Form 3160-5
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Hobbs

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010

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 reverse side.

5. Lease Serial No.: NMLC069515
6. If Indian, Allottee or Tribe Name
7. If Unit or CA/Agreement, Name and/or No.
8. Well Name and No.: WAR HAMMER 25 FEDERAL COM W1 3H
9. API Well No.: 30-025-42027-00-X1
10. Field and Pool, or Exploratory: WILDCAT
11. County or Parish, and State: LEA COUNTY, NM

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

2. Name of Operator: CONOCOPHILLIPS COMPANY
Contact: GUSTAVO FEJERVARY
E-Mail: g.fejervary@conocophillips.com

3a. Address: MIDLAND, TX 79710

3b. Phone No. (include area code): Ph: 432.688.6913

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 25 T26S R32E NENE 316FNL 125FEL
32.011229 N Lat, 103.371282 W Lon

HOBBS OCD
MAR 09 2015
RECEIVED

12. CHECK 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 Change to Original A PD
	☐ 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 shall 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 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

**REVISED. Please substitute for EC Transaction #264488 & #287881

ConocoPhillips Company respectfully requests to amend the approved APD with the revised BOPE test, the proposed casing and cementing program, and the pre-set surface casing with a spudder rig.

Attachment # 1 Wellbore Casing & Cementing Schematic
Attachment # 2 BOP/BOPE and Wellhead Schematic
Attachment # 3 Spudder Rig Specifications
Attachment # 4 WellHead Schematic for Pre-set Surface
Attachment # 5 Special Premium Connections
Attachment # 6 Skid-Batch Drilling Operations

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

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

Electronic Submission #290111 verified by the BLM Well Information System
For CONOCOPHILLIPS COMPANY, sent to the Hobbs
Committed to AFMSS for processing by CHRISTOPHER WALLS on 02/26/2015 (15CRW0048SE)

Name *(Printed/Typed)* GUSTAVO FEJERVARY — Title REGULATORY SPECIALIST

Signature (Electronic Submission) — Date 01/30/2015

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

APPROVED
FEB 27 2015
/s/ Chris Walls
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

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.

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

MAR 10 2015

Sundry Notice Request
ConocoPhillips Company
Red Hills West; Wolfcamp
War Hammer 25 Federal COM W1 3H

Lea County, New Mexico

ConocoPhillips Company respectfully requests to amend the approved permit to drill with the revised BOPE test, casing and cementing program, pre-set surface casing with a spudder rig.

1. Proposed BOP/BOPE Tests

The BOP/BOPE testing procedures for prior to drill out of the surface casing (12-1/4" hole size) shall still apply to the approved working pressures of a 5M system, and not the upgraded higher working pressures. The reason is that the maximum anticipated surface pressures for the 12-1/4" hole section is less than 1,500 psi (0.46 psi/ft pressure gradient assuming fully evacuated). ConocoPhillips intends to test as indicated in the Onshore Order 2 for 5M rated BOPE with a test plug to 5,000 psi for all ram and annular type preventers.

In the 8-3/4" hole section, the maximum anticipated surface pressure remains to be less than 2,500 psi (0.30 psi/ft pressure gradient assuming partial evacuated).

Note: If the wells are to be drill conventionally (uninterrupted) without lifting the BOP stack, ConocoPhillips chooses the option to continue drilling the 8-3/4" hole section without retest (less than 21 days) as which the previously test 5M system for the 12-1/4" hole section would still apply to the approved working pressure for the subsequent hole. Multibowl wellhead See Schematic

Prior to drilling out the 7-5/8" intermediate casing, ConocoPhillips shall test to the rated working pressure of a full 10M BOPE system as it is subjected to the maximum anticipated surface pressure of 6,500 psi (0.655 psi/ft pressure gradient assuming fully evacuated) per Onshore Order 2. The full pressure test and 50% for annular shall be performed with a 10M rated test plug after installing the 7-5/8" 10M wellhead packoff assembly prior to drilling out the 7-5/8" intermediate casing. Please see the following attached schematics.

2. Proposed Casing and Cementing Program

It is ConocoPhillips intent to case and cement the well with 13-3/8" surface, 9-5/8" intermediate1, 7-5/8" intermediate2, and 5" production casing. The changes proposed will be the use of lesser wt/strength casing than originally approved to optimize the casing design for frac stimulation load case. The proposed casing and cementing program would meet the BLM's Onshore Order 2 – Casing & Cementing Requirements with the only exception of the collapse design of 1.125 with fully evacuated pipe.

However, we feel that 7-5/8" 29.7# P-110 W523 would not be at risk of collapse when set as the intermediate2 casing. Our reasons and justification for the exception are as follows:

1. The 7-5/8" intermediate casing for this well would not be subject to the production collapse load case of being pumped off to zero pressure on the inside for production of leveling the fluid down. The 7-5/8" casing would be isolated from the production collapse load case by the 5" production casing (long string) that would be run and cemented.

2. If loss of circulation occurs during the drilling phase while drilling below the 7-5/8" intermediate casing, we would expect the fluid level would fall no further than 2000' below the surface of ground before reaching hydrostatic balance with the pore pressure of the loss zone. Our experience has been that we have not had severe losses with the mud program in our previous wells in this area.

3. The 7-5/8" casing will be filled with mud while running it by filling it at least once each 30 joints (1260').

4. ConocoPhillips Casing & Tubing Design Manual for intermediate casing only considers 1/3 partial evacuation to the next casing depth as the collapse design. For this instance, the actual safety factor (~1.7) would meet our required corporate minimum design factor for collapse of 1.05. Which is feasible and fit for this horizontal well's casing design.

All Tubulars used for this design will be new. A multi-bowl system will be utilized.

Hole Size (in)	Casing (in)	Wt/Ft	Grade	Connection	Thread & Cplg OD	Depth (ft)	Depth (ftTVD)	Depth (ftMD)	BOPE System
17 1/2	13 3/8	54.5	J-55	BTC	14.375	0-800	800	800	N/A
12 1/4	9 5/8	40	L-80	BTC	10.625	0-4825	4825	4825	5M
8 3/4	7 5/8	29.7	P-110	Tenaris W523	7.752	0-12150	12150	12150	5M
6 3/4	5	18	P-110	Tenaris Blue/TXP	5.720	0-19670	12974	19670	10M

Minimum casing design factors: Burst 1.0, Collapse 1.125, Tensile Strength 1.6 Dry / 1.0 Buoyant

Hole Size (in)	Casing (in)	Burst	Collapse	Tension	Minimum Clearance
17 1/2	13 3/8	6.07	2.51	20.39	1.5625
12 1/4	9 5/8	2.18	1.17	5.84	0.8125
8 3/4	7-5/8	1.58	**1.7	2.11	0.4990
6 3/4	5	1.74	1.68	3.22	0.515

***COP Collapse Design*

1/3 Partial Evacuation to Next Csg

		Volume (sx)	Type	Weight (ppg)	Yield (ft3/sx)	Water (Gal/sx)	Excess	Cement Top
Surface	*Lead*	530	Class C	13.6	1.73	10.88	>100%	Surface
	Tail	310	Class C	14.8	1.35	6.39	>100%	650ft
Additives (BWOB): 4% Extender, 2% CaCl2, 0.125 lb/sx LCM, 0.2% Anti-Foam								
Intermediate 1	*Lead*	1430	Tuned Light	11.9	1.91	11.85	>100%	Surface
	Tail	380	Class C	14.8	1.33	8.23	>100%	4325ft
Additives (BWOB): 4% Extender, 2% CaCl2, 0.125 lb/sx LCM, 0.2% Anti-Foam								
Intermediate 2	*Lead*	430	Tuned Light	9.7	2.44	9.116	>30%	4325ft
	Tail	140	TXI	13.2	1.53	7.474	>30%	11650ft
Additives (BWOB): 0.4% Dispersant, 1 lb/sx Salt, 0.1% Retarder, 0.5% Fluid Loss, 3 lb/sx LCM								
Production	*Lead*							
	Tail	750	Class H	15	1.14	3.216	>35%	11650ft
Additives (BWOB): 0.4% Retarder, 0.2% Anti-foam, 0.7 Anti-gelling, 0.4% Fluid Loss, 2% Expanding Agent, 5.0% Silica								

3. Spudder Rig and Skid Operation

The reasons for using the spudder rig to drill and pre-set surface casing are: Time & Cost Saving.

The "Pinnergy #1" Rig will be used to drill the surface hole and pre-set surface casing on all of the wells in the same pad. Once each surface hole section has been drilled, it will be cased and cemented according to all applicable rules and regulations (Onshore Order #2). The wellhead will be nippled up and tested as soon as 13-3/8" surface casing is cut off after the applicable WOC time has been reached. A blind flange of the same pressure rating as the wellhead will be utilized to seal the wellbore on all casing strings. Pressure will be monitored via wing valves on each wellhead section and a means for intervention will be maintained while the drilling rig is not over the well. Spudder rig operation is expected to take 7-10 days for a quad pad and 4-6 days for a dual pad. The BLM will be contacted / notified 24 hours prior to commencing spudder rig operations.

Drilling operation will start with a big Drilling Rig (H&P Flex 3 rig type) and an approved BOP stack will be nippled up and tested on the wellhead before drilling operations resumes on each well. The rig will skid between the wells until each well's section has been drilled as planned (see Attachment #6). The BLM will be contacted / notified 24 hours before the big rig moves back on the location.

Once "Spudder Rig" has left the location, The "big Drilling Rig" will be on location within 90 days to drill each well in the Pad as batch drilling operations.

