

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 30-015-44097	² Pool Code 98199	³ Pool Name PARKWAY; BONE SPRING, WEST
⁴ Property Code 317514	⁵ Property Name EMERALD PWU 20-21	⁶ Well Number 12H
⁷ OGRID No. 6137	⁸ Operator Name DEVON ENERGY PRODUCTION COMPANY, L.P.	⁹ Elevation 3313.8

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	20	19 S	29 E		15	SOUTH	265	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	21	19 S	29 E		440	SOUTH	330	EAST	EDDY

¹² Dedicated Acres 320	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.

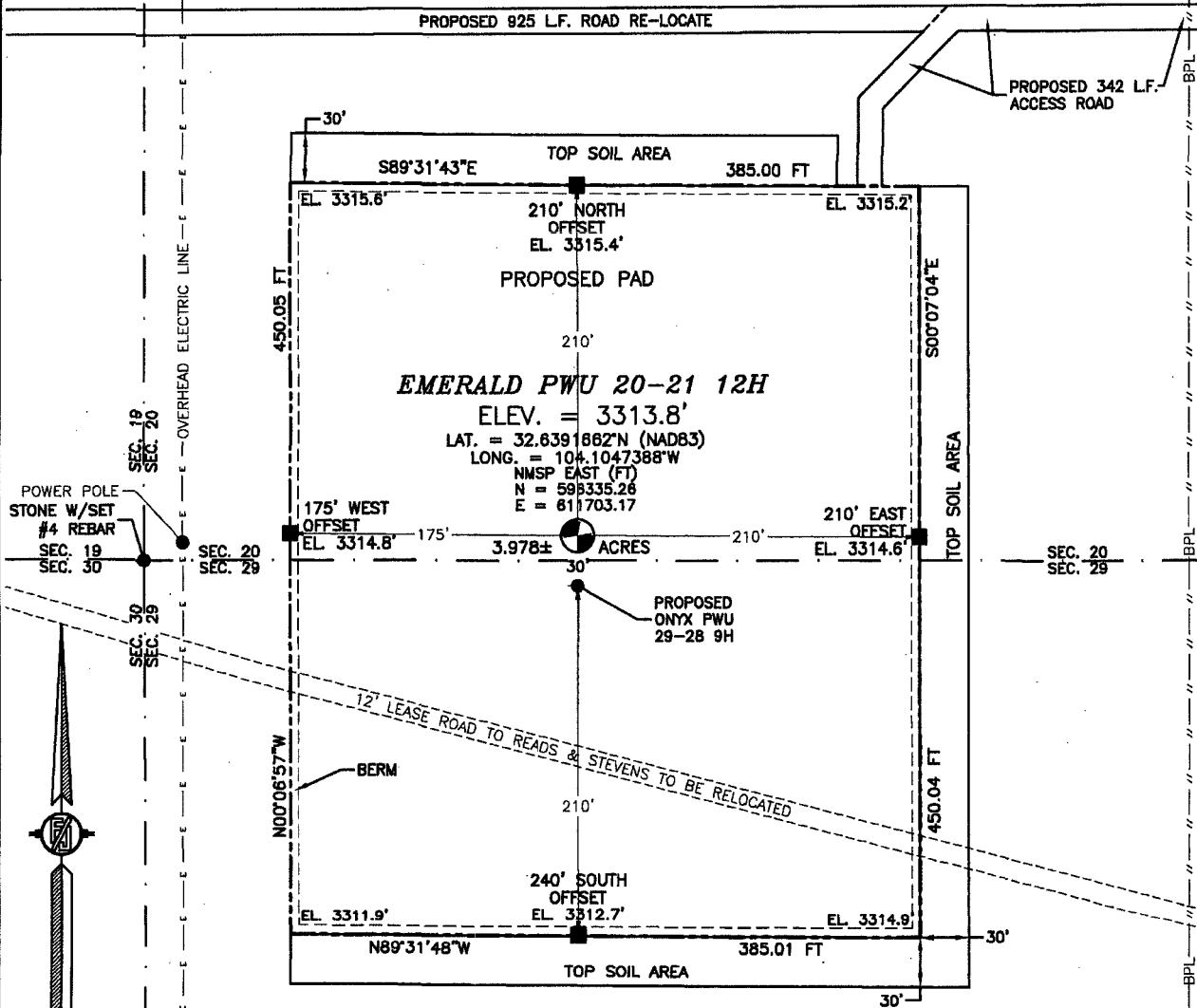
¹⁶ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Erin Workman</i> 03/02/2017 Signature Date Erin Workman Printed Name Erin.workman@dvn.com E-mail Address		¹⁷ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. MARCH 1, 2017 Date of Survey <i>William F. Jaramillo</i> Signature and Seal of Professional Surveyor Certificate Number: 12790 SURVEY NO. 5145B	
NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE. ELEVATION VALUES ARE NAVD83. W/4 CORNER SEC. 20 LAT. = 32.6463832°N LONG. = 104.1055990°W NMSP EAST (FT) N = 601599.76 E = 611427.11 N/4 CORNER SEC. 20 LAT. = 32.6536028°N LONG. = 104.0970017°W NMSP EAST (FT) N = 601592.59 E = 614073.11 SECTION CORNER LAT. = 32.6535924°N LONG. = 104.0883657°W NMSP EAST (FT) N = 601594.86 E = 616731.03 N/4 CORNER SEC. 21 LAT. = 32.6535538°N LONG. = 104.0797751°W NMSP EAST (FT) N = 601586.93 E = 619375.01 NE CORNER SEC. 21 LAT. = 32.6535398°N LONG. = 104.0711864°W NMSP EAST (FT) N = 601588.25 E = 622018.36 W/4 CORNER SEC. 20 LAT. = 32.6463832°N LONG. = 104.1055990°W NMSP EAST (FT) N = 599980.29 E = 611432.86 SEC. 20 EMERALD PWU 20-21 12H ELEV. = 3313.8' QUARTER CORNER LAT. = 32.6483286°N LONG. = 104.0883964°W NMSP EAST (FT) N = 598952.19 E = 616727.68 SEC. 21 E/4 CORNER SEC. 21 LAT. = 32.6462644°N LONG. = 104.0712566°W NMSP EAST (FT) N = 598941.42 E = 622003.29 W/4 CORNER SEC. 20 LAT. = 32.6391287°N LONG. = 104.1055990°W NMSP EAST (FT) N = 598321.06 E = 611438.23 S/4 CORNER SEC. 20 LAT. = 32.6390910°N LONG. = 104.0968797°W NMSP EAST (FT) N = 598313.14 E = 614091.64 SECTION CORNER LAT. = 32.6390569°N LONG. = 104.0883927°W NMSP EAST (FT) N = 598311.43 E = 616734.90 S/4 CORNER SEC. 21 LAT. = 32.6390356°N LONG. = 104.0798189°W NMSP EAST (FT) N = 598305.14 E = 619374.13 SE CORNER SEC. 21 LAT. = 32.6390370°N LONG. = 104.0712463°W NMSP EAST (FT) N = 598312.05 E = 622012.94 SURFACE LOCATION 265' BOTTOM OF HOLE LAT. = 32.6402460°N LONG. = 104.0723198°W NMSP EAST (FT) N = 596751.08 E = 621681.41 BOTTOM OF HOLE 330'			

Accepted for record • NMOCD

RWP 3-9-17

**SECTION 20, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
SITE MAP**

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE. ELEVATION VALUES ARE NAVD88.



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM CR. 235 (CURRY COMB) AND CR. 256 (MILLMAN) GO EAST-SOUTHEAST ON CR. 235 4.4 MILES, TURN RIGHT ON CALICHE ROAD GO SOUTH 1.2 MILES TO STAKED ROAD ON RIGHT, FOLLOW FLAGS WEST ABOUT 342 FT. TO NORTHEAST CORNER OF PROPOSED PAD.

**DEVON ENERGY PRODUCTION COMPANY, L.P.
EMERALD PWU 20-21 12H**

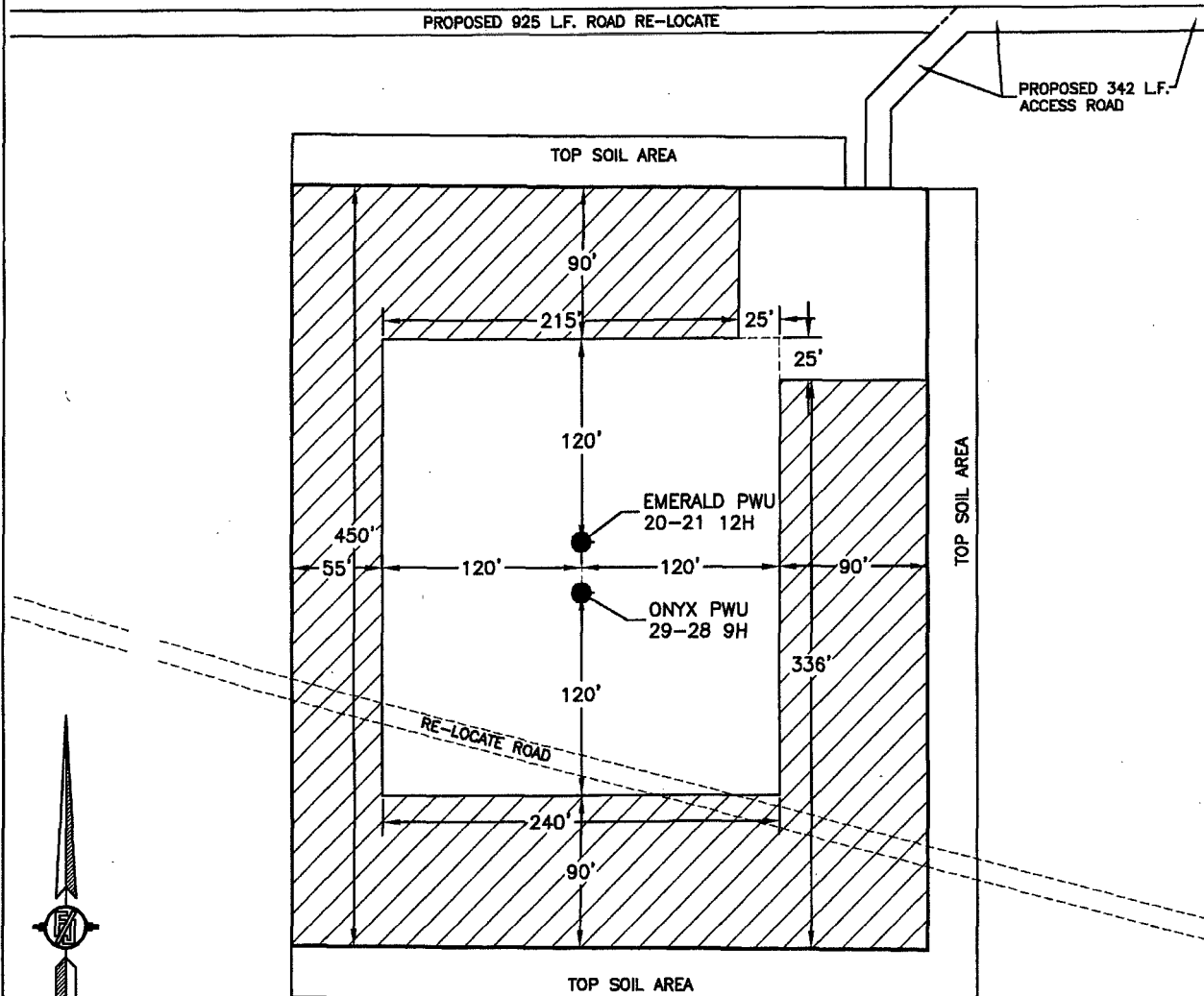
**LOCATED 15 FT. FROM THE SOUTH LINE
AND 265 FT. FROM THE WEST LINE OF
SECTION 20, TOWNSHIP 19 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO**

MARCH 1, 2017

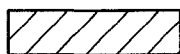
SURVEY NO. 5145B

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

SECTION 20, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
INTERIM SITE RECLAMATION



0 10 50 100 200
SCALE 1" = 100'

 DENOTES RECLAMATION AREA
2.206± ACRES RECLAMATION AREA

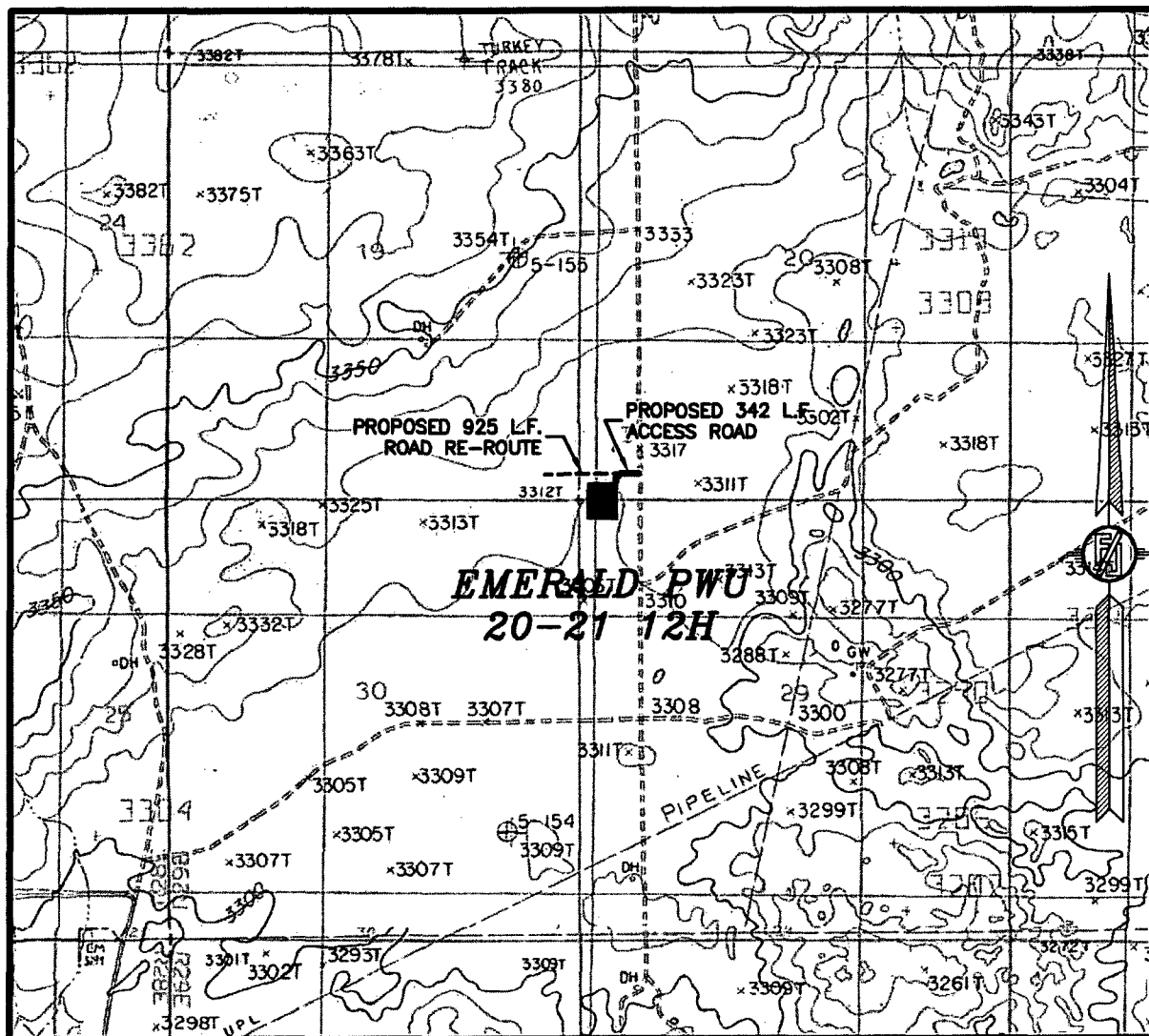
DEVON ENERGY PRODUCTION COMPANY, L.P.
EMERALD PWU 20-21 12H
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EDDY COUNTY, STATE OF NEW MEXICO

MARCH 1, 2017

SURVEY NO. 5145B

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

SECTION 20, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
LOCATION VERIFICATION MAP



USGS QUAD MAP:
ILLINOIS CAMP NE

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.
EMERALD PWU 20-21 12H

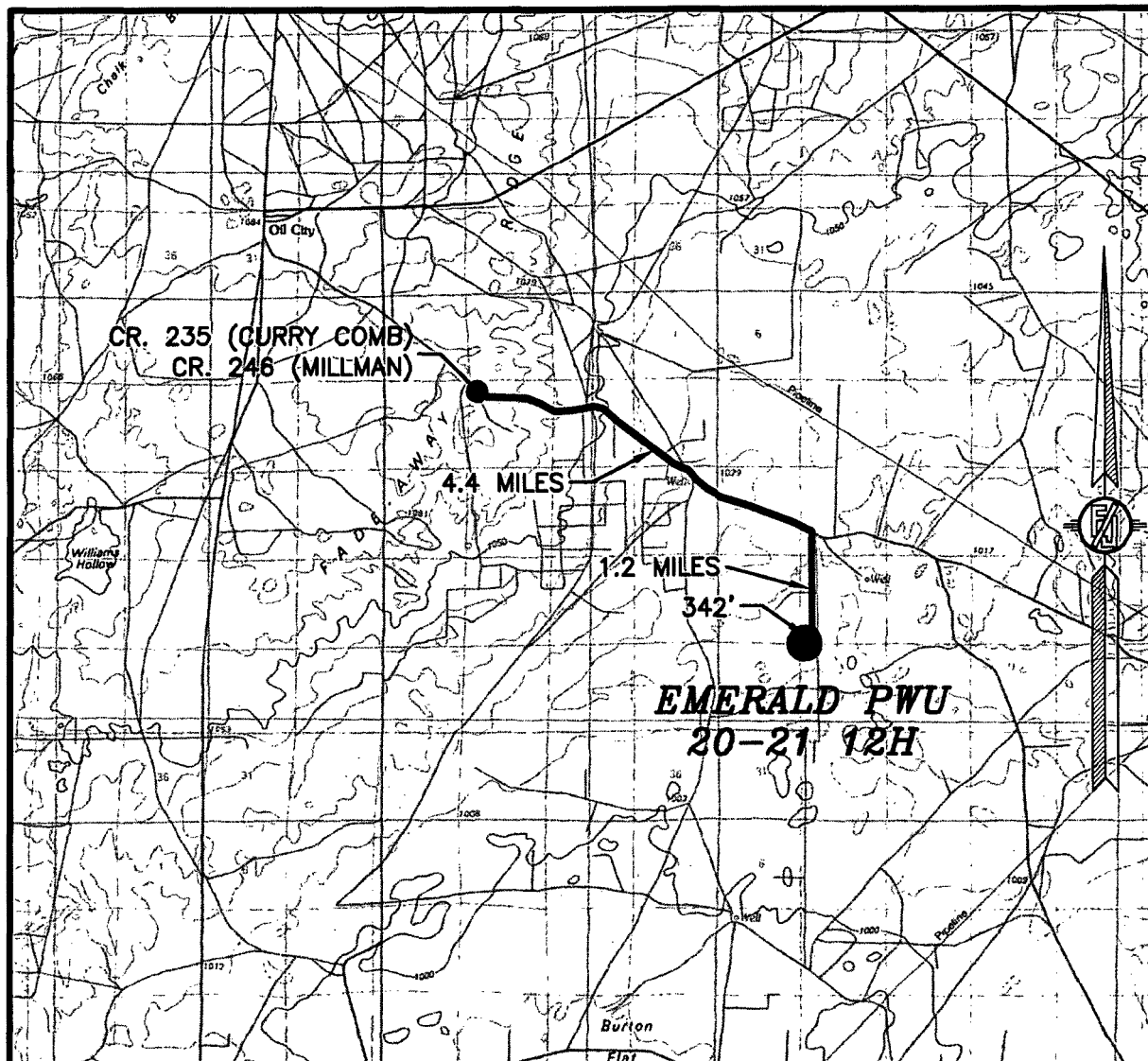
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EDDY COUNTY, STATE OF NEW MEXICO

MARCH 1, 2017

SURVEY NO. 5145B

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

SECTION 20, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION

FROM CR. 235 (CURRY COMB) AND CR. 256 (MILLMAN) GO EAST-SOUTHEAST ON CR. 235 4.4 MILES, TURN RIGHT ON CALICHE ROAD GO SOUTH 1.2 MILES TO STAKED ROAD ON RIGHT, FOLLOW FLAGS WEST ABOUT 342 FT. TO NORTHEAST CORNER OF PROPOSED PAD.

