OCD-ARTESIA

Form 3160-3
(February 2005)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No: **USA NMLC 063622**

6 If Indian, Allotee or Tribe Name:

1a. Type of work: ☑ DRILL ☐ REENTER

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.: **Vega 29 Federal 2H** [39050]

2 Name of Operator: **Devon Energy Production Co., LP** [6137]

9 API Well No: 30-015-39864

3a Address: **20 North Broadway, OKC, OK 73102**

3b Phone No. *(include area code)*: **(405)-552-7802**

10 Field and Pool, or Exploratory: **Hackberry; Bone Spring,** [29345]

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface: **NWNE 137' FNL & 2310' FEL Lot B**

At proposed prod. zone: **SWSE 340' FSL & 1980' FEL Lot O**

UNORTHODOX LOCATION

11 Sec., T. R. M. or Blk and Survey or Area: **Sec 29-T19S-R31E**

14 Distance in miles and direction from nearest town or post office*: **Approximately 14 miles southeast of Loco Hills, NM.**

12 County or Parish: **Eddy**

13 State: **NM**

15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drlg unit line, if any)	16 No. of acres in lease	17 Spacing Unit dedicated to this well
137'	**1081 acres**	**160**

18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft	19 Proposed Depth	20 BLM/BIA Bond No. on file
SL: 630' BHL: 655'	**13627' MD 9050' MTVD** (~~19370~~)	**PH: 9370' CO-1104**

21 Elevations (Show whether DF, KDB, RT, GL, etc.)	22 Approximate date work will start*	23 Estimated duration
3470.8' GL	**01/15/2012**	**45 days**

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No 1, must 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 must 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 BLM.

25 Signature	Name *(Printed/Typed)*	Date
	Stephanie A. Ysasaga	**11/18/2011**

Title: **Sr. Staff Engineering Technician**

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
/s/ Don Peterson		JAN 23 2012

Title	Office
FIELD MANAGER	CARLSBAD FIELD OFFICE

Application approval 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.
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

*(Instructions on page 2)

Capitan Controlled Water Basin

RECEIVED
JAN 25 2012
NMOCD ARTESIA

CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

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 & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised October 15,2009
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-015-39864	29345	HACKBERRY; BONE SPRING,

4 Property Code	5 Property Name	6 Well Number
39050	VEGA "29" FEDERAL	2H

7 OGRID No.	8 Operator Name	9 Elevation
6137	DEVON ENERGY PRODUCTION COMPANY, L.P.	3470.8

10 Surface Location

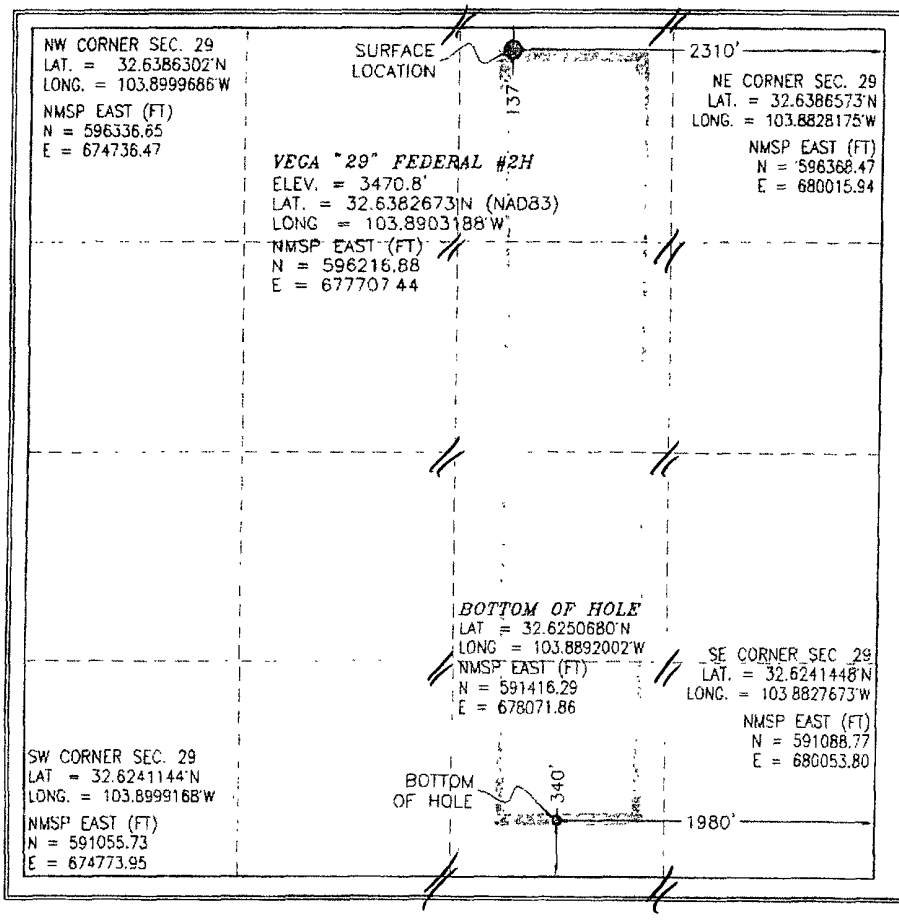
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	29	19 S	31 E		137	NORTH	2310	EAST	EDDY

11 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
O	29	19 S	31 E		340	SOUTH	1980	EAST	EDDY

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 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.



17 OPERATOR CERTIFICATION

I hereby certify that the information contained 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 a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name **STEPHANIE A. YSASAGA**

18 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.

