

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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.

5. Lease Serial No.
NMNM0107697

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well
 Oil Well Gas Well Other

8. Well Name and No.
ANTARES 23 FEDERAL 4H

2. Name of Operator
DEVON ENERGY PRODUCTION CO. **Contact: ERIN L WORKMAN**
E-Mail: ERIN.WORKMAN@DVN.COM

9. API Well No.
30-015-41108

3a. Address
333 WEST SHERIDAN AVENUE
OKC, OK 73102

3b. Phone No. (include area code)
Ph: 405-552-7970

10. Field and Pool, or Exploratory
LUSK; BONE SPRING, WEST

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 23 T19S R31E 2080FSL 185FWL

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			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other Change to Original A PD
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Devon Energy Production Company, LP respectfully requests to change the currently approved location, as well as the drilling and cement changes per the attached documents.

Attachments:

Directional Information(2)
Drilling Plan
Revised C-102

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**



Engr reviewed - revised COP with signature 4/1/13

Accepted for record

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

Electronic Submission #202063 verified by the BLM Well Information System
For DEVON ENERGY PRODUCTION CO., LP, sent to the Carlsbad
Committed to AFMSS for processing by KURT SIMMONS on 03/25/2013 ()

Name (Printed/Typed) ERIN L WORKMAN Title REGULATORY COMPLIANCE ASSOC.

Signature (Electronic Submission) Date 03/20/2013

NMOCD TCS
4/9/2013

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By James D. Jones Title SEPS Date 4-4-13

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 CARLSBAD FIELD 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.

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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 August 1, 2011
Submit one copy to appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number		² Pool Code		³ Pool Name Lusk; Bone Spring West	
⁴ Property Code		⁵ Property Name ANTARES 23 FEDERAL			⁶ Well Number 4H
⁷ OGRID No. 6137		⁸ Operator Name DEVON ENERGY PRODUCTION COMPANY, L.P.			⁹ Elevation 3545.2

¹⁰ Surface Location

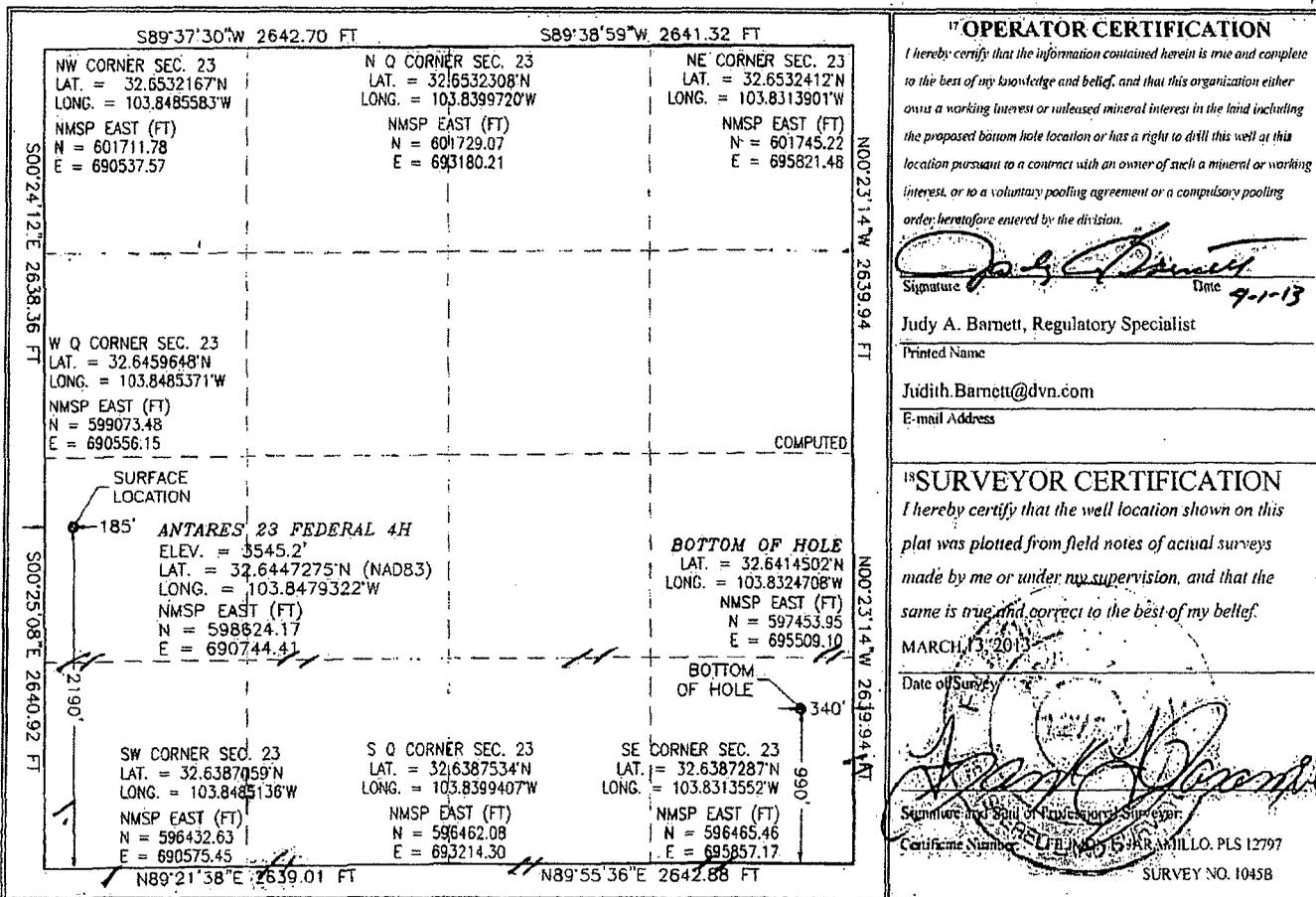
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	23	19 S	31 E		2190	SOUTH	185	WEST	EDDY

¹¹ Bottom Hole Location If Different From Surface

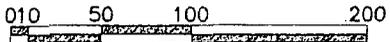
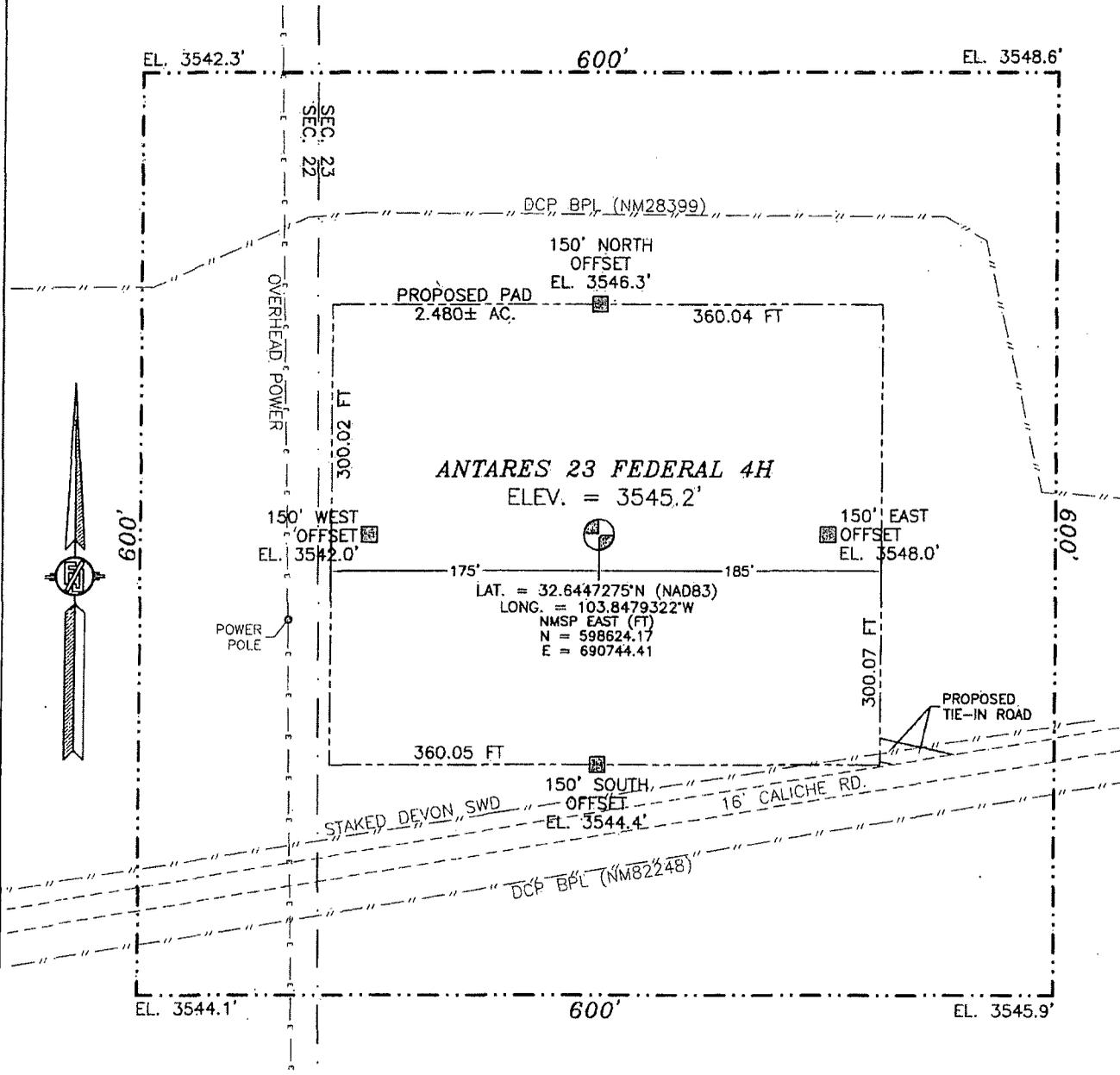
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	23	19 S	31 E		990	SOUTH	340	EAST	EDDY

¹² Dedicated Acres 160	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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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.



SECTION 23, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO



SCALE 1" = 100'
 DIRECTIONS TO LOCATION
 FROM THE INTERSECTION OF CR 222 (SHUGART RD.) AND CR 248
 (LUSK PLANT RD.) GO SOUTH ON CR 222 1.1 MILES TURN LEFT
 (EAST) ON CALICHE LEASE ROAD GO 1.23 MILES TO CALICHE ROAD
 ON RIGHT (SOUTH) GO 0.2 MILES TO ROAD INTERSECTION TURN
 RIGHT (WEST) GO 0.15 MILES SITE IS ABOUT 100 FT. ON RIGHT.

