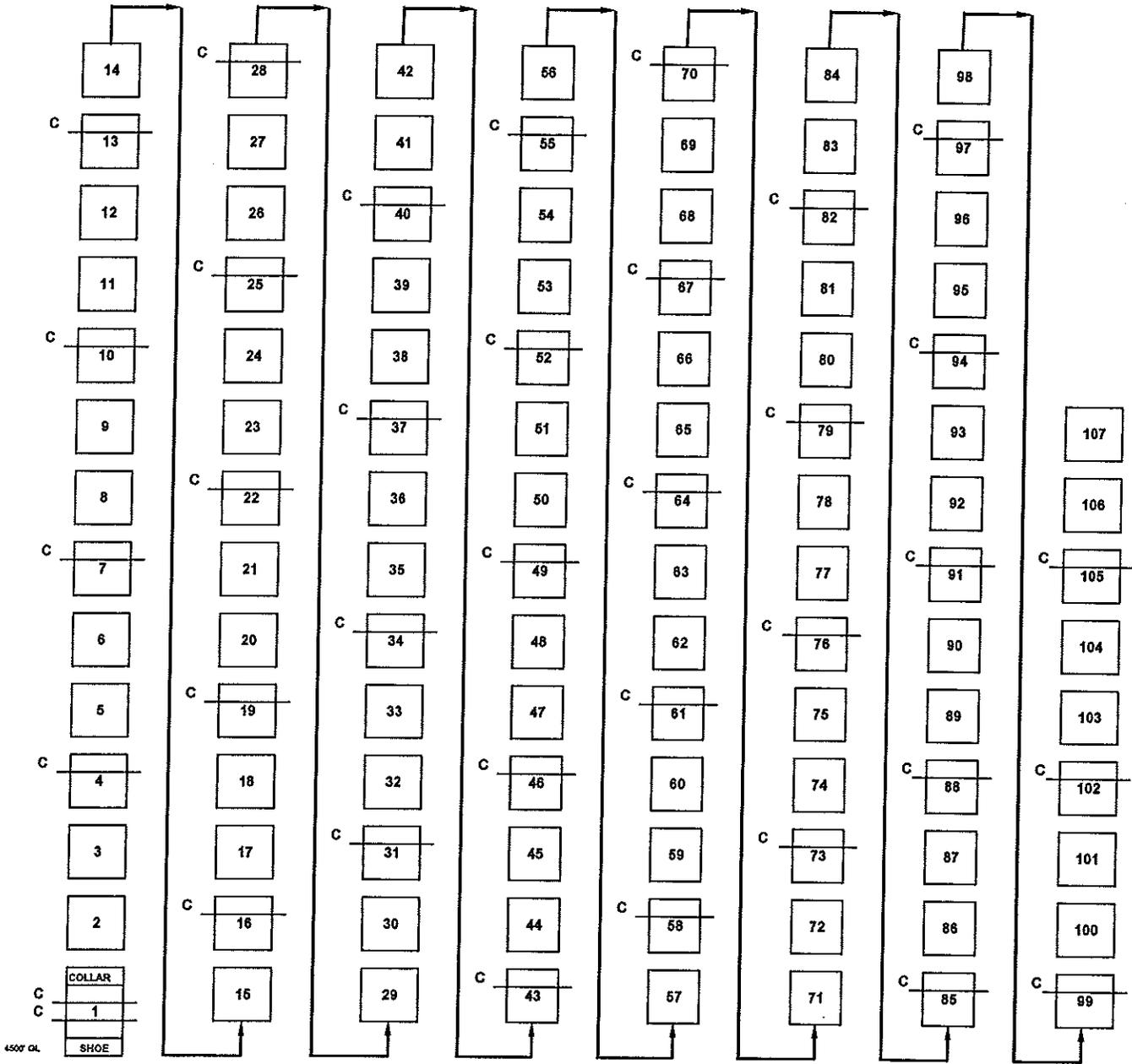
3. Final Casing:

12-1/4" Borehole

Surface to Approx. 4,500 ft.

9-5/8" - 0.395" Wall, 40 lb/ft, J/K-55, LT&C

El Paso Natural Gas Company  
 Picacho Storage Project  
 Strat Well  
 7" Casing & Cementing Hardware Program



C - 7" x 9-7/8" Bow Type Centralizers

## CEMENTING PROGRAM

### 1. Conductor Casing:

26" x 20" Borehole - Surface to Approx. 80 ft.

$$(26^2 - 20^2) \times \pi/4 \times 1/144 = 1.5053 \text{ ft}^3/\text{ft}$$

$$80 \text{ ft} \times 1.5053 \text{ ft}^3/\text{ft} = 120 \text{ ft}^3$$

Excess: 50% of Open Hole Volume

145 sacks Standard/Class A Cement + 0.25 lbs/sack Cello Flake + 2% Calcium Chloride

Slurry Weight (lb/gal)	15.20
Slurry Yield (ft <sup>3</sup> /sack)	1.27
Amount of Mix Water (gal/sk)	5.75
Estimated Pumping Time	2:23
Compressive Strength 24 hrs @ 80 ° F (psi)	3000

### 2. Surface Casing:

17-1/2" x 13-3/8" Borehole - Surface to Approx. 1,600 ft.

$$(19^2 - 13.375^2) \times \pi/4 \times 1/144 = 0.9933 \text{ ft}^3/\text{ft}$$

$$80 \text{ ft} \times 0.9933 \text{ ft}^3/\text{ft} = 79.5 \text{ ft}^3$$

$$(17.5^2 - 13.375^2) \times \pi/4 \times 1/144 = 0.9757 \text{ ft}^3/\text{ft}$$

$$1020 \text{ ft} \times 0.9757 \text{ ft}^3/\text{ft} = 975.7 \text{ ft}^3$$

$$500 \text{ ft} \times 0.9757 \text{ ft}^3/\text{ft} = 487.8 \text{ ft}^3$$

Excess: 50% of Open Hole Volume or 15% over caliper

Lead Slurry: 500 sacks Standard Lite Cement + 0.25 lbs/sack Cello Flake + 2% Calcium Chloride

Tail Slurry: 385 sacks Standard/Class A Cement + 0.25 lbs/sack Cello Flake + 2% Calcium Chloride

	Lead Slurry	Tail Slurry
Slurry Weight (lb/gal)	12.00	15.20
Slurry Yield (ft <sup>3</sup> /sack)	2.12	1.27
Amount of Mix Water (gal/sk)	12.11	5.75
Estimated Pumping Time	5:00	2:30
Compressive Strength 24 hrs @ 80 ° F (psi)	340	3000



PB Energy  
Storage  
Services, Inc.

ENGINEERING - CONSTRUCTION - OPERATIONS - MAINTENANCE

A Parsons Brinckerhoff Company

3. Final Casing:

12.25" x 9.625" Borehole - Surface to Approx. 4,500 ft.

$$(12.615^2 - 9.925^2) \times \pi/4 \times 1/144 = 0.3627 \text{ ft}^3/\text{ft}$$

$$1600 \text{ ft} \times 0.3627 \text{ ft}^3/\text{ft} = 580.3 \text{ ft}^3$$

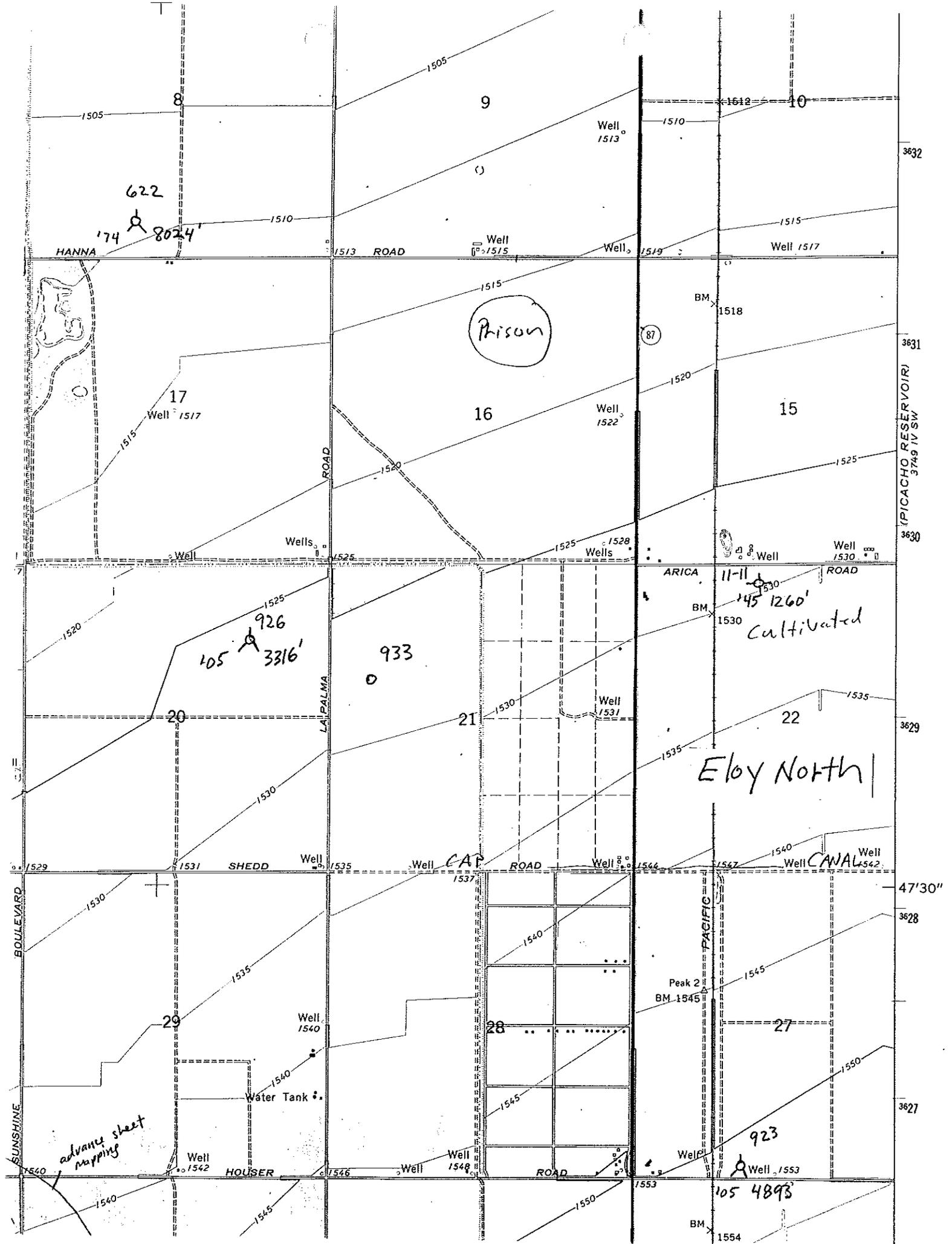
$$(12.25^2 - 9.625^2) \times \pi/4 \times 1/144 = 0.3132 \text{ ft}^3/\text{ft}$$

$$2900 \text{ ft} \times 0.3132 \text{ ft}^3/\text{ft} = 908.2 \text{ ft}^3$$

Excess: 50% of Open Hole Volume or 15% over caliper

Lead Slurry: 1520 sacks Standard Cement + 35.2% Salt + 0.7% Attapulgite+ 0.25  
lbs/sack Cello Flake + 2% Calcium Chloride + 0.25% Defoamer

	Lead Slurry
Slurry Weight (lb/gal)	16.20
Slurry Yield (ft <sup>3</sup> /sack)	1.28
Amount of Mix Water (gal/sk)	5.23
Estimated Pumping Time	5:30 +
<b>COMPRESSIVE STRENGTH</b>	
24 hrs @ 80 ° F (psi)	1292



622  
174  
8024'

Prison

Cultivated

Eloy North

advance sheet  
mapping

3632  
3631  
3630  
3629  
3628  
3627

(PICACHO RESERVOIR)  
3749 IV SW

SUNSHINE BOULEVARD

LA PALMA ROAD

SHEDD ROAD

CAP ROAD

ROAD

PACIFIC

WELL CANAL

HOUSER ROAD

ROAD

1505

8

1505

9

Well 1513

1510

1612

10

1510

1513 ROAD

Well 1515

Well 1519

Well 1517

1515

BM 1518

17

Well 1517

16

Well 1522

15

(87)

1520

1515

Wells 1525

1525

1528

Wells

Well 1530

1520

1525

926

105

3316'

933

ARICA

11-11

145

1260'

BM 1530

1530

Well 1530

1529

1531

1535

1530

21

Well 1531

1535

22

1529

1531

SHEDD

Well 1535

Well CAP

1537

Well 1544

1547

1540

Well CANAL

1542

1530

1530

1535

Well 1540

1540

28

Peak 2

BM 1545

1545

27

1540

1540

Well 1542

HOUSER

Well 1546

Well 1548

Well 1548

1550

1553

Well 1553

923

105 4893'