Attachments:

- Attachment # 1 ..... Wellbore Casing & Cementing Schematic
- Attachment # 2 ..... BOP/BOPE and Wellhead Schematic
- Attachment # 3 ..... Spudder Rig Specifications
- Attachment # 4 ..... WellHead Schematic for Pre-set Surface
- Attachment # 5 ..... Special Premium Connections
- Attachment # 6 ..... Skid-Batch Drilling Operations

Sundry request proposed 27 February 2015 by:
James Chen, P.E.
Drilling Engineer | ConocoPhillips Permian Shale
Office Phone: 281.206.5244
Cell Phone: 832.768.1647

ConocoPhillips

ConocoPhillips

Lea County, NM
War Hammer 25 Fed Com
W1 3H

Original Hole

Plan: Design #5

Standard Planning Report

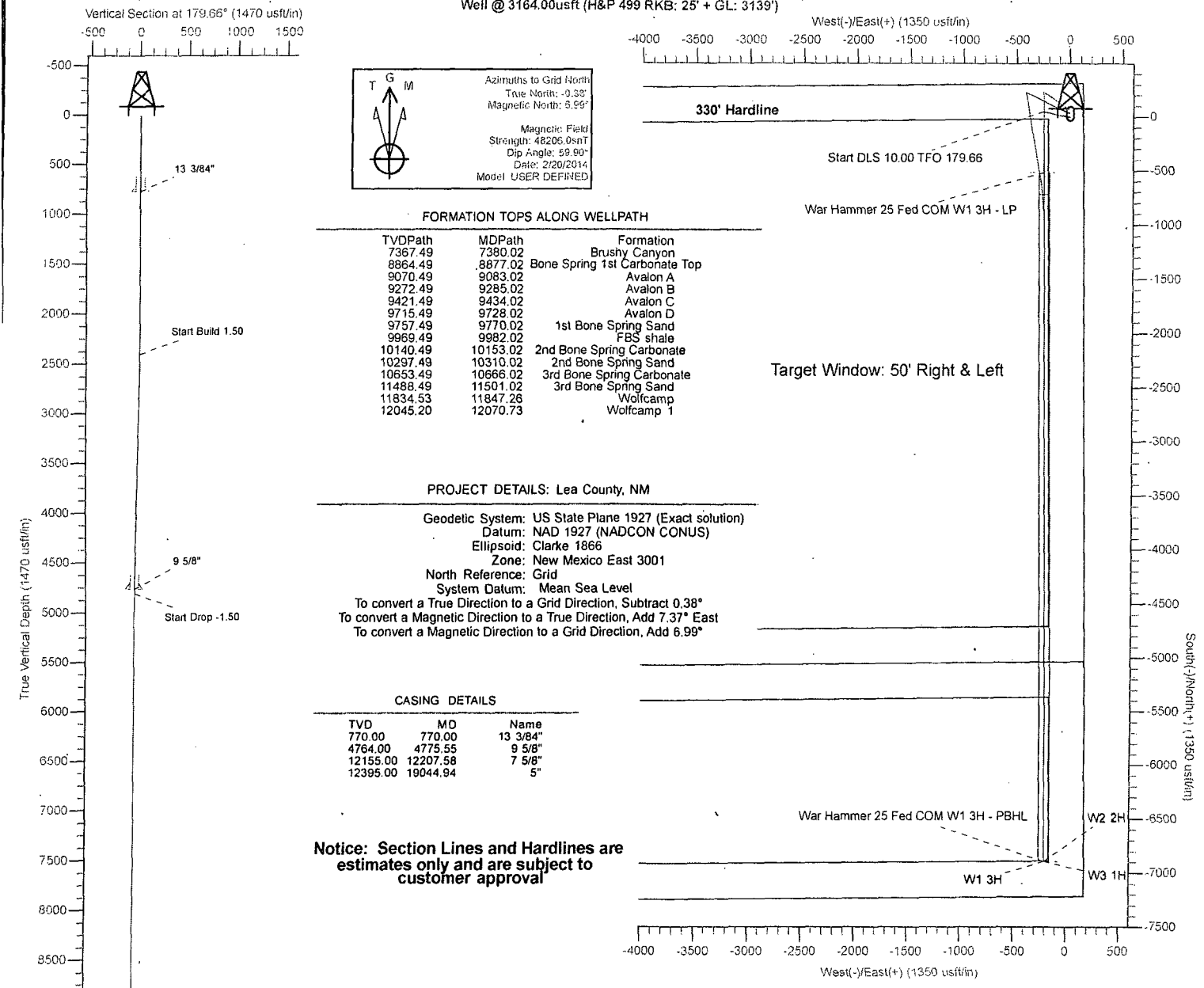
26 February, 2015

gyrodata
Precision Wellbore Placement

ConocoPhillips

ConocoPhillips
Lea County, NM
War Hammer 25 Fed Com
W1 3H
Original Hole
Plan: Design #5 (W1 3H/Original Hole)
Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')

gyrodata
Precision Wellbore Placement



FORMATION TOPS ALONG WELLPATH

TVDPath	MDPath	Formation
7367.49	7380.02	Brushy Canyon
8864.49	8877.02	Bone Spring 1st Carbonate Top
9070.49	9083.02	Avalon A
9272.49	9285.02	Avalon B
9421.49	9434.02	Avalon C
9715.49	9728.02	Avalon D
9757.49	9770.02	1st Bone Spring Sand
9969.49	9982.02	FBS shale
10140.49	10153.02	2nd Bone Spring Carbonate
10297.49	10310.02	2nd Bone Spring Sand
10653.49	10666.02	3rd Bone Spring Carbonate
11488.49	11501.02	3rd Bone Spring Sand
11834.53	11847.26	Wolfcamp
12045.20	12070.73	Wolfcamp 1

PROJECT DETAILS: Lea County, NM

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
North Reference: Grid
System Datum: Mean Sea Level
To convert a True Direction to a Grid Direction, Subtract 0.38°
To convert a Magnetic Direction to a True Direction, Add 7.37° East
To convert a Magnetic Direction to a Grid Direction, Add 6.99°

CASING DETAILS

TVD	MD	Name
770.00	770.00	13 3/84"
4764.00	4775.55	9 5/8"
12155.00	12207.58	7 5/8"
12395.00	19044.94	5"

Notice: Section Lines and Hardlines are estimates only and are subject to customer approval

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2400.00	0.00	0.00	2400.00	0.00	0.00	0.00	0.00	0.00	Start Build 1.50
3	2800.00	6.00	282.00	2799.27	4.35	-20.47	1.50	282.00	-4.47	
4	4820.00	6.00	282.00	4808.20	48.25	-227.00	0.00	0.00	-49.60	Start Drop -1.50
5	5220.00	0.00	0.00	5207.47	52.60	-247.47	1.50	180.00	-54.07	
6	11774.59	0.00	0.00	11762.07	52.60	-247.47	0.00	0.00	-54.07	Start DLS 10.00 TFO 179.66
7	12669.20	89.46	179.66	12335.00	-514.95	-244.12	10.00	179.66	513.50	
8	19044.94	89.46	179.66	12395.00	-6890.30	-206.45	0.00	0.00	6888.95	

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
W1 3H - LP - plan hits target center	12335.00	-514.95	-244.12	371201.52	720914.09	32° 1' 6.76 N	103° 37' 14.01 W	Rectangle (Sides: L50.00 W100.00
W1 3H - PBHL - plan hits target center	12395.00	-6890.30	-206.45	364826.17	720951.76	32° 0' 3.67 N	103° 37' 14.07 W	Rectangle (Sides: L50.00 W100.00

LP @ 12,335' TVD & PBHL @ 12,395' TVD

Target Window: 25' Up & Down

Window at Landing: 5' Up & 45' Down

Vertical Section at 179.66° (1000 usft/in)

Created By: Erik de La Fe Date: 12:03, February 26 2015

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well W13H
Company:	ConocoPhillips	**TVD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Project:	Lea County, NM	**MD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Site:	War Hammer 25 Fed Com	**North Reference:**	Grid
Well:	W13H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Design #5		

Project Lea County, NM

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site War Hammer 25 Fed Com

Site Position:		**Northing:**	371,782.24 usft	**Latitude:**	32° 1' 12.49 N
From:	Map	**Easting:**	721,157.76 usft	**Longitude:**	103° 37' 11.14 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.20 in	**Grid Convergence:**	0.38 °

Well W13H

Well Position	**+N/-S**	-65.77 usft	**Northing:**	371,716.47 usft	**Latitude:**	32° 1' 11.84 N
	+E/-W	0.45 usft	**Easting:**	721,158.21 usft	**Longitude:**	103° 37' 11.14 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	3,139.00 usft

Wellbore Original Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	2/20/2014	7.37	59.90	48,206

Design Design #5

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.66

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,800.00	6.00	282.00	2,799.27	4.35	-20.47	1.50	1.50	0.00	282.00	
4,820.00	6.00	282.00	4,808.20	48.25	-227.00	0.00	0.00	0.00	0.00	
5,220.00	0.00	0.00	5,207.47	52.60	-247.47	1.50	-1.50	0.00	180.00	
11,774.59	0.00	0.00	11,762.07	52.60	-247.47	0.00	0.00	0.00	0.00	
12,669.20	89.46	179.66	12,335.00	-514.95	-244.12	10.00	10.00	20.08	179.66	
19,044.94	89.46	179.66	12,395.00	-6,890.30	-206.45	0.00	0.00	0.00	0.00	War Hammer 25 Fed

Database:	Gyrodata NWDB	Local Co-ordinate Reference:	Well W1 3H
Company:	ConocoPhillips	TVD Reference:	Well @ 3164.00usft (H&P 499 RKB: 25 + GL: 3139')
Project:	Lea County, NM	MD Reference:	Well @ 3164.00usft (H&P 499 RKB: 25 + GL: 3139')
Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	W1 3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Design #5		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
770.00	0.00	0.00	770.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	1.50	282.00	2,499.99	0.27	-1.28	-0.28	1.50	1.50	0.00
2,600.00	3.00	282.00	2,599.91	1.09	-5.12	-1.12	1.50	1.50	0.00
2,700.00	4.50	282.00	2,699.69	2.45	-11.52	-2.52	1.50	1.50	0.00
2,800.00	6.00	282.00	2,799.27	4.35	-20.47	-4.47	1.50	1.50	0.00
2,900.00	6.00	282.00	2,898.72	6.52	-30.69	-6.71	0.00	0.00	0.00
3,000.00	6.00	282.00	2,998.17	8.70	-40.92	-8.94	0.00	0.00	0.00
3,100.00	6.00	282.00	3,097.63	10.87	-51.14	-11.17	0.00	0.00	0.00
3,200.00	6.00	282.00	3,197.08	13.04	-61.37	-13.41	0.00	0.00	0.00
3,300.00	6.00	282.00	3,296.53	15.22	-71.59	-15.64	0.00	0.00	0.00
3,400.00	6.00	282.00	3,395.98	17.39	-81.81	-17.88	0.00	0.00	0.00
3,500.00	6.00	282.00	3,495.43	19.56	-92.04	-20.11	0.00	0.00	0.00
3,600.00	6.00	282.00	3,594.89	21.74	-102.26	-22.34	0.00	0.00	0.00
3,700.00	6.00	282.00	3,694.34	23.91	-112.49	-24.58	0.00	0.00	0.00
3,800.00	6.00	282.00	3,793.79	26.08	-122.71	-26.81	0.00	0.00	0.00
3,900.00	6.00	282.00	3,893.24	28.26	-132.94	-29.04	0.00	0.00	0.00
4,000.00	6.00	282.00	3,992.70	30.43	-143.16	-31.28	0.00	0.00	0.00
4,100.00	6.00	282.00	4,092.15	32.60	-153.39	-33.51	0.00	0.00	0.00
4,200.00	6.00	282.00	4,191.60	34.78	-163.61	-35.75	0.00	0.00	0.00
4,300.00	6.00	282.00	4,291.05	36.95	-173.83	-37.98	0.00	0.00	0.00
4,400.00	6.00	282.00	4,390.50	39.12	-184.06	-40.21	0.00	0.00	0.00
4,500.00	6.00	282.00	4,489.96	41.30	-194.28	-42.45	0.00	0.00	0.00
4,600.00	6.00	282.00	4,589.41	43.47	-204.51	-44.68	0.00	0.00	0.00
4,700.00	6.00	282.00	4,688.86	45.64	-214.73	-46.92	0.00	0.00	0.00
4,775.55	6.00	282.00	4,764.00	47.28	-222.46	-48.60	0.00	0.00	0.00
9 5/8"									