DEVON ENERGY PRODUCTION COMPANY, L.P.
EMERALD PWU 20-21 12H

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SECTION 20, TOWNSHIP 19 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 1, 2017

SURVEY NO. 5145B

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

SECTION 20, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 AERIAL ACCESS ROUTE MAP



NOT TO SCALE
 AERIAL PHOTO:
 GOOGLE EARTH
 MAR. 2016

DEVON ENERGY PRODUCTION COMPANY, L.P.
 EMERALD PWU 20-21 12H

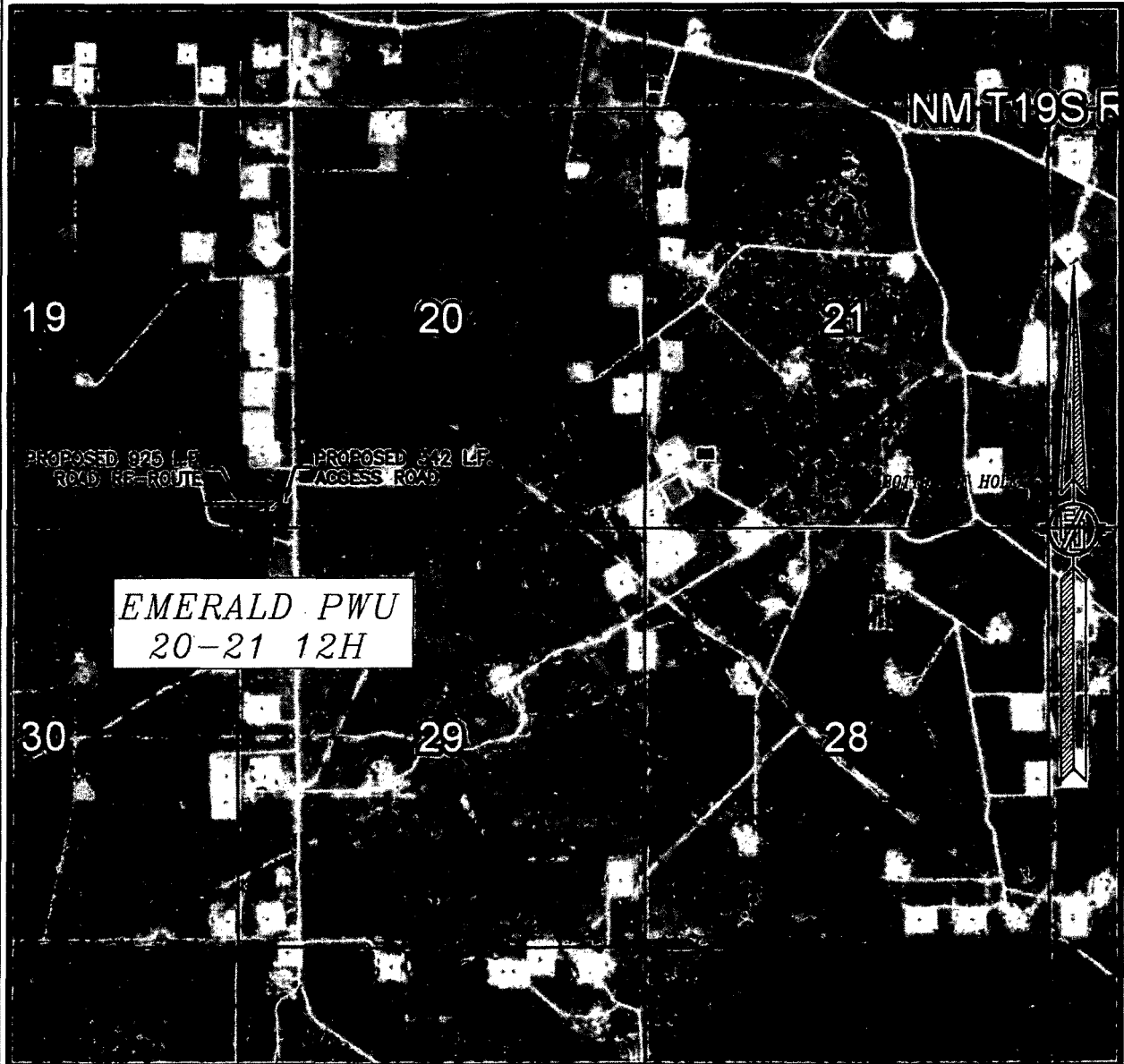
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 EDDY COUNTY, STATE OF NEW MEXICO

MARCH 1, 2017

SURVEY NO. 5145B

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

SECTION 20, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
MAR. 2016

DEVON ENERGY PRODUCTION COMPANY, L.P.
EMERALD PWU 20-21 12H

LOCATED 15 FT. FROM THE SOUTH LINE
AND 265 FT. FROM THE WEST LINE OF
SECTION 20, TOWNSHIP 19 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

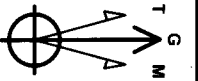
MARCH 1, 2017

SURVEY NO. 5145B

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

Devon Energy

Project: Eddy County, NM (NAD-83)
 Site: Emerald PWU 20-21
 Well: 12H
 Wellbore: OH
 Design: Plan #1



Azimuths to Grid North
 True North: -0.12°
 Magnetic North: 7.34°
 Magnetic Field
 Strength: 48234.4 nT
 Dip Angle: 60.52°
 Date: 2/28/2017
 Model: HDGM

PROJECT DETAILS: Eddy County, NM (NAD-83)

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Eastern Zone



3313.8 GE + 23.5 KB @ 3337.30 usft
 Ground Level: 3313.80

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3600.00	0.00	0.00	3600.00	0.00	0.00	0.00	0.00	0.00	
3	4124.09	5.24	332.66	4123.36	21.28	-11.00	1.00	332.66	-11.00	
4	8492.99	5.24	332.66	8473.99	375.77	-194.28	0.00	0.00	-194.28	
5	9236.87	89.50	90.00	8969.85	415.82	278.61	12.00	117.28	278.61	
6	18958.87	89.50	90.00	9054.50	415.82	9978.24	0.00	0.00	9978.24	

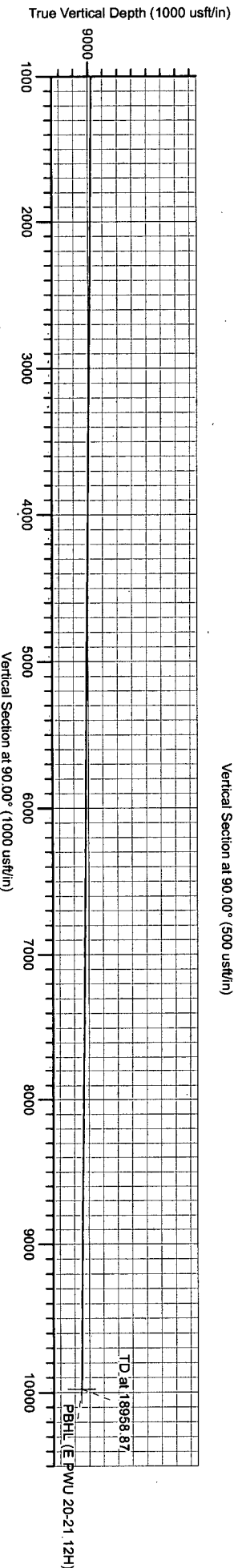
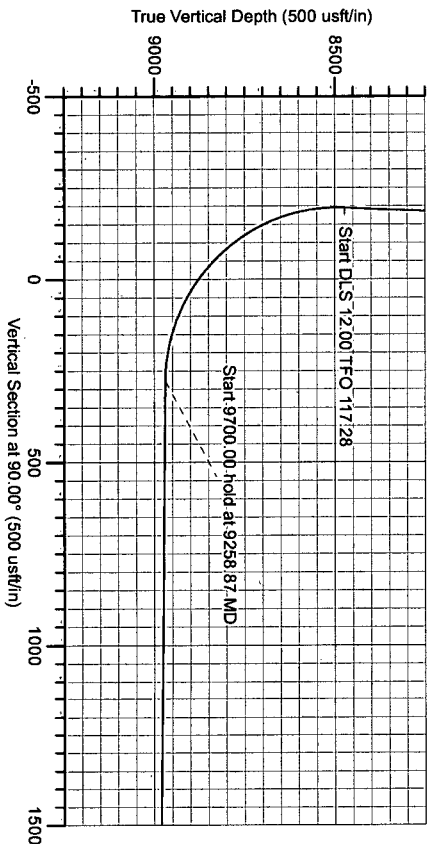
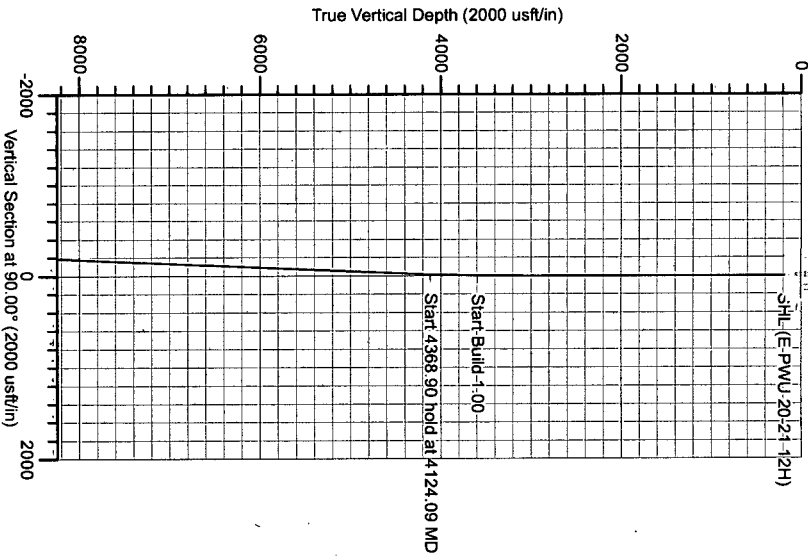
DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Latitude	Longitude
PBHL (E PWU 20-21 12H)	9054.50	415.82	9978.24	32° 38' 24.885 N	104° 6' 17.060 W
SHL (E PWU 20-21 12H)	0.00	0.00	0.00	32° 38' 20.998 N	

NM OIL CONSERVATION
 ARTESIA DISTRICT

MAR 06 2017

RECEIVED

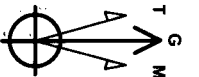


LEAM DRILLING SYSTEMS LLC
 2010 East Davis, Comroe, Texas 77301
 Phone: 936/756-7577, Fax: 936/756-7595

Plan: Plan #1 (12H/OH)
 Emerald PWU 20-21
 Created By: Brady Deaver
 Date: 10/04, March 02 2017
 Approved: _____ Date: _____

Devon Energy

Project: Eddy County, NM (NAD-83)
 Site: Emerald PWU 20-21
 Well: 12H
 Wellbore: OH
 Design: Plan #1



Azimuths to Grid North
 True North: -0.12°
 Magnetic North: 7.34°
 Magnetic Field
 Strength: 48234.4nT
 Dip Angle: 60.52°
 Date: 2/28/2017
 Model: HDGM

PROJECT DETAILS: Eddy County, NM (NAD-83)
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Eastern Zone

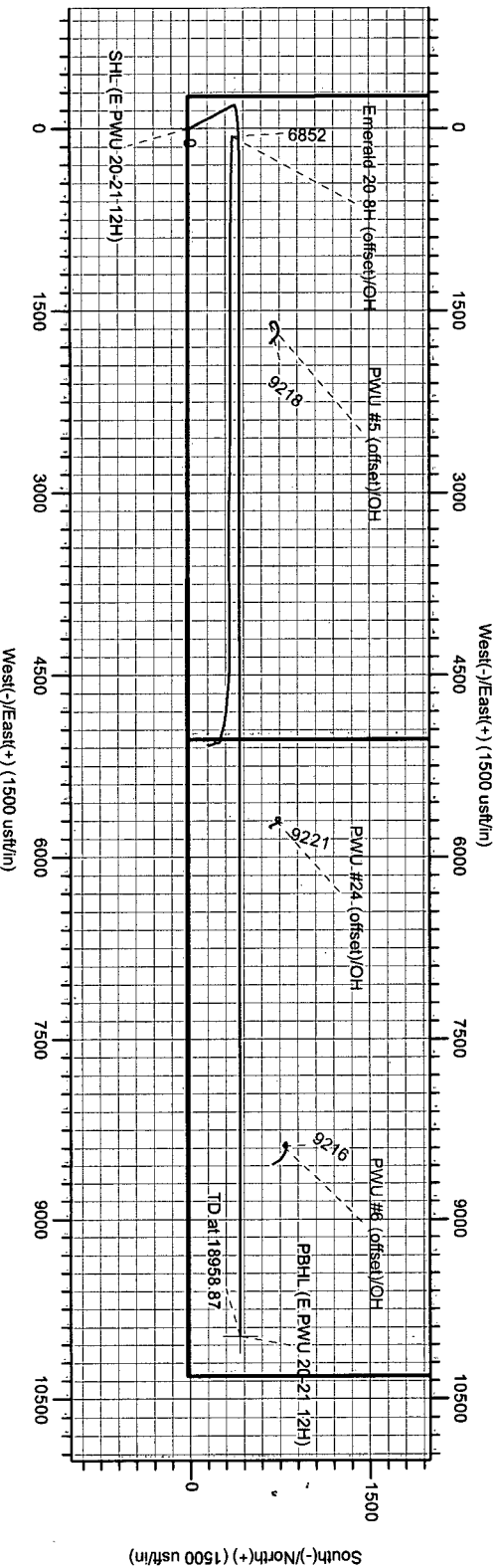


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (E PWU 20-21 12H)	9054.50	415.82	9978.24	586751.08	621681.41	32° 38' 24.885 N	104° 4' 20.351 W
SHL (E PWU 20-21 12H)	0.00	0.00	0.00	596335.26	611703.17	32° 38' 20.998 N	104° 6' 17.060 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3600.00	0.00	0.00	3600.00	0.00	0.00	0.00	0.00	0.00	
3	4124.09	5.24	332.66	4123.36	21.28	-11.00	1.00	332.66	-11.00	
4	8462.99	5.24	332.66	8473.99	375.77	-194.28	0.00	0.00	-194.28	
5	9258.87	89.50	90.00	8869.85	415.82	278.61	12.00	117.28	278.61	
6	18958.87	89.50	90.00	9054.50	415.82	9978.24	0.00	0.00	9978.24	



LEAM DRILLING SYSTEMS LLC
 2010 East Davis, Conroe, Texas 77301
 Phone: 936/756-7577, Fax: 936/756-7595

Plan: Plan #1 (12H)/OH
 Emerald PWU 20-21
 Created By: Brady Deaver
 Date: _____
 Approved: _____
 Date: 10-04, March 02 2017

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 06 2017

RECEIVED

Devon Energy

Eddy County, NM (NAD-83)

Emerald PWU 20-21

12H

OH

Plan: Plan #1

Standard Planning Report

02 March, 2017

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 12H
Company:	Devon Energy	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Project:	Eddy County, NM (NAD-83)	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site:	Emerald PWU 20-21	North Reference:	Grid
Well:	12H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project	Eddy County, NM (NAD-83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Emerald PWU 20-21		
Site Position:		Northing:	596,335.26 usft
From:	Map	Easting:	611,703.17 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 38' 20.998 N
		Longitude:	104° 6' 17.060 W
		Grid Convergence:	0.12 °

Well	12H		
Well Position	+N/-S	0.00 usft	Northing: 596,335.26 usft
	+E/-W	0.00 usft	Easting: 611,703.17 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 38' 20.998 N
		Longitude:	104° 6' 17.060 W
		Ground Level:	3,313.80 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	2/28/2017	7.47
			Dip Angle (°)
			60.52
			Field Strength (nT)
			48,234

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction (°)
			90.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,124.09	5.24	332.66	4,123.36	21.28	-11.00	1.00	1.00	0.00	332.66	
8,492.99	5.24	332.66	8,473.99	375.77	-194.28	0.00	0.00	0.00	0.00	
9,258.87	89.50	90.00	8,969.85	415.82	278.61	12.00	11.00	15.32	117.28	
18,958.87	89.50	90.00	9,054.50	415.82	9,978.24	0.00	0.00	0.00	0.00	PBHL (E PWU 20-21)

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 12H
Company:	Devon Energy	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Project:	Eddy County, NM (NAD-83)	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site:	Emerald PWU 20-21	North Reference:	Grid
Well:	12H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHL (E PWU 20-21 12H)									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	1.00	332.66	3,700.00	0.78	-0.40	-0.40	1.00	1.00	0.00
3,800.00	2.00	332.66	3,799.96	3.10	-1.60	-1.60	1.00	1.00	0.00
3,900.00	3.00	332.66	3,899.86	6.98	-3.61	-3.61	1.00	1.00	0.00
4,000.00	4.00	332.66	3,999.68	12.40	-6.41	-6.41	1.00	1.00	0.00
4,100.00	5.00	332.66	4,099.37	19.37	-10.01	-10.01	1.00	1.00	0.00
4,124.09	5.24	332.66	4,123.36	21.28	-11.00	-11.00	1.00	1.00	0.00
4,200.00	5.24	332.66	4,198.95	27.44	-14.19	-14.19	0.00	0.00	0.00
4,300.00	5.24	332.66	4,298.53	35.55	-18.38	-18.38	0.00	0.00	0.00
4,400.00	5.24	332.66	4,398.12	43.66	-22.58	-22.58	0.00	0.00	0.00
4,500.00	5.24	332.66	4,497.70	51.78	-26.77	-26.77	0.00	0.00	0.00
4,600.00	5.24	332.66	4,597.28	59.89	-30.97	-30.97	0.00	0.00	0.00
4,700.00	5.24	332.66	4,696.86	68.01	-35.16	-35.16	0.00	0.00	0.00
4,800.00	5.24	332.66	4,796.44	76.12	-39.36	-39.36	0.00	0.00	0.00
4,900.00	5.24	332.66	4,896.03	84.23	-43.55	-43.55	0.00	0.00	0.00
5,000.00	5.24	332.66	4,995.61	92.35	-47.75	-47.75	0.00	0.00	0.00
5,100.00	5.24	332.66	5,095.19	100.46	-51.94	-51.94	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 12H
Company:	Devon Energy	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Project:	Eddy County, NM (NAD-83)	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site:	Emerald PWU 20-21	North Reference:	Grid
Well:	12H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,200.00	5.24	332.66	5,194.77	108.58	-56.14	-56.14	0.00	0.00	0.00
5,300.00	5.24	332.66	5,294.35	116.69	-60.33	-60.33	0.00	0.00	0.00
5,400.00	5.24	332.66	5,393.94	124.80	-64.53	-64.53	0.00	0.00	0.00
5,500.00	5.24	332.66	5,493.52	132.92	-68.72	-68.72	0.00	0.00	0.00
5,600.00	5.24	332.66	5,593.10	141.03	-72.92	-72.92	0.00	0.00	0.00
5,700.00	5.24	332.66	5,692.68	149.15	-77.11	-77.11	0.00	0.00	0.00
5,800.00	5.24	332.66	5,792.26	157.26	-81.31	-81.31	0.00	0.00	0.00
5,900.00	5.24	332.66	5,891.85	165.37	-85.50	-85.50	0.00	0.00	0.00
6,000.00	5.24	332.66	5,991.43	173.49	-89.70	-89.70	0.00	0.00	0.00
6,100.00	5.24	332.66	6,091.01	181.60	-93.89	-93.89	0.00	0.00	0.00
6,200.00	5.24	332.66	6,190.59	189.72	-98.09	-98.09	0.00	0.00	0.00
6,300.00	5.24	332.66	6,290.17	197.83	-102.28	-102.28	0.00	0.00	0.00
6,400.00	5.24	332.66	6,389.76	205.94	-106.48	-106.48	0.00	0.00	0.00
6,500.00	5.24	332.66	6,489.34	214.06	-110.67	-110.67	0.00	0.00	0.00
6,600.00	5.24	332.66	6,588.92	222.17	-114.87	-114.87	0.00	0.00	0.00
6,700.00	5.24	332.66	6,688.50	230.29	-119.06	-119.06	0.00	0.00	0.00
6,800.00	5.24	332.66	6,788.08	238.40	-123.26	-123.26	0.00	0.00	0.00
6,900.00	5.24	332.66	6,887.66	246.51	-127.45	-127.45	0.00	0.00	0.00
7,000.00	5.24	332.66	6,987.25	254.63	-131.65	-131.65	0.00	0.00	0.00
7,100.00	5.24	332.66	7,086.83	262.74	-135.84	-135.84	0.00	0.00	0.00
7,200.00	5.24	332.66	7,186.41	270.86	-140.04	-140.04	0.00	0.00	0.00
7,300.00	5.24	332.66	7,285.99	278.97	-144.23	-144.23	0.00	0.00	0.00
7,400.00	5.24	332.66	7,385.57	287.08	-148.43	-148.43	0.00	0.00	0.00
7,500.00	5.24	332.66	7,485.16	295.20	-152.63	-152.63	0.00	0.00	0.00
7,600.00	5.24	332.66	7,584.74	303.31	-156.82	-156.82	0.00	0.00	0.00
7,700.00	5.24	332.66	7,684.32	311.43	-161.02	-161.02	0.00	0.00	0.00
7,800.00	5.24	332.66	7,783.90	319.54	-165.21	-165.21	0.00	0.00	0.00
7,900.00	5.24	332.66	7,883.48	327.65	-169.41	-169.41	0.00	0.00	0.00
8,000.00	5.24	332.66	7,983.07	335.77	-173.60	-173.60	0.00	0.00	0.00
8,100.00	5.24	332.66	8,082.65	343.88	-177.80	-177.80	0.00	0.00	0.00
8,200.00	5.24	332.66	8,182.23	352.00	-181.99	-181.99	0.00	0.00	0.00
8,300.00	5.24	332.66	8,281.81	360.11	-186.19	-186.19	0.00	0.00	0.00
8,400.00	5.24	332.66	8,381.39	368.22	-190.38	-190.38	0.00	0.00	0.00
8,492.99	5.24	332.66	8,473.99	375.77	-194.28	-194.28	0.00	0.00	0.00
8,500.00	4.91	341.43	8,480.98	376.34	-194.52	-194.52	12.00	-4.69	125.03
8,525.00	4.87	17.18	8,505.89	378.37	-194.55	-194.55	12.00	-0.16	143.00
8,550.00	6.43	43.73	8,530.77	380.39	-193.27	-193.27	12.00	6.22	106.19
8,575.00	8.77	58.15	8,555.56	382.41	-190.69	-190.69	12.00	9.35	57.70
8,600.00	11.42	66.25	8,580.17	384.41	-186.80	-186.80	12.00	10.60	32.39
8,625.00	14.20	71.27	8,604.54	386.39	-181.63	-181.63	12.00	11.15	20.08
8,650.00	17.06	74.65	8,628.62	388.35	-175.19	-175.19	12.00	11.44	13.53
8,675.00	19.96	77.08	8,652.32	390.27	-167.49	-167.49	12.00	11.60	9.72
8,700.00	22.89	78.92	8,675.59	392.16	-158.56	-158.56	12.00	11.70	7.33
8,725.00	25.83	80.35	8,698.36	394.01	-148.41	-148.41	12.00	11.76	5.75
8,750.00	28.78	81.51	8,720.58	395.81	-137.09	-137.09	12.00	11.81	4.64
8,775.00	31.74	82.48	8,742.17	397.56	-124.62	-124.62	12.00	11.84	3.84
8,800.00	34.71	83.29	8,763.08	399.26	-111.02	-111.02	12.00	11.87	3.25
8,825.00	37.68	83.99	8,783.25	400.89	-96.35	-96.35	12.00	11.89	2.80
8,850.00	40.66	84.60	8,802.63	402.46	-80.64	-80.64	12.00	11.90	2.45
8,875.00	43.63	85.14	8,821.17	403.95	-63.94	-63.94	12.00	11.91	2.17
8,900.00	46.61	85.63	8,838.80	405.38	-46.28	-46.28	12.00	11.92	1.94
8,925.00	49.60	86.07	8,855.50	406.72	-27.72	-27.72	12.00	11.93	1.76
8,950.00	52.58	86.47	8,871.20	407.99	-8.31	-8.31	12.00	11.93	1.61
8,975.00	55.56	86.84	8,885.86	409.17	11.89	11.89	12.00	11.94	1.49