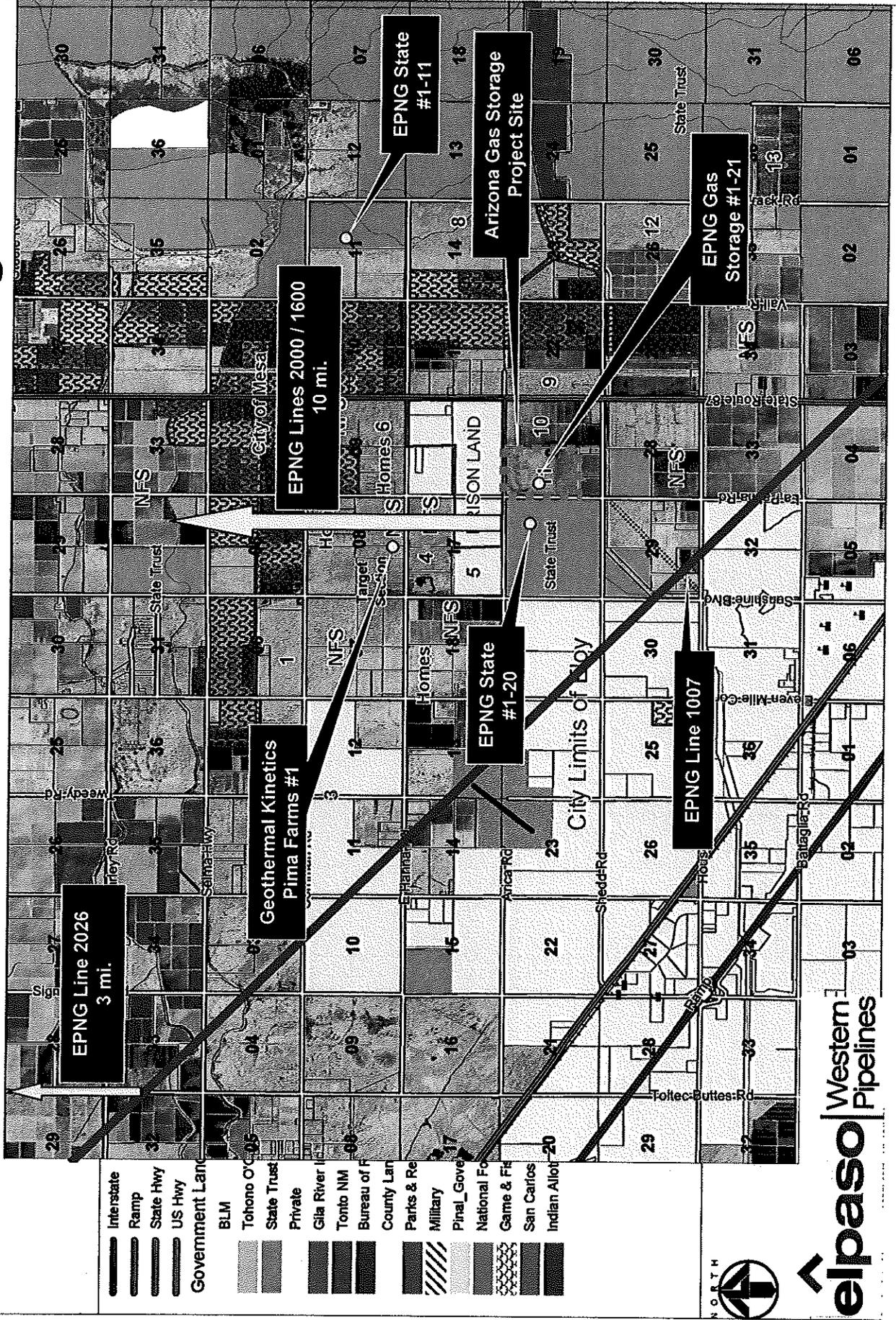
BM 1554

47'30"

3628

3627

# Arizona Natural Gas Storage



**GREG GETTMAN**  
**LOUISE GETTMAN**  
 PH. 719-685-1556  
 2640 WHITE ROCK LN.  
 COLORADO SPRINGS, CO 80904

82-8928/1021 1173  
 Date 3/14/2006

Pay To The Order Of Arizona Oil + Gas Conservation Comm \$ 25<sup>00</sup>/<sub>100</sub>  
Twenty Five + 00/<sub>100</sub> Dollars

**WORLD SAVINGS BANK, FSB**  
 3 NORTH TEJON  
 COLORADO SPRINGS, COLORADO 80903

For EPNG AGS #1-21 [Signature]

MICR: ⑆ 102189285⑆ 1173 ⑆ 663511681⑆

CHECKS ARE VOID AFTER 6 MONTHS  
 TO REORDER: 1-800-394-2344 • www.worldsavings.com

Security Features Included. Details on Back.

**RECEIPT** Date 3-21-2006 No. 3139

Received From El Paso Nat Gas Company  
 Address 2 North Nevada Ave, Colorado Springs, CO 80903  
(25) Twenty five and no/100 Dollars \$  
 For Filing fee permit 933

ACCOUNT		HOW PAID	
AMT. OF ACCOUNT		CASH	
AMT. PAID		CHECK	<u>73 25 00</u>
BALANCE DUE		MONEY ORDER	

By SL Rainz

8K806 Radiform

EL PASO NATURAL GAS COMPANY  
P.O. BOX 4430  
HOUSTON, TX 77210-4430

REMITTANCE ADVICE

CHECK DATE 01/19/2006  
CHECK NUMBER 07530562  
VENDOR NUM F000004071

ARIZONA OIL & GAS CONSERVATION  
COMMISSION  
416 WEST CONGRESS STE 100  
TUCSON, AZ 85201

*This check was  
lost by UPS*

RETAIN FOR YOUR RECORDS

Refer Payment Inquires to EPGTR - 713-420-4200

Voucher ID	Invoice Number	Invoice Date	Discount	Paid Amount
00255412	CKREQ060113 Off 1032 Colorado Springs, CO	01/13/2006	0.00	25.00
TOTAL			\$0.00	\$25.00

EL PASO NATURAL GAS COMPANY  
P.O. BOX 4430  
HOUSTON, TX 77210-4430

CITIBANK DELAWARE  
A Subsidiary of Citicorp  
One Penn's Way

01/19/2006 07530562

62-20  
311

Amount

\$ **\*\*\*25.00**

VOID AFTER ONE YEAR

Pay \*\*\*TWENTY-FIVE AND XX / 100 US DOLLAR\*\*\*

To The Order Of ARIZONA OIL & GAS CONSERVATION  
COMMISSION

*[Signature]*  
Authorized Signature

07530562 031100209

38691601

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS

Bond Serial No. 23-007-048

That we: El Paso Natural Gas Company

of the County of El Paso in the State of Colorado

as principal, and Liberty Mutual Insurance Company

of 175 Berkeley Street, Boston, MA 02117

AUTHORIZED TO DO BUSINESS WITHIN THE STATE OF ARIZONA

as surety, are held and firmly bound unto the State of Arizona and the Oil and Gas Conservation Commission, hereinafter referred to as the "Commission", in the penal sum of Twenty Five Thousand and 00/100 Dollars, (\$25,000.00) lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The conditions of this obligation are that, whereas the above bounden principal proposes to drill a well or wells for oil, gas or stratigraphic purposes in and upon the following described land situated within the State, to-wit:

Sections 11 + 20 T7S, R8E Pinal County, Arizona

(May be used as blanket bond or for single well)

NOW THEREFORE, if the above bounden principal shall comply with all the provisions of the Laws of this State and the rules, regulations and orders of the Commission, especially with reference to the requirements of A.R.S. § 27-516, providing for the proper drilling, casing and plugging of said well or wells, and filing with the Oil and Gas Conservation Commission all notices and records required by said Commission, then in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, this obligation is void; otherwise it shall remain in full force and effect.

Whenever the principal shall be, and declared by the Oil and Gas Conservation Commission in violation of the Laws of this State and the rules, regulations and orders of the Commission, the surety shall promptly:

- 1. Remedy the violation by its own efforts, or
2. Obtain a bid or bids for submission to the Commission to remedy the violation, and upon determination by the Commission and the surety of the lowest responsible bidder, arrange for a contract between such bidder and the Commission, and make available as work progresses sufficient funds to pay the cost of remedying the violation; but not exceeding, including other costs and damages for which the surety may be liable hereunder, the amount set forth in the first paragraph hereof.

Liability under this bond may not be terminated without written permission of this Commission.

WITNESS our hands and seals, this 2 day of March, 20 05

El Paso Natural Gas Company
Greg G. Gubler Senior Vice President
Principal

WITNESS our hands and seals, this 1st day of March, 20 05

Liberty Mutual Insurance Company
Suzanne Holden, Attorney-In-Surety Fact
Countersignature Not Required

(Surety, Resident Arizona Agent
If issued in a state other than Arizona)

(If the principal is a corporation, the bond should be executed by its duly authorized officers, with the seal of the corporation affixed. When principal or surety executes this bond by agent, power of attorney or other evidence of authority must accompany the bond.)

Approved Date 3-21-2005
STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION
By: SL Rainz

STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION
Bond
File Two Copies
Form No. 2

Permit No. Blanket

**NOTICE FROM SURETY REQUIRED BY  
TERRORISM RISK INSURANCE ACT OF 2002**

In accordance with the Terrorism Risk Insurance Act of 2002 (referred to hereinafter as the "Act"), this disclosure notice is provided for surety bonds on which one or more of the following companies is the issuing surety: Liberty Mutual Insurance Company; Liberty Mutual Fire Insurance Company; LM Insurance Corporation; The First Liberty Insurance Corporation; Liberty Insurance Corporation; Employers Insurance Company of Wausau (formerly "EMPLOYERS INSURANCE OF WAUSAU A Mutual Company"); Peerless Insurance Company; and any other company that is a part of or added to the Liberty Mutual Group for which surety business is underwritten by Liberty Bond Services (referred to collectively hereinafter as the "Issuing Sureties").

**NOTICE FORMS PART OF BOND**

This notice forms part of surety bonds issued by any one or more of the Issuing Sureties.

**DISCLOSURE OF PREMIUM**

The premium attributable to any bond coverage for "acts of terrorism" as defined in Section 102(1) of the Act is Zero Dollars (\$0.00).

**DISCLOSURE OF FEDERAL PARTICIPATION  
IN PAYMENT OF TERRORISM LOSSES**

The United States will reimburse the Issuing Sureties for ninety percent (90%) of any covered losses from terrorist acts certified under the Act exceeding the applicable surety deductible.

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

LIBERTY MUTUAL INSURANCE COMPANY
BOSTON, MASSACHUSETTS
POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS: That Liberty Mutual Insurance Company (the "Company"), a Massachusetts stock insurance company, pursuant to and by authority of the By-law and Authorization hereinafter set forth, does hereby name, constitute and appoint PATRICK D. DINEEN, HEIDI BOCKUS, THOMAS J. JOCHUMS, KATHIE L. WIEGERS, SUZANNE HOLDEN, THERESA A. LAMB, KRISTA M. LEE, ALL OF THE CITY OF SEATTLE, STATE OF WASHINGTON

each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations in the penal sum not exceeding SEVENTY-FIVE MILLION AND 00/100 DOLLARS (\$ 75,000,000.00) each, and the execution of such undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company in their own proper persons.

That this power is made and executed pursuant to and by authority of the following By-law and Authorization:

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

By the following instrument the chairman or the president has authorized the officer or other official named therein to appoint attorneys-in-fact:

Pursuant to Article XIII, Section 5 of the By-Laws, Garnet W. Elliott, Assistant Secretary of Liberty Mutual Insurance Company, is hereby authorized to appoint such attorneys-in-fact as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

That the By-law and the Authorization set forth above are true copies thereof and are now in full force and effect.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Company and the corporate seal of Liberty Mutual Insurance Company has been affixed thereto in Plymouth Meeting, Pennsylvania this 16th day of December 2004

LIBERTY MUTUAL INSURANCE COMPANY

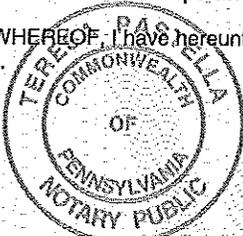
By Garnet W. Elliott, Assistant Secretary



COMMONWEALTH OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 16th day of December, 2004, before me, a Notary Public, personally came Garnet W. Elliott, to me known, and acknowledged that he is an Assistant Secretary of Liberty Mutual Insurance Company; that he knows the seal of said corporation; and that he executed the above Power of Attorney and affixed the corporate seal of Liberty Mutual Insurance Company thereto with the authority and at the direction of said corporation.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires Mar. 28, 2005
Member, Pennsylvania Association of Notaries

By Teresa Pastella, Notary Public

CERTIFICATE

I, the undersigned, Assistant Secretary of Liberty Mutual Insurance Company, do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy, is in full force and effect on the date of this certificate; and I do further certify that the officer or official who executed the said power of attorney is an Assistant Secretary specially authorized by the chairman or the president to appoint attorneys-in-fact as provided in Article XIII, Section 5 of the By-laws of Liberty Mutual Insurance Company.

This certificate and the above power of attorney may be signed by facsimile or mechanically reproduced signatures under and by authority of the following vote of the board of directors of Liberty Mutual Insurance Company at a meeting duly called and held on the 12th day of March, 1980.

