RECEIVED DTS-08-318

Form 3160-3
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APR 10 2008

BY:

FORM APPROVED
OMB No 1004-0136
Expires July 31, 2010

EC

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a Type of Work ☒ DRILL ☐ REENTER CONFIDENTIAL	5 Lease Serial No NMNM95630
	6 If Indian, Allottee or Tribe Name
	7 If Unit or CA Agreement, Name and No
1b Type of Well ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone	8 Lease Name and Well No CROW FLATS 14 FEDERAL 2H 37197
2 Name of Operator CHESAPEAKE OPERATING, INC Contact: LINDA GOOD E-Mail: linda good@chk.com 147179	9 API Well No 30-015-36349
3a Address PO BOX 18496 OKLAHOMA CITY, OK 73154-0496 / 3b Phone No (include area code) Ph: 405-767-4275 Fx 405-879-7899	10 Field and Pool, or Exploratory WILDCAT
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface SENE 1980FNL 200FEL MAY 28 2008 At proposed prod zone SWNW 1980FNL 700FWL OCD-ARTESIA	11 Sec, T, R, M, or Blk and Survey or Area Sec 14 T16S R28E Mer NMP SME: BLM
14 Distance in miles and direction from nearest town or post office*	12 County or Parish EDDY / 13 State NM
15 Distance from proposed location to nearest property or lease line, ft (Also to nearest drig unit line, if any)	16 No of Acres in Lease 1760.00 / 17 Spacing Unit dedicated to this well 320.00
18 Distance from proposed location to nearest well, drilling, completed, applied for, on this lease, ft	19 Proposed Depth 10765 MD 6155' TVD / 20 BLM/BIA Bond No on file NM2634
21 Elevations (Show whether DF, KB, RT, GL, etc 3577 GL	22 Approximate date work will start / 23 Estimated duration

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No 1, shall be attached to this form

1 Well plat certified by a registered surveyor
2 A Drilling Plan
3 A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office)
4 Bond to cover the operations unless covered by an existing bond on file (see Item 20 above)
5 Operator certification
6 Such other site specific information and/or plans as may be required by the authorized officer

25 Signature (Electronic Submission)	Name (Printed/Typed) LINDA GOOD	Date 01/31/2008
Title REGULATORY COMPLIANCE SPECIALI		
Approved by (Signature)	Name (Printed/Typed) /s/ Don Peterson	Date 4/7/2008
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

NOTE: New Pit Rule NMAC 19-15-17

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

APPROVAL FOR TWO YEARS

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

Additional Operator Remarks (see next page) ROSWELL CONTROLLED WATER BASIN

Electronic Submission #58372 verified by the BLM Well Information System
For CHESAPEAKE OPERATING, INC., sent to the Carl
Committed to AFMSS for processing by TESSA CISNEROS on 01/31/

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

SEE ATTACHED FOR CONDITIONS OF APPROVAL

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

Additional Operator Remarks:

CHESAPEAKE OPERATING, INC. RESPECTFULLY REQUESTS PERMISSION TO DRILL A WELL TO 10,765' TO TEST THE WOLFCAMP FORMATION. IF PRODUCTIVE, CASING WILL BE RUN AND THE WELL COMPLETED IF DRY, THE WELL WILL BE PLUGGED AND AVANDONED AS PER BLM AND NEW MEXICO OIL CONSERVATION DIVISION REQUIREMENTS.

PLEASE FIND THE SURFACE USE PLAN AND DRILLING PLAN AS REQUIRED BY ONSHORE ORDER NO. 1

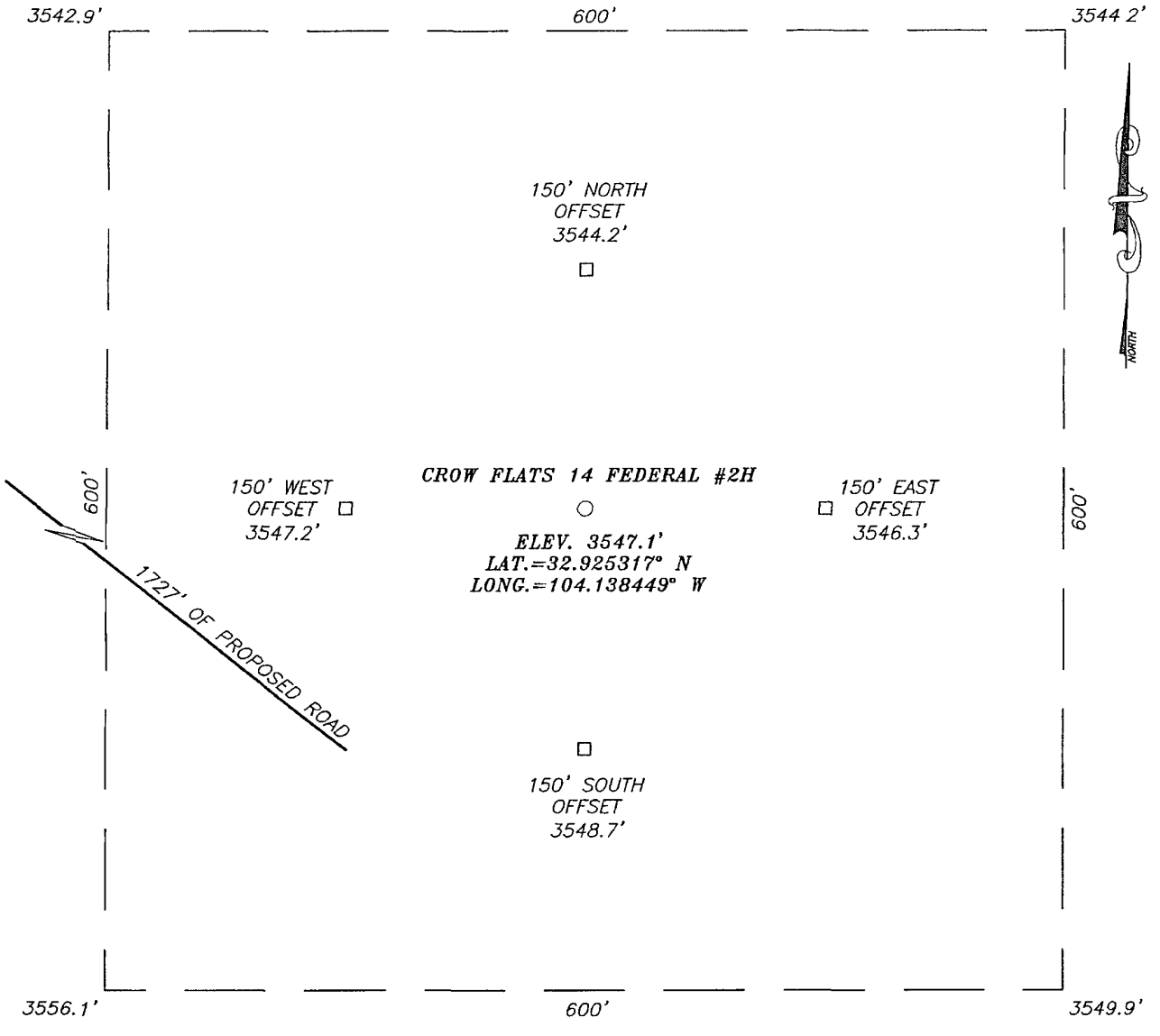
CHESAPEAKE OPERATING, INC. HAS AN AGREEMENT WITH THE GRAZING LESSEE.

PLEASE BE ADVISED THAT CHESAPEAKE OPERATING, INC IS CONSIDERED TO BE THE OPERATOR OF THE ABOVE MENTIONED WELL. CHESAPEAKE OPERATING, INC. AGREES TO BE RESPONSIBLE UNDER THE TERMS AND CONDITIONS OF THE LEASE FOR THE OPERATIONS CONDUCTED UPON THE LEASE LANDS.

(CHK PN 615831)

SECTION 14, TOWNSHIP 16 SOUTH, RANGE 28 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY. 82 AND CO. RD. 202 (SOUTHERN UNION), GO NORTH–NORTHEAST ON CO. RD. 202 APPROX. 3.8 MILES. TURN LEFT AT ROAD BEND AND GO APPROX. 0.1 MILE. TURN RIGHT AND GO APPROX. 1.0 MILE. TURN LEFT (NORTH) AND STAY ON MAIN ROAD AT 10.6 MILES FROM U.S. HWY. 82 TO DOG CANYON RD. AND GO APPROX. 1.5 MILES. TURN RIGHT ON ABANDONED LEASE RD. AND GO APPROX. 0.6 MILES TO ABANDONED WELL PAD. THIS LOCATION IS 1727 FEET SOUTHEAST ALONG PROPOSED ROAD.

100 0 100 200 Feet

Scale:1"=100'

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

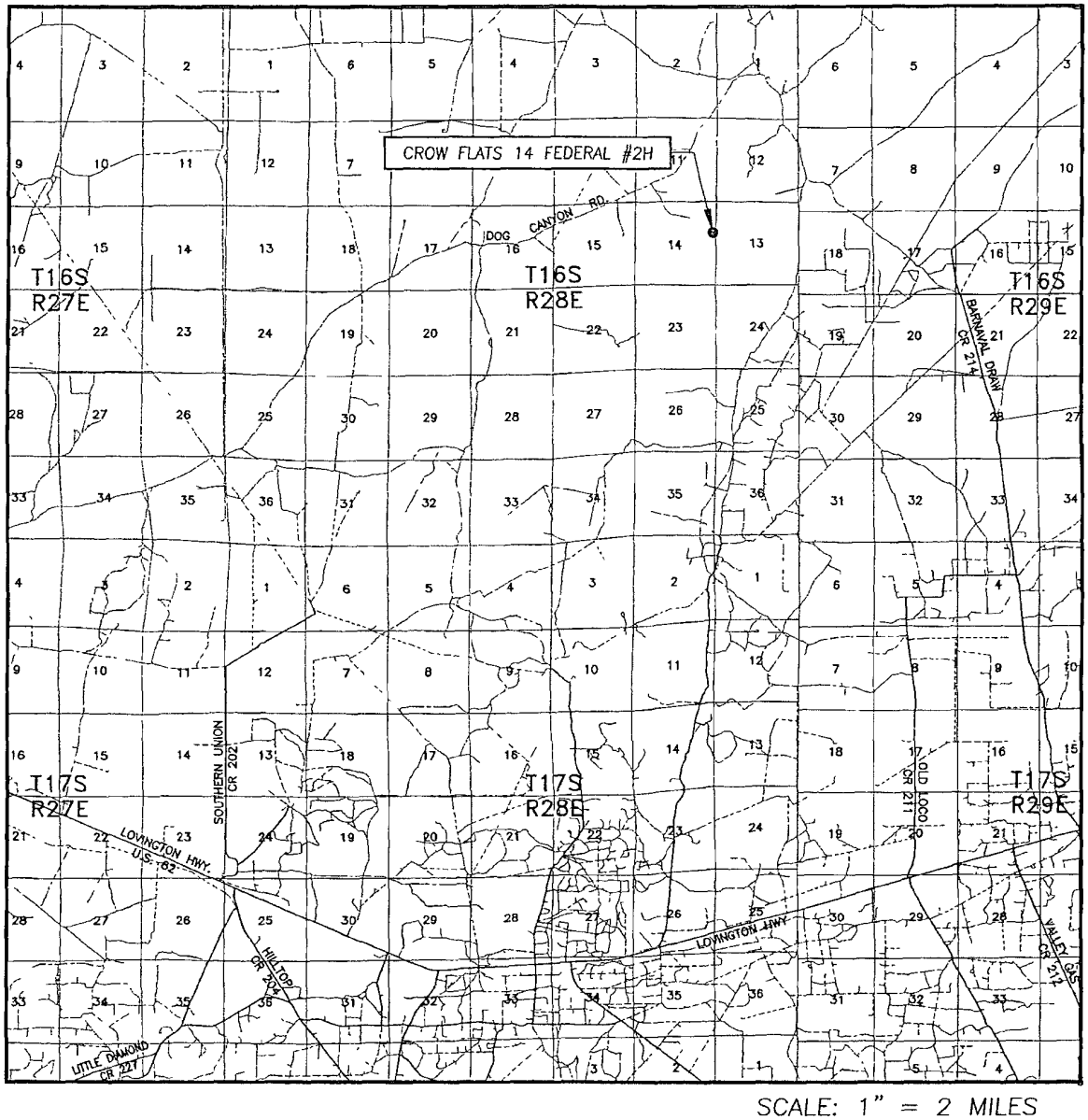
CHESAPEAKE OPERATING, INC.

