

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

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.**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMLC063622
2. Name of Operator DEVON ENERGY PRODUCTION CO LP		6. If Indian, Allottee or Tribe Name
Contact: LINDA GOOD Email: linda.good@dvn.com		7. If Unit or CA/Agreement, Name and/or No.
3a. Address 333 WEST SHERIDAN AVE OKLAHOMA CITY, OK 73102	3b. Phone No. (include area code) Ph: 405.552.6558	8. Well Name and No. VEGA 29 FEDERAL 4H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 20 T19S R31E SESE 0460FSL 0777FEL 32.639917 N Lat, 103.885445 W Lon		9. API Well No. 30-015-42347-00-X1
		10. Field and Pool, or Exploratory HACKBERRY
		11. County or Parish, and State EDDY COUNTY, NM

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 Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original APD
	☐ 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 recomple 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 recomple 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.)

Devon Energy Production Company, L.P. respectfully requests changing the 13-3/8", Intermediate 2 setting depth approved at 2440' on the APD to 2,350'. This allows the DVT/ECP on the 9-5/8" casing room to space the tools at 50' below the 13-3/8" casing and set the ECP packer element above the Capitan Reef estimated at 2460'.

Devon Energy Production Company, L.P. respectfully requests to run a tapered production string on 7" x 5.5" casing to a total depth of 13,111 ft measured depth as long as hole conditions permits. If lost circulation is encountered we will stay as originally planned to run a 5-1/2" production longstring. Casing design requirements are below as well as the cement design for both the 7" x 5-1/2" tapered production string and the 5-1/2" production longstring.

Additionally, due to hardlines and offset collision risk, the well path has been adjusted east by

Accepted for record

NMOCDC

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

NM OIL CONSERVATION

ARTESIA DISTRICT

NOV 07 2014

14. I hereby certify that the foregoing is true and correct.		Electronic Submission #274224 verified by the BLM Well Information System For DEVON ENERGY PRODUCTION CO LP, sent to the Carlsbad Committed to AFMSS for processing by CHRISTOPHER WALLS on 10/29/2014 (15CRW0018SE)		RECEIVED APPROVED NOV 3 2014 BUREAU OF LAND MANAGEMENT CARLSBAD FIELD OFFICE
Name (Printed/Typed)	LINDA GOOD	Title	REGULATORY SPECIALIST	
Signature	(Electronic Submission)	Date	10/28/2014	
THIS SPACE FOR FEDERAL OR STATE OFFICE USE				
Approved By		Title	Date	
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office		

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

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

Additional data for EC transaction #274224 that would not fit on the form

32. Additional remarks, continued

453', which is located within the same production box.

Attached please find the revised Drilling Plan, Drawing and Directional Plan.

Vega 29 Fed 4H – Sundry Request

AAA 10-27-2014: Adjust 13-3/8" Intermediate 2 Setting Depth, add option for a 7" x 5.5" Combination Production String, and move bottom-hole location east

Sundry Request:

Devon Energy Production Company, L.P. respectfully requests changing the 13-3/8", Intermediate 2 setting depth approved at 2440' on the APD to 2,350'. This allows the DVT/ECP on the 9-5/8" casing room to space the tools at 50' below the 13-3/8" casing and set the ECP packer element above the Capitan Reef estimated at 2460'.

Devon Energy Production Company, L.P. respectfully requests to run a tapered production string of 7" x 5.5" casing to a total depth of 13,111 ft measured depth as long as hole conditions permits. If lost circulation is encountered we will stay as originally planned to run a 5-1/2" production longstring. Casing design requirements are below as well as the cement design for both the 7" x 5-1/2" tapered production string and the 5-1/2" production longstring.

Additionally, due to hardlines and offset collision risk, the well path has been adjusted east by 453', which is located within the same production box.

Casing Program Changes: 7" x 5.5" Tapered Production String

Hole Size	Hole Interval	OD Csg	Casing Interval	Weight	Collar	Grade
17-1/2"	450 - 2350	13-3/8"	0 - 2350	68	BTC	J-55
12-1/4"	2350 - 4100	9-5/8"	0 - 4100	40	LTC	J-55
8-3/4"	4100 - 7649	7"	0 - 7487	29#	BTC	P-110
8-3/4"	7649 - 13112	5-1/2"	7649 - 13111	17#	BTC	P-110

Original Option: 5.5 Production Longstring

Hole Size	Hole Interval	OD Csg	Casing Interval	Weight	Collar	Grade
8-3/4"	0 - 13111	5-1/2"	0 - 13111	17#	BTC	P-110

Note: only new casing will be utilized

MAXIMUM LATERAL TVD 8,213

Design Factors: 7" x 5.5" Tapered Production String

Casing Size	Collapse Design Factor	Burst Design Factor	Tension Design Factor
7" 29# P-110 BTC	2.40	3.16	4.22
5-1/2" 17# P-110 BTC	1.95	2.77	5.83

Original Option: 5.5 Production Longstring

Casing Size	Collapse Design Factor	Burst Design Factor	Tension Design Factor
5-1/2" 17# P-110 BTC	1.95	2.77	2.45

CEMENTING TABLE:

String	Number of sx	Weight lbs/gal	Water Volume g/sx	Yield cf/sx	Stage; Lead/Tail	Slurry Description
1 st Intermediate	1475	12.8	8.23	1.65	Lead	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.1% bwoc R-3 + 0.125 lbs/sack Cello Flake + 3 lbs/sack LCM-1 + 0.25% bwoc FL-52 + 1% bwoc Sodium Metasilicate + 83.4% Fresh Water
	500	13.8	6.42	1.38	Tail	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.5% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 65.3% Fresh Water
2 nd Intermediate	625	12.6	8.81	1.73	Lead	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 3 lbs/sack LCM-1 + 0.25% bwoc FL-52 + 1% bwoc Sodium Metasilicate + 89.6% Fresh Water
	500	13.8	6.41	1.38	Tail	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.5% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 65.3% Fresh Water
2 nd Intermediate 2 Stage	310	12.6	8.81	1.73	1 st Lead	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 3 lbs/sack LCM-1 + 0.25% bwoc FL-52 + 1% bwoc Sodium Metasilicate + 89.6% Fresh Water
	300	13.8	6.41	1.38	1 st Tail	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.1% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 65.2% Fresh Water
	DVT @ 2400'					
	370	12.8	8.2	1.65	2 nd Lead	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 3 lbs/sack LCM-1 + 0.25% bwoc FL-52 + 1.5% bwoc Sodium Metasilicate + 83.7% Fresh Water
	150	13.8	6.41	1.38	2 nd Tail	(60:40) Poz (Fly Ash):Prem Plus C + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.5% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 65.3% Fresh Water
7" x 5-1/2" Production Casing Single Stage	275	11.8	13.16	2.3	1 st Lead	(50:50) Poz (Fly Ash):Class H + 0.5% bwoc FL-52 + 0.3% bwoc ASA-301 + 10% bwoc Bentonite + 0.35% bwoc R-21 + 130.7% Fresh Water
	110	12.5	11.01	2.01	2 nd Tail	(35:65) Poz (Fly Ash):Prem Plus H + 3% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.7% bwoc FL-52 + 0.3% bwoc ASA-301 + 6% bwoc Bentonite + 105.5% Fresh Water
	1435	14.2	5.77	1.28	Tail	(50:50) Poz (Fly Ash):Class H + 5% bwow Sodium Chloride + 0.3% bwoc CD-32 + 0.5% bwoc FL-25 + 0.4% bwoc FL-52 + 0.5% bwoc Sodium Metasilicate + 57.3% Fresh Water
5-1/2" Production 2-Stage Original Option	340	12.5	11.02	2.01	Lead	(35:65) Poz (Fly Ash):Prem Plus H + 6% bwoc Bentonite + 3% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.7% bwoc FL-52 + 0.3% bwoc ASA-301 + 105.6% Fresh Water
	1480	14.2	5.76	1.28	Tail	(50:50) Poz (Fly Ash):Prem Plus H + 5% bwow Sodium Chloride + 0.3% bwoc CD-32 + 0.5% bwoc FL-25 + 0.5% bwoc FL-52 + 0.3% bwoc Sodium Metasilicate + 57.2% Fresh Water
	DVT @ 5000'					
	185	11.4	17.69	2.88	Lead	Prem Plus C + 1% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.3% bwoc FL-52 + 3% bwoc Sodium Metasilicate + 157% Fresh Water 150 sacks
	150	13.8	6.4	1.37	Tail	(60:40) Poz (Fly Ash):Prem Plus C + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 65.1% Fresh Water