VOTED that the facsimile or mechanically reproduced signature of any assistant secretary of the company, wherever appearing upon a certified copy of any power of attorney issued by the company in connection with surety bonds, shall be valid and binding upon the company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the said company, this 1st day of March, 2005



By David M. Carey, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, bank deposit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

**All-Purpose  
Certificate of Acknowledgment**

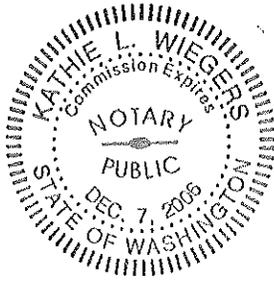
State of Washington  
County of King }

On March 1, 2005 before me, Kathie L. Wieggers,  
DATE NAME OF NOTARY PUBLIC

personally appeared Suzanne Holden  
NAME(S) OF SIGNER(S)

personally known to me - **OR**

proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



Witness my hand and official seal.

*Kathie L. Wieggers*  
SIGNATURE OF NOTARY PUBLIC

Though the data below is not required by law, it may prove valuable to persons relying on the document and prevent fraudulent reattachment of this form.

**CAPACITY CLAIMED BY SIGNER**

- Individual(s)
- Corporate Officer:
- Title(s)
- Partner(s)
- Attorney-in-Fact
- Trustee(s)
- Subscribing Witness
- Guardian/Conservator
- Other:

**DESCRIPTION OF ATTACHED DOCUMENT(S)**

Type of Document  
**Performance Bond**

Number of Pages  
**Two (2)**

Date of Document  
**March 1, 2005**

Signer(s) Other Than Named Above  
**El Paso Natural Gas Company**

**SIGNER IS REPRESENTING:**  
NAME OF PERSON(S) OR ENTITY(IES)  
**Liberty Mutual Insurance Company**

# ORGANIZATION REPORT

Full Name of the Company, Organization, or Individual

El Paso Natural Gas Company

Mailing Address and Phone Number

PO Box 1087 Colorado Springs CO 80944-1087 (719)473.2300

Plan of Organization (State whether organization is a corporation joint stock association, firm or partnership, or individual Corporation)

Purpose of Organization (State type of business in which engaged)  
Natural Gas Transmission

If a reorganization, give name and address of previous organization

If a foreign corporation give (1) State where incorporated	(2) Name and mailing address of state agent	(3) Date of permit to do business in state
Delaware	CT Corporation System 3225 N. Central Avenue Phoenix AZ 85012	(AZ) May 22, 1936
Principal Officers or Partners (if partnership) NAME	TITLE	MAILING ADDRESS
James J. Cleary	President	P O Box 1087 Co Springs CO 80944 - 1087
William H. Healy, Jr.	Vice President	P O Box 1087 Co Springs CO 80944-1087
Thomas P. Morgan	Vice President	P O Box 1087 Co Springs CO 80944-1087
Catherine E. Palazzari	Vice President	P O Box 1087 Co Springs CO 80944-1087
Donald J. Zinko	Vice President	P O Box 1087 Co Springs CO 80944-1087
DIRECTORS NAME		MAILING ADDRESS

James J. Cleary	P O Box 1087 Co Springs CO 80944-1087
Greg G. Gruber	1001 Louisiana St Houston TX 77002
John W. Somerhalder II	1001 Louisiana St Houston TX 77002

CERTIFICATE I, the undersigned, under the penalty of perjury state that I am the Corporate Secretary of the El Paso Natural Gas Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

*Stacy F. James*  
Signature

2-16-05  
Date

STATE OF ARIZONA  
OIL & GAS CONSERVATION COMMISSION  
Organization Report  
File One Copy  
Form No. 1

Mail completed form to  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W Congress., #100  
Tucson, AZ 85701

## EL PASO NATURAL GAS

**Operator:** El Paso Natural Gas Company

**Bond Company:** Liberty Mutual Insurance

**Bond No.:** 23-007-048

**Amount:** \$25,000.00

**Date of Bond:** 3/2/2005

**Date approved:** 3/21/2005

### **Permits covered by this bond:**

925 Plugged 9/5/05

926 Plugged 8/6/05

928 Expired, not drilled

933 TA 10/16/06

August 8, 2007

Mr. Steven Rauzi  
State of Arizona  
Oil and Gas Conservation Commission  
416 West Congress  
Suite 100  
Tucson, AZ 85701

Re: El Paso Natural Gas Company  
AGS #1-21  
Section 21, T7S, R8E  
Pinal County, AZ  
AZOGCC Permit #933

933

Through Oct '09

Dear Mr. Rauzi:

Pursuant to the Arizona Administrative Code R12-7-121-C El Paso Natural Gas Company (EPNG) requests that all well completion information from the captioned wells be kept confidential for an additional two years (three years total). As you are aware EPNG is working toward the development of a salt cavern gas storage facility in Section 21, T7S, R8E, Pinal County AZ. The disclosure of this information could harm our competitive position with relation to the development of the facility and the possible need to purchase additional acreage.

Please let me know if you have any questions or concerns.

Sincerely Yours,



Greg W. Gettman  
Manager, Business Development  
El Paso Natural Gas Company  
Office 719-520-4533  
Cell 719-351-4093

RECEIVED  
AUG 13 2007



933

# Lack of natural gas storage space means volatility

**Mark Shaffer**  
The Arizona Republic  
Mar. 21, 2007 08:15 PM

When the coldest weather in a quarter-century struck the state in January, it was more than just a meteorological phenomenon.

Thousands of Southwest Gas customers, from Bullhead City to Maricopa to just north of the Mexican border, were without heating fuel, some for up to two days.

The event highlights a continuing concern in the state.

Arizona is the only state in the Four Corners region with no natural-gas storage, leaving it open to potential shortages. In addition, consumers have no cost protection except the skill of gas traders in hedging the volatile natural-gas spot market.

On top of that, natural gas is increasingly used as a power source for electric generation, especially during the summer months.

With the closest storage facilities 700 miles away in west Texas and California's prohibition on natural-gas storage for out-of-state users, the situation could become critical if there is a terrorist attack on pipelines or an accident such as Kinder Morgan's 2003 pipeline break in Tucson. Cold weather, at times, also has slowed natural-gas delivery to Arizona from northwestern New Mexico to a trickle.

## In-state storage

The Arizona Corporation Commission conducted a special hearing last month after losing patience with the proposed El Paso Natural Gas Co. storage project just outside Eloy's city limits. The hearing was triggered by the company's failure to file any preapproval paperwork with government agencies that would officially sign off on the project.

Last year, the company announced that it would excavate a series of deep salt caverns next to privately owned prisons and store about 3.5 billion cubic feet of natural gas, or enough to serve about 735,000 homes.

But questions have been raised about how El Paso Natural Gas, which is the transmission company, would remove brine, which is the mix of salt and water created when water is used to hollow out subterranean salt deposits about 3,000 feet below ground.

El Paso Natural Gas officials said Tuesday that the project has been delayed but that it is still expected to be up and running by 2011.

"The project is very much alive," said Richard Wheatley, an El Paso Natural Gas spokesman in Houston. "We're doing test digs below the salt to know if it is good for brine disposal."

Wheatley said the project would cost between \$100 million and \$175 million, depending on the ultimate size and contracts struck with other energy companies. Wheatley said the method of financing the project had not been determined.

Tom Dobson, manager of the Arizona gas-storage project, said an application is expected to be filed with the Federal Energy Regulatory Commission by December or early 2008.

Residents of Eloy have been largely supportive of the project because it is expected to bring in about \$3 million annually in city taxes, said Joe Blanton, Eloy's interim city manager. Blanton said the city is working on a development agreement and rezoning issues with El Paso Natural Gas.

"The big picture for Arizona first and foremost is reliability of supply," Dobson said. "Fossil fuels have to be imported basically because if they aren't out of state they are far away in-state from the Phoenix area. Our project would move production to within 40 miles of Phoenix."

### **Vanishing options**

The Eloy site appears to be the last alternative for the Phoenix area for natural-gas storage.

A promising salt cavern was discovered a decade ago in Glendale near Luke Air Force Base. El Paso Natural Gas purchased the land, but the state Legislature prohibited development of the site for natural-gas storage.

Likewise, another potential site was found near Kingman and purchased by Aguila Energy Co. five years ago. But that area in northwestern Arizona is too far away to help natural-gas needs in the Valley and was recently purchased by real estate development interests.

According to a recent filing with the commission, Arizona Public Service Co. officials said they have sufficient pipeline reliability and natural-gas storage space in the Permian Basin and Waha sites of west Texas, after increased allocations were made five years ago.

But an increase in the price of pipeline use this year and "substantial financial penalties" from imbalances in pipeline usage have APS officials looking for other alternatives in natural-gas storage, according to the document.

933

Randy Dietrich, fuels manager for Salt River Project, said pipeline imbalances typically catch shippers by surprise.

"If all the shippers don't buy sufficient quantities, the pressure in the pipeline can fall dramatically and the supplier says they can't overburn (produce more to rectify the loss of pressure). And if they do, we all have to pay a lot of penalties," Dietrich said. "In cases like that, it sure would be great to have local storage that can be called on at short notice."

Dietrich also said that even the additional storage capacity near Eloy could have an impact on prices to consumers.

"You used to be able to count on gas costs going up in the winter and down in the summer, but during the past 10 years, there has been so much construction of gas-fired plants that summer demand is almost the same," Dietrich said. "Trying to hedge that is increasingly speculative and having gas stored at home could help some on price."

But the main advantage of local storage is having gas at hand when state consumers need it, said Damon Gross, an APS spokesman.

"That will ensure reliability and it can help against price volatility, but there's no guarantee," Gross said.

Reach the reporter at [mark.shaffer@arizonarepublic.com](mailto:mark.shaffer@arizonarepublic.com) or (602) 444-8057.

933

933

2-9-07

Greg Gettman called  
Completing clean up of 1-21 loc  
All cuttings + tarp removed to proper landfill  
Needs about 150 tons dirt to build up loc

= 1 of leveling of loc w/out need for dirt.  
El Pas. is owner + if ok with them ok with me.

SCR

December 11, 2006

Mr. Steven Rauzi  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W. Congress #100  
Tucson, AZ 85701-1315

933

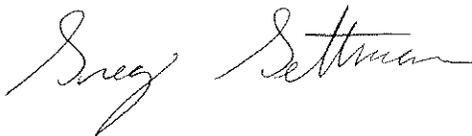
Re: El Paso Natural Gas Company  
AGS #1-21  
Section 21, T7S, R8E  
Pinal County, Arizona  
AZOGCC Permit #933

Dear Steve:

Attached for your records is the color copy of the Schlumberger Combinable Magnetic Resonance Log from covering the interval from 7,700' to 8,795'. Please keep this and the other logs, drilling and completion data from the AGS #1-21 confidential as provided for in R12-7-121(C).

If you have any questions or problems with the attached, please give me a call at (719) 520-4533.

Sincerely,



Greg Gettman  
Manager, Facility Planning  
El Paso Natural Gas Company

RECEIVED

DEC 13 2006

November 15, 2006

Mr. Steven Rauzi  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W. Congress #100  
Tucson, AZ 85701-1315

933

Re: El Paso Natural Gas Company  
AGS #1-21  
Section 21, T7S, R8E  
Pinal County, Arizona  
AZOGCC Permit #933

Dear Steve:

Attached for your review are two copies of the revised Sundry Notice and Reports Form requesting authority from the Arizona Oil and Gas Conservation Commission to temporarily abandon the AGS #1-21 for a period of up to three years. This form incorporates the additional information you requested from R12-7-125.

Also attached are two copies of the Detail of Formations Penetrated Log for inclusion with the previously filed Well Completion or Recompletion Report. In addition I have included:

- ✓ 1. Zia Geological Mud log with sample descriptions from 2,720' to 7,922'
- ✓ 2. EPNG sample descriptions from 95' to 2,800' and 7,922' to 8,784'
- ✓ 3. Schlumberger Color PEX Array Induction, Gamma, SP Log 5,639' – 7,927'
- ✓ 4. Schlumberger Color Combinable Magnetic Resonance Log 5,639' – 7,927'
- ✓ 5. Schlumberger Color Elemental Capture Log 5,639' – 7,927'
- ✓ 6. Schlumberger Color PEX Compensated Neutron Litho Density 5,639' – 7,927'
- ✓ 7. Schlumberger Cement Bond Log 60'-5,612'

I will provide you with color copies from of the third Schlumberger logging run covering the interval from 7,922' to 8,795' once Schlumberger gets copies to me. If you have any questions or problems with the attached, please give me a call at (719) 520-4533.

Sincerely,



Greg Gettman  
Manager, Facility Planning  
El Paso Natural Gas Company

10-10-2006.

Greg Gettaman, El Paso Natural Gas called today to request extension of the proposed total depth on the 1-21 AGS (permit 933) by 1,000 ft.

El Paso has sufficient surety bond to cover a PTD of 9,999 ft so I approved the extension.