NOVEMBER 11, 2011

Date of Survey

Signature and Seal of Professional Surveyor

Certificate Number EDMUND P. JARAMILLO PLS 12797

SURVEY NO. 705

PENETRATION POINT: 435' FNL & 2160' FEL

PRODUCING AREA **PROJECT AREA**

DRILLING PROGRAM

Devon Energy Production Company, LP
Vega 29 Federal 2H
Surface Location: 137' FNL & 2310' FEL, Unit B, Sec 29 T19S R31E, Eddy, NM
Bottom hole Location: 340' FSL & 1980' FEL, Unit O, Sec 29 T19S R31E, Eddy, NM

1. Geologic Name of Surface Formation

a. Quaternary

2. Estimated Tops of Geological Markers & Depths of Anticipated Fresh Water, Oil or Gas:

a.	Quaternary Alluvium	95'	Fresh Water
b.	Rustler	395'	Barren
c.	Salado	535'	Barren
d.	Base Salado	1970'	Barren
e.	Tansil Dolomite	2025'	Barren
f.	Yates	2125'	Barren
g.	Seven Rivers	2380'	Barren
h.	Capitan	2490'	Barren
i.	Base Capitan	3995'	Barren
j.	Delaware	4370'	Oil
k.	Bone Springs	6655'	Oil
l.	1st Bone Spring Ss	7925'	Oil
m.	2nd Bone Spring Lime	8255'	Oil
n.	2nd Bone Spring Ss	8795'	Oil
o.	2nd Bone Spring Middle Ss	8930'	Oil
p.	2nd Bone Spring Middle Ss Base	9045'	Oil
q.	3rd Bone Spring Lm	9220'	Oil
r.	Pilot Hole	9370'	
s.	Total Depth	TVD 9050' MD 13627'	

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 13 3/8" casing at 475' and circulating cement back to surface. The fresh water sands will be protected by setting 9 5/8" casing at ~~4175'~~ and circulating cement to surface. The Delaware intervals will be isolated by setting 5 ½" casing to total depth and circulating cement above the base of the 9 5/8" casing. All casing is new and API approved.

NOTE: THIS WELL WILL BE DRILLED WITH A PILOT HOLE (PH)

3. Casing Program:

Hole Size	Hole Interval	OD Csg	Casing Interval	Weight	Collar	Grade
17 1/2"	0'-~~450'~~ 475	13 3/8"	0'-475'	48#	STC	H-40
12 ¼"	450'-~~4175~~'	9 5/8"	0'-~~4175'~~ 425	40#	LTC	J-55
8 ¾"	~~4175'~~–8300'	5 ½"	0'-8300'	17#	LTC	P-110HC
8 ¾"	8300'- 13627'	5 ½"	8300-13627'	17#	BTC	P-110HC

See COA

An 8-3/4" pilot hole will be drilled to 9,370' MD and plugged back to KOP. The cement plug details are included below in the "Cementing Program".

Design Parameter Factors:

Casing Size	Collapse Design Factor	Burst Design Factor	Tension Design Factor
13 3/8"	2.99	6.72	12.20
9 5/8" 40# J-55 LTC	1.21	1.82	3.35
5 1/2" 17# P-110HC LTC	1.64	2.02	1.55
5 ½" 17# P-110HC BTC	1.84	2.27	5.22

4. Cement Program: (Note: All cement volumes are calculated with 25% excesses.)

a. 13 3/8" ~~Conductor~~ Surface

Lead: 186 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.125 lbs/sack Cello Flake + 4% bwoc Bentonite + 81.4% Fresh Water, 13.5 ppg. **Yield:** 1.75 cf/sk

Tail: 250 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.125 lbs/sack Cello Flake + 56.3% Fresh Water, 14.8 ppg. **Yield:** 1.35 cf/sk.. **TOC @ surface.**

b. 9 5/8" Intermediate

Lead: 1420 sacks (35:65) Poz (Fly Ash):Class C Cement + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 6% bwoc Bentonite + 107.8% Fresh Water, 12.5 ppg. **Yield**: 1.73 cf/sk

Tail: 300 sacks Class C Cement + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.4% bwoc Sodium Metasilicate + 4% bwoc MPA-5 + 52.7% Water, 14.8 ppg. **Yield**: 1.38 cf/sk. **TOC @ surface.**

c. 5 ½" Production

1st Stage

Lead: 755 sacks (35:65) Poz (Fly Ash):Class H Cement + 5% bwow Sodium Chloride + 0.3% bwoc CD-32 + 0.5% bwoc FL-25 + 2% bwoc Bentonite + 0.6% bwoc Sodium Metasilicate + 0.5% bwoc FL-52A + 102.5% Fresh Water, 12.5 ppg. **Yield**: 2.00 cf/sk

Tail: 1,510 sacks (50:50) Poz (Fly Ash):Class H Cement + 1% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 58.3% Fresh Water, 14.2 ppg. **Yield**: 1.28 cf/sk

DV TOOL at ~5,500 ft

2nd Stage

Lead: 375 sacks Class C Cement + 1% bwow Calcium Chloride + 0.125 lbs/sack Cello Flake + 157.8% Fresh Water, 11.4 ppg. **Yield**: 2.88 cf/sk

Tail: 150 sacks (60:40) Poz (Fly Ash):Class C Cement + 1% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 63.2% Fresh Water, 13.8 ppg. **Yield**: 1.37cf/sk. **TOC @ 2,400'**

8-3/4" Pilot Hole Plug

415 sacks Class H, 15.6 ppg, 1.18 cf/sk
Top of Plug 8,400' (KOP)
Bottom of Plug 9,370' (pilot hole TD)

TOC for All Strings:

Surface:	0'
Intermediate:	0'
Production:	2,400'

The above cement volumes could be revised pending the caliper measurement from the open hole logs. Actual cement volumes will be adjusted bases on fluid caliper and caliper log data.

5. **Pressure Control Equipment:**

The BOP system used to drill the intermediate hole will consist of a 13-5/8" 3M Annular preventer. The BOP system will be tested as per BLM Onshore Oil and Gas Order No. 2 as a 2M system prior to drilling out the surface casing shoe.

The BOP system used to drill the production hole will consist of an 11" 3M Double Ram and Annular preventer. The BOP system will be tested as per BLM Onshore Oil and Gas Order No. 2 as a 3M system prior to drilling out the intermediate casing shoe.