TOC for all Strings:

Production @ 2410' (Cement top will tie-back 50' above Capitan Reef at 2460')

Notes:

- Cement volumes Production based on at least 25% excess
- Actual cement volumes will be adjusted based on fluid caliper and caliper log data
- If lost circulation is encountered while drilling the production wellbore, the 5.5" original production longstring will be used with a DV tool installed a minimum of 50' below the previous casing shoe and of 200' above the current shoe. If the DV tool has to be moved, the cement volumes will be adjusted proportionately.

devon

Vega 29 Federal 4H
Eddy Co, NM

Weatherford

Plan Data for Vega 29 Federal 4H

Plan Point Information:
Dogleg Severity Unit: */100.00ft Position offsets from Slot centre
MD Inc Az TVD +N/-S +E/-W Northing Easting VSec DLS
(USft) (°) (°) (USft) (USft) (USft) (USft) (USft) (DLSU)
0.00 0.00 0.00 0.00 0.00 0.00 596823.47 679235.88 0.00 0.00
4200.00 0.00 0.00 4200.00 0.00 0.00 596823.47 679235.88 0.00 0.00
4844.87 6.45 129.32 4843.51 -22.97 28.05 596800.50 679263.93 22.97 1.00
7648.93 6.45 129.32 7629.83 -22.52 271.69 596600.95 679507.57 22.52 0.00
8501.32 89.32 180.00 8160.00 -787.22 317.50 596036.25 679553.38 787.22 10.00
13111.61 89.34 180.00 8213.00 -5397.21 317.50 591426.26 679553.38 5397.21 0.00

Plan Data for Vega 29 Federal 4H

Slot: Vega 29 Federal 4H
Position:
Offset is from Site centre
+N/-S: 0.00USft Northing: 596823.47USft Latitude: 32°38'23.7"
+E/-W: 0.00USft Easting: 679235.88USft Longitude: -103°53'7.2"
Elevation Above VRD: 3482.00USft

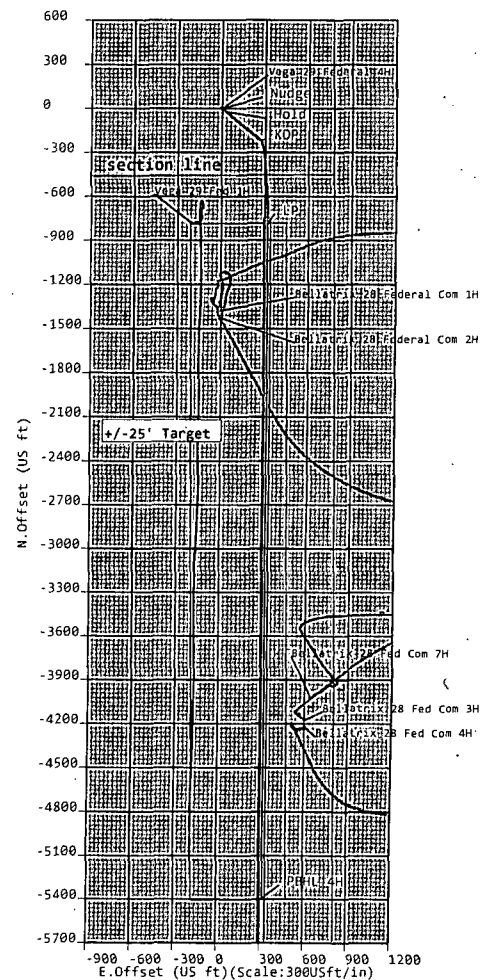
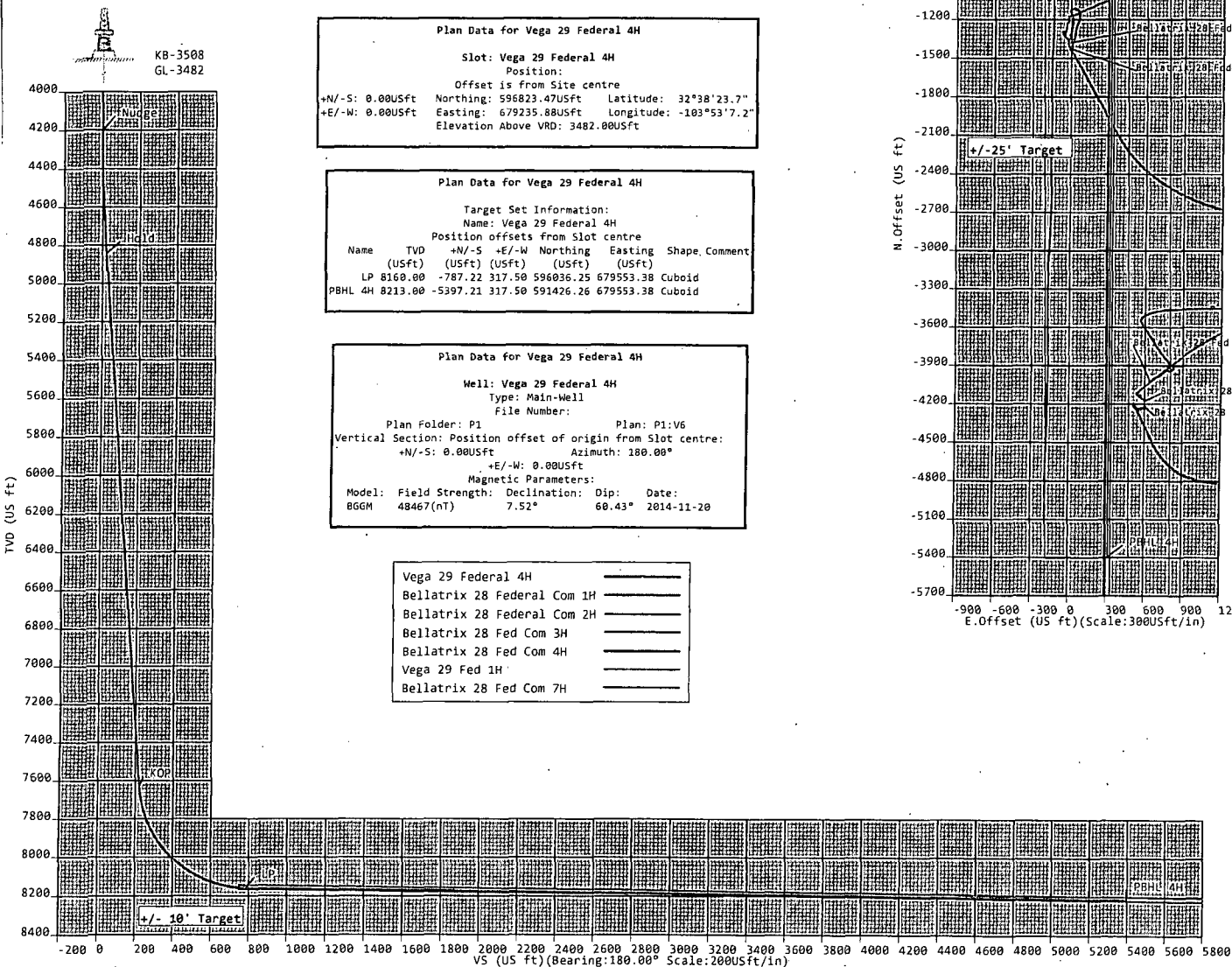
Plan Data for Vega 29 Federal 4H