SL Raining

October 5, 2006

Mr. Steven Rauzi  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W. Congress #100  
Tucson, AZ 85701-1315

Re: El Paso Natural Gas Company  
AGS #1-21  
Section 21, T7S, R8E  
Pinal County, Arizona  
AZOGCC Permit #933

RECEIVED

OCT 10 2006

Dear Steve:

Attached for your review are two copies of the Sundry Notice and Reports Form requesting authority from the Arizona Oil and Gas Conservation Commission to temporarily abandon the AGS #1-21 for a period of up to three years. This Temporary Abandonment is necessary for El Paso Natural Gas to apply for a Temporary Aquifer Protection Permit with the Arizona Department of Environmental Quality and a Class I disposal permit from the Environmental Protection Agency to conduct injection testing in this well bore. If you have any questions or problems with the attached, please give me a call at (719) 520-4533.

Sincerely,



Greg Gettman

Manager, Facility Planning  
El Paso Natural Gas Company

**SUNDRY NOTICES AND REPORTS ON WELLS**

1. Name of Operator El Paso Natural Gas Company  
 2. OIL WELL  GAS WELL  OTHER  (Specify) Stratigraphic Test  
 3. Well Name AGS #1-21  
 Location 1980' FNL, 660' FWL  
 Sec. 21 Twp. 7S Rge. 8E County Pinal, Arizona  
 4. Federal, State, or Indian Lease Number, or lessor's name if fee lease  
Owned by El Paso Natural Gas  
 5. Field or Pool Name NA

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

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF  PULL OR ALTER CASING   
 FRACTURE TREAT  DIRECTIONAL DRILL   
 SHOOT OR ACIDIZE  PERFORATE CASING   
 REPAIR WELL  CHANGE PLANS   
 (OTHER) \_\_\_\_\_

SUBSEQUENT REPORT OF:

WATER SHUT-OFF  WEEKLY PROGRESS   
 FRACTURE TREATMENT  REPAIRING WELL   
 SHOOTING OR ACIDIZING  ALTER CASING   
TEMPORARY ABANDONMENT   
 (OTHER) \_\_\_\_\_

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log, Form 4)

1. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.

El Paso Natural Gas Company (EPNG) is in the process of drilling the AGS #1-21 stratigraphic test well. We currently anticipate completing the drilling and initial testing of this well during the week of October 9th, 2006. At the completion of drilling the AGS #1-21 we will have surface 13 3/8" casing set and cemented from 1,604' KB to the surface and 9 5/8" intermediate casing set at 5,640' KB and also cemented to the surface. The remainder of the well bore from 5,940' KB to the projected total depth at approximately 7,900' will be left open hole. At the conclusion of drill stem testing EPNG intends to install a master valve at the surface and set a Baker cast iron bridge plug depth of approximately 5,420' to seal off the well bore.

EPNG is requesting approval from the Arizona Oil and Gas Conservation Commission to temporarily abandon the AGS #1-21 a period of up to three years while we apply for and wait on the processing of the necessary permits from the Arizona Department of Environmental Quality and the Environmental Protections Agency to conduct injection testing in this well bore to evaluate the suitability of the open hole portion of this well bore for brine disposal associated with the potential development of a salt cavern natural gas storage facility at this site.

8. I hereby certify that the foregoing is true and correct.

Signed [Signature] Title Manager Date 10-5-2006

Permit No. 933

**RECEIVED**  
OCT 10 2006

**STATE OF ARIZONA**  
**OIL & GAS CONSERVATION COMMISSION**  
 Sundry Notice and Reports On Wells  
 File One Copy  
 Form No. 25

**SUNDRY NOTICES AND REPORTS ON WELLS**

1. Name of Operator El Paso Natural Gas Company  
 2. OIL WELL  GAS WELL  OTHER  (Specify) Stratigraphic Test  
 3. Well Name AGS #1-21  
 Location 1980' FNL, 660' FWL  
 Sec. 21 Twp. 7S Rge. 8E County Pinal, Arizona  
 4. Federal, State, or Indian Lease Number, or lessor's name if fee lease  
Owned by El Paso Natural Gas  
 5. Field or Pool Name NA  
 6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	WEEKLY PROGRESS <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	DIRECTIONAL DRILL <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	PERFORATE CASING <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ALTER CASING <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(OTHER) <u>TEMPORARY</u> <input type="checkbox"/>	ABANDONMENT <input checked="" type="checkbox"/>
(OTHER) _____		(OTHER) _____	

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log, Form 4)

1. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.

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8. I hereby certify that the foregoing is true and correct.

Signed [Signature] Title Manager Date 10-5-2006

Permit No. 933

**RECEIVED**  
OCT 10 2006

**STATE OF ARIZONA**  
**OIL & GAS CONSERVATION COMMISSION**  
 Sundry Notice and Reports On Wells  
 File One Copy  
 Form No. 25

**Subject:** FW: Southwest Gryo Deviation Survey to the top of Fish on AGS #1-21  
**From:** "Gettman, Greg W" <Greg.Gettman@ElPaso.com>  
**Date:** Thu, 21 Sep 2006 14:18:33 -0600  
**To:** Steve Rauzi <steve.rauzi@azgs.az.gov>

933

Greg W. Gettman  
Manager, Facility Planning  
El Paso Western Pipelines  
2 North Nevada Ave.  
Colorado Springs, CO 80903  
(719) 520-4533 Office  
(719) 351-4093 Cell  
(719) 520-3792 Fax

-----Original Message-----

From: Gettman, Greg W  
Sent: Monday, August 28, 2006 9:57 AM  
To: Gentges, Richard J (Rick); Lentz, Jac; Veatch, David I (David)  
Subject: FW: Southwest Gryo Deviation Survey to the top of Fish on AGS #1-21

fyi

-----Original Message-----

From: Varcoe, Brian E. [<mailto:Brian.Varcoe@weatherford.com>]  
Sent: Sunday, August 27, 2006 3:25 PM  
To: Kennedy Jr, Larry D; Rasmussen, Pat D.  
Cc: Brugeman, John D (Dan); Gettman, Greg W  
Subject: RE: Southwest Gryo Deviation Survey to the top of Fish on AGS #1-21

Based upon new info here is a revised draft plan. Since we have some inclination it would be best just to drop to 0 inclination and hold to casing point. If I understand the location correctly as 1980 FNL and 660 FWL (well center is in the NW 1/4 of Section 21) and you own the NW 1/4 and the north 1/2 of the SW 1/4 this should be okay unless you have other offset requirements.

I'm sorry the fax number (281-260-4730) didn't work. I did a test fax here and it is working so I do not know what the problem is.

Regards, Brian

-----Original Message-----

From: Kennedy Jr, Larry D [<mailto:Larry.Kennedy@ElPaso.com>]  
Sent: Sunday, August 27, 2006 12:55 PM  
To: Varcoe, Brian E.; [pat.rasmussen@precision-es.com](mailto:pat.rasmussen@precision-es.com)  
Cc: Brugeman, John D (Dan); Gettman, Greg W  
Subject: FW: Southwest Gryo Deviation Survey to the top of Fish on AGS #1-21

Pat and Brain

Attached is the survy run from yesterday. Please include in the plan getting the well back to vertical and away from the lease line which is 660' to the west of the well's surface location.

Larry

---

From: Gettman, Greg W

Sent: Sun 8/27/2006 11:31 AM  
To: Brugeman, John D (Dan); Gentges, Richard J (Rick); Kennedy Jr, Larry D; Lentz, Jac; Veatch, David I (David); Buschbom, Klaus  
Cc: [CurtisBagwell@aol.com](mailto:CurtisBagwell@aol.com)  
Subject: Southwest Gyro Deviation Survey to the top of Fish on AGS #1-21

The attached files contain the results of the Southwest Exploration gyro deviation survey we ran on the AGS #1-21. As you can see, the deviation begins at 1,300' and continues to increase to over 8 degrees at the top of the fish. Consequently, I recommend that we have Weatherford develop a directional program to get us back to vertical and away from the lease line by the casing set depth.

I do not have the e-mail addresses for the Weatherboard directional personnel we talked to yesterday about designing the program. Dan or Larry, please forward to Weatherford ASAP.

Thanks,

Greg G.

\*\*\*\*\*  
This email and any files transmitted with it from the ElPaso Corporation are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.

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<b>AGS #1-21 SIDETRACK DRAFT rev.pdf</b>	<b>Content-Description:</b> AGS #1-21 SIDETRACK DRAFT rev.pdf <b>Content-Type:</b> application/octet-stream <b>Content-Encoding:</b> base64
--	---

**Subject:** FW: Southwest Gryo Deviation Survey to the top of Fish on AGS #1-21  
**From:** "Gettman, Greg W" <Greg.Gettman@ElPaso.com>  
**Date:** Thu, 21 Sep 2006 14:21:27 -0600  
**To:** Steve Rauzi <steve.rauzi@azgs.az.gov>

Greg W. Gettman  
Manager, Facility Planning  
El Paso Western Pipelines  
2 North Nevada Ave.  
Colorado Springs, CO 80903  
(719) 520-4533 Office  
(719) 351-4093 Cell  
(719) 520-3792 Fax

---

**From:** Gettman, Greg W  
**Sent:** Sunday, August 27, 2006 11:31 AM  
**To:** Brugeman, John D (Dan); Gentges, Richard J (Rick); Kennedy Jr, Larry D; Lentz, Jac; Veatch, David I (David); Buschbom, Klaus  
**Cc:** CurtisBagwell@aol.com  
**Subject:** Southwest Gryo Deviation Survey to the top of Fish on AGS #1-21

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Thanks,  
Greg G.

\*\*\*\*\*  
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\*\*\*\*\*



**Southwest Exploration Services, LLC**  
 geophysical & geospatial services

## GYRO - Deviation Plot: Bulls-Eye View

Survey Calculation Method : *Minimum Curvature*

Gyro Reference : True North

Mag Declination : 12.5 Deg

WELL # AGS1-21  
 CLIENT EL PASO NAT. GAS CO.  
 FIELD/SITE ELOY  
 COUNTY PRIMA STATE ARIZONA  
 OPERATOR Kevin Mitchell WITNESS ELPASO  
 Field Note: 100 FT STATIONS