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well W1 3H
Company:	ConocoPhillips	**TVD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Project:	Lea County, NM	**MD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Site:	War Hammer 25 Fed Com	**North Reference:**	Grid
Well:	W1 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Design #5		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,800.00	6.00	282.00	4,788.31	47.82	-224.96	-49.15	0.00	0.00	0.00
4,820.00	6.00	282.00	4,808.20	48.25	-227.00	-49.60	0.00	0.00	0.00
4,900.00	4.80	282.00	4,887.85	49.82	-234.37	-51.21	1.50	-1.50	0.00
5,000.00	3.30	282.00	4,987.59	51.28	-241.27	-52.72	1.50	-1.50	0.00
5,100.00	1.80	282.00	5,087.49	52.21	-245.62	-53.67	1.50	-1.50	0.00
5,200.00	0.30	282.00	5,187.47	52.59	-247.42	-54.06	1.50	-1.50	0.00
5,220.00	0.00	0.00	5,207.47	52.60	-247.47	-54.07	1.50	-1.50	0.00
5,300.00	0.00	0.00	5,287.47	52.60	-247.47	-54.07	0.00	0.00	0.00
5,400.00	0.00	0.00	5,387.47	52.60	-247.47	-54.07	0.00	0.00	0.00
5,500.00	0.00	0.00	5,487.47	52.60	-247.47	-54.07	0.00	0.00	0.00
5,600.00	0.00	0.00	5,587.47	52.60	-247.47	-54.07	0.00	0.00	0.00
5,700.00	0.00	0.00	5,687.47	52.60	-247.47	-54.07	0.00	0.00	0.00
5,800.00	0.00	0.00	5,787.47	52.60	-247.47	-54.07	0.00	0.00	0.00
5,900.00	0.00	0.00	5,887.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,000.00	0.00	0.00	5,987.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,100.00	0.00	0.00	6,087.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,200.00	0.00	0.00	6,187.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,300.00	0.00	0.00	6,287.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,400.00	0.00	0.00	6,387.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,500.00	0.00	0.00	6,487.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,600.00	0.00	0.00	6,587.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,700.00	0.00	0.00	6,687.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,800.00	0.00	0.00	6,787.47	52.60	-247.47	-54.07	0.00	0.00	0.00
6,900.00	0.00	0.00	6,887.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,000.00	0.00	0.00	6,987.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,100.00	0.00	0.00	7,087.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,200.00	0.00	0.00	7,187.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,300.00	0.00	0.00	7,287.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,380.02	0.00	0.00	7,367.49	52.60	-247.47	-54.07	0.00	0.00	0.00
Brushy Canyon									
7,400.00	0.00	0.00	7,387.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,500.00	0.00	0.00	7,487.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,600.00	0.00	0.00	7,587.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,700.00	0.00	0.00	7,687.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,800.00	0.00	0.00	7,787.47	52.60	-247.47	-54.07	0.00	0.00	0.00
7,900.00	0.00	0.00	7,887.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,000.00	0.00	0.00	7,987.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,100.00	0.00	0.00	8,087.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,200.00	0.00	0.00	8,187.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,300.00	0.00	0.00	8,287.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,400.00	0.00	0.00	8,387.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,500.00	0.00	0.00	8,487.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,600.00	0.00	0.00	8,587.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,700.00	0.00	0.00	8,687.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,800.00	0.00	0.00	8,787.47	52.60	-247.47	-54.07	0.00	0.00	0.00
8,877.02	0.00	0.00	8,864.49	52.60	-247.47	-54.07	0.00	0.00	0.00
Bone Spring 1st Carbonate Top									
8,900.00	0.00	0.00	8,887.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,000.00	0.00	0.00	8,987.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,083.02	0.00	0.00	9,070.49	52.60	-247.47	-54.07	0.00	0.00	0.00
Avalon A									
9,100.00	0.00	0.00	9,087.47	52.60	-247.47	-54.07	0.00	0.00	0.00

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well W1 3H
Company:	ConocoPhillips	**TVD Reference:**	Well @ 3164.00usft (H&P 499 RKB 25 + GL 3139')
Project:	Lea County, NM	**MD Reference:**	Well @ 3164.00usft (H&P 499 RKB 25 + GL 3139')
Site:	War Hammer 25 Fed Com	**North Reference:**	Grid
Well:	W1 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Design #5		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,200.00	0.00	0.00	9,187.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,285.02	0.00	0.00	9,272.49	52.60	-247.47	-54.07	0.00	0.00	0.00
Avalon B									
9,300.00	0.00	0.00	9,287.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,400.00	0.00	0.00	9,387.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,434.02	0.00	0.00	9,421.49	52.60	-247.47	-54.07	0.00	0.00	0.00
Avalon C									
9,500.00	0.00	0.00	9,487.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,600.00	0.00	0.00	9,587.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,700.00	0.00	0.00	9,687.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,728.02	0.00	0.00	9,715.49	52.60	-247.47	-54.07	0.00	0.00	0.00
Avalon D									
9,770.02	0.00	0.00	9,757.49	52.60	-247.47	-54.07	0.00	0.00	0.00
1st Bone Spring Sand									
9,800.00	0.00	0.00	9,787.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,900.00	0.00	0.00	9,887.47	52.60	-247.47	-54.07	0.00	0.00	0.00
9,982.02	0.00	0.00	9,969.49	52.60	-247.47	-54.07	0.00	0.00	0.00
FBS shale									
10,000.00	0.00	0.00	9,987.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,100.00	0.00	0.00	10,087.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,153.02	0.00	0.00	10,140.49	52.60	-247.47	-54.07	0.00	0.00	0.00
2nd Bone Spring Carbonate									
10,200.00	0.00	0.00	10,187.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,300.00	0.00	0.00	10,287.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,310.02	0.00	0.00	10,297.49	52.60	-247.47	-54.07	0.00	0.00	0.00
2nd Bone Spring Sand									
10,400.00	0.00	0.00	10,387.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,500.00	0.00	0.00	10,487.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,600.00	0.00	0.00	10,587.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,666.02	0.00	0.00	10,653.49	52.60	-247.47	-54.07	0.00	0.00	0.00
3rd Bone Spring Carbonate									
10,700.00	0.00	0.00	10,687.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,800.00	0.00	0.00	10,787.47	52.60	-247.47	-54.07	0.00	0.00	0.00
10,900.00	0.00	0.00	10,887.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,000.00	0.00	0.00	10,987.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,100.00	0.00	0.00	11,087.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,200.00	0.00	0.00	11,187.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,300.00	0.00	0.00	11,287.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,400.00	0.00	0.00	11,387.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,500.00	0.00	0.00	11,487.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,501.02	0.00	0.00	11,488.49	52.60	-247.47	-54.07	0.00	0.00	0.00
3rd Bone Spring Sand									
11,600.00	0.00	0.00	11,587.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,700.00	0.00	0.00	11,687.47	52.60	-247.47	-54.07	0.00	0.00	0.00
11,774.59	0.00	0.00	11,762.07	52.60	-247.47	-54.07	0.00	0.00	0.00
11,800.00	2.54	179.66	11,787.46	52.04	-247.47	-53.51	10.00	10.00	0.00
11,847.26	7.27	179.66	11,834.53	48.00	-247.44	-49.47	10.00	10.00	0.00
Wolfcamp									
11,900.00	12.54	179.66	11,886.47	38.93	-247.39	-40.40	10.00	10.00	0.00
12,000.00	22.54	179.66	11,981.70	8.83	-247.21	-10.30	10.00	10.00	0.00
12,070.73	29.61	179.66	12,045.20	-22.24	-247.03	20.77	10.00	10.00	0.00