CROW FLATS 14 FEDERAL #2H WELL
LOCATED 1980 FEET FROM THE NORTH LINE
AND 200 FEET FROM THE EAST LINE OF SECTION 14,
TOWNSHIP 16 SOUTH, RANGE 28 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

Survey Date: 08/07/07	Sheet 1 of 1 Sheets		
W.O. Number: 07.11.0954	DSS		Rev 1:N/A
Date: 08/21/07	Disk: .	07110954	Scale:1"=100'

EXHIBIT A-2

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 14 TWP. 16-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 1980' FNL & 200' FEL

ELEVATION 3547'

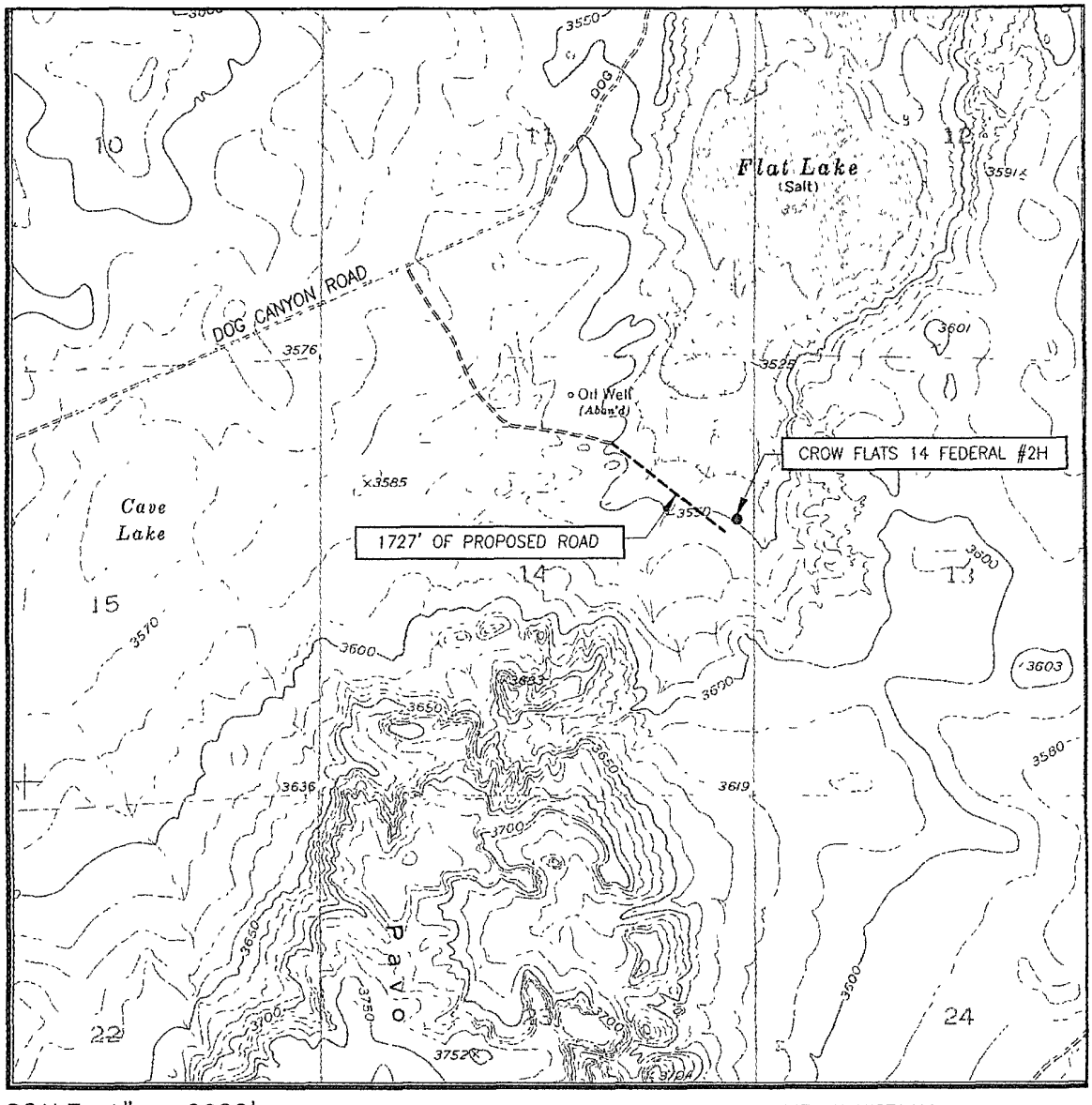
OPERATOR CHESAPEAKE OPERATING, INC.

LEASE CROW FLATS 14 FEDERAL

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

EXHIBIT A-3

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
DIAMOND MOUND, N.M. – 10'

SEC. 14 TWP. 16-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 1980' FNL & 200' FEL

ELEVATION 3547'

OPERATOR CHESAPEAKE OPERATING, INC.

LEASE CROW FLATS 14 FEDERAL

U.S.G.S. TOPOGRAPHIC MAP
DIAMOND MOUND, N.M.

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

EXHIBIT A-4

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240

DISTRICT II
1301 W. GRAND AVENUE, ARTESIA, NM 88210

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

DISTRICT IV
1220 S ST. FRANCIS DR, SANTA FE, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
	97102	Undes. Crow Flats; Wolfcamp Oil

Property Code	Property Name	Well Number
	CROW FLATS 14 FEDERAL	2H

OGRID No.	Operator Name	Elevation
147179	CHESAPEAKE OPERATING, INC.	3547'

Surface Location

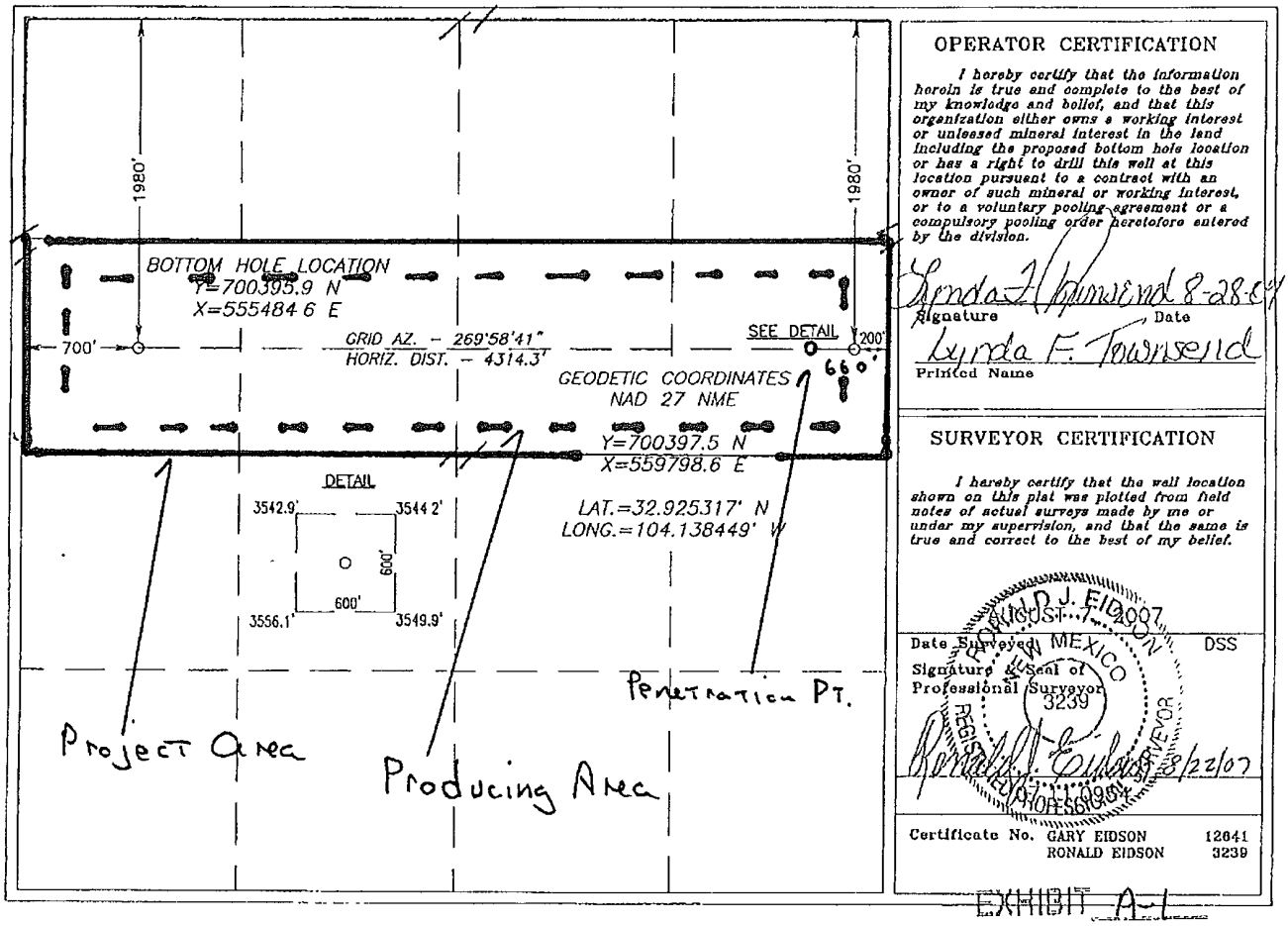
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	14	16-S	28-E		1980	NORTH	200	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	14	16-S	28-E		1980	NORTH	700	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Linda F. Townsend 8-28-07
Signature Date

Linda F. Townsend
Printed Name

SURVEYOR CERTIFICATION

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

RONALD J. EIDSON
AUGUST 7, 2007
NEW MEXICO
3239
REGISTERED PROFESSIONAL SURVEYOR

Date Surveyed: DSS
Signature & Seal of Professional Surveyor
Ronald J. Eidson 8/22/07

Certificate No. GARY EIDSON 12641
RONALD EIDSON 3239

EXHIBIT A-1

ONSHORE ORDER NO. 1
Chesapeake Operating, Inc.
Crow Flats14 Federal 2H
SL: 1980' FNL & 200' FEL
BL: 1980' FNL & 700' FWL
of Section 14-16S-28E
Eddy Co., New Mexico

CONFIDENTIAL – TIGHT HOLE
Lease Contract No. NMNM 095630

DRILLING PROGRAM

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
San Andres	1695	1897
Tubb	-1015	4607
Abo	-1775	5667
*Wolfcamp "Pay"	-2935	6527
TD (vertical)		6830
TVD at BHL		Approx. 6867
MD		Approx. 10,680

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	Wolfcamp	6527

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

ONSHORE ORDER NO. 1
Chesapeake Operating, Inc.
Crow Flats14 Federal 2H
SL: 1980' FNL & 200' FEL
BL: 1980' FNL & 700' FWL
of Section 14-16S-28E
Eddy Co., New Mexico

CONFIDENTIAL – TIGHT HOLE
Lease Contract No. NMNM 095630

DRILLING PROGRAM

3 BOP EQUIPMENT.

Will have a 3000 psi simplified rental stack (see proposed schematic) for drill out below surface casing; this system will be tested to 2000 psi working pressure

Will have a 5000 psi rig stack (see proposed schematic) for drill out below intermediate casing; this system will be tested to 3000 psi working pressure

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

I. BOP, Annular, Choke Manifold, Pressure Test - See Exhibit F-1 thru F-3.

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	Surface – 350'	17-1/2"	13-3/8"	48 0#	H-40	STC	New
Intermediate	Surface – 2,000'	12-1/4"	9-5/8"	40.0#	J-55	LTC	New
Production	Surface – 10,765'	8-3/4"/ 8-1/2"	5-1/2"	17 0#	P-110	LTC	New

b Casing design subject to revision based on geologic conditions encountered.

c. Casing Safety Factors:
13-3/8" Surface Casing: SFb = 1.44, SFc = 3.98 and SFt = 6.15
9-5/8" Intermediate Casing. SFb = 2.63, SFc = 2.75 and SFt = 6.78
5-1/2" Production Casing: SFb = 1.55, SFc = 2.47 and SFt = 1.56

d. The cementing program will be as follows:

5. Cementing Program

Interval	Type	Amount	Yield	Top of CMT	Excess
Surface	Class C 2% CaCl2 (Accelerator)	400 sks	1.34	Surface	100%
Intermediate	Lead. 50/50 Poz/Class C 1% CaCl2 (Accelerator) Tail: Class C Neat	600 sks 400 sks	2 03 1 26	Surface	100% 100%
Production	Class H 0.5% LAP-1 (Fluid Loss Control) 0.4% CFR-3 (Dispersant) 1 lbm/sk Salt 0.3% HR-7 (Retarder) 0.25 lbm D-AIR 3000 (Defoamer)	1600 sks	1 57	1,800'	50%

6 MUD PROGRAM

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

Interval	Mud Type	Mud Weight	Viscosity	Fluid Loss
0' – 350'	FW/Gel	8.5 – 8.9	30-36	NC
350' – 2,000'	Native/Brine	8.8 – 9.9	28-30	NC
2,000' - TD	FW/LSND	9.0 – 9.5	34-45	20-10

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.

