

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

NOV 06 2017

RECEIVED

5. Lease Serial No.
NMLC029519B

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.

BLACK AND TAN 27 FEDERAL COM 303H

2. Name of Operator

APACHE CORPORATION

Contact: SORINA FLORES

E-Mail: sorina.flores@apachecorp.com

9. API Well No.

30-025-43921-00-X1

3a. Address

303 VETERANS AIRPARK LANE SUITE 3000
MIDLAND, TX 79705

3b. Phone No. (include area code)

Ph: 432-818-1167

10. Field and Pool or Exploratory Area

LEA

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 27 T20S R34E SESW 2160FWL
32.537437 N Lat, 103.549660 W Lon

11. County or Parish, State

LEA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☒ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

BLM-CO-1463 NMB-000736 NATIONWIDE

APACHE RESPECTFULLY REQUEST TO CHANGE PILOT HOLE DEPTH AND TO CHANGE PROD TVD/MD. AFTER REVIEWING LOGS, ZONE OF HIGHER QUALITY DEEPER THAN ANTICIPATED.

Approved pilot hole depth: 12000' MD/12000' TVD
NEW PILOT HOLE DEPTH: 12050' MD/12050' TVDApproved Prod Setting depth: 15863.39' MD/11030' TVD
NEW PROD SETTING DEPTH: 15824' MD/11146' TVD

Approved Safety Factors: Collapse-1.35, Body Tensile: 2.03, Joint Tensile-2.13 NEW SAFETY FACTORS:

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

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

Electronic Submission #393498 verified by the BLM Well Information System

For APACHE CORPORATION, sent to the Hobbs

Committed to AFMSS for processing by ZOTA STEVENS on 11/01/2017 (18ZS0022SE)

Name (Printed/Typed) SORINA FLORES

Title SUBMITTING CONTACT

Signature (Electronic Submission)

Date 10/30/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS

Title PETROLEUM ENGINEER

Date 11/01/2017

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Hobbs

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

msb/ocd 11/7/2017

Additional data for EC transaction #393498 that would not fit on the form

32. Additional remarks, continued

Collapse-1.33, Body Tensile: 2.02, Joint Tensile-2.11

String: **SURFACE**

Hole Size: 17.5

Top Setting Depth (MD):	<u>0</u>	Top Setting Depth (TVD):	<u>0</u>	Btm setting depth (MD):	<u>1700</u>	Btm setting depth (TVD):	<u>1700</u>
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Size:	<u>13-3/8"</u>	Grade:	<u>J-55</u>	Weight (lbs/ft):	<u>54.5</u>	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	<u>Buttress</u>
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Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 2.15 Burst Design Safety Factor: 1.82

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 3.79

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 4.04

String: **INTERMEDIATE**

Hole Size: 12.25

Top Setting Depth (MD):	<u>0</u>	Top Setting Depth (TVD):	<u>0</u>	Btm setting depth (MD):	<u>900</u>	Btm setting depth (TVD):	<u>900</u>
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Size:	<u>9-5/8"</u>	Grade:	<u>J-55</u>	Weight (lbs/ft):	<u>40</u>	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	<u>Buttress</u>
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Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 5.37 Burst Design Safety Factor: 1.7

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 1.96

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 2.24

Top Setting Depth (MD):	<u>900</u>	Top Setting Depth (TVD):	<u>900</u>	Btm setting depth (MD):	<u>5780</u>	Btm setting depth (TVD):	<u>5780</u>
Size:	<u>9-5/8"</u>	Grade:	<u>J-55</u>	Weight (lbs/ft):	<u>40</u>	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	<u>LTC</u>
Condition (New/Used):	<u>New</u>	Standard (API/Non-API):	<u>API</u>				

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 1.54 Burst Design Safety Factor: 1.87

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 2.15

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 1.8

String: PRODUCTION

Pilot Hole down to 12,050' MD / 12,050' TVD

Hole Size: 8.75

Top Setting Depth (MD):	<u>0</u>	Top Setting Depth (TVD):	<u>0</u>	Btm setting depth (MD):	<u>15824</u>	Btm setting depth (TVD):	<u>11146</u>
Size:	<u>5-1/2"</u>	Grade:	<u>P-110</u>	Weight (lbs/ft):	<u>17</u>	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	<u>Buttress</u>
Condition (New/Used):	<u>New</u>	Standard (API/Non-API):	<u>API</u>				

Safety Factors

Collapse Design Safety Factor: 1.33 Burst Design Safety Factor: 1.28

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant

Body Tensile Design Safety Factor: 2.02

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant

Joint Tensile Design Safety Factor: 2.11

Tapered String (Y/N)?: N
If yes, need spec attachment

Project: Lea County, NM (NAD83 NME)
Site: Black & Tan 27 Federal Com
Well: 303H
Wellbore: ST01 / Job #61822
Design: Plan 3 10-20-17
Rig: H&P 482