Database:	Gyrodata NWDB	Local Co-ordinate Reference:	Well W1 3H
Company:	ConocoPhillips	TVD Reference:	Well @ 3164.00usft (H&P 499 RKB: 25 + GL: 3139')
Project:	Lea County, NM	MD Reference:	Well @ 3164.00usft (H&P 499 RKB: 25 + GL: 3139')
Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	W1 3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Design #5		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Wolfcamp 1									
12,100.00	32.54	179.66	12,070.26	-37.35	-246.94	35.88	10.00	10.00	0.00
12,200.00	42.54	179.66	12,149.45	-98.20	-246.58	96.74	10.00	10.00	0.00
12,207.58	43.30	179.66	12,155.00	-103.36	-246.55	101.90	10.00	10.00	0.00
7 5/8"									
12,300.00	52.54	179.66	12,216.87	-171.88	-246.14	170.42	10.00	10.00	0.00
12,400.00	62.54	179.66	12,270.47	-256.15	-245.64	254.69	10.00	10.00	0.00
12,500.00	72.54	179.66	12,308.63	-348.45	-245.10	346.99	10.00	10.00	0.00
12,600.00	82.54	179.66	12,330.17	-445.97	-244.52	444.51	10.00	10.00	0.00
12,669.20	89.46	179.66	12,335.00	-514.95	-244.12	513.50	10.00	10.00	0.00
12,700.00	89.46	179.66	12,335.29	-545.75	-243.93	544.30	0.00	0.00	0.00
12,800.00	89.46	179.66	12,336.23	-645.75	-243.34	644.29	0.00	0.00	0.00
12,900.00	89.46	179.66	12,337.17	-745.74	-242.75	744.29	0.00	0.00	0.00
13,000.00	89.46	179.66	12,338.11	-845.73	-242.16	844.28	0.00	0.00	0.00
13,100.00	89.46	179.66	12,339.05	-945.73	-241.57	944.28	0.00	0.00	0.00
13,200.00	89.46	179.66	12,339.99	-1,045.72	-240.98	1,044.27	0.00	0.00	0.00
13,300.00	89.46	179.66	12,340.93	-1,145.72	-240.39	1,144.27	0.00	0.00	0.00
13,400.00	89.46	179.66	12,341.87	-1,245.71	-239.80	1,244.26	0.00	0.00	0.00
13,500.00	89.46	179.66	12,342.82	-1,345.70	-239.21	1,344.26	0.00	0.00	0.00
13,600.00	89.46	179.66	12,343.76	-1,445.70	-238.62	1,444.26	0.00	0.00	0.00
13,700.00	89.46	179.66	12,344.70	-1,545.69	-238.03	1,544.25	0.00	0.00	0.00
13,800.00	89.46	179.66	12,345.64	-1,645.69	-237.44	1,644.25	0.00	0.00	0.00
13,900.00	89.46	179.66	12,346.58	-1,745.68	-236.84	1,744.24	0.00	0.00	0.00
14,000.00	89.46	179.66	12,347.52	-1,845.67	-236.25	1,844.24	0.00	0.00	0.00
14,100.00	89.46	179.66	12,348.46	-1,945.67	-235.66	1,944.23	0.00	0.00	0.00
14,200.00	89.46	179.66	12,349.40	-2,045.66	-235.07	2,044.23	0.00	0.00	0.00
14,300.00	89.46	179.66	12,350.34	-2,145.65	-234.48	2,144.22	0.00	0.00	0.00
14,400.00	89.46	179.66	12,351.29	-2,245.65	-233.89	2,244.22	0.00	0.00	0.00
14,500.00	89.46	179.66	12,352.23	-2,345.64	-233.30	2,344.22	0.00	0.00	0.00
14,600.00	89.46	179.66	12,353.17	-2,445.64	-232.71	2,444.21	0.00	0.00	0.00
14,700.00	89.46	179.66	12,354.11	-2,545.63	-232.12	2,544.21	0.00	0.00	0.00
14,800.00	89.46	179.66	12,355.05	-2,645.62	-231.53	2,644.20	0.00	0.00	0.00
14,900.00	89.46	179.66	12,355.99	-2,745.62	-230.94	2,744.20	0.00	0.00	0.00
15,000.00	89.46	179.66	12,356.93	-2,845.61	-230.35	2,844.19	0.00	0.00	0.00
15,100.00	89.46	179.66	12,357.87	-2,945.60	-229.76	2,944.19	0.00	0.00	0.00
15,200.00	89.46	179.66	12,358.81	-3,045.60	-229.16	3,044.19	0.00	0.00	0.00
15,300.00	89.46	179.66	12,359.76	-3,145.59	-228.57	3,144.18	0.00	0.00	0.00
15,400.00	89.46	179.66	12,360.70	-3,245.59	-227.98	3,244.18	0.00	0.00	0.00
15,500.00	89.46	179.66	12,361.64	-3,345.58	-227.39	3,344.17	0.00	0.00	0.00
15,600.00	89.46	179.66	12,362.58	-3,445.57	-226.80	3,444.17	0.00	0.00	0.00
15,700.00	89.46	179.66	12,363.52	-3,545.57	-226.21	3,544.16	0.00	0.00	0.00
15,800.00	89.46	179.66	12,364.46	-3,645.56	-225.62	3,644.16	0.00	0.00	0.00
15,900.00	89.46	179.66	12,365.40	-3,745.56	-225.03	3,744.15	0.00	0.00	0.00
16,000.00	89.46	179.66	12,366.34	-3,845.55	-224.44	3,844.15	0.00	0.00	0.00
16,100.00	89.46	179.66	12,367.29	-3,945.54	-223.85	3,944.15	0.00	0.00	0.00
16,200.00	89.46	179.66	12,368.23	-4,045.54	-223.26	4,044.14	0.00	0.00	0.00
16,300.00	89.46	179.66	12,369.17	-4,145.53	-222.67	4,144.14	0.00	0.00	0.00
16,400.00	89.46	179.66	12,370.11	-4,245.52	-222.08	4,244.13	0.00	0.00	0.00
16,500.00	89.46	179.66	12,371.05	-4,345.52	-221.48	4,344.13	0.00	0.00	0.00
16,600.00	89.46	179.66	12,371.99	-4,445.51	-220.89	4,444.12	0.00	0.00	0.00
16,700.00	89.46	179.66	12,372.93	-4,545.51	-220.30	4,544.12	0.00	0.00	0.00
16,800.00	89.46	179.66	12,373.87	-4,645.50	-219.71	4,644.11	0.00	0.00	0.00

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well W1 3H
Company:	ConocoPhillips	**TVD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Project:	Lea County, NM	**MD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Site:	War Hammer 25 Fed Com	**North Reference:**	Grid
Well:	W1 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Design #5		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,900.00	89.46	179.66	12,374.81	-4,745.49	-219.12	4,744.11	0.00	0.00	0.00
17,000.00	89.46	179.66	12,375.76	-4,845.49	-218.53	4,844.11	0.00	0.00	0.00
17,100.00	89.46	179.66	12,376.70	-4,945.48	-217.94	4,944.10	0.00	0.00	0.00
17,200.00	89.46	179.66	12,377.64	-5,045.48	-217.35	5,044.10	0.00	0.00	0.00
17,300.00	89.46	179.66	12,378.58	-5,145.47	-216.76	5,144.09	0.00	0.00	0.00
17,400.00	89.46	179.66	12,379.52	-5,245.46	-216.17	5,244.09	0.00	0.00	0.00
17,500.00	89.46	179.66	12,380.46	-5,345.46	-215.58	5,344.08	0.00	0.00	0.00
17,600.00	89.46	179.66	12,381.40	-5,445.45	-214.99	5,444.08	0.00	0.00	0.00
17,700.00	89.46	179.66	12,382.34	-5,545.44	-214.40	5,544.07	0.00	0.00	0.00
17,800.00	89.46	179.66	12,383.28	-5,645.44	-213.80	5,644.07	0.00	0.00	0.00
17,900.00	89.46	179.66	12,384.23	-5,745.43	-213.21	5,744.07	0.00	0.00	0.00
18,000.00	89.46	179.66	12,385.17	-5,845.43	-212.62	5,844.06	0.00	0.00	0.00
18,100.00	89.46	179.66	12,386.11	-5,945.42	-212.03	5,944.06	0.00	0.00	0.00
18,200.00	89.46	179.66	12,387.05	-6,045.41	-211.44	6,044.05	0.00	0.00	0.00
18,300.00	89.46	179.66	12,387.99	-6,145.41	-210.85	6,144.05	0.00	0.00	0.00
18,400.00	89.46	179.66	12,388.93	-6,245.40	-210.26	6,244.04	0.00	0.00	0.00
18,500.00	89.46	179.66	12,389.87	-6,345.39	-209.67	6,344.04	0.00	0.00	0.00
18,600.00	89.46	179.66	12,390.81	-6,445.39	-209.08	6,444.03	0.00	0.00	0.00
18,700.00	89.46	179.66	12,391.75	-6,545.38	-208.49	6,544.03	0.00	0.00	0.00
18,800.00	89.46	179.66	12,392.70	-6,645.38	-207.90	6,644.03	0.00	0.00	0.00
18,900.00	89.46	179.66	12,393.64	-6,745.37	-207.31	6,744.02	0.00	0.00	0.00
19,000.00	89.46	179.66	12,394.58	-6,845.36	-206.72	6,844.02	0.00	0.00	0.00
19,044.94	89.46	179.66	12,395.00	-6,890.30	-206.45	6,888.95	0.00	0.00	0.00
5"									

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
War Hammer 25 Fed CC	90.54	179.66	12,335.00	-514.95	-244.12	371,201.52	720,914.09	32° 1' 6.76 N	103° 37' 14.01 W
- plan misses target center by 0.01usft at 12669.20usft MD (12335.00 TVD, -514.95 N, -244.12 E)									
- Rectangle (sides W100.00 H50.00 D200.00)									
War Hammer 25 Fed CC	90.54	179.66	12,395.00	-6,890.30	-206.45	364,826.17	720,951.76	32° 0' 3.67 N	103° 37' 14.07 W
- plan hits target center									
- Rectangle (sides W100.00 H50.00 D6,058.00)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
770.00	770.00	13 3/84"	5.50	6.00
4,775.55	4,764.00	9 5/8"	9.62	12.25
12,207.58	12,155.00	7 5/8"	5.50	6.00
19,044.94	12,395.00	5"	5.50	6.00

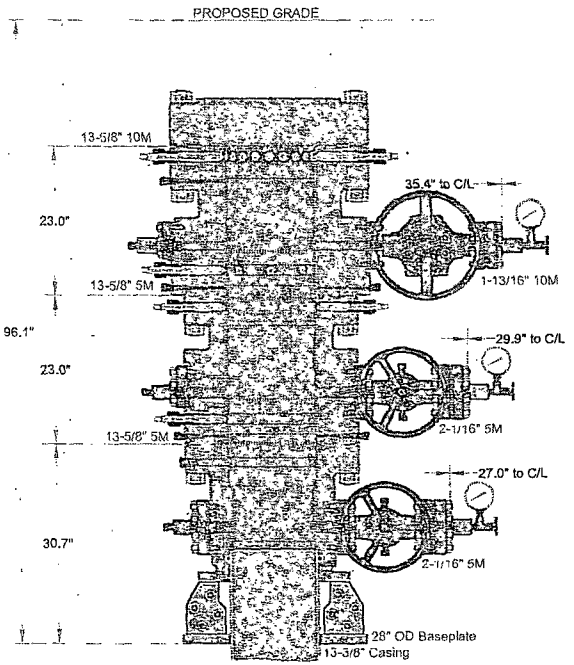
Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well W1 3H
Company:	ConocoPhillips	**TVD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Project:	Lea County, NM	**MD Reference:**	Well @ 3164.00usft (H&P 499 RKB: 25' + GL: 3139')
Site:	War Hammer 25 Fed Com	**North Reference:**	Grid
Well:	W1 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Design #5		

Formations

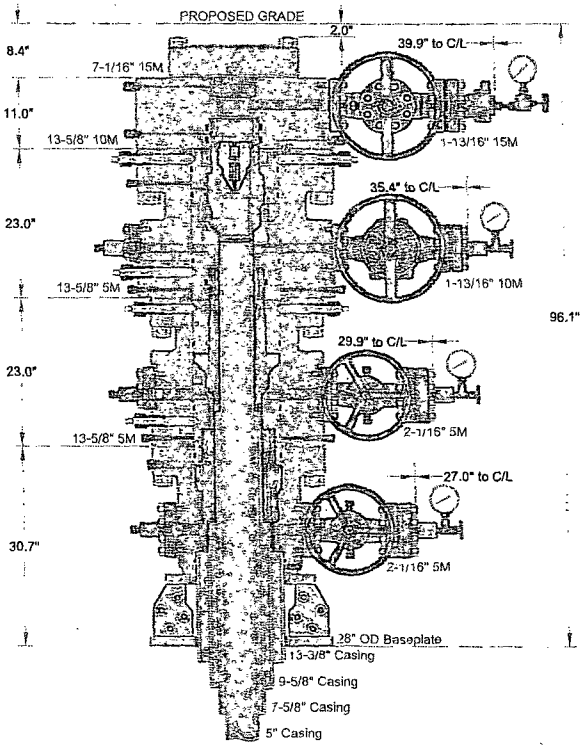
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,380.02	7,367.49	Brushy Canyon		0.54	179.66
8,877.02	8,864.49	Bone Spring 1st Carbonate Top		0.54	179.66
9,083.02	9,070.49	Avalon A		0.54	179.66
9,285.02	9,272.49	Avalon B		0.54	179.66
9,434.02	9,421.49	Avalon C		0.54	179.66
9,728.02	9,715.49	Avalon D		0.54	179.66
9,770.02	9,757.49	1st Bone Spring Sand		0.54	179.66
9,982.02	9,969.49	FBS shale		0.54	179.66
10,153.02	10,140.49	2nd Bone Spring Carbonate		0.54	179.66
10,310.02	10,297.49	2nd Bone Spring Sand		0.54	179.66
10,666.02	10,653.49	3rd Bone Spring Carbonate		0.54	179.66
11,501.02	11,488.49	3rd Bone Spring Sand		0.54	179.66
11,847.26	11,834.53	Wolfcamp		0.54	179.66
12,070.73	12,045.20	Wolfcamp 1		0.54	179.66