7 ABNORMAL PRESSURES AND HYDROGEN SULFIDE

a. The estimated bottom hole pressure is 3000 No abnormal pressures or temperatures are anticipated
b. Hydrogen sulfide gas is not anticipated.

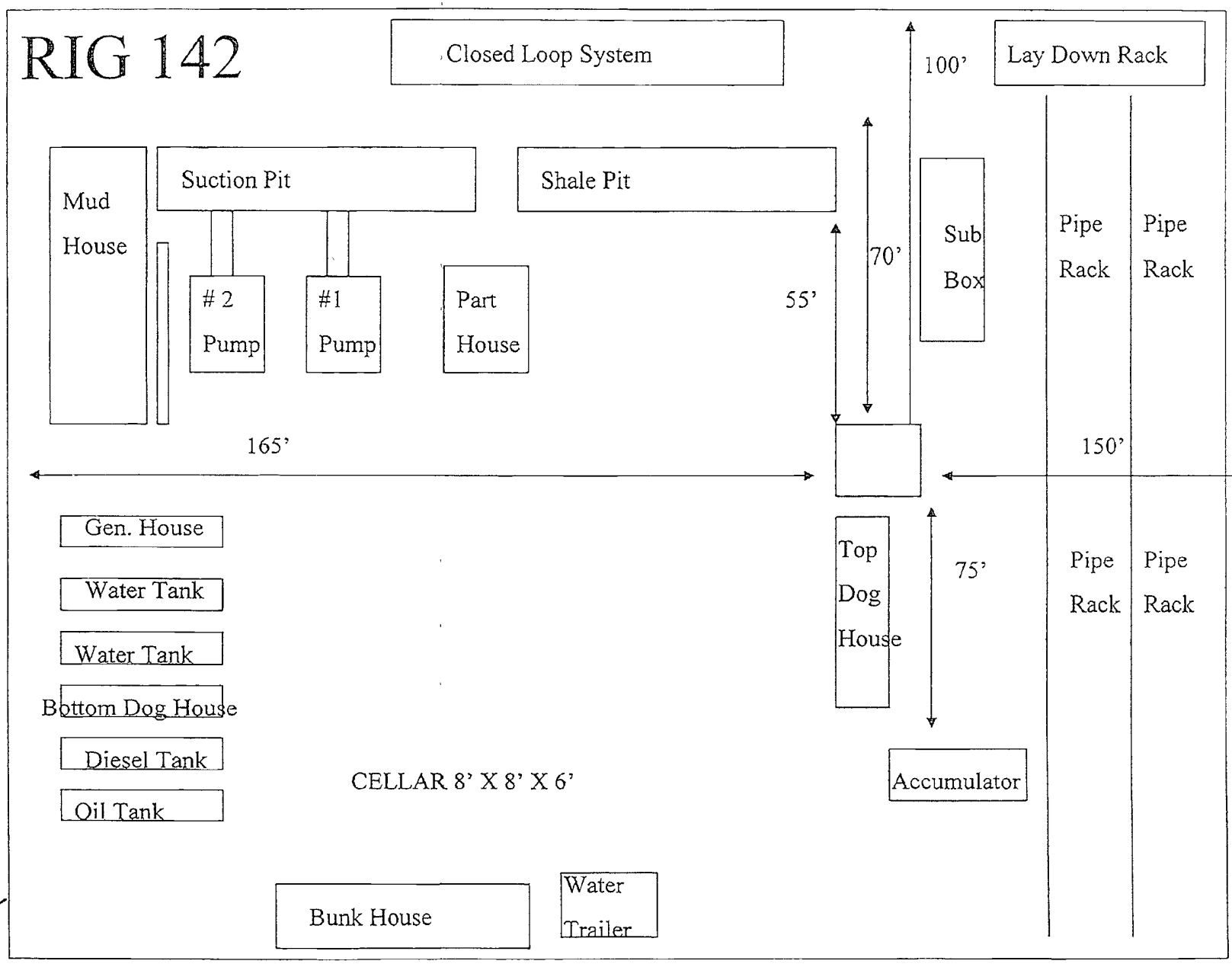
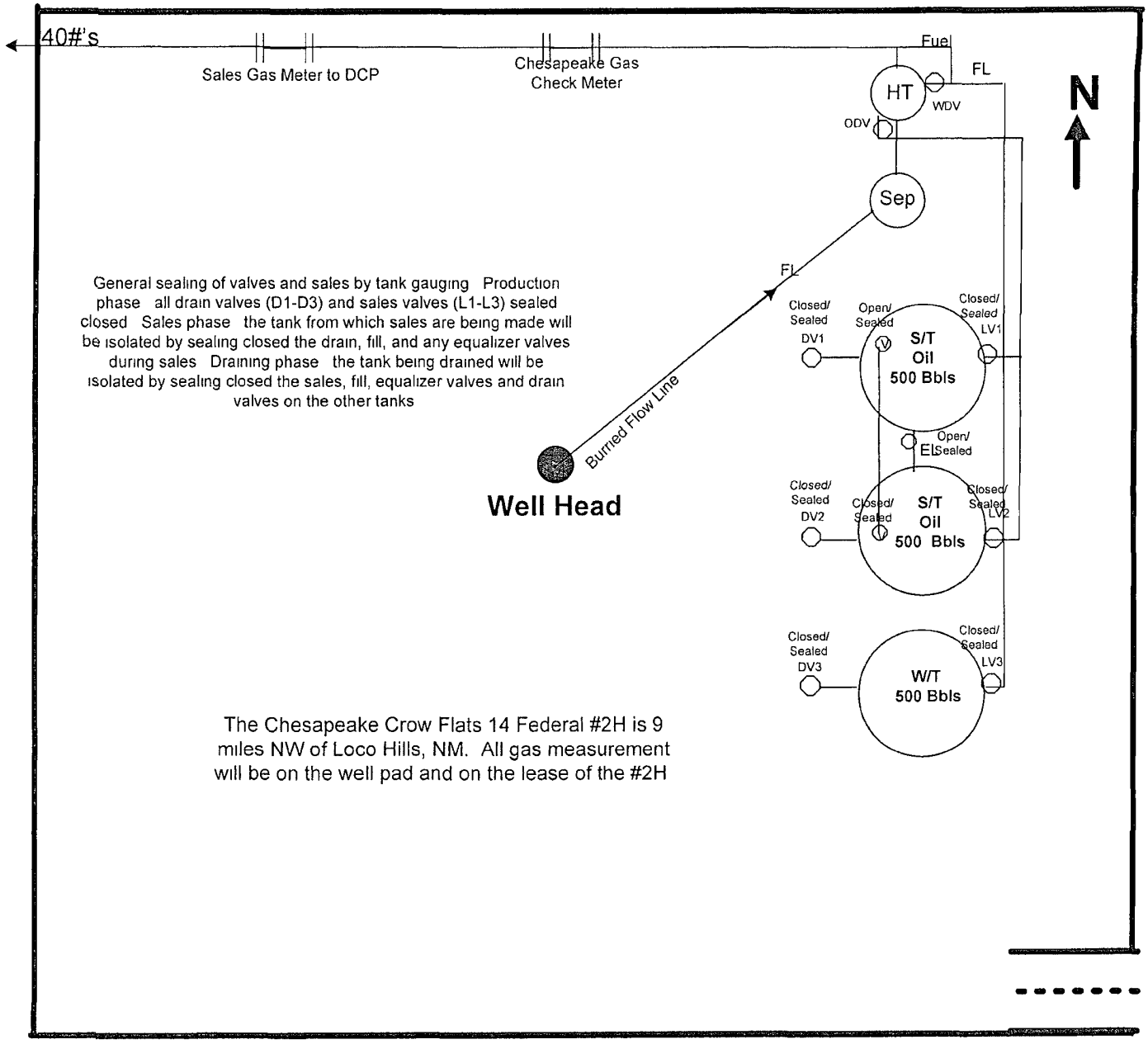

RIG 142
Closed Loop System
100'
Lay Down Rack
Mud House
Suction Pit
Shale Pit
2 Pump
#1 Pump
Part House
55'
70'
Sub Box
Pipe Rack
Pipe Rack
40'
165'
150'
30'
Gen. House
Water Tank
Water Tank
Bottom Dog House
Diesel Tank
Oil Tank
Top Dog House
75'
Pipe Rack
Pipe Rack
CELLAR 8' X 8' X 6'
Accumulator
Bunk House
Water Trailer

EXHIBIT D

CHESAPEAKE OPERATING, INC.

Crow Flats 14
Federal #2H
1980'N & 200'E, Sec. 14-16-28
Eddy County, NM



CROW FLATS 14 FEDERAL #2H

This lease is subject to Chesapeake's Site Security Plan located at 6100 N Western Oklahoma City, OK 73118

Direction of Flow off Site: N

Prepared by: DEBBIE HERNANDEZ
Date: 8-27-2007

Approved by:
Date:

EXHIBIT C

BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

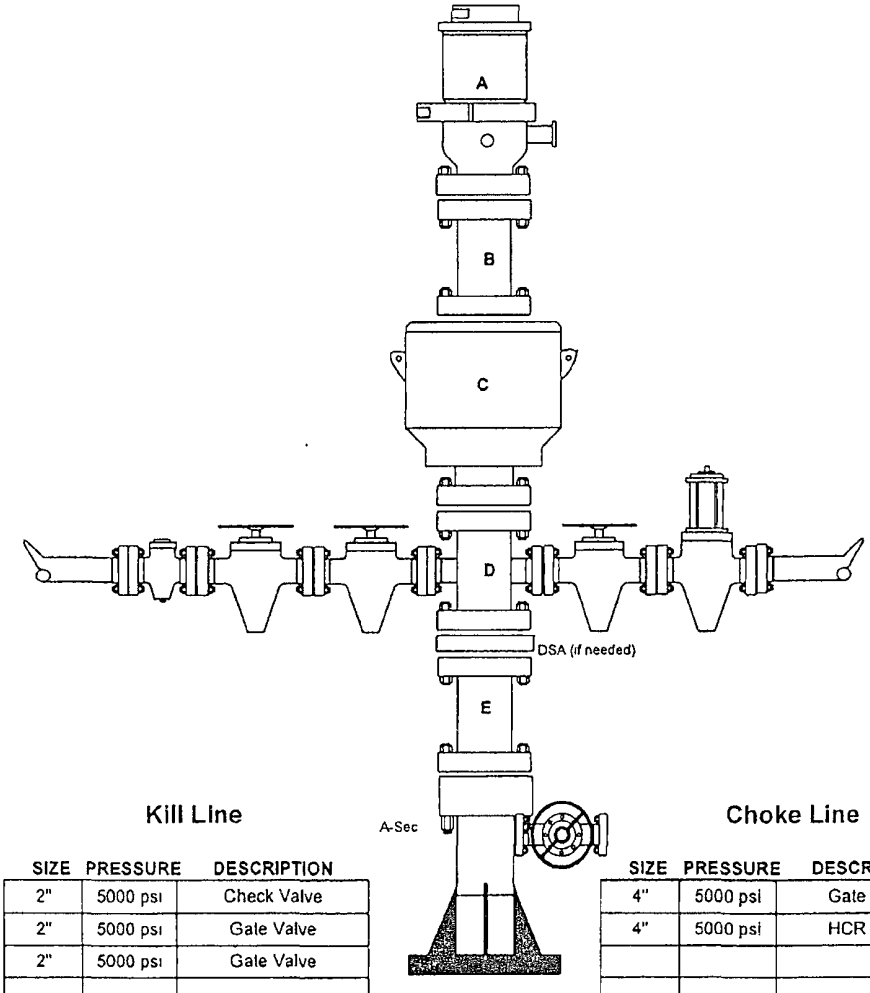
WELL : Crow Flats 14 Federal #2H

RIG : Patterson 142

COUNTY : Eddy **STATE:** New Mexico

OPERATION: Drill out below 13-3/8" Casing (12-¼" hole size)