The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 3,000 psi WP.

6. **Proposed Mud Circulation System**

Depth	Mud Wt.	Visc	Fluid Loss	Type System
0' – 450' 475	8.4-9.0	30-34	NC	Fresh Water
450' – 4175' 4125	9.8-10.0	28-32	NC	Brine
4175' – 14363'	8.6-9.0	28-32	NC-12	Fresh Water

The necessary mud products for weight addition and fluid loss control will be on location at all times.

7. **Auxiliary Well Control and Monitoring Equipment:**
   a. A Kelly cock will be in the drill string at all times.
   b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
   c. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

8. **Logging, Coring, and Testing Program:** See COA
   a. Drill stem tests will be based on geological sample shows.
   b. If a drill stem test is anticipated; a procedure, equipment to be used and safety measures will be provided via sundry notice to the BLM.
   c. The open hole electrical logging program will be:
      i. Total Depth to Intermediate Casing — Dual Laterolog-Micro Laterolog with SP and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.
      ii. Total Depth to Surface — Compensated Neutron with Gamma Ray
      iii. No coring program is planned
      iv. Additional testing will be initiated subsequent to setting the 5 ½" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

9. **Potential Hazards:**
   a. No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6 No lost circulation is expected to occur. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Estimated BHP 3800 psi and Estimated BHT 140°. No H2S is anticipated to be encountered.

10. **Anticipated Starting Date and Duration of Operations:**
   a. Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 32 days. If production casing is run then an additional 30 days will be needed to complete well and construct surface facilities and/or lay flow lines in order to place well on production.

Devon Energy Production Co, LP

Eddy Co., New Mexico (Nad 83)
Vega 29 Fed 2H
Vega 29 Fed 2H
30-015-XXXXX
Lateral #1

Plan: Design #2

Standard Planning Report

17 November, 2011

CUDD Drilling and Measurement

Planning Report

devon

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Vega 29 Fed 2H
Company:	Devon Energy Production Co, LP	**TVD Reference:**	WELL @ 3491.00ft (Original Well Elev)
Project:	Eddy Co., New Mexico (Nad 83)	**MD Reference:**	WELL @ 3491.00ft (Original Well Elev)
Site:	Vega 29 Fed 2H	**North Reference:**	Grid
Well:	Vega 29 Fed 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #2		

Project Eddy Co., New Mexico (Nad 83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Vega 29 Fed 2H, Sec 29, T-19S, R-31E

Site Position:		**Northing:**	596,216 88 usft	**Latitude:**	32° 38' 17.762 N
From:	Map	**Easting:**	677,707.44 usft	**Longitude:**	103° 53' 25 148 W
Position Uncertainty:	0 00 ft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0 24 °

Well Vega 29 Fed 2H

Well Position	**+N/-S**	0.00 ft	**Northing:**	596,216.88 usft	**Latitude:**	32° 38' 17 762 N
	+E/-W	0 00 ft	**Easting:**	677,707 44 usft	**Longitude:**	103° 53' 25.148 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	3,491.00 ft	**Ground Level:**	3,471.00 ft

Wellbore Lateral #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/2/2011	7.72	60.51	48,792

Design Design #2

Audit Notes:

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

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	180 00

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0 00	0.00	0.00	0.00	0 00	0.00	0 00	0.00	0.00	
8,437.07	0.00	0.00	8,437 07	0 00	0.00	0 00	0.00	0 00	0 00	
9,331.73	89.47	157.43	9,010 00	-524 15	217.86	10 00	10.00	0.00	157.43	
10,083 87	89.47	180.00	9,017 09	-1,256 95	364.12	3.00	0.00	3 00	90.10	
13,627.68	89.47	180 00	9,050 00	-4,800 60	364.42	0 00	0 00	0 00	0.00	PBHL - TD (V29F2I