Plan Annotations

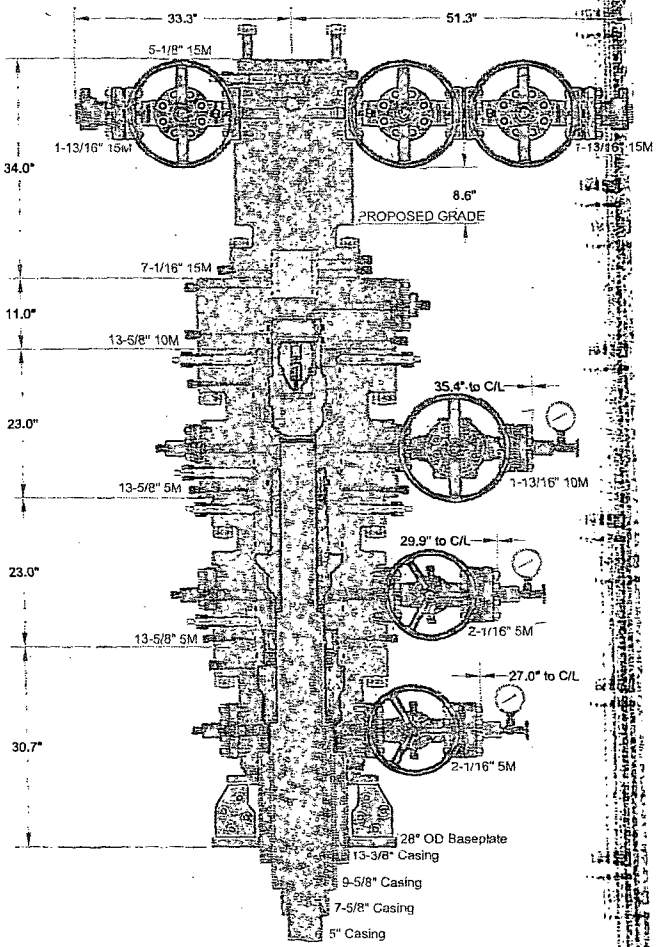
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
2,400.00	2,400.00	0.00	0.00	Start Build 1.50
4,820.00	4,808.20	4.35	-20.47	Start Drop -1.50
11,774.59	11,762.07	48.25	-227.00	Start DLS 10.00 TFO 179.66



SPUD CONFIGURATION



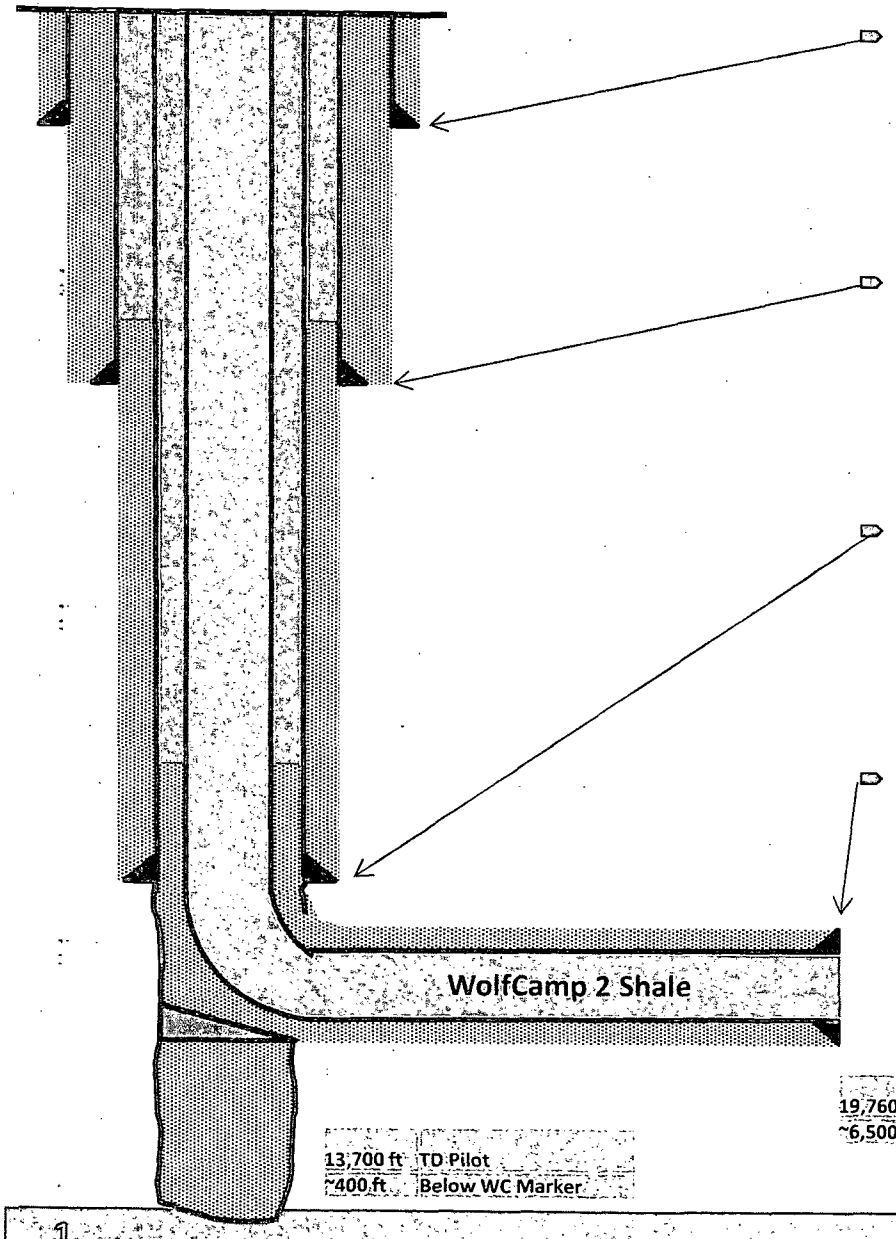
DRILL & SKID CONFIGURATION



COMPLETION CONFIGURATION

CACTUS WELLHEAD LLC	CONOCOPHILLIPS 4 STRING CONFIGURATION		
13-3/8" x 9-5/8" x 7-5/8" x 5" 5M MBS2 Wellhead System With 13-5/8" 10M x 7-1/16" 15M DBLHPS DSPA And 7-1/16" 15M x 5-1/8" 15M CMT-FB-EN Tubing Head, 34" Tall	DRAWN	THH	23FEB15
	APPRV		
	DRAWING NO.	ODE0000491	

Attachment #2: WC4 heel pilot & W2 lateral Wellbore Schematic



Surface Section:

- Objective: Protect fresh water horizons.
- Drill 17-1/2" hole to +/- 800ft.
- Mud weight: 8.6 – 9.1 ppg FW-Native Mud
- Set 13-3/8" 54.5# J-55 BTC casing.
- Cement to surface.

Intermediate1 Section:

- Objective: Isolate the Delaware Sand interval
- Drill 12-1/4" hole to +/- 4825ft. "Ford Shale"
- Mud weight: 9.0 – 10.0 ppg brine.
- Set 9-5/8" 40# L-80 BTC casing.
- Cement to surface.

Intermediate2 Section:

- Objective: Isolate depleted/weak formations above WC1
- Drill 8-3/4" hole to +/- 12250ft. "WC1 Landing Point"
- Mud weight: 8.9 – 9.5 ppg cut-brine.
- Set 7-5/8" 29.7# P-110 Tenaris *W523* casing.
- Cement lap 500ft above previous shoe.

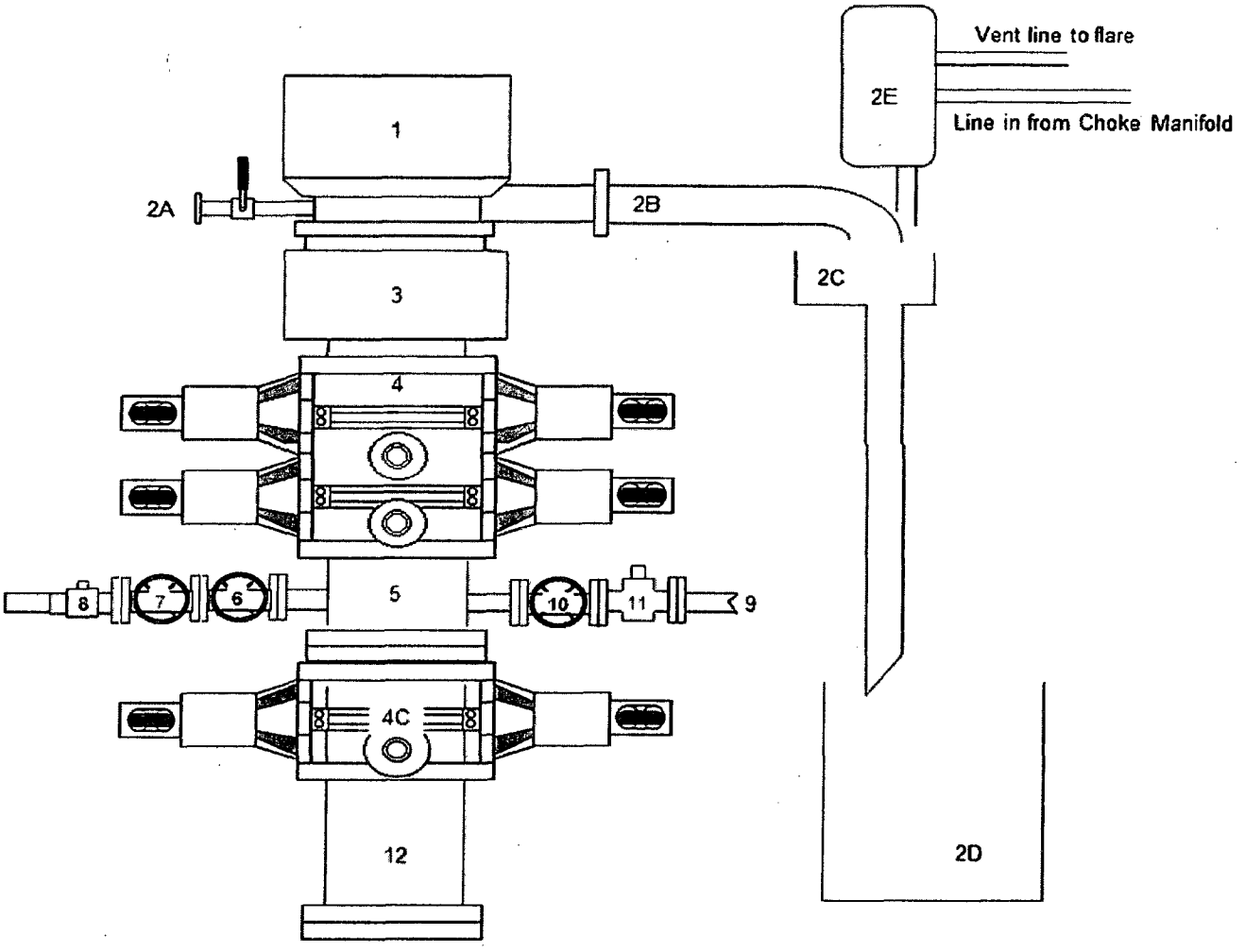
Production Section:

- Objective: Provide zonal isolation of production interval and provide medium for stimulation.
- Drill 6-3/4" hole to +/-19325ft. "Production TD"
- Mud Weight: 11.8 – 15.5ppg OBM.
- Set 5" 18# P-110 Tblue/TXP casing.
- Cement lap 500 ft above previous shoe (near KOP).