LEAM Drilling Systems LLC

Planning Report

Database: EDM 5000.1 Multi User Db
Company: Devon Energy
Project: Eddy County, NM (NAD-83)
Site: Emerald PWU 20-21
Well: 12H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well 12H
TVD Reference: 3313.8' GE + 23.5' KB @ 3337.30usft
MD Reference: 3313.8' GE + 23.5' KB @ 3337.30usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,000.00	58.55	87.19	8,899.46	410.26	32.84	32.84	12.00	11.94	1.38
9,025.00	61.54	87.51	8,911.94	411.26	54.48	54.48	12.00	11.95	1.30
9,050.00	64.52	87.82	8,923.28	412.17	76.74	76.74	12.00	11.95	1.23
9,075.00	67.51	88.11	8,933.44	412.98	99.56	99.56	12.00	11.95	1.17
9,100.00	70.50	88.39	8,942.39	413.69	122.89	122.89	12.00	11.95	1.12
9,125.00	73.49	88.66	8,950.12	414.31	146.66	146.66	12.00	11.96	1.08
9,150.00	76.48	88.92	8,956.59	414.82	170.79	170.79	12.00	11.96	1.04
9,175.00	79.47	89.17	8,961.80	415.22	195.24	195.24	12.00	11.96	1.02
9,200.00	82.46	89.42	8,965.73	415.53	219.92	219.92	12.00	11.96	1.00
9,225.00	85.45	89.67	8,968.36	415.72	244.78	244.78	12.00	11.96	0.99
9,250.00	88.44	89.91	8,969.69	415.81	269.74	269.74	12.00	11.96	0.98
9,258.87	89.50	90.00	8,969.85	415.82	278.61	278.61	12.00	11.96	0.97
9,300.00	89.50	90.00	8,970.21	415.82	319.74	319.74	0.00	0.00	0.00
9,400.00	89.50	90.00	8,971.08	415.82	419.74	419.74	0.00	0.00	0.00
9,500.00	89.50	90.00	8,971.96	415.82	519.73	519.73	0.00	0.00	0.00
9,600.00	89.50	90.00	8,972.83	415.82	619.73	619.73	0.00	0.00	0.00
9,700.00	89.50	90.00	8,973.70	415.82	719.72	719.72	0.00	0.00	0.00
9,800.00	89.50	90.00	8,974.58	415.82	819.72	819.72	0.00	0.00	0.00
9,900.00	89.50	90.00	8,975.45	415.82	919.72	919.72	0.00	0.00	0.00
10,000.00	89.50	90.00	8,976.32	415.82	1,019.71	1,019.71	0.00	0.00	0.00
10,100.00	89.50	90.00	8,977.19	415.82	1,119.71	1,119.71	0.00	0.00	0.00
10,200.00	89.50	90.00	8,978.07	415.82	1,219.71	1,219.71	0.00	0.00	0.00
10,300.00	89.50	90.00	8,978.94	415.82	1,319.70	1,319.70	0.00	0.00	0.00
10,400.00	89.50	90.00	8,979.81	415.82	1,419.70	1,419.70	0.00	0.00	0.00
10,500.00	89.50	90.00	8,980.68	415.82	1,519.69	1,519.69	0.00	0.00	0.00
10,600.00	89.50	90.00	8,981.56	415.82	1,619.69	1,619.69	0.00	0.00	0.00
10,700.00	89.50	90.00	8,982.43	415.82	1,719.69	1,719.69	0.00	0.00	0.00
10,800.00	89.50	90.00	8,983.30	415.82	1,819.68	1,819.68	0.00	0.00	0.00
10,900.00	89.50	90.00	8,984.17	415.82	1,919.68	1,919.68	0.00	0.00	0.00
11,000.00	89.50	90.00	8,985.05	415.82	2,019.67	2,019.67	0.00	0.00	0.00
11,100.00	89.50	90.00	8,985.92	415.82	2,119.67	2,119.67	0.00	0.00	0.00
11,200.00	89.50	90.00	8,986.79	415.82	2,219.67	2,219.67	0.00	0.00	0.00
11,300.00	89.50	90.00	8,987.66	415.82	2,319.66	2,319.66	0.00	0.00	0.00
11,400.00	89.50	90.00	8,988.54	415.82	2,419.66	2,419.66	0.00	0.00	0.00
11,500.00	89.50	90.00	8,989.41	415.82	2,519.66	2,519.66	0.00	0.00	0.00
11,600.00	89.50	90.00	8,990.28	415.82	2,619.65	2,619.65	0.00	0.00	0.00
11,700.00	89.50	90.00	8,991.16	415.82	2,719.65	2,719.65	0.00	0.00	0.00
11,800.00	89.50	90.00	8,992.03	415.82	2,819.64	2,819.64	0.00	0.00	0.00
11,900.00	89.50	90.00	8,992.90	415.82	2,919.64	2,919.64	0.00	0.00	0.00
12,000.00	89.50	90.00	8,993.77	415.82	3,019.64	3,019.64	0.00	0.00	0.00
12,100.00	89.50	90.00	8,994.65	415.82	3,119.63	3,119.63	0.00	0.00	0.00
12,200.00	89.50	90.00	8,995.52	415.82	3,219.63	3,219.63	0.00	0.00	0.00
12,300.00	89.50	90.00	8,996.39	415.82	3,319.63	3,319.63	0.00	0.00	0.00
12,400.00	89.50	90.00	8,997.26	415.82	3,419.62	3,419.62	0.00	0.00	0.00
12,500.00	89.50	90.00	8,998.14	415.82	3,519.62	3,519.62	0.00	0.00	0.00
12,600.00	89.50	90.00	8,999.01	415.82	3,619.61	3,619.61	0.00	0.00	0.00
12,700.00	89.50	90.00	8,999.88	415.82	3,719.61	3,719.61	0.00	0.00	0.00
12,800.00	89.50	90.00	9,000.75	415.82	3,819.61	3,819.61	0.00	0.00	0.00
12,900.00	89.50	90.00	9,001.63	415.82	3,919.60	3,919.60	0.00	0.00	0.00
13,000.00	89.50	90.00	9,002.50	415.82	4,019.60	4,019.60	0.00	0.00	0.00
13,100.00	89.50	90.00	9,003.37	415.82	4,119.59	4,119.59	0.00	0.00	0.00
13,200.00	89.50	90.00	9,004.25	415.82	4,219.59	4,219.59	0.00	0.00	0.00
13,300.00	89.50	90.00	9,005.12	415.82	4,319.59	4,319.59	0.00	0.00	0.00
13,400.00	89.50	90.00	9,005.99	415.82	4,419.58	4,419.58	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 12H
Company:	Devon Energy	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Project:	Eddy County, NM (NAD-83)	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site:	Emerald PWU 20-21	North Reference:	Grid
Well:	12H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,500.00	89.50	90.00	9,006.86	415.82	4,519.58	4,519.58	0.00	0.00	0.00
13,600.00	89.50	90.00	9,007.74	415.82	4,619.58	4,619.58	0.00	0.00	0.00
13,700.00	89.50	90.00	9,008.61	415.82	4,719.57	4,719.57	0.00	0.00	0.00
13,800.00	89.50	90.00	9,009.48	415.82	4,819.57	4,819.57	0.00	0.00	0.00
13,900.00	89.50	90.00	9,010.35	415.82	4,919.56	4,919.56	0.00	0.00	0.00
14,000.00	89.50	90.00	9,011.23	415.82	5,019.56	5,019.56	0.00	0.00	0.00
14,100.00	89.50	90.00	9,012.10	415.82	5,119.56	5,119.56	0.00	0.00	0.00
14,200.00	89.50	90.00	9,012.97	415.82	5,219.55	5,219.55	0.00	0.00	0.00
14,300.00	89.50	90.00	9,013.84	415.82	5,319.55	5,319.55	0.00	0.00	0.00
14,400.00	89.50	90.00	9,014.72	415.82	5,419.55	5,419.55	0.00	0.00	0.00
14,500.00	89.50	90.00	9,015.59	415.82	5,519.54	5,519.54	0.00	0.00	0.00
14,600.00	89.50	90.00	9,016.46	415.82	5,619.54	5,619.54	0.00	0.00	0.00
14,700.00	89.50	90.00	9,017.34	415.82	5,719.53	5,719.53	0.00	0.00	0.00
14,800.00	89.50	90.00	9,018.21	415.82	5,819.53	5,819.53	0.00	0.00	0.00
14,900.00	89.50	90.00	9,019.08	415.82	5,919.53	5,919.53	0.00	0.00	0.00
15,000.00	89.50	90.00	9,019.95	415.82	6,019.52	6,019.52	0.00	0.00	0.00
15,100.00	89.50	90.00	9,020.83	415.82	6,119.52	6,119.52	0.00	0.00	0.00
15,200.00	89.50	90.00	9,021.70	415.82	6,219.51	6,219.51	0.00	0.00	0.00
15,300.00	89.50	90.00	9,022.57	415.82	6,319.51	6,319.51	0.00	0.00	0.00
15,400.00	89.50	90.00	9,023.44	415.82	6,419.51	6,419.51	0.00	0.00	0.00
15,500.00	89.50	90.00	9,024.32	415.82	6,519.50	6,519.50	0.00	0.00	0.00
15,600.00	89.50	90.00	9,025.19	415.82	6,619.50	6,619.50	0.00	0.00	0.00
15,700.00	89.50	90.00	9,026.06	415.82	6,719.50	6,719.50	0.00	0.00	0.00
15,800.00	89.50	90.00	9,026.93	415.82	6,819.49	6,819.49	0.00	0.00	0.00
15,900.00	89.50	90.00	9,027.81	415.82	6,919.49	6,919.49	0.00	0.00	0.00
16,000.00	89.50	90.00	9,028.68	415.82	7,019.48	7,019.48	0.00	0.00	0.00
16,100.00	89.50	90.00	9,029.55	415.82	7,119.48	7,119.48	0.00	0.00	0.00
16,200.00	89.50	90.00	9,030.42	415.82	7,219.48	7,219.48	0.00	0.00	0.00
16,300.00	89.50	90.00	9,031.30	415.82	7,319.47	7,319.47	0.00	0.00	0.00
16,400.00	89.50	90.00	9,032.17	415.82	7,419.47	7,419.47	0.00	0.00	0.00
16,500.00	89.50	90.00	9,033.04	415.82	7,519.47	7,519.47	0.00	0.00	0.00
16,600.00	89.50	90.00	9,033.92	415.82	7,619.46	7,619.46	0.00	0.00	0.00
16,700.00	89.50	90.00	9,034.79	415.82	7,719.46	7,719.46	0.00	0.00	0.00
16,800.00	89.50	90.00	9,035.66	415.82	7,819.45	7,819.45	0.00	0.00	0.00
16,900.00	89.50	90.00	9,036.53	415.82	7,919.45	7,919.45	0.00	0.00	0.00
17,000.00	89.50	90.00	9,037.41	415.82	8,019.45	8,019.45	0.00	0.00	0.00
17,100.00	89.50	90.00	9,038.28	415.82	8,119.44	8,119.44	0.00	0.00	0.00
17,200.00	89.50	90.00	9,039.15	415.82	8,219.44	8,219.44	0.00	0.00	0.00
17,300.00	89.50	90.00	9,040.02	415.82	8,319.43	8,319.43	0.00	0.00	0.00
17,400.00	89.50	90.00	9,040.90	415.82	8,419.43	8,419.43	0.00	0.00	0.00
17,500.00	89.50	90.00	9,041.77	415.82	8,519.43	8,519.43	0.00	0.00	0.00
17,600.00	89.50	90.00	9,042.64	415.82	8,619.42	8,619.42	0.00	0.00	0.00
17,700.00	89.50	90.00	9,043.51	415.82	8,719.42	8,719.42	0.00	0.00	0.00
17,800.00	89.50	90.00	9,044.39	415.82	8,819.42	8,819.42	0.00	0.00	0.00
17,900.00	89.50	90.00	9,045.26	415.82	8,919.41	8,919.41	0.00	0.00	0.00
18,000.00	89.50	90.00	9,046.13	415.82	9,019.41	9,019.41	0.00	0.00	0.00
18,100.00	89.50	90.00	9,047.01	415.82	9,119.40	9,119.40	0.00	0.00	0.00
18,200.00	89.50	90.00	9,047.88	415.82	9,219.40	9,219.40	0.00	0.00	0.00
18,300.00	89.50	90.00	9,048.75	415.82	9,319.40	9,319.40	0.00	0.00	0.00
18,400.00	89.50	90.00	9,049.62	415.82	9,419.39	9,419.39	0.00	0.00	0.00
18,500.00	89.50	90.00	9,050.50	415.82	9,519.39	9,519.39	0.00	0.00	0.00
18,600.00	89.50	90.00	9,051.37	415.82	9,619.39	9,619.39	0.00	0.00	0.00
18,700.00	89.50	90.00	9,052.24	415.82	9,719.38	9,719.38	0.00	0.00	0.00
18,800.00	89.50	90.00	9,053.11	415.82	9,819.38	9,819.38	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 12H
Company:	Devon Energy	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Project:	Eddy County, NM (NAD-83)	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site:	Emerald PWU 20-21	North Reference:	Grid
Well:	12H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,900.00	89.50	90.00	9,053.99	415.82	9,919.37	9,919.37	0.00	0.00	0.00
18,958.87	89.50	90.00	9,054.50	415.82	9,978.24	9,978.24	0.00	0.00	0.00
PBHL (E PWU 20-21 12H)									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL (E PWU 20-21 12H)	0.00	0.00	0.00	0.00	0.00	596,335.26	611,703.17	32° 38' 20.998 N	104° 6' 17.060 W
- plan hits target center									
- Point									
PBHL (E PWU 20-21 12H)	0.00	0.00	9,054.50	415.82	9,978.24	596,751.08	621,681.41	32° 38' 24.885 N	104° 4' 20.351 W
- plan hits target center									
- Point									

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 06 2017

RECEIVED

Devon Energy

Eddy County, NM (NAD-83)

Emerald PWU 20-21

12H

OH

Plan #1

Anticollision Report

02 March, 2017

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	3/2/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	18,958.87	Plan #1 (OH)	LEAM MWD+HDGM	MWD+HDGM	

Summary						
Site Name	Reference	Offset	Distance		Separation	Warning
	Measured	Measured	Between	Between		
Offset Well - Wellbore - Design	Depth	Depth	Centres	Ellipses	Factor	
	(usft)	(usft)	(usft)	(usft)		
Emerald PWU 20-21						
Emerald 20 8H (offset) - OH - OH	6,865.72	11,684.00	221.49	121.61	2.218	CC, ES, SF
PWU #24 (offset) - OH - OH	14,671.68	8,997.26	302.34	133.45	1.790	CC, ES, SF
PWU #5 (offset) - OH - OH	10,588.04	8,969.68	262.75	198.52	4.091	CC
PWU #5 (offset) - OH - OH	10,600.00	8,970.12	263.02	198.42	4.072	ES, SF
PWU #6 (offset) - OH - OH	17,359.74	9,032.12	363.68	129.99	1.556	CC, ES, SF