	SIZE	PRESSURE	DESCRIPTION
A	13-5/8"	500 psi	Rot Head
B	13-5/8"	3000 psi	Spacer Spool
C	13-5/8"	3000 psi	Annular
D	13-5/8"	3000 psi	Mud Cross
E	13-5/8"	3000 psi	Spacer Spool
DSA	13-5/8" 3M x 13-5/8" 3M (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

EXHIBIT F-1

BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

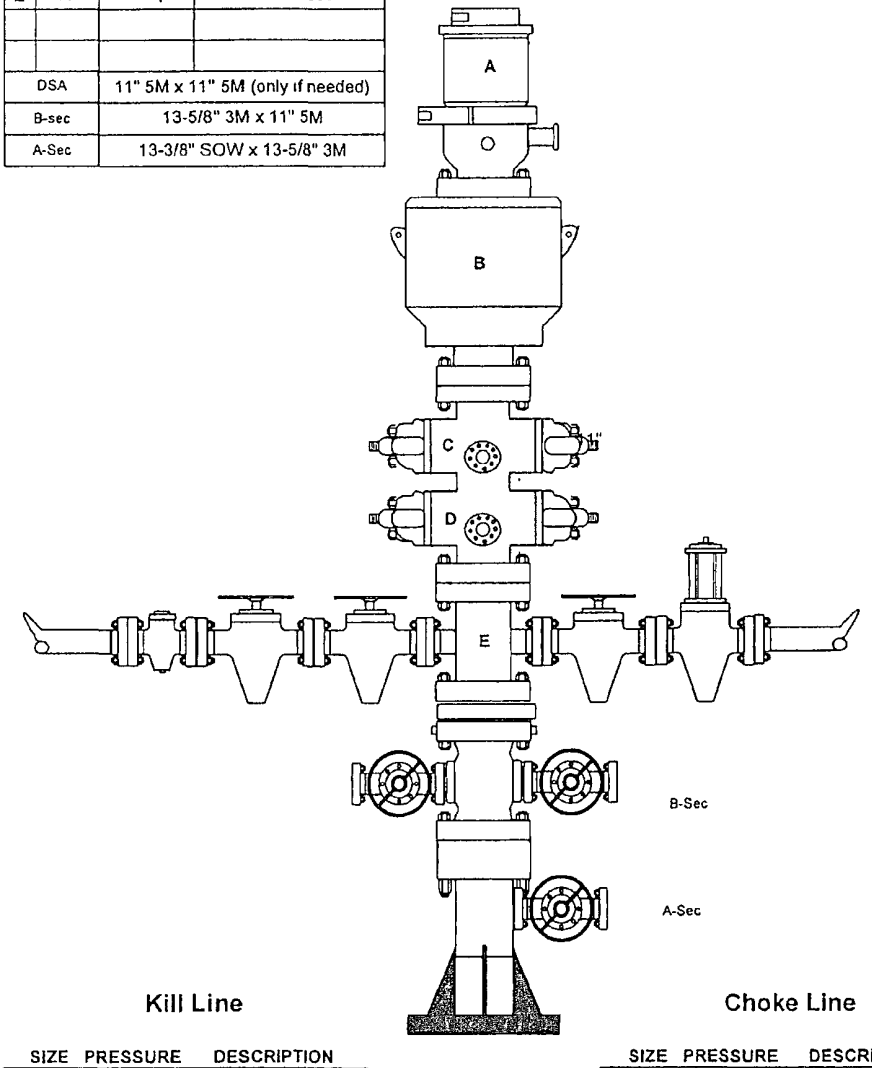
WELL : Crow Flats 14 Federal #2H

RIG : Patterson 142

COUNTY : Eddy STATE: New Mexico

OPERATION: *Drill out below 9-5/8" Casing (8-3/4"/8-½" 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

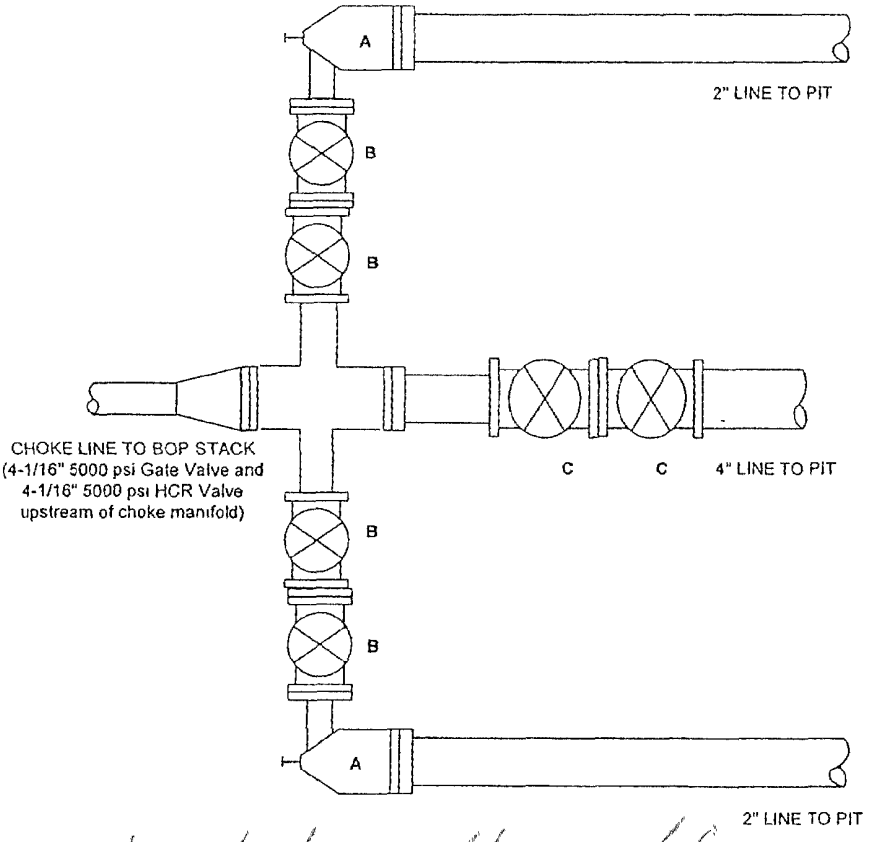
SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

EXHIBIT F-2

CHOKE MANIFOLD SCHEMATIC

CHESAPEAKE OPERATING, INC.

WELL : Crow Flats 14 Federal #2H
RIG : Patterson #142
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

EXHIBIT F-3

Permian District

NM - Eddy - Morrow Project
Crow Flats 14 Federal 2H
Well #1
Wellbore #1

Plan: Plan #1

Standard Planning Report

24 January, 2008

EXHIBIT G

Database:	Drilling Database	**Local Co-ordinate Reference:**	Well Well #1
Company:	Permian District	**TVD Reference:**	RKB @ 3565 0ft
Project:	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 3565 0ft
Site:	Crow Flats 14 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

Project	NM - Eddy - Morrow Project		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Ground Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Crow Flats 14 Federal 2H				
Site Position		**Northing:**	ft	**Latitude:**	
From:	None	**Easting:**	ft	**Longitude:**	
Position Uncertainty	ft	**Slot Radius:**	in	**Grid Convergence:**	0 00 °

Well	Well #1					
Well Position	**+N/-S**	0 0 ft	**Northing:**	0 00 ft	**Latitude:**	30° 59' 24 51165130 N
	+E/-W	0 0 ft	**Easting:**	0 00 ft	**Longitude**	105° 55' 44 13731823 W
Position Uncertainty		ft	**Wellhead Elevation:**	ft	**Ground Level:**	3,547 0 ft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	User Defined	1/24/2008	0.00	0 00	0

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0 0
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0 0	0 0	0 0	270 00	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0 00	0 00	0 00	
6,175 0	0 00	0 00	6,175 0	0 0	0 0	0 00	0 00	0 00	0 00	
6,934 1	90 60	270 00	6,655 0	0 0	-485 1	11 94	11 94	0 00	270 00	
10,764 0	90 60	270 00	6,614 9	0 0	-4,314 8	0 00	0 00	0 00	0.00	

Database:	Drilling Database	**Local Co-ordinate Reference**	Well Well #1
Company:	Permian District	**TVD Reference:**	RKB @ 3565 0ft
Project:	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 3565 0ft
Site:	Crow Flats 14 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0 0	0 00	0 00	0 0	0 0	0 0	0 0	0 00	0 00	0 00
100 0	0 00	0 00	100 0	0 0	0 0	0 0	0 00	0 00	0 00
200 0	0 00	0 00	200 0	0 0	0 0	0 0	0 00	0 00	0 00
300 0	0 00	0 00	300 0	0 0	0 0	0 0	0 00	0 00	0 00
350 0	0 00	0 00	350 0	0 0	0 0	0 0	0 00	0 00	0 00
13 3/8"									
400 0	0 00	0 00	400 0	0 0	0 0	0 0	0 00	0 00	0 00
500 0	0 00	0 00	500 0	0 0	0 0	0 0	0 00	0 00	0 00
600 0	0 00	0 00	600 0	0 0	0 0	0 0	0 00	0 00	0 00
700 0	0 00	0 00	700 0	0 0	0 0	0 0	0 00	0 00	0 00
800 0	0 00	0 00	800 0	0 0	0 0	0 0	0 00	0 00	0 00
900 0	0 00	0 00	900 0	0 0	0 0	0 0	0 00	0 00	0 00
1,000 0	0 00	0 00	1,000 0	0 0	0 0	0 0	0 00	0 00	0 00
1,100 0	0 00	0 00	1,100 0	0 0	0 0	0 0	0 00	0 00	0 00
1,200 0	0 00	0 00	1,200 0	0 0	0 0	0 0	0 00	0 00	0 00
1,300 0	0 00	0 00	1,300 0	0 0	0 0	0 0	0 00	0 00	0 00
1,400 0	0 00	0 00	1,400 0	0 0	0 0	0 0	0 00	0 00	0 00
1,500 0	0 00	0 00	1,500 0	0 0	0 0	0.0	0 00	0 00	0 00
1,600 0	0 00	0 00	1,600 0	0 0	0 0	0 0	0 00	0 00	0 00
1,700 0	0 00	0 00	1,700 0	0.0	0 0	0 0	0 00	0 00	0 00
1,800 0	0 00	0.00	1,800 0	0 0	0 0	0 0	0 00	0 00	0 00
1,900 0	0 00	0 00	1,900 0	0 0	0 0	0 0	0 00	0 00	0 00
2,000 0	0 00	0 00	2,000 0	0 0	0 0	0 0	0 00	0 00	0 00
9 5/8"									
2,100 0	0 00	0 00	2,100 0	0 0	0 0	0 0	0 00	0 00	0 00
2,200 0	0 00	0 00	2,200 0	0 0	0 0	0 0	0 00	0 00	0 00
2,300 0	0 00	0.00	2,300 0	0 0	0 0	0 0	0 00	0 00	0 00
2,400 0	0 00	0 00	2,400 0	0 0	0 0	0 0	0 00	0 00	0 00
2,500 0	0 00	0 00	2,500 0	0 0	0 0	0 0	0 00	0 00	0 00
2,600 0	0 00	0 00	2,600 0	0 0	0 0	0 0	0 00	0 00	0 00
2,700 0	0 00	0 00	2,700 0	0 0	0 0	0 0	0 00	0 00	0 00
2,800 0	0 00	0 00	2,800 0	0 0	0 0	0 0	0 00	0 00	0 00
2,900 0	0 00	0 00	2,900 0	0 0	0 0	0 0	0 00	0 00	0 00
3,000 0	0 00	0 00	3,000 0	0 0	0 0	0 0	0 00	0.00	0 00
3,100 0	0 00	0 00	3,100 0	0 0	0 0	0 0	0 00	0 00	0 00
3,200 0	0 00	0 00	3,200 0	0 0	0 0	0 0	0 00	0 00	0 00
3,300 0	0 00	0 00	3,300 0	0 0	0 0	0 0	0 00	0 00	0 00
3,400 0	0 00	0 00	3,400 0	0 0	0 0	0.0	0 00	0 00	0 00
3,500 0	0 00	0 00	3,500 0	0 0	0 0	0 0	0 00	0 00	0 00
3,600 0	0 00	0 00	3,600 0	0 0	0 0	0 0	0 00	0 00	0 00
3,700 0	0 00	0 00	3,700 0	0 0	0 0	0 0	0 00	0 00	0 00
3,800 0	0 00	0 00	3,800 0	0 0	0 0	0 0	0 00	0 00	0 00
3,900 0	0 00	0 00	3,900 0	0 0	0 0	0 0	0 00	0 00	0 00
4,000 0	0 00	0 00	4,000 0	0 0	0 0	0 0	0 00	0 00	0 00
4,100 0	0 00	0 00	4,100 0	0 0	0 0	0 0	0 00	0 00	0 00
4,200 0	0 00	0 00	4,200 0	0 0	0 0	0 0	0 00	0 00	0 00
4,300 0	0 00	0 00	4,300 0	0 0	0 0	0 0	0 00	0 00	0 00
4,400 0	0 00	0.00	4,400 0	0 0	0 0	0 0	0 00	0 00	0 00
4,500 0	0 00	0 00	4,500 0	0 0	0 0	0 0	0 00	0 00	0 00
4,600 0	0 00	0 00	4,600 0	0 0	0 0	0 0	0 00	0 00	0 00
4,700 0	0 00	0 00	4,700 0	0 0	0 0	0 0	0 00	0 00	0 00
4,800 0	0 00	0 00	4,800 0	0 0	0.0	0 0	0 00	0 00	0 00
4,900 0	0 00	0 00	4,900 0	0 0	0 0	0 0	0 00	0 00	0 00