Attachment #3

BLOWOUT PREVENTER ARRANGEMENT - H&P486

10M System per Onshore Oil and Gas Order No. 2 utilizing 10M Rated Equipment



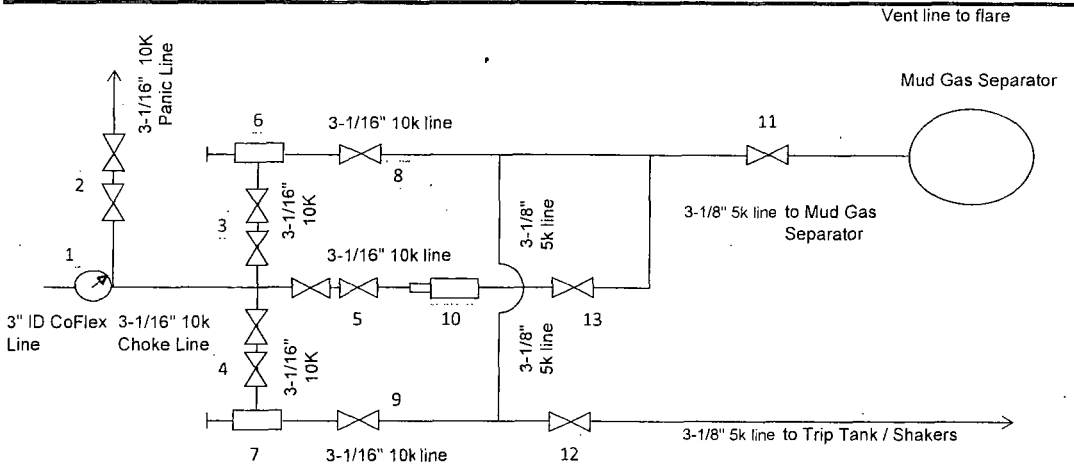
Item	Description
1	Rotating Head
2A	Fill up Line and Valve
2B	Flow Line (8")
2C	Shale Shakers and Centrifuges
2D	Cuttings Bins for Zero Discharge
2E	Mud Gas Separator with vent line to flare and return line to mud system
3	Annular Preventer (13-5/8", 10M)
4	Double Ram (13-5/8", 10M, Bline Ram bottom x Pipe Ram top)
5	Drilling Spool (13-5/8" 10M)
4C	Single Ram (13-5/8", 10M, Pipe Rams)
6	Kill Line Gate Valve, Inner (4-1/16", 10k psi WP)
7	Kill Line Gate Valve, Outer (4-1/16", 10k psi WP)
8	Kill Line Check Valve (4-1/16, 10k psi WP)
9	CoFlex hoke Line (4-1/16", 10k psi WP)
10	Choke Line Gate Valve, Inner (4-1/16", 10k psi WP)
11	Choke Line Hydraulically Operated Gate Valve, Outer, (4-1/6" 10k psi WP HCR)
12	Drilling Spool Adapter (13-5/8", 10M)

Drawn by:
James Chen, P.E.
Drilling Engineer, ConocoPhillips Company
Date: June 25th-2014

Attachment #3

CHOKE MANIFOLD ARRANGEMENT - HP486

10M System per Onshore Oil and Gas Order No. 2 utilizing 5M/10M Equipment



All Tees must be Targeted

Item	Description
1	Pressure Gauge
2	2 Gate Valves, 3-1/16" 10M
3	2 Gate Valves, 3-1/16" 10M
4	2 Gate Valves, 3-1/16" 10M
5	2 Gate Valves, 3-1/16" 10M
6	Upper Manual Adjustable Choke, 4-1/16", 10M
7	Lower Manual Adjustable Choke, 4-1/16", 10M
8	Gate Valve, 3-1/16" 10M
9	Gate Valve, 3-1/16" 10M
10	Remote Controlled Hydraulic Adjustable Choke, 4-1/16", 10M
11	Gate Valve, 3-1/8" 5M
12	Gate Valve, 3-1/8" 5M
13	Gate Valve, 3-1/16" 10M

The 10M Choke Manifold & Valves will be tested to rated working pressure.

Drawn by:
James Chen, P.E.
Drilling Engineer, ConocoPhillips Company
Date: June 25th-2014

Attachment #4

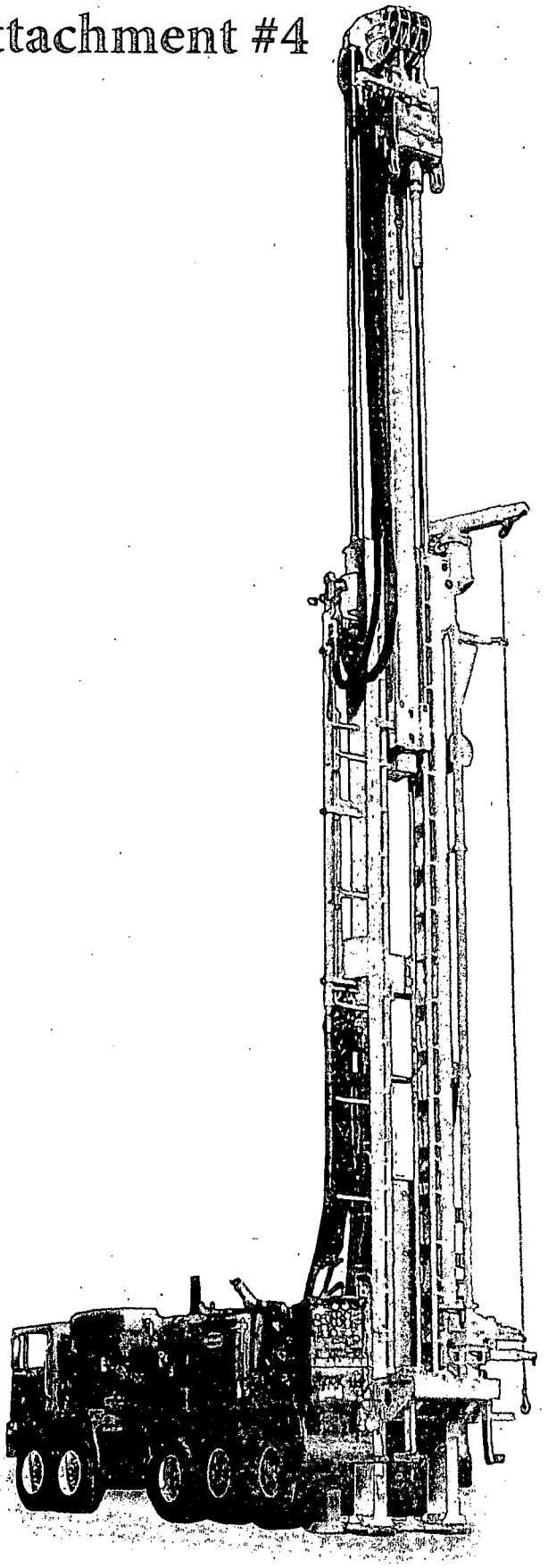
SCHRAMM

T130XD

ROTADRILL

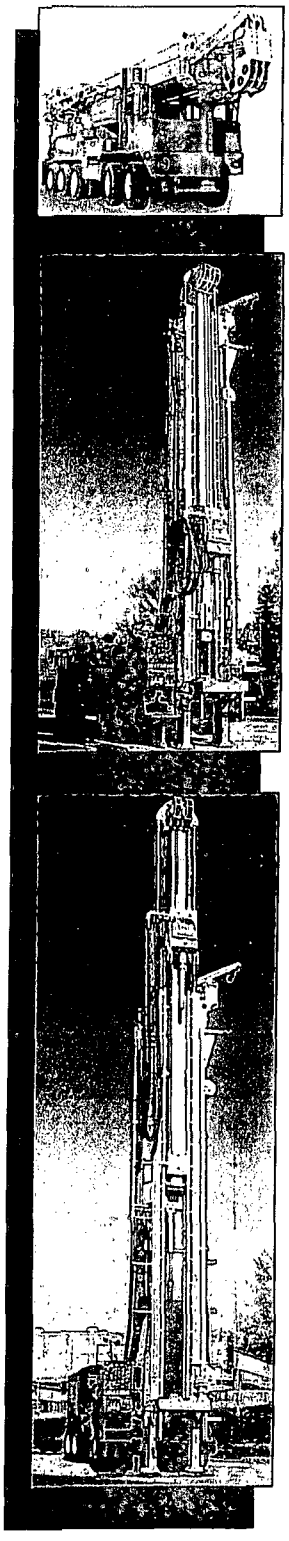
A heavy duty, heavy hoist carrier mounted drill rig. The T130XD utilizes innovative Telemast technology to achieve Range III pipe capability in a compact over the road package.

- Equipped with Schramm Telemast
- 50' head travel handles Range III casing
- 43' transport length with less than 6' overhang
- 130,000 lbs hoist
- No sub-structure required
- Mast slides to clear BOP



CARRIER MOUNTED RIG EQUIPPED WITH TELEMAST

T130XD ROTADRILL SPECIFICATIONS



Engine
Detroit Diesel DDC/MTU 12V-2000TA DDEC
760 bhp (567 kw) @ 1800 rpm

Standard Compressor
Variable volume two-stage, oil flooded rotary screw
1350 cfm @ 350 psi (38.0 cu. m/min @ 24.1 bar), up to 1150 cfm @ 500 psi (32.6 cu. m/min @ 35.5 bar)

Cooling
Three core, side by side type
130°F (54.4°C) ambient design temp.