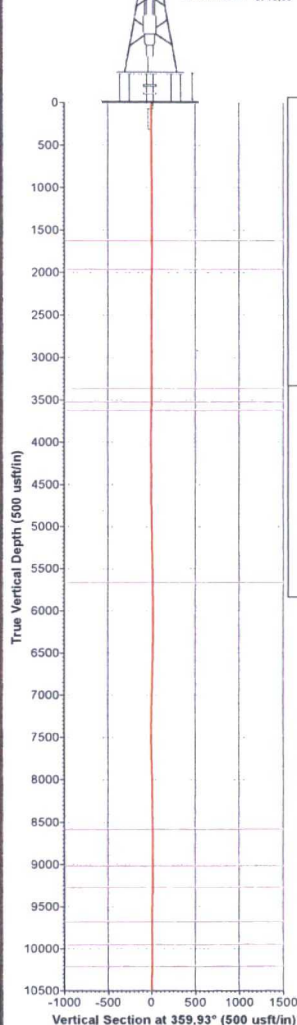


PHOENIX
TECHNOLOGY SERVICES



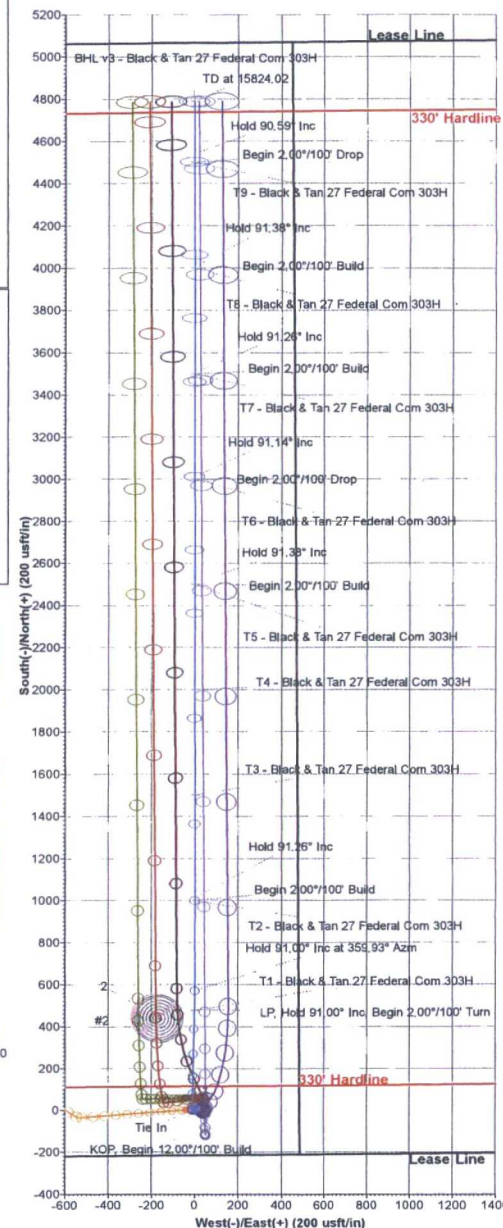
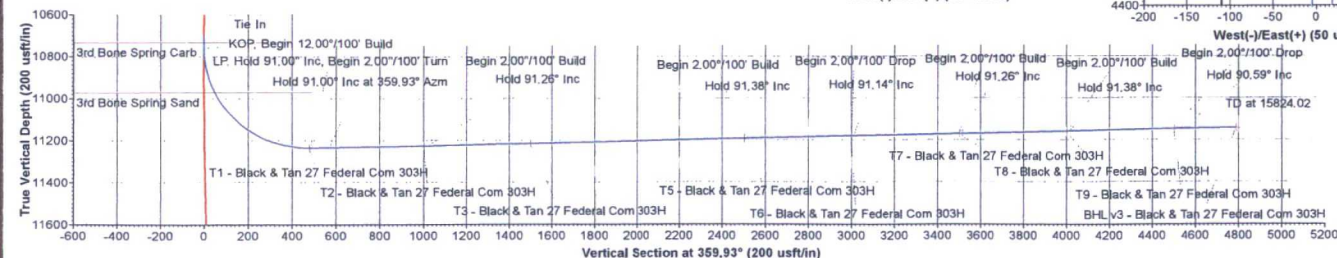
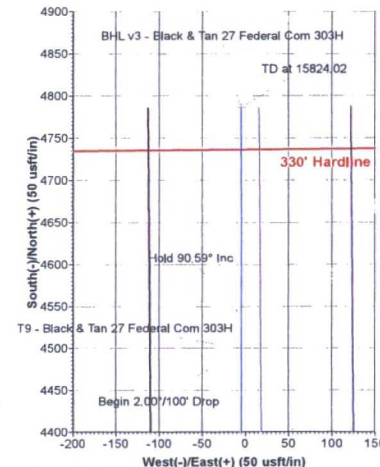
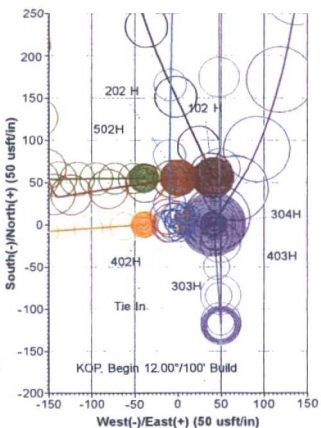
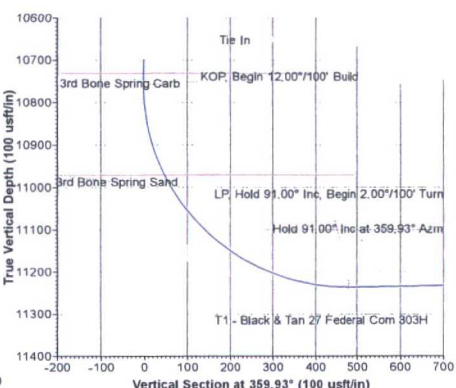
Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.31°
Magnetic Field
Strength: 48289.9nT
Dip Angle: 60.52°
Date: 10/20/2017
Model: HDGM