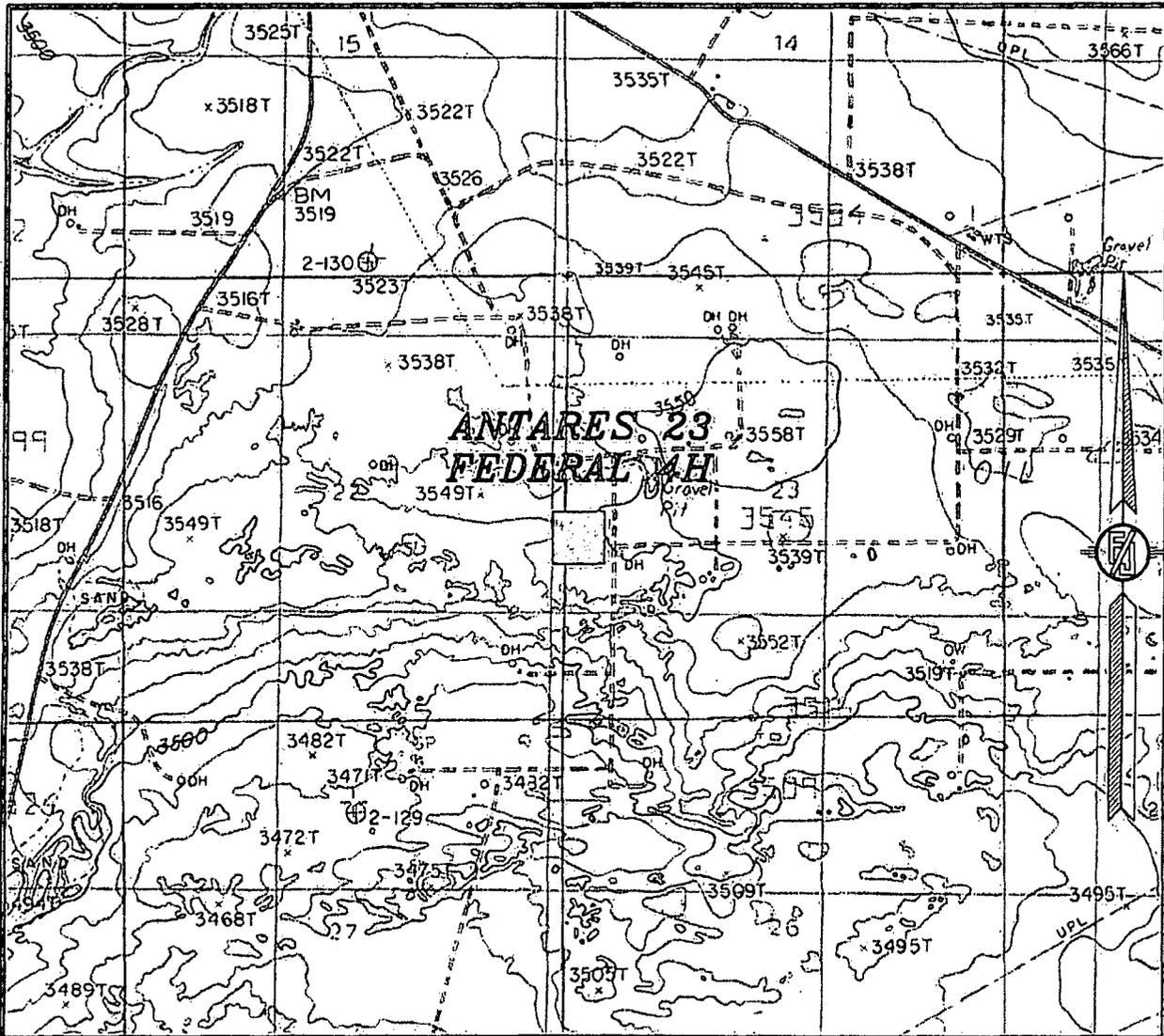
DEVON ENERGY PRODUCTION COMPANY, L.P.
ANTARES 23 FEDERAL 4H
 LOCATED 2190 FT. FROM THE SOUTH LINE
 AND 185 FT. FROM THE WEST LINE OF
 SECTION 23, TOWNSHIP 19 SOUTH,
 RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO

MARCH 13, 2013

SURVEY NO. 1045B

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
 (575) 234-3341

SECTION 23, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 LOCATION VERIFICATION MAP



USGS QUAD MAP:
 GREENWOOD LAKE

NOT TO SCALE

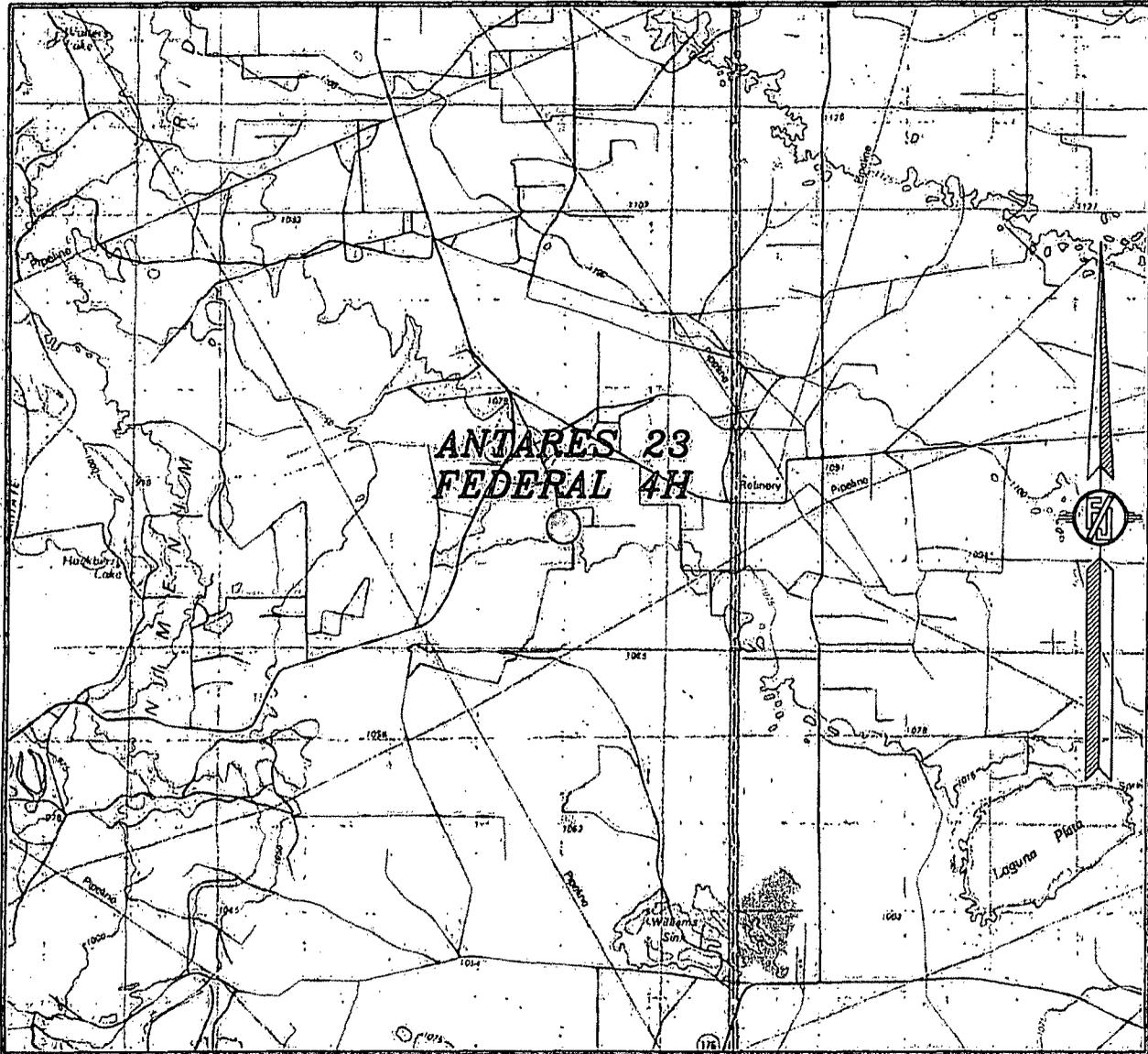
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 (575) 234-3341

SECTION 23, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
VICINITY MAP



NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

ANTARES 23 FEDERAL 4H

LOCATED 2190 FT. FROM THE SOUTH LINE

AND 185 FT. FROM THE WEST LINE OF

SECTION 23, TOWNSHIP 19 SOUTH,

RANGE 31 EAST, N.M.P.M.

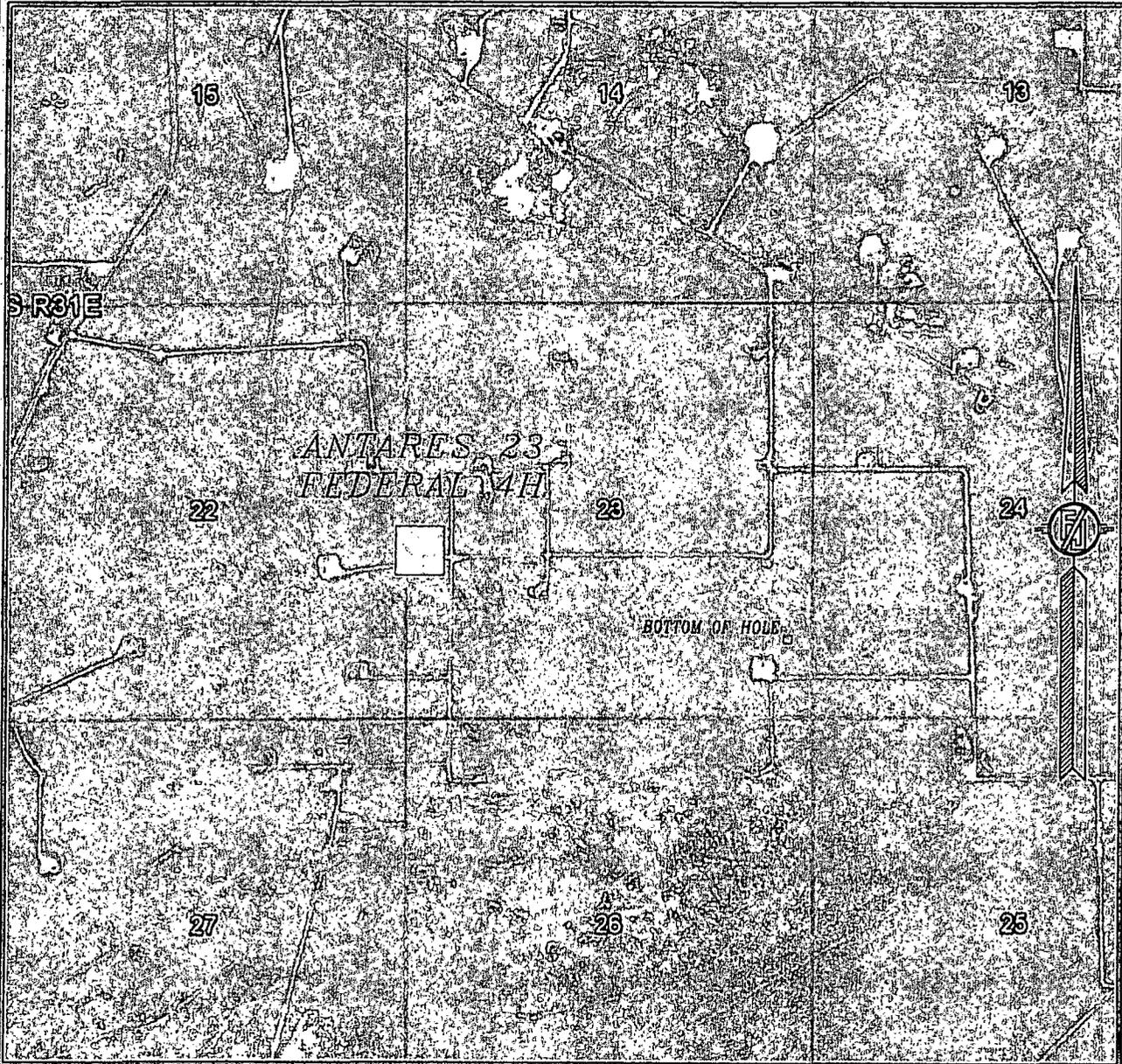
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 13, 2013

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MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
(575) 234-3341