Database:	Drilling Database	**Local Co-ordinate Reference:**	Well Well #1
Company	Permian District	**TVD Reference:**	RKB @ 3565 0ft
Project	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 3565 0ft
Site.	Crow Flats 14 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method:**	Minimum Curvature
Wellbore.	Wellbore #1		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,000 0	0 00	0 00	5,000 0	0 0	0 0	0 0	0.00	0 00	0 00
5,100 0	0 00	0.00	5,100 0	0 0	0 0	0 0	0 00	0 00	0 00
5,200 0	0 00	0 00	5,200 0	0 0	0 0	0 0	0 00	0 00	0 00
5,300 0	0 00	0 00	5,300 0	0 0	0 0	0 0	0 00	0 00	0 00
5,400 0	0 00	0 00	5,400 0	0 0	0 0	0 0	0 00	0 00	0.00
5,500 0	0 00	0 00	5,500 0	0 0	0 0	0 0	0 00	0 00	0 00
5,600 0	0 00	0 00	5,600 0	0 0	0 0	0 0	0.00	0 00	0 00
5,700 0	0 00	0 00	5,700 0	0 0	0 0	0 0	0 00	0 00	0 00
5,800 0	0 00	0 00	5,800 0	0 0	0 0	0 0	0 00	0 00	0 00
5,900 0	0 00	0 00	5,900 0	0 0	0 0	0 0	0 00	0 00	0 00
6,000 0	0 00	0 00	6,000.0	0 0	0 0	0 0	0 00	0 00	0 00
6,100 0	0 00	0 00	6,100 0	0 0	0 0	0 0	0 00	0.00	0 00
6,175 0	0 00	0 00	6,175 0	0 0	0 0	0 0	0 00	0 00	0 00
6,200 0	2 98	270 00	6,200 0	0 0	-0 7	0 7	11 94	11 94	0 00
6,300 0	14 92	270 00	6,298 6	0 0	-16 2	16 2	11 94	11 94	0 00
6,400 0	26 86	270 00	6,391 9	0 0	-51 8	51 8	11 94	11 94	0 00
6,500 0	38 79	270 00	6,475 7	0 0	-105 9	105 9	11 94	11 94	0 00
6,600 0	50 73	270 00	6,546 6	0 0	-176 2	176 2	11.94	11 94	0 00
6,700 0	62 66	270 00	6,601 4	0 0	-259 6	259 6	11 94	11 94	0 00
6,773 3	71 42	270 00	6,630 0	0 0	-327.1	327 1	11 94	11.94	0 00
Wolfcamp Pay Subsea 3070'									
6,800 0	74 60	270 00	6,637 8	0 0	-352 6	352 6	11 94	11 94	0 00
6,900 0	86 54	270 00	6,654 1	0 0	-451 0	451 0	11 94	11 94	0 00
6,934 1	90 60	270 00	6,655 0	0 0	-485 1	485 1	11 94	11 94	0 00
7,000.0	90 60	270.00	6,654 3	0 0	-551 0	551 0	0 00	0 00	0 00
7,100 0	90 60	270 00	6,653 3	0 0	-651 0	651 0	0 00	0.00	0 00
7,200 0	90 60	270 00	6,652 2	0 0	-751 0	751 0	0 00	0 00	0 00
7,300 0	90 60	270 00	6,651 2	0 0	-851 0	851 0	0 00	0 00	0 00
7,400 0	90 60	270 00	6,650 1	0 0	-951.0	951 0	0 00	0.00	0.00
7,500 0	90 60	270 00	6,649 1	0 0	-1,051 0	1,051 0	0 00	0 00	0 00
7,600 0	90 60	270 00	6,648 0	0 0	-1,151 0	1,151 0	0 00	0 00	0 00
7,700 0	90 60	270 00	6,647 0	0 0	-1,251 0	1,251 0	0 00	0 00	0 00
7,800.0	90 60	270 00	6,645 9	0 0	-1,351 0	1,351 0	0 00	0 00	0 00
7,900 0	90 60	270 00	6,644 9	0 0	-1,450 9	1,450 9	0 00	0 00	0 00
8,000 0	90.60	270 00	6,643 8	0 0	-1,550 9	1,550.9	0.00	0.00	0 00
8,100 0	90.60	270.00	6,642 8	0 0	-1,650 9	1,650 9	0 00	0 00	0.00
8,200 0	90 60	270 00	6,641 7	0 0	-1,750 9	1,750 9	0 00	0 00	0 00
8,300.0	90 60	270.00	6,640 7	0 0	-1,850 9	1,850 9	0 00	0 00	0 00
8,400 0	90 60	270 00	6,639 6	0 0	-1,950 9	1,950 9	0 00	0 00	0 00
8,500 0	90 60	270.00	6,638 6	0 0	-2,050 9	2,050 9	0 00	0 00	0 00
8,600 0	90 60	270 00	6,637 6	0 0	-2,150 9	2,150 9	0 00	0 00	0 00
8,700 0	90 60	270 00	6,636 5	0 0	-2,250 9	2,250 9	0 00	0 00	0 00
8,800 0	90 60	270 00	6,635 5	0 0	-2,350 9	2,350 9	0 00	0 00	0 00
8,900 0	90 60	270 00	6,634 4	0 0	-2,450 9	2,450 9	0 00	0 00	0 00
9,000 0	90 60	270 00	6,633 4	0 0	-2,550 9	2,550 9	0 00	0 00	0 00
9,100.0	90 60	270 00	6,632 3	0 0	-2,650 9	2,650 9	0 00	0 00	0 00
9,200 0	90 60	270 00	6,631 3	0 0	-2,750 9	2,750 9	0 00	0.00	0 00
9,300 0	90 60	270.00	6,630.2	0 0	-2,850 9	2,850 9	0.00	0 00	0 00
9,400 0	90 60	270 00	6,629 2	0 0	-2,950 9	2,950 9	0 00	0 00	0 00
9,500 0	90 60	270 00	6,628 1	0 0	-3,050 9	3,050 9	0 00	0 00	0 00
9,600 0	90.60	270 00	6,627.1	0 0	-3,150 9	3,150 9	0 00	0 00	0 00
9,700 0	90 60	270 00	6,626 0	0 0	-3,250 9	3,250 9	0 00	0 00	0 00
9,800 0	90 60	270 00	6,625 0	0 0	-3,350 8	3,350 8	0 00	0 00	0 00

Database:	Drilling Database	**Local Co-ordinate Reference:**	Well Well #1
Company:	Permian District	**TVD Reference:**	RKB @ 3565 0ft
Project:	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 3565 0ft
Site:	Crow Flats 14 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,900 0	90 60	270 00	6,623 9	0 0	-3,450 8	3,450 8	0 00	0 00	0 00
10,000 0	90 60	270 00	6,622 9	0 0	-3,550 8	3,550 8	0 00	0 00	0 00
10,100 0	90 60	270 00	6,621 8	0 0	-3,650 8	3,650 8	0 00	0 00	0 00
10,200 0	90 60	270 00	6,620 8	0 0	-3,750 8	3,750 8	0 00	0 00	0 00
10,300 0	90 60	270 00	6,619 8	0 0	-3,850 8	3,850 8	0 00	0 00	0 00
10,400 0	90 60	270 00	6,618 7	0 0	-3,950 8	3,950 8	0 00	0 00	0 00
10,500 0	90 60	270 00	6,617 7	0 0	-4,050 8	4,050 8	0 00	0 00	0 00
10,600 0	90 60	270 00	6,616 6	0 0	-4,150 8	4,150 8	0 00	0 00	0 00
10,700 0	90 60	270 00	6,615 6	0.0	-4,250 8	4,250 8	0 00	0 00	0 00
10,764 0	90 60	270 00	6,614 9	0 0	-4,314 8	4,314 8	0 00	0 00	0 00
5 1/2"									

Casing Points

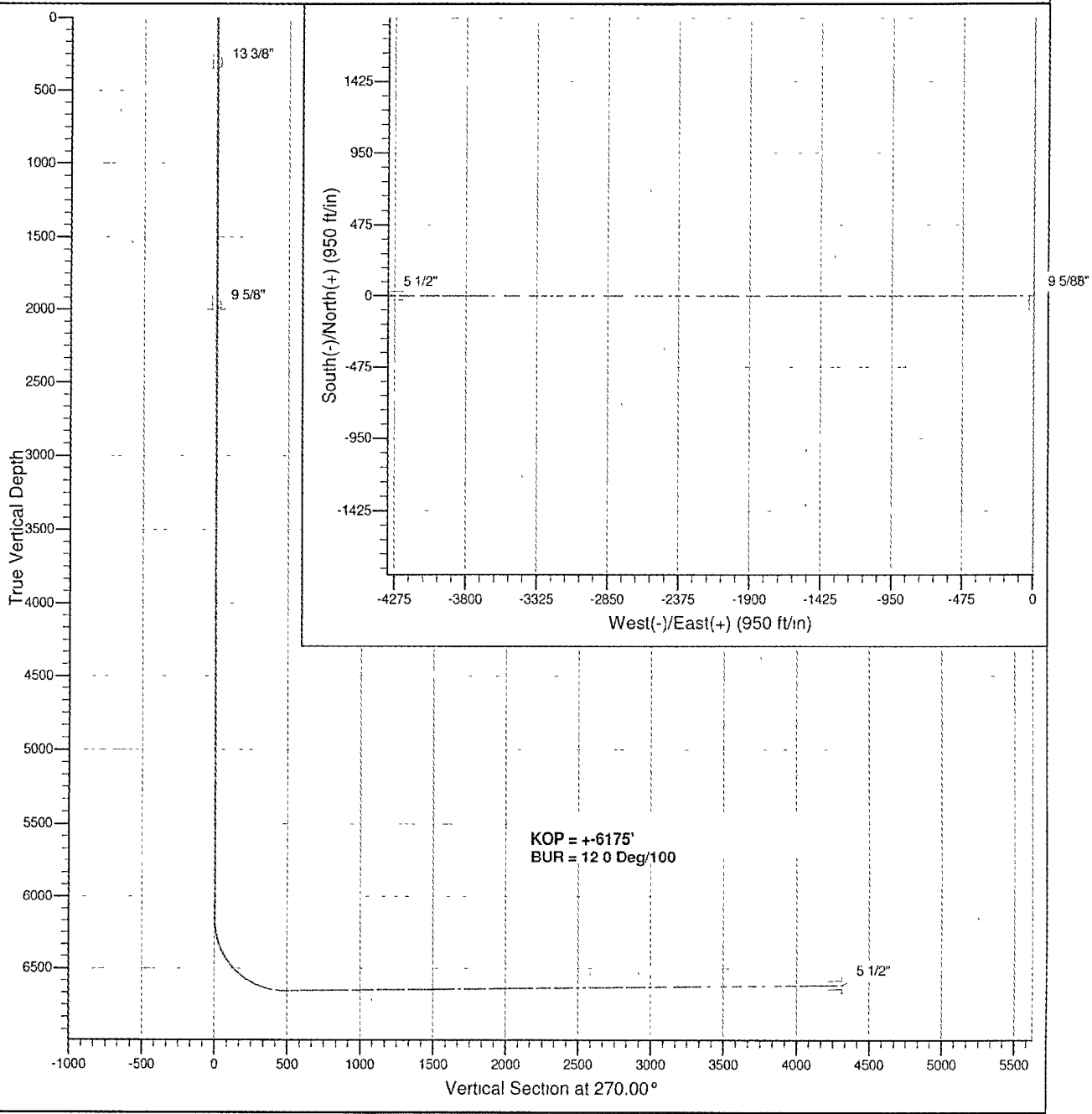
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
350 0	350 0	13 3/8"	13 375	17 500
2,000 0	2,000.0	9 5/8"	9 625	12 250
10,764 0	6,614 9	5 1/2"	5 500	8 750