GL + KB @ 3741.00usft (H&P 482)
Ground Level: 3715.90



WELL DETAILS														
SECTION DETAILS														
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Northing	Ground Level	3715.00	Latitude	Longitude	Target	Annotation	
1	10700.00	0.94	218.77	10698.74	-3.09	-7.87	0.00	0.00	-3.08				Tie In	
2	10758.89	0.94	256.58	10757.63	-3.58	-8.64	1.03	108.90	-3.57				KOP, Begin 12.00°/100° Build	
3	11519.27	91.00	1.70	11237.00	482.23	-1.94	12.00	105.10	482.23				LP, Hold 91.00° Inc, Begin 2.00°/100° Turn	
4	11607.85	91.00	359.93	11235.46	570.59	-0.88	2.00	-90.14	570.59				Hold 91.00° Inc at 359.93° Azm	
5	12037.13	91.00	359.93	11228.00	1000.00	-1.17	0.00	0.00	1000.00				Begin 2.00°/100° Build	
6	12950.44	91.26	359.93	11227.74	1013.31	-1.19	2.00	-0.24	1013.31				Hold 91.26° Inc	
7	13537.49	91.26	359.93	11195.00	2500.00	-2.93	0.00	0.00	2500.00				Begin 2.00°/100° Build	
8	13543.19	91.38	359.93	11194.87	2505.70	-2.93	2.00	0.00	2505.70				Hold 91.38° Inc	
9	14037.63	91.38	359.93	11183.00	3000.00	-3.51	0.00	0.00	3000.00				Begin 2.00°/100° Drop	
10	14049.25	91.14	359.93	11182.74	3011.62	-3.52	2.00	-180.00	3011.62				Hold 91.14° Inc	
11	14537.73	91.14	359.93	11173.00	3500.00	-4.10	0.00	0.00	3500.00				Begin 2.00°/100° Build	
12	14543.63	91.26	359.93	11172.88	3505.89	-4.10	2.00	0.00	3505.89				Hold 91.26° Inc	
13	15037.85	91.26	359.93	11162.00	4000.00	-4.88	0.00	0.00	4000.00				Begin 2.00°/100° Build	
14	15043.58	91.38	359.93	11161.87	4005.72	-4.89	2.00	0.00	4005.72				Hold 91.38° Inc	
15	15538.00	91.38	359.93	11150.00	4500.00	-5.27	0.00	0.00	4500.00				Begin 2.00°/100° Drop	
16	15577.09	90.59	359.93	11149.33	4539.08	-5.31	2.00	-180.00	4539.08				Hold 90.59° Inc	
17	15824.02	90.59	359.93	11146.77	4786.00	-5.90	0.00	0.00	4786.00				BHL v3 - B&T 27 Fed Com 303H	TD at 15824.02