SECTION 23, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
MARCH 2012

DEVON ENERGY PRODUCTION COMPANY, L.P.
ANTARES 23 FEDERAL 4H
LOCATED 2190 FT. FROM THE SOUTH LINE
AND 185 FT. FROM THE WEST LINE OF
SECTION 23, TOWNSHIP 19 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 13, 2013

SURVEY NO. 1045B

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
(575) 234-3341

Antares 23 Fed 4H – APD DRILLING PLAN
Section 23-19S-31E
 Revised 3.19.13 SKS

Casing Program

<u>Hole Size</u>	<u>Hole Interval</u>	<u>OD Csg</u>	<u>Casing Interval</u>	<u>Weight</u>	<u>Collar</u>	<u>Grade</u>
26"	0 - 750 <i>670</i> see	<i>COA</i> 20"	0 - 750	94#	BTC	J/K-55
17-1/2"	0 - 2620	13-3/8"	0 - 2620	61#	BTC	J/K-55
12-1/4"	2620 - 4450 <i>4300</i> see	9-5/8"	0 - 4450	40#	LTC	J-55
8-3/4"	4450 - 8318 <i>COA</i>	5-1/2"	0 - 8318	17#	LTC	P-110
8-3/4"	8318 - 13892	5-1/2"	8318 - 13892	17#	BTC	P-110

Max TVD: 9,240 ft

<u>Casing Size</u>	<u>Collapse Design Factor</u>	<u>Burst Design Factor</u>	<u>Tension Design Factor</u>
20"	1.48	6.01	20.99
13-3/8"	1.13	2.27	3.39
9-5/8"	1.23	1.90	3.54
5-1/2" 17# P-110 LTC	2.20	2.73	1.88
5-1/2" 17# P-110 BTC	1.97	2.44	4.70

The maximum possible collapse load that the intermediate casing will experience will result from evacuated casing with the pore pressure exerting a collapse load at TD. The pore pressure is estimated to be **10.0 ppg** for this calculation. This results in a collapse design factor of **1.23** for **9.625" 40# J-55 LT&C** casing at a depth of **4,450ft**. While running the intermediate casing, the casing will never be completely evacuated. There is no potential for the intermediate casing to be used as a production string.

Mud Program:

<u>Depth</u>	<u>Mud Wt.</u>	<u>Visc.</u>	<u>Fluid Loss</u>	<u>Type System</u>
0 - 750 <i>670</i>	8.4 – 9.0	30 – 34	N/C	FW
0 - 2620	9.8 – 10.0	28 – 32	N/C	Brine
2620 - 4450 <i>4300</i>	8.4 – 9.0	28 – 30	N/C	FW
4450 - 13892	8.6 – 9.0	28 – 32	N/C	FW

Pressure Control Equipment:

The BOP system used to drill the **17-1/2"** hole will consist of a **20" 2M 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 casing shoe.

The BOP system used to drill the **12-1/4"** and **8-3/4"** holes will consist of a **13-5/8" 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 casing shoe.

The pipe rams will be operated and checked as per Onshore Order No 2. 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**.

Devon requests a variance to use a flexible line with flanged ends between the BOP and the choke manifold (choke line). The line will be kept as straight as possible with minimal turns.

**Antares 23 Federal 4H
Cementing Program (cement volumes based on at least 100% excess Surface, 50% on Intermediate and 25% excess on the Production)**

20" Surface **Tail:** 1700 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.125 lbs/sack Poly-E-Flake + 63.1% Fresh Water, 14.8 ppg
Yield: 1.35 cf/sk
TOC @ surface

13 3/8" Intermediate **Lead:** 925 sacks (65:35) Class C Cement:Poz (Fly Ash): + 5% bwoc Sodium Chloride + 0.125 lbs/sack Poly-E-Flake + 6% bwoc Bentonite + 70.9% Fresh Water, 12.9 ppg
Yield: 1.85 cf/sk
TOC @ surface
Tail: 800 sacks Class C Cement + 0.125 lbs/sack Poly-E-Flake + 63.5% Water, 14.8 ppg
Yield: 1.33 cf/sk

9 5/8" Intermediate **1st Stage**
Lead: 250 sacks (65:35) Class H Cement:Poz (Fly Ash) + 6% bwoc Bentonite + 0.2% bwoc HR-601 + 74.1% Fresh Water, 12.5 ppg
Yield: 1.95 cf/sk
Tail: 360 sks Class C Cement +0.125 lbs Poly E Flake+0.2%bwoc Halad 9 @14.8 #/gal
Yield: 1.35 cf/sk.

2nd Stage
DV TOOL at 2670

Lead: 450 sks (65:35) Class C Cement: Poz(Flyash)+5%bwowSodium Chloride+0.125#/sk Poly E Flake+65 Bentonite @ 12.9 #/gal
Yield: 1.85 Cf/sk.
Tail: 360 sks Class C Cement+ 0.2% Halad 9 @ 14.8#/gal
Yield: 1.35 cf/sk.

5 1/2" Production **1st stage**
Lead: 4392 ft.800 sks (65:35)Class H: Poz (Fly.Ash) +5% KCL+ 0.5% Halad 322@ 12.8 #/gal
Yield: 1.75cf/sk

Tail: 1610 sacks (50:50) Class H Cement:Poz (Fly Ash) + 1 lb/sk Sodium Chloride + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.1% bwoc HR-601 + 2% bwoc Bentonite + 58.8% Fresh Water, 14.5 ppg
Yield: 1.22 cf/sk

DV TOOL at 4500 ft

2nd Stage
Lead: 200 sacks Class C Cement + 3% bwoc Econolite + 0.125 lbs/sack Poly-E-Flake + 82.4% Fresh Water, 11.4 ppg

Yield: 2.87 cf/sk

Tail: 240 sacks Class C Cement + 0.125 lbs/sack Poly-E-Flake + 63.5% Fresh Water, 14.8 ppg

Yield: 1.33cf/sk

TOC for All Strings:

Surface:	0
Intermediate:	0
Intermediate 2	0
Production:	2300 ft

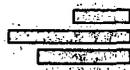
ACTUAL CEMENT VOLUMES WILL BE ADJUSTED BASED ON FLUID CALIPER AND CALIPER LOG DATA. LOG DATA.



Weatherford®

Drilling Services

Proposal



devon

ANTARES 23 FEDERAL 4H

EDDY COUNTY, NM

WELL FILE: **PLAN 2**

MARCH 19, 2013

Weatherford International, Ltd.

P.O. Box 61028

Midland, TX 79711 USA

+1.432.561.8892 Main

+1.432.561.8895 Fax

www.weatherford.com



Weatherford

Wft Plan Report X Y's.



Company: Devon Energy	Date: 3/19/2013	Time: 10:44:02	Page: 1
Field: Eddy Co., NM (NAD 83)	Co-ordinate (NE) Reference: Well: Antares 23 Federal #4H, Grid North		
Site: Antares 23 Federal #4H	Vertical (TVD) Reference: SITE 3565.0		
Well: Antares 23 Federal #4H	Section (VS) Reference: Well (0.00N,0.00E,104.07Azi)		
Wellpath: 1	Survey Calculation Method: Minimum Curvature		
			Db: Sybase

Plan: Plan #2	Date Composed: 12/6/2012
Principal: Yes	Version: 1
	Tied-to: From Surface

Site: Antares 23 Federal #4H

Site Position:	Northing: 598624.17 ft	Latitude: 32 38 41.007 N
From: Map	Easting: 690744.41 ft	Longitude: 103 50 52.572 W
Position Uncertainty: 0.00 ft		North Reference: Grid
Ground Level: 3545.00 ft		Grid Convergence: 0.26 deg

Well: Antares 23 Federal #4H	Slot Name:	
Well Position: +N/-S 0.00 ft	Northing: 598624.17 ft	Latitude: 32 38 41.007 N
+E/-W 0.00 ft	Easting: 690744.41 ft	Longitude: 103 50 52.572 W
Position Uncertainty: 0.00 ft		

Wellpath: 1	Drilled From: Surface	
Current Datum: SITE	Tie-on Depth: 0.00 ft	
Magnetic Data: 6/6/2013	Above System Datum: Mean Sea Level	
Field Strength: 48667 nT	Declination: 7.50 deg	
Vertical Section: Depth From (TVD)	Mag Dip Angle: 60.48 deg	
ft	+N/-S	Direction
	ft	deg
9305.00	0.00	104.07

Plan Section Information

MD	Incl	Azim	TVD	N/S	E/W	DLS	Build	Turn	TFO	Target
ft	deg	deg	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	deg	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6073.00	0.00	0.00	6073.00	0.00	0.00	0.00	0.00	0.00	0.00	
6906.49	25.00	187.55	6880.29	-177.45	-23.53	3.00	3.00	0.00	0.00	
8418.48	25.00	187.55	8250.55	-811.02	-107.52	0.00	0.00	0.00	0.00	
9944.86	88.08	89.67	9173.04	-1216.75	819.07	6.00	4.13	-6.41	-97.95	LP Tgt
13892.78	88.08	89.67	9305.00	-1194.15	4764.72	0.00	0.00	0.00	0.00	PBHL

Survey

MD	Incl	Azim	TVD	N/S	E/W	VS	DLS	MapN	MapE	Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	ft	
6000.00	0.00	0.00	6000.00	0.00	0.00	0.00	0.00	598624.17	690744.41	
6073.00	0.00	0.00	6073.00	0.00	0.00	0.00	0.00	598624.17	690744.41	Nudge
6100.00	0.81	187.55	6100.00	-0.19	-0.03	0.02	3.00	598623.98	690744.38	
6200.00	3.81	187.55	6199.91	-4.18	-0.55	0.48	3.00	598619.99	690743.86	
6300.00	6.81	187.55	6299.47	-13.36	-1.77	1.53	3.00	598610.81	690742.64	
6400.00	9.81	187.55	6398.40	-27.68	-3.67	3.17	3.00	598596.49	690740.74	
6500.00	12.81	187.55	6496.45	-47.12	-6.25	5.40	3.00	598577.05	690738.16	
6600.00	15.81	187.55	6593.34	-71.62	-9.49	8.20	3.00	598552.55	690734.92	
6700.00	18.81	187.55	6688.80	-101.12	-13.40	11.58	3.00	598523.05	690731.01	
6800.00	21.81	187.55	6782.57	-135.52	-17.97	15.52	3.00	598488.65	690726.44	
6900.00	24.81	187.55	6874.40	-174.74	-23.17	20.01	3.00	598449.43	690721.24	
6906.49	25.00	187.55	6880.29	-177.45	-23.53	20.32	3.00	598446.72	690720.88	Hold
7000.00	25.00	187.55	6965.03	-216.64	-28.72	24.81	0.00	598407.53	690715.69	
7100.00	25.00	187.55	7055.66	-258.54	-34.27	29.61	0.00	598365.63	690710.14	
7200.00	25.00	187.55	7146.28	-300.44	-39.83	34.40	0.00	598323.73	690704.58	
7300.00	25.00	187.55	7236.91	-342.34	-45.38	39.20	0.00	598281.83	690699.03	
7400.00	25.00	187.55	7327.54	-384.25	-50.94	44.00	0.00	598239.92	690693.47	
7500.00	25.00	187.55	7418.17	-426.15	-56.49	48.80	0.00	598198.02	690687.92	
7600.00	25.00	187.55	7508.79	-468.05	-62.05	53.60	0.00	598156.12	690682.36	
7700.00	25.00	187.55	7599.42	-509.96	-67.60	58.40	0.00	598114.21	690676.81	
7800.00	25.00	187.55	7690.05	-551.86	-73.16	63.20	0.00	598072.31	690671.25	



Weatherford Wft Plan Report X Y's.