DATE 8-26-06

FINAL LOCATION

CLOSURE DISTANCE 246 FT

BEARING 220.8 DEG

TVD 6189.7 FT

Cased hole survey PIPE

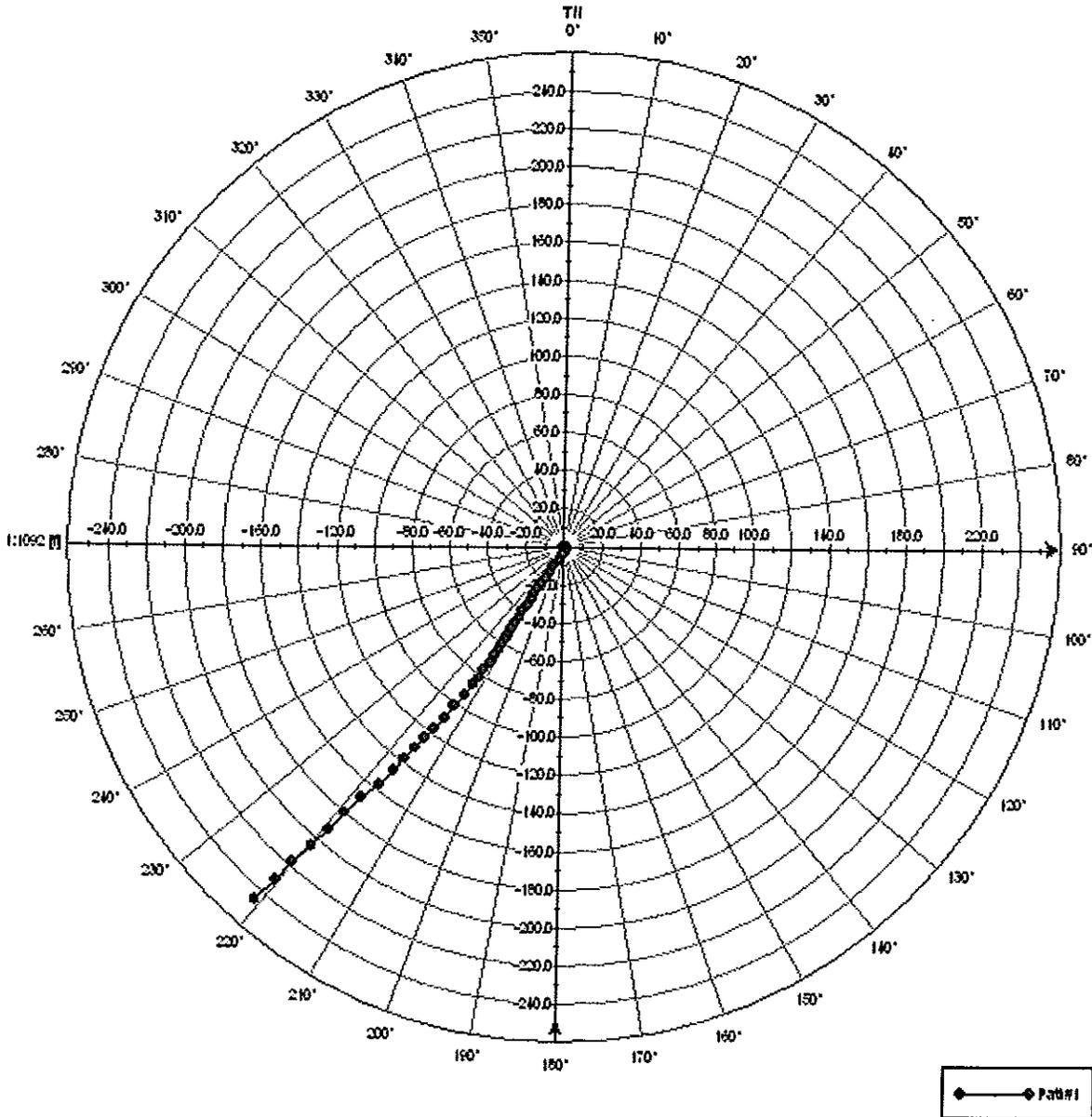
Centralized Yes

Tool Zero Reference Ground Level

Elevation: \_\_\_\_\_

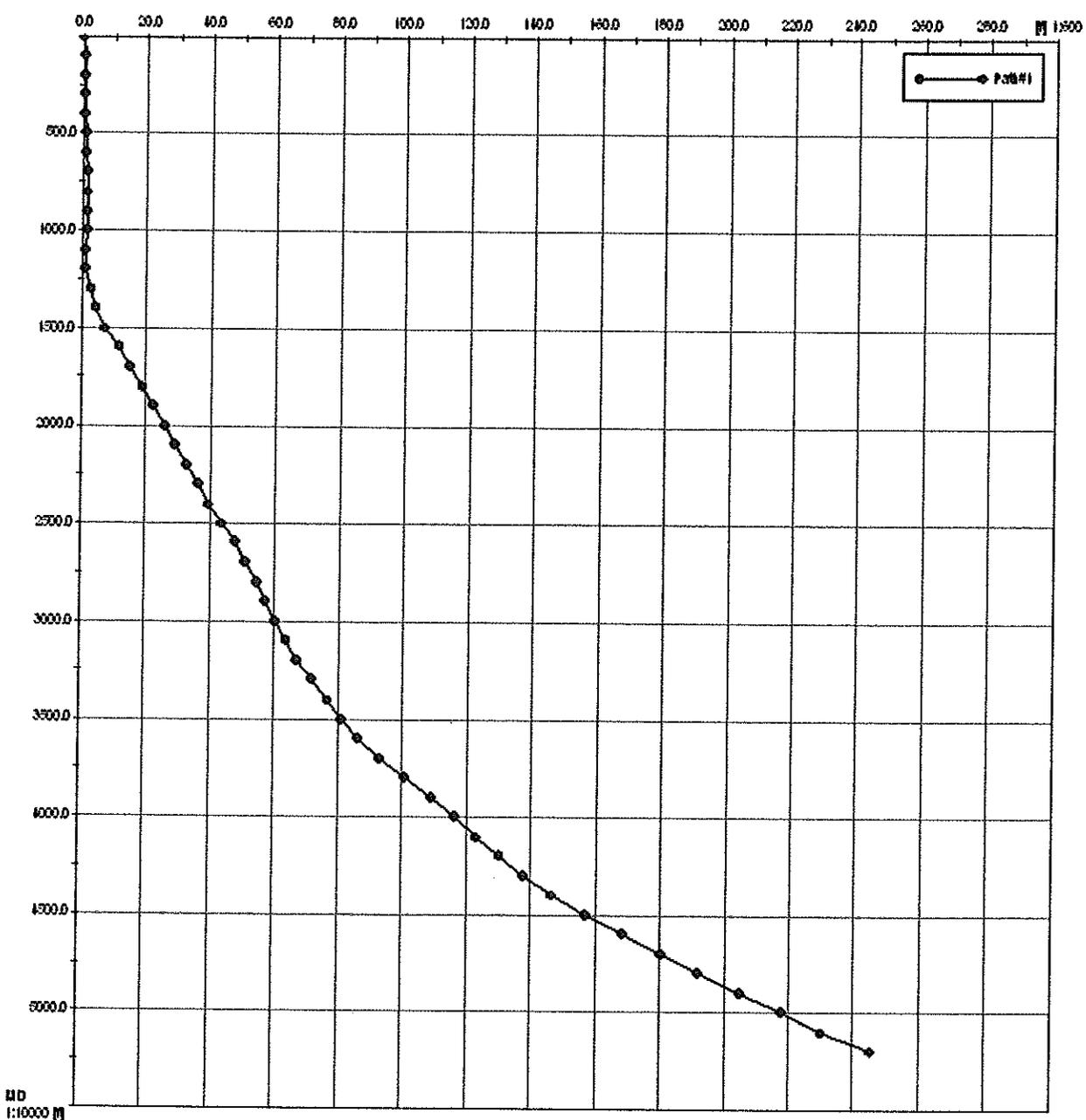
Tool Model Weinav. SRG 301040-1

Serial No: SWEXP-1





 <b>Southwest Exploration Services, LLC</b> geophysical & well services	<h2 style="margin: 0;">GYRO - Deviation Plot: Closure View</h2>		Gyro Reference : <u>True North</u> Mag Declination : <u>12.5 Deg</u>
	Survey Calculation Method : <u>Minimum Curvature</u>		
WELL # <u>AGS1-21</u> CLIENT <u>EL PASO NAT. GAS</u> FIELD/SITE <u>ELOY</u> COUNTY <u>PIVAL</u> STATE <u>ARIZONA</u> OPERATOR <u>Kevin Mitchell</u> WITNESS <u>EL PASO</u> Field Note: <u>100 FT STATIONS</u>	DATE <u>8-26-08</u>	FINAL LOCATION CLOSURE DISTANCE <u>245 FT</u> BEARING <u>220.8 Deg</u> TVD <u>5189.7 FT</u>	
	Cased hole survey <u>PIPE</u> Tool Zero Reference <u>Ground Level</u> Tool Model <u>Wetnav. SRG 301040-1</u>	Centralized <u>YES</u> Elevation: _____ Serial No: <u>SWEXP-1</u>	



TVD	Depth	AZIMUTH	TILT	Easting	Northing
[ft]	Closure Distance	Deg	Closure Angle	DLS	[ft]
	ft	[ft]	Deg	[deg/100ft]	
0.00	-999.000	-999.000	-999.000	0.000000	0.000000
-5.00616e-005	0.000000	0.000000	0.000000	0.000000	0.000000
100.00	42.1400	0.250000	0.292754	0.323543	
99.9990	0.436331	42.1400	0.0762000		
200.00	141.380	0.210000	0.521517	0.0371811	
199.998	0.522841	85.9221	0.107097		
300.00	166.510	0.200000	0.602946	-0.302254	
299.998	0.674463	116.624	0.0273487		
400.00	248.770	0.130000	0.391451	-0.384414	
399.997	0.548642	134.480	0.0680849		
500.00	95.3601	0.300000	0.912758	-0.433326	
499.996	1.01040	115.396	0.128107		
600.00	176.480	0.210000	0.935262	-0.799153	
599.995	1.23019	130.513	0.103205		
700.00	141.270	0.230000	1.18641	-1.11231	
699.995	1.62628	133.154	0.0409764		
800.00	43.3800	0.220000	1.45014	-0.833230	
799.994	1.67247	119.881	0.103449		
900.00	192.250	0.270000	1.35015	-1.29374	
899.993	1.86994	133.778	0.143933		
1000.00	310.550	0.120000	1.19101	-1.15758	
999.992	1.66087	134.184	0.104712		
1100.00	281.950	0.180000	0.883663	-1.09253	
1099.99	1.40516	141.033	0.0287080		
1200.00	199.190	0.0500001	0.854978	-1.17495	
1199.99	1.45310	143.958	0.0550596		
1300.00	187.530	0.730000	0.688019	-2.43802	
1299.98	2.53324	164.241	0.207601		
1400.00	221.150	1.35000	-0.862289	-4.21204	
1399.96	4.29940	191.570	0.257563		
1500.00	210.380	1.91000	-2.54788	-7.08735	
1499.90	7.53142	199.773	0.193833		
1600.00	216.050	2.35000	-4.96091	-10.4025	
1599.82	11.5249	205.496	0.148542		
1700.00	217.230	2.09000	-7.16736	-13.3063	
1699.75	15.1138	208.309	0.0804589		
1800.00	218.380	2.11000	-9.45330	-16.1925	
1799.68	18.7500	210.277	0.0142172		
1900.00	212.090	2.25000	-11.5390	-19.5186	
1899.60	22.6743	210.591	0.0844311		
2000.00	211.740	1.88000	-13.2648	-22.3086	
1999.55	25.9544	210.736	0.112841		
2100.00	211.750	1.97000	-15.0737	-25.2318	
2099.49	29.3915	210.855	0.0274320		
2200.00	210.180	2.11000	-16.9246	-28.4145	
2199.42	33.0731	210.779	0.0459427		
2300.00	209.920	1.79000	-18.4827	-31.1219	
2299.38	36.1964	210.705	0.0975728		
2400.00	218.850	2.03000	-20.7047	-33.8806	
2399.31	39.7061	211.429	0.116327		
2500.00	218.360	2.34000	-23.2386	-37.0821	
2499.23	43.7620	212.075	0.0946586		
2600.00	211.260	2.33000	-25.3482	-40.5574	
2599.15	47.8271	212.005	0.0881654		
2700.00	212.150	1.94000	-27.1497	-43.4236	
2699.09	51.2124	212.015	0.119297		
2800.00	205.550	1.96000	-28.6248	-46.5093	
2799.03	54.6122	211.611	0.0686844		
2900.00	207.470	1.68000	-29.9772	-49.1105	
2898.99	57.5367	211.400	0.0873326		
3000.00	213.190	1.68000	-31.5820	-51.5639	

2998.94	60.4670	211.487	0.0510921	
3100.00	210.910	1.73000	-33.1329	-54.1541
3098.90	63.4859	211.459	0.0256836	
3200.00	210.820	2.13000	-35.0371	-57.3459
3198.83	67.2023	211.424	0.121923	
3300.00	213.850	2.53000	-37.4959	-61.0120
3298.73	71.6129	211.573	0.127528	
3400.00	218.400	2.91000	-40.6493	-64.9905
3398.60	76.6560	212.025	0.133128	
3500.00	218.480	2.63000	-43.5045	-68.5826
3498.50	81.2171	212.388	0.0853512	
3600.00	218.800	3.09000	-46.8822	-72.7836
3598.35	86.5760	212.787	0.140291	
3700.00	217.530	3.82000	-50.9407	-78.0670
3698.13	93.2170	213.125	0.223710	
3800.00	219.880	4.54000	-56.0159	-84.1413
3797.82	101.082	213.653	0.225535	
3900.00	220.420	4.73000	-61.3626	-90.4191
3897.48	109.275	214.163	0.0594192	
4000.00	223.430	4.28000	-66.4932	-95.8389
3997.20	116.647	214.753	0.154892	
4100.00	223.670	3.78000	-71.0454	-100.607
4096.98	123.164	215.228	0.152486	
4200.00	222.760	4.07000	-75.8641	-105.818
4196.73	130.203	215.638	0.0904040	
4300.00	223.270	4.47000	-81.2062	-111.493
4296.42	137.932	216.068	0.122467	
4400.00	224.490	4.97000	-87.2774	-117.674
4396.05	146.507	216.564	0.155434	
4500.00	226.040	6.26000	-95.1264	-125.243
4495.45	157.273	217.218	0.395863	
4600.00	230.720	6.70000	-104.157	-132.629
4594.77	168.639	218.144	0.209423	
4700.00	227.490	6.81000	-112.898	-140.642
4694.06	180.350	218.755	0.120539	
4800.00	227.260	6.66000	-121.416	-148.513
4793.39	191.828	219.268	0.0464531	
4900.00	226.560	7.54000	-130.944	-157.535
4892.52	204.850	219.733	0.269512	
5000.00	226.540	7.64000	-140.594	-166.680
4991.64	218.057	220.148	0.0304899	
5100.00	225.010	6.88999	-149.078	-175.161
5090.91	230.013	220.401	0.236065	
5200.00	226.350	8.95000	-160.335	-185.900
5189.70	245.491	220.777	0.630365	

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 Content-Encoding: base64

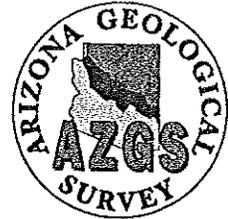
**AGS1-21GYRO-FINAL.TXT** Content-Description: AGS1-21GYRO-FINAL.TXT  
 Content-Type: text/plain



Janet Napolitano  
Governor

State of Arizona  
**Arizona Geological Survey**

416 W. Congress, Suite 100  
Tucson, Arizona 85701  
(520) 770-3500  
www.azgs.az.gov



M. Lee Allison  
Director and State Geologist

September 5, 2006

Greg Gettman  
El Paso Natural Gas Company  
PO Box 1087  
Colorado Springs CO 80944

933

Dear Mr. Gettman:

I received your letter and Sundry Notice dated August 30, 2006. I approve your proposed course of action in light of the problems you have encountered in the AGS #1-21 hole.