DESIGN TARGET DETAILS														
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude							
T4 - Black & Tan 27 Federal Com 303H	1206.00	2000.00	-2.34	562138.30	782840.26	32° 32' 34.5944 N	103° 32' 58.6292 W							
BHL v3 - Black & Tan 27 Federal Com 303H	11146.77	4786.00	-5.60	564924.30	782837.00	32° 32' 2.12612 N	103° 32' 58.42757 W							
T9 - Black & Tan 27 Federal Com 303H	11150.00	4500.00	-5.27	564638.30	782837.33	32° 32' 59.29621 N	103° 32' 58.44825 W							
T8 - Black & Tan 27 Federal Com 303H	11162.00	4000.00	-4.68	564138.30	782837.92	32° 32' 54.34865 N	103° 32' 58.48441 W							
T7 - Black & Tan 27 Federal Com 303H	11173.00	3500.00	-4.10	563838.30	782838.50	32° 32' 49.40150 N	103° 32' 58.52057 W							
T6 - Black & Tan 27 Federal Com 303H	11183.00	3000.00	-3.51	563138.30	782839.09	32° 32' 44.45415 N	103° 32' 58.55672 W							
T5 - Black & Tan 27 Federal Com 303H	11195.00	2500.00	-2.93	562638.30	782839.67	32° 32' 39.50679 N	103° 32' 58.59287 W							
T3 - Black & Tan 27 Federal Com 303H	11217.00	1500.00	-1.76	561638.30	782840.84	32° 32' 29.61208 N	103° 32' 58.66516 W							
T2 - Black & Tan 27 Federal Com 303H	11228.00	1000.00	-1.17	561138.30	782841.43	32° 32' 24.66472 N	103° 32' 58.70130 W							
T1 - Black & Tan 27 Federal Com 303H	11237.00	477.00	-0.56	560615.30	782842.04	32° 32' 19.48978 N	103° 32' 58.73910 W							





Apache Corporation

Lea County, NM (NAD83 NME)
Black & Tan 27 Federal Com
303H

ST01/ Job #61822

Plan: Plan 3 10-20-17

Standard Planning Report

20 October, 2017

HOBBS OCD

NOV 06 2017

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Phoenix Technology Services LP

Planning Report



Database: Compass 5000 GCR
Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Site: Black & Tan 27 Federal Com
Well: 303H
Wellbore: ST01 / Job #61822
Design: Plan 3 10-20-17

Local Co-ordinate Reference: Well 303H
TVD Reference: GL + KB @ 3741.00usft (H&P 482)
MD Reference: GL + KB @ 3741.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Lea County, NM (NAD83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Black & Tan 27 Federal Com				
Site Position:		Northing:	560,131.70 usft	Latitude:	32° 32' 14.81280 N
From:	Map	Easting:	781,352.90 usft	Longitude:	103° 33' 16.17520 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well	303H				
Well Position	+N/-S	6.60 usft	Northing:	560,138.30 usft	Latitude: 32° 32' 14.77000 N
	+E/-W	1,489.70 usft	Easting:	782,842.60 usft	Longitude: 103° 32' 58.77358 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft	Ground Level: 3,715.00 usft

Wellbore	ST01 / Job #61822				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/20/2017	6.73	60.52	48,290

Design	Plan 3 10-20-17				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	10,700.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	359.93	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
10,700.00	0.94	218.77	10,698.74	-3.09	-7.87	0.00	0.00	0.00	0.00	
10,758.89	0.94	256.58	10,757.63	-3.58	-8.64	1.03	0.00	64.20	108.90	
11,519.27	91.00	1.70	11,237.00	482.23	-1.94	12.00	11.84	13.83	105.10	
11,607.65	91.00	359.93	11,235.46	570.59	-0.68	2.00	-0.01	-2.00	-90.14	
12,037.13	91.00	359.93	11,228.00	1,000.00	-1.17	0.00	0.00	0.00	0.00	T2 - Black & Tan 27
12,050.44	91.26	359.93	11,227.74	1,013.31	-1.19	2.00	2.00	-0.01	-0.24	
13,537.49	91.26	359.93	11,195.00	2,500.00	-2.93	0.00	0.00	0.00	0.00	T5 - Black & Tan 27
13,543.19	91.38	359.93	11,194.87	2,505.70	-2.93	2.00	2.00	0.00	0.00	
14,037.63	91.38	359.93	11,183.00	3,000.00	-3.51	0.00	0.00	0.00	0.00	T6 - Black & Tan 27
14,049.25	91.14	359.93	11,182.74	3,011.62	-3.52	2.00	-2.00	0.00	-180.00	
14,537.73	91.14	359.93	11,173.00	3,500.00	-4.10	0.00	0.00	0.00	0.00	T7 - Black & Tan 27
14,543.63	91.26	359.93	11,172.88	3,505.89	-4.10	2.00	2.00	0.00	0.00	
15,037.85	91.26	359.93	11,162.00	4,000.00	-4.68	0.00	0.00	0.00	0.00	T8 - Black & Tan 27
15,043.58	91.38	359.93	11,161.87	4,005.72	-4.69	2.00	2.00	0.00	0.00	
15,538.00	91.38	359.93	11,150.00	4,500.00	-5.27	0.00	0.00	0.00	0.00	T9 - Black & Tan 27
15,577.09	90.59	359.93	11,149.33	4,539.08	-5.31	2.00	-2.00	0.00	-180.00	
15,824.02	90.59	359.93	11,146.77	4,786.00	-5.60	0.00	0.00	0.00	0.00	BHL v3 - Black & T



Phoenix Technology Services LP

Planning Report



Database: Compass 5000 GCR
Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Site: Black & Tan 27 Federal Com
Well: 303H
Wellbore: ST01 / Job #61822
Design: Plan 3 10-20-17