Dimensions
OA length, transport - 42' 9" (13 m)
OA width - 8' 6" (2.6 m)
OA height, transport - 13' 6" (4.1 m)
Weight std. rig - 92,000 lb (41,723 kg)

Carrier
CCC 8x4 Carrier
Cat C-13, 410 hp @ 2100 rpm engine
44,000 lb (19,955 kg) front axles
21,500 lb (9,750 kg) pusher axle
52,000 lb (23,587 kg) rear axles
117,500 lb (53,298 kg) GVWR

Top Head Rotation
Ductile iron, single reduction oil bath gearbox with two disc valve type hydraulic motors. Infinitely variable rotation speed.
3.5:1 Reduction Gear
3" diameter (76.2 mm) spindle thru hole
0-143 rpm, infinitely variable
106,600 in-lb (12,045 N·m) torque

Feed System
Top head is driven by hydraulic traverse cylinders through special wire rope and large diameter Nylatron sheaves. As top head is raised, the inner mast section extends by a ratio of 1:2 until it reaches its fully extended position at 50' of clear head travel.
42' 9" (13 m) OA height (retracted)
69' 9" (21.65 m) OA height (extended)
50' (15.24 m) top head travel
130,000 lb (59,090 kg) pullup
8 fpm (2.44 mpm) pullup speed-slow feed
125 fpm (38.1 mpm) pullup speed-rapid feed
32,000 lb (14,545 kg) pulldown capacity
26 fpm (7.92 mpm) pulldown speed-slow feed
270 fpm (82.3 mpm) pulldown speed-rapid feed
52' 10" (16.1 m) working clearance mast spindle to table (sub removed)
48' 10" (14.9 m) working clearance mast sub to table

Drill Pipe & Casing
30' x 4-½" OD x 2-⅞ IF breakout style drill pipe, range III casing
28" (711 mm) max. diameter through slipbox

Mast
Telescoping construction permits long head travel and working height, yet short OA length in transport position.
32" (813 mm) cylinder operated slide
Free-standing mast
hydaulically operated adjustable mast feet
hydraulically retracted slip box
20" (508 mm) table opening w/o slips

Winch
Planetary with spring applied hydraulic release brake
9,600 lb (4,354 kg) bare drum line pull
151 fpm (46 mpm) bare drum line speed

Hydraulic System
Open loop load sensing system
7 micron filtration
200 gallon (760 l) system capacity

Water Injection System
25 gpm (95 lpm) water pump
Electric foam pump

Outriggers
Front - (1) 5" bore x 41" stroke (127 mm x 1.4 m)
Rear - (2) 5" bore x 41" stroke (127 mm x 1.4 m)

Tool Lubricator
Positive displacement, air pump operated piston type pump variable to 5.0 gph (18.9 lph)

Lighting & Electrical System - 24 Volt
Mast - (4) 60 watt floodlights
Control Panel - (2) 60 watt gauge floodlights
Work - (3) 70 watt halogen

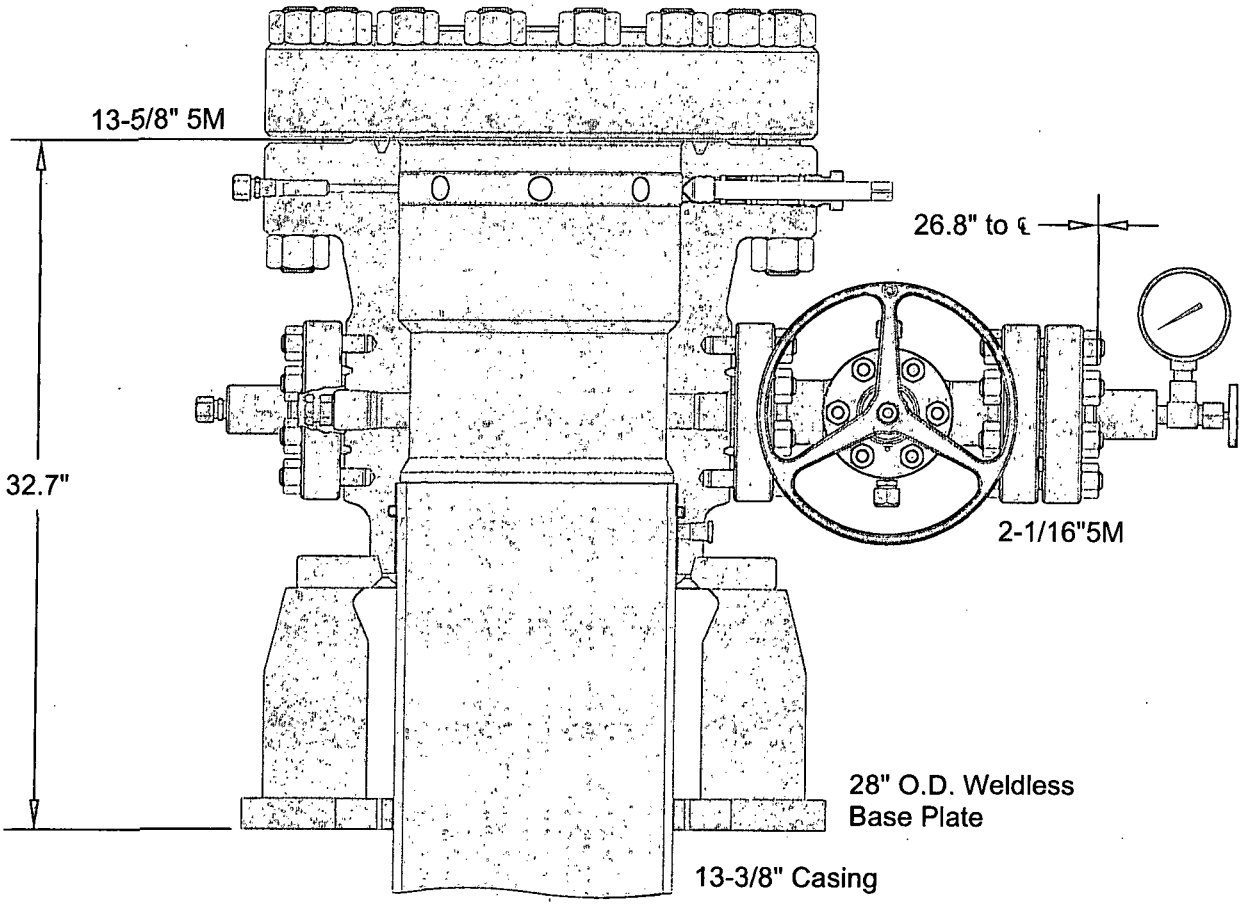
Accessories
Pipe handling sling, 60" breakout wrench, and 50 hour maintenance kit.

Optional Equipment
Many modifications are available including:
Third driving axle
Reverse circulation package
Tilt-out top head
High capacity top head
Single pipe loading arm
Auxiliary winch controls
Auxiliary air supply

SCHRAMM®
SCHRAMM, INC.
800 E. Virginia Avenue
West Chester, PA 19380 USA
Phone: 610-696-2500
Fax: 610-696-6950
E-mail: schramm@schramminc.com
www.schramminc.com

GE Oil & Gas

Attachment #5



ALL DIMENSIONS ARE APPROXIMATE

CONOCOPHILLIPS
SPUDDER RIG

HSG,WG,SH2-LWR,13-5/8 5M X 13-3/8 SOW,W/2 2-1/16 5M FP
BASEPLATE,WELDLESS,28 OD
FLANGE;BLIND; 13-5/8 5M

DRAWN	VJK	19AUG14
APPRV	KN	16AUG14

FOR REFERENCE ONLY
DRAWING NO. PE00624

January 28 2014

TenarisHydril

Size: 7.625 in.
Wall: 0.375 in.
Weight: 29.70 lbs/ft
Grade: P110
Min. Wall Thickness: 87.5 %

Connection: Wedge 523™
Casing/Tubing: CAS

PIPE BODY DATA					
GEOMETRY					
Nominal OD	**7.625** in.	Nominal Weight	**29.70** lbs/ft	Standard Drift Diameter	**6.750** in.
Nominal ID	**6.875** in.	Wall Thickness	**0.375** in.	Special Drift Diameter	**N/A**
Plain End Weight	**29.06** lbs/ft				
PERFORMANCE					
Body Yield Strength	**940** x 1000 lbs	Internal Yield	**9470** psi	SMYS	**110000** psi
Collapse	**5350** psi				

WEDGE 523™ CONNECTION DATA					
GEOMETRY					
Connection OD	**7.752** in.	Connection ID	**6.800** in.	Make-Up Loss	**4.420** in.
Critical Section Area	**6.021** sq. in.	Threads per in.	**3.29**		
PERFORMANCE					
Tension Efficiency	**70.5** %	Joint Yield Strength	**663** x 1000 lbs	Internal Pressure Capacity	**9470** psi
Compression Strength	**768** x 1000 lbs	Compression Efficiency	**81.7** %	Bending	**47** °/100 ft
External Pressure Capacity	**5350** psi				
MAKE-UP TORQUES					
Minimum	**9900** ft-lbs	Target	**11900** ft-lbs	Maximum (*)	**17300** ft-lbs
OPERATIONAL LIMIT TORQUES					
Operating Torque	**52000** ft-lbs	Yield Torque	**78000** ft-lbs		
BLANKING DIMENSIONS					
Blanking Dimensions					

* If you need to use torque values that are higher than the maximum indicated, please contact a local Tenaris technical sales representative.

October 21 2014

TenarisHydril

Size: 5.000 in.
Wall: 0.362 in.
Weight: 18.00 lbs/ft
Grade: P110
Min. Wall Thickness: 87.5 %

Connection: Blue®
Casing/Tubing: CAS
Coupling Option: REGULAR

PIPE BODY DATA

GEOMETRY

Nominal OD	**5.000** in.	Nominal Weight	**18.00** lbs/ft	Standard Drift Diameter	**4.151** in.
Nominal ID	**4.276** in.	Wall Thickness	**0.362** in.	Special Drift Diameter	**N/A**
Plain End Weight	**17.95** lbs/ft				

PERFORMANCE

Body Yield Strength	**580** x 1000 lbs	Internal Yield	**13940** psi	SMYS	**110000** psi
Collapse	**13470** psi				

BLUE® CONNECTION DATA

GEOMETRY

Connection OD	**5.630** in.	Coupling Length	**10.551** in.	Connection ID	**4.264** in.
Critical Section Area	**5.275** sq. in.	Make-Up Loss	**4.579** in.	Threads per in.	**5.00**

PERFORMANCE

Tension Efficiency	**100** %	Joint Yield Strength	**580** x 1000 lbs	Internal Pressure Capacity	**13940** psi
Compression Efficiency	**100** %	Compression Strength	**580** x 1000 lbs	Bending	**101** °/100 ft
External Pressure Capacity	**13470** psi				

MAKE-UP TORQUES

Minimum	**6400** ft-lbs	Target	**7110** ft-lbs	Maximum	**7820** ft-lbs

OPERATIONAL LIMIT TORQUES

Operating Torque	**ASK**	Yield Torque	**17600** ft-lbs		

SHOULDER TORQUES

Minimum	**1070** ft-lbs	Maximum	**6040** ft-lbs		

BLANKING DIMENSIONS

Blanking Dimensions

Datasheet is also valid for Special Bevel option when applicable.

