OCD-ARTESIA

Form 3160-5
(February 2005)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No 1004-0137
Expires March 31, 2007

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.

SUBMIT IN TRIPLICATE – *Other instructions on page 2.*

5 Lease Serial No.
NMNM 017222

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☐ Oil Well ☑ Gas Well ☐ Other

8. Well Name and No.
MOSAIC 34 FEDERAL 2H

2 Name of Operator
CHESAPEAKE OPERATING, INC. ATTN: LINDA GOOD

9. API Well No.
30-015- 35831

3a Address
P O BOX 18496
OKLAHOMA CITY, OK 73154-0496

3b Phone No. *(include area code)*
405-767-4275

10. Field and Pool or Exploratory Area
UNDES. WILLOW LAKE

4. Location of Well *(Footage, Sec., T.,R.,M, or Survey Description)*
SHL 371' FSL 365' FEL, (SESE), BHL 330 FSL 2310 FWL (SESW) SECTION 34, T24S, R28E

11. Country or Parish, State
EDDY COUNTY, NEW MEXICO

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	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☑ Other Additional info. for APD
	☑ 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 recomplete 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 recompletion 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.)

1. Target formation is part of the Delaware Group
2. BOP nomenclature has been corrected and re-submitted (see attachment).
3. The choke info requested is attached.
4. Attached are the casing safety factors; I did not know these were required or requested in the "drilling plan" package.
5. The top of cement is at ground level for the surface and intermediate casing strings, and at ~2090' for the production casing (will be 500' above the actual intermediate casing shoe depth).
6. The mud program summary was complete for all three sections but must have not been visible in what was submitted to the BLM. On what I sent, two sections were at the bottom of the page, and the third hole section was at the top of the next page. I have reformatted to make the mud info more clear (in one table).
7. I have submitted directional plans (from Quantum) that give both section and plan views (see attachment)..

Drilling Engineer
Randy Patterson

(CHK PN 615928)

14 I hereby certify that the foregoing is true and correct
Name *(Printed/Typed)*
LINDA GOOD

Title FEDERAL REGULATORY ANALYST

Signature Linda Good

Date 08/24/2007

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
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	

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)

BOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

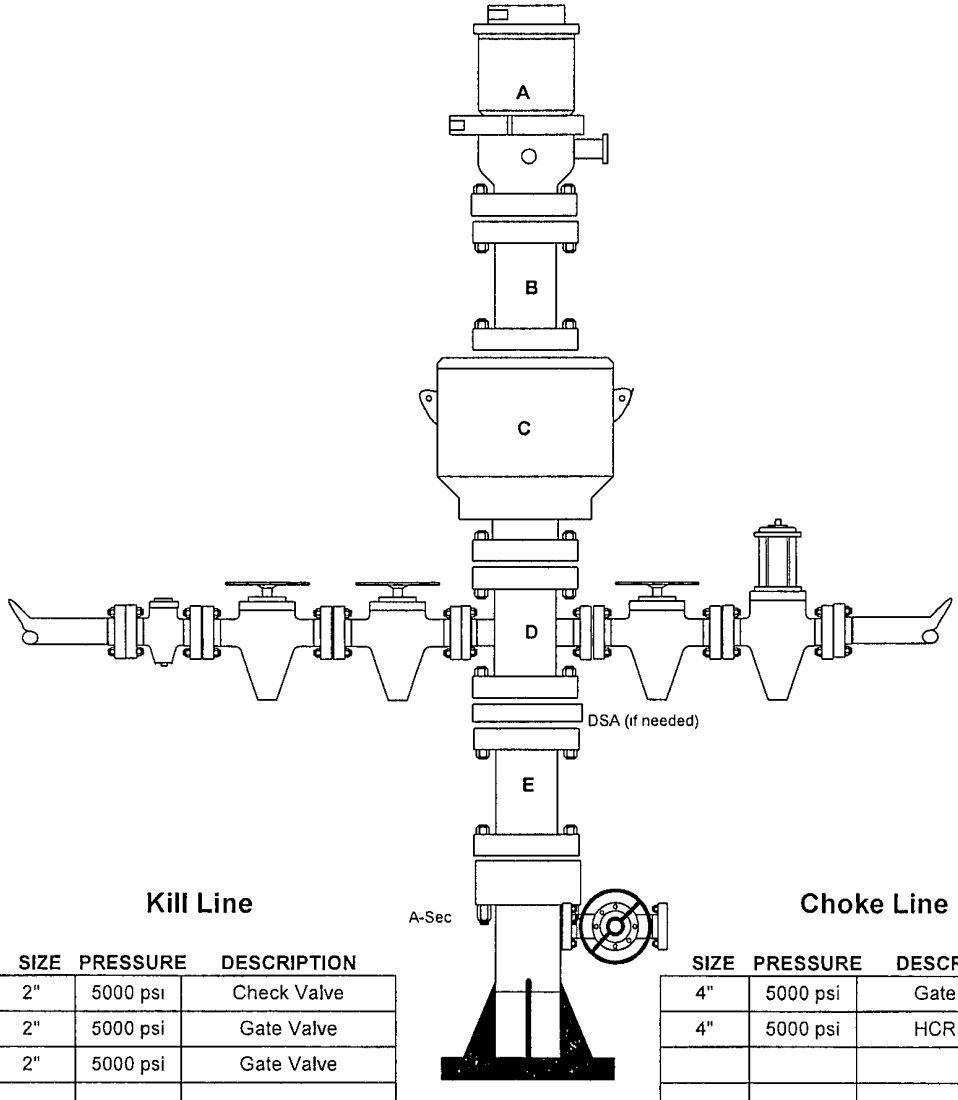
...ic 34 Federal 2H

...Forster 15

WEL... : Eddy **STATE: New Mexico**

...ATION: Drill out below 13-3/8" Casing (11" hole size)

	SIZE	PRESSURE	DESCRIPTION
A	13-5/8"	500 psi	Rot Head
B	13-5/8"	2000 psi	Spacer Spool
C	13-5/8"	2000 psi	Annular
D	13-5/8"	2000 psi	Mud Cross
E	13-5/8"	2000 psi	Spacer Spool
DSA	13-5/8" 3M x 13-5/8" 2M (if needed)		
A-Sec	13-3/8" SOW x 13-5/8" 3M		



Kill Line

SIZE	PRESSURE	DESCRIPTION
2"	5000 psi	Check Valve
2"	5000 psi	Gate Valve
2"	5000 psi	Gate Valve