Local Co-ordinate Reference: Well 303H
TVD Reference: GL + KB @ 3741.00usft (H&P 482)
MD Reference: GL + KB @ 3741.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,700.00	0.94	218.77	10,698.74	-3.09	-7.87	-3.08	0.00	0.00	0.00
Tie In									
10,732.26	0.89	239.55	10,731.00	-3.42	-8.25	-3.41	1.03	-0.16	64.42
3rd Bone Spring Carb									
10,758.89	0.94	256.58	10,757.63	-3.58	-8.64	-3.57	1.03	0.19	63.95
KOP, Begin 12.00°/100' Build									
10,800.00	4.78	350.75	10,798.69	-1.97	-9.24	-1.96	12.00	9.33	229.08
10,900.00	16.71	358.66	10,896.76	16.58	-10.25	16.60	12.00	11.94	7.91
10,979.89	26.29	359.85	10,971.00	45.83	-10.57	45.84	12.00	11.99	1.49
3rd Bone Spring Sand									
11,000.00	28.70	0.03	10,988.84	55.11	-10.58	55.12	12.00	11.99	0.89
11,100.00	40.70	0.63	11,070.91	111.93	-10.21	111.94	12.00	12.00	0.60
11,200.00	52.69	0.99	11,139.37	184.56	-9.15	184.57	12.00	12.00	0.36
11,300.00	64.69	1.26	11,191.24	269.83	-7.46	269.84	12.00	12.00	0.26
11,400.00	76.69	1.47	11,224.24	364.01	-5.22	364.01	12.00	12.00	0.21
11,500.00	88.69	1.67	11,236.95	462.97	-2.50	462.98	12.00	12.00	0.19
11,519.27	91.00	1.70	11,237.00	482.23	-1.94	482.23	12.00	12.00	0.19
LP, Hold 91.00° Inc, Begin 2.00°/100' Turn									
11,600.00	91.00	0.09	11,235.59	562.94	-0.68	562.94	2.00	-0.01	-2.00
11,607.65	91.00	359.93	11,235.46	570.59	-0.68	570.59	2.00	-0.01	-2.00
Hold 91.00° Inc at 359.93° Azm									
11,700.00	91.00	359.93	11,233.86	662.92	-0.78	662.92	0.00	0.00	0.00
11,800.00	91.00	359.93	11,232.12	762.91	-0.90	762.91	0.00	0.00	0.00
11,900.00	91.00	359.93	11,230.38	862.89	-1.01	862.89	0.00	0.00	0.00
12,000.00	91.00	359.93	11,228.65	962.88	-1.13	962.88	0.00	0.00	0.00
12,037.13	91.00	359.93	11,228.00	1,000.00	-1.17	1,000.00	0.00	0.00	0.00
Begin 2.00°/100' Build									
12,050.44	91.26	359.93	11,227.74	1,013.31	-1.19	1,013.31	2.00	2.00	-0.01
Hold 91.26° Inc									
12,100.00	91.26	359.93	11,226.65	1,062.86	-1.24	1,062.86	0.00	0.00	0.00
12,200.00	91.26	359.93	11,224.45	1,162.83	-1.36	1,162.84	0.00	0.00	0.00
12,300.00	91.26	359.93	11,222.24	1,262.81	-1.48	1,262.81	0.00	0.00	0.00
12,400.00	91.26	359.93	11,220.04	1,362.79	-1.59	1,362.79	0.00	0.00	0.00
12,500.00	91.26	359.93	11,217.84	1,462.76	-1.71	1,462.76	0.00	0.00	0.00
12,600.00	91.26	359.93	11,215.64	1,562.74	-1.83	1,562.74	0.00	0.00	0.00
12,700.00	91.26	359.93	11,213.44	1,662.71	-1.95	1,662.71	0.00	0.00	0.00
12,800.00	91.26	359.93	11,211.24	1,762.69	-2.06	1,762.69	0.00	0.00	0.00
12,900.00	91.26	359.93	11,209.03	1,862.66	-2.18	1,862.67	0.00	0.00	0.00
13,000.00	91.26	359.93	11,206.83	1,962.64	-2.30	1,962.64	0.00	0.00	0.00
13,100.00	91.26	359.93	11,204.63	2,062.62	-2.41	2,062.62	0.00	0.00	0.00
13,200.00	91.26	359.93	11,202.43	2,162.59	-2.53	2,162.59	0.00	0.00	0.00
13,300.00	91.26	359.93	11,200.23	2,262.57	-2.65	2,262.57	0.00	0.00	0.00
13,400.00	91.26	359.93	11,198.03	2,362.54	-2.76	2,362.54	0.00	0.00	0.00
13,500.00	91.26	359.93	11,195.83	2,462.52	-2.88	2,462.52	0.00	0.00	0.00
13,537.49	91.26	359.93	11,195.00	2,500.00	-2.93	2,500.00	0.00	0.00	0.00
Begin 2.00°/100' Build									
13,543.19	91.38	359.93	11,194.87	2,505.70	-2.93	2,505.70	2.00	2.00	0.00
Hold 91.38° Inc									
13,600.00	91.38	359.93	11,193.51	2,562.49	-3.00	2,562.49	0.00	0.00	0.00
13,700.00	91.38	359.93	11,191.10	2,662.46	-3.12	2,662.46	0.00	0.00	0.00
13,800.00	91.38	359.93	11,188.70	2,762.43	-3.23	2,762.44	0.00	0.00	0.00
13,900.00	91.38	359.93	11,186.30	2,862.40	-3.35	2,862.41	0.00	0.00	0.00
14,000.00	91.38	359.93	11,183.90	2,962.38	-3.47	2,962.38	0.00	0.00	0.00