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Vega 29 Fed 2H
Company:	Devon Energy Production Co, LP	**TVD Reference:**	WELL @ 3491.00ft (Original Well Elev)
Project:	Eddy Co., New Mexico (Nad 83)	**MD Reference:**	WELL @ 3491.00ft (Original Well Elev)
Site:	Vega 29 Fed 2H	**North Reference:**	Grid
Well:	Vega 29 Fed 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,437.07	0.00	0.00	8,437.07	0.00	0 00	0 00	0.00	0.00	0 00
KOP: Build 10° / 100'									
8,450.00	1 29	157.43	8,450.00	-0.13	0 06	0.13	10.00	10.00	0.00
8,500.00	6 29	157.43	8,499 87	-3.19	1 33	3 19	10.00	10 00	0.00
8,550.00	11.29	157.43	8,549 27	-10.24	4 26	10.24	10 00	10.00	0.00
8,600.00	16 29	157.43	8,597 81	-21.25	8 83	21.25	10.00	10 00	0.00
8,650.00	21.29	157.43	8,645 13	-36.12	15.01	36 12	10.00	10.00	0.00
8,700.00	26.29	157.43	8,690 87	-54.74	22.75	54 74	10 00	10 00	0.00
8,750.00	31.29	157 43	8,734.67	-76.97	31.99	76 97	10 00	10.00	0.00
8,800.00	36 29	157.43	8,776.21	-102.64	42.66	102 64	10 00	10 00	0 00
8,825.06	38.80	157 43	8,796.08	-116 74	48 52	116.74	10 00	10.00	0 00
2nd Bone Spring Ss									
8,850.00	41.29	157.43	8,815 17	-131.56	54 68	131.56	10.00	10 00	0.00
8,900.00	46.29	157.43	8,851.25	-163.50	67 96	163.50	10 00	10 00	0.00
8,950 00	51.29	157.43	8,884.18	-198.22	82 39	198.22	10.00	10 00	0.00
9,000.00	56.29	157.43	8,913 71	-235 47	97 87	235.47	10 00	10 00	0 00
9,035.41	59 83	157 43	8,932 44	-263.21	109.40	263.21	10.00	10 00	0.00
2nd Bone Spring Middle Ss									
9,050.00	61 29	157.43	8,939.60	-274.94	114 28	274 94	10 00	10 00	0 00
9,100 00	66.29	157.43	8,961.68	-316.36	131 49	316.36	10 00	10.00	0.00
9,150 00	71.29	157 43	8,979.76	-359 39	149 38	359.39	10 00	10.00	0 00
9,200 00	76.29	157 43	8,993.71	-403 71	167 80	403.71	10 00	10.00	0 00
9,250.00	81 29	157.43	9,003.43	-448.98	186.62	448.98	10.00	10.00	0 00
9,300.00	86.29	157.43	9,008 83	-494.87	205.69	494.87	10.00	10.00	0 00
9,331 73	89.47	157.43	9,010.00	-524.14	217.86	524.14	10.00	10.00	0 00
EOC: Hold I: 89.47° turn to A: 180°									
9,400.00	89 46	159.48	9,010.64	-587 64	242 93	587.64	3 00	0 00	3 00
9,500.00	89.46	162 48	9,011.58	-682.16	275.52	682 16	3.00	0.00	3 00
9,600.00	89.46	165.48	9,012.53	-778.26	303 11	778.26	3.00	0.00	3.00
9,700.00	89.46	168.48	9,013 48	-875.68	325 64	875.68	3 00	0.00	3 00
9,800.00	89 46	171 48	9,014 43	-974.13	343.04	974.13	3 00	0.00	3.00
9,900.00	89.46	174.48	9,015.37	-1,073.37	355 26	1,073 37	3 00	0.00	3 00
10,000.00	89.46	177.48	9,016.31	-1,173.11	362.27	1,173.11	3 00	0.00	3 00
10,083.87	89 47	180.00	9,017.09	-1,256.95	364.12	1,256 95	3.00	0 01	3.00
10,100.00	89 47	180.00	9,017 24	-1,273.07	364 12	1,273 07	0 00	0 00	0.00
10,200.00	89 47	180.00	9,018.17	-1,373 07	364 13	1,373 07	0 00	0 00	0 00
10,300 00	89.47	180 00	9,019.10	-1,473.07	364 14	1,473 07	0 00	0.00	0 00
10,400.00	89.47	180 00	9,020.03	-1,573.06	364 15	1,573.06	0 00	0.00	0 00
10,500.00	89 47	180.00	9,020 96	-1,673.06	364.16	1,673.06	0.00	0.00	0 00
10,600.00	89 47	180.00	9,021 89	-1,773.05	364.16	1,773 05	0.00	0 00	0.00
10,700 00	89.47	180.00	9,022.81	-1,873.05	364.17	1,873 05	0 00	0 00	0 00
10,800.00	89.47	180 00	9,023.74	-1,973.04	364.18	1,973 04	0.00	0.00	0 00
10,900.00	89 47	180.00	9,024 67	-2,073.04	364 19	2,073.04	0 00	0 00	0.00
11,000.00	89.47	180.00	9,025.60	-2,173.04	364.20	2,173.04	0.00	0.00	0 00
11,100.00	89.47	180 00	9,026 53	-2,273.03	364 21	2,273 03	0 00	0.00	0 00
11,200.00	89 47	180.00	9,027 46	-2,373.03	364 21	2,373.03	0 00	0 00	0.00
11,300.00	89.47	180.00	9,028.39	-2,473.02	364.22	2,473.02	0.00	0.00	0.00
11,400 00	89.47	180.00	9,029.31	-2,573.02	364 23	2,573.02	0.00	0.00	0 00
11,500.00	89.47	180 00	9,030 24	-2,673.01	364 24	2,673 01	0 00	0.00	0.00
11,600.00	89 47	180 00	9,031 17	-2,773 01	364.25	2,773 01	0 00	0 00	0 00
11,700.00	89 47	180 00	9,032 10	-2,873 01	364.26	2,873.01	0.00	0.00	0.00
11,800.00	89.47	180.00	9,033.03	-2,973.00	364.27	2,973.00	0.00	0.00	0.00
11,900.00	89.47	180.00	9,033.96	-3,073.00	364.27	3,073.00	0.00	0.00	0.00