Company: Devon Energy Date: 3/19/2013 Time: 10:44:02 Page: 2
 Field: Eddy Co., NM (NAD 83) Co-ordinate (NE) Reference: Well: Antares 23 Federal #4H Grid: North
 Site: Antares 23 Federal #4H Vertical (FVD) Reference: SITE 3565.0
 Well: Antares 23 Federal #4H Section (VS) Reference: Well: (0.00N;0.00E; 104.07Az)
 Wellpath: Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	FVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comments
7900.00	25.00	187.55	7780.67	-593.76	-78.71	67.99	0.00	598030.41	690665.70	
8000.00	25.00	187.55	7871.30	-635.66	-84.27	72.79	0.00	597988.51	690660.14	
8100.00	25.00	187.55	7961.93	-677.57	-89.82	77.59	0.00	597946.60	690654.59	
8200.00	25.00	187.55	8052.56	-719.47	-95.38	82.39	0.00	597904.70	690649.03	
8300.00	25.00	187.55	8143.18	-761.37	-100.94	87.19	0.00	597862.80	690643.47	
8400.00	25.00	187.55	8233.81	-803.28	-106.49	91.99	0.00	597820.89	690637.92	
8418.48	25.00	187.55	8250.55	-811.02	-107.52	92.87	0.00	597813.15	690636.89	KOP
8500.00	24.78	175.93	8324.55	-845.16	-108.57	100.15	6.00	597779.01	690635.84	
8600.00	25.71	162.00	8415.08	-886.72	-100.37	118.21	6.00	597737.45	690644.04	
8700.00	27.85	149.53	8504.42	-927.52	-81.80	146.14	6.00	597696.65	690662.61	
8800.00	30.95	139.03	8591.59	-967.11	-53.07	183.63	6.00	597657.06	690691.34	
8900.00	34.74	130.45	8675.64	-1005.04	-14.50	230.27	6.00	597619.13	690729.91	
9000.00	39.03	123.44	8755.64	-1040.91	33.50	285.55	6.00	597583.26	690777.91	
9100.00	43.67	117.67	8830.72	-1074.33	90.40	348.87	6.00	597549.84	690834.81	
9200.00	48.55	112.82	8900.05	-1104.91	155.58	419.53	6.00	597519.26	690899.99	
9300.00	53.60	108.66	8962.88	-1132.34	228.32	496.75	6.00	597491.83	690972.73	
9400.00	58.78	105.01	9018.52	-1156.32	307.82	579.70	6.00	597467.85	691052.23	
9500.00	64.05	101.75	9066.35	-1176.57	393.22	667.45	6.00	597447.60	691137.63	
9600.00	69.39	98.77	9105.86	-1192.87	483.57	759.06	6.00	597431.30	691227.98	
9700.00	74.78	95.99	9136.61	-1205.05	577.90	853.52	6.00	597419.12	691322.31	
9800.00	80.20	93.35	9158.26	-1212.98	675.16	949.79	6.00	597411.19	691419.57	
9900.00	85.64	90.80	9170.59	-1216.57	774.28	1046.81	6.00	597407.60	691518.69	
9944.86	88.08	89.67	9173.04	-1216.75	819.07	1090.30	6.00	597407.42	691563.48	LP Tgt
10000.00	88.08	89.67	9174.88	-1216.43	874.18	1143.68	0.00	597407.74	691618.59	
10100.00	88.08	89.67	9178.23	-1215.86	974.12	1240.48	0.00	597408.31	691718.53	
10200.00	88.08	89.67	9181.57	-1215.29	1074.06	1337.29	0.00	597408.88	691818.47	
10300.00	88.08	89.67	9184.91	-1214.72	1174.01	1434.09	0.00	597409.45	691918.42	
10400.00	88.08	89.67	9188.25	-1214.14	1273.95	1530.90	0.00	597410.03	692018.36	
10500.00	88.08	89.67	9191.60	-1213.57	1373.89	1627.70	0.00	597410.60	692118.30	
10600.00	88.08	89.67	9194.94	-1213.00	1473.83	1724.51	0.00	597411.17	692218.24	
10700.00	88.08	89.67	9198.28	-1212.43	1573.78	1821.31	0.00	597411.74	692318.19	
10800.00	88.08	89.67	9201.62	-1211.85	1673.72	1918.12	0.00	597412.32	692418.13	
10900.00	88.08	89.67	9204.97	-1211.28	1773.66	2014.92	0.00	597412.89	692518.07	
11000.00	88.08	89.67	9208.31	-1210.71	1873.60	2111.73	0.00	597413.46	692618.01	
11100.00	88.08	89.67	9211.65	-1210.14	1973.55	2208.53	0.00	597414.03	692717.96	
11200.00	88.08	89.67	9214.99	-1209.56	2073.49	2305.34	0.00	597414.61	692817.90	
11300.00	88.08	89.67	9218.34	-1208.99	2173.43	2402.14	0.00	597415.18	692917.84	
11400.00	88.08	89.67	9221.68	-1208.42	2273.37	2498.95	0.00	597415.75	693017.78	
11500.00	88.08	89.67	9225.02	-1207.85	2373.32	2595.75	0.00	597416.32	693117.73	
11600.00	88.08	89.67	9228.36	-1207.28	2473.26	2692.56	0.00	597416.89	693217.67	
11700.00	88.08	89.67	9231.71	-1206.70	2573.20	2789.36	0.00	597417.47	693317.61	
11800.00	88.08	89.67	9235.05	-1206.13	2673.14	2886.17	0.00	597418.04	693417.55	
11900.00	88.08	89.67	9238.39	-1205.56	2773.09	2982.97	0.00	597418.61	693517.50	
12000.00	88.08	89.67	9241.73	-1204.99	2873.03	3079.78	0.00	597419.18	693617.44	
12100.00	88.08	89.67	9245.08	-1204.41	2972.97	3176.58	0.00	597419.76	693717.38	
12200.00	88.08	89.67	9248.42	-1203.84	3072.91	3273.39	0.00	597420.33	693817.32	
12300.00	88.08	89.67	9251.76	-1203.27	3172.86	3370.19	0.00	597420.90	693917.27	
12400.00	88.08	89.67	9255.10	-1202.70	3272.80	3467.00	0.00	597421.47	694017.21	
12500.00	88.08	89.67	9258.45	-1202.12	3372.74	3563.80	0.00	597422.05	694117.15	
12600.00	88.08	89.67	9261.79	-1201.55	3472.68	3660.61	0.00	597422.62	694217.09	
12700.00	88.08	89.67	9265.13	-1200.98	3572.63	3757.41	0.00	597423.19	694317.04	
12800.00	88.08	89.67	9268.47	-1200.41	3672.57	3854.22	0.00	597423.76	694416.98	
12900.00	88.08	89.67	9271.82	-1199.83	3772.51	3951.02	0.00	597424.34	694516.92	



Weatherford

Wft Plan Report X Y's.



Company: Devon Energy	Date: 3/19/2013	Time: 10:44:02	Page: 3
Field: Eddy Co., NM (NAD 83)	Co-ordinate(NE) Reference: Well: Antares 23 Federal #4H, Grid: North	Vertical (TVD) Reference: SITE 3565 0	
Site: Antares 23 Federal #4H	Section (VS) Reference: Well (0.00N 0.00E 104.07Azi)	Survey Calculation Method: Minimum Curvature	Db: Sybase
Well: Antares 23 Federal #4H			
Wellpath: 1			

Survey

MD ft	Incl. deg	Azim. deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comments
13000.00	88.08	89.67	9275.16	-1199.26	3872.45	4047.83	0.00	597424.91	694616.86	
13100.00	88.08	89.67	9278.50	-1198.69	3972.40	4144.63	0.00	597425.48	694716.81	
13200.00	88.08	89.67	9281.84	-1198.12	4072.34	4241.44	0.00	597426.05	694816.75	
13300.00	88.08	89.67	9285.19	-1197.54	4172.28	4338.24	0.00	597426.63	694916.69	
13400.00	88.08	89.67	9288.53	-1196.97	4272.22	4435.05	0.00	597427.20	695016.63	
13500.00	88.08	89.67	9291.87	-1196.40	4372.17	4531.85	0.00	597427.77	695116.58	
13600.00	88.08	89.67	9295.21	-1195.83	4472.11	4628.66	0.00	597428.34	695216.52	
13700.00	88.08	89.67	9298.56	-1195.25	4572.05	4725.46	0.00	597428.92	695316.46	
13800.00	88.08	89.67	9301.90	-1194.68	4671.99	4822.27	0.00	597429.49	695416.40	
13892.78	88.08	89.67	9305.00	-1194.15	4764.72	4912.08	0.00	597430.02	695509.13	PBHL

Targets

Name	Description Dip	TVD Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	Latitude Deg Min Sec	Longitude Deg Min Sec
LP Tgt			9173.04	-1216.75	819.07	597407.42	691563.48	32 38 28.930 N	103 50 43.058 W
PBHL	1.92	89.67	9305.00	-1194.15	4764.72	597430.02	695509.13	32 38 28.972 N	103 49 56.912 W
-Rectangle (3947x50)									

Casing Points

MD	TVD	Diameter	Hole Size	Name

Annotation

MD ft	TVD ft	
6073.00	6073.00	Nudge
6906.49	6880.28	Hold
8418.48	8250.56	KOP
9944.86	9173.04	LP
13892.77	9305.00	PBHL



Weatherford Anticollision Report



Company:	Devon Energy	Date:	3/19/2013	Time:	10:45:03	Page:	1
Field:	Eddy Co., NM (NAD:83)	Reference Site:	Antares 23 Federal #4H	Co-ordinate (NE) Reference:	Well: Antares 23 Federal #4H; Grid North	Reference Well:	Antares 23 Federal #4H
Reference Wellpath:		Vertical (TVD) Reference:	SITE 3565.0	Db:	Sybase		

NO GLOBAL SCAN: Using user defined selection & scan criteria Interpolation Method: MD + Stations Interval: 100.00 ft Depth Range: 100.00 to 13428.72 ft Maximum Radius: 0000.00 ft	Reference: Plan: Plan #2 Error Model: ISCWSA Ellipse Scan Method: Closest Approach 3D Error Surface: Ellipse
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Plan: Plan #2 Principal: Yes	Date Composed: 12/6/2012 Version: 1 Tied-to: From Surface
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Site	Offset Wellpath Well	Wellpath	Reference MD	Offset MD	Ctr-Ctr Edge Distance	Separation Distance	Factor	Warning
Aquila 22 Fed Com 4H	Aquila 22 Fed Com 4H V0	Plan: Plan #1 V1	8500.00	8487.84	93.18	47.19	2.03	

Site: Aquila 22 Fed Com 4H
 Well: Aquila 22 Fed Com 4H
 Wellpath: 1 V0 Plan: Plan #1 V1
Inter-Site Error: 0.00 ft