Phoenix Technology Services LP

Planning Report



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Wellbore: ST01 / Job #61822
Design: Plan 3 10-20-17

Local Co-ordinate Reference: Well 303H
TVD Reference: GL + KB @ 3741.00usft (H&P 482)
MD Reference: GL + KB @ 3741.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,037.63	91.38	359.93	11,183.00	3,000.00	-3.51	3,000.00	0.00	0.00	0.00
Begin 2.00°/100' Drop									
14,049.25	91.14	359.93	11,182.74	3,011.61	-3.52	3,011.61	2.00	-2.00	0.00
Hold 91.14° Inc									
14,100.00	91.14	359.93	11,181.73	3,062.35	-3.58	3,062.35	0.00	0.00	0.00
14,200.00	91.14	359.93	11,179.74	3,162.33	-3.70	3,162.33	0.00	0.00	0.00
14,300.00	91.14	359.93	11,177.74	3,262.31	-3.82	3,262.31	0.00	0.00	0.00
14,400.00	91.14	359.93	11,175.75	3,362.29	-3.93	3,362.29	0.00	0.00	0.00
14,500.00	91.14	359.93	11,173.75	3,462.27	-4.05	3,462.27	0.00	0.00	0.00
14,537.73	91.14	359.93	11,173.00	3,500.00	-4.10	3,500.00	0.00	0.00	0.00
Begin 2.00°/100' Build									
14,543.63	91.26	359.93	11,172.88	3,505.89	-4.10	3,505.90	2.00	2.00	0.00
Hold 91.26° Inc									
14,600.00	91.26	359.93	11,171.64	3,562.25	-4.17	3,562.25	0.00	0.00	0.00
14,700.00	91.26	359.93	11,169.44	3,662.23	-4.29	3,662.23	0.00	0.00	0.00
14,800.00	91.26	359.93	11,167.23	3,762.20	-4.40	3,762.20	0.00	0.00	0.00
14,900.00	91.26	359.93	11,165.03	3,862.18	-4.52	3,862.18	0.00	0.00	0.00
15,000.00	91.26	359.93	11,162.83	3,962.15	-4.64	3,962.16	0.00	0.00	0.00
15,037.85	91.26	359.93	11,162.00	3,999.99	-4.68	4,000.00	0.00	0.00	0.00
Begin 2.00°/100' Build									
15,043.58	91.38	359.93	11,161.87	4,005.72	-4.69	4,005.72	2.00	2.00	0.00
Hold 91.38° Inc									
15,100.00	91.38	359.93	11,160.51	4,062.13	-4.75	4,062.13	0.00	0.00	0.00
15,200.00	91.38	359.93	11,158.11	4,162.10	-4.87	4,162.10	0.00	0.00	0.00
15,300.00	91.38	359.93	11,155.71	4,262.07	-4.99	4,262.07	0.00	0.00	0.00
15,400.00	91.38	359.93	11,153.31	4,362.04	-5.10	4,362.04	0.00	0.00	0.00
15,500.00	91.38	359.93	11,150.91	4,462.01	-5.22	4,462.01	0.00	0.00	0.00
15,538.00	91.38	359.93	11,150.00	4,500.00	-5.27	4,500.00	0.00	0.00	0.00
Begin 2.00°/100' Drop									
15,577.09	90.59	359.93	11,149.33	4,539.08	-5.31	4,539.09	2.00	-2.00	0.00
Hold 90.59° Inc									
15,600.00	90.59	359.93	11,149.09	4,561.99	-5.34	4,561.99	0.00	0.00	0.00
15,700.00	90.59	359.93	11,148.06	4,661.99	-5.45	4,661.99	0.00	0.00	0.00
15,800.00	90.59	359.93	11,147.02	4,761.98	-5.57	4,761.98	0.00	0.00	0.00
15,824.02	90.59	359.93	11,146.77	4,786.00	-5.60	4,786.00	0.00	0.00	0.00
TD at 15824.02									