Sincerely,

A handwritten signature in cursive script that reads "Steven L. Rauzi".

Steven L. Rauzi  
Oil & Gas Administrator

Enclosure

August 30, 2006

Mr. Steven Rauzi  
State of Arizona  
Oil & Gas Conservation Commission  
416 West Congress  
Suite 100  
Tucson, AZ 85701

933

Re: El Paso Natural Gas Company  
AGS #1-21  
Section 21, T7S, R8E  
Pinal County, AZ  
AZOGCC Permit #933

Dear Mr. Rauzi:

Attached for your review and approval is the Sundry Notice to notify the Arizona Oil and Gas Conservation Commission of the problems we have experienced on the AGS #1-21. Also detailed are the steps I discussed with you over the phone on August 25 that we plan to take to resolve the situation. Please let me know if you have any questions or concerns.

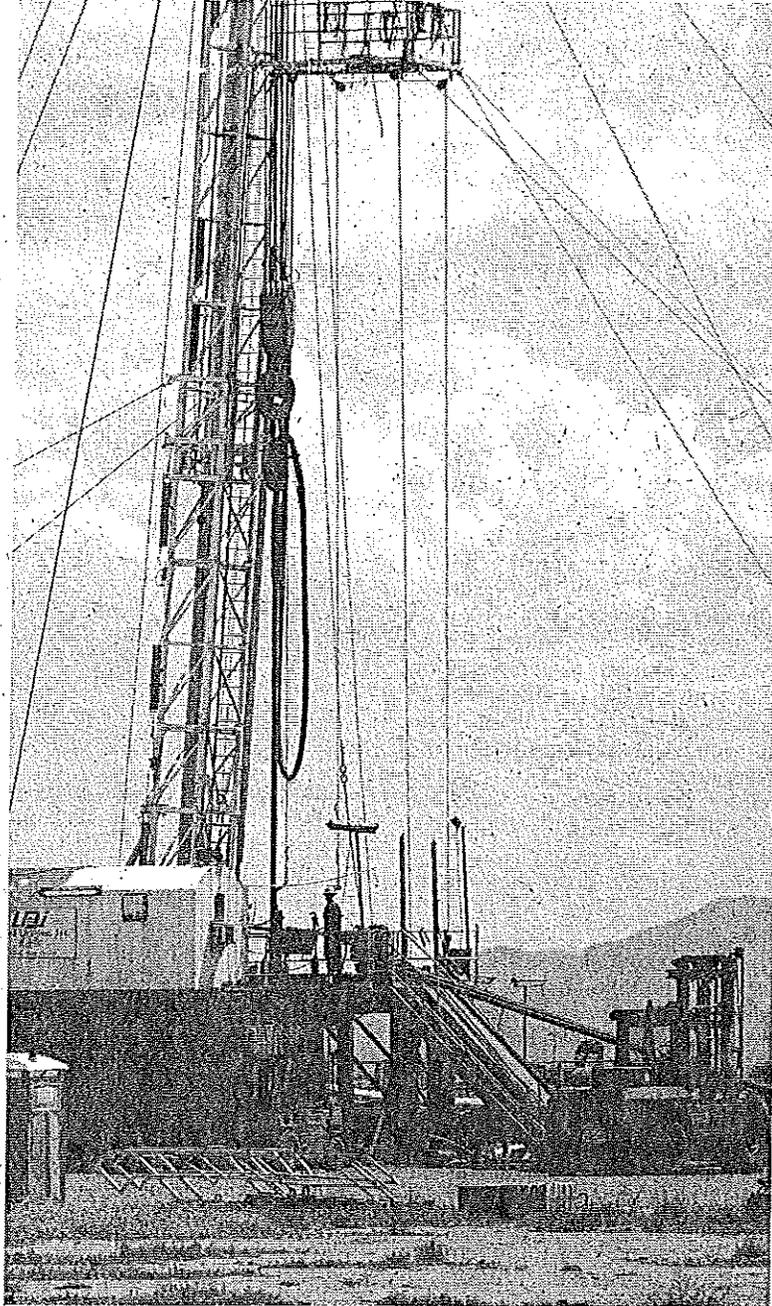
Sincerely Yours,



Greg Gettman  
Manager, Facility Planning  
El Paso Natural Gas Company  
Office 719-520-4533  
Cell 719-351-4093

# Deep drill

933



Staff photo by Temple A. Stark

El Paso Natural Gas employees are drilling a well in Eloy to test the possibility of building natural gas storage caverns. The well, which will be 7,500 to 8,000 feet deep, is for what's called a stratigraphic test, and the data analysis will give El Paso Natural Gas engineers further information about the geology in the area. They will use that information to determine the suitability of constructing salt caverns to store the gas deep below ground. The first of the caverns would open in mid-2010. Drilling began July 31 and is expected to continue for another five to six weeks.

7-12-06

Just rigging down on Enterprise hole

Enterprise hole to last 40 dys lasted 110 dys

Will clean big & hope start trucking next week

Hope to spud  $\approx$  7-24

Modify to do pump test

Notif. Christie Kilsobe ADEC Nancy Rumbill.

Atty Pinal Ways article - July 10

Eloy indicates some developers oppose project.



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933



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Wednesday 12 July, 2006

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### Natural Gas Storage Facility Comes to Eloy

by Jerilyn Martin, Editor

July 10, 2006

Email to a friend  Voice your opinion

**Pinal County is expected to see Arizona's first natural gas storage facility within the next four years. The project is proposed in Eloy, near the CCA prison, around La Palma and Arica roads.**

According to James Cleary, president of El Paso Natural Gas Company, Bisbee and Douglas became the first Arizona towns to receive natural gas by pipeline in 1931, thanks to a burgeoning copper industry scrambling for energy to fuel its smelters. Within two years, a natural gas pipeline was also serving Tucson and Phoenix.

Natural gas lines have served Arizona and crossed the state from Texas to California and back to New Mexico. Now, a storage facility will help to push this gas through the state and serve more areas in between for greater efficiency. In fact, the Federal Energy Regulatory Commission recently concluded that Arizona is one of the most natural gas storage-poor states in America.

Cleary said development of substantial underground natural gas storage is, therefore, critical to Arizona's energy future. Storage also promotes supply diversity and mitigates market price volatility, all of which benefit consumers. While storage is not a substitute for more supplies, it does significantly enhance the efficiency and reliability of existing pipelines.

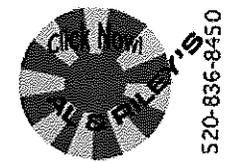
El Paso Natural Gas' Western Pipelines has purchased 240 acres with salt domes beneath the desert floor. The salt beds act as a barrier, a poison of sorts, that prevents plant growth, making the land area impractical for farmers and ideal for gas storage. Only 70 acres will house buildings and piping, enclosed with a fence. The storage facility will be very low profile and the company hopes the remaining acres will be utilized by the community, benefiting the Eloy area. Even though there are no housing units near the site, there soon will be as the population grows over the next five to 10 years. "We want to be active and we have this asset," Tom Dobson, business development manager for El Paso Western Pipelines, said. "We'll be here a long time. We want to find out what we can do."

Dobson also said that there are not many places in Arizona that have the salt dome formations. Kingman was one site, but it was too far away from Phoenix. The location, ideal for natural gas storage, is well suited to ensure steady supplies to meet the increasing heating and electricity generation needs of Arizona's growing economy. More than 70 percent of Arizona's natural gas consumption is used to generate electricity. That number is pretty impressive compared to only 20 percent in most states.

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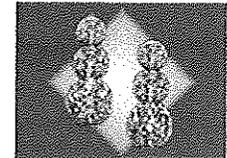


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"Arizona is predicted to be one of the top five fastest-growing states in the nation during the next 30 years," said Cleary. "That growth will increase demand for energy to sustain economic development in the state, and natural gas storage is one of the most efficient, low-cost and least environmentally disruptive ways to provide that energy to meet the needs of consumers."

El Paso is the largest operator of natural gas storage in the United States and has safely operated storage facilities across the United States since the 1940s to meet energy demand in major natural gas markets. The Arizona Natural Gas Storage project is to include state-of-the-art safety and efficiency features, such as remote emergency shutdown capabilities, below-surface shutoff valves, gas-leak detection with alarms, and advanced fire detection and suppression technology.

"Most people don't realize that we don't own the gas in our pipelines," Loren H. Locher, regional director of the El Paso Pipeline Group of Texas, said. "We're a transportation company like Federal Express."

### Uses

Natural gas is one of the nation's fastest-growing, clean-burning, domestic energy sources, according to the EIA Annual Energy Outlook 2006.

It is used across the U.S., and most of the supply comes from North America. There are many uses for natural, clean-burning gas across the board: 57 percent of households use the gas for heat and more than 90 percent of electricity capacities built in the last five years use natural gas.

Other uses for natural gas include fuel for cooking, cooling homes and providing an energy source for production of daily supplies such as fabrics, steel, processed foods and medical supplies.

### Supply/demand

The Energy Information Administration predicts that consumption of natural gas will increase by 22 percent over the next 20-some years. Today the supply of natural gas to the United States is about 24 percent. The development of new natural gas supplies will offset declining production from older producing natural gas fields.

Recent estimates by the Minerals Management Service and U.S. Geologic Survey for future undiscovered natural gas resources range as high as 1042 tcf (trillion cubic feet), enough to last more than 47 years at current production rates. Federal lands contain about 60 percent of the nation's estimated undiscovered natural gas. The United States produced 18.2 trillion cubic feet of natural gas in 2005.

In the past decade, demand for natural gas by Arizona's power plants has increased ten-fold. Since 2001 alone, more than 9,500 megawatts of new, natural gas-fired power generation has been installed. Moreover, the state's electric load, totaling 15,000 megawatts at summer peak, will continue to increase as the population and economy expand, according to the Governor's Essential Services Task Force. This will drive even greater demand for natural gas and place additional strains on limited pipeline-delivered supplies of natural gas.

Pinal County is leading the charge, issuing a reported 30 percent of 2005 Arizona housing permits. According to University of Arizona projections, residential permits for the Metro Phoenix area - Pinal and Maricopa counties - could average more than 56,000 units annually through 2015 and population growth could be 140,000 on an average annual basis.

## Eloy facility

933

The facility will bring much-needed storage capacity to Arizona - helping to meet rapidly growing demand for clean-burning natural gas and to ensure the reliability of Arizona's energy supplies well into the 21st century.

Nine miles of pipeline will be needed to link the storage caverns with the company's current network of pipes at a point somewhere along Arizona 87. One special feature for the Eloy facility is to have an automatic shut-off switch underground, activated by rapid changes in pressure differences. It is not, however, required for inland facilities.

One fear that always eventually comes out in the discussion is one of smell. Natural methane, Locher said, is almost entirely odorless and smells nothing like bovine-generated, hay-based emissions.

By 2010, El Paso Natural Gas plans to create storage deep underground, north of the city near the CCA prisons. The total capacity will be 3.5 billion cubic feet of methane. That's the equivalent of 2,000 megawatts of power or about a sixth of what Phoenix uses in a typical summer day.

The facility would be able to deliver 350 million cubic feet of natural gas per day, enough to meet the electricity needs of 735,000 homes on a daily basis.

El Paso expects to file an application for project approval with the Federal Energy Regulatory Commission in the third quarter of 2007. Subject to federal and state regulatory approvals, construction could begin in 2008. The company estimates the first cavern will be in service by mid-2010 and the remaining three caverns by 2011-2012.

Just as the Pinal Partnership, area chambers of commerce and leaders in towns such as Casa Grande, Florence and Eloy - and a host of others in the region - are working diligently to plan for sound growth and economic development, so too does El Paso have to work hard to ensure proper natural gas transportation and storage infrastructure is in place, where it's needed, when it's needed.

Clery said that as the company looks to the future, it is incumbent that it does the job correctly and works closely with local and state officials and key area stakeholders to plan diligently for Arizona's energy future. That's how innovative solutions were found for Arizona's nascent copper industry three quarters of a century ago when El Paso Natural Gas built its first pipeline here.

El Paso Corporation provide natural gas and related energy products in a safe, efficient and dependable manner. The company owns North America's largest natural gas pipeline system and one of North America's largest independent natural gas producers. El Paso has 27 other storage facilities throughout the country. For more information, visit online at [www.elpaso.com](http://www.elpaso.com).

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6-26-06

Contractor fishing beaver on LPG Cavern hole  
near Hobbs for Enterprise Products.

≈ July 3 at best more likely ≈ July 10

---

Meeting w/ Eloy tomorrow about annexing  
site into City of Eloy.

Meeting w/ Pinal Co. next day

Press release = bring out opposition early before  
sinking a lot of money.

V. 79, no. 122

933

## El Paso planning new natural gas storage project in Arizona

**E**L PASO Corp said its Western Pipeline Group plans to develop a new underground natural gas storage facility near Eloy in southern Arizona.

Plans call for the Arizona Natural Gas Storage project to be located in a currently unincorporated area about 40 miles southeast of Phoenix.