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,773 3	6,630 0	Wolfcamp Pay Subsea 3070'		0.00	

Chesapeake Operating Inc.Crow Flats 14 Federal 2H County: Eddy, NM

Section 14-16S-28E



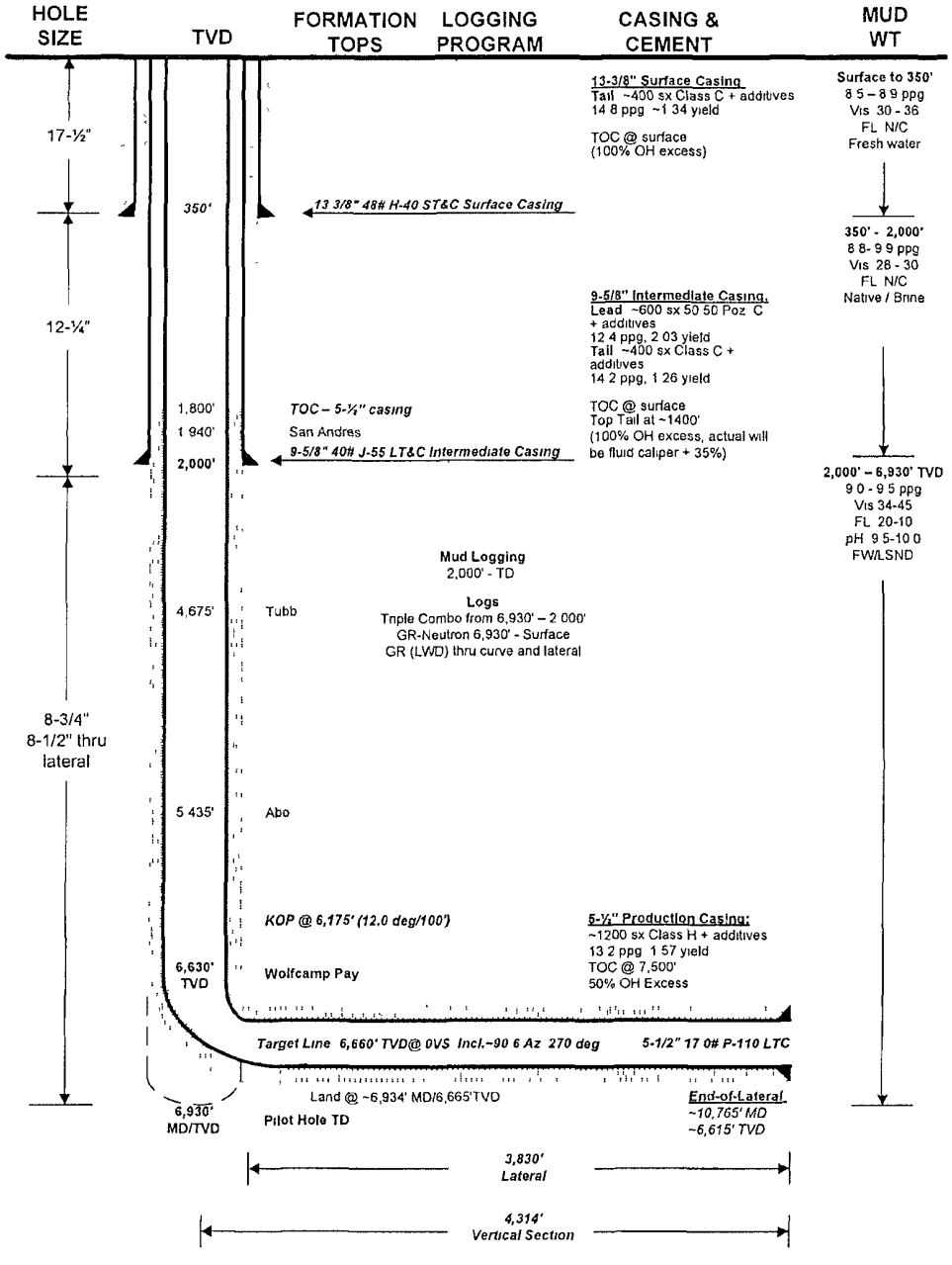
SECTION DETAILS

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	6175.0	0.00	0.00	6175.0	0.0	0.0	0 00	0.00	0.0	
3	6934.1	90 60	270.00	6655.0	0 0	-485.1	11.94	270.00	485.1	
4	10764.0	90.60	270.00	6614 9	0.0	-4314.8	0.00	0.00	4314.8	

CHESAPEAKE OPERATING INC

Proposed Well Schematic (drilling)

WELL : Crow Flats 14 Federal #2H
SHL : Section 14 - 16S - 28E, 1,980' FNL & 200' FEL
BHL : Section 14 - 16S - 28E, 1,980' FNL & 700' FWL
COUNTY : Eddy
STATE : New Mexico
FIELD : Pioneer Wolfcamp
ELEVATION : GL – 3,547' RKB – 3,565'



PREPARED BY: TAN DATE 1/24/08

APPROVED BY: _____ DATE _____

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

1. EXISTING ROADS

a Existing county and lease roads will be used to enter proposed access road.

b. Location, access, and vicinity plats attached hereto See Exhibits A-1 to A-4.

2. PLANNED ACCESS ROADS

a A proposed access road 1727' in length and 14' in travel way width with a maximum disturbance area of 30' will be used, and in accordance with guidelines set forth in the BLM Onshore Orders. No turnouts are expected.

b. In order to level the location, cut and fill will be required. Please see attached Well Location and Acreage Dedication Plat – Exhibits A-1 to A-4.

c A locking gate will be installed at the site entrance

d Any fences cut will be repaired Cattle guards will be installed, if needed.

e. Surface disturbance and vehicular travel will be limited to the approved location and approved access route. Any additional area needed will be approved in advance

f. Driving directions are from the intersection of US Hwy 82 and Co. Rd. 202 (Southern Union), go North-Northeast on Co Rd 202 approx 3 8 miles. Turn left at road bend and go approx. 0 1 miles Turn right and go approx. 1 0 miles Turn left (North) and stay on main road at 10 6 miles from US Hwy 82 to Dog Canyon Rd. and go approx 1 5 miles. Turn right on abandoned lease road and go approx. 0.6 miles to abandoned well pad This location is 1727 feet Southeast along proposed road

3. LOCATION OF EXISTING WELLS WITHIN A 1-MILE RADIUS OF THE PROPOSED LOCATION – see Exhibit B

4. LOCATION OF PRODUCTION FACILITIES

It is anticipated that production facilities will be located on the well pad as product will be sold at the wellhead and/or tank battery – See Exhibit C

5 LOCATION AND TYPE OF WATER SUPPLY

Water will be obtained from a private water source. Chesapeake Operating, Inc will ensure all proper notifications and filings are made with the state

6 CONSTRUCTION MATERIALS

No construction materials will be used from Section 14-16S-28E All material (i.e. shale) will be acquired from private or commercial sources

7 METHODS FOR HANDLING WASTE DISPOSAL

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

8. ANCILLARY FACILITIES
None

9 WELLSITE LAYOUT

The proposed site layout plat is attached showing rig orientation and equipment location. See Exhibit D. Also see Exhibit A for the size of the pad.

10 PLANS FOR RECLAMATION OF THE SURFACE

The location will be restored to as near as original condition as possible Reclamation of the surface shall be done in strict compliance with the existing New Mexico Oil Conservation Division regulations

Backfilling leveling, and contouring are planned as soon as the drilling rig and steel tanks are removed. Wastes and spoils materials will be buried immediately after drilling is completed. If production is obtained, the unused area will be restored as soon as possible. The rehabilitation will begin after the drilling rig is removed.

11 SURFACE & MINERAL OWNERSHIP

United States of America
Department of Interior
Bureau of Land Management

GRAZING LESSEE

Bogle Limited 505-734-5442
P.O. Box 460
Dexter, NM 88230

(Chesapeake Operating, Inc. has an agreement with the surface owner.)

12. ADDITIONAL INFORMATION

A Class III cultural resource inventory report was prepared by Boone Archaeological Services, Carlsbad, New Mexico for the proposed location. A copy of the report has been sent to the BLM office under separate cover and is also attached for reference. See Exhibit E.

Chesapeake Operating, Inc. agrees to be responsible under the terms and conditions of the lease for the operations conducted upon the lease lands.

13 OPERATOR'S REPRESENTATIVES

Drilling and Completion Operations
Jarvis Hensley
District Manager – Northern Permian
P.O. Box 18496
Oklahoma City, OK 73154
(405) 879-7863 (OFFICE)
(405) 879-9529 (FAX)
jarvis hensley@chk com

Sr. Drilling Engineer
Todd Nance
P.O Box 14896
Oklahoma City, OK 73154
(405) 879-9301 (OFFICE)
(405) 767-4528 (FAX)
(405) 919-9148 (MOBILE)
todd nance@chk com

Field Representative
Curtis Griffin
1616 W. Bender
Hobbs, NM
505-391-1462 (OFFICE)
505-391-6679 (FAX)
curtis griffin@chk.com

Assett Manager
Jeff Finnell
P.O. Box 18496
Oklahoma City, OK 73154-0496
405-767-4347 (OFFICE)
405-879-7930 (FAX)
jeff finnell@chk com

Regulatory Compliance
Linda Good
Regulatory Compliance Specialist
P.O. Box 18496
Oklahoma City, OK 73154
(405) 767-4275 (OFFICE)
(405) 753-5468 (FAX)
linda.good@chk.com

CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and, that the work associated with the operations proposed will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