Reference MD	TVD	Offset		Semi-Major Axis			Offset Location		Ctr-Ctr Edge		Separation Distance	Factor	Warning
		MD	TVD	Ref	Offset	TFO-HS	North	East	Distance	Distance			
100.00	100.00	96.00	96.00	0.09	0.09	262.56	-53.47	-409.56	413.04	412.86	2343.91		
200.00	200.00	196.00	196.00	0.31	0.31	262.56	-53.47	-409.56	413.04	412.42	665.81		
300.00	300.00	296.00	296.00	0.54	0.53	262.56	-53.47	-409.56	413.04	411.97	386.06		
400.00	400.00	396.00	396.00	0.76	0.76	262.56	-53.47	-409.56	413.04	411.52	271.84		
500.00	500.00	496.00	496.00	0.99	0.98	262.56	-53.47	-409.56	413.04	411.07	209.77		
600.00	600.00	596.00	596.00	1.21	1.20	262.56	-53.47	-409.56	413.04	410.62	170.78		
700.00	700.00	696.00	696.00	1.44	1.43	262.56	-53.47	-409.56	413.04	410.17	144.01		
800.00	800.00	796.00	796.00	1.66	1.65	262.56	-53.47	-409.56	413.04	409.72	124.50		
900.00	900.00	896.00	896.00	1.89	1.88	262.56	-53.47	-409.56	413.04	409.27	109.64		
1000.00	1000.00	896.00	896.00	2.11	2.10	262.56	-53.47	-409.56	413.04	408.82	97.95		
1100.00	1100.00	1096.00	1096.00	2.34	2.33	262.56	-53.47	-409.56	413.04	408.37	88.52		
1200.00	1200.00	1196.00	1196.00	2.56	2.55	262.56	-53.47	-409.56	413.04	407.92	80.74		
1300.00	1300.00	1296.00	1296.00	2.79	2.78	262.56	-53.47	-409.56	413.04	407.47	74.22		
1400.00	1400.00	1396.00	1396.00	3.01	3.00	262.56	-53.47	-409.56	413.04	407.02	68.67		
1500.00	1500.00	1496.00	1496.00	3.24	3.23	262.56	-53.47	-409.56	413.04	406.57	63.90		
1600.00	1600.00	1596.00	1596.00	3.46	3.45	262.56	-53.47	-409.56	413.04	406.12	59.74		
1700.00	1700.00	1696.00	1696.00	3.69	3.68	262.56	-53.47	-409.56	413.04	405.67	56.09		
1800.00	1800.00	1796.00	1796.00	3.91	3.90	262.56	-53.47	-409.56	413.04	405.22	52.87		
1900.00	1900.00	1896.00	1896.00	4.14	4.13	262.56	-53.47	-409.56	413.04	404.77	49.99		
2000.00	2000.00	1896.00	1896.00	4.36	4.35	262.56	-53.47	-409.56	413.04	404.32	47.41		
2100.00	2100.00	2096.00	2096.00	4.59	4.58	262.56	-53.47	-409.56	413.04	403.87	45.08		
2200.00	2200.00	2196.00	2196.00	4.81	4.80	262.56	-53.47	-409.56	413.04	403.42	42.98		
2300.00	2300.00	2296.00	2296.00	5.03	5.03	262.56	-53.47	-409.56	413.04	402.98	41.06		
2400.00	2400.00	2396.00	2396.00	5.26	5.25	262.56	-53.47	-409.56	413.04	402.53	39.30		
2500.00	2500.00	2496.00	2496.00	5.48	5.48	262.56	-53.47	-409.56	413.04	402.08	37.69		
2600.00	2600.00	2596.00	2596.00	5.71	5.70	262.56	-53.47	-409.56	413.04	401.63	36.20		
2700.00	2700.00	2696.00	2696.00	5.93	5.92	262.56	-53.47	-409.56	413.04	401.18	34.83		
2800.00	2800.00	2796.00	2796.00	6.16	6.15	262.56	-53.47	-409.56	413.04	400.73	33.56		
2900.00	2900.00	2896.00	2896.00	6.38	6.37	262.56	-53.47	-409.56	413.04	400.28	32.38		
3000.00	3000.00	2896.00	2896.00	6.61	6.60	262.56	-53.47	-409.56	413.04	399.83	31.27		
3100.00	3100.00	3096.00	3096.00	6.83	6.82	262.56	-53.47	-409.56	413.04	399.38	30.24		
3200.00	3200.00	3196.00	3196.00	7.06	7.05	262.56	-53.47	-409.56	413.04	398.93	29.28		
3300.00	3300.00	3296.00	3296.00	7.28	7.27	262.56	-53.47	-409.56	413.04	398.48	28.38		
3400.00	3400.00	3396.00	3396.00	7.51	7.50	262.56	-53.47	-409.56	413.04	398.03	27.53		
3500.00	3500.00	3496.00	3496.00	7.73	7.72	262.56	-53.47	-409.56	413.04	397.58	26.73		
3600.00	3600.00	3596.00	3596.00	7.96	7.95	262.56	-53.47	-409.56	413.04	397.13	25.97		



Weatherford Anticollision Report



Company:	Devon Energy	Date:	3/19/2013	Time:	10:45:03	Page:	2
Field:	Eddy Co., NM (NAD83)	Co-ordinate(NE) Reference:	Well: Antares 23: Federal #4H; Grid North				
Reference Site:	Antares 23: Federal #4H	Vertical(TVD) Reference:	SITE 3565.0				
Reference Well:	Antares 23: Federal #4H	Db:	Sybase				
Reference Wellpath:							

Site: Aquila 22 Fed Com 4H
 Well: Aquila 22 Fed Com 4H
 Wellpath: 1 VO Plan: Plan #1 V1

Inter-Site Error: 0.00 ft

Reference MD	TVD	Offset		Semi-Major Axis			Offset Location		Ctr-Ctr Edge		Separation Factor	Warning
		MD	TVD	Ref	Offset	TFO:HS	North	East	Distance	Distance		
3700.00	3700.00	3696.00	3696.00	8.18	8.17	262.56	-53.47	-409.56	413.04	396.68	25.26	
3800.00	3800.00	3796.00	3796.00	8.41	8.40	262.56	-53.47	-409.56	413.04	396.23	24.58	
3900.00	3900.00	3896.00	3896.00	8.63	8.62	262.56	-53.47	-409.56	413.04	395.78	23.94	
4000.00	4000.00	3996.00	3996.00	8.86	8.85	262.56	-53.47	-409.56	413.04	395.33	23.33	
4100.00	4100.00	4096.00	4096.00	9.08	9.07	262.56	-53.47	-409.56	413.04	394.88	22.75	
4200.00	4200.00	4196.00	4196.00	9.31	9.30	262.56	-53.47	-409.56	413.04	394.43	22.20	
4300.00	4300.00	4296.00	4296.00	9.53	9.52	262.56	-53.47	-409.56	413.04	393.98	21.68	
4400.00	4400.00	4396.00	4396.00	9.75	9.75	262.56	-53.47	-409.56	413.04	393.53	21.18	
4500.00	4500.00	4496.00	4496.00	9.98	9.97	262.56	-53.47	-409.56	413.04	393.09	20.70	
4600.00	4600.00	4596.00	4596.00	10.20	10.20	262.56	-53.47	-409.56	413.04	392.64	20.25	
4700.00	4700.00	4696.00	4696.00	10.43	10.42	262.56	-53.47	-409.56	413.04	392.19	19.81	
4800.00	4800.00	4796.00	4796.00	10.65	10.64	262.56	-53.47	-409.56	413.04	391.74	19.39	
4900.00	4900.00	4896.00	4896.00	10.88	10.87	262.56	-53.47	-409.56	413.04	391.29	18.99	
5000.00	5000.00	4996.00	4996.00	11.10	11.09	262.56	-53.47	-409.56	413.04	390.84	18.61	
5100.00	5100.00	5096.00	5096.00	11.33	11.32	262.56	-53.47	-409.56	413.04	390.39	18.24	
5200.00	5200.00	5196.00	5196.00	11.55	11.54	262.56	-53.47	-409.56	413.04	389.94	17.88	
5300.00	5300.00	5296.00	5296.00	11.78	11.77	262.56	-53.47	-409.56	413.04	389.49	17.54	
5400.00	5400.00	5396.00	5396.00	12.00	11.99	262.56	-53.47	-409.56	413.04	389.04	17.21	
5500.00	5500.00	5496.00	5496.00	12.23	12.22	262.56	-53.47	-409.56	413.04	388.59	16.90	
5600.00	5600.00	5596.00	5596.00	12.45	12.44	262.56	-53.47	-409.56	413.04	388.14	16.59	
5700.00	5700.00	5696.00	5696.00	12.68	12.67	262.56	-53.47	-409.56	413.04	387.69	16.30	
5800.00	5800.00	5796.00	5796.00	12.90	12.89	262.56	-53.47	-409.56	413.04	387.24	16.01	
5900.00	5900.00	5896.00	5896.00	13.13	13.12	262.56	-53.47	-409.56	413.04	386.79	15.74	
6000.00	6000.00	5996.00	5996.00	13.35	13.34	262.56	-53.47	-409.56	413.04	386.34	15.47	
6073.00	6073.00	6069.00	6069.00	13.52	13.51	262.56	-53.47	-409.56	413.04	386.01	15.29	
6100.00	6100.00	6096.00	6096.00	13.57	13.57	75.04	-53.47	-409.56	412.99	385.85	15.22	
6200.00	6199.91	6198.34	6198.32	13.73	13.77	75.38	-55.23	-409.09	411.72	384.22	14.97	
6300.00	6299.47	6301.29	6301.00	13.90	13.94	75.76	-62.25	-407.24	408.44	380.60	14.67	
6400.00	6398.40	6404.22	6403.12	14.07	14.12	76.17	-74.60	-403.97	403.13	374.96	14.31	
6500.00	6496.45	6507.07	6504.32	14.24	14.30	76.61	-92.24	-399.30	395.81	367.29	13.88	
6600.00	6593.34	6609.75	6604.24	14.43	14.49	77.09	-115.07	-393.25	386.49	357.61	13.38	
6700.00	6688.80	6712.21	6702.53	14.65	14.70	77.61	-143.00	-385.86	375.22	345.92	12.81	
6800.00	6782.57	6814.39	6798.86	14.89	14.94	78.18	-175.88	-377.15	362.01	332.25	12.16	
6900.00	6874.40	6916.22	6892.93	15.17	15.22	78.80	-213.57	-367.17	346.92	316.61	11.45	
6906.49	6880.29	6922.82	6898.95	15.19	15.24	78.84	-216.18	-366.48	345.88	315.53	11.40	
7000.00	6965.03	7015.81	6983.30	15.49	15.54	78.83	-254.02	-356.46	330.62	299.68	10.69	
7100.00	7055.66	7114.46	7072.71	15.84	15.89	78.78	-294.32	-345.79	314.27	282.64	9.94	
7200.00	7146.28	7213.12	7162.12	16.23	16.27	78.72	-334.63	-335.12	297.92	265.54	9.20	
7300.00	7236.91	7311.77	7251.53	16.64	16.68	78.65	-374.93	-324.45	281.58	248.38	8.48	
7400.00	7327.54	7410.43	7340.94	17.09	17.12	78.58	-415.24	-313.78	265.23	231.16	7.79	
7500.00	7418.17	7509.08	7430.35	17.55	17.59	78.50	-455.55	-303.11	248.88	213.90	7.11	
7600.00	7508.79	7607.74	7519.76	18.04	18.08	78.41	-495.85	-292.43	232.54	196.59	6.47	
7700.00	7599.42	7706.39	7609.17	18.55	18.59	78.30	-536.16	-281.76	216.19	179.24	5.85	
7800.00	7690.05	7805.04	7698.58	19.09	19.12	78.18	-576.46	-271.09	199.85	161.85	5.26	
7900.00	7780.67	7903.70	7787.99	19.64	19.67	78.04	-616.77	-260.42	183.51	144.42	4.70	
8000.00	7871.30	8002.35	7877.40	20.20	20.23	77.86	-657.07	-249.75	167.16	126.97	4.16	
8100.00	7961.93	8101.01	7966.81	20.78	20.82	77.65	-697.38	-239.08	150.82	109.49	3.65	
8200.00	8052.56	8199.66	8056.22	21.38	21.41	77.39	-737.69	-228.41	134.49	91.98	3.16	
8300.00	8143.18	8298.32	8145.63	21.99	22.02	77.05	-777.99	-217.73	118.15	74.45	2.70	
8400.00	8233.81	8396.97	8235.04	22.61	22.64	76.61	-818.30	-207.06	101.82	56.91	2.27	
8418.48	8250.55	8413.94	8250.43	22.72	22.74	76.52	-825.24	-205.30	98.89	53.76	2.19	