Target Set Information:
Name: Vega 29 Federal 4H
Position offsets from Slot centre
Name TVD +N/-S +E/-W Northing Easting Shape Comment
(USft) (USft) (USft) (USft) (USft)
LP 8160.00 -787.22 317.50 596036.25 679553.38 Cuboid
PBHL 4H 8213.00 -5397.21 317.50 591426.26 679553.38 Cuboid

Plan Data for Vega 29 Federal 4H

Well: Vega 29 Federal 4H
Type: Main-Well
File Number:
Plan Folder: P1 Plan: P1:V6
Vertical Section: Position offset of origin from Slot centre:
+N/-S: 0.00USft Azimuth: 180.00°
+E/-W: 0.00USft
Magnetic Parameters:
Model: Field Strength: Declination: Dip: Date:
BGGM 48467(nT) 7.52° 60.43° 2014-11-20

Vega 29 Federal 4H
Bellatrix 28 Federal Com 1H
Bellatrix 28 Federal Com 2H
Bellatrix 28 Fed Com 3H
Bellatrix 28 Fed Com 4H
Vega 29 Fed 1H
Bellatrix 28 Fed Com 7H



Sign Off: Russell Joyner

5D Plan Report

Devon Energy

Field Name: *Eddy Co, NM (Nad 83 NME)*

Site Name: *Vega 29 Federal 4H*

Well Name: *Vega 29 Federal 4H*

Plan: *P1:V6*

17 October 2014



Weatherford®

Vega 29 Federal 4H

Field Name Eddy Co, NM (Nad 83 NME)	Map Units : US ft		Company Name : Devon Energy	
	Vertical Reference Datum (VRD) : Mean Sea Level			
	Projected Coordinate System : NAD83 / New Mexico East (ftUS)			
	Comment :			
Site Name Vega 29 Federal 4H	Units : US ft	North Reference : Grid	Convergence Angle : 0.24	
	Position	Northing : 596823.47 US ft	Latitude : 32°38'23.70"	
		Easting : 679235.88 US ft	Longitude : 103°53'7.24"	
	Elevation above Mean Sea Level: 3482.00 US ft			
Comment :				
Slot Name Vega 29 Federal 4H	Position (Offsets relative to Site Centre)			
	+N / -S : 0.00 US ft	Northing : 596823.47 US ft	Latitude : 32°38'23.70"	
	+E / -W : 0.00 US ft	Easting : 679235.88 US ft	Longitude : 103°53'7.24"	
	Slot TVD Reference : Ground Elevation			
Elevation above Mean Sea Level : 3482.00 US ft				
Comment :				
Well Name Vega 29 Federal 4H	Type : Main well		UWI :	Plan : P1:V6
	Rig Height <i>Kelly Bushing</i> : 26.00 US ft		Comment :	
	Relative to Mean Sea Level: 3508.00 US ft			
	Closure Distance : 5406.54 US ft		Closure Azimuth : 176.633°	
	Vertical Section (Position of Origin Relative to Slot)			
	+N / -S : 0.00 US ft		+E / -W : 0.00 US ft	Az : 180.00°
	Magnetic Parameters			
	Model : BGGM	Field Strength : 48467.9nT	Dec : 7.52°	Dip : 60.43° Date : 20/Nov/2014

Target Set

Name : Vega 29 Federal 4H **Number of Targets :** 2

Comment :

Target Name LP Shape: Cuboid	Position (Relative to Slot centre)			
	+N / -S : 787.22 US ft	Northing : 596036.25 US ft	Latitude : 32°38'15.90"	
	+E / -W : 317.50 US ft	Easting : 679553.38 US ft	Longitude : 103°53'3.57"	
	TVD (Kelly Bushing) : 8160.00 US ft			
Orientation Azimuth : 0.00°		Inclination : 0.00°		
Dimensions Length : 20.00 US ft	Breadth : 20.00 US ft	Height : 20.00 US ft		

5D Plan Report

Target Name:	Position (Relative to Slot centre)		
PBHL 4H	+N / -S : 5397.21US ft	Northing : 591426.26 US ft	Latitude : 32°37'30.28"
Shape:	+E / -W : 317.50 US ft	Easting : 679553.38US ft	Longitude : -103°53'3.80"
Cuboid	TVD (Kelly Bushing) : 8213.00 US ft		
	Orientation Azimuth : 180.00°	Inclination : -0.66°	
	Dimensions Length : 9290.00 US ft	Breadth : 50.00 US ft	Height : 20.00 US ft

Casing Points (Relative to Slot centre, TVD relative to Kelly Bushing)									
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	Northing (US ft)	Easting (US ft)	Name	
4100.00	0.00	0.00	4100.00	0.00	0.00	596823.47	679235.88	9 5/8 in	

Well path created using minimum curvature

Salient Points (Relative to Slot centre, TVD relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	B. Rate (%/100 US ft)	T. Rate (%/100 US ft)	T. Face (°)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	
4100.00	0.00	0.00	4100.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	9 5/8 in
4200.00	0.00	0.00	4200.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	Nudge
4844.87	6.45	129.32	4843.51	-22.97	28.05	22.97	1.00	1.00	0.00	129.32	Hold
7648.93	6.45	129.32	7629.83	-222.52	271.69	222.52	0.00	0.00	0.00	0.00	KOP
8501.32	89.32	180.00	8160.00	-787.22	317.50	787.22	10.00	9.72	5.95	50.92	LP
13111.61	89.34	180.00	8213.00	-5397.21	317.50	5397.21	0.00	0.00	0.00	0.01	PBHL 4H