Executed this 31st day of January, 2008

Name: _____
Paul Hagemeier, Vice President – Regulatory Compliance

Address: P.O Box 18496, Oklahoma City, OK 73154-0496

Telephone: 405-848-8000

Field Representative: Curtis Griffin

Telephone: 505-391-1462 Ext 6238

E-mail: curtis.griffin@chk.com

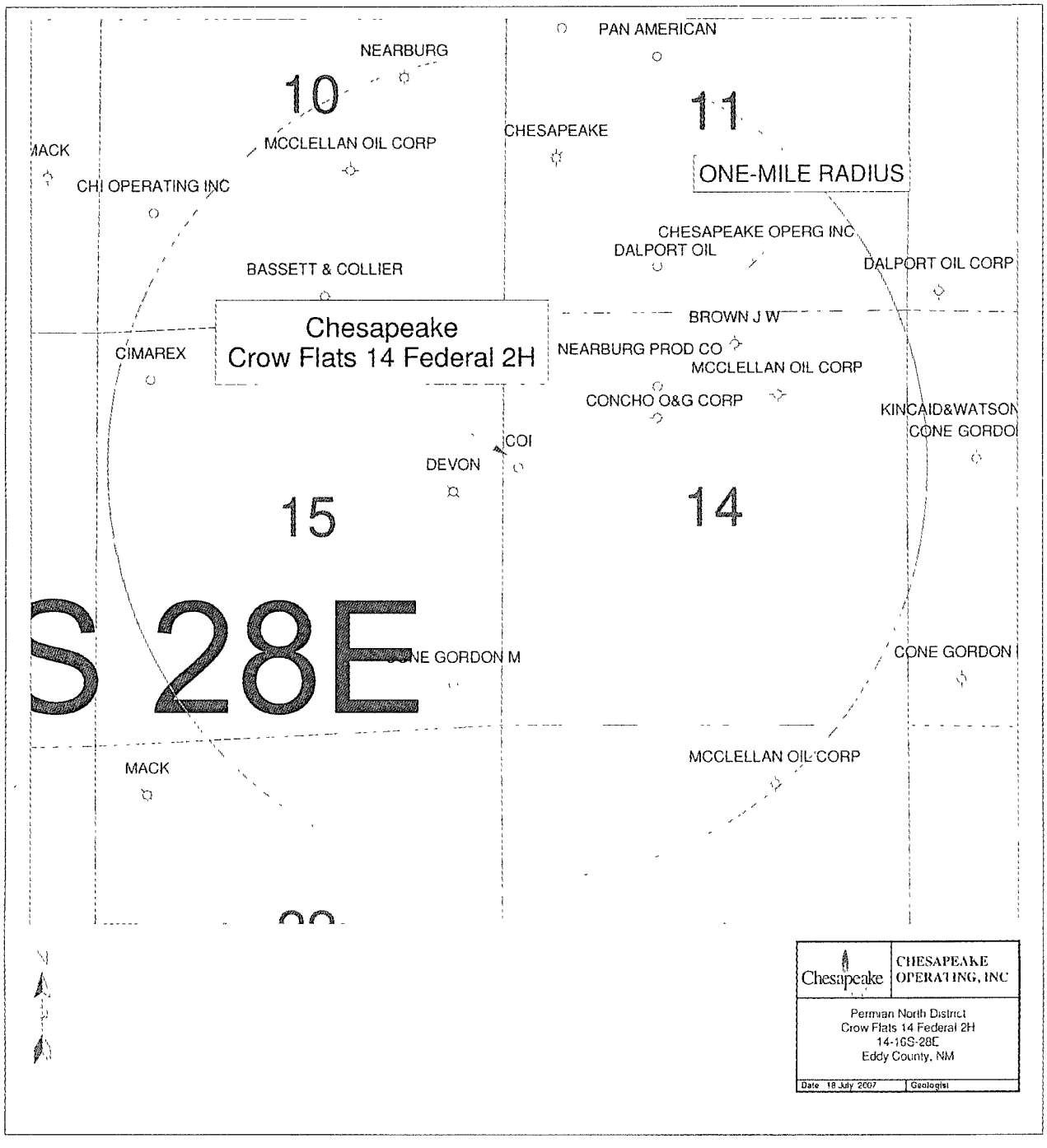

PAN AMERICAN
NEARBURG
10
11
CHESAPEAKE
MCCLELLAN OIL CORP
MACK
CHI OPERATING INC
ONE-MILE RADIUS
CHESAPEAKE OPERG INC
DALPORT OIL
DALPORT OIL CORP
BASSETT & COLLIER
Chesapeake
Crow Flats 14 Federal 2H
BROWN J W
CIMAREX
NEARBURG PROD CO
MCCLELLAN OIL CORP
CONCHO O&G CORP
KINCAID&WATSON
CONE GORDO
COI
DEVON
15
14
S 28E
NE GORDON M
CONE GORDON
MCCLELLAN OIL CORP
MACK
Chesapeake
CHESAPEAKE OPERATING, INC
Permian North District
Crow Flats 14 Federal 2H
14-16S-28E
Eddy County, NM
Date 18 July 2007
Geologist

EXHIBIT B

NMCRIS INVESTIGATION ABSTRACT FORM (NIAF)

1 NMCRIS Activity No.: 107400	2a Lead (Sponsoring) Agency: BLM	2b Other Permitting Agency(ies)	3. Lead Agency Report No

4 Title of Report: A Class III archaeological survey for the Crow Flats 14 Federal well 2H pad and access road.

Author(s) Jeffrey Pangburn and Dagmar Youngberg

5. Type of Report ☒ Negative ☐ Positive

6 Investigation Type
☐ Research Design ☒ Survey/Inventory ☐ Test Excavation ☐ Excavation ☐ Collections/Non-Field Study
☐ Overview/Lit Review ☐ Monitoring ☐ Ethnographic study ☐ Site specific visit ☐ Other

7 Description of Undertaking (what does the project entail?) On 8 August, 2007, Jeffrey Pangburn, of Boone Archaeological service conducted a class III archaeological survey of the Crow Flats 14 Federal well 2H pad and access road for Chessapeak Operating Inc This survey was designed to meet, but not limited to, the requirements detailed in the BLM Manual Supplement H-8100-1 New Mexico, Oklahoma and Texas, Procedures for performing Cultural Resource Fieldwork on Public Lands in the area of New Mexico BLM Responsibilities 2002
The well pad is in section 14 of township16 S, Range 28E. The survey area for the well pad measures 600' x 600', the impact area is unknown but estimated to be 400' x 400'. The survey of the well pad was conducted by a pedestrian survey with transects spaced 15 meters apart for 100% coverage of the survey area The survey area for the access road is with a 100' wide survey corridor centered on the flagged right of way. The estimated impact area is unknown but estimated to be 50' wide centered on the flagged centerline The access road extends from the west portion of the well pad and follows a northwesterly bearing for 1727' (+/-) to an abandoned well location with an existing lease road leading to the abandoned well location. Rebecca Hill of the BLM-CFO was consulted about this project on 24 August 2007 It was determined during the consultation that the existing lease road did not require a survey since no improvements to the existing lease road would be needed for it to be utilised The existing lease road is clearly shown on the BLM-DOQ maps The survey resulted in the location of two isolated manifestations (IM), detailed in section 18 (additional narrative), of this report. The IM's noted were located within shallow drainages and are suspected to represent transportation of materials from water runoff from sites located up slope, well out side the current project area. The project is recommended to proceed as it is currently delineated. The client delineated the survey area, for the entire project, prior to fieldwork with lathe and marking tape. A representative of the client, Curtis Griffin, requested an infield meeting with Jeffrey Pangburn associated with Boone Archaeological Services, Cody Layton of the BLM-CFO, and representitives of John West Surveying, for the purpose of ensuring the location of the well was vaible. The area was selected as the best location to avoid any cultural resources and other enviromental concerns. Upon selection of this area the surveyors staked the location and the archaeological survey was conducted.

8. Dates of Investigation. (from. 8/8/2007 to.)	9. Report Date 24 August 2007
10. Performing Agency/Consultant: Boone Archaeological Services, LLC Principal Investigator: Danny Boone Field Supervisor: Jeffrey Pangburn Field Personnel Names.	11. Performing Agency/Consultant Report No.: BAS 08-07-07 12. Applicable Cultural Resource Permit No(s) BLM 190-2920-06-J STATE: NM-07-157
13 Client/Customer (project proponent): Chesapeake Operating, Inc. Contact: Linda Good Address: PO BOX 18496 Oklahoma City OK 73154-0496 Phone: (405) 848-8000	14 Client/Customer Project No:

15. Land Ownership Status *(Must be indicated on project map)*

Land Owner	Acres Surveyed	Acres in APE
BLM	12 22 (+/-)	5 65 (+/-)
TOTALS	12.22 (+/-)	5.65 (+/-)

RECEIVED
AUG 30 2007

EXHIBIT E

16 Records Search(es).

Date(s) of ARMS File Review 7/25/07	Name of Reviewer(s) Dagmar Youngberg	
Date(s) of NR/SR File Review	Name of Reviewer(s)	
Date(s) of Other Agency File Review 8/3/07	Name of Reviewer(s) Dagmar Youngberg	Agency BLM

Findings: LA 129596 is within 500' of the current undertaking.

17 Survey Data:

a Source Graphics ☒ NAD 27 ☐ NAD 83

☒ USGS 7.5' (1:24,000) topo map ☐ Other topo map, Scale:

☒ GPS Unit Accuracy ☐<1.0m ☒ 1-10m ☐ 10-100m ☐>100m

b. USGS 7 5' Topographic Map Name / USGS Quad Code

DIAMOND MOUND, NM (1951)	32104-H2

c. County(ies): Eddy, Nm

17. Survey Data (continued):

d Nearest City or Town: Artesia, NM

e. Legal Description:

Township (N/S)	Range (E/W)	Section	¼ ¼ ¼
16S	28E	14	SE NE, SW NE, NW NE, , .
16S	28E	13	SW NW, ,
			, , .
			, , .
			, , .
			, , .
			, ,
			, ,
			, , .

Projected legal description? Yes ☒ No ☐ Unplatted ☐

f. Other Description (e.g. well pad footages, mile markers, plats, land grant name, etc.): 1980'FNL, 200'FEL

18 Survey Field Methods:

Intensity: ☒ 100% coverage ☐ <100% coverage

Configuration: ☒ block survey units ☒ linear survey units (l x w): 1727' x 100' (access road) ☐ other survey units (specify):

Scope: ☒ non-selective (all sites recorded) ☐ selective/thematic (selected sites recorded)

Coverage Method: ☒ systematic pedestrian coverage ☐ other method (describe)

Survey Interval (m): 15 Crew Size: 1 Fieldwork Dates: 8/8/07

Survey Person Hours: 6 Recording Person Hours: 0 Total Hours: 6

Additional Narrative: IM #1 is a piece of burned rock (caliche), 4cm in diameter, located at GPS cooordinates NAD 27, E: 580504 N: 3643168; IM#2 consists of 3 pieces of burned rock (caliche) ranging in size from 2-5cm in diameter covering a 0.5x3 meter area, located at GPS coordinates NAD 27: E:580519 N. 3643090. Both IM's are located in shallow drainages

19. Environmental Setting (NRCS soil designation; vegetative community; elevation; etc.):

Topography: overall the area is flat with a 2-3 degree slope trending in a easterly direction bisected by several shallow drainages

Vegetative community: mesquite,blackthorn,cresote,yucca,thistle,broom snake weed, and various other desert grasses and forbes

NRCS: Kimbrough-Stegall association: Loamy soils that are very shallow to moderately deep to caliche; from old alluvium

Elevation: 3550'

20. a. Percent Ground Visibility. 85% b Condition of Survey Area (grazed, bladed, undisturbed, etc) Grazed	
21. CULTURAL RESOURCE FINDINGS ☒ Yes, See Page 3 ☐No, Discuss Why:	
22. Required Attachments (check all appropriate boxes): ☒ USGS 7.5 Topographic Map with sites, isolates, and survey area clearly drawn ☐ Copy of NMCRIS Mapserver Map Check ☐ LA Site Forms - new sites (*with sketch map & topographic map*) ☐ LA Site Forms (update) - previously recorded & un-relocated sites (*first 2 pages minimum*) ☐ Historic Cultural Property Inventory Forms ☐ List and Description of isolates, if applicable ☐List and Description of Collections, if applicable	23. Other Attachments ☐ Photographs and Log ☐ Other Attachments *(Describe)*:
24 I certify the information provided above is correct and accurate and meets all applicable agency standards. Principal Investigator/Responsible Archaeologist: Jeffrey Pangburn Signature _____ Date. 24 August 2007 Title (If not PI)· Field Supervisor	
25 Reviewing Agency: Reviewer's Name/Date Accepted ( ) Rejected ( ) Tribal Consultation (if applicable). ☐ Yes ☐No	26 SHPO Reviewer's Name/Date: HPD Log #. SHPO File Location. Date sent to ARMS.

CULTURAL RESOURCE FINDINGS

[fill in appropriate section(s)]

1. NMCRIS Activity No.:	2. Lead (Sponsoring) Agency.	3 Lead Agency Report No :
107400	BLM	

SURVEY RESULTS:

Sites discovered and registered: 0
Sites discovered and NOT registered: 0
Previously recorded sites revisited (*site update form required*) 0
Previously recorded sites not relocated (*site update form required*) 0
TOTAL SITES VISITED: 0
Total isolates recorded 2 Non-selective isolate recording? ☐
Total structures recorded (*new and previously recorded, including acequias*). 0

MANAGEMENT SUMMARY. Archaeological clearance is recommended, as the project is currently delineated, for the Crow Flats 14 Federal well #2H pad and access road for Chesapeake Operatig, Inc Should cultural material be encountered, at any time, all work should cease and a BLM-CFO staff archaeologist notified immediately

IF REPORT IS NEGATIVE YOU ARE DONE AT THIS POINT

SURVEY LA NUMBER LOG

Sites Discovered:

LA No.	Field/Agency No	Eligible? (Y/N, applicable criteria)

Previously recorded revisited sites:

LA No.	Field/Agency No.	Eligible? (Y/N, applicable criteria)

MONITORING LA NUMBER LOG (*site form required*)

Sites Discovered (*site form required*) : Previously recorded sites (*Site update form required*).