Phoenix Technology Services LP

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Design: Plan 3 10-20-17

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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
T4 - Black & Tan 27 F - plan misses target center by 9701.78usft at 10700.00usft MD (10698.74 TVD, -3.09 N, -7.87 E) - Point	0.00	0.00	1,206.00	2,000.00	-2.34	562,138.30	782,840.26	32° 32' 34.55944 N 03° 32' 58.62902 W	
BHL v3 - Black & Tan - plan hits target center - Point	0.00	0.00	11,146.77	4,786.00	-5.60	564,924.30	782,837.00	32° 33' 2.12612 N 03° 32' 58.42757 W	
T9 - Black & Tan 27 F - plan hits target center - Point	0.00	0.00	11,150.00	4,500.00	-5.27	564,638.30	782,837.33	32° 32' 59.29621 N 03° 32' 58.44826 W	
T8 - Black & Tan 27 F - plan hits target center - Point	0.00	0.00	11,162.00	4,000.00	-4.68	564,138.30	782,837.92	32° 32' 54.34885 N 03° 32' 58.48441 W	
T7 - Black & Tan 27 F - plan hits target center - Point	0.00	0.00	11,173.00	3,500.00	-4.10	563,638.30	782,838.50	32° 32' 49.40150 N 03° 32' 58.52057 W	
T6 - Black & Tan 27 F - plan hits target center - Point	0.00	0.00	11,183.00	3,000.00	-3.51	563,138.30	782,839.09	32° 32' 44.45415 N 03° 32' 58.55672 W	
T5 - Black & Tan 27 F - plan hits target center - Point	0.00	0.00	11,195.00	2,500.00	-2.93	562,638.30	782,839.67	32° 32' 39.50679 N 03° 32' 58.59287 W	
T3 - Black & Tan 27 F - plan misses target center by 0.02usft at 12537.25usft MD (11217.02 TVD, 1500.00 N, -1.76 E) - Point	0.00	0.00	11,217.00	1,500.00	-1.76	561,638.30	782,840.84	32° 32' 29.61208 N 03° 32' 58.66516 W	
T2 - Black & Tan 27 F - plan hits target center - Point	0.00	0.00	11,228.00	1,000.00	-1.17	561,138.30	782,841.43	32° 32' 24.66472 N 03° 32' 58.70130 W	
T1 - Black & Tan 27 F - plan misses target center by 1.53usft at 11514.08usft MD (11237.06 TVD, 477.04 N, -2.09 E) - Point	0.00	0.00	11,237.00	477.00	-0.56	560,615.30	782,842.04	32° 32' 19.48978 N 03° 32' 58.73910 W	



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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,626.02	1,626.00	Rustler			
1,961.03	1,961.00	Salado			
3,363.12	3,363.00	Tansill			
3,521.13	3,521.00	Yates			
3,621.14	3,621.00	Seven Rivers			
5,671.37	5,671.00	Delaware			
8,582.02	8,581.00	Bone Spring			
9,017.05	9,016.00	Avalon			
9,272.07	9,271.00	1st Bone Spring Carb			
9,677.14	9,676.00	1st Bone Spring Sand			
9,952.15	9,951.00	2nd Bone Spring Carb			
10,212.16	10,211.00	2nd Bone Spring Sand			
10,732.26	10,731.00	3rd Bone Spring Carb			
10,979.89	10,971.00	3rd Bone Spring Sand			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,700.00	10,698.74	-3.09	-7.87	Tie In
10,758.89	10,757.63	-3.58	-8.64	KOP, Begin 12.00°/100' Build
11,519.27	11,237.00	482.23	-1.94	LP, Hold 91.00° Inc, Begin 2.00°/100' Turn
11,607.65	11,235.46	570.59	-0.68	Hold 91.00° Inc at 359.93° Azm
12,037.13	11,228.00	1,000.00	-1.17	Begin 2.00°/100' Build
12,050.44	11,227.74	1,013.31	-1.19	Hold 91.26° Inc
13,537.49	11,195.00	2,500.00	-2.93	Begin 2.00°/100' Build
13,543.19	11,194.87	2,505.70	-2.93	Hold 91.38° Inc
14,037.63	11,183.00	3,000.00	-3.51	Begin 2.00°/100' Drop
14,049.25	11,182.74	3,011.61	-3.52	Hold 91.14° Inc
14,537.73	11,173.00	3,500.00	-4.10	Begin 2.00°/100' Build
14,543.63	11,172.88	3,505.89	-4.10	Hold 91.26° Inc
15,037.85	11,162.00	3,999.99	-4.68	Begin 2.00°/100' Build
15,043.58	11,161.87	4,005.72	-4.69	Hold 91.38° Inc
15,538.00	11,150.00	4,500.00	-5.27	Begin 2.00°/100' Drop
15,577.09	11,149.33	4,539.08	-5.31	Hold 90.59° Inc
15,824.02	11,146.77	4,786.00	-5.60	TD at 15824.02