Choke Line

SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

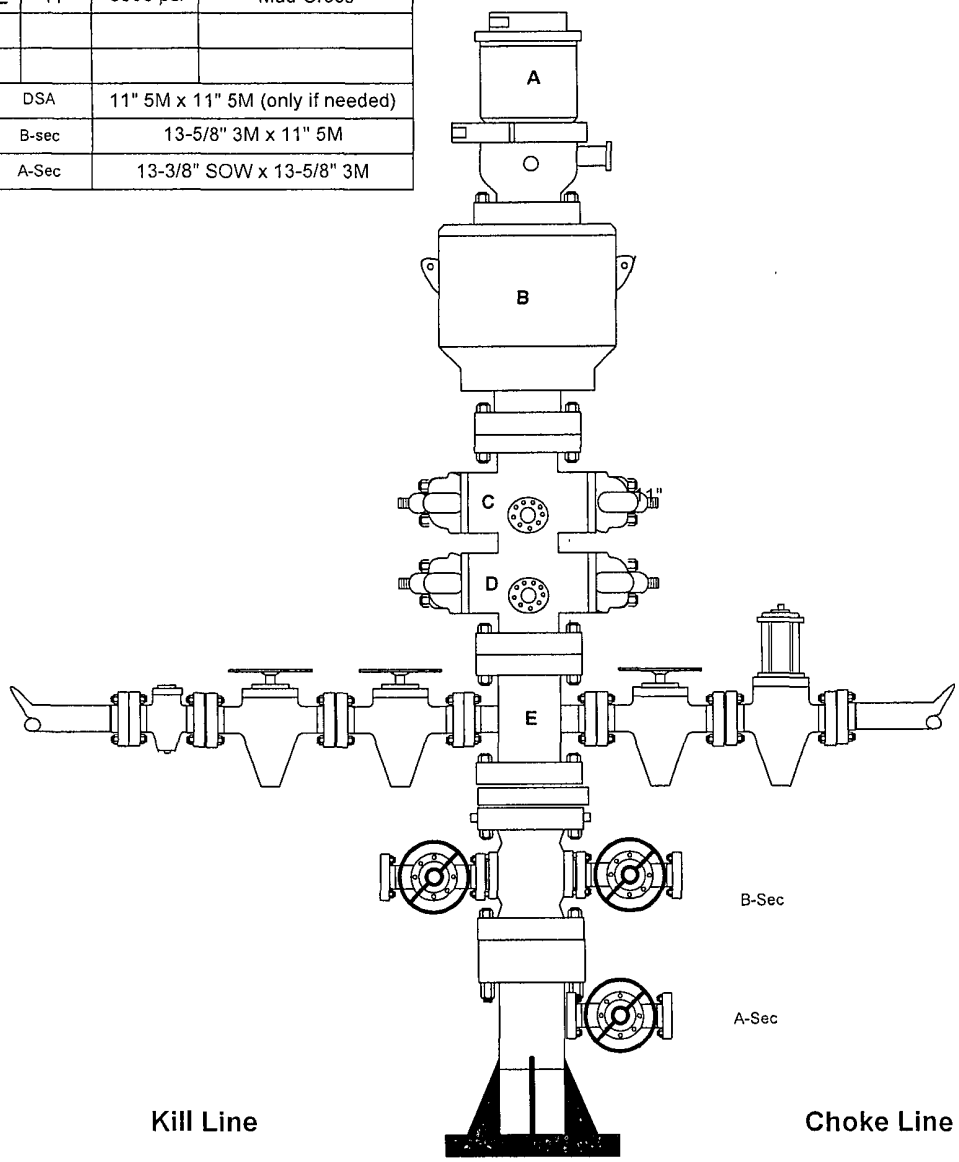
WELL : **Mosaic 34 Federal 2H**

RIG : **Forster 15**

COUNTY : **Eddy** **STATE: New Mexico**

OPERATION: Drill out below 8-5/8" Casing (7-7/8" hole size)

	SIZE	PRESSURE	DESCRIPTION
A	11"	500 psi	Rot Head
B	11"	5000 psi	Annular
C	11"	5000 psi	Pipe Rams
D	11"	5000 psi	Blind Rams
E	11"	5000 psi	Mud Cross
DSA		11" 5M x 11" 5M (only if needed)	
B-sec		13-5/8" 3M x 11" 5M	
A-Sec		13-3/8" SOW x 13-5/8" 3M	



Kill Line

SIZE	PRESSURE	DESCRIPTION
2"	5000 psi	Check Valve
2"	5000 psi	Gate Valve
2"	5000 psi	Gate Valve