Offset Design												Offset Site Error:		0.00 usft
Survey Program: 100-ISCWSA-GYRO-3, 6428-MWD-ISCWSA												Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	88.24	156.02	5,081.22	5,083.67					
100.00	100.00	104.11	104.11	0.09	0.10	88.24	156.02	5,080.93	5,083.40	5,083.22	0.19	N/A		
200.00	200.00	234.82	234.81	0.31	0.32	88.25	155.48	5,079.83	5,082.55	5,081.90	0.64	7,891.001		
300.00	300.00	344.54	344.52	0.54	0.52	88.26	154.40	5,078.42	5,081.22	5,080.16	1.06	4,794.107		
400.00	400.00	443.87	443.83	0.76	0.69	88.27	153.16	5,077.17	5,079.93	5,078.47	1.46	3,487.480		
500.00	500.00	553.00	552.95	0.99	0.88	88.28	151.99	5,075.66	5,078.51	5,076.64	1.87	2,711.576		
600.00	600.00	637.64	637.58	1.21	1.03	88.29	151.10	5,074.44	5,077.06	5,074.81	2.24	2,262.964		
700.00	700.00	700.00	699.93	1.43	1.14	88.30	150.60	5,073.90	5,076.19	5,073.61	2.58	1,971.182		
800.00	800.00	783.50	783.43	1.66	1.29	88.30	150.18	5,073.61	5,075.84	5,072.89	2.95	1,723.258		
873.85	873.85	850.42	850.35	1.83	1.40	88.31	149.98	5,073.59	5,075.81	5,072.58	3.23	1,572.436		
900.00	900.00	875.33	875.26	1.88	1.45	88.31	149.91	5,073.60	5,075.81	5,072.48	3.33	1,524.223		
1,000.00	1,000.00	955.66	955.59	2.11	1.59	88.31	149.84	5,073.74	5,075.99	5,072.30	3.69	1,373.912		
1,100.00	1,100.00	1,033.49	1,033.41	2.33	1.72	88.31	150.13	5,074.23	5,076.64	5,072.58	4.05	1,252.021		
1,200.00	1,200.00	1,115.91	1,115.83	2.56	1.86	88.30	150.36	5,075.08	5,077.66	5,073.24	4.42	1,148.045		
1,300.00	1,300.00	1,201.88	1,201.79	2.78	2.01	88.30	150.81	5,076.21	5,079.00	5,074.21	4.80	1,058.734		
1,400.00	1,400.00	1,321.06	1,320.96	3.01	2.22	88.29	151.42	5,077.76	5,080.32	5,075.09	5.23	971.610		
1,500.00	1,500.00	1,441.76	1,441.65	3.23	2.43	88.29	152.05	5,078.69	5,081.09	5,075.42	5.66	897.160		
1,600.00	1,600.00	1,537.82	1,537.71	3.46	2.60	88.28	152.65	5,079.39	5,081.83	5,075.77	6.06	839.149		
1,700.00	1,700.00	1,639.86	1,639.75	3.68	2.78	88.27	153.41	5,080.13	5,082.58	5,076.12	6.46	786.916		
1,800.00	1,800.00	11,684.00	6,828.90	3.91	123.69	10.30	356.29	64.74	5,065.36	5,025.85	39.51	128.205		
1,900.00	1,900.00	11,684.00	6,828.90	4.13	123.69	10.30	356.29	64.74	4,965.62	4,926.14	39.48	125.764		
2,000.00	2,000.00	11,684.00	6,828.90	4.36	123.69	10.30	356.29	64.74	4,865.89	4,826.43	39.46	123.304		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3, 6428-MWD-ISCWSA												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
2,100.00	2,100.00	11,684.00	6,828.90	4.58	123.69	10.30	356.29	64.74	4,766.17	4,726.73	39.45	120.824	
2,200.00	2,200.00	11,684.00	6,828.90	4.81	123.69	10.30	356.29	64.74	4,666.47	4,627.03	39.44	118.324	
2,300.00	2,300.00	11,684.00	6,828.90	5.03	123.69	10.30	356.29	64.74	4,566.78	4,527.34	39.44	115.803	
2,400.00	2,400.00	11,684.00	6,828.90	5.26	123.69	10.30	356.29	64.74	4,467.10	4,427.66	39.44	113.262	
2,500.00	2,500.00	11,684.00	6,828.90	5.48	123.69	10.30	356.29	64.74	4,367.44	4,327.98	39.45	110.700	
2,600.00	2,600.00	11,684.00	6,828.90	5.71	123.69	10.30	356.29	64.74	4,267.79	4,228.31	39.47	108.116	
2,700.00	2,700.00	11,684.00	6,828.90	5.93	123.69	10.30	356.29	64.74	4,168.16	4,128.65	39.50	105.511	
2,800.00	2,800.00	11,684.00	6,828.90	6.15	123.69	10.30	356.29	64.74	4,068.55	4,029.00	39.54	102.884	
2,900.00	2,900.00	11,684.00	6,828.90	6.38	123.69	10.30	356.29	64.74	3,968.95	3,929.36	39.60	100.236	
3,000.00	3,000.00	11,684.00	6,828.90	6.60	123.69	10.30	356.29	64.74	3,869.38	3,829.72	39.66	97.566	
3,100.00	3,100.00	11,684.00	6,828.90	6.83	123.69	10.30	356.29	64.74	3,769.83	3,730.10	39.74	94.874	
3,200.00	3,200.00	11,684.00	6,828.90	7.05	123.69	10.30	356.29	64.74	3,670.31	3,630.48	39.82	92.162	
3,300.00	3,300.00	11,684.00	6,828.90	7.28	123.69	10.30	356.29	64.74	3,570.81	3,530.88	39.93	89.430	
3,400.00	3,400.00	11,684.00	6,828.90	7.50	123.69	10.30	356.29	64.74	3,471.34	3,431.29	40.05	86.678	
3,500.00	3,500.00	11,684.00	6,828.90	7.73	123.69	10.30	356.29	64.74	3,371.90	3,331.71	40.19	83.908	
3,600.00	3,600.00	11,684.00	6,828.90	7.95	123.69	10.30	356.29	64.74	3,272.49	3,232.15	40.34	81.120	
3,700.00	3,700.00	11,684.00	6,828.90	8.18	123.69	43.77	356.29	64.74	3,173.05	3,132.54	40.51	78.318	
3,800.00	3,799.98	11,684.00	6,828.90	8.40	123.69	51.40	356.29	64.74	3,073.52	3,032.75	40.76	75.396	
3,900.00	3,899.86	11,684.00	6,828.90	8.62	123.69	60.72	356.29	64.74	2,973.91	2,932.91	41.00	72.531	
4,000.00	3,999.68	11,684.00	6,828.90	8.84	123.69	71.70	356.29	64.74	2,874.26	2,833.03	41.22	69.727	
4,100.00	4,099.37	11,684.00	6,828.90	9.07	123.69	83.81	356.29	64.74	2,774.58	2,733.16	41.42	66.984	
4,124.09	4,123.36	11,684.00	6,828.90	9.12	123.69	86.78	356.29	64.74	2,750.57	2,709.10	41.47	66.333	
4,200.00	4,198.95	11,684.00	6,828.90	9.29	123.69	86.78	356.29	64.74	2,674.91	2,633.30	41.61	64.286	
4,300.00	4,298.53	11,684.00	6,828.90	9.52	123.69	86.78	356.29	64.74	2,575.27	2,533.45	41.81	61.590	
4,400.00	4,398.12	11,684.00	6,828.90	9.75	123.69	86.78	356.29	64.74	2,475.65	2,433.62	42.04	58.895	
4,500.00	4,497.70	11,684.00	6,828.90	9.98	123.69	86.78	356.29	64.74	2,376.07	2,333.79	42.28	56.201	
4,600.00	4,597.28	11,684.00	6,828.90	10.22	123.69	86.78	356.29	64.74	2,276.52	2,233.98	42.54	53.512	
4,700.00	4,696.86	11,684.00	6,828.90	10.45	123.69	86.78	356.29	64.74	2,177.02	2,134.19	42.83	50.828	
4,800.00	4,796.44	11,684.00	6,828.90	10.69	123.69	86.78	356.29	64.74	2,077.56	2,034.42	43.15	48.150	
4,900.00	4,696.03	11,684.00	6,828.90	10.92	123.69	86.78	356.29	64.74	1,978.16	1,934.67	43.49	45.482	
5,000.00	4,995.61	11,684.00	6,828.90	11.16	123.69	86.78	356.29	64.74	1,878.83	1,834.95	43.87	42.823	
5,100.00	5,095.19	11,684.00	6,828.90	11.40	123.69	86.78	356.29	64.74	1,779.56	1,735.27	44.29	40.176	
5,200.00	5,194.77	11,684.00	6,828.90	11.64	123.69	86.78	356.29	64.74	1,680.39	1,635.63	44.76	37.542	
5,300.00	5,294.35	11,684.00	6,828.90	11.89	123.69	86.78	356.29	64.74	1,581.31	1,536.03	45.28	34.923	
5,400.00	5,393.94	11,684.00	6,828.90	12.13	123.69	86.78	356.29	64.74	1,482.37	1,436.50	45.86	32.320	
5,500.00	5,493.52	11,684.00	6,828.90	12.37	123.69	86.78	356.29	64.74	1,383.57	1,337.04	46.53	29.736	
5,600.00	5,593.10	11,684.00	6,828.90	12.62	123.69	86.78	356.29	64.74	1,284.96	1,237.67	47.29	27.173	
5,700.00	5,692.68	11,684.00	6,828.90	12.86	123.69	86.78	356.29	64.74	1,186.58	1,138.41	48.17	24.634	
5,800.00	5,792.26	11,684.00	6,828.90	13.11	123.69	86.78	356.29	64.74	1,088.50	1,039.29	49.21	22.121	
5,900.00	5,891.85	11,684.00	6,828.90	13.36	123.69	86.78	356.29	64.74	990.80	940.35	50.44	19.641	
6,000.00	5,991.43	11,684.00	6,828.90	13.61	123.69	86.78	356.29	64.74	893.61	841.66	51.95	17.200	
6,100.00	6,091.01	11,684.00	6,828.90	13.85	123.69	86.78	356.29	64.74	797.12	743.28	53.83	14.807	
6,200.00	6,190.59	11,684.00	6,828.90	14.10	123.69	86.78	356.29	64.74	701.60	645.37	56.24	12.476	
6,300.00	6,290.17	11,684.00	6,828.90	14.35	123.69	86.78	356.29	64.74	607.54	548.14	59.39	10.229	
6,400.00	6,389.76	11,684.00	6,828.90	14.60	123.69	86.78	356.29	64.74	515.71	452.03	63.68	8.099	
6,500.00	6,489.34	11,684.00	6,828.90	14.86	123.69	86.78	356.29	64.74	427.57	357.91	69.65	6.139	
6,600.00	6,588.92	11,684.00	6,828.90	15.11	123.69	86.78	356.29	64.74	345.93	267.88	78.05	4.432	
6,700.00	6,688.50	11,684.00	6,828.90	15.36	123.69	86.78	356.29	64.74	276.63	187.60	89.03	3.107	
6,800.00	6,788.08	11,684.00	6,828.90	15.61	123.69	86.78	356.29	64.74	231.04	132.12	98.92	2.336	
6,865.72	6,853.53	11,684.00	6,828.90	15.78	123.69	86.78	356.29	64.74	221.49	121.61	99.88	2.218 CC, ES, SF	
6,900.00	6,887.66	11,684.00	6,828.90	15.86	123.69	86.78	356.29	64.74	224.13	126.41	97.72	2.294	
7,000.00	6,987.25	11,684.00	6,828.90	16.12	123.69	86.78	356.29	64.74	259.01	174.24	84.78	3.055	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error: 0.00 usft	
Survey Program: 100-ISCWSA-GYRO-3, 6428-MWD-ISCWSA													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
7,100.00	7,086.83	11,684.00	6,828.90	16.37	123.69	86.78	356.29	64.74	322.40	250.85	71.55	4.506		
7,200.00	7,186.41	11,684.00	6,828.90	16.63	123.69	86.78	356.29	64.74	401.00	338.40	62.59	6.406		
7,300.00	7,285.99	11,684.00	6,828.90	16.88	123.69	86.78	356.29	64.74	487.50	430.39	57.11	8.536		
7,400.00	7,385.57	11,684.00	6,828.90	17.14	123.69	86.78	356.29	64.74	578.37	524.60	53.77	10.757		
7,500.00	7,485.16	11,684.00	6,828.90	17.39	123.69	86.78	356.29	64.74	671.84	620.16	51.68	13.001		
7,600.00	7,584.74	11,684.00	6,828.90	17.65	123.69	86.78	356.29	64.74	766.95	716.61	50.34	15.236		
7,700.00	7,684.32	11,684.00	6,828.90	17.90	123.69	86.78	356.29	64.74	863.18	813.71	49.47	17.449		
7,800.00	7,783.90	11,684.00	6,828.90	18.16	123.69	86.78	356.29	64.74	960.17	911.27	48.90	19.635		
7,900.00	7,883.48	11,684.00	6,828.90	18.41	123.69	86.78	356.29	64.74	1,057.73	1,009.19	48.53	21.794		
8,000.00	7,983.07	11,684.00	6,828.90	18.67	123.69	86.78	356.29	64.74	1,155.70	1,107.39	48.30	23.925		
8,100.00	8,082.65	11,684.00	6,828.90	18.93	123.69	86.78	356.29	64.74	1,253.99	1,205.82	48.18	26.029		
8,200.00	8,182.23	11,684.00	6,828.90	19.19	123.69	86.78	356.29	64.74	1,352.53	1,304.41	48.12	28.107		
8,300.00	8,281.81	11,684.00	6,828.90	19.44	123.69	86.78	356.29	64.74	1,451.28	1,403.16	48.12	30.159		
8,400.00	8,381.39	11,684.00	6,828.90	19.70	123.69	86.78	356.29	64.74	1,550.18	1,502.02	48.16	32.186		
8,492.99	8,473.99	11,684.00	6,828.90	19.94	123.69	86.78	356.29	64.74	1,642.27	1,594.03	48.23	34.049		
8,500.00	8,480.98	11,684.00	6,828.90	19.96	123.69	80.92	356.29	64.74	1,649.21	1,600.97	48.24	34.189		
8,525.00	8,505.89	11,684.00	6,828.90	20.01	123.69	52.41	356.29	64.74	1,673.85	1,625.59	48.26	34.687		
8,550.00	8,530.77	11,684.00	6,828.90	20.06	123.69	30.29	356.29	64.74	1,698.26	1,649.99	48.27	35.181		
8,575.00	8,555.56	11,684.00	6,828.90	20.11	123.69	18.83	356.29	64.74	1,722.40	1,674.12	48.29	35.671		
8,600.00	8,580.17	11,684.00	6,828.90	20.15	123.69	12.86	356.29	64.74	1,746.21	1,697.91	48.30	36.154		
8,625.00	8,604.54	11,684.00	6,828.90	20.19	123.69	9.45	356.29	64.74	1,769.64	1,721.33	48.31	36.631		
8,650.00	8,628.62	11,684.00	6,828.90	20.23	123.69	7.33	356.29	64.74	1,792.64	1,744.32	48.32	37.101		
8,675.00	8,652.32	11,684.00	6,828.90	20.27	123.69	5.92	356.29	64.74	1,815.16	1,766.84	48.33	37.561		
8,700.00	8,675.59	11,684.00	6,828.90	20.30	123.69	4.94	356.29	64.74	1,837.17	1,788.84	48.33	38.013		
8,725.00	8,698.36	11,684.00	6,828.90	20.34	123.69	4.22	356.29	64.74	1,858.61	1,810.28	48.33	38.454		
8,750.00	8,720.58	11,684.00	6,828.90	20.36	123.69	3.69	356.29	64.74	1,879.46	1,831.13	48.33	38.884		
8,775.00	8,742.17	11,684.00	6,828.90	20.39	123.69	3.27	356.29	64.74	1,899.68	1,851.35	48.33	39.303		
8,800.00	8,763.08	11,684.00	6,828.90	20.41	123.69	2.95	356.29	64.74	1,919.23	1,870.90	48.33	39.709		
8,825.00	8,783.25	11,684.00	6,828.90	20.43	123.69	2.69	356.29	64.74	1,938.07	1,889.75	48.33	40.102		
8,850.00	8,802.63	11,684.00	6,828.90	20.45	123.69	2.48	356.29	64.74	1,956.19	1,907.87	48.32	40.482		
8,875.00	8,821.17	11,684.00	6,828.90	20.47	123.69	2.31	356.29	64.74	1,973.54	1,925.23	48.32	40.846		
8,900.00	8,838.80	11,684.00	6,828.90	20.49	123.69	2.17	356.29	64.74	1,990.11	1,941.80	48.31	41.196		
8,925.00	8,855.50	11,684.00	6,828.90	20.50	123.69	2.05	356.29	64.74	2,005.86	1,957.56	48.30	41.529		
8,950.00	8,871.20	11,684.00	6,828.90	20.52	123.69	1.95	356.29	64.74	2,020.78	1,972.49	48.29	41.846		
8,975.00	8,885.86	11,684.00	6,828.90	20.53	123.69	1.87	356.29	64.74	2,034.84	1,986.56	48.28	42.145		
9,000.00	8,899.46	11,684.00	6,828.90	20.55	123.69	1.80	356.29	64.74	2,048.02	1,999.75	48.27	42.426		
9,025.00	8,911.94	11,678.11	6,828.95	20.59	123.55	1.76	356.13	70.62	2,060.29	2,012.06	48.23	42.718		
9,050.00	8,923.28	11,655.79	6,829.14	20.68	122.99	1.75	355.53	92.94	2,071.46	2,023.38	48.09	43.074		
9,075.00	8,933.44	11,632.91	6,829.33	20.82	122.42	1.74	354.92	115.81	2,081.48	2,033.52	47.95	43.408		
9,100.00	8,942.39	11,609.50	6,829.53	20.99	121.83	1.74	354.30	139.21	2,090.26	2,042.45	47.81	43.720		
9,125.00	8,950.12	11,583.86	6,829.76	21.18	121.19	1.74	353.65	164.84	2,097.81	2,050.15	47.66	44.017		
9,150.00	8,956.59	11,554.17	6,830.07	21.38	120.45	1.74	352.96	194.53	2,104.07	2,056.58	47.49	44.308		
9,175.00	8,961.80	11,520.45	6,830.55	21.60	119.60	1.75	352.23	228.24	2,108.96	2,061.66	47.29	44.592		
9,200.00	8,965.73	11,486.37	6,831.18	21.84	118.75	1.76	351.54	262.30	2,112.45	2,065.34	47.10	44.848		
9,225.00	8,968.36	11,445.33	6,832.17	22.09	117.73	1.77	350.75	303.32	2,114.50	2,067.63	46.87	45.111		
9,250.00	8,969.69	11,401.24	6,833.62	22.36	116.63	1.79	349.86	347.38	2,115.03	2,068.41	46.63	45.360		
9,258.87	8,969.85	11,385.59	6,834.23	22.46	116.24	1.80	349.53	363.01	2,114.85	2,068.31	46.54	45.441		
9,300.00	8,970.21	11,330.15	6,836.68	22.93	114.85	1.83	348.32	418.39	2,113.42	2,067.18	46.24	45.703		
9,400.00	8,971.08	11,204.20	6,843.47	24.24	111.71	1.91	345.46	544.12	2,108.96	2,063.36	45.60	46.250		
9,500.00	8,971.96	11,113.68	6,848.75	25.75	109.46	1.96	343.87	634.47	2,104.07	2,058.86	45.22	46.533		
9,600.00	8,972.83	11,009.22	6,854.52	27.43	106.86	2.00	342.70	738.76	2,099.47	2,054.67	44.80	46.867		
9,700.00	8,973.70	10,924.61	6,859.07	29.25	104.75	2.02	342.20	823.25	2,094.99	2,050.45	44.54	47.036		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - Emerald 20 8H (offset) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3, 6428-MWD-ISCWSA													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,800.00	8,974.58	10,823.89	8,863.97	31.19	102.25	2.01	342.42	923.85	2,090.99	2,048.77	44.22	47.282		
9,900.00	8,975.45	10,756.52	8,866.90	33.22	100.57	2.01	342.51	991.15	2,087.56	2,043.41	44.15	47.284		
10,000.00	8,976.32	10,670.87	8,869.20	35.33	98.44	2.02	342.45	1,076.78	2,085.69	2,041.71	43.99	47.415		
10,100.00	8,977.19	10,571.84	8,872.12	37.51	95.97	2.03	342.03	1,175.76	2,083.63	2,039.87	43.76	47.611		
10,200.00	8,978.07	10,466.85	8,874.84	39.74	93.36	2.05	341.19	1,280.71	2,081.96	2,038.44	43.52	47.838		
10,300.00	8,978.94	10,348.19	8,878.93	42.02	90.41	2.08	340.51	1,399.30	2,079.39	2,036.19	43.21	48.127		
10,400.00	8,979.81	10,270.62	8,881.57	44.34	88.48	2.09	340.16	1,476.82	2,076.90	2,033.71	43.19	48.090		
10,500.00	8,980.68	10,178.02	8,883.81	46.69	86.18	2.10	339.87	1,569.39	2,075.36	2,032.27	43.09	48.169		
10,600.00	8,981.56	10,087.40	8,885.87	49.07	83.93	2.11	339.52	1,659.99	2,073.98	2,030.97	43.01	48.220		
10,700.00	8,982.43	9,972.91	8,888.25	51.48	81.09	2.13	338.84	1,774.45	2,072.83	2,030.04	42.78	48.449		
10,800.00	8,983.30	9,831.51	8,893.78	53.90	77.58	2.14	338.67	1,915.74	2,069.69	2,027.32	42.38	48.839		
10,900.00	8,984.17	9,703.02	8,900.04	56.35	74.41	2.11	339.72	2,044.07	2,065.79	2,023.72	42.07	49.102		
11,000.00	8,985.05	9,600.75	8,906.52	58.81	71.89	2.09	340.86	2,146.13	2,060.28	2,018.32	41.96	49.098		
11,100.00	8,985.92	9,538.41	8,909.89	61.29	70.35	2.08	341.36	2,208.37	2,055.79	2,013.64	42.16	48.766		
11,200.00	8,986.79	9,487.00	8,911.59	63.78	69.08	2.08	341.36	2,259.76	2,053.44	2,011.01	42.43	48.390		
11,300.00	8,987.66	9,393.00	8,913.20	66.28	66.76	2.11	340.39	2,353.74	2,052.63	2,010.23	42.41	48.404		
11,400.00	8,988.54	9,272.02	8,915.63	68.79	63.77	2.16	338.58	2,474.67	2,051.60	2,009.41	42.19	48.632		
11,500.00	8,989.41	9,147.59	8,919.64	71.31	60.70	2.20	337.14	2,599.03	2,049.32	2,007.38	41.94	48.858		
11,600.00	8,990.28	9,042.44	8,924.08	73.84	58.12	2.21	336.84	2,704.09	2,045.97	2,004.12	41.85	48.883		
11,700.00	8,991.16	8,973.77	8,926.58	76.38	56.44	2.23	336.46	2,772.71	2,043.31	2,001.26	42.05	48.595		
11,789.00	8,991.93	8,920.00	8,927.52	78.64	55.12	2.26	335.28	2,826.46	2,042.58	2,000.30	42.28	48.314		
11,800.00	8,992.03	8,912.14	8,927.59	78.92	54.92	2.27	335.04	2,834.31	2,042.59	2,000.30	42.30	48.292		
11,900.00	8,992.90	8,826.00	8,928.21	81.47	52.81	2.33	332.69	2,920.42	2,042.88	2,000.52	42.37	48.220		
12,000.00	8,993.77	8,731.00	8,928.32	84.02	50.48	2.41	330.01	3,015.38	2,043.76	2,001.38	42.38	48.230		
12,100.00	8,994.65	8,626.45	8,928.15	86.58	47.93	2.47	327.53	3,119.90	2,044.90	2,002.58	42.32	48.321		
12,200.00	8,995.52	8,507.43	8,928.87	89.15	45.03	2.52	325.91	3,238.91	2,045.22	2,003.06	42.16	48.514		
12,300.00	8,996.39	8,395.44	8,930.25	91.72	42.32	2.54	325.07	3,350.89	2,044.89	2,002.84	42.05	48.629		
12,400.00	8,997.26	8,271.62	8,932.80	94.29	39.35	2.55	325.00	3,474.67	2,043.73	2,001.87	41.85	48.831		
12,500.00	8,998.14	8,176.65	8,935.29	96.86	37.08	2.52	325.97	3,569.61	2,041.94	2,000.06	41.88	48.754		
12,600.00	8,999.01	8,104.14	8,936.60	99.44	35.36	2.49	327.04	3,642.10	2,040.97	1,998.88	42.09	48.490		
12,615.24	8,999.14	8,093.59	8,936.69	99.83	35.11	2.49	327.20	3,652.65	2,040.95	1,998.83	42.13	48.448		
12,700.00	8,999.88	8,036.98	8,938.77	102.02	33.77	2.46	328.21	3,709.25	2,041.52	1,999.18	42.34	48.216		
12,800.00	9,000.75	7,970.03	8,935.76	104.61	32.20	2.41	330.08	3,776.17	2,043.76	2,001.17	42.59	47.986		
12,900.00	9,001.63	7,852.62	8,933.98	107.19	29.49	2.31	333.40	3,893.51	2,045.98	2,003.53	42.45	48.195		
13,000.00	9,002.50	7,761.99	8,932.27	109.78	27.42	2.29	334.10	3,984.12	2,048.67	2,006.14	42.53	48.167		
13,100.00	9,003.37	7,603.07	8,932.24	112.37	23.86	2.30	333.52	4,143.03	2,049.42	2,007.32	42.10	48.682		
13,200.00	9,004.25	7,508.00	8,933.25	114.97	21.80	2.29	333.88	4,238.09	2,049.22	2,007.05	42.17	48.596		