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Vega 29 Fed 2H
Company:	Devon Energy Production Co, LP	TVD Reference:	WELL @ 3491.00ft (Original Well Elev)
Project:	Eddy Co., New Mexico (Nad 83)	MD Reference:	WELL @ 3491.00ft (Original Well Elev)
Site:	Vega 29 Fed 2H	North Reference:	Grid
Well:	Vega 29 Fed 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,000.00	89.47	180 00	9,034.89	-3,172.99	364.28	3,172 99	0.00	0.00	0.00
12,100.00	89 47	180 00	9,035.81	-3,272.99	364.29	3,272 99	0.00	0.00	0.00
12,200.00	89.47	180 00	9,036.74	-3,372.98	364 30	3,372.98	0 00	0.00	0.00
12,300.00	89 47	180.00	9,037.67	-3,472.98	364.31	3,472.98	0.00	0 00	0.00
12,400 00	89.47	180 00	9,038.60	-3,572.98	364.32	3,572.98	0.00	0 00	0.00
12,500 00	89.47	180 00	9,039.53	-3,672.97	364 33	3,672.97	0 00	0 00	0 00
12,600.00	89.47	180.00	9,040.46	-3,772.97	364 33	3,772.97	0 00	0.00	0 00
12,700 00	89.47	180.00	9,041.39	-3,872.96	364.34	3,872.96	0.00	0.00	0.00
12,800.00	89 47	180.00	9,042.31	-3,972.96	364.35	3,972.96	0.00	0.00	0.00
12,900.00	89.47	180.00	9,043.24	-4,072.95	364 36	4,072.95	0.00	0.00	0 00
13,000.00	89 47	180 00	9,044.17	-4,172.95	364.37	4,172.95	0.00	0.00	0 00
13,100.00	89.47	180.00	9,045 10	-4,272.95	364.38	4,272.95	0.00	0.00	0.00
13,200.00	89.47	180.00	9,046.03	-4,372 94	364.38	4,372 94	0.00	0.00	0.00
13,300.00	89.47	180.00	9,046 96	-4,472.94	364.39	4,472.94	0.00	0 00	0 00
13,400.00	89.47	180.00	9,047.89	-4,572 93	364.40	4,572.93	0.00	0.00	0 00
13,500.00	89 47	180.00	9,048 81	-4,672.93	364.41	4,672.93	0 00	0 00	0 00
13,600.00	89.47	180.00	9,049.74	-4,772.92	364.42	4,772.92	0.00	0 00	0 00
13,627.68	89.47	180 00	9,050 00	-4,800.60	364 42	4,800 60	0 00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL - TD (V29F2H) - plan hits target center - Point	0 00	0.00	9,050.00	-4,800.60	364.42	591,416.29	678,071.86	32° 37' 30 245 N	103° 53' 21.121 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
395.00	395.00	Rustler		0 53	180 00
535 00	535.00	Salado		0.53	180 00
2,025.00	2,025 00	Tansil Dolomite		0 53	180 00
2,125.00	2,125.00	Yates		0 53	180 00
2,380 00	2,380 00	Seven Rivers		0 53	180.00
2,490 00	2,490.00	Capitan		0.53	180.00
3,995.00	3,995 00	B/Capitan		0 53	180.00
4,370 00	4,370.00	Delaware		0 53	180.00
6,655.00	6,655 00	Bone Spring		0.53	180.00
7,925 00	7,925.00	1st Bone Spring Ss		0 53	180.00
8,255.00	8,255.00	2nd Bone Spring Lime		0.53	180 00
8,825 06	8,796.08	2nd Bone Spring Ss		0.53	180 00
9,035.41	8,932 44	2nd Bone Spring Middle Ss		0 53	180.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Vega 29 Fed 2H
Company:	Devon Energy Production Co, LP	**TVD Reference:**	WELL @ 3491.00ft (Original Well Elev)
Project:	Eddy Co., New Mexico (Nad 83)	**MD Reference:**	WELL @ 3491.00ft (Original Well Elev)
Site:	Vega 29 Fed 2H	**North Reference:**	Grid
Well:	Vega 29 Fed 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #2		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
8,437.07	8,437.07	0 00	0.00	KOP: Build 10* / 100'
9,331 73	9,010 00	-524.14	217.86	EOC. Hold I: 89.47* turn to A: 180*

Devon Energy Production Co, LP
Vega 29 Fed 2H - Design #2

Eddy Co., New Mexico (Nad 83)
Vega 29 Fed 2H

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	0.00
8437.07	0.000	0.000	8437.07	0.00 N	0.00 E	0.00	0.00
8450.00	1.293	157.430	8450.00	0.13 S	0.06 E	0.13	10.00
8500.00	6.293	157.430	8499.87	3.19 S	1.33 E	3.19	10.00
8550.00	11.293	157.430	8549.27	10.24 S	4.26 E	10.24	10.00
8600.00	16.293	157.430	8597.81	21.25 S	8.83 E	21.25	10.00
8650.00	21.293	157.430	8645.13	36.12 S	15.01 E	36.12	10.00
8700.00	26.293	157.430	8690.87	54.74 S	22.75 E	54.74	10.00
8750.00	31.293	157.430	8734.67	76.97 S	31.99 E	76.97	10.00
8800.00	36.293	157.430	8776.21	102.64 S	42.66 E	102.64	10.00
8850.00	41.293	157.430	8815.17	131.56 S	54.68 E	131.56	10.00
8900.00	46.293	157.430	8851.25	163.50 S	67.96 E	163.50	10.00
8950.00	51.293	157.430	8884.18	198.22 S	82.39 E	198.22	10.00
9000.00	56.293	157.430	8913.71	235.47 S	97.87 E	235.47	10.00
9050.00	61.293	157.430	8939.60	274.94 S	114.28 E	274.94	10.00
9100.00	66.293	157.430	8961.68	316.36 S	131.49 E	316.36	10.00
9150.00	71.293	157.430	8979.76	359.39 S	149.38 E	359.39	10.00
9200.00	76.293	157.430	8993.71	403.71 S	167.80 E	403.71	10.00
9250.00	81.293	157.430	9003.43	448.98 S	186.62 E	448.98	10.00
9300.00	86.293	157.430	9008.83	494.87 S	205.69 E	494.87	10.00
9331.73	89.466	157.430	9010.00	524.15 S	217.86 E	524.15	10.00
9400.00	89.463	159.478	9010.64	587.64 S	242.93 E	587.64	3.00
9500.00	89.459	162.478	9011.58	682.16 S	275.52 E	682.16	3.00
9600.00	89.457	165.478	9012.53	778.26 S	303.11 E	778.26	3.00
9700.00	89.456	168.479	9013.48	875.68 S	325.64 E	875.68	3.00