Interpolated Points (Relative to Slot centre, TVD relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	Northing (US ft)	Easting (US ft)	Comment	
4200.00	0.00	0.00	4200.00	0.00	0.00	-0.00	0.00	596823.47	679235.88	Nudge	
4300.00	1.00	129.32	4299.99	-0.55	0.68	0.55	1.00	596822.92	679236.56		
4400.00	2.00	129.32	4399.96	-2.21	2.70	2.21	1.00	596821.26	679238.58		
4500.00	3.00	129.32	4499.86	-4.98	6.07	4.98	1.00	596818.49	679241.95		
4600.00	4.00	129.32	4599.68	-8.84	10.80	8.84	1.00	596814.63	679246.68		
4700.00	5.00	129.32	4699.37	-13.81	16.87	13.81	1.00	596809.66	679252.75		
4800.00	6.00	129.32	4798.90	-19.89	24.28	19.89	1.00	596803.58	679260.16		
4844.87	6.45	129.32	4843.51	-22.97	28.05	22.97	1.00	596800.50	679263.93	Hold	
4900.00	6.45	129.32	4898.29	-26.89	32.84	26.89	0.00	596796.58	679268.72		
5000.00	6.45	129.32	4997.66	-34.01	41.53	34.01	0.00	596789.46	679277.41		
5100.00	6.45	129.32	5097.03	-41.13	50.21	41.13	0.00	596782.34	679286.09		
5200.00	6.45	129.32	5196.39	-48.24	58.90	48.24	0.00	596775.23	679294.78		
5300.00	6.45	129.32	5295.76	-55.36	67.59	55.36	0.00	596768.11	679303.47		
5400.00	6.45	129.32	5395.13	-62.48	76.28	62.48	0.00	596760.99	679312.16		
5500.00	6.45	129.32	5494.49	-69.59	84.97	69.59	0.00	596753.88	679320.85		
5600.00	6.45	129.32	5593.86	-76.71	93.66	76.71	0.00	596746.76	679329.54		
5700.00	6.45	129.32	5693.23	-83.83	102.35	83.83	0.00	596739.64	679338.23		
5800.00	6.45	129.32	5792.60	-90.94	111.04	90.94	0.00	596732.53	679346.92		
5900.00	6.45	129.32	5891.96	-98.06	119.73	98.06	0.00	596725.41	679355.61		
6000.00	6.45	129.32	5991.33	-105.18	128.41	105.18	0.00	596718.29	679364.29		
6100.00	6.45	129.32	6090.70	-112.29	137.10	112.29	0.00	596711.18	679372.98		
6200.00	6.45	129.32	6190.07	-119.41	145.79	119.41	0.00	596704.06	679381.67		
6300.00	6.45	129.32	6289.43	-126.53	154.48	126.53	0.00	596696.94	679390.36		
6400.00	6.45	129.32	6388.80	-133.64	163.17	133.64	0.00	596689.83	679399.05		
6500.00	6.45	129.32	6488.17	-140.76	171.86	140.76	0.00	596682.71	679407.74		
6600.00	6.45	129.32	6587.53	-147.88	180.55	147.88	0.00	596675.59	679416.43		
6700.00	6.45	129.32	6686.90	-154.99	189.24	154.99	0.00	596668.48	679425.12		
6800.00	6.45	129.32	6786.27	-162.11	197.93	162.11	0.00	596661.36	679433.81		

5D Plan Report

Interpolated Points (Relative to Slot centre, TVD relative to Kelly Bushing)										
MD (US.ft)	Incl (°)	Az (°)	TVD (US.ft)	N.Offset (US.ft)	E.Offset (US.ft)	NVS (US.ft)	DLS (°/100US.ft)	Northing (US.ft)	Easting (US.ft)	Comment
6900.00	6.45	129.32	6885.64	-169.23	206.62	169.23	0.00	596654.24	679442.50	
7000.00	6.45	129.32	6985.00	-176.34	215.30	176.34	0.00	596647.13	679451.18	
7100.00	6.45	129.32	7084.37	-183.46	223.99	183.46	0.00	596640.01	679459.87	
7200.00	6.45	129.32	7183.74	-190.58	232.68	190.58	0.00	596632.89	679468.56	
7300.00	6.45	129.32	7283.11	-197.69	241.37	197.69	0.00	596625.78	679477.25	
7400.00	6.45	129.32	7382.47	-204.81	250.06	204.81	0.00	596618.66	679485.94	
7500.00	6.45	129.32	7481.84	-211.93	258.75	211.93	0.00	596611.54	679494.63	
7600.00	6.45	129.32	7581.21	-219.04	267.44	219.04	0.00	596604.43	679503.32	
7648.93	6.45	129.32	7629.83	-222.52	271.69	222.52	0.00	596600.95	679507.57	KOP
7700.00	10.45	151.72	7680.35	-228.42	276.11	228.42	10.00	596595.05	679511.99	
7800.00	19.80	165.99	7776.81	-252.90	284.52	252.90	10.00	596570.57	679520.40	
7900.00	29.57	171.19	7867.57	-293.82	292.42	293.82	10.00	596529.65	679528.30	
8000.00	39.45	173.95	7949.87	-349.94	299.57	349.94	10.00	596473.53	679535.45	
8100.00	49.37	175.75	8021.22	-419.55	305.74	419.55	10.00	596403.92	679541.62	
8200.00	59.31	177.08	8079.45	-500.54	310.75	500.54	10.00	596322.93	679546.63	
8300.00	69.27	178.16	8122.78	-590.45	314.45	590.45	10.00	596233.02	679550.33	
8400.00	79.22	179.11	8149.90	-686.54	316.72	686.54	10.00	596136.93	679552.60	
8500.00	89.19	179.99	8159.98	-785.90	317.50	785.90	10.00	596037.57	679553.38	
8501.32	89.32	180.00	8160.00	-787.22	317.50	787.22	10.00	596036.25	679553.38	LP
8600.00	89.32	180.00	8161.18	-885.90	317.50	885.90	0.00	595937.57	679553.38	
8700.00	89.32	180.00	8162.37	-985.89	317.50	985.89	0.00	595837.58	679553.38	
8800.00	89.32	180.00	8163.56	-1085.88	317.50	1085.88	0.00	595737.59	679553.38	
8900.00	89.32	180.00	8164.75	-1185.88	317.50	1185.88	0.00	595637.59	679553.38	
9000.00	89.32	180.00	8165.94	-1285.87	317.50	1285.87	0.00	595537.60	679553.38	
9100.00	89.32	180.00	8167.13	-1385.86	317.50	1385.86	0.00	595437.61	679553.38	
9200.00	89.32	180.00	8168.31	-1485.85	317.50	1485.85	0.00	595337.62	679553.38	
9300.00	89.32	180.00	8169.50	-1585.85	317.50	1585.85	0.00	595237.62	679553.38	
9400.00	89.32	180.00	8170.68	-1685.84	317.50	1685.84	0.00	595137.63	679553.38	
9500.00	89.32	180.00	8171.87	-1785.83	317.50	1785.83	0.00	595037.64	679553.38	
9600.00	89.32	180.00	8173.05	-1885.83	317.50	1885.83	0.00	594937.64	679553.38	
9700.00	89.32	180.00	8174.23	-1985.82	317.50	1985.82	0.00	594837.65	679553.38	
9800.00	89.32	180.00	8175.41	-2085.81	317.50	2085.81	0.00	594737.66	679553.38	
9900.00	89.32	180.00	8176.59	-2185.81	317.50	2185.81	0.00	594637.66	679553.38	
10000.00	89.32	180.00	8177.77	-2285.80	317.50	2285.80	0.00	594537.67	679553.38	
10100.00	89.32	180.00	8178.95	-2385.79	317.50	2385.79	0.00	594437.68	679553.38	
10200.00	89.33	180.00	8180.13	-2485.78	317.50	2485.78	0.00	594337.69	679553.38	
10300.00	89.33	180.00	8181.31	-2585.78	317.50	2585.78	0.00	594237.69	679553.38	
10400.00	89.33	180.00	8182.48	-2685.77	317.50	2685.77	0.00	594137.70	679553.38	
10500.00	89.33	180.00	8183.66	-2785.76	317.50	2785.76	0.00	594037.71	679553.38	
10600.00	89.33	180.00	8184.83	-2885.76	317.50	2885.76	0.00	593937.71	679553.38	
10700.00	89.33	180.00	8186.00	-2985.75	317.50	2985.75	0.00	593837.72	679553.38	
10800.00	89.33	180.00	8187.17	-3085.74	317.50	3085.74	0.00	593737.73	679553.38	
10900.00	89.33	180.00	8188.34	-3185.74	317.50	3185.74	0.00	593637.73	679553.38	
11000.00	89.33	180.00	8189.51	-3285.73	317.50	3285.73	0.00	593537.74	679553.38	
11100.00	89.33	180.00	8190.68	-3385.72	317.50	3385.72	0.00	593437.75	679553.38	
11200.00	89.33	180.00	8191.85	-3485.72	317.50	3485.72	0.00	593337.75	679553.38	
11300.00	89.33	180.00	8193.02	-3585.71	317.50	3585.71	0.00	593237.76	679553.38	
11400.00	89.33	180.00	8194.19	-3685.70	317.50	3685.70	0.00	593137.77	679553.38	
11500.00	89.33	180.00	8195.35	-3785.70	317.50	3785.70	0.00	593037.77	679553.38	
11600.00	89.33	180.00	8196.51	-3885.69	317.50	3885.69	0.00	592937.78	679553.38	
11700.00	89.33	180.00	8197.68	-3985.68	317.50	3985.68	0.00	592837.79	679553.38	
11800.00	89.33	180.00	8198.84	-4085.68	317.50	4085.68	0.00	592737.79	679553.38	
11900.00	89.33	180.00	8200.00	-4185.67	317.50	4185.67	0.00	592637.80	679553.38	
12000.00	89.33	180.00	8201.16	-4285.66	317.50	4285.66	0.00	592537.81	679553.38	
12100.00	89.34	180.00	8202.32	-4385.66	317.50	4385.66	0.00	592437.81	679553.38	
12200.00	89.34	180.00	8203.48	-4485.65	317.50	4485.65	0.00	592337.82	679553.38	
12300.00	89.34	180.00	8204.64	-4585.64	317.50	4585.64	0.00	592237.83	679553.38	
12400.00	89.34	180.00	8205.80	-4685.64	317.50	4685.64	0.00	592137.83	679553.38	
12500.00	89.34	180.00	8206.95	-4785.63	317.50	4785.63	0.00	592037.84	679553.38	