13,203.61	9,004.28	7,504.65	8,933.28	115.06	21.73	2.29	333.87	4,241.45	2,049.22	2,007.05	42.17	48.592		
13,300.00	9,005.12	7,444.55	8,933.30	117.56	20.48	2.29	334.10	4,301.54	2,050.03	2,007.54	42.49	48.245		
13,400.00	9,005.99	7,375.43	8,932.05	120.16	19.08	2.29	333.97	4,370.68	2,052.66	2,008.87	42.78	47.979		
13,500.00	9,006.86	7,312.00	8,930.37	122.76	17.83	2.31	333.06	4,434.05	2,056.44	2,013.31	43.13	47.681		
13,600.00	9,007.74	7,249.00	8,927.64	125.36	16.65	2.37	330.85	4,496.95	2,062.00	2,018.49	43.50	47.398		
13,700.00	9,008.61	7,217.00	8,925.39	127.96	16.08	2.42	328.75	4,528.80	2,070.36	2,026.25	44.11	46.931		
13,800.00	9,009.48	7,164.09	8,920.41	130.56	15.17	2.55	323.85	4,581.25	2,081.31	2,036.70	44.61	46.653		
13,900.00	9,010.35	7,135.74	8,916.89	133.17	14.71	2.62	321.15	4,609.24	2,095.24	2,049.97	45.27	46.282		
14,000.00	9,011.23	7,123.00	8,914.95	135.78	14.51	2.65	319.89	4,621.77	2,112.78	2,066.78	46.00	45.926		
14,100.00	9,012.10	7,091.00	8,908.81	138.38	14.03	2.73	316.97	4,653.03	2,133.76	2,087.14	46.63	45.762		
14,200.00	9,012.97	7,091.00	8,908.81	140.99	14.03	2.73	316.97	4,653.03	2,158.68	2,111.32	47.36	45.584		
14,300.00	9,013.84	7,060.00	8,900.78	143.60	13.60	2.78	314.60	4,682.88	2,186.75	2,138.82	47.93	45.619		
14,400.00	9,014.72	7,044.04	8,895.85	146.21	13.39	2.80	313.52	4,698.01	2,218.48	2,169.95	48.53	45.716		
14,500.00	9,015.59	7,028.00	8,890.47	148.82	13.19	2.82	312.47	4,713.09	2,253.40	2,204.33	49.07	45.918		
14,600.00	9,016.46	7,028.00	8,890.47	151.43	13.19	2.82	312.47	4,713.09	2,291.90	2,242.31	49.59	46.218		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3, 6428-MWD-ISCWSA													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toelface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,700.00	9,017.34	6,992.18	6,876.83	154.05	12.80	2.88	309.93	4,746.10	2,332.49	2,282.44	50.04	46.808		
14,800.00	9,018.21	6,984.00	6,864.48	156.66	12.49	2.92	307.58	4,771.32	2,376.62	2,326.14	50.48	47.076		
14,900.00	9,019.08	6,984.00	6,864.48	158.28	12.49	2.92	307.58	4,771.32	2,423.16	2,372.31	50.85	47.652		
15,000.00	9,019.95	6,949.80	6,857.69	161.89	12.37	2.95	306.25	4,783.71	2,472.56	2,421.37	51.19	48.300		
15,100.00	9,020.83	6,933.00	6,849.08	164.51	12.22	2.98	304.51	4,798.04	2,524.61	2,473.10	51.51	49.012		
15,200.00	9,021.70	6,933.00	6,849.08	167.12	12.22	2.98	304.51	4,798.04	2,579.09	2,527.36	51.73	49.854		
15,300.00	9,022.57	6,915.02	6,839.24	169.74	12.08	3.02	302.49	4,812.94	2,635.80	2,583.81	52.00	50.692		
15,400.00	9,023.44	6,901.00	6,831.15	172.36	11.97	3.05	300.84	4,824.28	2,694.75	2,642.55	52.20	51.623		
15,500.00	9,024.32	6,901.00	6,831.15	174.98	11.97	3.05	300.84	4,824.28	2,755.81	2,703.49	52.32	52.676		
15,600.00	9,025.19	6,870.00	6,811.99	177.60	11.77	3.13	298.78	4,848.30	2,818.88	2,766.30	52.58	53.616		
15,700.00	9,026.06	6,870.00	6,811.99	180.22	11.77	3.13	298.78	4,848.30	2,883.42	2,830.78	52.64	54.776		
15,800.00	9,026.93	6,870.00	6,811.99	182.84	11.77	3.13	298.78	4,848.30	2,949.94	2,897.26	52.68	55.998		
15,900.00	9,027.81	6,852.48	6,800.45	185.46	11.68	3.18	294.34	4,861.26	3,017.95	2,965.14	52.82	57.142		
16,000.00	9,028.68	6,838.00	6,790.56	188.08	11.60	3.22	292.38	4,871.65	3,087.55	3,034.63	52.92	58.346		
16,100.00	9,029.55	6,838.00	6,790.56	190.70	11.60	3.22	292.38	4,871.65	3,158.54	3,105.63	52.91	59.700		
16,200.00	9,030.42	6,823.19	6,780.14	193.32	11.54	3.25	290.42	4,881.98	3,230.82	3,177.83	52.99	60.968		
16,300.00	9,031.30	6,807.00	6,768.39	195.94	11.47	3.29	288.36	4,892.93	3,304.43	3,251.35	53.08	62.254		
16,400.00	9,032.17	6,807.00	6,768.39	198.57	11.47	3.29	288.36	4,892.93	3,379.12	3,326.09	53.04	63.712		
16,500.00	9,033.04	6,807.00	6,768.39	201.19	11.47	3.29	288.36	4,892.93	3,455.10	3,402.11	52.99	65.208		
16,600.00	9,033.92	6,775.00	6,744.19	203.81	11.37	3.35	284.49	4,913.50	3,532.03	3,478.85	53.18	66.411		
16,700.00	9,034.79	6,775.00	6,744.19	206.44	11.37	3.35	284.49	4,913.50	3,609.76	3,556.64	53.12	67.950		
16,800.00	9,035.66	6,775.00	6,744.19	209.06	11.37	3.35	284.49	4,913.50	3,688.57	3,635.51	53.06	69.519		
16,900.00	9,036.53	6,775.00	6,744.19	211.69	11.37	3.35	284.49	4,913.50	3,768.37	3,715.38	52.99	71.115		
17,000.00	9,037.41	6,744.00	6,719.59	214.31	11.29	3.41	280.68	4,931.96	3,848.99	3,795.81	53.18	72.377		
17,100.00	9,038.28	6,744.00	6,719.59	216.94	11.29	3.41	280.68	4,931.96	3,930.16	3,877.05	53.11	74.003		
17,200.00	9,039.15	6,744.00	6,719.59	219.56	11.29	3.41	280.68	4,931.96	4,012.19	3,959.15	53.04	75.650		
17,300.00	9,040.02	6,744.00	6,719.59	222.19	11.29	3.41	280.68	4,931.96	4,095.01	4,042.05	52.96	77.318		
17,400.00	9,040.90	6,729.64	6,707.85	224.81	11.27	3.44	278.83	4,940.03	4,178.40	4,125.39	53.02	78.815		
17,500.00	9,041.77	6,712.00	6,693.18	227.44	11.25	3.47	276.54	4,949.55	4,262.56	4,209.46	53.10	80.279		
17,600.00	9,042.64	6,712.00	6,693.18	230.07	11.25	3.47	276.54	4,949.55	4,347.12	4,294.09	53.03	81.980		
17,700.00	9,043.51	6,712.00	6,693.18	232.69	11.25	3.47	276.54	4,949.55	4,432.32	4,379.36	52.96	83.696		
17,800.00	9,044.39	6,712.00	6,693.18	235.32	11.25	3.47	276.54	4,949.55	4,518.12	4,465.23	52.89	85.425		
17,900.00	9,045.26	6,712.00	6,693.18	237.95	11.25	3.47	276.54	4,949.55	4,604.50	4,551.68	52.82	87.167		
18,000.00	9,046.13	6,681.00	6,666.70	240.57	11.21	3.53	272.59	4,965.18	4,691.24	4,638.21	53.03	88.462		
18,100.00	9,047.01	6,681.00	6,666.70	243.20	11.21	3.53	272.59	4,965.18	4,778.35	4,725.38	52.97	90.209		
18,200.00	9,047.88	6,681.00	6,666.70	245.83	11.21	3.53	272.59	4,965.18	4,865.96	4,813.05	52.91	91.985		
18,300.00	9,048.75	6,681.00	6,666.70	248.46	11.21	3.53	272.59	4,965.18	4,954.04	4,901.18	52.85	93.730		
18,400.00	9,049.62	6,681.00	6,666.70	251.09	11.21	3.53	272.59	4,965.18	5,042.56	4,989.76	52.80	95.501		
18,500.00	9,050.50	6,681.00	6,666.70	253.71	11.21	3.53	272.59	4,965.18	5,131.51	5,078.76	52.75	97.280		
18,600.00	9,051.37	6,681.00	6,666.70	256.34	11.21	3.53	272.59	4,965.18	5,220.85	5,168.15	52.70	99.063		
18,700.00	9,052.24	6,649.00	6,638.42	258.97	11.19	3.58	268.74	4,979.63	5,310.42	5,257.49	52.93	100.326		
18,800.00	9,053.11	6,649.00	6,638.42	261.60	11.19	3.58	268.74	4,979.63	5,400.24	5,347.35	52.89	102.106		
18,900.00	9,053.99	6,649.00	6,638.42	264.23	11.19	3.58	268.74	4,979.63	5,490.42	5,437.57	52.85	103.890		
18,958.87	9,054.50	6,649.00	6,638.42	265.78	11.19	3.58	268.74	4,979.63	5,543.66	5,490.84	52.83	104.941		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #24 (offset) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (usft)	Highside Tooface (")	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	83.27		680.07	5,766.62	5,806.63				
100.00	100.00	178.55	178.54	0.09	0.24	83.29		678.26	5,765.13	5,805.79	5,805.43	0.36	N/A	
200.00	200.00	284.97	284.92	0.31	0.42	83.30		676.69	5,763.29	5,803.90	5,803.15	0.74	7,806.474	
300.00	300.00	389.54	389.47	0.54	0.60	83.32		675.15	5,761.48	5,802.00	5,800.86	1.15	5,062.790	
400.00	400.00	484.35	484.28	0.76	0.77	83.33		673.73	5,759.82	5,800.09	5,798.56	1.53	3,783.535	
500.00	500.00	591.42	591.29	0.99	0.96	83.34		672.06	5,757.96	5,798.19	5,796.24	1.95	2,980.977	
600.00	600.00	685.56	685.41	1.21	1.12	83.35		670.62	5,756.29	5,796.25	5,793.92	2.33	2,484.174	
700.00	700.00	773.21	773.03	1.43	1.28	83.37		669.42	5,754.86	5,794.47	5,791.76	2.71	2,138.113	
800.00	800.00	848.18	848.00	1.66	1.41	83.37		668.49	5,753.85	5,792.99	5,789.92	3.06	1,890.341	
900.00	900.00	924.06	923.87	1.88	1.54	83.38		667.68	5,753.19	5,792.00	5,788.58	3.42	1,692.912	
1,000.00	1,000.00	1,020.13	1,019.93	2.11	1.71	83.39		666.83	5,752.55	5,791.24	5,787.42	3.81	1,518.322	
1,100.00	1,100.00	1,123.85	1,123.45	2.33	1.89	83.39		666.15	5,751.80	5,790.44	5,786.22	4.22	1,372.068	
1,200.00	1,200.00	1,217.99	1,217.78	2.56	2.05	83.40		665.89	5,751.10	5,789.67	5,785.06	4.61	1,255.924	
1,300.00	1,300.00	1,313.48	1,313.27	2.78	2.22	83.39		666.01	5,750.45	5,789.01	5,784.00	5.00	1,157.440	
1,400.00	1,400.00	1,414.51	1,414.30	3.01	2.40	83.39		666.42	5,749.74	5,788.36	5,782.96	5.40	1,071.322	
1,500.00	1,500.00	1,514.71	1,514.49	3.23	2.57	83.38		667.11	5,749.01	5,787.71	5,781.91	5.80	997.359	
1,600.00	1,600.00	1,618.60	1,618.37	3.46	2.75	83.37		667.99	5,748.18	5,787.02	5,780.81	6.21	931.940	
1,700.00	1,700.00	1,720.19	1,719.96	3.68	2.93	83.36		668.94	5,747.32	5,786.28	5,779.67	6.61	875.079	
1,800.00	1,800.00	1,819.95	1,819.70	3.91	3.11	83.35		669.92	5,746.45	5,785.53	5,778.52	7.01	825.116	
1,900.00	1,900.00	1,915.83	1,915.58	4.13	3.27	83.34		671.01	5,745.61	5,784.80	5,777.39	7.40	781.252	
2,000.00	2,000.00	2,000.00	1,999.74	4.36	3.42	83.33		672.00	5,745.05	5,784.26	5,776.48	7.78	743.795	
2,100.00	2,100.00	2,118.47	2,118.19	4.58	3.63	83.31		673.46	5,744.16	5,783.65	5,775.45	8.21	704.535	
2,200.00	2,200.00	2,209.40	2,209.11	4.81	3.79	83.30		674.69	5,743.43	5,783.02	5,774.43	8.59	672.958	
2,300.00	2,300.00	2,310.82	2,310.53	5.03	3.97	83.29		676.05	5,742.70	5,782.45	5,773.46	9.00	642.767	
2,400.00	2,400.00	2,418.37	2,418.06	5.26	4.16	83.27		677.55	5,741.77	5,781.76	5,772.35	9.41	614.442	
2,500.00	2,500.00	2,503.18	2,502.86	5.48	4.30	83.26		678.79	5,741.13	5,781.17	5,771.39	9.78	590.912	
2,600.00	2,600.00	2,612.38	2,612.03	5.71	4.50	83.24		680.44	5,740.35	5,780.84	5,770.44	10.20	566.724	
2,700.00	2,700.00	2,719.68	2,719.32	5.93	4.69	83.22		682.17	5,739.38	5,779.93	5,769.32	10.61	544.578	
2,800.00	2,800.00	2,810.15	2,809.78	6.15	4.84	83.21		683.58	5,738.61	5,779.27	5,768.28	11.00	525.508	
2,900.00	2,900.00	2,901.32	2,900.94	6.38	5.00	83.19		684.87	5,738.00	5,778.78	5,767.39	11.38	507.692	
3,000.00	3,000.00	3,000.60	3,000.21	6.60	5.18	83.18		686.15	5,737.43	5,778.36	5,766.58	11.78	490.462	
3,100.00	3,100.00	3,104.09	3,103.69	6.83	5.36	83.17		687.42	5,736.81	5,777.92	5,765.73	12.19	474.072	
3,200.00	3,200.00	3,200.00	3,199.59	7.05	5.53	83.16		688.57	5,736.29	5,777.52	5,764.93	12.58	459.229	
3,300.00	3,300.00	3,305.78	3,305.36	7.28	5.71	83.14		689.90	5,735.68	5,777.10	5,764.10	12.99	444.689	
3,400.00	3,400.00	3,400.00	3,399.57	7.50	5.88	83.13		691.20	5,735.11	5,776.66	5,763.28	13.38	431.885	
3,500.00	3,500.00	3,488.71	3,488.27	7.73	6.04	83.11		692.56	5,734.69	5,776.37	5,762.61	13.76	419.721	
3,600.00	3,600.00	3,600.86	3,600.40	7.95	6.23	83.09		694.57	5,734.12	5,776.08	5,761.90	14.18	407.201	
3,673.14	3,673.14	3,675.85	3,675.37	8.12	6.37	110.42		696.07	5,733.61	5,775.93	5,761.45	14.48	398.884	
3,700.00	3,700.00	3,703.30	3,702.82	8.18	6.41	110.42		696.81	5,733.42	5,775.95	5,761.36	14.59	395.924	
3,800.00	3,799.96	3,800.00	3,799.49	8.40	6.59	110.42		698.78	5,732.72	5,776.41	5,761.43	14.98	385.596	
3,900.00	3,899.86	3,890.92	3,890.38	8.62	6.75	110.42		701.18	5,732.11	5,777.59	5,762.22	15.36	376.079	
4,000.00	3,999.68	4,013.32	4,012.73	8.84	6.98	110.44		704.63	5,731.16	5,779.30	5,763.50	15.80	365.741	
4,100.00	4,099.37	4,125.15	4,124.50	9.07	7.16	110.47		707.77	5,729.98	5,781.33	5,765.11	16.22	356.369	
4,124.09	4,123.36	4,154.90	4,154.24	9.12	7.22	110.48		708.58	5,729.61	5,781.87	5,765.54	16.33	354.074	
4,200.00	4,198.95	4,241.86	4,241.16	9.29	7.37	110.53		710.86	5,728.41	5,783.49	5,766.84	16.65	347.268	
4,300.00	4,298.53	4,340.73	4,339.99	9.52	7.55	110.59		713.36	5,726.96	5,785.55	5,768.49	17.06	339.213	
4,400.00	4,398.12	4,438.32	4,437.54	9.75	7.72	110.65		715.63	5,725.65	5,787.71	5,770.25	17.46	331.547	
4,500.00	4,497.70	4,542.45	4,541.63	9.98	7.91	110.71		718.14	5,724.14	5,789.78	5,771.91	17.87	323.982	
4,600.00	4,597.28	4,646.81	4,645.95	10.22	8.09	110.77		720.43	5,722.66	5,791.87	5,773.58	18.29	316.731	
4,700.00	4,696.86	4,752.94	4,752.04	10.45	8.28	110.84		722.72	5,720.95	5,793.76	5,775.06	18.71	309.720	
4,800.00	4,796.44	4,863.15	4,862.21	10.69	8.47	110.91		725.08	5,719.15	5,795.64	5,776.51	19.13	302.884	
4,900.00	4,896.03	4,984.83	4,983.85	10.92	8.69	110.98		727.74	5,716.72	5,797.17	5,777.59	19.58	296.008	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #24 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference Semi Major Axis (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	4,995.01	5,087.05	5,086.02	11.16	8.87	111.04	729.99	5,714.45	5,798.49	5,778.49	20.00	289.908	
5,100.00	5,095.19	5,199.12	5,198.03	11.40	9.07	111.11	732.18	5,711.89	5,799.72	5,779.29	20.44	283.804	
5,200.00	5,194.77	5,270.12	5,269.01	11.64	9.19	111.16	733.43	5,710.37	5,801.09	5,780.29	20.80	278.901	
5,300.00	5,294.35	5,338.09	5,336.96	11.89	9.31	111.20	734.45	5,709.29	5,802.97	5,781.81	21.16	274.257	
5,400.00	5,393.94	5,405.84	5,404.70	12.13	9.43	111.25	735.22	5,708.63	5,805.44	5,783.92	21.52	269.799	
5,500.00	5,493.52	5,501.07	5,499.93	12.37	9.60	111.32	736.04	5,708.02	5,808.21	5,786.29	21.92	264.915	
5,600.00	5,593.10	5,600.00	5,598.85	12.62	9.77	111.40	736.77	5,707.41	5,811.02	5,788.68	22.34	260.129	
5,700.00	5,692.68	5,694.48	5,693.33	12.86	9.94	111.47	737.33	5,706.89	5,813.88	5,791.14	22.75	255.602	
5,800.00	5,792.26	5,828.94	5,827.79	13.11	10.17	111.58	737.86	5,705.85	5,816.51	5,793.28	23.22	250.464	
5,900.00	5,891.85	5,942.79	5,941.63	13.36	10.37	111.67	738.30	5,704.50	5,818.74	5,795.07	23.66	245.883	
6,000.00	5,991.43	6,057.86	6,056.68	13.61	10.57	111.76	738.97	5,702.83	5,820.74	5,796.63	24.11	241.431	
6,100.00	6,091.01	6,162.55	6,161.35	13.85	10.75	111.83	740.14	5,701.03	5,822.53	5,798.00	24.54	237.291	
6,200.00	6,190.59	6,264.91	6,263.67	14.10	10.93	111.89	742.31	5,699.16	5,824.32	5,799.36	24.96	233.309	
6,300.00	6,290.17	6,363.82	6,362.51	14.35	11.15	111.96	745.65	5,696.70	5,825.96	5,800.54	25.42	229.181	
6,400.00	6,389.76	6,497.42	6,496.05	14.60	11.35	112.03	747.98	5,694.07	5,827.26	5,801.39	25.87	225.274	
6,500.00	6,489.34	6,593.87	6,592.47	14.86	11.52	112.09	749.14	5,691.82	5,828.49	5,802.21	26.28	221.757	
6,600.00	6,588.92	6,681.92	6,680.50	15.11	11.67	112.16	749.67	5,689.94	5,829.86	5,803.18	26.68	218.475	
6,700.00	6,688.50	6,775.45	6,774.01	15.36	11.83	112.23	749.99	5,688.12	5,831.41	5,804.31	27.10	215.220	
6,800.00	6,788.08	6,876.44	6,874.98	15.61	12.01	112.31	750.08	5,686.21	5,833.01	5,805.49	27.52	211.964	
6,900.00	6,887.66	6,975.88	6,974.41	15.86	12.18	112.40	750.10	5,684.32	5,834.59	5,806.65	27.94	208.824	
7,000.00	6,987.25	7,102.37	7,100.86	16.12	12.40	112.50	749.81	5,681.71	5,836.02	5,807.61	28.41	205.434	
7,100.00	7,086.83	7,207.45	7,205.91	16.37	12.59	112.59	749.06	5,679.23	5,837.12	5,808.28	28.84	202.395	
7,200.00	7,186.41	7,300.00	7,298.43	16.63	12.75	112.68	747.84	5,677.11	5,838.24	5,808.99	29.25	199.588	
7,300.00	7,285.99	7,377.40	7,375.80	16.88	12.89	112.76	746.39	5,675.58	5,839.63	5,810.00	29.64	197.035	
7,400.00	7,385.57	7,445.25	7,443.62	17.14	13.01	112.83	744.80	5,674.53	5,841.49	5,811.48	30.01	194.667	
7,500.00	7,485.16	7,500.00	7,498.35	17.39	13.10	112.89	743.35	5,674.02	5,843.97	5,813.61	30.35	192.525	
7,600.00	7,584.74	7,571.13	7,569.46	17.65	13.23	112.96	741.42	5,673.80	5,847.06	5,816.33	30.73	190.274	
7,700.00	7,684.32	7,650.61	7,648.91	17.90	13.37	113.05	739.43	5,674.04	5,850.75	5,819.63	31.12	188.007	
7,800.00	7,783.90	7,756.74	7,755.01	18.16	13.56	113.16	737.03	5,674.42	5,854.54	5,822.98	31.56	185.519	
7,900.00	7,883.48	7,859.29	7,857.53	18.41	13.74	113.27	734.69	5,674.61	5,858.17	5,826.18	31.99	183.130	
8,000.00	7,983.07	7,960.25	7,958.47	18.67	13.92	113.37	732.44	5,674.82	5,861.86	5,829.44	32.42	180.821	
8,100.00	8,082.65	8,069.18	8,067.37	18.93	14.11	113.48	729.98	5,674.93	5,865.45	5,832.59	32.86	178.490	
8,200.00	8,182.23	8,144.31	8,142.48	19.19	14.24	113.56	728.20	5,675.01	5,869.09	5,835.85	33.24	176.543	
8,300.00	8,281.81	8,200.00	8,198.15	19.44	14.34	113.62	726.90	5,675.41	5,873.37	5,839.78	33.59	174.843	
8,400.00	8,381.39	8,268.50	8,266.63	19.70	14.46	113.69	725.48	5,676.33	5,878.29	5,844.32	33.96	173.085	
8,492.99	8,473.99	8,330.87	8,328.98	19.94	14.57	113.75	724.43	5,677.54	5,883.42	5,849.12	34.30	171.517	
8,500.00	8,480.98	8,335.94	8,334.05	19.96	14.58	105.02	724.35	5,677.65	5,883.77	5,849.45	34.33	171.403	
8,525.00	8,505.89	8,354.06	8,352.16	20.01	14.61	69.42	724.07	5,678.06	5,884.22	5,849.81	34.41	170.998	
8,550.00	8,530.77	8,372.17	8,370.27	20.06	14.64	43.00	723.80	5,678.49	5,883.39	5,848.89	34.49	170.560	
8,575.00	8,555.56	8,400.00	8,398.09	20.11	14.69	28.71	723.40	5,679.18	5,881.29	5,846.70	34.59	170.005	
8,600.00	8,580.17	8,414.18	8,412.26	20.15	14.71	20.72	723.21	5,679.55	5,877.90	5,843.23	34.67	169.540	
8,625.00	8,604.54	8,444.97	8,443.04	20.19	14.77	15.82	722.79	5,680.31	5,873.21	5,838.44	34.77	168.899	
8,650.00	8,628.62	8,475.42	8,473.47	20.23	14.82	12.54	722.41	5,681.03	5,867.22	5,832.34	34.88	168.232	
8,675.00	8,652.32	8,504.82	8,502.87	20.27	14.87	10.20	722.06	5,681.70	5,859.95	5,824.97	34.97	167.549	
8,700.00	8,675.59	8,531.05	8,529.09	20.30	14.92	8.44	721.76	5,682.27	5,851.42	5,816.35	35.07	166.868	
8,725.00	8,698.36	8,556.74	8,554.77	20.34	14.96	7.07	721.48	5,682.83	5,841.66	5,806.51	35.16	166.168	
8,750.00	8,720.58	8,581.83	8,579.85	20.36	15.01	5.98	721.21	5,683.35	5,830.71	5,795.47	35.24	165.451	
8,775.00	8,742.17	8,606.47	8,604.48	20.39	15.05	5.04	720.95	5,683.86	5,818.59	5,783.26	35.32	164.717	
8,800.00	8,763.08	8,631.00	8,629.01	20.41	15.09	4.24	720.71	5,684.34	5,805.33	5,769.92	35.41	163.964	
8,825.00	8,783.25	8,654.69	8,652.69	20.43	15.13	3.55	720.49	5,684.80	5,790.97	5,755.49	35.48	163.200	