9800.00	89.457	171.479	9014.43	974.13 S	343.04 E	974.13	3.00
9900.00	89.460	174.479	9015.37	1073.37 S	355.26 E	1073.37	3.00
10000.00	89.464	177.479	9016.31	1173.11 S	362.27 E	1173.11	3.00
10083.87	89.468	179.995	9017.09	1256.95 S	364.12 E	1256.95	3.00
10100.00	89.468	179.995	9017.24	1273.07 S	364.12 E	1273.07	0.00
10200.00	89.468	179.995	9018.17	1373.07 S	364.13 E	1373.07	0.00
10300.00	89.468	179.995	9019.10	1473.07 S	364.14 E	1473.07	0.00
10400.00	89.468	179.995	9020.03	1573.06 S	364.15 E	1573.06	0.00
10500.00	89.468	179.995	9020.96	1673.06 S	364.16 E	1673.06	0.00
10600.00	89.468	179.995	9021.89	1773.05 S	364.16 E	1773.05	0.00
10700.00	89.468	179.995	9022.81	1873.05 S	364.17 E	1873.05	0.00
10800.00	89.468	179.995	9023.74	1973.04 S	364.18 E	1973.04	0.00
10900.00	89.468	179.995	9024.67	2073.04 S	364.19 E	2073.04	0.00
11000.00	89.468	179.995	9025.60	2173.04 S	364.20 E	2173.04	0.00
11100.00	89.468	179.995	9026.53	2273.03 S	364.21 E	2273.03	0.00
11200.00	89.468	179.995	9027.46	2373.03 S	364.21 E	2373.03	0.00
11300.00	89.468	179.995	9028.39	2473.02 S	364.22 E	2473.02	0.00
11400.00	89.468	179.995	9029.31	2573.02 S	364.23 E	2573.02	0.00
11500.00	89.468	179.995	9030.24	2673.01 S	364.24 E	2673.01	0.00
11600.00	89.468	179.995	9031.17	2773.01 S	364.25 E	2773.01	0.00
11700.00	89.468	179.995	9032.10	2873.01 S	364.26 E	2873.01	0.00
11800.00	89.468	179.995	9033.03	2973.00 S	364.27 E	2973.00	0.00
11900.00	89.468	179.995	9033.96	3073.00 S	364.27 E	3073.00	0.00
12000.00	89.468	179.995	9034.89	3172.99 S	364.28 E	3172.99	0.00
12100.00	89.468	179.995	9035.81	3272.99 S	364.29 E	3272.99	0.00
12200.00	89.468	179.995	9036.74	3372.98 S	364.30 E	3372.98	0.00
12300.00	89.468	179.995	9037.67	3472.98 S	364.31 E	3472.98	0.00
12400.00	89.468	179.995	9038.60	3572.98 S	364.32 E	3572.98	0.00
12500.00	89.468	179.995	9039.53	3672.97 S	364.33 E	3672.97	0.00
12600.00	89.468	179.995	9040.46	3772.97 S	364.33 E	3772.97	0.00
12700.00	89.468	179.995	9041.39	3872.96 S	364.34 E	3872.96	0.00
12800.00	89.468	179.995	9042.31	3972.96 S	364.35 E	3972.96	

0.00						
12900.00	89.468	179.995	9043.24	4072.95 S	364.36 E	4072.95
0.00						
13000.00	89.468	179.995	9044.17	4172.95 S	364.37 E	4172.95
0.00						
13100.00	89.468	179.995	9045.10	4272.95 S	364.38 E	4272.95
0.00						
13200.00	89.468	179.995	9046.03	4372.94 S	364.38 E	4372.94
0.00						
13300.00	89.468	179.995	9046.96	4472.94 S	364.39 E	4472.94
0.00						
13400.00	89.468	179.995	9047.89	4572.93 S	364.40 E	4572.93
0.00						
13500.00	89.468	179.995	9048.81	4672.93 S	364.41 E	4672.93
0.00						
13600.00	89.468	179.995	9049.74	4772.92 S	364.42 E	4772.92
0.00						
13627.68	89.468	179.995	9050.00	4800.60 S	364.42 E	4800.60
0.00						

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to WELL. Northings and Eastings are relative to Site.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Slot and calculated along an Azimuth of 180.000° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.
Central meridian is -104.333°.
Grid Convergence at Surface is 0.239°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 13627.68ft., the Bottom Hole Displacement is 4814.41ft., in the Direction of 180.000° (Grid).

devon

Project: Eddy Co., New Mexico (Nad 83)
Site: Vega 29 Fed 2H
Well: Vega 29 Fed 2H
Wellbore: Lateral #1
Design: Design #2

CUDD DRILLING & MEASUREMENT SERVICES

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0 00	0 00	0.00	0.00	0 00	0 00	0 00	0.00	
2	8437 07	0 00	0 00	8437.07	0.00	0.00	0 00	0.00	0 00	
3	9331 73	89 47	157 43	9010.00	-524.15	217 86	10 00	157.43	524 15	
4	10083.87	89 47	180 00	9017 09	-1256.95	364 12	3.00	90 10	1256 95	
5	13627.68	89.47	180 00	9050.00	-4800.60	364 42	0 00	0 00	4800 60	PBHL - TD (V29F2H)

ANNOTATIONS

TVD	MD	Annotation
8437 07	8437.07	KOP Build 10° / 100'
9010 00	9331.73	EOC Hold I 89 47° turn to A 180°

PROJECT DETAILS Eddy Co , New Mexico (Nad 83)

Geodetic System. US State Plane 1983
Datum North American Datum 1983
Ellipsoid. GRS 1980
Zone New Mexico Eastern Zone
System Datum Mean Sea Level

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL - TD (V29F2H)	9050.00	-4800.60	364 42	591416 29	678071 86	32° 37' 30 245 N	103° 53' 21 121 W	Point

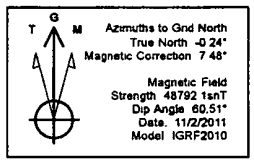
WELL DETAILS Vega 29 Fed 2H

Ground Level
3471.00
WELL @ 3491.00ft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0 00	0.00	596216.88	677707 44	32° 38' 17 762 N	103° 53' 25 148 W	