LA No.	Field/Agency No.	LA No	Field/Agency No.

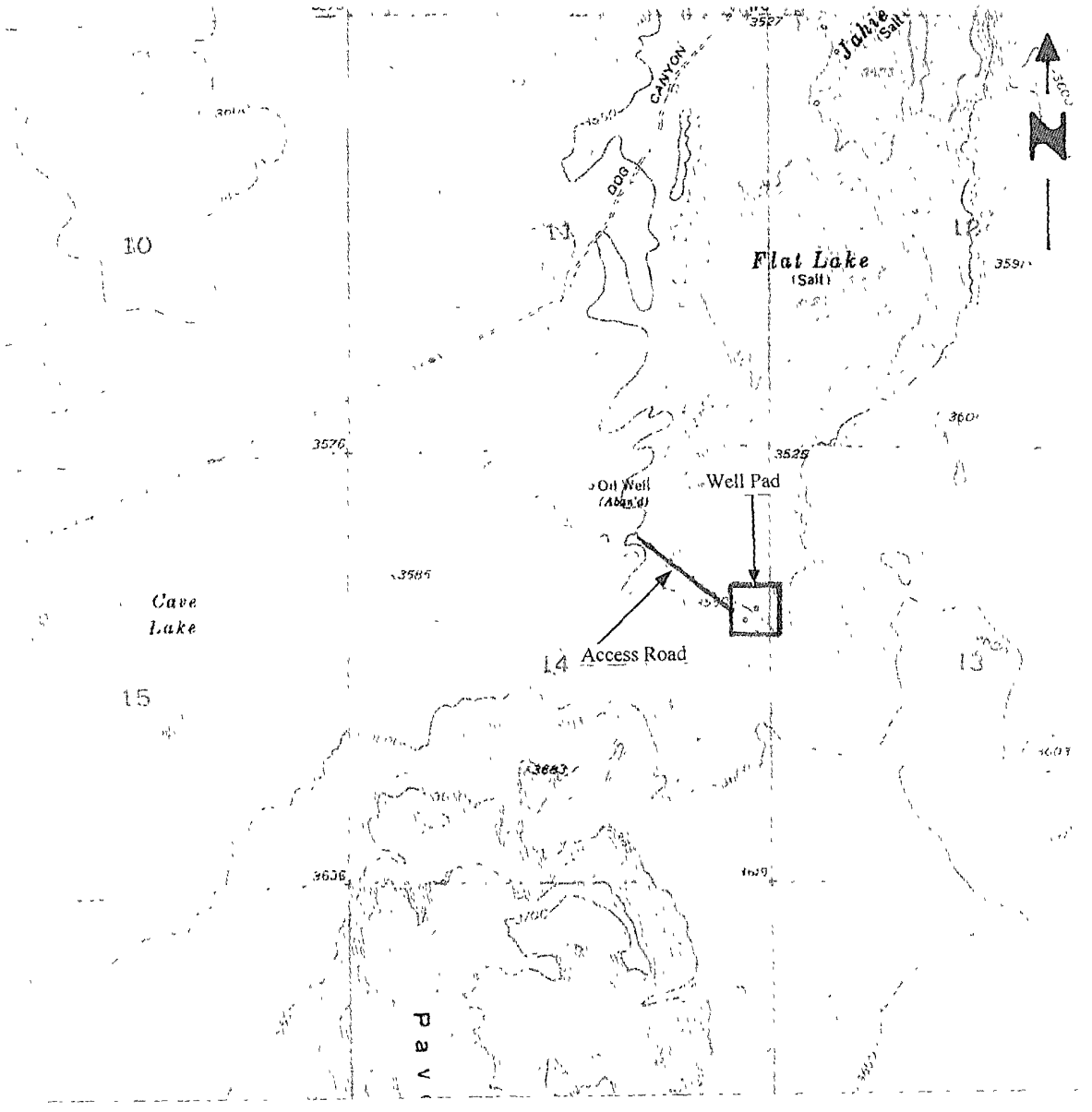
Areas outside known nearby site boundaries monitored? Yes ☐, No ☐ If no explain why.

TESTING & EXCAVATION LA NUMBER LOG (*site form required*)

Tested LA number(s)	Excavated LA number(s)

Project Map

BAS 08-07-07



Location Map for Crow Flats 14 Federal well 2H pad and access road for Chesapeake Operating, Inc.

Section(s) 13 and 14; T 16S, R 28E: NMPM, Eddy County, New Mexico.

Map Reference: USGS 7.5' Series; DIAMOND MOUND, NM (1951) 32104-H2

SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

BAS

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Chesapeake Operating
LEASE NO.:	NMNM95630
WELL NAME & NO.:	Crow Flats 14 Federal No 2H
SURFACE HOLE FOOTAGE:	1980' FNL & 200' FEL
BOTTOM HOLE FOOTAGE	1980' FNL & 700' FWL
LOCATION:	Section 14, T. 16 S., R 28 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Mitigation Measures: The location needs to have a berm placed around the entire pad location to help prevent drainage and erosion across the pads location and also below the pad location.

Crow Flats 14 Federal 2H: Closed Loop System South V-Door West

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (505) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall stockpile the topsoil of the well pad. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

The Closed Loop system shall be constructed on the South side of the well pad V-Door West.

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

C. FEDERAL MINERAL MATERIALS PIT

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the
Carlsbad Field Office at (505) 234-5972.

D. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

E. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

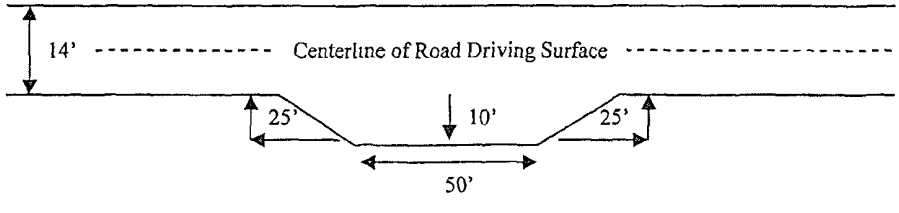
Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching

Ditching shall be required on both sides of the road.

Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:

Standard Turnout – Plan View

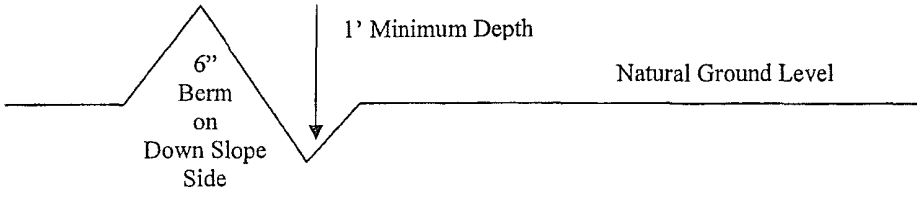


Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ lead-off ditch interval

Culvert Installations

Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

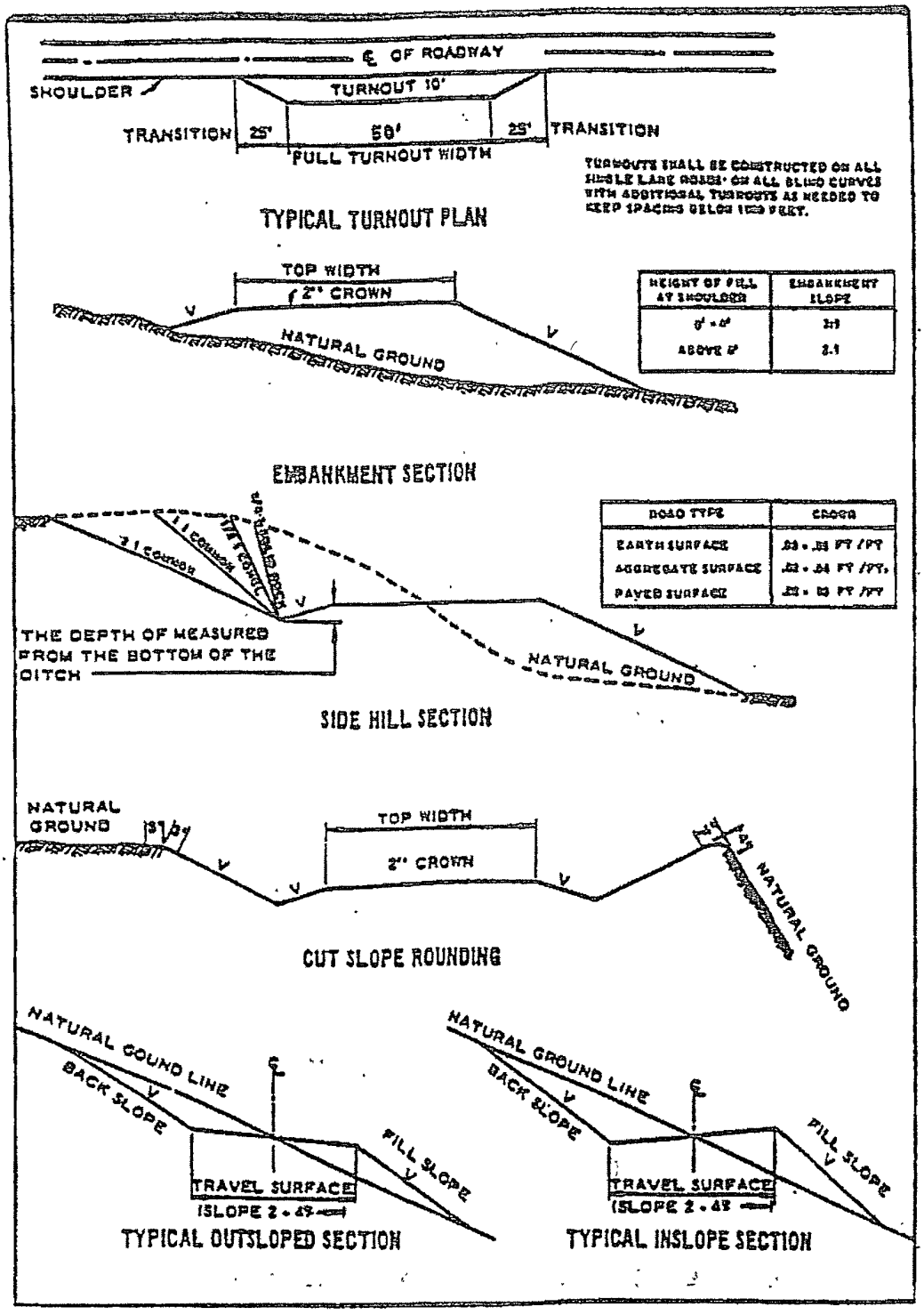
A gate shall be constructed and fastened securely to H-braces.

Fence Requirement
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Public Access
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Figure 1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

☒ **Chaves and Roosevelt Counties, T16S Eddy County**
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
(575) 627-0205 and (575) 361-2822.

1. **Although there are no measured amounts of Hydrogen Sulfide reported, it is always a potential hazard. If Hydrogen Sulfide is encountered, please provide measured values to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

B. CASING

1. The **13-3/8** inch surface casing shall be set **within the Tansill formation at approximately 350** feet and cemented to the surface. **Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**

   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 a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

   b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement). **Please provide WOC times to inspector for cement slurries.**

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 action will be done prior to drilling out that string.

High cave/karst.
Possible lost circulation in the Grayburg and San Andres formations.
Possible high pressure in the Wolfcamp formation.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

   ☒ Cement to surface. If cement does not circulate see B.1.a-d above. **Please provide WOC times to inspector for cement slurries.**

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i.

If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.

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

   ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification. **Centralizers required on horizontal leg, minimum of one every other joint.**

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

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. **Operator using 3M annular and testing to 2000 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 **3000 (3M)** psi. **Operator using 5M, but testing to 3M.**

4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. The tests shall be done by an independent service company.

    b. The results of the test shall be reported to the appropriate BLM office.

    c. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

    d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

    e. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation **if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days.** This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

WWI 030108

Seed Mixture 4, for Gypsum Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Alkali Sacaton (Sporobolus airoides)	1.0
DWS⊆ Four-wing saltbush (Atriplex canescens)	5.0

⊆DWS: DeWinged Seed

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed

(Insert Seed Mixture Here)

X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.