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	Depth (RKB)	Subsea
San Andres	4,737'	-783'
Glorietta	6,369'	-2,415'
Padduck/Blinberry	6,908'	-2,954'
Tubb	7,512'	-3,558'
Drinkard	7,761'	-3,807'
Abo	8,189'	-4,235'
Wolfcamp Limestone	9,681'	-5,727'
Gilmore Dolomite	10,557'	-6,623'
Townsend Reef	**10,638'**	**-6,684'**
Cisco Shale	10,918'	-6,964'
Total Depth	**11,000'**	

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

Substance	Formation	Depth
Water	Surface Water	0' - 450'
Oil & Gas	Wolfcamp Limestone	9,681'
Oil & Gas	Townsend Reef	10,638'

3. BOP EQUIPMENT: 5,000 psi system with 11" stack (See BOP schematic)

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

I. BOP, Annular, Choke Manifold, Pressure Test

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 the rated working pressure.
7. 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:

System Operating Pressures	Precharge Pressure
1,500 PSI	750 PSI
2,000 PSI	1,000 PSI
3,000 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

Because of the lack of historical bit, casing and mud records, the casing, cementing and mud programs presented below may need to be modified during drilling. If the situation permits, Chesapeake will notify the BLM petroleum engineer prior to changes.

a. The proposed casing program will be as follows:

Purpose	Interval	Size	Weight	Grade	Thread	Condition
Surface	0' – 450'	13 3/8"	48#	J-55	STC	New
Intermediate	0' – 4,735'	8 5/8"	32#	J-55	LTC	New
Production	0 - TD'	5 ½"	17#	N/L-80	LTC	New

Casing design subject to revision based on geologic conditions encountered.

b. The cementing program will be as follows:

Location	Type	Amount	Yield	Excess
Surface	Class C + additives	+/- 500 sks	1.34	100%
Inter. Lead	36:65 Poz: Class C + additives	+/- 1200 sks	2.04	100%
Inter. Tail	Class C	+/- 200 sks	1.34	100%
Prod. 1st Lead	36:65 Poz: Class C + additives	+/- 300 sks	2.04	OH Caliper
Prod. 1st Tail	15:61:11 Poz:Class C:CSE + additives	+/- 200 sks	1.71	OH Caliper
Prod. 2nd Lead**	36:65 Poz: Class H + additives	+/- 400 sks	1.99	OH Caliper
Prod. 2nd Tail	Class H + additives	+/- 200 sks	1.18	OH Caliper

** DV tool will be set approx. 100' above the Abo Formation (~8,050)

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' – 450'	Spud Mud	8.6 – 9.5 ppg	334 – 36 sec	NC
450' – 4,735'	Brine water mud	8.4 – 10.4 ppg	32- 34 sec	NC
4,735 – 9,500'	Frest water w/lime & paper	8.4 – 8.6 ppg	28 29 sec	NC
9,500' – TD	Low solids non dispersed	8.6 – 9 ppg	34 – 40 sec	8 – 10 cc

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 will be performed on the Townsend Reef.
   b. Natural GR, Density, Neutron & Pe from total depth to intermediate, then GR & Neutron to 200'; Induction & Micro from total depth to intermediate; and Compensated Sonic from total depth to intermediate. Minimum CMR footage over Townsend Reef.
   c. Cores samples are not planned.

7. ABNORMAL PRESSURES AND HYDROGEN SULFIDE
   a. The estimated bottom hole pressures for the Townsend Reef is expected between 3,500 – 4,000#. No abnormal pressures or temperatures are anticipated.
   b. Hydrogen sulfide gas is not expected to be encountered.