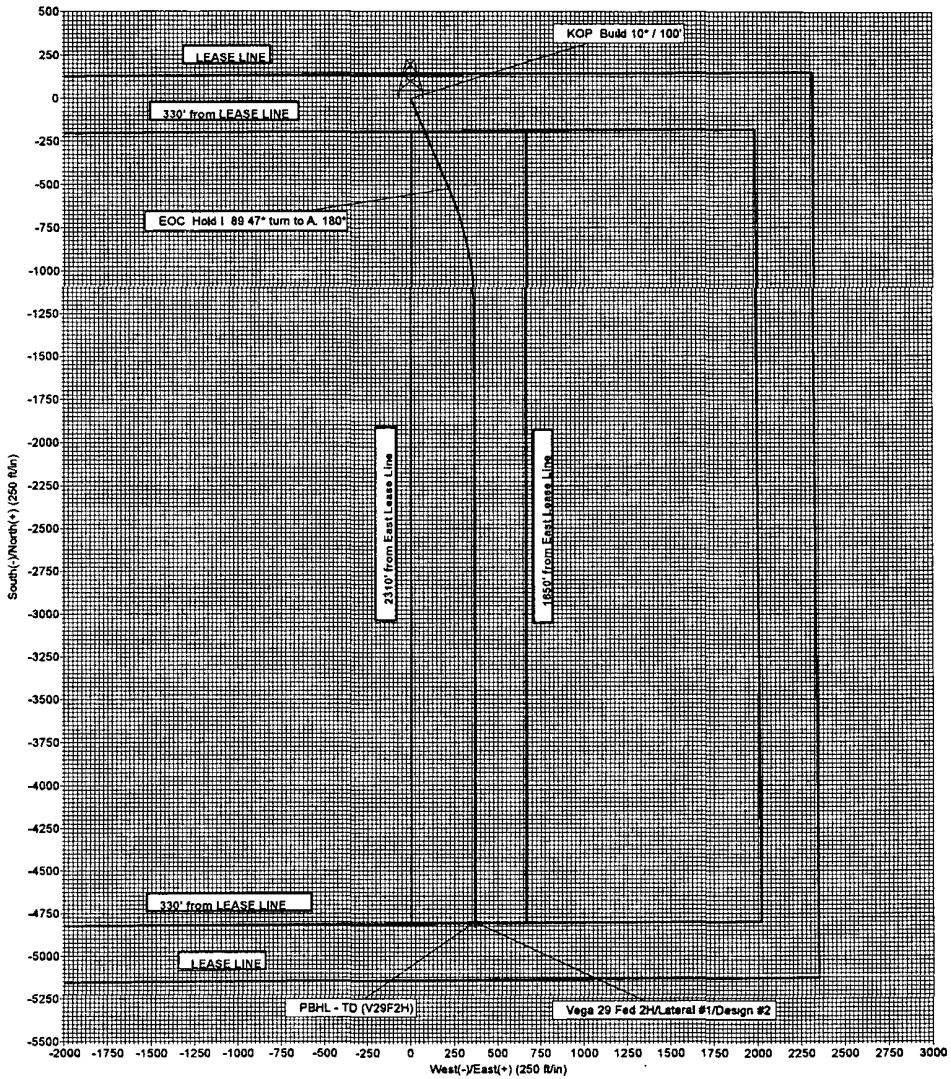
Plan Design #2 (Vega 29 Fed 2H/Lateral #1)

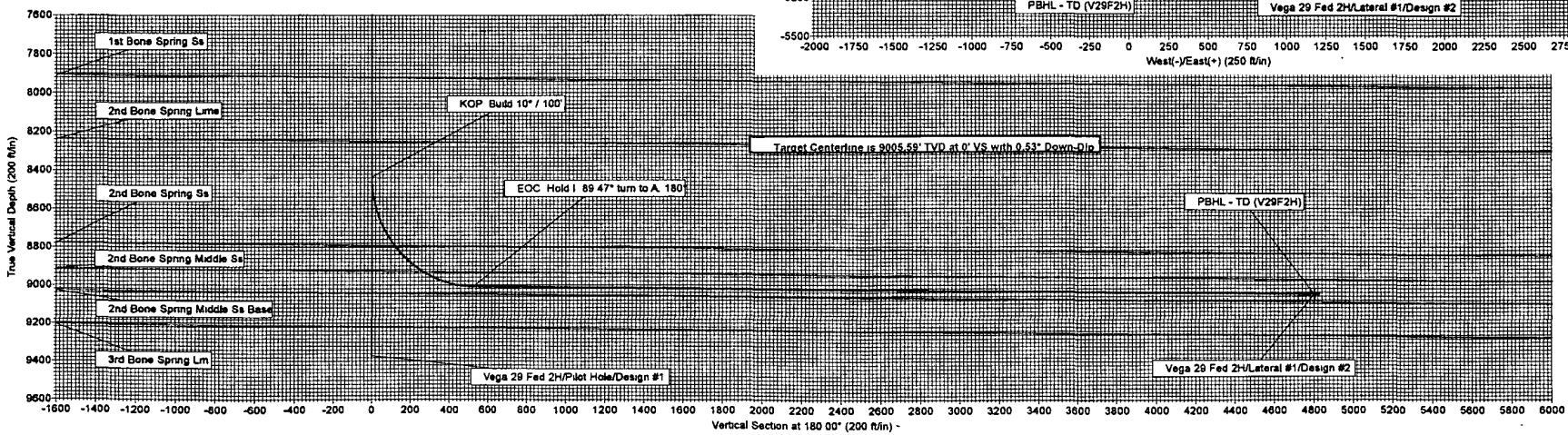
Created By Eric Minchew Date 11 30, November 17 2011
Checked _____ Date _____
Reviewed _____ Date _____
Approved _____ Date _____