Weatherford Anticollision Report



Weatherford

Company: Devon Energy Date: 3/19/2013 Time: 10:45:03 Page: 3
 Field: Eddy Co.: NM (NAD 83)
 Reference Site: Antares 23 Federal #4H Co-ordinate (NE) Reference: Well: Antares 23 Federal #4H Grid North
 Reference Well: Antares 23 Federal #4H Vertical (TVD) Reference: SITE 3565.0
 Reference Wellpath: Db: Sybase

Site: Aquila 22 Fed Com 4H
 Well: Aquila 22 Fed Com 4H
 Wellpath: 1 V0 Plan: Plan #1 V1

Inter-Site Error: 0.00 ft

Reference		Offset		Semi-Major Axis			Offset Location		Cir-Ctr Edge		Separation	Warning
MD	TVD	MD	TVD	Ref	Offset	TFO-HS	North	East	Distance	Distance	Factor	
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
8450.00	8279.15	8442.35	8276.22	22.90	22.90	80.49	-836.92	-203.01	95.12	49.62	2.09	
8500.00	8324.55	8487.84	8317.56	23.14	23.10	86.98	-855.78	-201.09	93.18	47.19	2.03	
8550.00	8369.90	8533.24	8358.82	23.33	23.26	93.58	-874.75	-201.33	96.22	49.82	2.07	
8600.00	8415.08	8577.92	8399.28	23.48	23.38	100.08	-893.51	-203.67	104.19	57.48	2.23	
8650.00	8459.96	8621.23	8438.33	23.59	23.46	106.25	-911.76	-207.92	116.97	70.02	2.49	
8700.00	8504.42	8662.65	8475.42	23.65	23.51	111.95	-929.23	-213.80	134.36	87.25	2.85	
8750.00	8548.34	8701.73	8510.12	23.68	23.53	117.10	-945.69	-220.97	156.09	108.91	3.31	
8800.00	8591.59	8738.12	8542.13	23.67	23.52	121.68	-960.99	-229.06	181.86	134.69	3.86	
8850.00	8634.06	8771.59	8571.28	23.62	23.49	125.71	-975.01	-237.68	211.34	164.23	4.49	
8900.00	8675.64	8802.03	8597.50	23.55	23.45	129.22	-987.69	-246.50	244.17	197.19	5.20	
8950.00	8716.20	8829.37	8620.81	23.46	23.40	132.28	-999.03	-255.21	280.01	233.20	5.98	
9000.00	8755.64	8853.66	8641.30	23.36	23.35	134.91	-1009.05	-263.56	318.49	271.89	6.84	
9050.00	8793.85	8874.98	8659.10	23.26	23.30	137.17	-1017.80	-271.36	359.29	312.95	7.75	
9100.00	8830.72	8893.44	8674.38	23.18	23.25	139.09	-1025.33	-278.48	402.10	356.03	8.73	
9150.00	8866.15	8909.19	8687.30	23.13	23.21	140.69	-1031.73	-284.81	446.61	400.84	9.76	
9200.00	8900.05	8922.39	8698.06	23.13	23.17	141.97	-1037.07	-290.30	492.55	447.10	10.84	
9250.00	8932.32	8933.21	8706.82	23.19	23.14	142.91	-1041.43	-294.92	539.68	494.53	11.95	
9300.00	8962.88	8941.82	8713.75	23.31	23.12	143.44	-1044.89	-298.67	587.76	542.90	13.10	
9350.00	8991.64	8950.00	8720.31	23.50	23.09	143.44	-1048.16	-302.30	636.57	591.97	14.27	
9400.00	9018.52	8950.00	8720.31	23.75	23.09	141.92	-1048.16	-302.30	685.94	641.40	15.40	
9450.00	9043.44	8956.00	8725.10	24.07	23.08	137.81	-1050.56	-305.01	735.65	690.87	16.43	
9500.00	9066.35	8957.33	8726.16	24.45	23.07	112.90	-1051.09	-305.61	785.58	738.56	16.71	
9550.00	9087.18	8957.20	8726.05	24.89	23.07	-0.06	-1051.04	-305.55	835.57	795.87	21.05	
9600.00	9105.86	8950.00	8720.31	25.38	23.09	343.03	-1048.16	-302.30	885.51	844.82	21.76	
9650.00	9122.35	8950.00	8720.31	25.92	23.09	339.91	-1048.16	-302.30	935.19	894.46	22.96	
9700.00	9136.61	8950.00	8720.31	26.51	23.09	338.61	-1048.16	-302.30	984.56	943.98	24.26	
9750.00	9148.59	8950.00	8720.31	27.14	23.09	337.95	-1048.16	-302.30	1033.55	993.16	25.59	
9800.00	9158.26	8938.35	8710.96	27.81	23.13	337.41	-1043.49	-297.15	1081.95	1041.70	26.88	
9850.00	9165.60	8931.59	8705.52	28.52	23.15	337.14	-1040.78	-294.22	1129.77	1089.67	28.18	
9900.00	9170.59	8924.03	8699.39	29.27	23.17	336.92	-1037.73	-290.99	1176.88	1136.92	29.45	
9944.86	9173.04	8916.60	8693.35	29.95	23.19	336.75	-1034.73	-287.87	1218.49	1178.61	30.55	
10000.00	9174.88	8900.00	8679.78	31.05	23.24	336.67	-1028.00	-281.09	1269.38	1228.98	31.42	
10100.00	9178.23	8900.00	8679.78	33.13	23.24	336.67	-1028.00	-281.09	1362.10	1320.85	33.02	
10200.00	9181.57	8877.02	8660.80	35.30	23.30	336.57	-1018.63	-272.14	1455.33	1413.08	34.45	
10300.00	9184.91	8863.56	8649.59	37.54	23.33	336.51	-1013.12	-267.13	1549.13	1505.89	35.83	
10400.00	9188.25	8850.00	8638.23	39.85	23.36	336.46	-1007.54	-262.26	1643.41	1599.13	37.12	
10500.00	9191.60	8850.00	8638.23	42.21	23.36	336.46	-1007.54	-262.26	1738.18	1692.88	38.38	
10600.00	9194.94	8828.63	8620.19	44.62	23.40	336.38	-998.73	-254.96	1833.14	1786.73	39.50	
10700.00	9198.28	8818.53	8611.60	47.07	23.42	336.35	-994.54	-251.66	1928.53	1881.02	40.59	
10800.00	9201.62	8800.00	8595.77	49.54	23.45	336.29	-986.85	-245.88	2024.29	1975.62	41.60	
10900.00	9204.97	8800.00	8595.77	52.05	23.45	336.29	-986.85	-245.88	2120.19	2070.41	42.59	
11000.00	9208.31	8800.00	8595.77	54.58	23.45	336.29	-986.85	-245.88	2216.45	2165.55	43.54	
11100.00	9211.65	8784.02	8582.02	57.13	23.47	336.25	-980.19	-241.17	2312.85	2260.75	44.40	
11200.00	9214.99	8776.62	8575.64	59.70	23.48	336.23	-977.11	-239.07	2409.50	2356.23	45.23	
11300.00	9218.34	8769.64	8569.60	62.28	23.49	336.21	-974.19	-237.15	2506.34	2451.88	46.02	
11400.00	9221.68	8750.00	8552.52	64.88	23.51	336.16	-965.97	-231.99	2603.47	2547.79	46.75	
11500.00	9225.02	8750.00	8552.52	67.49	23.51	336.16	-965.97	-231.99	2700.56	2643.68	47.48	
11600.00	9228.36	8750.00	8552.52	70.11	23.51	336.16	-965.97	-231.99	2797.85	2739.78	48.18	
11700.00	9231.71	8750.00	8552.52	72.74	23.51	336.16	-965.97	-231.99	2895.33	2836.05	48.84	
11800.00	9235.05	8750.00	8552.52	75.38	23.51	336.16	-965.97	-231.99	2992.97	2932.48	49.47	
11900.00	9238.39	8750.00	8552.52	78.03	23.51	336.16	-965.97	-231.99	3090.77	3029.05	50.08	



Weatherford Anticollision Report



Company: Devon Energy	Date: 3/19/2013	Time: 10:45:03	Page: 4
Field: Eddy Co. NM(NAD83)	Co-ordinate(NE) Reference: Well: Antares 23 Federal #4H. Grid North		
Reference Site: Antares 23 Federal #4H	Vertical (FVD) Reference: SITE 35650		
Reference Well: Antares 23 Federal #4H	Db: Sybase		
Reference Wellpath:			

Site: Aquila 22 Fed Com 4H
 Well: Aquila 22 Fed Com 4H
 Wellpath: 1 V0 Plan: Plan #1 V1

Inter-Site Error: 0.00 ft

Reference MD	TVD	Offset		Semi-Major Axis			Offset Location		Ctr-Ctr Edge		Separation	Warning
		MD	TVD	Ref	Offset	TFO-HS	North	East	Distance	Distance		
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
12000.00	9241.73	8729.95	8534.98	80.69	23.52	336.11	-957.56	-227.13	3188.42	3125.45	50.63	
12100.00	9245.08	8725.33	8530.92	83.35	23.52	336.10	-955.62	-226.06	3286.34	3222.12	51.17	
12200.00	9248.42	8720.91	8527.04	86.02	23.52	336.09	-953.76	-225.07	3384.36	3318.89	51.70	
12300.00	9251.76	8700.00	8508.60	88.69	23.53	336.05	-944.97	-220.62	3482.64	3415.90	52.18	
12400.00	9255.10	8700.00	8508.60	91.36	23.53	336.05	-944.97	-220.62	3580.75	3512.76	52.67	
12500.00	9258.45	8700.00	8508.60	94.05	23.53	336.05	-944.97	-220.62	3678.95	3609.72	53.14	
12600.00	9261.79	8700.00	8508.60	96.73	23.53	336.05	-944.97	-220.62	3777.25	3706.77	53.59	
12700.00	9265.13	8700.00	8508.60	99.42	23.53	336.05	-944.97	-220.62	3875.64	3803.90	54.02	
12800.00	9268.47	8700.00	8508.60	102.11	23.53	336.05	-944.97	-220.62	3974.11	3901.11	54.44	
12900.00	9271.82	8700.00	8508.60	104.81	23.53	336.05	-944.97	-220.62	4072.65	3998.40	54.85	
13000.00	9275.16	8700.00	8508.60	107.51	23.53	336.05	-944.97	-220.62	4171.27	4095.75	55.24	
13100.00	9278.50	8700.00	8508.60	110.21	23.53	336.05	-944.97	-220.62	4269.94	4193.16	55.61	
13200.00	9281.84	8700.00	8508.60	112.91	23.53	336.05	-944.97	-220.62	4368.68	4290.63	55.97	
13300.00	9285.19	8700.00	8508.60	115.62	23.53	336.05	-944.97	-220.62	4467.47	4388.16	56.33	
13400.00	9288.53	8680.17	8491.02	118.33	23.52	336.02	-936.61	-216.82	4566.07	4485.45	56.64	



Weatherford

Weatherford Drilling Services

GeoDec v5.03

Report Date: March 19, 2013
 Job Number: _____
 Customer: Devon Energy
 Well Name: Antares 23 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 598624.170 USFT	Latitude 32.6447275 DEG
East/West 690744.410 USFT	Longitude -103.8479322 DEG
Grid Convergence: .26°	
Total Correction: +7.35°	

Geodetic Location WGS84 Elevation = 0.0 Meters
 Latitude = 32.64473° N 32° 38 min 41.019 sec
 Longitude = 103.84793° W 103° 50 min 52.556 sec

Magnetic Declination =	7.61°	[True North Offset]	
Local Gravity =	.9988 g	Checksum =	6609
Local Field Strength =	48635 nT	Magnetic Vector X =	23783 nT
Magnetic Dip =	60.44°	Magnetic Vector Y =	3178 nT
Magnetic Model =	bggm2012	Magnetic Vector Z =	42304 nT
Spud Date =	Jun 15, 2013	Magnetic Vector H =	23994 nT

Signed: _____ Date: _____

Weatherford
Wft Plan Report X Y's.