December 18 2014

Tenaris

Size: 5.000 in.
Wall: 0.362 in.
Weight: 18.00 lbs/ft
Grade: P110
Min. Wall Thickness: 87.5 %

Connection: TenarisXP™ BTC
Casing/Tubing: CAS
Coupling Option: REGULAR

PIPE BODY DATA

GEOMETRY

Nominal OD	**5.000** in.	Nominal Weight	**18.00** lbs/ft	Standard Drift Diameter	**4.151** in.
Nominal ID	**4.276** in.	Wall Thickness	**0.362** in.	Special Drift Diameter	**N/A**
Plain End Weight	**17.95** lbs/ft				

PERFORMANCE

Body Yield Strength	**580** x 1000 lbs	Internal Yield	**13940** psi	SMYS	**110000** psi
Collapse	**13470** psi				

TENARISXP™ BTC CONNECTION DATA

GEOMETRY

Connection OD	**5.720** in.	Coupling Length	**9.325** in.	Connection ID	**4.264** in.
Critical Section Area	**5.275** sq. in.	Threads per in.	**5.00**	Make-Up Loss	**4.141** in.

PERFORMANCE

Tension Efficiency	**100** %	Joint Yield Strength	**580** x 1000 lbs	Internal Pressure Capacity(1)	**13940** psi
Structural Compression Efficiency	**100** %	Structural Compression Strength	**580** x 1000 lbs	Structural Bending(2)	**101** °/100 ft
External Pressure Capacity	**13470** psi				

ESTIMATED MAKE-UP TORQUES(3)

Minimum	**N/A** ft-lbs	Target	**N/A** ft-lbs	Maximum	**N/A** ft-lbs

OPERATIONAL LIMIT TORQUES

Operating Torque	**ASK**	Yield Torque	**N/A** ft-lbs		

BLANKING DIMENSIONS

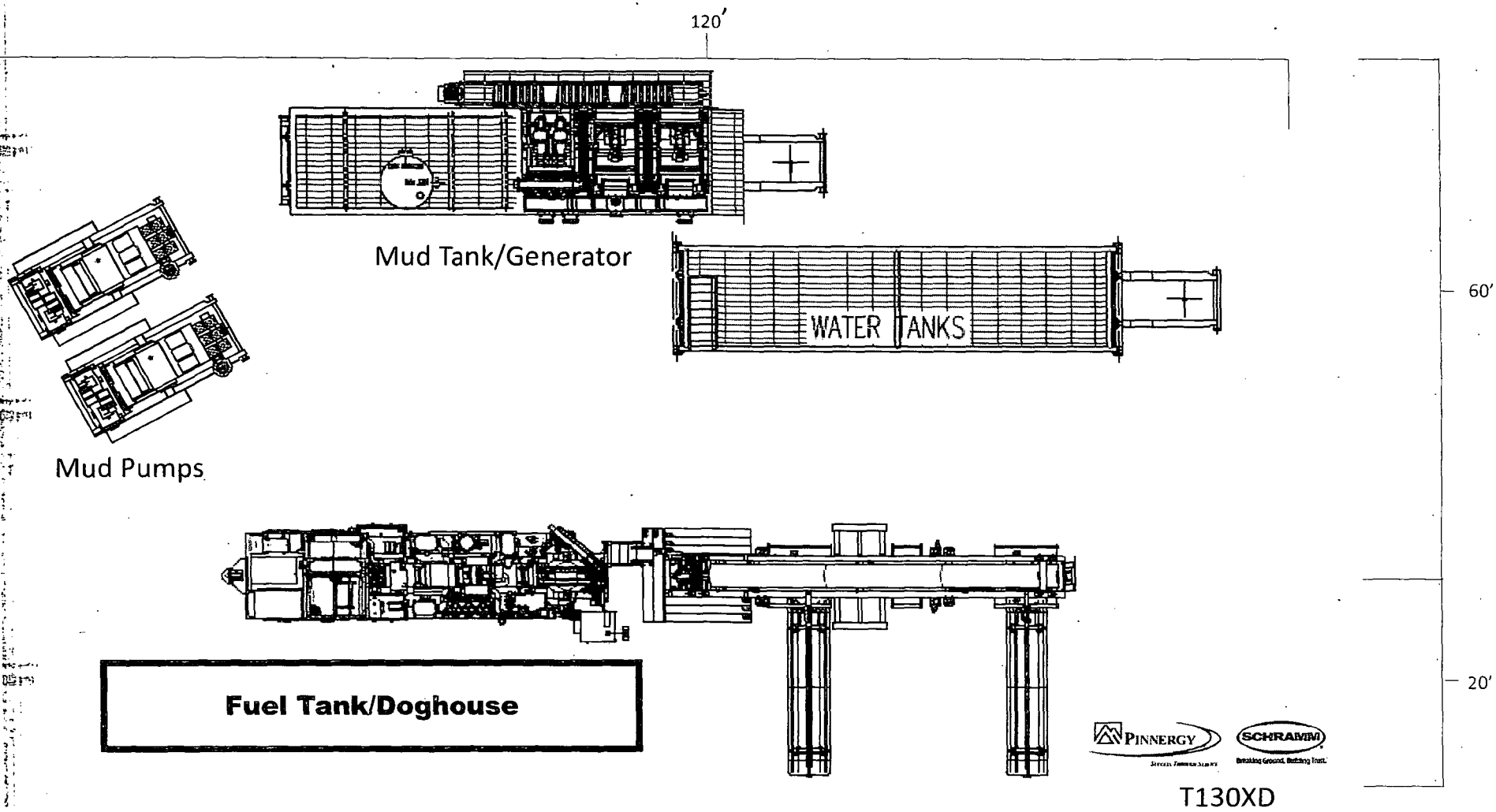
Blanking Dimensions

(1) Internal Pressure Capacity related to structural resistance only. Internal pressure leak resistance as per section 10.3 API 5C3 / ISO 10400 - 2007.

(2) Structural rating, pure bending to yield (i.e no other loads applied)

(3) Torque values calculated for API Modified thread compounds with Friction Factor=1. For other thread compounds please contact us at licensees@oilfield.tenaris.com. Torque values may be further reviewed.

For additional information, please contact us at contact-tenarishydril@tenaris.com



"Pinnergy #1" Spudder Rig Layout

SKID / BATCH DRILLING OPTION – "QUAD PAD"

SKID / BATCH DRILLING OPERATION OPTION FOR "QUAD PAD":

1. **ALL SURFACE CASINGS PRE-SET** (Pre-set with "Spudder Rig").
2. WELL 1 / WolfCamp 3. 9-5/8" CASING – WBM.
3. WELL 2 / WolfCamp 2. 9-5/8" CASING – WBM.
4. WELL 3 / WolfCamp 1. 9-5/8" CASING – WBM.
5. WELL 4 / BS 3rd Carb. 9-5/8" CASING – WBM.

"INTERMEDIATE 1" BATCH

6. WELL 4 / BS 3rd Carb. 5-1/2" CASING – WBM.
7. WELL 3 / WolfCamp 1. 7-5/8" CASING – WBM.
8. WELL 2 / WolfCamp 2. 7-5/8" CASING – WBM.
9. WELL 1 / WolfCamp 3. 7-5/8" CASING – WBM.

"INTERMEDIATE 2" BATCH

10. WELL 1 / WolfCamp 3. 5" CASING – **OBM**.
11. WELL 2 / WolfCamp 2. 5" CASING – **OBM**.
12. WELL 3 / WolfCamp 1. 5" CASING – **OBM**.

"PRODUCTION" BATCH

13. **RIG RELEASE**.

CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CONOCOPHILLIPS
LEASE NO.:	NMLC069515
WELL NAME & NO.:	War Hammer 25 Federal Com W1 3H
SURFACE HOLE FOOTAGE:	316' FNL & 125' FEL
BOTTOM HOLE FOOTAGE	330' FSL & 380' FEL
LOCATION:	Section 25, T.26S., R32E., NMPM
COUNTY:	Lea County, New Mexico

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ **Lea County**
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 393-3612

1. A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Delaware** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.**

2. Setting surface casing with Pinnergy Rig

   a. Notify the BLM when removing the Pinnergy Rig.

   b. Notify the BLM when moving in the H&P Flex Rig. Rig to be moved in within 90 days of notification that Pinnergy Rig has left the location. Failure to notify or have rig on location within 90 days will result in an Incident of Non-Compliance.

   c. Once the H&P Flex Rig is on location, it will drill the War Hammer 25 Federal Com 1H/2H/3H/4H in conjunction using batch drilling.

   d. BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as H&P Flex Rig is rigged up on well. CIT for the surface casing shall be performed and results recorded on subsequent sundry.

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 is located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Water Basin:
After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Abnormal pressures may occur in the Wolfcamp.
Possible water flows in the Salt and the Castile.
Possible lost circulation in the Delaware.

1. The **13-3/8** inch surface casing shall be set at approximately **800** feet (**in a competent bed below the Magenta Dolomite, a Member of the Rustler**) and cemented to the surface.

    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 is to include the lead cement slurry.

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.

Formation below the 13-3/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

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, c-d above.

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

3. The minimum required fill of cement behind the **7-5/8** inch 2nd intermediate casing is:

☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

Formation below the 7-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

4. The minimum required fill of cement behind the **5** inch production casing is:

   ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification. **Additional cement may be required as the excess calculates to 0%.**

5. 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. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

Option 1 - BOP testing if wells are drilled conventionally- BOP is not removed between casing strings.

3. **Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 5000 psi.**
   a. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
   b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
   c. **Manufacturer representative shall install the test plug for the initial BOP test.**
   d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**

e. **Operator shall perform the 9-5/8" casing integrity tests to 70% of the casing burst. This will test the multi-bowl seals.**
f. **If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.**

5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

Option 2 - BOP testing for Batch Drilling-BOP is removed between casing strings

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.** BOP/BOPE shall be tested after nipple up according to Onshore Order #2.

5. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **7-5/8** inch shoe shall be **10,000 (10M)** psi. **10M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

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

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

    b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

    c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

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

e. 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.**

f. 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. This test shall be performed prior to the test at full stack pressure.

g. 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.

F. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

CRW 022715