8,850.00	8,802.63	8,677.46	8,675.46	20.45	15.17	2.91	720.30	5,685.23	5,775.56	5,740.00	35.56	162.427	
8,875.00	8,821.17	8,699.26	8,697.26	20.47	15.21	2.33	720.13	5,685.62	5,759.12	5,723.50	35.63	161.647	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #24 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,900.00	8,838.80	8,716.80	8,714.60	20.49	15.24	1.76	720.00	5,885.93	5,741.73	5,706.04	35.69	160.889	
8,925.00	8,855.50	8,732.93	8,730.93	20.50	15.27	1.21	719.88	5,886.23	5,723.42	5,687.88	35.74	160.127	
8,950.00	8,871.20	8,748.33	8,746.32	20.52	15.29	0.64	719.77	5,886.51	5,704.25	5,668.46	35.79	159.361	
8,975.00	8,885.86	8,762.76	8,760.74	20.53	15.32	0.05	719.67	5,886.77	5,684.27	5,648.43	35.84	158.593	
9,000.00	8,899.46	8,776.17	8,774.15	20.55	15.34	-0.59	719.58	5,887.02	5,683.54	5,627.66	35.89	157.825	
9,025.00	8,911.94	8,788.53	8,786.51	20.59	15.36	-1.30	719.49	5,887.24	5,642.11	5,606.19	35.92	157.058	
9,050.00	8,923.28	8,800.00	8,797.98	20.68	15.38	-2.13	719.41	5,887.46	5,620.05	5,584.09	35.96	156.292	
9,075.00	8,933.44	8,809.86	8,807.84	20.82	15.40	-3.12	719.35	5,887.64	5,597.40	5,561.41	35.99	155.535	
9,100.00	8,942.39	8,818.78	8,816.75	20.99	15.42	-4.35	719.29	5,887.81	5,574.24	5,538.22	36.01	154.782	
9,125.00	8,950.12	8,826.54	8,824.51	21.18	15.43	-5.97	719.24	5,887.95	5,550.62	5,514.59	36.03	154.036	
9,150.00	8,956.59	8,833.13	8,831.10	21.38	15.44	-8.19	719.19	5,888.08	5,526.61	5,490.56	36.05	153.299	
9,175.00	8,961.80	8,838.51	8,836.49	21.60	15.45	-11.49	719.15	5,888.18	5,502.28	5,466.22	36.06	152.572	
9,200.00	8,965.73	8,842.69	8,840.66	21.84	15.46	-16.89	719.13	5,888.26	5,477.70	5,441.62	36.07	151.855	
9,225.00	8,968.36	8,845.64	8,843.61	22.09	15.46	-27.03	719.11	5,888.31	5,452.92	5,416.84	36.08	151.151	
9,250.00	8,969.69	8,847.38	8,845.33	22.36	15.46	-49.91	719.10	5,888.35	5,428.02	5,391.94	36.08	150.459	
9,258.87	8,969.85	8,847.67	8,845.64	22.46	15.47	-64.00	719.09	5,888.35	5,419.17	5,383.10	36.08	150.215	
9,300.00	8,970.21	8,848.76	8,846.73	22.93	15.47	-64.17	719.09	5,888.37	5,378.12	5,342.05	36.07	149.099	
9,400.00	8,971.08	8,851.40	8,849.37	24.24	15.47	-64.57	719.07	5,888.42	5,278.32	5,242.26	36.06	146.379	
9,500.00	8,971.96	8,854.05	8,852.01	25.75	15.48	-64.98	719.05	5,888.47	5,178.53	5,142.48	36.05	143.649	
9,600.00	8,972.83	8,856.70	8,854.66	27.43	15.48	-65.39	719.03	5,888.52	5,078.74	5,042.70	36.04	140.909	
9,700.00	8,973.70	8,859.35	8,857.32	29.25	15.49	-65.80	719.02	5,888.57	4,978.96	4,942.92	36.04	138.160	
9,800.00	8,974.58	8,862.02	8,859.98	31.19	15.49	-66.22	719.00	5,888.62	4,879.18	4,843.15	36.04	135.401	
9,900.00	8,975.45	8,864.68	8,862.65	33.22	15.49	-66.64	718.98	5,888.68	4,779.42	4,743.38	36.04	132.632	
10,000.00	8,976.32	8,867.35	8,865.32	35.33	15.50	-67.07	718.96	5,888.73	4,679.66	4,643.62	36.04	129.853	
10,100.00	8,977.19	8,870.03	8,867.99	37.51	15.50	-67.50	718.94	5,888.78	4,579.92	4,543.87	36.04	127.064	
10,200.00	8,978.07	8,872.71	8,870.67	39.74	15.51	-67.93	718.93	5,888.83	4,480.18	4,444.12	36.05	124.265	
10,300.00	8,978.94	8,875.39	8,873.35	42.02	15.51	-68.37	718.91	5,888.88	4,380.45	4,344.38	36.07	121.456	
10,400.00	8,979.81	8,878.08	8,876.04	44.34	15.52	-68.81	718.89	5,888.93	4,280.73	4,244.65	36.08	118.637	
10,500.00	8,980.68	8,880.78	8,878.74	46.69	15.52	-69.25	718.87	5,888.99	4,181.03	4,144.92	36.10	115.806	
10,600.00	8,981.56	8,883.47	8,881.44	49.07	15.53	-69.69	718.85	5,889.04	4,081.33	4,045.20	36.13	112.965	
10,700.00	8,982.43	8,886.18	8,884.14	51.48	15.53	-70.14	718.84	5,889.09	3,981.65	3,945.49	36.16	110.112	
10,800.00	8,983.30	8,888.89	8,886.85	53.90	15.54	-70.60	718.82	5,889.14	3,881.99	3,845.79	36.20	107.248	
10,900.00	8,984.17	8,891.60	8,889.56	56.35	15.54	-71.05	718.80	5,889.19	3,782.34	3,746.10	36.24	104.371	
11,000.00	8,985.05	8,894.32	8,892.28	58.81	15.55	-71.51	718.78	5,889.25	3,682.71	3,646.42	36.29	101.482	
11,100.00	8,985.92	8,897.04	8,895.00	61.29	15.55	-71.98	718.76	5,889.30	3,583.10	3,546.75	36.35	98.580	
11,200.00	8,986.79	8,900.00	8,897.96	63.78	15.56	-72.48	718.74	5,889.36	3,483.50	3,447.09	36.41	95.662	
11,300.00	8,987.66	8,902.68	8,900.64	66.28	15.56	-72.94	718.73	5,889.41	3,383.93	3,347.44	36.49	92.732	
11,400.00	8,988.54	8,905.60	8,903.56	68.79	15.57	-73.45	718.71	5,889.47	3,284.38	3,247.80	36.58	89.785	
11,500.00	8,989.41	8,908.51	8,906.47	71.31	15.57	-73.96	718.69	5,889.52	3,184.86	3,148.18	36.68	86.823	
11,600.00	8,990.28	8,911.42	8,909.38	73.84	15.58	-74.46	718.67	5,889.58	3,085.36	3,048.56	36.80	83.844	
11,700.00	8,991.16	8,914.32	8,912.27	76.38	15.58	-74.97	718.65	5,889.64	2,985.90	2,948.97	36.93	80.847	
11,800.00	8,992.03	8,917.21	8,915.16	78.92	15.59	-75.48	718.63	5,889.69	2,886.47	2,849.38	37.09	77.832	
11,900.00	8,992.90	8,920.09	8,918.04	81.47	15.59	-75.99	718.61	5,889.75	2,787.08	2,749.82	37.26	74.798	
12,000.00	8,993.77	8,922.97	8,920.92	84.02	15.60	-76.51	718.59	5,889.80	2,687.73	2,650.27	37.46	71.743	
12,100.00	8,994.65	8,925.84	8,923.79	86.58	15.60	-77.02	718.58	5,889.86	2,588.43	2,550.73	37.70	68.666	
12,200.00	8,995.52	8,928.70	8,926.65	89.15	15.61	-77.53	718.56	5,889.91	2,489.18	2,451.21	37.96	65.568	
12,300.00	8,996.39	8,931.55	8,929.50	91.72	15.61	-78.05	718.54	5,889.97	2,389.99	2,351.72	38.27	62.448	
12,400.00	8,997.26	8,934.40	8,932.35	94.29	15.62	-78.57	718.52	5,890.02	2,290.86	2,252.23	38.63	59.304	
12,500.00	8,998.14	8,937.24	8,935.19	96.86	15.62	-79.08	718.50	5,890.07	2,191.82	2,152.77	39.04	56.138	
12,600.00	8,999.01	8,940.08	8,938.02	99.44	15.63	-79.60	718.49	5,890.13	2,092.86	2,053.33	39.52	52.950	
12,700.00	8,999.88	8,942.90	8,940.85	102.02	15.63	-80.12	718.47	5,890.18	1,993.99	1,953.91	40.09	49.742	
12,800.00	9,000.75	8,945.72	8,943.67	104.61	15.63	-80.64	718.45	5,890.24	1,895.25	1,854.51	40.74	46.516	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #24 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
12,900.00	9,001.83	8,948.54	8,948.48	107.19	15.84	-81.15	718.44	5,890.29	1,796.84	1,755.12	41.52	43.276	
13,000.00	9,002.50	8,951.34	8,949.29	109.78	15.84	-81.67	718.42	5,890.34	1,898.19	1,855.76	42.43	40.027	
13,100.00	9,003.37	8,954.14	8,952.09	112.37	15.85	-82.19	718.40	5,890.39	1,599.92	1,556.42	43.50	36.778	
13,200.00	9,004.25	8,956.93	8,954.88	114.97	15.85	-82.71	718.39	5,890.45	1,501.88	1,457.10	44.78	33.538	
13,300.00	9,005.12	8,959.72	8,957.67	117.56	15.86	-83.23	718.37	5,890.50	1,404.10	1,357.80	46.31	30.320	
13,400.00	9,005.99	8,962.50	8,960.44	120.16	15.86	-83.75	718.35	5,890.55	1,306.86	1,258.52	48.14	27.141	
13,500.00	9,006.86	8,965.27	8,963.22	122.76	15.87	-84.27	718.34	5,890.60	1,209.64	1,159.27	50.36	24.019	
13,600.00	9,007.74	8,968.04	8,965.98	125.36	15.87	-84.79	718.32	5,890.66	1,113.13	1,060.06	53.06	20.978	
13,700.00	9,008.61	8,970.80	8,968.74	127.96	15.88	-85.30	718.31	5,890.71	1,017.28	960.91	56.38	18.045	
13,800.00	9,009.48	8,973.58	8,971.49	130.56	15.88	-85.82	718.29	5,890.76	922.32	861.84	60.48	15.250	
13,900.00	9,010.35	8,976.29	8,974.24	133.17	15.89	-86.34	718.27	5,890.81	828.53	762.90	65.62	12.625	
14,000.00	9,011.23	8,979.03	8,976.97	135.78	15.89	-86.86	718.26	5,890.86	736.36	664.22	72.14	10.207	
14,100.00	9,012.10	8,981.78	8,979.71	138.38	15.70	-87.37	718.24	5,890.91	646.52	566.02	80.50	8.031	
14,200.00	9,012.97	8,984.49	8,982.43	140.99	15.70	-87.89	718.23	5,890.96	560.11	468.78	91.34	6.132	
14,300.00	9,013.84	8,987.21	8,985.15	143.60	15.71	-88.40	718.21	5,891.01	479.01	373.61	105.40	4.545	
14,400.00	9,014.72	8,989.92	8,987.86	146.21	15.71	-88.92	718.20	5,891.06	406.40	283.17	123.23	3.298	
14,500.00	9,015.59	8,992.63	8,990.57	148.82	15.72	-89.43	718.18	5,891.11	347.65	203.77	143.88	2.416	
14,600.00	9,016.46	8,995.33	8,993.27	151.43	15.72	-89.94	718.17	5,891.16	310.72	148.45	162.27	1.915	
14,671.68	9,017.09	8,997.26	8,995.20	153.31	15.72	-90.30	718.16	5,891.20	302.34	133.45	168.89	1.790 CC, ES, SF	
14,700.00	9,017.34	8,998.02	8,995.96	154.05	15.73	-90.45	718.16	5,891.21	303.67	134.38	169.29	1.794	
14,800.00	9,018.21	9,000.71	8,998.65	156.66	15.73	-90.96	718.14	5,891.26	328.43	167.03	161.40	2.035	
14,900.00	9,019.08	9,003.41	9,001.35	159.28	15.73	-91.47	718.13	5,891.31	378.82	233.32	145.51	2.803	
15,000.00	9,019.95	9,006.11	9,004.05	161.89	15.74	-91.98	718.11	5,891.36	446.24	317.16	129.08	3.457	
15,100.00	9,020.83	9,008.81	9,006.75	164.51	15.74	-92.49	718.10	5,891.41	524.16	409.04	115.12	4.553	
15,200.00	9,021.70	9,011.51	9,009.45	167.12	15.75	-93.00	718.08	5,891.46	608.55	504.58	103.97	5.853	
15,300.00	9,022.57	9,014.21	9,012.15	169.74	15.75	-93.51	718.07	5,891.51	697.08	601.89	95.18	7.324	
15,400.00	9,023.44	9,016.91	9,014.85	172.36	15.76	-94.02	718.06	5,891.55	788.34	700.12	88.22	8.936	
15,500.00	9,024.32	9,019.61	9,017.55	174.98	15.76	-94.53	718.04	5,891.60	881.50	798.85	82.65	10.666	
15,600.00	9,025.19	9,022.31	9,020.24	177.60	15.77	-95.04	718.03	5,891.65	976.00	897.88	78.12	12.494	
15,700.00	9,026.06	9,025.01	9,022.94	180.22	15.77	-95.55	718.01	5,891.70	1,071.49	997.09	74.40	14.402	
15,800.00	9,026.93	9,027.71	9,025.64	182.84	15.78	-96.05	718.00	5,891.75	1,167.73	1,096.43	71.31	16.376	
15,900.00	9,027.81	9,030.41	9,028.34	185.46	15.78	-96.56	717.98	5,891.80	1,264.55	1,195.85	68.71	18.405	
16,000.00	9,028.68	9,033.11	9,031.04	188.08	15.79	-97.07	717.97	5,891.85	1,361.83	1,295.33	66.50	20.479	
16,100.00	9,029.55	9,035.81	9,033.74	190.70	15.79	-97.57	717.96	5,891.90	1,459.47	1,394.85	64.61	22.588	
16,200.00	9,030.42	9,038.51	9,036.44	193.32	15.80	-98.07	717.94	5,891.95	1,557.40	1,494.42	62.98	24.727	
16,300.00	9,031.30	9,041.21	9,039.14	195.94	15.80	-98.57	717.93	5,892.00	1,655.57	1,594.00	61.57	26.889	
16,400.00	9,032.17	9,043.91	9,041.84	198.57	15.80	-99.07	717.91	5,892.05	1,753.95	1,693.81	60.34	29.070	
16,500.00	9,033.04	9,046.61	9,044.54	201.19	15.81	-99.57	717.90	5,892.10	1,852.50	1,793.24	59.25	31.264	
16,600.00	9,033.92	9,049.31	9,047.24	203.81	15.81	-100.07	717.88	5,892.15	1,951.19	1,892.89	58.30	33.468	
16,700.00	9,034.79	9,052.01	9,049.94	206.44	15.82	-100.57	717.87	5,892.20	2,050.00	1,992.55	57.46	35.680	
16,800.00	9,035.66	9,054.71	9,052.64	209.06	15.82	-101.06	717.86	5,892.25	2,148.93	2,092.22	56.70	37.897	
16,900.00	9,036.53	9,057.41	9,055.34	211.69	15.83	-101.55	717.84	5,892.29	2,247.94	2,191.90	56.04	40.116	
17,000.00	9,037.41	9,060.11	9,058.04	214.31	15.83	-102.04	717.83	5,892.34	2,347.03	2,291.59	55.44	42.335	
17,100.00	9,038.28	9,062.81	9,060.74	216.94	15.84	-102.53	717.81	5,892.39	2,446.20	2,391.29	54.90	44.554	
17,200.00	9,039.15	9,065.51	9,063.44	219.56	15.84	-103.02	717.80	5,892.44	2,545.42	2,491.00	54.42	46.770	
17,300.00	9,040.02	9,068.21	9,066.14	222.19	15.85	-103.51	717.78	5,892.49	2,644.71	2,590.71	53.99	48.982	
17,400.00	9,040.90	9,070.91	9,068.83	224.81	15.85	-103.99	717.77	5,892.54	2,744.04	2,690.43	53.61	51.189	
17,500.00	9,041.77	9,073.61	9,071.53	227.44	15.86	-104.47	717.76	5,892.59	2,843.41	2,790.16	53.26	53.391	
17,600.00	9,042.64	9,076.31	9,074.23	230.07	15.86	-104.95	717.74	5,892.64	2,942.83	2,889.89	52.94	55.586	
17,700.00	9,043.51	9,079.01	9,076.93	232.69	15.87	-105.43	717.73	5,892.69	3,042.28	2,989.62	52.66	57.775	
17,800.00	9,044.39	9,081.71	9,079.63	235.32	15.87	-105.91	717.71	5,892.74	3,141.77	3,089.36	52.40	59.955	
17,900.00	9,045.26	9,084.41	9,082.33	237.95	15.87	-106.38	717.70	5,892.79	3,241.28	3,189.11	52.17	62.127	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Emerald PWU 20-21 - PWU #24 (offset) - OH - OH												Offset Well Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3													
Reference		Offset		Semi Major Axis		Highside Toothface (")	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
18,000.00	9,046.13	9,087.11	9,085.03	240.57	15.88	-106.85	717.68	5,692.84	3,340.82	3,288.86	51.96	64.280	
18,100.00	9,047.01	9,089.81	9,087.73	243.20	15.88	-107.32	717.67	5,692.89	3,440.39	3,388.61	51.78	66.444	
18,200.00	9,047.88	9,092.51	9,090.43	245.83	15.89	-107.79	717.66	5,692.94	3,539.97	3,488.36	51.61	68.589	
18,300.00	9,048.75	9,095.21	9,093.13	248.46	15.89	-108.25	717.64	5,692.99	3,639.58	3,588.12	51.46	70.723	
18,400.00	9,049.62	9,097.91	9,095.83	251.09	15.90	-108.71	717.63	5,693.03	3,739.21	3,687.88	51.33	72.848	
18,500.00	9,050.50	9,100.61	9,098.53	253.71	15.90	-109.17	717.61	5,693.08	3,838.85	3,787.64	51.21	74.962	
18,600.00	9,051.37	9,103.31	9,101.23	256.34	15.91	-109.63	717.60	5,693.13	3,938.52	3,887.41	51.11	77.066	
18,700.00	9,052.24	9,106.01	9,103.93	258.97	15.91	-110.08	717.58	5,693.18	4,038.19	3,987.18	51.01	79.159	
18,800.00	9,053.11	9,108.71	9,106.63	261.60	15.92	-110.53	717.57	5,693.23	4,137.88	4,086.95	50.93	81.241	
18,900.00	9,053.99	9,111.41	9,109.33	264.23	15.92	-110.98	717.56	5,693.28	4,237.58	4,186.72	50.86	83.312	
18,958.87	9,054.50	9,113.00	9,110.92	265.78	15.92	-111.24	717.55	5,693.31	4,296.28	4,245.46	50.83	84.526	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #5 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	69.19	671.00	1,765.05	1,888.44				
100.00	100.00	77.97	77.97	0.09	0.07	69.18	671.00	1,765.02	1,888.26	1,888.11	0.15	N/A	
200.00	200.00	177.34	177.34	0.31	0.22	69.18	671.01	1,764.93	1,888.18	1,887.65	0.53	3,537.806	
300.00	300.00	277.24	277.24	0.54	0.40	69.18	671.08	1,764.87	1,888.15	1,887.22	0.93	2,023.987	
349.57	349.57	328.08	328.07	0.65	0.48	69.18	671.15	1,764.83	1,888.14	1,887.01	1.13	1,871.731	
400.00	400.00	375.01	375.01	0.76	0.57	69.18	671.21	1,764.82	1,888.15	1,886.83	1.33	1,421.752	
500.00	500.00	475.01	475.01	0.99	0.74	69.17	671.37	1,764.87	1,888.25	1,886.53	1.73	1,093.346	
600.00	600.00	573.52	573.52	1.21	0.92	69.17	671.62	1,764.88	1,888.36	1,886.23	2.12	889.185	
700.00	700.00	666.80	666.80	1.43	1.08	69.16	671.90	1,765.08	1,888.66	1,886.15	2.51	751.905	
800.00	800.00	761.08	761.08	1.66	1.24	69.16	672.21	1,765.66	1,889.35	1,886.45	2.90	651.059	
900.00	900.00	857.33	857.33	1.88	1.41	69.16	672.59	1,766.46	1,890.27	1,886.98	3.30	573.634	
1,000.00	1,000.00	957.36	957.35	2.11	1.59	69.15	673.14	1,767.38	1,891.32	1,887.63	3.69	511.870	
1,100.00	1,100.00	1,058.53	1,058.51	2.33	1.76	69.15	673.63	1,768.24	1,892.29	1,888.19	4.10	461.924	
1,200.00	1,200.00	1,158.86	1,158.84	2.56	1.94	69.14	674.21	1,769.03	1,893.23	1,888.74	4.50	421.011	
1,300.00	1,300.00	1,267.25	1,267.22	2.78	2.13	69.12	674.99	1,769.65	1,894.03	1,889.12	4.91	385.686	
1,400.00	1,400.00	1,370.49	1,370.46	3.01	2.31	69.10	675.65	1,769.76	1,894.35	1,889.04	5.32	356.350	
1,500.00	1,500.00	1,471.92	1,471.88	3.23	2.49	69.09	676.26	1,769.85	1,894.66	1,888.94	5.72	331.347	
1,600.00	1,600.00	1,575.41	1,575.38	3.46	2.67	69.07	676.82	1,769.81	1,894.81	1,888.69	6.12	309.432	
1,700.00	1,700.00	1,681.54	1,681.51	3.68	2.86	69.05	677.32	1,769.52	1,894.73	1,888.19	6.53	290.014	
1,800.00	1,800.00	1,786.76	1,786.72	3.91	3.04	69.04	677.70	1,768.91	1,894.32	1,887.37	6.94	272.915	
1,900.00	1,900.00	1,885.21	1,885.17	4.13	3.21	69.02	678.06	1,768.23	1,893.80	1,886.46	7.34	258.108	
2,000.00	2,000.00	1,985.65	1,985.61	4.36	3.39	69.00	678.58	1,767.53	1,893.34	1,885.60	7.74	244.713	
2,100.00	2,100.00	2,086.51	2,086.46	4.58	3.56	68.98	679.03	1,766.82	1,892.83	1,884.70	8.14	232.604	
2,200.00	2,200.00	2,184.91	2,184.86	4.81	3.73	68.95	679.64	1,766.06	1,892.34	1,883.81	8.53	221.741	
2,300.00	2,300.00	2,285.51	2,285.45	5.03	3.91	68.92	680.32	1,765.32	1,891.89	1,882.96	8.93	211.755	
2,400.00	2,400.00	2,383.13	2,383.06	5.26	4.08	68.90	680.94	1,764.64	1,891.47	1,882.14	9.33	202.739	
2,500.00	2,500.00	2,486.08	2,486.02	5.48	4.26	68.87	681.64	1,763.92	1,891.07	1,881.34	9.73	194.273	
2,600.00	2,600.00	2,587.65	2,587.57	5.71	4.44	68.84	682.30	1,763.07	1,890.52	1,880.38	10.14	186.512	
2,700.00	2,700.00	2,684.51	2,684.44	5.93	4.61	68.81	683.01	1,762.25	1,890.00	1,879.47	10.53	179.483	
2,800.00	2,800.00	2,785.40	2,785.32	6.15	4.79	68.79	683.67	1,761.54	1,889.58	1,878.65	10.93	172.861	
2,900.00	2,900.00	2,888.80	2,888.72	6.38	4.97	68.76	684.30	1,760.69	1,889.03	1,877.69	11.34	166.632	
3,000.00	3,000.00	2,988.72	2,988.63	6.60	5.14	68.73	684.97	1,759.72	1,888.37	1,876.64	11.74	160.906	
3,100.00	3,100.00	3,086.70	3,086.60	6.83	5.31	68.70	685.66	1,758.83	1,887.78	1,875.65	12.13	155.604	
3,200.00	3,200.00	3,186.58	3,186.47	7.05	5.49	68.67	686.50	1,757.94	1,887.26	1,874.73	12.53	150.603	
3,300.00	3,300.00	3,289.21	3,289.09	7.28	5.67	68.63	687.34	1,756.96	1,886.67	1,873.73	12.94	145.852	
3,400.00	3,400.00	3,384.14	3,384.02	7.50	5.83	68.60	688.13	1,756.09	1,886.11	1,872.79	13.33	141.531	
3,500.00	3,500.00	3,483.33	3,483.19	7.73	6.01	68.56	689.15	1,755.31	1,885.76	1,872.03	13.72	137.397	
3,600.00	3,600.00	3,585.61	3,585.46	7.95	6.19	68.53	690.12	1,754.48	1,885.35	1,871.22	14.13	133.442	
3,700.00	3,700.00	3,697.84	3,697.68	8.18	6.38	68.50	691.15	1,753.15	1,884.68	1,870.13	14.55	129.556	
3,800.00	3,799.96	3,817.08	3,816.90	8.40	6.59	68.47	692.12	1,750.83	1,883.27	1,868.30	14.97	125.765	
3,900.00	3,899.86	3,927.25	3,927.02	8.62	6.79	68.43	692.77	1,747.53	1,881.31	1,865.93	15.39	122.272	
4,000.00	3,999.68	4,030.89	4,030.60	8.84	6.97	68.39	693.31	1,744.06	1,879.03	1,863.24	15.79	119.014	
4,100.00	4,099.37	4,117.98	4,117.63	9.07	7.12	68.35	694.37	1,741.22	1,877.28	1,861.12	16.17	116.124	
4,124.09	4,123.36	4,137.47	4,137.12	9.12	7.15	68.33	694.73	1,740.64	1,877.01	1,860.76	16.26	115.472	