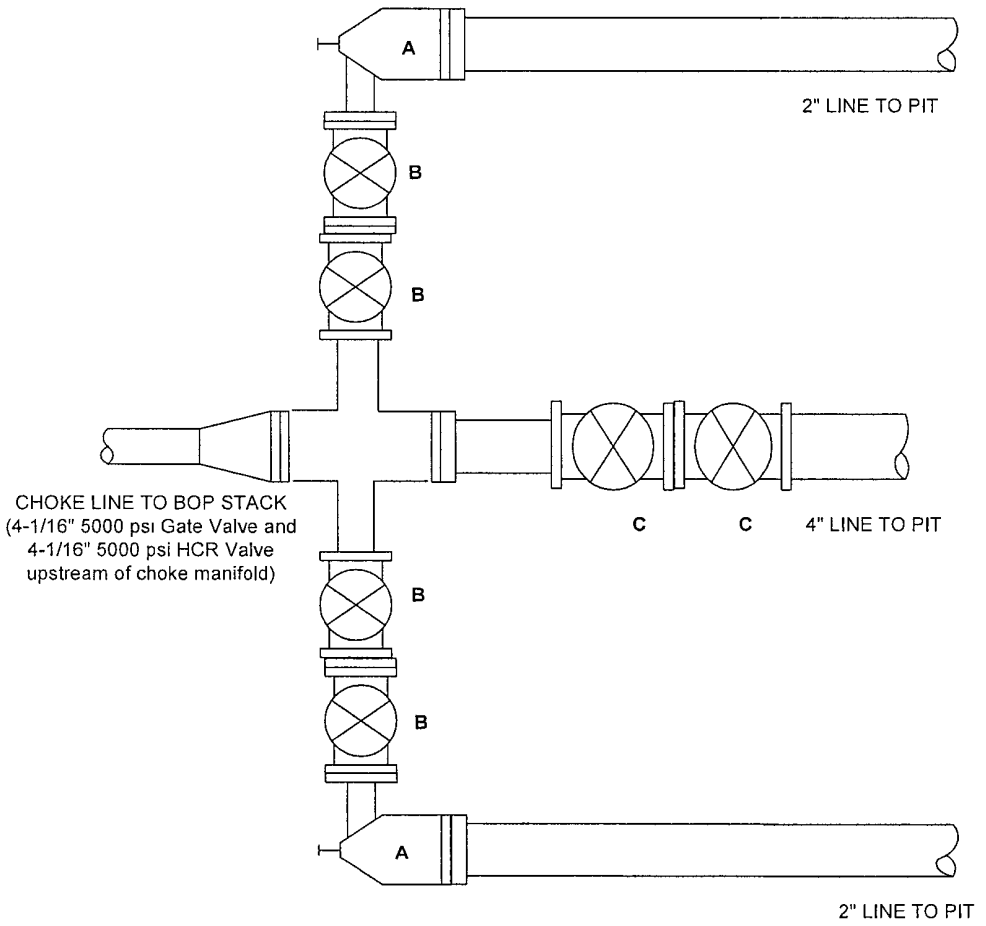
Choke Line

SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

CHOKE MANIFOLD SCHEMATIC

CHESAPEAKE OPERATING, INC.

WELL : **Mosaic 34 Federal 2H**
RIG : **Forster Rig 15**
COUNTY : **Eddy** **STATE** : **New Mexico**
OPERATION: Drilling below/beyond 13-3/8" surface casing



	SIZE	PRESSURE	DESCRIPTION
A	2-1/16"	5000 psi	Manual Choke
B	2-1/16"	5000 psi	Gate Valve
C	4-1/16"	5000 psi	Gate Valve

Chesapeake ENERGY

Casing Program

Mosaic 34 Federal 2H

Proposed TD: 6625' MD

(4914' est. max TVD)

SHL: 371' FSL & 365' FEL
EOW: 371' FSL & 2280' FEL
Section 34 - 24S - 28E

Eddy County, New Mexico

RLP
8/23/2007

Mosaic 34 Federal 2H
17-1/2" Hole Section
0' – 650'

Casing Design:

Size	Interval	Length	Weight	Grade	Conn	Sec. Weight
13-3/8"	0' – 650'	650'	48 ppf	H-40	ST&C	31.2 Klbs

Recommended Make-up Torque: 3220 ft-lbs (Opt)
2420 ft-lbs (Minimum)
4030 ft-lbs (Maximum)

- Minimum collapse safety factor of 2.18 (complete evacuation; 10.0 ppg mud on backside). 100% collapse value of 740 psi.
- Minimum burst safety factor of 1.44 (Testing casing at 1200 psi). 100% burst value of 1730 psi.
- Minimum tension safety factor of 3.87 (casing full of 12.4 ppg cement without backup). 100% tension value of 322,000 lbs.

11" Hole Section
650' – 2590'

Casing Design:

Size	Interval	Length	Weight	Grade	Conn	Sec. Weight
8-5/8"	0' – 2590'	2590'	32 ppf	J-55	LT&C	82.9 Klbs

Recommended Make-up Torque: 4170 ft-lbs (Opt)
3130 ft-lbs (Minimum)
5210 ft-lbs (Maximum)

- Minimum collapse safety factor of 1.87 (complete evacuation; 10.0 ppg on backside). 100% collapse value of 2530 psi.
- Minimum burst safety factor of 1.96 (Casing test to 2000 psi). 100% burst value of 3930 psi.
- Minimum tension safety factor of 2.52 (casing full of 12.4 ppg cement without backup). 100% tension value of 417,000 lbs.