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

RECEIVED

OPERATOR'S NAME:	APACHE CORPORATION
LEASE NO.:	NMCL029519B
WELL NAME & NO.:	BLACK & TAN 27 FEDERAL COM 303H
SURFACE HOLE FOOTAGE:	215' FSL & 1670' FWL
BOTTOM HOLE FOOTAGE:	280' FNL & 1670' FWL
LOCATION:	Section 27, T. 20 S., R 34 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

All COAs still apply expect the following:

H2S	☐ Yes	☒ No	
Potash	☐ None	☐ Secretary	☒ R-111-P
Cave/Karst Potential	☒ Low	☐ Medium	☐ High
Variance	☐ None	☒ Flex Hose	☐ Other
Wellhead	☒ Conventional	☐ Multibowl	☐ Both
Other	☐ 4 String Area	☒ Capitan Reef	☐ WIPP

A. Hydrogen Sulfide

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

- The 13-3/8 inch surface casing shall be set at approximately 1700 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **Additional cement may be required. Excess calculates to 23%.**
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
1. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:

Option 1

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Additional cement may be required. Excess calculates to 17%.**

Option 2

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- Second stage above DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement may be required. Excess calculates to 12%.**
- ❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:
(Use this for 3 string wells in the Capitan Reef, if 4 string well ensure FW based mud used across the capitan interval)
 - Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.
 - Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

Pilot hole is required to have a plug at the bottom of the hole. The BLM is to be contacted (575-361-2822) prior to tag of bottom plug, which must be a minimum of 200' in length. The Wolfcamp plug from 11,135' - 11,345' needs to be tagged. Operator can set one plug from bottom of pilot hole to kick-off point and save the WOC time for tagging the first plug. Note plug tops on subsequent drilling report.

2. The minimum required fill of cement behind the 5-1/2 inch production casing is:

Option 1

- Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement may be required. Excess calculates to -6%.**

Option 2

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job. **Additional cement may be required. Excess calculates to 21%.**
- Second stage above DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement may be required. Excess calculates to -51%.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **5000 (5M)** psi.

ZS 110117

R111P Cap KFC

13 3/8	surface csg in a	17 1/2	inch hole.	Design Factors			SURFACE		
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight	
"A"	54.50	J 55	BUTT	9.21	1.42	0.87	1,700	92,650	
"B"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,169			Tail Cmt	does not	circ to sfc.	Totals:	1,700	92,650	
<u>Comparison of Proposed to Minimum Required Cement Volumes</u>									
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
17 1/2	0.6946	950	1524	1235	23	9.00	1881	2M	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

9 5/8	casing inside the		13 3/8		Design Factors		INTERMEDIATE		
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight	
"A"	40.00	J 55	BUTT	2.72	5.24	0.62	900	36,000	
"B"	40.00	J 55	LT&C	2.66	0.82	0.62	4,880	195,200	
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	5,780	231,200	
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		1700	overlap.	
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
12 1/4	0.3132	1243	2234	1913	17	10.50	3917	5M	0.81
D V Tool(s):			3500				sum of sx	Σ CuFt	Σ%excess
t by stage % :		25	12				1310	2242	17

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 4.39, 0.68, c, d <0.70 a Problem!!

Alt Burst = 1.01 = OK. Collapse = 0.82*1.5 = 1.23 = OK

5 1/2 Segment	casing inside the #/ft	9 5/8 Grade	Coupling	Body	Design Factors		PRODUCTION		
"A"	17.00	P 110	BUTT	2.88	Collapse	Burst	Length	Weight	
"B"	17.00	P 110	BUTT	6.86	1.07	1.67	5,035	85,595	
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,374							Totals:	15,824	269,008
B would be:				89.69	1.17	if it were a vertical wellbore.			
No Pilot Hole Planned		MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC	
		15824	11147	11147	10789	91	12	11519	
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		5780	overlap.	
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0.2526	2068	3793	4050	-6	11.00			1.35
Setting Depths for D V Tool(s):				5830		sum of sx	Σ CuFt	Σ % excess	
% excess cmt by stage:				21	-51	2153	3794	-6	
Class 'H' tail cmt yld > 1.20				Collapse = 7468/ (0.052*11*11106) = 1.177 > 1.125 = OK					

2nd plug					
Top of plug	10072 ft			Length of pilot hole	600 ft
Bottom of plug	10672 ft			Length of plug	602 ft
No. of sacks	266 sks			Percent excess	0%
Yield	0.945				
Hole Size	8.75 in	vol hole (cft/ft)	0.4176	Distance between plugs	1108 ft
1st plug					
Top of plug	11780 ft			Length of pilot hole	270 ft
Bottom of plug	12050 ft			Length of plug	220 ft
No. of sacks	73 sks			Percent excess	-18%
Yield	1.26				
Hole Size	8.75 in	vol hole (cft/ft)	0.4176		