5D Plan Report

Interpolated Points (Relative to Slot centre, TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (%/100 US ft)	Northing (US ft)	Easting (US ft)	Comment
12600.00	89.34	180.00	8208.11	-4885.62	317.50	4885.62	0.00	591937.85	679553.38	
12700.00	89.34	180.00	8209.26	-4985.62	317.50	4985.62	0.00	591837.85	679553.38	
12800.00	89.34	180.00	8210.41	-5085.61	317.50	5085.61	0.00	591737.86	679553.38	
12900.00	89.34	180.00	8211.56	-5185.60	317.50	5185.60	0.00	591637.87	679553.38	
13000.00	89.34	180.00	8212.72	-5285.60	317.50	5285.60	0.00	591537.87	679553.38	
13100.00	89.34	180.00	8213.87	-5385.59	317.50	5385.59	0.00	591437.88	679553.38	
13111.65	89.34	180.00	8213.00	-5397.21	317.50	5397.21	0.00	591426.26	679553.38	PBHL 4H

5D Anti-Collision Report

Devon Energy

Field Name: *Eddy Co, NM (Nad 83 NME)*

Site Name: *Vega 29 Federal 4H*

Well Name: *Vega 29 Federal 4H*

17 October 2014





Weatherford

Vega 29 Federal 4H

Field Name Eddy Co., NM (Nad 83 NME)	Map Units : US ft		Company Name : Devon Energy	
	Vertical Reference Datum (VRD) : Mean Sea Level			
	Projected Coordinate System : NAD83 / New Mexico East (ftUS)			
Comment :				
Site Name Vega 29 Federal 4H	Units : US ft	North Reference : Grid	Convergence Angle : 0.24	
	Position	Northing : 596823.47 US ft	Latitude : 32° 38' 23.70"	
		Easting : 679235.88 US ft	Longitude : -103° 53' 7.24"	
Elevation above Mean Sea Level: 3482.00 US ft				
Comment :				
Slot Name Vega 29 Federal 4H	Position (Offsets relative to Site Centre)			
	+N / -S : 0.00 US ft	Northing : 596823.47 US ft	Latitude : 32° 38' 23.70"	
	+E / -W : 0.00 US ft	Easting : 679235.88 US ft	Longitude : -103° 53' 7.24"	
Slot TVD Reference : Ground Elevation				
Elevation above Mean Sea Level : 3482.00 US ft				
Comment :				
Well Name Vega 29 Federal 4H	Type : Main well		UWI :	Plan : Working Plan
	Rig Height Kelly Bushing : 26.00 US ft		Comment :	
	Relative to Mean Sea Level: 3508.00 US ft			
	Closure Distance : 5406.54 US ft		Closure Azimuth : 176.633°	
	Vertical Section (Position of Origin Relative to Slot)			
	+N / -S : 0.00 US ft		+E / -W : 0.00 US ft	Az : 180.00°
Magnetic Parameters				
Model : BGGM	Field Strength : 48467.9nT	Dec : 7.52°	Dip : 60.43°	Date : 20/Nov/2014

Collision / Uncertainty Analysis				
Primary Well	Start MD (US ft)	End MD (US ft)	Collision Risk Interval	No. of Std Deviations in Error Computation
Vega 29 Federal 4H (p)	0.00	13111.61	100.00	2

Secondary Well Names
Bellatrix 28 Federal Com 1H (s)
Bellatrix 28 Federal Com 2H (s)
Bellatrix 28 Fed Com 3H (s)
Bellatrix 28 Fed Com 4H (s)
Bellatrix 28 Fed Com 7H (s)
Vega 29 Fed 1H (s)

Anti-Collision Report Terminology
S.Minor, S.Major : Radii of the ellipse of uncertainty at the current location as seen in the along hole direction.
PHI : Angle between high-side vector and semi-minor axis
TVD Spread : Total TVD range of the ellipsoid of uncertainty at the current location
ES : Distance between the extremities of the primary and secondary uncertainty ellipsoids in the direction Cr-Cr
T.Face to Sec : Angle between the Hi-Side vector of the primary well at the current location and line of closest approach between the two wells

AC Filter Info: The following filter(s) have been applied: Separation Factor:

5D Anti-Collision Report

Separation factors calculated using Pedal Curve (Independent Uncertainty); Well path created using minimum curvature.

Anti Collision Proximity Summary (TVD relative to Kelly Bushing)

Secondary Well Name	Prim MD (US.ft)	Sec MD (US.ft)	TVD (US.ft)	CC (US.ft)	ES (US.ft)	SF	Risk
Bellatrix 28 Fed Com 4H (s)	11930.08	8199.32	8200.35	193.25	96.85	2.00	
Bellatrix 28 Fed Com 3H (s)	11844.92	8200.37	8199.36	221.43	126.43	2.33	
Bellatrix 28 Fed Com 7H (s)	11226.56	7990.65	8192.16	452.64	382.53	6.46	
Bellatrix 28 Federal Com 2H (s)	9152.15	8207.55	8167.74	317.08	270.59	6.82	
Bellatrix 28 Federal Com 1H (s)	8900.98	8176.35	8164.76	331.56	285.51	7.20	
Vega 29 Fed 1H (s)	12988.87	13419.00	8212.59	1005.28	894.83	9.10	

Primary Well: Vega 29 Federal 4H (p) (TVD Relative to Kelly Bushing; All Azimuth Relative to GRID NORTH)