4,200.00	4,198.95	4,200.00	4,199.80	9.29	7.26	68.30	696.22	1,739.00	1,876.57	1,860.03	16.54	113.472	
4,225.48	4,224.33	4,220.75	4,220.34	9.35	7.30	68.24	696.83	1,738.52	1,876.54	1,859.91	16.63	112.823	
4,300.00	4,298.53	4,284.74	4,284.28	9.52	7.41	68.14	698.94	1,737.19	1,876.76	1,859.84	16.92	110.948	
4,400.00	4,398.12	4,376.71	4,376.17	9.75	7.57	68.00	702.56	1,735.58	1,877.57	1,860.26	17.31	108.478	
4,500.00	4,497.70	4,502.24	4,501.54	9.98	7.79	67.93	707.98	1,732.74	1,878.10	1,860.33	17.76	105.739	
4,600.00	4,597.28	4,615.45	4,614.61	10.22	7.99	67.90	712.20	1,728.85	1,877.27	1,859.07	18.19	103.181	
4,700.00	4,696.86	4,702.51	4,701.60	10.45	8.15	67.83	714.56	1,726.28	1,876.57	1,857.99	18.58	100.978	
4,800.00	4,796.44	4,800.00	4,799.04	10.69	8.32	67.72	716.78	1,724.02	1,876.33	1,857.34	18.99	98.797	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #5 (offset) - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: 100-ISCWSA-GYRO-3													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,900.00	4,896.03	4,898.80	4,897.79	10.92	8.49	97.61	718.82	1,721.90	1,878.21	1,856.80	19.40	96.696		
4,978.51	4,974.20	4,974.88	4,973.84	11.11	8.63	97.76	720.32	1,720.32	1,876.15	1,856.43	19.72	95.119		
5,000.00	4,995.61	4,995.70	4,994.65	11.16	8.67	97.80	720.77	1,719.89	1,876.16	1,856.34	19.81	94.696		
5,100.00	5,095.19	5,091.54	5,090.46	11.40	8.83	97.99	722.57	1,718.13	1,876.31	1,856.09	20.22	92.791		
5,200.00	5,194.77	5,179.27	5,178.17	11.64	8.99	98.19	723.83	1,717.04	1,876.90	1,856.28	20.62	91.043		
5,300.00	5,294.35	5,280.18	5,279.07	11.89	9.17	98.42	725.14	1,716.25	1,877.90	1,856.87	21.03	89.280		
5,400.00	5,393.94	5,390.96	5,389.84	12.13	9.36	98.67	726.64	1,714.91	1,878.56	1,857.09	21.47	87.497		
5,500.00	5,493.52	5,518.17	5,516.99	12.37	9.58	98.93	728.75	1,711.86	1,878.21	1,856.28	21.93	85.634		
5,600.00	5,593.10	5,648.34	5,647.02	12.62	9.82	99.17	731.29	1,706.54	1,876.40	1,854.00	22.40	83.776		
5,700.00	5,692.68	5,770.65	5,769.07	12.86	10.03	99.34	734.43	1,699.25	1,872.97	1,850.12	22.85	81.970		
5,800.00	5,792.26	5,877.72	5,875.85	13.11	10.22	99.48	737.59	1,691.95	1,868.87	1,845.59	23.28	80.276		
5,900.00	5,891.85	5,984.68	5,982.51	13.36	10.41	99.62	740.24	1,684.43	1,864.45	1,840.74	23.71	78.630		
6,000.00	5,991.43	6,086.61	6,084.15	13.61	10.59	99.78	742.21	1,677.15	1,859.76	1,835.63	24.14	77.052		
6,100.00	6,091.01	6,187.89	6,185.19	13.85	10.77	99.96	743.40	1,670.08	1,855.01	1,830.45	24.56	75.529		
6,200.00	6,190.59	6,282.53	6,279.62	14.10	10.94	100.16	743.70	1,663.80	1,850.35	1,825.37	24.98	74.085		
6,300.00	6,290.17	6,374.30	6,371.21	14.35	11.10	100.37	743.41	1,658.23	1,846.08	1,820.69	25.39	72.713		
6,400.00	6,389.76	6,471.41	6,468.17	14.60	11.27	100.63	742.24	1,652.95	1,842.17	1,816.36	25.81	71.381		
6,500.00	6,489.34	6,565.79	6,562.41	14.86	11.43	100.89	740.80	1,648.03	1,838.43	1,812.20	26.22	70.106		
6,600.00	6,588.92	6,663.52	6,660.02	15.11	11.60	101.16	739.46	1,643.18	1,835.01	1,808.36	26.64	68.871		
6,700.00	6,688.50	6,765.86	6,762.21	15.36	11.78	101.45	737.96	1,638.05	1,831.57	1,804.50	27.07	67.658		
6,800.00	6,788.08	6,863.73	6,859.95	15.61	11.95	101.73	736.51	1,633.06	1,828.08	1,800.58	27.49	66.493		
6,900.00	6,887.66	6,963.85	6,959.93	15.86	12.12	102.01	734.93	1,628.12	1,824.76	1,796.84	27.92	65.362		
7,000.00	6,987.25	7,061.80	7,057.75	16.12	12.30	102.31	733.04	1,623.30	1,821.41	1,793.07	28.34	64.269		
7,100.00	7,086.83	7,165.13	7,160.93	16.37	12.48	102.63	730.73	1,618.38	1,818.20	1,789.43	28.77	63.197		
7,200.00	7,186.41	7,273.64	7,269.27	16.63	12.67	102.97	727.99	1,612.80	1,814.59	1,785.38	29.21	62.129		
7,300.00	7,285.99	7,384.62	7,380.03	16.88	12.87	103.33	724.79	1,606.56	1,810.49	1,780.84	29.65	61.071		
7,400.00	7,385.57	7,469.40	7,464.63	17.14	13.02	103.62	722.11	1,601.81	1,806.41	1,776.36	30.05	60.105		
7,500.00	7,485.16	7,549.57	7,544.67	17.39	13.16	103.90	719.48	1,598.21	1,803.42	1,772.97	30.46	59.214		
7,600.00	7,584.74	7,630.96	7,625.97	17.65	13.30	104.19	716.78	1,595.46	1,801.56	1,770.70	30.86	58.381		
7,700.00	7,684.32	7,715.19	7,710.12	17.90	13.45	104.51	713.72	1,593.44	1,800.66	1,769.40	31.26	57.595		
7,756.84	7,740.92	7,764.26	7,759.14	18.05	13.54	104.70	711.86	1,592.59	1,800.53	1,769.04	31.50	57.166		
7,800.00	7,783.90	7,801.72	7,796.57	18.16	13.61	104.84	710.41	1,592.09	1,800.61	1,768.94	31.67	56.850		
7,900.00	7,883.48	7,900.00	7,894.77	18.41	13.78	105.23	706.41	1,590.99	1,801.02	1,768.92	32.10	56.107		
8,000.00	7,983.07	7,988.18	7,982.87	18.67	13.94	105.59	702.83	1,590.30	1,801.84	1,769.33	32.51	55.424		
8,100.00	8,082.65	8,074.90	8,069.54	18.93	14.09	105.92	699.84	1,590.08	1,803.39	1,770.47	32.92	54.785		
8,200.00	8,182.23	8,159.04	8,153.65	19.19	14.24	106.23	697.60	1,590.38	1,805.76	1,772.44	33.32	54.195		
8,300.00	8,281.81	8,251.32	8,245.90	19.44	14.40	106.56	695.45	1,591.37	1,808.95	1,775.22	33.73	53.625		
8,400.00	8,381.39	8,349.56	8,344.11	19.70	14.57	106.90	693.29	1,592.46	1,812.28	1,778.12	34.16	53.057		
8,492.99	8,473.99	8,436.42	8,430.93	19.94	14.73	107.22	690.99	1,593.65	1,815.61	1,781.07	34.54	52.559		
8,500.00	8,480.98	8,442.78	8,437.29	19.96	14.74	98.51	690.82	1,593.75	1,815.83	1,781.28	34.57	52.524		
8,525.00	8,505.89	8,465.49	8,459.99	20.01	14.78	62.96	690.20	1,594.13	1,815.80	1,781.13	34.66	52.383		
8,550.00	8,530.77	8,488.19	8,482.68	20.06	14.82	36.58	689.59	1,594.53	1,814.51	1,779.76	34.76	52.208		
8,575.00	8,555.56	8,510.01	8,504.48	20.11	14.86	22.29	689.00	1,594.95	1,811.98	1,777.13	34.84	52.002		
8,600.00	8,580.17	8,530.83	8,525.29	20.15	14.89	14.29	688.46	1,595.39	1,808.21	1,773.28	34.93	51.766		
8,625.00	8,604.54	8,551.49	8,545.94	20.19	14.93	9.34	687.94	1,595.86	1,803.23	1,768.22	35.01	51.500		
8,650.00	8,628.62	8,571.94	8,566.37	20.23	14.96	5.99	687.45	1,596.37	1,797.05	1,761.95	35.10	51.203		
8,675.00	8,652.32	8,592.13	8,586.55	20.27	15.00	3.56	686.98	1,596.91	1,789.67	1,754.50	35.18	50.877		
8,700.00	8,675.59	8,614.17	8,608.58	20.30	15.04	1.69	686.48	1,597.54	1,781.12	1,745.86	35.26	50.518		
8,725.00	8,698.36	8,637.18	8,631.57	20.34	15.08	0.17	685.97	1,598.19	1,771.37	1,736.03	35.34	50.126		
8,750.00	8,720.58	8,659.66	8,654.04	20.38	15.12	-1.11	685.46	1,598.83	1,760.45	1,725.03	35.42	49.708		
8,775.00	8,742.17	8,681.55	8,675.91	20.39	15.15	-2.25	684.97	1,599.46	1,748.39	1,712.90	35.49	49.284		
8,800.00	8,763.08	8,702.80	8,697.15	20.41	15.19	-3.29	684.49	1,600.06	1,735.22	1,699.66	35.56	48.795		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #5 (offset) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-ISCWSA-GYRO-3													Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,825.00	8,783.25	8,723.34	8,717.68	20.43	15.23	-4.29	684.03	1,600.65	1,720.98	1,685.35	35.63	48.304	
8,850.00	8,802.63	8,743.12	8,737.44	20.45	15.26	-5.27	683.59	1,601.21	1,705.70	1,670.01	35.69	47.790	
8,875.00	8,821.17	8,762.08	8,756.40	20.47	15.30	-6.27	683.16	1,601.76	1,689.44	1,653.68	35.75	47.255	
8,900.00	8,838.80	8,780.18	8,774.48	20.49	15.33	-7.32	682.76	1,602.27	1,672.22	1,638.42	35.81	46.702	
8,925.00	8,855.50	8,797.36	8,791.65	20.50	15.36	-8.45	682.37	1,602.76	1,654.11	1,618.26	35.86	46.131	
8,950.00	8,871.20	8,813.58	8,807.86	20.52	15.38	-9.70	682.01	1,603.22	1,635.15	1,599.25	35.90	45.543	
8,975.00	8,885.86	8,828.79	8,823.05	20.53	15.41	-11.10	681.66	1,603.68	1,615.40	1,579.45	35.95	44.940	
9,000.00	8,899.46	8,842.94	8,837.20	20.55	15.44	-12.70	681.35	1,604.06	1,594.90	1,558.92	35.98	44.324	
9,025.00	8,911.94	8,856.01	8,850.26	20.59	15.46	-14.58	681.05	1,604.43	1,573.73	1,537.71	36.02	43.696	
9,050.00	8,923.28	8,867.96	8,862.20	20.68	15.48	-16.83	680.79	1,604.78	1,551.92	1,515.88	36.04	43.057	
9,075.00	8,933.44	8,878.74	8,872.98	20.82	15.50	-19.55	680.54	1,605.08	1,529.56	1,493.49	36.07	42.409	
9,100.00	8,942.39	8,888.34	8,882.57	20.99	15.52	-22.93	680.33	1,605.36	1,506.69	1,470.81	36.09	41.753	
9,125.00	8,950.12	8,896.73	8,890.95	21.18	15.53	-27.21	680.14	1,605.60	1,483.39	1,447.29	36.10	41.091	
9,150.00	8,956.59	8,903.87	8,898.09	21.38	15.54	-32.71	679.98	1,605.80	1,459.72	1,423.61	36.11	40.425	
9,175.00	8,961.80	8,909.77	8,903.98	21.60	15.55	-39.89	679.85	1,605.97	1,435.74	1,399.63	36.12	39.754	
9,200.00	8,965.73	8,914.39	8,908.60	21.84	15.56	-49.25	679.74	1,606.10	1,411.53	1,375.42	36.12	39.082	
9,225.00	8,968.36	8,917.72	8,911.93	22.09	15.57	-61.17	679.67	1,606.19	1,387.16	1,351.04	36.11	38.410	
9,250.00	8,969.69	8,919.77	8,913.97	22.36	15.57	-75.31	679.62	1,606.25	1,362.68	1,326.57	36.11	37.738	
9,258.87	8,969.85	8,920.18	8,914.38	22.46	15.57	-80.82	679.61	1,606.26	1,353.99	1,317.88	36.11	37.500	
9,300.00	8,970.21	8,921.71	8,915.92	22.93	15.57	-80.95	679.58	1,606.31	1,313.69	1,277.59	36.09	36.397	
9,400.00	8,971.08	8,925.43	8,919.64	24.24	15.58	-81.73	679.50	1,606.41	1,215.94	1,179.86	36.08	33.704	
9,500.00	8,971.96	8,929.16	8,923.36	25.75	15.59	-82.53	679.41	1,606.52	1,118.58	1,082.49	36.09	30.994	
9,600.00	8,972.83	8,932.88	8,927.08	27.43	15.59	-83.32	679.33	1,606.63	1,021.71	985.56	36.15	28.260	
9,700.00	8,973.70	8,936.81	8,930.80	29.25	15.60	-84.12	679.24	1,606.73	925.50	889.20	36.30	25.496	
9,800.00	8,974.58	8,940.33	8,934.52	31.19	15.61	-84.92	679.16	1,606.84	830.17	793.59	36.58	22.696	
9,900.00	8,975.45	8,944.05	8,938.25	33.22	15.61	-85.72	679.08	1,606.95	736.05	698.98	37.07	19.853	
10,000.00	8,976.32	8,947.78	8,941.97	35.33	15.62	-86.53	678.99	1,607.05	643.70	605.76	37.94	16.968	
10,100.00	8,977.19	8,951.50	8,945.69	37.51	15.63	-87.33	678.91	1,607.16	553.97	514.57	39.41	14.058	
10,200.00	8,978.07	8,955.23	8,949.41	39.74	15.63	-88.14	678.83	1,607.26	468.40	428.53	41.88	11.185	
10,300.00	8,978.94	8,958.95	8,953.13	42.02	15.64	-88.95	678.74	1,607.37	389.73	343.83	45.90	8.491	
10,400.00	8,979.81	8,962.68	8,956.85	44.34	15.64	-89.76	678.66	1,607.48	323.03	271.08	51.94	6.219	
10,500.00	8,980.68	8,966.40	8,960.58	46.69	15.65	-90.57	678.58	1,607.58	277.09	217.78	59.31	4.672	
10,588.04	8,981.45	8,968.68	8,963.85	48.79	15.66	-91.29	678.50	1,607.68	262.75	198.52	64.22	4.091 CC	
10,600.00	8,981.56	8,970.12	8,964.30	49.07	15.66	-91.38	678.49	1,607.69	263.02	198.42	64.60	4.072 ES, SF	
10,700.00	8,982.43	8,973.85	8,968.02	51.48	15.66	-92.20	678.41	1,607.80	285.58	220.92	64.66	4.417	
10,800.00	8,983.30	8,977.57	8,971.74	53.90	15.67	-93.01	678.32	1,607.90	337.49	276.26	61.24	5.511	
10,900.00	8,984.17	8,981.30	8,975.46	56.35	15.68	-93.82	678.24	1,608.01	407.70	350.40	57.30	7.115	
11,000.00	8,985.05	8,985.02	8,979.19	58.81	15.68	-94.63	678.16	1,608.11	488.38	434.38	54.00	9.043	
11,100.00	8,985.92	8,988.75	8,982.91	61.29	15.69	-95.43	678.07	1,608.22	575.13	523.67	51.47	11.175	
11,200.00	8,986.79	8,992.47	8,986.63	63.78	15.70	-96.24	677.99	1,608.33	665.59	618.05	49.54	13.434	
11,300.00	8,987.66	8,996.19	8,990.35	66.28	15.70	-97.05	677.91	1,608.43	758.44	710.36	48.07	15.777	
11,400.00	8,988.54	8,999.92	8,994.07	68.79	15.71	-97.85	677.82	1,608.54	852.88	805.95	46.93	18.172	
11,500.00	8,989.41	9,003.64	8,997.79	71.31	15.72	-98.65	677.74	1,608.65	948.45	902.42	46.03	20.603	
11,600.00	8,990.28	9,007.37	9,001.52	73.84	15.72	-99.44	677.66	1,608.75	1,044.84	999.52	45.31	23.058	
11,700.00	8,991.16	9,011.09	9,005.24	76.38	15.73	-100.24	677.57	1,608.86	1,141.83	1,097.10	44.73	25.527	
11,800.00	8,992.03	9,014.81	9,008.96	78.92	15.74	-101.03	677.49	1,608.96	1,239.29	1,195.04	44.25	28.005	
11,900.00	8,992.90	9,018.54	9,012.68	81.47	15.74	-101.81	677.41	1,609.07	1,337.12	1,293.26	43.86	30.488	
12,000.00	8,993.77	9,022.26	9,016.40	84.02	15.75	-102.60	677.32	1,609.18	1,435.24	1,391.71	43.53	32.974	
12,100.00	8,994.65	9,025.99	9,020.12	86.58	15.76	-103.37	677.24	1,609.28	1,533.59	1,490.34	43.25	35.459	
12,200.00	8,995.52	9,029.71	9,023.85	89.15	15.76	-104.15	677.15	1,609.39	1,632.13	1,589.12	43.02	37.943	
12,300.00	8,996.39	9,033.44	9,027.57	91.72	15.77	-104.92	677.07	1,609.50	1,730.83	1,688.02	42.82	40.424	
12,400.00	8,997.26	9,037.16	9,031.29	94.29	15.78	-105.68	676.99	1,609.60	1,829.67	1,787.02	42.65	42.900	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #5 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,500.00	8,998.14	9,040.88	9,035.01	96.86	15.78	-106.44	676.90	1,809.71	1,928.62	1,886.11	42.51	45.372	
12,600.00	8,999.01	9,044.61	9,038.73	99.44	15.79	-107.19	676.82	1,809.81	2,027.66	1,985.28	42.39	47.838	
12,700.00	8,999.88	9,048.33	9,042.46	102.02	15.79	-107.94	676.74	1,809.92	2,126.79	2,084.51	42.28	50.298	
12,800.00	9,000.75	9,052.06	9,046.18	104.61	15.80	-108.68	676.65	1,810.03	2,225.99	2,183.79	42.20	52.751	
12,900.00	9,001.63	9,055.78	9,049.90	107.19	15.81	-109.42	676.57	1,810.13	2,325.25	2,283.12	42.13	55.197	
13,000.00	9,002.50	9,059.51	9,053.62	109.78	15.81	-110.15	676.49	1,810.24	2,424.57	2,382.50	42.07	57.636	
13,100.00	9,003.37	9,063.23	9,057.34	112.37	15.82	-110.87	676.40	1,810.35	2,523.93	2,481.91	42.02	60.068	
13,200.00	9,004.25	9,066.95	9,061.06	114.97	15.83	-111.59	676.32	1,810.45	2,623.34	2,581.36	41.98	62.488	
13,300.00	9,005.12	9,070.68	9,064.79	117.56	15.83	-112.30	676.24	1,810.56	2,722.79	2,680.84	41.95	64.902	
13,400.00	9,005.99	9,074.40	9,068.51	120.16	15.84	-113.00	676.15	1,810.66	2,822.27	2,780.34	41.93	67.306	
13,500.00	9,006.86	9,078.13	9,072.23	122.76	15.85	-113.70	676.07	1,810.77	2,921.78	2,879.86	41.92	69.702	
13,600.00	9,007.74	9,081.85	9,075.95	125.36	15.85	-114.39	675.98	1,810.88	3,021.32	2,979.41	41.91	72.088	
13,700.00	9,008.61	9,085.58	9,079.67	127.96	15.86	-115.07	675.90	1,810.98	3,120.88	3,078.97	41.91	74.465	
13,800.00	9,009.48	9,089.30	9,083.40	130.56	15.87	-115.75	675.82	1,811.09	3,220.47	3,178.55	41.92	76.832	
13,900.00	9,010.35	9,093.02	9,087.12	133.17	15.87	-116.42	675.73	1,811.19	3,320.08	3,278.15	41.93	79.190	
14,000.00	9,011.23	9,096.75	9,090.84	135.78	15.88	-117.08	675.65	1,811.30	3,419.70	3,377.76	41.94	81.537	
14,100.00	9,012.10	9,100.47	9,094.56	138.38	15.89	-117.73	675.57	1,811.41	3,519.35	3,477.39	41.96	83.874	
14,200.00	9,012.97	9,104.20	9,098.28	140.99	15.89	-118.38	675.48	1,811.51	3,619.01	3,577.02	41.98	86.200	
14,300.00	9,013.84	9,107.92	9,102.00	143.60	15.90	-119.02	675.40	1,811.62	3,718.68	3,676.67	42.01	88.516	
14,400.00	9,014.72	9,111.64	9,105.73	146.21	15.91	-119.65	675.32	1,811.73	3,818.37	3,776.33	42.04	90.822	
14,500.00	9,015.59	9,115.37	9,109.45	148.82	15.91	-120.28	675.23	1,811.83	3,918.07	3,875.99	42.08	93.116	
14,600.00	9,016.46	9,119.09	9,113.17	151.43	15.92	-120.90	675.15	1,811.94	4,017.78	3,975.66	42.12	95.400	
14,700.00	9,017.34	9,122.82	9,116.89	154.05	15.92	-121.50	675.06	1,812.04	4,117.50	4,075.35	42.16	97.672	
14,800.00	9,018.21	9,126.54	9,120.61	156.66	15.93	-122.11	674.98	1,812.15	4,217.23	4,175.03	42.20	99.933	
14,900.00	9,019.08	9,130.27	9,124.33	159.28	15.94	-122.70	674.90	1,812.26	4,316.97	4,274.73	42.25	102.183	
15,000.00	9,019.95	9,133.99	9,128.06	161.89	15.94	-123.29	674.81	1,812.36	4,416.72	4,374.43	42.30	104.422	
15,100.00	9,020.83	9,137.71	9,131.78	164.51	15.95	-123.87	674.73	1,812.47	4,516.48	4,474.13	42.35	106.649	
15,200.00	9,021.70	9,141.44	9,135.50	167.12	15.96	-124.44	674.65	1,812.58	4,616.25	4,573.84	42.40	108.884	
15,300.00	9,022.57	9,145.16	9,139.22	169.74	15.96	-125.01	674.56	1,812.68	4,716.02	4,673.56	42.46	111.068	
15,400.00	9,023.44	9,148.89	9,142.94	172.36	15.97	-125.56	674.48	1,812.79	4,815.80	4,773.28	42.52	113.280	
15,500.00	9,024.32	9,152.61	9,146.67	174.98	15.98	-126.12	674.40	1,812.89	4,915.58	4,873.00	42.58	115.441	
15,600.00	9,025.19	9,156.34	9,150.39	177.60	15.98	-126.66	674.31	1,813.00	5,015.37	4,972.73	42.64	117.609	
15,700.00	9,026.06	9,160.06	9,154.11	180.22	15.99	-127.19	674.23	1,813.11	5,115.17	5,072.46	42.71	119.765	
15,800.00	9,026.93	9,163.78	9,157.83	182.84	16.00	-127.72	674.15	1,813.21	5,214.97	5,172.19	42.78	121.910	
15,900.00	9,027.81	9,167.51	9,161.55	185.46	16.00	-128.24	674.06	1,813.32	5,314.78	5,271.93	42.85	124.042	
16,000.00	9,028.68	9,171.23	9,165.27	188.08	16.01	-128.76	673.98	1,813.43	5,414.59	5,371.67	42.92	126.182	
16,100.00	9,029.55	9,174.96	9,169.00	190.70	16.02	-129.27	673.89	1,813.53	5,514.40	5,471.41	42.99	128.270	
16,200.00	9,030.42	9,178.68	9,172.72	193.32	16.02	-129.77	673.81	1,813.64	5,614.22	5,571.16	43.07	130.366	
16,300.00	9,031.30	9,182.41	9,176.44	195.94	16.03	-130.28	673.73	1,813.74	5,714.04	5,670.90	43.14	132.449	
16,400.00	9,032.17	9,186.13	9,180.16	198.57	16.04	-130.75	673.64	1,813.85	5,813.87	5,770.65	43.22	134.521	
16,500.00	9,033.04	9,189.85	9,183.88	201.19	16.04	-131.23	673.56	1,813.96	5,913.70	5,870.40	43.30	136.579	
16,600.00	9,033.92	9,193.58	9,187.60	203.81	16.05	-131.70	673.48	1,814.06	6,013.53	5,970.15	43.38	138.626	
16,700.00	9,034.79	9,197.30	9,191.33	206.44	16.05	-132.17	673.39	1,814.17	6,113.37	6,069.91	43.46	140.680	
16,800.00	9,035.66	9,200.00	9,194.02	209.06	16.06	-132.50	673.33	1,814.25	6,213.21	6,169.67	43.54	142.687	
16,900.00	9,036.53	9,200.00	9,194.02	211.69	16.06	-132.50	673.33	1,814.25	6,313.06	6,269.43	43.62	144.713	
17,000.00	9,037.41	9,200.00	9,194.02	214.31	16.06	-132.50	673.33	1,814.25	6,412.90	6,369.20	43.71	146.728	
17,100.00	9,038.28	9,200.00	9,194.02	216.94	16.06	-132.50	673.33	1,814.25	6,512.76	6,468.97	43.79	148.731	