7-7/8" Hole Section
2590' – 6625'

Casing Design:

Size	Interval	Length	Weight	Grade	Conn	Sec. Weight
5-1/2"	0' – 6625'	6625'	17 ppf	N-80	LT&C	112.6 Klbs

Recommended Make-up Torque: 3410 ft-lbs (Opt)
2560 ft-lbs (Minimum)
4260 ft-lbs (Maximum)

- Minimum collapse safety factor of 2.46 (complete evacuation; 10.0 ppg on backside). 100% collapse value of 6290 psi.
- Minimum burst safety factor of 1.54 (surface pressure of 5000 psi, testing or treating). 100% burst value of 7740 psi.
- Minimum tension safety factor of 2.34 (casing full of 13.5 ppg cement without backup). 100% tension value of 348,000 lbs

ONSHORE OIL & GAS ORDER NO. 1
Approval of Operations on Onshore
Federal and Indian Oil and Gas Leases

All lease and/or unit operations are to be conducted in such a manner that full compliance is made with the applicable laws, regulations (CFR 43, Part 3160) and the approved Application for Permit to Drill. The operator is considered fully responsible for the actions of his subcontractors. A copy of the approved APD must be on location during construction, drilling and completion operations.

Approval of this application 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.

1. FORMATION TOPS

The estimated tops of important geologic markers are as follows:

Formation	Subsea	Depth (kbtvd)
BASE OF SALT	414'	2590' (2590')
*BELL CANYON	365'	2639' (2639')
MANZANITA MARKER	-575'	3593' (3593')
KOP	-1433	4437' (4437)
**WILLOW LAKE HORIZ. TOP	-1,907'	5070' (4911')
**WILLOW LAKE HORIZONTAL TARGET LINE	-1,925'	5201' (4929')
** WILLOW LAKE HORIZ. BASE (not penetrated)	-1,944	NP (4948')
**Potentially productive zones		
TOTAL DEPTH	TD (MD)	6625' (4929')

2. ESTIMATED DEPTH OF WATER, OIL, GAS & OTHER MINERAL BEARING FORMATIONS

The estimated depths at which the top and bottom of the anticipated water, oil, gas or other mineral bearing formations are expected to be encountered are as follows:

Substance	Formation	Depth
Oil/Gas	Willow Lake Horizontal	5200' – 6625' MD
-	-	-

All shows of fresh water and minerals will be reported and protected.

3. BOP EQUIPMENT: 3000 psi System

Chesapeake Operating, Inc.'s minimum specifications for pressure control equipment are as follows:

I. BOP, Annular, Choke Manifold, Pressure Test - See Exhibit F-1 and F-2.

A. Equipment
1. The equipment to be tested includes all of the following that is installed on the well:
(a) Ram-type and annular preventers,
(b) Choke manifolds and valves,
(c) Kill lines and valves, and
(d) Upper and lower kelly cock valves, inside BOP's and safety valves.

B. Test Frequency
1. All tests should be performed with clear **water**,
(a) when installed,
(b) before drilling out each casing string,
(c) at any time that there is a repair requiring a pressure seal to be broken in the assembly, and
(d) at least once every **30 days** while drilling.

C. Test Pressure
1. In some drilling operations, the pressures to be used for low and high-pressure testing of preventers and casing may be different from those given below due to governmental regulations, or approved local practices.
2. If an individual component does not test at the low pressure, **do not,** test to the high pressure and then drop back down to the low pressure.
3. All valves located downstream of a valve being tested must be placed in the open position.
4. All equipment will be tested with an initial "low pressure" test at 250 psi.
5. The subsequent "high pressure" test will be conducted at the rated working pressure of the equipment for all equipment except the annular preventer.
6. The "high pressure" test for the annular preventer will be conducted at 70% of
7. the rated working pressure.
8. A record of all pressures will be made on a pressure-recording chart.

D. Test Duration
1. In each case, the individual components should be monitored for leaks for **5 minutes,** with no observable pressure decline, once the test pressure as been applied.

II. Accumulator Performance Test

A. Scope

1. The purpose of this test is to check the capabilities of the BOP control systems, and to detect deficiencies in the hydraulic oil volume and recharge time.

B. Test Frequency

1. The accumulator is to be tested each time the BOP's are tested, or any time a major repair is performed.

C. Minimum Requirements

1. The accumulator should be of sufficient volume to supply 1.5 times the volume to close and hold all BOP equipment in sequence, **without recharging** and the **pump turned off**, and have remaining pressures of **200 PSI above the precharge pressure**.

2. Minimum precharge pressures for the various accumulator systems per **manufacturers recommended specifications** are as follows:

3.

System Operating Pressures	Precharge Pressure
1500 PSI	750 PSI
2000 PSI	1,000 PSI
3000 PSI	1,000 PSI

3. Closing times for the Hydril should be less than **20 seconds**, and for the ram-type preventers less than **10 seconds**.