MD (US.ft)	TVD (US.ft)	T.Face to Sec (°)	S.Major (US.ft)	S.Minor (US.ft)	Nearst-Well	CC (US.ft)	ES (US.ft)	SF	Risk
9100.00	8167.12	89.37	30.49	13.42	Bellatrix 28 Federal Com 2H (s)	320.59	274.39	6.94	
9200.00	8168.31	89.54	31.98	13.89	Bellatrix 28 Federal Com 2H (s)	321.36	275.12	6.95	
11100.00	8190.68	306.14	64.10	25.08	Bellatrix 28 Fed Com 7H (s)	461.13	394.47	6.92	
11200.00	8191.85	307.02	65.87	25.73	Bellatrix 28 Fed Com 7H (s)	451.53	381.82	6.48	
11300.00	8193.02	307.97	67.64	26.38	Bellatrix 28 Fed Com 7H (s)	463.62	393.45	6.61	
11600.00	8196.51	271.47	72.96	28.35	Bellatrix 28 Fed Com 3H (s)	321.91	256.30	4.91	
11700.00	8197.68	271.05	74.74	29.05	Bellatrix 28 Fed Com 3H (s)	258.55	179.07	3.25	
11800.00	8198.84	270.63	76.53	29.74	Bellatrix 28 Fed Com 3H (s)	223.75	131.44	2.42	
11900.00	8200.00	270.26	78.31	30.43	Bellatrix 28 Fed Com 4H (s)	193.94	99.20	2.05	
12000.00	8201.16	270.78	80.10	31.13	Bellatrix 28 Fed Com 4H (s)	209.08	115.70	2.24	
12100.00	8202.32	271.30	81.89	31.82	Bellatrix 28 Fed Com 4H (s)	264.22	182.28	3.22	
12200.00	8203.48	271.82	83.68	32.52	Bellatrix 28 Fed Com 4H (s)	340.44	269.34	4.79	
12300.00	8204.64	272.33	85.47	33.21	Bellatrix 28 Fed Com 4H (s)	426.60	362.92	6.70	

Secondary Well: Bellatrix 28 Federal Com 2H (s) (TVD Relative to Kelly Bushing (Primary); All Azimuth Relative to GRID NORTH)

Prim MD (US.ft)	TVD (US.ft)	Sec MD (US.ft)	T.Face to Sec (°)	S.Major (US.ft)	S.Minor (US.ft)	CC (US.ft)	ES (US.ft)	SF	Risk
9100.00	8164.19	8207.06	89.37	14.68	13.67	320.59	274.39	6.94	
9200.00	8165.12	8207.99	89.54	14.68	13.67	321.36	275.12	6.95	

Secondary Well: Bellatrix 28 Fed Com 3H (s) (TVD Relative to Kelly Bushing (Primary); All Azimuth Relative to GRID NORTH)

Prim MD (US.ft)	TVD (US.ft)	Sec MD (US.ft)	T.Face to Sec (°)	S.Major (US.ft)	S.Minor (US.ft)	CC (US.ft)	ES (US.ft)	SF	Risk
11600.00	8193.55	8196.37	271.47	16.88	16.86	321.91	256.30	4.91	
11700.00	8195.18	8198.00	271.05	16.88	16.86	258.55	179.07	3.25	
11800.00	8196.82	8199.64	270.63	16.89	16.86	223.75	131.44	2.42	
11900.00	8198.45	8201.27	270.20	16.89	16.86	230.81	136.73	2.45	

5D Anti-Collision Report

Secondary Well: Bellatrix 28 Fed Com 3H (s) (TVD Relative to Kelly Bushing (Primary)); All Azimuth Relative to GRID NORTH									
PRIMD (US.ft)	TVD (US.ft)	SecMD (US.ft)	IT Face to Sec (°)	S Major (US.ft)	S Minor (US.ft)	CC (US.ft)	ES (US.ft)	SF	Risk
12000.00	8200.09	8202.91	269.78	16.89	16.86	276.55	191.03	3.23	
12100.00	8201.72	8204.54	269.36	16.89	16.86	345.94	270.46	4.58	
12200.00	8203.35	8206.17	268.94	16.89	16.86	427.64	359.94	6.32	

Secondary Well: Bellatrix 28 Fed Com 4H (s) (TVD Relative to Kelly Bushing (Primary)); All Azimuth Relative to GRID NORTH									
PRIMD (US.ft)	TVD (US.ft)	SecMD (US.ft)	IT Face to Sec (°)	S Major (US.ft)	S Minor (US.ft)	CC (US.ft)	ES (US.ft)	SF	Risk
11600.00	8204.69	8205.18	268.68	16.77	16.75	373.18	319.17	6.91	
11700.00	8202.93	8203.41	269.20	16.77	16.75	292.21	227.40	4.51	
11800.00	8201.15	8201.63	269.73	16.77	16.75	226.94	146.48	2.82	
11900.00	8199.36	8199.85	270.26	16.76	16.74	193.94	99.20	2.05	
12000.00	8197.61	8198.09	270.78	16.76	16.74	209.08	115.70	2.24	
12100.00	8195.86	8196.34	271.30	16.76	16.74	264.22	182.28	3.22	
12200.00	8194.12	8194.60	271.82	16.75	16.73	340.44	269.34	4.79	
12300.00	8192.39	8192.86	272.33	16.75	16.73	426.60	362.92	6.70	

Secondary Well: Bellatrix 28 Fed Com 7H (s) (TVD Relative to Kelly Bushing (Primary)); All Azimuth Relative to GRID NORTH									
PRIMD (US.ft)	TVD (US.ft)	SecMD (US.ft)	IT Face to Sec (°)	S Major (US.ft)	S Minor (US.ft)	CC (US.ft)	ES (US.ft)	SF	Risk
11100.00	7925.49	7999.58	306.14	14.12	13.64	461.13	394.47	6.92	
11200.00	7919.98	7992.61	307.02	14.12	13.65	451.53	381.82	6.48	
11300.00	7913.98	7985.07	307.97	14.14	13.62	463.62	393.45	6.61	

**Weatherford®****Weatherford Drilling Services**

GeoDec v5.03

Report Date: October 17, 2014
Job Number: _____
Customer: Devon
Well Name: Vega 29 Federal 4H
API Number: _____
Rig Name: _____
Location: Eddy Co., NM
Block: _____
Engineer: RWJ

US State Plane 1983	Geodetic Latitude / Longitude
System: New Mexico Eastern Zone	System: Latitude / Longitude
Projection: Transverse Mercator/Gauss Kruger	Projection: Geodetic Latitude and Longitude
Datum: North American Datum 1983	Datum: North American Datum 1983
Ellipsoid: GRS 1980	Ellipsoid: GRS 1980
North/South 596823.470 USFT	Latitude 32.6399170 DEG
East/West 679235.880 USFT	Longitude -103.8853453 DEG
Grid Convergence: .24°	
Total Correction: +7.28°	

Geodetic Location WGS84	Elevation =	0.0 Meters
Latitude =	32.63992° N	32° 38 min 23.701 sec
Longitude =	103.88535° W	103° 53 min 7.243 sec

Magnetic Declination =	7.52°	[True North Offset]
Local Gravity =	.9988 g	Checksum = 6635
Local Field Strength =	48468 nT	Magnetic Vector X = 23715 nT
Magnetic Dip =	60.43°	Magnetic Vector Y = 3129 nT
Magnetic Model =	bggm2014	Magnetic Vector Z = 42154 nT
Spud Date =	Nov 20, 2014	Magnetic Vector H = 23921 nT

Signed: _____

Date: _____

Vega 29 Federal 4H

Field: Eddy Co, NM (Nad 83 NME)

Map Units: US ft
Vertical Reference Datum (VRD): Mean Sea Level
Projected Coordinate System: NAD83 / New Mexico East (ftUS)

Site: Vega 29 Federal 4H

Company Name: Devon Energy
Units: US ft
TVD Reference:
Position:

North:	596823.47US ft	Latitude:	32° 38' 23.70"
East:	679235.88US ft	Longitude:	-103° 53' 7.24"

North Reference: Grid **Convergence Angle:** 0.24
Elevation above Mean Sea Level : 3482.00US ft
Comment :

Slot: Vega 29 Federal 4H

Position (Relative to Site centre)

+N/-S: 0.00US ft	North:	596823.47US ft	Latitude:	32° 38' 23.70"
+E/-W: 0.00US ft	East:	679235.88US ft	Longitude:	-103° 53' 7.24"

Elevation above Mean Sea Level : 3482.00US ft
Comment :

Well: Vega 29 Federal 4H

Type: Main well **Rig Height (Kelly Bushing):** 26.00US ft **Relative To Mean Sea Level:** 3508.00US ft
File Number:
Plan Folder: P1 **Plan:** P1-V6

Comment: Chagne BHL TVD to 8213.