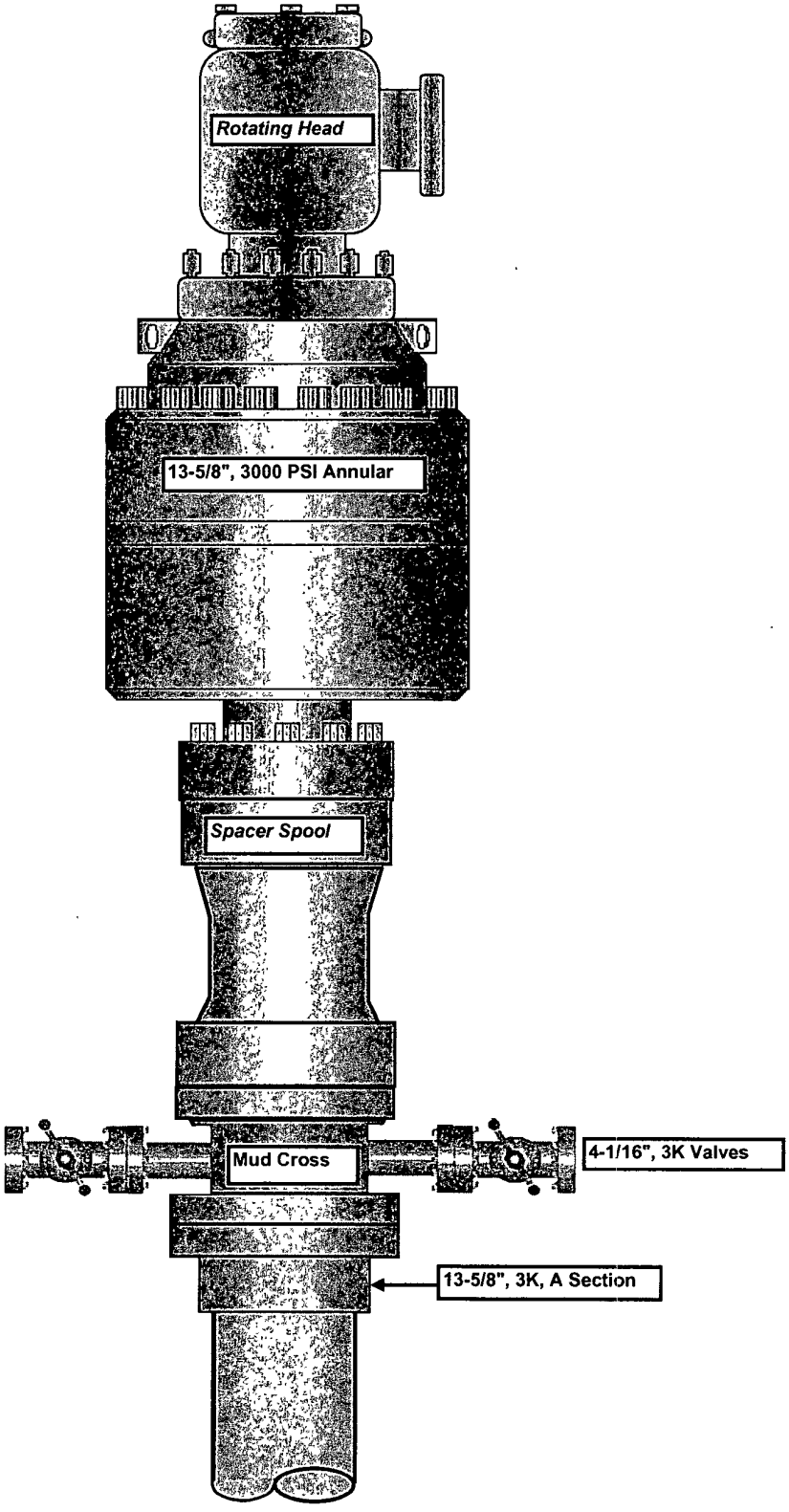
Azimuths to Grid North
True North -0 24°
Magnetic Correction 7 48°

Magnetic Field
Strength 48792 1snT
Dip Angle 60.51°
Date. 11/2/2011
Model IGRF2010





13-5/8" 3K Annular



PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	DEVON ENERGY
LEASE NO.:	NMLC063622
WELL NAME & NO.:	2H VEGA 29 FEDERAL
SURFACE HOLE FOOTAGE:	137' FNL & 2310' FEL
BOTTOM HOLE FOOTAGE	340' FSL & 1980' FEL
LOCATION:	Section 29, T.19 S., R.319 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)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

Hackberry Lake Special Recreation Management Area: Pipelines shall be buried a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. Surface lines shall not obstruct roads, "two-tracks" or trails. Surface lines shall be buried a minimum of 6 inches under all approved trails within the Hackberry SRMA to allow safe passage of motorcycles and ATV's. Power poles and associated ground structures (poles, guy wires) will not be placed within 20 feet of recreation trails. Guy wires must be equipped with a sleeve, tape or other industry approved apparatus that is highly visible during the day and reflective at night. Appropriate safety signage will be in place during all phases of the project. Upon completion of construction, the road shall be returned to pre-construction condition with no bumps or dips. All vehicle and equipment operators will observe speed limits and practice responsible defensive driving habits.

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 (575) 234-6235 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 in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 4 inches in depth. The topsoil will be used for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. 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.

F. 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 twenty (20) feet.

Wait on cement (WOC) time prior to drilling out 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 for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. 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.

Possible water and brine flows in the Salado and Artesia groups.
Possible lost circulation in the Artesia group and Capitan Reef.

1. The **13-3/8** inch surface casing shall be set at **approximately 475 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** 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.

Special Capitan Reef requirements:

If any lost circulation occurs below the Base of the Salt, the operator shall do the following:

- **Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.**

- **Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing (**set casing in the base of the Capitan Reef at approximately 4125'**) is:

   ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef.**

Positive standoff centralizers shall be utilized for the production string every other joint of casing from 100' MD above KOP or at the legal footage setback, whichever is the deeper MD, up to TOC.

The pilot hole plugging procedure is approved as written.

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

   a. First stage to DV tool, cement shall:

   ☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage..

   b. Second stage above DV tool, cement shall:

   ☒ Cement should tie-back a minimum of 50 feet above the Capitan Reef. Operator shall provide method of verification.

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.

    a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** inch intermediate casing shoe shall be **3000 (3M)** psi.

4. 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**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

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

    d. 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.**

e. 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.

D. DRILL STEM TEST

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

E. 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.

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