Based on customer demand and final determination of geologic suitability, the project could consist of four underground salt caverns

capable of storing approximately 3.5 billion cu ft of natural gas, El Paso said.

The facility would be able to deliver 350 million cu ft of gas per day, enough to meet the electric energy needs of 735,000 homes on a daily basis. The storage caverns will support the company's nearby interstate pipelines.

El Paso expects to file an application for project approval with the Federal Energy Regulatory Commis-

sion in the third quarter of 2007. Subject to federal and state regulatory approvals, construction could begin in 2008. The company estimates the first cavern will be in service by mid-2010 and the remaining three caverns by 2011-2012.

In the past year, El Paso has scheduled four stratigraphic tests near Eloy in Pinal County as part of an effort to evaluate the potential for gas storage in the area (RMRR 4-19 & 7-21-05, 3-24-06).

# Arizona Daily Star®

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Published: 06.22.2006

## Eloy natural-gas plant in works

933

**\$100M facility to guard against in-state shortfall**

**By Scott Simonson**

ARIZONA DAILY STAR

El Paso Corp. said Wednesday that it plans to build Arizona's first natural-gas storage facility in underground salt caverns outside Eloy, about 50 miles northwest of Downtown Tucson.

If approved by federal regulators, the \$100 million storage facility could help Arizona natural-gas companies, including Southwest Gas Corp., protect against shortages or interruptions in supply, said Richard Wheatley, an El Paso Corp. spokesman.

Bill Moody, vice president of gas resources for Southwest Gas Corp., called the plan "a positive step" for local utility customers. Southwest Gas has never experienced a short-term natural-gas supply shortage affecting Arizona customers, Moody said.

UniSource Energy Services, which provides natural-gas service in Santa Cruz County, also views El Paso Corp.'s plan as a positive step, said Joe Salkowski, spokesman for UniSource Energy Corp., whose subsidiaries include UniSource Energy Services and Tucson Electric Power Co.

El Paso Corp.'s plan has several hurdles to clear. First, the company needs drilling tests to confirm that underground salt caverns will accommodate the project, Wheatley said.

Then, the company needs approval from federal regulators.

If federal and state regulators approve, the company anticipates that construction will begin in 2008, with the first storage available in 2010.

The proposed storage facility would hold up to 3.5 billion cubic feet of natural gas in salt caverns more than 1,000 feet underground.

The natural gas stored at the facility would not belong to El Paso Corp., but to whoever paid to store it there, Wheatley said.

That could benefit power plants, which are large consumers of natural gas, Moody said.

A 500- to 1,000-megawatt power plant operating at peak capacity on a summer day can use as much natural gas as 800,000 Southwest Gas residential customers in Arizona, Moody said.

Gas companies could use the storage facility the same way a homeowner can use a rain-collecting cistern if regular water service is disrupted, Moody said.

Currently, the natural-gas storage facility nearest to Tucson is in Carlsbad, N.M., Wheatley said.

Storage facilities are useful during a shortage because natural gas moves slowly through supply pipelines. It takes 24 to 30 hours for natural gas to travel from supply sources in West Texas to customers in Arizona, Wheatley said.

The plant would be mostly automated, and would create four jobs at most, said Loren Locher, regional director of state government affairs for El Paso Pipeline Group.

• Contact reporter Scott Simonson at 573-4176 or at [simonson@azstarnet.com](mailto:simonson@azstarnet.com).

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**Subject:** El Paso

**From:** Lee Allison <lee.allison@azgs.az.gov>

**Date:** Fri, 16 Jun 2006 09:10:00 -0700

**To:** Steve Rauzi <steve.rauzi@azgs.az.gov>

**CC:** Jon Spencer <jon.spencer@azgs.az.gov>

933

Steve, I've heard that El Paso NG discovered they did not have full access to mineral rights for their Picacho basin well. Reportedly there are many family owners of some of the properties that were not involved in the leasing, and EPNG is tracking them down prior to drilling.

LA

--

Lee Allison, PhD, PG  
State Geologist & Director  
Arizona Geological Survey  
416 W. Congress, #100  
Tucson, AZ 85701  
520-770-3500 fax-3505  
[www.azgs.az.gov](http://www.azgs.az.gov)

Nyal Niemuth

**Subject:** Re: AGS #1-21 Update  
**From:** Steve Rauzi <steve.rauzi@azgs.az.gov>  
**Date:** Fri, 09 Jun 2006 11:19:06 -0700  
**To:** "Gettman, Greg W" <Greg.Gettman@ElPaso.com>

933

Thanks for the update.

Gettman, Greg W wrote:

Steve,

Just thought I would drop you a quick note and let you know that our United Drilling rig #22 is taking longer on the current job just outside of Hobbs, NM than anyone expected. At this point, we do not anticipate starting to drill the AGS #1-21 until the week of June 26<sup>th</sup>. It should be hot enough by then. Hope all is well.

Thanks,

Greg W. Gettman

Manager, Facility Planning

El Paso Western Pipelines

2 North Nevada Ave.

Colorado Springs, CO 80903

(719) 520-4533 Office

(719) 351-4093 Cell

(719) 520-3792 Fax

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This email and any files transmitted with it from the ElPaso Corporation are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.  
\*\*\*\*\*

Re: Picacho Reservoir well

**Subject:** Re: Picacho Reservoir well  
**From:** Steve Rauzi <steve.rauzi@azgs.az.gov>  
**Date:** Tue, 16 May 2006 08:57:17 -0700  
**To:** Tom Shaw <thshaw@msn.com>

933

Yes, El Paso permitted the 1-21 hole in 21-7s-8e in March. El Paso has not yet started drilling. I've attached a copy of this permit, number 933. Steve

Tom Shaw wrote:

Last question, have any other permits been issued for deep tests in the Eloy area? If so, can I get a copy(s)?

---

**From:** Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]  
**Sent:** Tuesday, May 16, 2006 10:08 AM  
**To:** Tom Shaw  
**Subject:** Re: Picacho Reservoir well

Tom, Here is the approved permit 926 for the El Paso 1-20 well. El Paso finished drilling the 1-20 in August 2005. By the way, I need to correct an error in my previous email: El Paso finished drilling the 1-11 well in September 2005 not 2006. Steve

Tom Shaw wrote:

Thanks. Can I also get a copy of the permit for the well they drilled on State lands over behind the prison?

T-

---

**From:** Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]  
**Sent:** Monday, May 15, 2006 5:35 PM  
**To:** Tom Shaw  
**Subject:** Re: Picacho Reservoir well

Hi Tom, Here's the approved permit 925 for the El Paso 1-11 well south of the Picacho Reservoir. El Paso finished drilled the 1-11 in September 2006 and the completion report will be confidential for one year from that date in accordance with R12-7-121(C). Steve

Tom Shaw wrote:

Steve,

Can I get scanned copies of the well permit and completion report for the well drilled by El Paso just south of the Picacho reservoir? I believe it was Sec. 10, or 12, on State lands.

Tom

--

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.1.392 / Virus Database: 268.5.6/339 - Release Date: 5/14/2006

April 7, 2006

Mr. Steven Rauzi  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 West Congress #100  
Tucson, AZ 85701-1315

Re: Arizona Gas Storage #1-21  
Section 21, T7S, R8E  
Pinal County, AZ  
AZO&GCC Permit # 933

933

Dear Steve,

Attached for your review and approval are two copies of the Amended Application for Permit to Drill or Re-Enter for the planned Arizona Gas Storage #1-21. Also attached are two sets of the revised drilling procedure for this well. As we have discussed, El Paso Natural Gas has revised the design of this stratigraphic test well to alleviate concerns express by the Environmental Protection Agency with our original plan. If you have any questions or concerns with the attached, please give me a call at (719) 520-4533.

Sincerely,



Greg Gettman

Manager, Facility Planning  
El Paso Natural Gas Company



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

933

March 31, 2006

Mr. Greg Gettman  
Manager of Facility Planning  
El Paso Western Pipelines  
P.O. Box 1087  
2 North Nevada Avenue  
Colorado Springs, CO 80944

Re: Response to Holland & Hart's letter dated March 8, 2006

Dear Mr. Gettman:

Thank you for the letter dated March 8, 2006 from Michael Brennan of Holland & Hart on behalf of El Paso Natural Gas Company concerning plans to drill a stratigraphic test well in Section 21, Township 7 South, Range 8 East, Pinal County, Arizona (AGS #1-21 well). A thorough review of your submittal indicates that you are proposing an underground injection well, and therefore you are required to have a UIC permit prior to all construction and drilling activities associated with the well.

As my staff informed you during our joint March 3, 2006 meeting, the federal UIC regulations require a UIC permit prior to construction of a proposed injection well. The relevant federal regulations prohibit injection activities, including construction of an injection well, unless and until the operator is authorized by permit. (See 40 C.F.R. § 144.31(a)). Thus, to the extent an injection well is proposed, a federal permit would be required.

EPA recognizes that El Paso would not need a UIC permit to drill a "stratigraphic test well" if the sole purpose of this test well was to obtain geological information, as regulated by and described in Arizona's Oil & Gas Conservation Commission regulations. In contrast, you have already proposed this well to have a dual purpose, which is to obtain geological information and to test the formation for suitability of injection. Although testing is proposed through the salt zone, the proposed depth of drilling would also include evaluation of the potential injection zone.

Further, a review of your drilling plan indicates construction consistent with a proposed injection well. Specifically, you propose in your drilling plan to use casing strings that are sized and designed ideally for injection purposes. The intent of the UIC permitting program is to regulate such construction through issuance of a UIC permit. The typical stratigraphic test well would use smaller diameter and less weight of casing, such as you proposed in your stratigraphic test well in 2005 (per Arizona Oil & Gas Conservation Commission Permit Nos. 925 and 926).

We recognize that El Paso has limited information regarding the suitability of the site for injection. This is acceptable since we are accustomed to writing the UIC permit with limited available information. Information can be generated during construction of the well, and the permit would require the submission of well logs, formation testing, and injection parameters, as described at 40 CFR §§ 146.14(b), prior to granting approval for operation of the well. We can assist you with developing a UIC Permit application that meets the requirements of the UIC program.

We appreciate the invitation for EPA's early involvement in this project and look forward to working with you in the future. If you have any questions concerning this letter or want additional guidance on providing a UIC Permit application, please contact Nancy Rumrill of my staff at 415-972-3293.

Sincerely,



David Albright

Manager, Ground Water Office

cc: ✓ Steve Rauzi, Arizona Oil & Gas Conservation Commission  
Jason Jones, ADEQ  
Michael J. Brennan, P.C., Holland and Hart LLP  
Christopher Thomas, Squire, Sanders & Dempsey LLP

V. 79, no. 58

## EPNG planning fourth stratigraphic test southeast of Phoenix Arizona

**E**L PASO Natural Gas Co (EPNG) has plans to drill a fourth stratigraphic test in southern Arizona near the town of Eloy southeast of Phoenix, this one to approximately 8000 ft.

The 1-21 El Paso, sw nw 21-7s-8e, Pinal County, is designed to evaluate the potential for gas storage in the area of the company's interstate pipelines. United Drilling Inc holds the contract.

EPNG last year scheduled three

4500-ft stratigraphic tests in the vicinity at the 1-20 State, c ne 20-7s-8e; 1-11 State, sw ne 11-7s-8e; and 1-14 Hiatt, ne nw 14-7s-8e (RMRR 4-19 & 7-21-05).

In 2003, EPNG purchased Copper Eagle Gas Storage LLC, which was developing a gas storage project near Luke Air Force Base west of Phoenix (RMRR 8-27-03). The company noted that the Luke salt deposit near Phoenix extends nearly

10,000 ft deep. EPNG's plans called for up to three underground storage caverns for a maximum storage capacity of 9.6 billion cu ft of gas.

Approximately two miles southeast of the 1-21 El Paso, Unocal Picacho Peak Gas Storage LLC a year ago scheduled a 5000-ft stratigraphic test at the 1-27 City of Mesa in se sw 27-7s-8e (RMRR 1-11-05). The latter project also is designed to evaluate gas storage potential.

*(Coastal, from preceding page)*

ft. Log tops at that 4768-ft well include Charles at 4509 ft and Mission Canyon at 4528 ft, measured from a kelly bushing elevation of 2564 ft. Three years ago, Samson Resources Co plugged its 1-21 Starbuck Coulee-Fee, sw sw 21-36n-37e, after production tests of two fract Cretaceous Eagle sand intervals at 1460-75 and 1760-75 ft proved unsuccessful. Total depth is 1970 ft.

In an area 18-19 miles to the east-northeast, Billings independent Canyon Natural Gas LLC has plans to drill two remote 11,750-ft horizontal Bakken wildcats in northern Valley County at

locations in n/2 n/2 36-37n-39e and n/2 n/2 25-37n-39e (RMRR 12-28-05). Drilling permits have yet to be issued for those ventures.

In an area 22-23 miles to the east-southeast, Stone Energy Corp early this year drilled the 31-11H Stahl, nw ne (proposed bottom-hole location: se se) 11-35n-40e, a remote horizontal Bakken wildcat projected to a measured total depth of 11,138 ft and a true vertical depth of 6634 ft (RMRR 10-3-05). No details have been disclosed. Stone took over the project from Canyon.