Closure Distance: 5406.54US ft **Closure Azimuth:** 176.633°
Comment:

Vertical Section:

Position of Origin (Relative to Slot centre) **+N/-S: 0.00US ft** **+E/-W: 0.00US ft**
Vertical Section Azimuth: 180.00°
Magnetic Parameters:
Model: BGGM **Field Strength:** 48467.9 nT **Declination:** 7.52° **Dip:** 60.43° **Date:** 20/Nov/2014 (dd/mm/yyyy)

Target Set: Vega 29 Federal 4H

Number of Targets: 2

Target: 1P

Position: (Relative to Slot centre)

+N/-S: -787.22	North: 596036.25	Latitude: 32° 38' 15.90"
+E/-W: 317.50	East: 679553.38	Longitude: -103° 53' 3.57"

TVD (Kelly Bushing) : 8160.00 US ft

Shape: Cuboid											
Orientation		Inclination: 0.00°		Azimuth: 0.00°							
Dimensions		Length: 20.00		Breadth: 20.00		Height: 20.00					
Target: PBHL 4H											
Position: (Relative to Slot centre)											
+N/-S: -5397.21		Northing: 591426.26		Latitude: 32°37'30.28"							
+E/-W: 317.50		Easting: 679553.38		Longitude: -103°53'3.80"							
TVD (Kelly Bushing):		8213.00 US ft									
Shape: Cuboid											
Orientation		Inclination: -0.66°		Azimuth: 180.00°							
Dimensions		Length: 9290.00		Breadth: 50.00		Height: 20.00					
Casing Points: (Relative to Slot Centre, TVD Relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name			
4100	0	0	4100	0	0	596823.47	679235.88	9 5/8 in			
Wellpath created using minimum curvature											
Salient Points: (Relative to Slot Centre, TVD Relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Rate (°/100 US ft)	T.Face (°)	Comment
0	0	0	0	0	0	0	0	0	0	0	
4100	0	0	4100	0	0	0	0	0	0	0	9 5/8 in
4200	0	0	4200	0	0	0	0	0	0	0	Nudge
4844.87	6.45	129.32	4843.51	-22.97	28.05	22.97	1	1	0	129.32	Hold
7648.93	6.45	129.32	7629.83	-222.52	271.69	222.52	0	0	0	0	KOP
8501.32	89.32	180	8160	-787.22	317.5	787.22	10	9.72	5.95	50.92	LP
13111.61	89.34	180	8213	-5397.21	317.5	5397.21	0	0	0	0.01	PBHL 4H
Interpolated Points: (Relative to Slot Centre, TVD Relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	Northing (US ft)	Easting (US ft)	Comment	
4200	0	0	4200	0	0	0	0	596823.47	679235.88	Nudge	
4300	1	129.32	4299.99	-0.55	0.68	0.55	1	596822.92	679236.56		
4400	2	129.32	4399.96	-2.21	2.7	2.21	1	596821.26	679238.58		
4500	3	129.32	4499.86	-4.98	6.07	4.98	1	596818.49	679241.95		
4600	4	129.32	4599.68	-8.84	10.8	8.84	1	596814.63	679246.68		
4700	5	129.32	4699.37	-13.81	16.87	13.81	1	596809.66	679252.75		
4800	6	129.32	4798.9	-19.89	24.28	19.89	1	596803.58	679260.16		
4844.87	6.45	129.32	4843.51	-22.97	28.05	22.97	1	596800.5	679263.93	Hold	
4900	6.45	129.32	4898.29	-26.89	32.84	26.89	0	596796.58	679268.72		
5000	6.45	129.32	4997.66	-34.01	41.53	34.01	0	596789.46	679277.41		
5100	6.45	129.32	5097.03	-41.13	50.21	41.13	0	596782.34	679286.09		
5200	6.45	129.32	5196.39	-48.24	58.9	48.24	0	596775.23	679294.78		
5300	6.45	129.32	5295.76	-55.36	67.59	55.36	0	596768.11	679303.47		
5400	6.45	129.32	5395.13	-62.48	76.28	62.48	0	596760.99	679312.16		

5500	6.45	129.32	5494.49	-69.59	84.97	69.59	0	596753.88	679320.85
5600	6.45	129.32	5593.86	-76.71	93.66	76.71	0	596746.76	679329.54
5700	6.45	129.32	5693.23	-83.83	102.35	83.83	0	596739.64	679338.23
5800	6.45	129.32	5792.6	-90.94	111.04	90.94	0	596732.53	679346.92
5900	6.45	129.32	5891.96	-98.06	119.73	98.06	0	596725.41	679355.61
6000	6.45	129.32	5991.33	-105.18	128.41	105.18	0	596718.29	679364.29
6100	6.45	129.32	6090.7	-112.29	137.1	112.29	0	596711.18	679372.98
6200	6.45	129.32	6190.07	-119.41	145.79	119.41	0	596704.06	679381.67
6300	6.45	129.32	6289.43	-126.53	154.48	126.53	0	596696.94	679390.36
6400	6.45	129.32	6388.8	-133.64	163.17	133.64	0	596689.83	679399.05
6500	6.45	129.32	6488.17	-140.76	171.86	140.76	0	596682.71	679407.74
6600	6.45	129.32	6587.53	-147.88	180.55	147.88	0	596675.59	679416.43
6700	6.45	129.32	6686.9	-154.99	189.24	154.99	0	596668.48	679425.12
6800	6.45	129.32	6786.27	-162.11	197.93	162.11	0	596661.36	679433.81
6900	6.45	129.32	6885.64	-169.23	206.62	169.23	0	596654.24	679442.5
7000	6.45	129.32	6985	-176.34	215.3	176.34	0	596647.13	679451.18
7100	6.45	129.32	7084.37	-183.46	223.99	183.46	0	596640.01	679459.87
7200	6.45	129.32	7183.74	-190.58	232.68	190.58	0	596632.89	679468.56
7300	6.45	129.32	7283.11	-197.69	241.37	197.69	0	596625.78	679477.25
7400	6.45	129.32	7382.47	-204.81	250.06	204.81	0	596618.66	679485.94
7500	6.45	129.32	7481.84	-211.93	258.75	211.93	0	596611.54	679494.63
7600	6.45	129.32	7581.21	-219.04	267.44	219.04	0	596604.43	679503.32
7648.93	6.45	129.32	7629.83	-222.52	271.69	222.52	0	596600.95	679507.57
7700	10.45	151.72	7680.35	-228.42	276.11	228.42	10	596595.05	679511.99
7800	19.8	165.99	7776.81	-252.9	284.52	252.9	10	596570.57	679520.4
7900	29.57	171.19	7867.57	-293.82	292.42	293.82	10	596529.65	679528.3
8000	39.45	173.95	7949.87	-349.94	299.57	349.94	10	596473.53	679535.45
8100	49.37	175.75	8021.22	-419.55	305.74	419.55	10	596403.92	679541.62
8200	59.31	177.08	8079.45	-500.54	310.75	500.54	10	596322.93	679546.63
8300	69.27	178.16	8122.78	-590.45	314.45	590.45	10	596233.02	679550.33
8400	79.22	179.11	8149.9	-686.54	316.72	686.54	10	596136.93	679552.6
8500	89.19	179.99	8159.98	-785.9	317.5	785.9	10	596037.57	679553.38
8501.32	89.32	180	8160	-787.22	317.5	787.22	10	596036.25	679553.38
8600	89.32	180	8161.18	-885.9	317.5	885.9	0	595937.57	679553.38
8700	89.32	180	8162.37	-985.89	317.5	985.89	0	595837.58	679553.38
8800	89.32	180	8163.56	-1085.88	317.5	1085.88	0	595737.59	679553.38
8900	89.32	180	8164.75	-1185.88	317.5	1185.88	0	595637.59	679553.38
9000	89.32	180	8165.94	-1285.87	317.5	1285.87	0	595537.6	679553.38
9100	89.32	180	8167.13	-1385.86	317.5	1385.86	0	595437.61	679553.38
9200	89.32	180	8168.31	-1485.85	317.5	1485.85	0	595337.62	679553.38
9300	89.32	180	8169.5	-1585.85	317.5	1585.85	0	595237.62	679553.38
9400	89.32	180	8170.68	-1685.84	317.5	1685.84	0	595137.63	679553.38
9500	89.32	180	8171.87	-1785.83	317.5	1785.83	0	595037.64	679553.38
9600	89.32	180	8173.05	-1885.83	317.5	1885.83	0	594937.64	679553.38
9700	89.32	180	8174.23	-1985.82	317.5	1985.82	0	594837.65	679553.38
9800	89.32	180	8175.41	-2085.81	317.5	2085.81	0	594737.66	679553.38
9900	89.32	180	8176.59	-2185.81	317.5	2185.81	0	594637.66	679553.38
10000	89.32	180	8177.77	-2285.8	317.5	2285.8	0	594537.67	679553.38
10100	89.32	180	8178.95	-2385.79	317.5	2385.79	0	594437.68	679553.38
10200	89.33	180	8180.13	-2485.78	317.5	2485.78	0	594337.69	679553.38
10300	89.33	180	8181.31	-2585.78	317.5	2585.78	0	594237.69	679553.38