Company: Devon Energy
Field: Eddy Co., NM (NAD 83)
Site: Antares 23 Federal #4H
Well: Antares 23 Federal #4H
Wellpath: 1

Date: 3/19/2013
Co-ordinate(NE) Refer
Vertical (TVD) Refere
Section (VS) Referenc
Survey Calculation Me

Plan: Plan #2

Date Composed:

Principal: Yes

Version:

Tied-to:

Site: Antares 23 Federal #4H

Site Position: Northing: 598624.17 ft Latitude:
From: Map Easting: 690744.41 ft Longitude: 1
Position Uncertainty: 0.00 ft North Reference:
Ground Level: 3545.00 ft Grid Convergence:

Well: Antares 23 Federal #4H

Slot Name:

Well Position: +N/-S 0.00 ft Northing: 598624.17 ft Latitude:
+E/-W 0.00 ft Easting : 690744.41 ft Longitude: 1
Position Uncertainty: 0.00 ft

Wellpath: 1

Drilled From:

Current Datum: SITE Height 3565.00 ft

Tie-on Depth:

Magnetic Data: 6/6/2013

Above System Datum

Field Strength: 48667 nT

Declination:

Vertical Section:Depth From (TVD)

+N/-S

Mag Dip Angle:

ft

ft

+E/-W

9305.00

0.00

ft

0.00

Plan Section Information

MD	Incl	Azim	TVD	+N/-S	+E/-W	DLS	Build
ft	deg	deg	ft	ft	ft	deg/100ft	deg/100f
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6073.00	0.00	0.00	6073.00	0.00	0.00	0.00	0.00
6906.49	25.00	187.55	6880.29	-177.45	-23.53	3.00	3.00
8418.48	25.00	187.55	8250.55	-811.02	-107.52	0.00	0.00
9944.86	88.08	89.67	9173.04	-1216.75	819.07	6.00	4.13
13892.78	88.08	89.67	9305.00	-1194.15	4764.72	0.00	0.00

Survey

MD	Incl	Azim	TVD	N/S	E/W	VS	DLS
ft	deg	deg	ft	ft	ft	ft	deg/100ft
6000.00	0.00	0.00	6000.00	0.00	0.00	0.00	0.00
6073.00	0.00	0.00	6073.00	0.00	0.00	0.00	0.00
6100.00	0.81	187.55	6100.00	-0.19	-0.03	0.02	3.00
6200.00	3.81	187.55	6199.91	-4.18	-0.55	0.48	3.00
6300.00	6.81	187.55	6299.47	-13.36	-1.77	1.53	3.00

6400.00	9.81	187.55	6398.40	-27.68	-3.67	3.17	3.00
6500.00	12.81	187.55	6496.45	-47.12	-6.25	5.40	3.00
6600.00	15.81	187.55	6593.34	-71.62	-9.49	8.20	3.00
6700.00	18.81	187.55	6688.80	-101.12	-13.40	11.58	3.00
6800.00	21.81	187.55	6782.57	-135.52	-17.97	15.52	3.00
6900.00	24.81	187.55	6874.40	-174.74	-23.17	20.01	3.00
6906.49	25.00	187.55	6880.29	-177.45	-23.53	20.32	3.00
7000.00	25.00	187.55	6965.03	-216.64	-28.72	24.81	0.00
7100.00	25.00	187.55	7055.66	-258.54	-34.27	29.61	0.00
7200.00	25.00	187.55	7146.28	-300.44	-39.83	34.40	0.00
7300.00	25.00	187.55	7236.91	-342.34	-45.38	39.20	0.00
7400.00	25.00	187.55	7327.54	-384.25	-50.94	44.00	0.00
7500.00	25.00	187.55	7418.17	-426.15	-56.49	48.80	0.00
7600.00	25.00	187.55	7508.79	-468.05	-62.05	53.60	0.00
7700.00	25.00	187.55	7599.42	-509.96	-67.60	58.40	0.00
7800.00	25.00	187.55	7690.05	-551.86	-73.16	63.20	0.00
7900.00	25.00	187.55	7780.67	-593.76	-78.71	67.99	0.00
8000.00	25.00	187.55	7871.30	-635.66	-84.27	72.79	0.00
8100.00	25.00	187.55	7961.93	-677.57	-89.82	77.59	0.00
8200.00	25.00	187.55	8052.56	-719.47	-95.38	82.39	0.00
8300.00	25.00	187.55	8143.18	-761.37	-100.94	87.19	0.00
8400.00	25.00	187.55	8233.81	-803.28	-106.49	91.99	0.00
8418.48	25.00	187.55	8250.55	-811.02	-107.52	92.87	0.00
8500.00	24.78	175.93	8324.55	-845.16	-108.57	100.15	6.00
8600.00	25.71	162.00	8415.08	-886.72	-100.37	118.21	6.00
8700.00	27.85	149.53	8504.42	-927.52	-81.80	146.14	6.00
8800.00	30.95	139.03	8591.59	-967.11	-53.07	183.63	6.00
8900.00	34.74	130.45	8675.64	-1005.04	-14.50	230.27	6.00
9000.00	39.03	123.44	8755.64	-1040.91	33.50	285.55	6.00
9100.00	43.67	117.67	8830.72	-1074.33	90.40	348.87	6.00
9200.00	48.55	112.82	8900.05	-1104.91	155.58	419.53	6.00
9300.00	53.60	108.66	8962.88	-1132.34	228.32	496.75	6.00
9400.00	58.78	105.01	9018.52	-1156.32	307.82	579.70	6.00
9500.00	64.05	101.75	9066.35	-1176.57	393.22	667.45	6.00
9600.00	69.39	98.77	9105.86	-1192.87	483.57	759.06	6.00
9700.00	74.78	95.99	9136.61	-1205.05	577.90	853.52	6.00
9800.00	80.20	93.35	9158.26	-1212.98	675.16	949.79	6.00
9900.00	85.64	90.80	9170.59	-1216.57	774.28	1046.81	6.00
9944.86	88.08	89.67	9173.04	-1216.75	819.07	1090.30	6.00
10000.00	88.08	89.67	9174.88	-1216.43	874.18	1143.68	0.00
10100.00	88.08	89.67	9178.23	-1215.86	974.12	1240.48	0.00
10200.00	88.08	89.67	9181.57	-1215.29	1074.06	1337.29	0.00
10300.00	88.08	89.67	9184.91	-1214.72	1174.01	1434.09	0.00
10400.00	88.08	89.67	9188.25	-1214.14	1273.95	1530.90	0.00
10500.00	88.08	89.67	9191.60	-1213.57	1373.89	1627.70	0.00
10600.00	88.08	89.67	9194.94	-1213.00	1473.83	1724.51	0.00
10700.00	88.08	89.67	9198.28	-1212.43	1573.78	1821.31	0.00
10800.00	88.08	89.67	9201.62	-1211.85	1673.72	1918.12	0.00
10900.00	88.08	89.67	9204.97	-1211.28	1773.66	2014.92	0.00
11000.00	88.08	89.67	9208.31	-1210.71	1873.60	2111.73	0.00

11100.00	88.08	89.67	9211.65	-1210.14	1973.55	2208.53	0.00
11200.00	88.08	89.67	9214.99	-1209.56	2073.49	2305.34	0.00
11300.00	88.08	89.67	9218.34	-1208.99	2173.43	2402.14	0.00
11400.00	88.08	89.67	9221.68	-1208.42	2273.37	2498.95	0.00
11500.00	88.08	89.67	9225.02	-1207.85	2373.32	2595.75	0.00
11600.00	88.08	89.67	9228.36	-1207.28	2473.26	2692.56	0.00
11700.00	88.08	89.67	9231.71	-1206.70	2573.20	2789.36	0.00
11800.00	88.08	89.67	9235.05	-1206.13	2673.14	2886.17	0.00
11900.00	88.08	89.67	9238.39	-1205.56	2773.09	2982.97	0.00
12000.00	88.08	89.67	9241.73	-1204.99	2873.03	3079.78	0.00
12100.00	88.08	89.67	9245.08	-1204.41	2972.97	3176.58	0.00
12200.00	88.08	89.67	9248.42	-1203.84	3072.91	3273.39	0.00
12300.00	88.08	89.67	9251.76	-1203.27	3172.86	3370.19	0.00
12400.00	88.08	89.67	9255.10	-1202.70	3272.80	3467.00	0.00
12500.00	88.08	89.67	9258.45	-1202.12	3372.74	3563.80	0.00
12600.00	88.08	89.67	9261.79	-1201.55	3472.68	3660.61	0.00
12700.00	88.08	89.67	9265.13	-1200.98	3572.63	3757.41	0.00
12800.00	88.08	89.67	9268.47	-1200.41	3672.57	3854.22	0.00
12900.00	88.08	89.67	9271.82	-1199.83	3772.51	3951.02	0.00
13000.00	88.08	89.67	9275.16	-1199.26	3872.45	4047.83	0.00
13100.00	88.08	89.67	9278.50	-1198.69	3972.40	4144.63	0.00
13200.00	88.08	89.67	9281.84	-1198.12	4072.34	4241.44	0.00
13300.00	88.08	89.67	9285.19	-1197.54	4172.28	4338.24	0.00
13400.00	88.08	89.67	9288.53	-1196.97	4272.22	4435.05	0.00
13500.00	88.08	89.67	9291.87	-1196.40	4372.17	4531.85	0.00
13600.00	88.08	89.67	9295.21	-1195.83	4472.11	4628.66	0.00
13700.00	88.08	89.67	9298.56	-1195.25	4572.05	4725.46	0.00
13800.00	88.08	89.67	9301.90	-1194.68	4671.99	4822.27	0.00
13892.78	88.08	89.67	9305.00	-1194.15	4764.72	4912.08	0.00

Targets

Name	Description		TVD ft	+N/-S ft	+E/-W ft	Map	M
	Dip.	Dir.				Northing ft	Ea
LP Tgt			9173.04	-1216.75	819.07	597407.42	691
PBHL	1.92	89.67	9305.00	-1194.15	4764.72	597430.02	695
-Rectangle (3947x50)							