Coastal Petroleum Co (CPC), a

wholly owned subsidiary of Apalachicola, Florida-based Coastal Caribbean Oils & Minerals Ltd, has leases covering approximately 25,000 acres in southwestern North Dakota as well as smaller areas of Montana.

Earlier this year, Coastal Caribbean concluded a long-running dispute with the state of Florida concerning its attempt to obtain a permit to drill on state leases offshore Florida. That settlement resulted in Coastal Caribbean becoming owner of all of the outstanding stock of CPC and gave it approximately \$4.9 million in cash, after payment of expenses.

# FAX

Date: 3-21-06

Number of pages including cover sheet: 3

To: Nancy Rumbill  
USEPA Region 9  
San Francisco CA

Phone: ( )

Fax phone: (415) 947-3545

CC: \_\_\_\_\_

From: Steve Rauzi  
Arizona Geological Survey  
416 W. Congress, Suite 100  
Tucson, AZ 85701

Phone: (520) 770-3500

Fax phone: (520) 770-3505

REMARKS:  Urgent  For your review  Reply ASAP  Please comment

*Approved application to drill:*

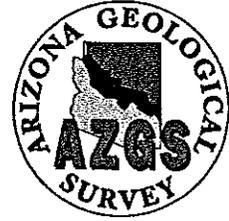
*El Paso Natural Gas Strat test 1-21 AGS*



Janet Napolitano  
Governor

State of Arizona  
**Arizona Geological Survey**

416 W. Congress, Suite 100  
Tucson, Arizona 85701  
(520) 770-3500  
[www.azgs.az.gov](http://www.azgs.az.gov)



M. Lee Allison  
Director and State Geologist

March 21, 2006

Terry Doolittle  
County Manager  
31 N. Pinal Street  
Florence, AZ 85232

Re: El Paso Natural Gas #1-21 AGS, Sec. 21-7s-8e, Pinal Co., State Permit 933.

Dear Mr. Doolittle:

I am enclosing a copy of the approved application to drill the referenced well because of a policy of the Arizona Oil and Gas Conservation Commission to inform county government about proposed exploration and drilling activity. The referenced well is a stratigraphic well to obtain information about subsurface geology.

The Commission issues a permit to drill under A.R.S. § 27-513. The permit is issued for wells that are in compliance with applicable statutes (A.R.S. § 27-516) and rules (12 A.A.C. 7), which were promulgated to safeguard the public health and safety and protect the environment and natural resources.

Sincerely,

A handwritten signature in cursive script that reads "Steven L. Rauzi".

Steven L. Rauzi  
Oil and Gas Program Administrator

Enclosure

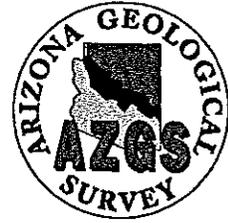
- c J. Dale Nations, Chairman, Oil and Gas Conservation Commission  
M. Lee Allison, Director and State Geologist



Janet Napolitano  
Governor

State of Arizona  
**Arizona Geological Survey**

416 W. Congress, Suite 100  
Tucson, Arizona 85701  
(520) 770-3500  
www.azgs.az.gov



M. Lee Allison  
Director and State Geologist

March 21, 2006

Mr. Greg Gettman  
El Paso Natural Gas Company  
PO Box 1087  
Colorado Springs CO 80944

Re: El Paso Natural Gas #1-21 AGS, Sec. 21-7s-8e, Pinal Co., State Permit 933

Dear Mr. Gettman:

I have enclosed an approved copy of your application for permit to drill, Permit to Drill #933, and filing-fee receipt #3139.

The referenced application is approved on the condition that El Paso Natural Gas Company conduct its operations in compliance with all applicable statutes and rules of the State of Arizona and that El Paso Natural Gas or its designated representative *notify me at least 48 hours* before you:

- Move in drilling equipment and commence operations, and
- Run and cement surface casing

An operator shall post a sign at the well site pursuant to A.A.C. R12-7-106 and submit drilling samples and all other well data and information pursuant to A.A.C. R12-7-121. Several Sundry Notice forms are enclosed for your use in reporting all pertinent drilling and testing activity to the Oil and Gas Conservation Commission of the State of Arizona. An operator is required to keep daily drilling reports detailing the spud date and daily progress (depth) and status of the well and to submit the reports to the Commission at the letterhead address on a weekly basis through the completion of operations.

Sincerely,

Steven L. Rauzi  
Oil & Gas Administrator

Enclosures

c J. Dale Nations, Chairman, Oil and Gas Conservation Commission  
M. Lee Allison, Director and State Geologist

3-15-06

933

Greg Gettman calls

Ralph Weeks, Amax (Environmental firm Tempe)

Amax has permitted class 1 & 3 wells

Providing input into application

Suggested changes to enhance EPA filing

- Add description of logging tools function
- Run CBL in surface pipe

Claus Bushbaum, PBKBB put together initial drill program

---

Also discuss: ADWR exemption ARB 95-591601

Storm water discharge (ADEQ General Permit)

March 14, 2006

Mr. Steven Rauzi  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W. Congress #100  
Tucson, AZ 85701-1315

933

RECEIVED  
MAR 15 2006

Dear Steve:

Attached is a personal check for \$25.00 as a replacement for the original check which was included with the Application for Permit to Drill or Re-Enter the Arizona Gas Storage #1-21 which was lost by UPS. Also included are two copies of the revised drilling program for this stratigraphic test well. If you have any questions or problems with the attached materials, please give me a call at (719) 520-4533.

Sincerely,



Greg Gettman

Manager, Facility Planning  
El Paso Natural Gas Company

**Subject:** Arizona Oil and Gas Commission Drilling Permit Application  
**From:** "Gettman, Greg W" <Greg.Gettman@ElPaso.com>  
**Date:** Wed, 08 Mar 2006 14:43:33 -0700  
**To:** Rumrill.Nancy@epamail.epa.gov  
**CC:** Steve Rauzi <steve.rauzi@azgs.az.gov>

933

Nancy,

Steve Rauzi with the Arizona Oil and Gas Conservation Commission contacted me this afternoon to let me know he had not yet received the Drilling Permit Application for the AGS #1-21. UPS has placed a tracker on the letter and they have confirmed it was picked up here on February 28, 2006 and that they never delivered to Mr. Rauzi in Tucson.

I have sent (via UPS Overnight) Mr. Rauzi two copies of the application and supporting documents that he should have in the morning. Sorry for the confusion.

Greg W. Gettman  
Manager, Facility Planning  
El Paso Western Pipelines  
2 North Nevada Ave.  
Colorado Springs, CO 80903  
(719) 520-4533 Office  
(719) 351-4093 Cell  
(719) 520-3792 Fax

Nancy,

For your review, I have attached El Paso Natural Gas Company's Permit Application with Arizona Oil and Gas Conservation Commission to Drill the AGS #1-21 stratigraphic test well. Also attached are our proposed drilling and completion procedures for the AGS #1-21 with the planned casing, logging, cementing programs, etc. and a regional map showing the location of this well in relation to other deep wells in the area. Please let me know if you have any questions regarding this material.

We intend to send you a formal letter in the near future to follow up on our March 3rd meeting with you and George, which will also include this information.

Thanks,  
Greg W. Gettman  
Manager, Facility Planning  
El Paso Western Pipelines  
2 North Nevada Ave.  
Colorado Springs, CO 80903  
(719) 520-4533 Office  
(719) 351-4093 Cell  
(719) 520-3792 Fax

-----Original Message-----

From: Rumrill.Nancy@epamail.epa.gov  
[mailto:Rumrill.Nancy@epamail.epa.gov]  
Sent: Tuesday, March 07, 2006 12:36 PM  
To: Gettman, Greg W  
Cc: Robin.George@epamail.epa.gov  
Subject: Letter concerning your plans for a new proposed well

Greg,

Per our meeting on friday, 3/3, I had asked for a letter from you describing your plans for the new proposed well, including its location, the scheduled rig date, the plans for drilling and construction and proposed testing. Please also include the permit or type of

authorization that you have obtained from Arizona's Oil and Gas Conservation Commission. If you can e-mail me this information as soon as possible, this would help me in informing my management and getting back to you on our management decision concerning this issue.

Thank you, Nancy

Nancy Rumrill  
U.S. Environmental Protection Agency, Region 9  
Ground Water Office, WTR-9  
75 Hawthorne Street  
San Francisco, CA 94105  
415-972-3293  
415-947-3545 (FAX)

\*\*\*\*\*  
This email and any files transmitted with it from the ElPaso Corporation are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.  
\*\*\*\*\*

**AGS1-21PermitApp.pdf** **Content-Description:** AGS1-21PermitApp.pdf  
**Content-Type:** application/octet-stream  
**Content-Encoding:** base64

**AGS1-21 Drilling Procedures Rev3 (2).doc** **Content-Description:** AGS1-21 Drilling Procedures Rev3 (2).doc  
**Content-Type:** application/msword  
**Content-Encoding:** base64

**Arizona NG Storage Exh 1.ppt** **Content-Description:** Arizona NG Storage Exh 1.ppt  
**Content-Type:** application/vnd.ms-powerpoint  
**Content-Encoding:** base64

933

3-8-06 Call Greg Bettman

Sent Application UPS overnight Feb 28 = lost  
UPS is tracking package.

Plan to set surf CSS to 1600' & circ cart

(do salt begins ~ 1700'

Set CSS to about 4700'

Drill through CGI etc into fractured bsmt.

Set perforated liner & do injection test.



**Subject:** Re: Fw: Requesting information on wells proposed by El Paso Natural Gas

**From:** Steve Rauzi <steve.rauzi@azgs.az.gov>

**Date:** Wed, 08 Mar 2006 10:08:09 -0700

**To:** Rumrill.Nancy@epamail.epa.gov

933

Hi Nancy, I have not yet received anything from El Paso about drilling a stratigraphic well but the permit you attached to your email looks like a follow-up to two stratigraphic tests that El Paso drilled last year to obtain information about the subsurface geology relative to potential subsurface storage of natural gas in the Picacho basin. El Paso plugged both of those holes shortly after they were drilled. It normally takes about a week to issue a permit for a stratigraphic test hole if an application is complete and in order. El Paso currently has a bond and organization report on file so that part of the application is already in place. Of course the process for permitting a storage well is far more involved than for a simple stratigraphic test. Steve

Rumrill.Nancy@epamail.epa.gov wrote:

Steve,

I received the permit application from El Paso Natural Gas. Do they meet all of your requirements for your agency to issue the permit? How long does your permit application processing take and about when would you issue the permit? Does El Paso have to get their permit from you prior to their drilling and constructing the well?

I've reviewed the OGCC website. What would a permit from your agency authorize them to do? (Conduct stratigraphic testing for the purpose of oil or gas production?)

Please call me at 415-972-3293 if you want to discuss my questions.

Thank you, Nancy

(See attached file: AGS1-21PermitApp.pdf)

Nancy Rumrill  
U.S. Environmental Protection Agency, Region 9  
Ground Water Office, WTR-9  
75 Hawthorne Street  
San Francisco, CA 94105  
415-972-3293  
415-947-3545 (FAX)

----- Forwarded by Nancy Rumrill/R9/USEPA/US on 03/07/2006 04:03 PM -----

Nancy  
Rumrill/R9/USEPA  
/US

03/07/2006 03:20  
PM

Steve.Rauzi@azgs.az.gov

To

cc

Subject  
Requesting information on wells  
proposed by El Paso Natural Gas

Steve,

The Ground Water Office, USEPA Region 9, is reviewing a proposed well owned by El Paso Natural Gas for injection of brine waste . I do not have all of their information yet or its location. El Paso has confirmed that they have classified the well as an oil and gas exploratory well to be drilled next month. Are you aware of a recent oil & gas exploratory permit that you've issued to El Paso Natural Gas? May I have a copy of the permit?

If you need additional info to look this up, I'll be getting more info soon.

Thank you, Nancy

Nancy Rumrill  
U.S. Environmental Protection Agency, Region 9  
Ground Water Office, WTR-9  
75 Hawthorne Street  
San Francisco, CA 94105  
415-972-3293  
415-947-3545 (FAX)

February 28, 2006

Mr. Steven Rauzi  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W. Congress #100  
Tucson, AZ 85701-1315

933

Dear Steve:

Attached for your review are two copies of the Application for Permit to Drill or Re-Enter for the proposed Arizona Gas Storage #1-21 along with the \$25.00 application fee. Also attached are two copies of the proposed drilling program for this stratigraphic test well. I believe the Organization Report and Performance Bond for El Paso Natural Gas Company that were filed with the Arizona Oil and Gas Commission on March 18<sup>th</sup> of 2005 are still current. If you have any questions or problems with the attached materials, please give me a call at (719) 520-4533.

Sincerely,



Greg Gettman

Manager, Facility Planning  
El Paso Natural Gas Company

Steve,  
I will send a new check if UPS does not locate the original letter.  
Thanks  
Greg G.

Greg

719-520-4533