4. System Recharge time should not exceed **10 minutes**.

D. Test Procedure

1. Shut accumulator pumps off and record accumulator pressure.

2. In sequence, close the annular and one set of properly sized pipe rams, and open the HCR valve.

3. Record time to close or open each element and the remaining accumulator pressure after each operation.

4. Record the remaining accumulator pressure at the end of the test sequence. Per the previous requirement, this pressure **should not be less** than the following pressures:

System Pressure	Remaining Pressure At Conclusion of Test
1,500 PSI	950 PSI
2,000 PSI	1,200 PSI
3,000 PSI	1,200 PSI

5. Turn the accumulator pumps on and record the recharge time. This time should not exceed **10 minutes.**

6. Open annular and ram-type preventers. Close HCR valve.

7. Place all 4-way control valves in **full open** or **full closed** position. **Do not leave in neutral position**.

4. CASING AND CEMENTING PROGRAM

a. The proposed casing program will be as follows:

Purpose	Interval	Hole Size	Casing Size	Weight	Grade	Thread	Condition
Surface	0' – 650'	17.5"	13-3/8"	48.0	H-40	ST&C	new
Intermediate	0' – 2590'	11.0"	8-5/8"	32.0	J-55	LT&C	new
Production	0' – 6625'	7.875"	5-1/2"	17.0	N-80	LT&C	new

b. Casing design subject to revision based on geologic conditions encountered.
c. The cementing program will be as follows:

Interval	Type	Amount	Yield	Washout	Excess
0' – 650'	35:65 Poz:C	350	2.10	0	100
	Class C (450' – sect TD)	200	1.34	0	100
0' – 2590'	35:65 Poz:C	500	2.10	0	125
	Class C (2200' – sect TD)	250	1.32	0	125
2000' – 6625'	50:50 Poz:C	250	2.43	30	20
	15:61:11 Poz:C:CE (4400' – sect TD)	400	1.47	30	20

5. MUD PROGRAM

a. The proposed circulating mediums to be used in drilling are as follows:

Interval	Mud Type	Mud Weight	Viscosity	Fluid Loss
0' – 650'	water	8.4 – 9.2	28 - 32	NC
650' – 2590'	brine	9.9 – 10.2	28 - 30	NC
2590' – 6625'	water base	8.6 – 9.3	28 - 36	8 - 12

A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

6. TESTING, LOGGING AND CORING

The anticipated type and amount of testing, logging and coring are as follows:

a. Drill stem tests are not planned.
b. The logging program will consist of Natural GR, Density-Neutron, PE & Dual Laterolog from TD to surface casing; Neutron-GR surface casing to surface.
c. Cores samples are not planned.

7. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

a. The estimated bottom hole pressure is 2200 psi (0.45 psi/ft @ 4900' tvd) . No abnormal pressures or temperatures are anticipated.
b. Hydrogen sulfide gas is not anticipated.

Chesapeake Operating

Project: Eddy County (NM Local)
Site: Sec 34-T24S-R28E
Well: Mosaic 34 Federal #2H
Wellbore: Wellbore #1
Design: 07-30-07
Plan Version

Local Coordinates Only

WELL DETAILS: Mosaic 34 Federal #2H

+N/-S	+E/-W	
0.0	0.0	371' FSL / 365' FEL

QUANTUM DRILLING MOTORS & DIRECTIONAL SERVICES

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
		Willow Lake Horiz. Base
		Willow Lake Horiz. Target Line
2590.0	2590.0	Base of Salt
2636.0	2636.0	Bell Canyon
3593.0	3593.0	Manzanita Marker
4911.0	5127.8	Willow Lake Horiz. Top

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W
PBHL	4871.0	0.0	-1915.0

PLAN DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4437.2	0.00	0.00	4437.2	0.0	0.0	0.00	0.00	0.0	
3	5201.8	91.75	270.00	4914.5	0.0	-492.0	12.00	270.00	492.0	
4	6625.4	91.75	270.00	4871.0	0.0	-1915.0	0.00	0.00	1915.0	PBHL

ANNOTATIONS

TVD	MD	Annotation
4437.2	4437.2	KOP - 12/100 @ 270 AZO
4914.5	5201.8	EOC - Hold to TD
4871.0	6625.4	TD at 6625.4