KOP

LP

10400	89.33	180	8182.48	-2685.77	317.5	2685.77	0	594137.7	679553.38
10500	89.33	180	8183.66	-2785.76	317.5	2785.76	0	594037.71	679553.38
10600	89.33	180	8184.83	-2885.76	317.5	2885.76	0	593937.71	679553.38
10700	89.33	180	8186	-2985.75	317.5	2985.75	0	593837.72	679553.38
10800	89.33	180	8187.17	-3085.74	317.5	3085.74	0	593737.73	679553.38
10900	89.33	180	8188.34	-3185.74	317.5	3185.74	0	593637.73	679553.38
11000	89.33	180	8189.51	-3285.73	317.5	3285.73	0	593537.74	679553.38
11100	89.33	180	8190.68	-3385.72	317.5	3385.72	0	593437.75	679553.38
11200	89.33	180	8191.85	-3485.72	317.5	3485.72	0	593337.75	679553.38
11300	89.33	180	8193.02	-3585.71	317.5	3585.71	0	593237.76	679553.38
11400	89.33	180	8194.19	-3685.7	317.5	3685.7	0	593137.77	679553.38
11500	89.33	180	8195.35	-3785.7	317.5	3785.7	0	593037.77	679553.38
11600	89.33	180	8196.51	-3885.69	317.5	3885.69	0	592937.78	679553.38
11700	89.33	180	8197.68	-3985.68	317.5	3985.68	0	592837.79	679553.38
11800	89.33	180	8198.84	-4085.68	317.5	4085.68	0	592737.79	679553.38
11900	89.33	180	8200	-4185.67	317.5	4185.67	0	592637.8	679553.38
12000	89.33	180	8201.16	-4285.66	317.5	4285.66	0	592537.81	679553.38
12100	89.34	180	8202.32	-4385.66	317.5	4385.66	0	592437.81	679553.38
12200	89.34	180	8203.48	-4485.65	317.5	4485.65	0	592337.82	679553.38
12300	89.34	180	8204.64	-4585.64	317.5	4585.64	0	592237.83	679553.38
12400	89.34	180	8205.8	-4685.64	317.5	4685.64	0	592137.83	679553.38
12500	89.34	180	8206.95	-4785.63	317.5	4785.63	0	592037.84	679553.38
12600	89.34	180	8208.11	-4885.62	317.5	4885.62	0	591937.85	679553.38
12700	89.34	180	8209.26	-4985.62	317.5	4985.62	0	591837.85	679553.38
12800	89.34	180	8210.41	-5085.61	317.5	5085.61	0	591737.86	679553.38
12900	89.34	180	8211.56	-5185.6	317.5	5185.6	0	591637.87	679553.38
13000	89.34	180	8212.72	-5285.6	317.5	5285.6	0	591537.87	679553.38
13100	89.34	180	8213.87	-5385.59	317.5	5385.59	0	591437.88	679553.38
13111.65	89.34	180	8213	-5397.21	317.5	5397.21	0	591426.26	679553.38

PBHL 4H

Formation Points: (Relative to Slot Centre, TVD Relative to Kelly Bushing)

MD	Inc	Az	TVD	N.Offset	E.Offset	Northing	Easting	Name	Comment
(US ft)	(°)	(°)	(US ft)	(US ft)	(US ft)	(US ft)	(US ft)		

Weatherford International Limited.

SD 7.5.9: 17 October 2014, 13:31:53 UTC

**PECOS DISTRICT
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Devon Energy Production Company, LP
LEASE NO.:	NMLC-063822
WELL NAME & NO.:	Vega 29 Federal 4H
SURFACE HOLE FOOTAGE:	0460' FSL & 0777' FEL
BOTTOM HOLE FOOTAGE:	0340' FSL & 0950' FEL Sec. 29, T. 19 S., R 31 E.
LOCATION:	Section 20, T. 19 S., R 31 E., NMPM
COUNTY:	Eddy County, New Mexico
API:	30-015-42347

The original COAs still stand with the following drilling modifications:

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)

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

1. A Hydrogen Sulfide (H₂S) Drilling Plan shall be activated 500 feet prior to drilling into the **Yates** 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. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
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 or are Non-API. 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.). The initial wellhead installed on the well will remain on the well with spools used as needed.

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

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. **IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS.** 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.

Capitan Reef

Possibility of water flows in the Artesia Group, Salado, and Delaware.

Possibility of lost circulation in the Artesia Group, Capitan Reef, and Delaware.

1. The **20** inch surface casing shall be set at approximately **450** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**
 - 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.
2. The minimum required fill of cement behind the **13-3/8** inch 1st intermediate casing, which shall be set at approximately **2350** feet, is:
☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.
3. The minimum required fill of cement behind the **9-5/8** inch 2nd intermediate casing, which shall be set at approximately **4100** feet, is:

Option #1 (Single Stage):

- ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

Option #2:

Operator has proposed DV tool at depth of 2400'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.

- a. First stage to DV tool:
☒ 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 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. Excess calculates to 2% - Additional cement may be required.**

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

Production casing without contingency:

4. The minimum required fill of cement behind the **7 X 5-1/2** inch production casing is:

- ☒ Cement should tie-back at least 50' above the Capitan Reef. Operator shall provide method of verification.

Contingency Production Casing:

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

Operator has proposed DV tool at depth of 5000'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.

a. First stage to DV tool:

- ☒ 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 approved top of cement on the next stage. **Excess calculates to 13% - Additional cement may be required.**

b. Second stage above DV tool:

- ☒ Cement should tie-back at least 50' above the Capitan Reef. Operator shall provide method of verification. **Excess calculates to 8% - Additional cement may be required.**

6. 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).
3. 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.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M)** psi.
5. 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 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.
- 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.

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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