Casing Points

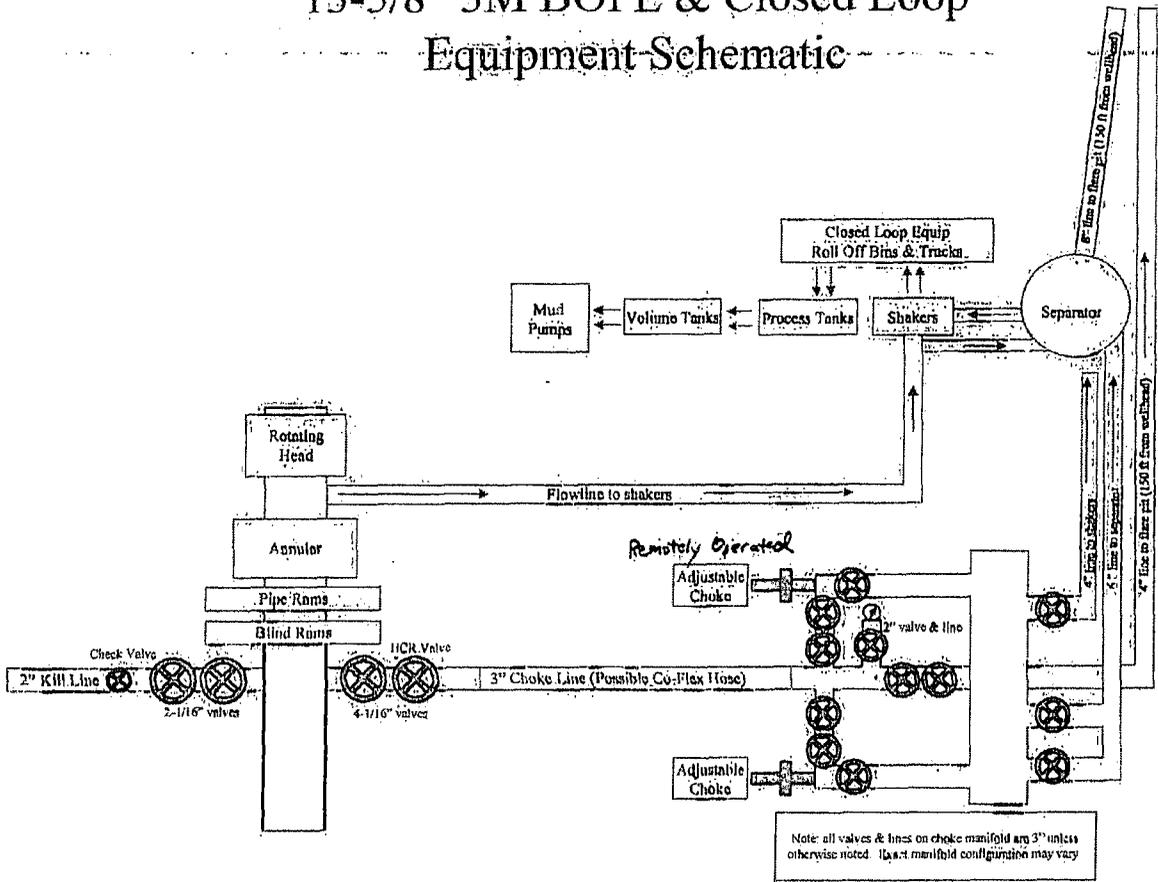
MD	TVD	Diameter	Hole Size	Name
----	-----	----------	-----------	------

Annotation

MD ft	TVD ft	
6073.00	6073.00	Nudge
6906.49	6880.28	Hold
8418.48	8250.56	KOP

9944.86	9173.04	LP
13892.77	9305.00	PBHL

13-5/8" 3M BOPE & Closed Loop Equipment Schematic



**PECOS DISTRICT
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Devon Energy Prod Co
LEASE NO.:	NM0107697
WELL NAME & NO.:	4H Antares 23 Federal
SURFACE HOLE FOOTAGE:	2080' FSL & 185' FWL
BOTTOM HOLE FOOTAGE:	0340' FSL & 0340' FEL
LOCATION:	Section 23, T.19 S., R.31 E., NMPM
COUNTY:	Eddy County, New Mexico

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

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

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

Eddy County

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

1. A Hydrogen Sulfide (H₂S) Drilling Plan should 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 are located, this does not include the dog house or stairway area.

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

B. CASING

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

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. 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 20 inch surface casing shall be set at approximately 670 feet (below the Magenta Dolomite member of the Rustler Anhydrite and above the salt) and cemented to the surface. If the salt is encountered, the casing shall be set 25' 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 first intermediate casing 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.**

If either DV tool cannot be set as proposed, operator shall submit a sundry requesting to move the tool and providing cement volumes.

3. The minimum required fill of cement behind the **9-5/8** inch second intermediate casing, **which shall be set in the base of the Capitan Reef at approximately 4300'**, is:

- a. First stage to DV tool, **which shall be set a minimum of 50 feet below the previous casing shoe:**

- 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.**

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

- 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 as proposed. Operator shall provide method of verification.

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

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review.** 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 **13-3/8** inch 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.

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.

WWI 032813

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy prod Co
LEASE NO.:	NM0107697
WELL NAME & NO.:	4H Antares 23 Federal
SURFACE HOLE FOOTAGE:	2190' FSL & 185' FWL
BOTTOM HOLE FOOTAGE:	1980' FSL & 340' FEL
LOCATION:	Section 23, T.19 S., R.31 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.

- General Provisions**
- Permit Expiration**
- Archaeology, Paleontology, and Historical Sites**
- Noxious Weeds**
- Special Requirements**
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
 - Hackberry Lake OHV Area
- Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- Road Section Diagram**
- Drilling**
 - H₂S – Onshore Order #6
 - Logging Requirements
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- Interim Reclamation**
- Final Abandonment & Reclamation**

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 OHV Special Recreation Management Area (SRMA)

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. 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 6 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.

Surfacing

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

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

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

Crowning

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

Ditching

Ditching shall be required on both sides of the road.

Turnouts

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

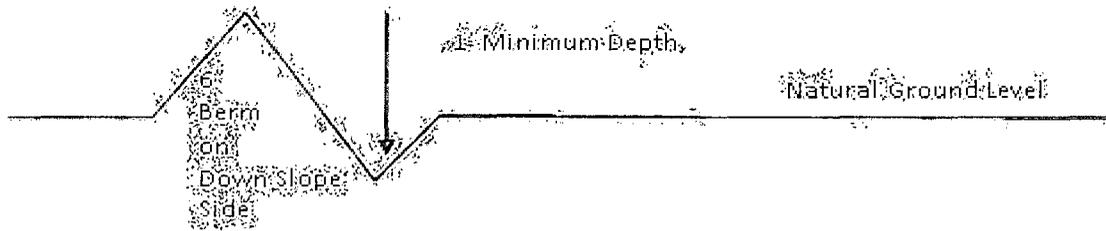


Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Culvert Installations

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

Cattleguards

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

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

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

Fence Requirement

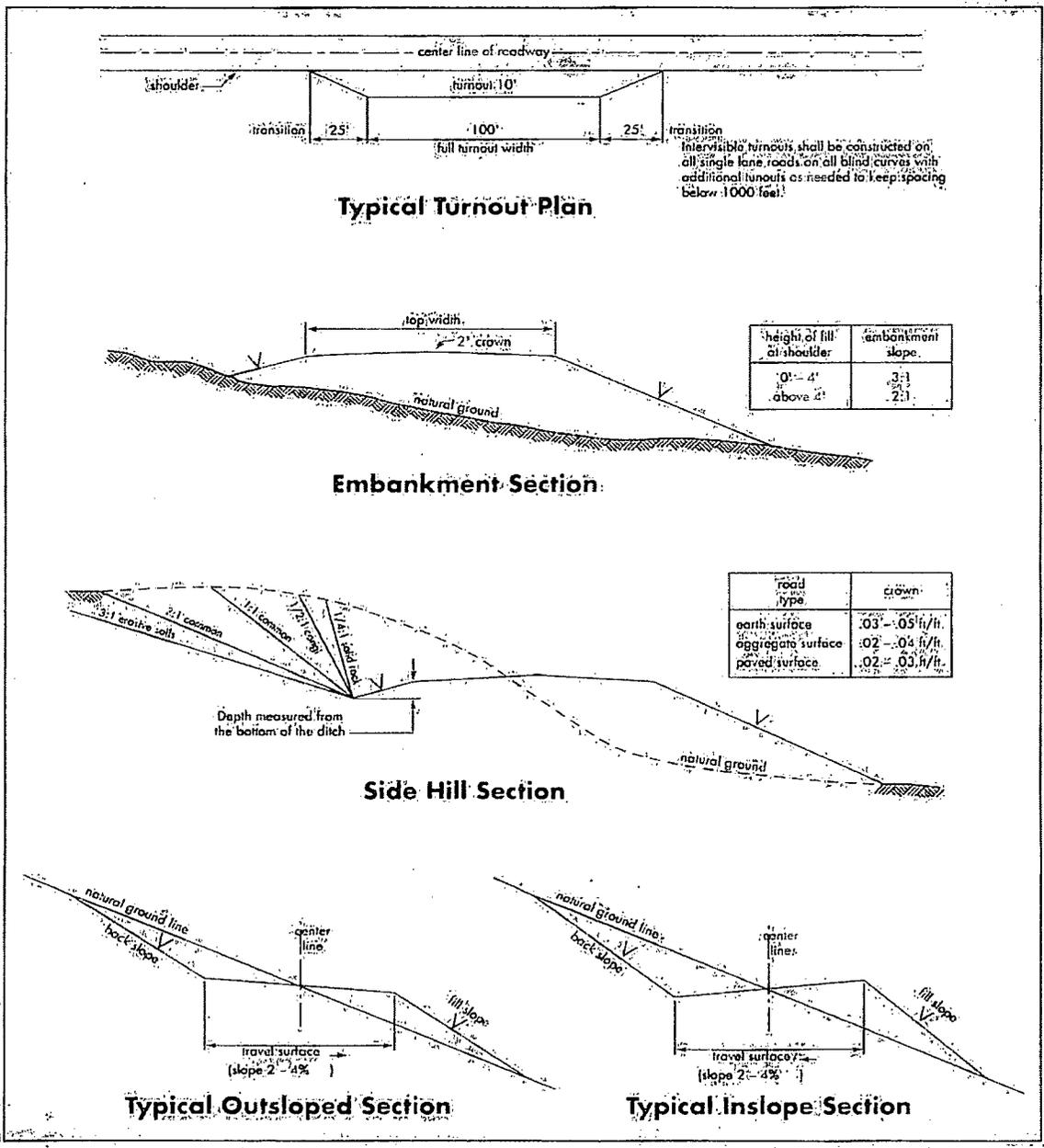
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

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

Public Access

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

Figure 1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

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

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

Eddy County

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

1. A Hydrogen Sulfide (H₂S) Drilling Plan should 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. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

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

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. 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 **20** inch surface casing shall be set at **approximately 670 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.
2. The minimum required fill of cement behind the **13-3/8** inch 1st intermediate casing 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.**

3. The minimum required fill of cement behind the **9-5/8** inch 2nd intermediate casing is: **(Set casing in the base of the Capitan Reef at approximately 4300')**
DV tool shall be set a minimum of 50 feet below previous casing shoe.
 - 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.**
4. 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 as proposed. Operator shall provide method of verification.
5. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

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

2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review.** 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** inch 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 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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VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Containment Structures

The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

Painting Requirement

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color Shale Green, Munsell Soil Color Chart # 5Y 4/2

B. PIPELINES – not requested

C. ELECTRIC LINES – not requested

IX. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

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.

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

<u>Species</u>	<u>lb/acre</u>
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

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