17,200.00	9,039.15	9,200.00	9,194.02	219.56	16.06	-132.50	673.33	1,814.25	6,612.62	6,568.74	43.87	150.723	
17,300.00	9,040.02	9,200.00	9,194.02	222.19	16.06	-132.50	673.33	1,814.25	6,712.48	6,668.52	43.96	152.702	
17,400.00	9,040.90	9,200.00	9,194.02	224.81	16.06	-132.50	673.33	1,814.25	6,812.35	6,768.30	44.04	154.670	
17,500.00	9,041.77	9,200.00	9,194.02	227.44	16.06	-132.50	673.33	1,814.25	6,912.22	6,868.08	44.13	156.626	
17,600.00	9,042.64	9,200.00	9,194.02	230.07	16.06	-132.50	673.33	1,814.25	7,012.09	6,967.87	44.22	158.569	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Emerald PWU 20-21 - PWU #5 (offset) - OH - OH												Offset Well Error:	0.00 usft
Survey Program: 100-ISCWSA-GYRO-3													
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
17,700.00	9,043.51	9,200.00	9,194.02	232.69	16.06	-132.50	673.33	1,614.25	7,111.97	7,087.66	44.31	160.502	
17,800.00	9,044.39	9,200.00	9,194.02	235.32	16.06	-132.50	673.33	1,614.25	7,211.85	7,187.45	44.40	162.422	
17,900.00	9,045.26	9,200.00	9,194.02	237.95	16.06	-132.50	673.33	1,614.25	7,311.73	7,287.24	44.49	164.330	
18,000.00	9,046.13	9,200.00	9,194.02	240.57	16.06	-132.50	673.33	1,614.25	7,411.62	7,387.03	44.59	166.226	
18,100.00	9,047.01	9,200.00	9,194.02	243.20	16.06	-132.50	673.33	1,614.25	7,511.51	7,486.83	44.68	168.111	
18,200.00	9,047.88	9,200.00	9,194.02	245.83	16.06	-132.50	673.33	1,614.25	7,611.40	7,586.63	44.78	169.984	
18,300.00	9,048.75	9,200.00	9,194.02	248.46	16.06	-132.50	673.33	1,614.25	7,711.30	7,686.43	44.87	171.845	
18,400.00	9,049.62	9,200.00	9,194.02	251.09	16.06	-132.50	673.33	1,614.25	7,811.20	7,786.23	44.97	173.694	
18,500.00	9,050.50	9,200.00	9,194.02	253.71	16.06	-132.50	673.33	1,614.25	7,911.10	7,886.03	45.07	175.532	
18,600.00	9,051.37	9,200.00	9,194.02	256.34	16.06	-132.50	673.33	1,614.25	8,011.00	7,985.83	45.17	177.357	
18,700.00	9,052.24	9,200.00	9,194.02	258.97	16.06	-132.50	673.33	1,614.25	8,110.91	8,085.64	45.27	179.171	
18,800.00	9,053.11	9,200.00	9,194.02	261.60	16.06	-132.50	673.33	1,614.25	8,210.82	8,185.45	45.37	180.973	
18,900.00	9,053.99	9,200.00	9,194.02	264.23	16.06	-132.50	673.33	1,614.25	8,310.73	8,285.26	45.47	182.784	
18,958.87	9,054.50	9,200.00	9,194.02	265.78	16.06	-132.50	673.33	1,614.25	8,369.55	8,324.01	45.53	183.813	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #6 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 3400-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	3,313.80	3,313.80	0.00	0.00	85.40	886.64	8,536.94	9,191.76				
100.00	100.00	3,313.80	3,313.80	0.09	0.00	85.40	886.64	8,536.94	9,155.92	9,154.40	1.52	6,024.083	
200.00	200.00	3,313.80	3,313.80	0.31	0.00	85.40	886.64	8,536.94	9,121.05	9,119.57	1.47	6,189.962	
300.00	300.00	3,313.80	3,313.80	0.54	0.00	85.40	886.64	8,536.94	9,087.14	9,085.67	1.46	6,213.077	
400.00	400.00	3,313.80	3,313.80	0.76	0.00	85.40	886.64	8,536.94	9,054.20	9,052.71	1.49	6,083.866	
500.00	500.00	3,313.80	3,313.80	0.99	0.00	85.40	886.64	8,536.94	9,022.26	9,020.71	1.55	5,824.551	
600.00	600.00	3,313.80	3,313.80	1.21	0.00	85.40	886.64	8,536.94	8,991.31	8,989.87	1.64	5,478.111	
700.00	700.00	3,313.80	3,313.80	1.43	0.00	85.40	886.64	8,536.94	8,961.37	8,959.81	1.76	5,090.301	
800.00	800.00	3,313.80	3,313.80	1.66	0.00	85.40	886.64	8,536.94	8,932.45	8,930.55	1.90	4,697.128	
900.00	900.00	3,313.80	3,313.80	1.88	0.00	85.40	886.64	8,536.94	8,904.56	8,902.50	2.06	4,321.362	
1,000.00	1,000.00	3,313.80	3,313.80	2.11	0.00	85.40	886.64	8,536.94	8,877.71	8,875.48	2.23	3,974.853	
1,100.00	1,100.00	3,313.80	3,313.80	2.33	0.00	85.40	886.64	8,536.94	8,851.91	8,849.49	2.42	3,661.213	
1,200.00	1,200.00	3,313.80	3,313.80	2.56	0.00	85.40	886.64	8,536.94	8,827.17	8,824.56	2.61	3,380.978	
1,300.00	1,300.00	3,313.80	3,313.80	2.78	0.00	85.40	886.64	8,536.94	8,803.49	8,800.68	2.81	3,131.749	
1,400.00	1,400.00	3,313.80	3,313.80	3.01	0.00	85.40	886.64	8,536.94	8,780.89	8,777.87	3.02	2,910.458	
1,500.00	1,500.00	3,313.80	3,313.80	3.23	0.00	85.40	886.64	8,536.94	8,759.37	8,756.14	3.23	2,713.857	
1,600.00	1,600.00	3,313.80	3,313.80	3.46	0.00	85.40	886.64	8,536.94	8,738.94	8,735.50	3.44	2,538.853	
1,700.00	1,700.00	3,313.80	3,313.80	3.68	0.00	85.40	886.64	8,536.94	8,719.61	8,715.95	3.66	2,382.648	
1,800.00	1,800.00	3,313.80	3,313.80	3.91	0.00	85.40	886.64	8,536.94	8,701.39	8,697.51	3.88	2,242.786	
1,900.00	1,900.00	3,313.80	3,313.80	4.13	0.00	85.40	886.64	8,536.94	8,684.28	8,680.18	4.10	2,117.138	
2,000.00	2,000.00	3,313.80	3,313.80	4.36	0.00	85.40	886.64	8,536.94	8,668.29	8,663.96	4.33	2,003.881	
2,100.00	2,100.00	3,313.80	3,313.80	4.58	0.00	85.40	886.64	8,536.94	8,653.42	8,648.87	4.55	1,901.453	
2,200.00	2,200.00	3,313.80	3,313.80	4.81	0.00	85.40	886.64	8,536.94	8,639.69	8,634.92	4.78	1,808.519	
2,300.00	2,300.00	3,313.80	3,313.80	5.03	0.00	85.40	886.64	8,536.94	8,627.10	8,622.09	5.00	1,723.940	
2,400.00	2,400.00	3,313.80	3,313.80	5.26	0.00	85.40	886.64	8,536.94	8,615.65	8,610.42	5.23	1,646.739	
2,500.00	2,500.00	3,313.80	3,313.80	5.48	0.00	85.40	886.64	8,536.94	8,605.34	8,599.88	5.46	1,576.076	
2,600.00	2,600.00	3,313.80	3,313.80	5.71	0.00	85.40	886.64	8,536.94	8,596.19	8,590.50	5.69	1,511.230	
2,700.00	2,700.00	3,313.80	3,313.80	5.93	0.00	85.40	886.64	8,536.94	8,588.19	8,582.27	5.92	1,451.575	
2,800.00	2,800.00	3,313.80	3,313.80	6.15	0.00	85.40	886.64	8,536.94	8,581.35	8,575.20	6.14	1,396.569	
2,900.00	2,900.00	3,313.80	3,313.80	6.38	0.00	85.40	886.64	8,536.94	8,575.67	8,569.30	6.37	1,345.740	
3,000.00	3,000.00	3,313.80	3,313.80	6.60	0.00	85.40	886.64	8,536.94	8,571.15	8,564.55	6.60	1,298.677	
3,100.00	3,100.00	3,313.80	3,313.80	6.83	0.00	85.40	886.64	8,536.94	8,567.80	8,560.97	6.83	1,255.017	
3,200.00	3,200.00	3,313.80	3,313.80	7.05	0.00	85.40	886.64	8,536.94	8,565.61	8,558.56	7.05	1,214.444	
3,300.00	3,300.00	3,313.80	3,313.80	7.28	0.00	85.40	886.64	8,536.94	8,564.59	8,557.31	7.28	1,176.677	
3,400.00	3,400.00	3,423.56	3,423.55	7.50	0.12	85.39	887.83	8,536.48	8,564.28	8,556.66	7.62	1,123.681	
3,500.00	3,500.00	3,525.78	3,525.75	7.73	0.30	85.38	889.56	8,535.77	8,563.72	8,555.69	8.03	1,066.865	
3,600.00	3,600.00	3,629.67	3,629.63	7.95	0.48	85.37	891.33	8,535.00	8,563.12	8,554.69	8.44	1,015.166	
3,691.76	3,691.76	3,721.25	3,721.19	8.16	0.64	112.71	892.95	8,534.28	8,562.81	8,554.01	8.80	972.874	
3,700.00	3,700.00	3,728.00	3,727.94	8.18	0.66	112.71	893.07	8,534.23	8,562.82	8,553.98	8.83	969.535	
3,800.00	3,799.96	3,840.45	3,840.36	8.40	0.86	112.71	895.27	8,533.45	8,563.31	8,554.06	9.25	925.571	
3,900.00	3,899.86	4,008.19	4,008.04	8.62	1.16	112.72	898.92	8,531.05	8,563.67	8,553.90	9.77	876.529	
4,000.00	3,999.68	4,111.95	4,111.77	8.84	1.34	112.73	701.32	8,529.23	8,564.47	8,554.29	10.18	841.689	
4,100.00	4,099.37	4,219.36	4,219.12	9.07	1.53	112.75	703.99	8,527.26	8,565.88	8,555.29	10.59	808.983	
4,124.09	4,123.36	4,245.88	4,245.62	9.12	1.58	112.76	704.68	8,526.76	8,566.31	8,555.62	10.69	801.353	
4,200.00	4,198.95	4,327.12	4,326.82	9.29	1.73	112.79	708.91	8,525.16	8,567.68	8,556.67	11.01	778.522	
4,300.00	4,298.53	4,424.04	4,423.68	9.52	1.90	112.83	709.71	8,523.22	8,569.45	8,558.05	11.40	751.406	
4,400.00	4,398.12	4,500.00	4,499.59	9.75	2.04	112.85	712.07	8,521.77	8,571.36	8,559.59	11.77	728.309	
4,500.00	4,497.70	4,587.20	4,586.73	9.98	2.20	112.88	714.83	8,520.29	8,573.48	8,561.32	12.16	705.326	
4,600.00	4,597.28	4,692.66	4,692.12	10.22	2.39	112.92	718.21	8,518.63	8,575.72	8,563.14	12.58	681.885	
4,700.00	4,696.86	4,805.23	4,804.61	10.45	2.60	112.95	722.00	8,516.89	8,577.83	8,564.81	13.01	659.204	
4,800.00	4,796.44	4,900.00	4,899.32	10.69	2.77	112.99	725.19	8,515.05	8,579.92	8,566.50	13.42	639.454	
4,900.00	4,896.03	5,048.13	5,047.31	10.92	3.04	113.03	730.80	8,511.94	8,581.66	8,567.73	13.92	616.431	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #6 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 3400-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toelface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,995.61	5,158.01	5,157.09	11.16	3.24	113.07	734.66	8,509.34	8,583.15	8,568.80	14.36	597.821	
5,100.00	5,095.19	5,296.83	5,295.76	11.40	3.50	113.11	739.89	8,505.69	8,584.41	8,569.56	14.85	578.200	
5,200.00	5,194.77	5,407.85	5,406.84	11.64	3.71	113.14	744.32	8,502.40	8,585.34	8,570.05	15.29	561.591	
5,300.00	5,294.35	5,575.62	5,574.15	11.89	4.02	113.18	751.73	8,496.49	8,585.71	8,569.87	15.83	542.228	
5,400.00	5,393.94	5,732.00	5,730.24	12.13	4.31	113.22	758.56	8,489.94	8,585.46	8,569.10	16.36	524.802	
5,500.00	5,493.52	5,965.99	5,963.66	12.37	4.75	113.28	768.82	8,477.30	8,583.85	8,566.83	17.02	504.259	
5,600.00	5,593.10	6,091.94	6,089.25	12.62	4.99	113.31	774.27	8,469.50	8,581.80	8,564.11	17.49	490.815	
5,700.00	5,692.68	6,187.58	6,184.81	12.86	5.17	113.33	778.32	8,463.41	8,579.16	8,561.26	17.91	479.105	
5,800.00	5,792.26	6,301.42	6,298.11	13.11	5.38	113.36	783.16	8,456.13	8,576.70	8,558.34	18.35	467.272	
5,900.00	5,891.85	6,412.11	6,408.49	13.36	5.59	113.39	787.23	8,448.90	8,574.06	8,555.27	18.80	456.172	
6,000.00	5,991.43	6,511.94	6,508.06	13.61	5.77	113.42	790.10	8,442.41	8,571.40	8,552.18	19.22	446.067	
6,100.00	6,091.01	6,640.92	6,636.71	13.85	6.00	113.47	793.64	8,433.75	8,568.50	8,548.82	19.69	435.271	
6,200.00	6,190.59	6,723.83	6,719.41	14.10	6.15	113.50	795.57	8,428.09	8,565.50	8,545.42	20.08	426.654	
6,300.00	6,290.17	6,800.00	6,795.41	14.35	6.28	113.53	796.90	8,423.38	8,563.02	8,542.57	20.45	418.634	
6,400.00	6,389.76	6,842.38	6,837.72	14.60	6.35	113.55	797.52	8,420.96	8,560.93	8,540.15	20.78	412.058	
6,500.00	6,489.34	6,950.40	6,945.56	14.86	6.54	113.60	799.09	8,414.98	8,559.15	8,537.94	21.21	403.555	
6,600.00	6,588.92	7,106.73	7,101.59	15.11	6.82	113.67	801.33	8,405.46	8,556.80	8,535.08	21.73	393.866	
6,700.00	6,688.50	7,229.13	7,223.70	15.36	7.03	113.72	803.42	8,397.46	8,554.05	8,531.87	22.18	385.584	
6,800.00	6,788.08	7,300.00	7,294.41	15.61	7.16	113.75	804.56	8,392.70	8,551.19	8,528.63	22.56	379.095	
6,900.00	6,887.66	7,374.95	7,369.20	15.86	7.29	113.78	805.42	8,387.93	8,548.64	8,525.70	22.94	372.722	
7,000.00	6,987.25	7,470.92	7,465.01	16.12	7.45	113.83	806.00	8,382.35	8,546.54	8,523.19	23.35	366.017	
7,100.00	7,086.83	7,598.08	7,591.93	16.37	7.67	113.89	806.45	8,374.63	8,544.19	8,520.38	23.82	358.738	
7,200.00	7,186.41	7,700.00	7,693.64	16.63	7.84	113.95	805.67	8,368.09	8,541.43	8,517.19	24.24	352.335	
7,300.00	7,285.99	7,776.01	7,769.49	16.88	7.97	114.00	804.21	8,363.38	8,538.86	8,514.23	24.62	346.763	
7,400.00	7,385.57	7,800.00	7,793.43	17.14	8.01	114.02	803.66	8,362.00	8,537.00	8,512.08	24.92	342.591	
7,500.00	7,485.16	7,852.24	7,845.59	17.39	8.10	114.06	802.36	8,359.41	8,535.77	8,510.51	25.26	337.886	
7,600.00	7,584.74	7,900.00	7,893.30	17.65	8.18	114.09	801.05	8,357.60	8,535.41	8,509.82	25.60	333.436	
7,613.86	7,598.54	7,900.00	7,893.30	17.68	8.18	114.09	801.05	8,357.60	8,535.40	8,509.77	25.63	332.975	
7,700.00	7,694.32	7,927.62	7,920.90	17.90	8.23	114.11	800.27	8,356.75	8,535.74	8,509.84	25.90	329.553	
7,800.00	7,793.90	8,000.00	7,993.22	18.16	8.35	114.16	798.30	8,355.00	8,536.82	8,510.54	26.28	324.839	
7,900.00	7,893.48	8,000.00	7,993.22	18.41	8.35	114.16	798.30	8,355.00	8,538.42	8,511.89	26.54	321.762	
8,000.00	7,993.07	8,068.04	8,061.23	18.67	8.47	114.21	796.65	8,353.97	8,540.62	8,513.71	26.91	317.394	
8,100.00	8,092.65	8,100.00	8,093.19	18.93	8.52	114.24	795.96	8,353.69	8,543.52	8,516.30	27.22	313.871	
8,200.00	8,192.23	8,162.79	8,155.97	19.19	8.63	114.28	795.03	8,353.51	8,546.99	8,519.41	27.58	309.882	
8,300.00	8,291.81	8,200.00	8,193.16	19.44	8.70	114.30	794.61	8,353.62	8,551.11	8,523.21	27.90	306.461	
8,400.00	8,391.39	8,241.37	8,234.54	19.70	8.77	114.32	794.63	8,354.03	8,555.94	8,527.71	28.23	303.120	
8,492.99	8,473.99	8,300.00	8,293.16	19.94	8.87	114.36	794.10	8,355.30	8,561.25	8,532.69	28.56	299.748	
8,500.00	8,480.98	8,300.00	8,293.16	19.96	8.87	105.63	794.10	8,355.30	8,561.60	8,533.02	28.58	299.584	
8,525.00	8,505.89	8,300.00	8,293.16	20.01	8.87	70.00	794.10	8,355.30	8,562.04	8,533.41	28.63	299.024	
8,550.00	8,530.77	8,300.00	8,293.16	20.06	8.87	43.57	794.10	8,355.30	8,561.25	8,532.56	28.69	298.428	
8,575.00	8,555.56	8,300.00	8,293.16	20.11	8.87	29.26	794.10	8,355.30	8,559.23	8,530.48	28.74	297.798	
8,600.00	8,580.17	8,300.00	8,293.16	20.15	8.87	21.26	794.10	8,355.30	8,555.68	8,527.18	28.79	297.135	
8,625.00	8,604.54	8,325.71	8,318.86	20.19	8.91	16.35	793.78	8,356.06	8,551.43	8,522.54	28.89	296.017	
8,650.00	8,628.62	8,338.04	8,331.18	20.23	8.93	13.06	793.63	8,356.46	8,545.66	8,516.70	28.96	295.094	
8,675.00	8,652.32	8,350.21	8,343.34	20.27	8.95	10.72	793.47	8,356.86	8,538.66	8,509.63	29.03	294.150	
8,700.00	8,675.59	8,362.19	8,355.32	20.30	8.97	8.96	793.31	8,357.28	8,530.44	8,501.35	29.10	293.188	
8,725.00	8,698.36	8,373.96	8,367.07	20.34	8.99	7.59	793.14	8,357.71	8,521.04	8,491.88	29.16	292.208	
8,750.00	8,720.58	8,438.24	8,431.30	20.36	9.10	6.52	791.99	8,359.96	8,510.43	8,481.12	29.31	290.363	
8,775.00	8,742.17	8,460.18	8,453.22	20.39	9.14	5.61	791.52	8,360.67	8,498.57	8,469.18	29.39	289.183	
8,800.00	8,763.08	8,481.47	8,474.51	20.41	9.18	4.84	791.07	8,361.36	8,485.58	8,456.11	29.46	288.000	
8,825.00	8,783.25	8,502.07	8,495.09	20.43	9.22	4.16	790.64	8,362.02	8,471.48	8,441.95	29.54	286.818	
8,850.00	8,802.63	8,521.91	8,514.91	20.45	9.25	3.56	790.22	8,362.66	8,466.33	8,426.73	29.60	285.639	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #6 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 3400-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
8,875.00	8,821.17	8,540.94	8,533.92	20.47	9.28	3.00	789.81	8,363.27	8,440.16	8,410.49	29.67	284.466	
8,900.00	8,838.80	8,559.10	8,552.07	20.49	9.32	2.48	789.43	8,363.86	8,423.02	8,393.29	29.73	283.301	
8,925.00	8,855.50	8,576.35	8,569.31	20.50	9.35	1.97	789.06	8,364.41	8,404.95	8,375.16	29.79	282.146	
8,950.00	8,871.20	8,592.64	8,585.59	20.52	9.37	1.47	788.72	8,364.94	8,386.00	8,356.16	29.84	281.004	
8,975.00	8,885.86	8,607.92	8,600.86	20.53	9.40	0.95	788.40	8,365.43	8,368.23	8,336.34	29.89	279.878	
9,000.00	8,899.46	8,622.16	8,615.09	20.55	9.43	0.40	788.09	8,365.89	8,345.69	8,315.75	29.94	278.769	
9,025.00	8,911.94	8,635.31	8,628.22	20.59	9.45	-0.21	787.82	8,366.32	8,324.43	8,294.45	29.98	277.680	
9,050.00	8,923.28	8,647.33	8,640.24	20.68	9.47	-0.89	787.56	8,366.70	8,302.52	8,272.50	30.01	276.613	
9,075.00	8,933.44	8,658.21	8,651.11	20.82	9.49	-1.70	787.33	8,367.05	8,280.01	8,249.96	30.05	275.569	
9,100.00	8,942.39	8,667.89	8,660.78	20.99	9.51	-2.70	787.13	8,367.37	8,258.96	8,226.89	30.07	274.550	
9,125.00	8,950.12	8,676.36	8,669.25	21.18	9.52	-3.98	786.95	8,367.64	8,233.45	8,203.35	30.10	273.557	
9,150.00	8,956.59	8,683.60	8,676.48	21.38	9.53	-5.72	786.80	8,367.87	8,209.53	8,179.41	30.12	272.593	
9,175.00	8,961.80	8,689.59	8,682.46	21.60	9.54	-8.26	786.67	8,368.07	8,185.26	8,155.13	30.13	271.658	
9,200.00	8,965.73	8,694.30	8,687.17	21.84	9.55	-12.32	786.57	8,368.22	8,160.72	8,130.58	30.14	270.753	
9,225.00	8,968.36	8,697.73	8,690.60	22.09	9.56	-19.83	786.50	8,368.33	8,135.98	8,105.83	30.15	269.878	
9,250.00	8,969.69	8,699.86	8,692.73	22.36	9.56	-37.10	786.45	8,368.40	8,111.09	8,080.94	30.15	269.033	
9,258.87	8,969.85	8,700.31	8,693.18	22.46	9.56	-48.86	786.44	8,368.41	8,102.24	8,072.09	30.15	268.738	
9,300.00	8,970.21	8,701.99	8,694.86	22.93	9.57	-49.01	786.41	8,368.47	8,061.19	8,031.04	30.15	267.403	
9,400.00	8,971.08	8,706.09	8,698.95	24.24	9.57	-49.36	786.32	8,368.60	7,961.38	7,931.24	30.14	264.145	
9,500.00	8,971.96	8,710.18	8,703.05	25.75	9.58	-49.72	786.23	8,368.73	7,861.56	7,831.43	30.14	260.869	
9,600.00	8,972.83	8,714.28	8,707.14	27.43	9.59	-50.09	786.15	8,368.86	7,761.76	7,731.62	30.13	257.576	
9,700.00	8,973.70	8,718.38	8,711.23	29.25	9.59	-50.45	786.06	8,368.99	7,661.95	7,631.82	30.13	254.264	
9,800.00	8,974.58	8,722.47	8,715.32	31.19	9.60	-50.82	785.97	8,369.13	7,562.15	7,532.01	30.14	250.936	
9,900.00	8,975.45	8,726.57	8,719.42	33.22	9.61	-51.20	785.89	8,369.26	7,462.35	7,432.21	30.14	247.590	
10,000.00	8,976.32	8,730.66	8,723.51	35.33	9.62	-51.58	785.80	8,369.39	7,362.56	7,332.41	30.15	244.227	
10,100.00	8,977.19	8,734.76	8,727.60	37.51	9.62	-51.97	785.71	8,369.52	7,262.76	7,232.61	30.16	240.847	
10,200.00	8,978.07	8,738.86	8,731.70	39.74	9.63	-52.35	785.63	8,369.65	7,162.97	7,132.81	30.17	237.451	
10,300.00	8,978.94	8,742.95	8,735.79	42.02	9.64	-52.75	785.54	8,369.79	7,063.19	7,033.01	30.18	234.038	
10,400.00	8,979.81	8,747.05	8,739.88	44.34	9.64	-53.15	785.45	8,369.92	6,963.41	6,933.21	30.20	230.609	
10,500.00	8,980.68	8,751.14	8,743.98	46.69	9.65	-53.55	785.37	8,370.05	6,863.63	6,833.41	30.21	227.164	
10,600.00	8,981.56	8,755.24	8,748.07	49.07	9.66	-53.95	785.28	8,370.18	6,763.86	6,733.62	30.24	223.703	
10,700.00	8,982.43	8,759.34	8,752.16	51.48	9.67	-54.36	785.19	8,370.31	6,664.09	6,633.83	30.26	220.226	
10,800.00	8,983.30	8,763.43	8,756.25	53.90	9.67	-54.78	785.11	8,370.45	6,564.32	6,534.03	30.29	216.733	
10,900.00	8,984.17	8,767.53	8,760.35	56.35	9.68	-55.20	785.02	8,370.58	6,464.56	6,434.24	30.32	213.225	
11,000.00	8,985.05	8,771.62	8,764.44	58.81	9.69	-55.62	784.93	8,370.71	6,364.81	6,334.45	30.35	209.701	
11,100.00	8,985.92	8,775.72	8,768.53	61.29	9.69	-56.05	784.85	8,370.84	6,265.06	6,234.67	30.39	206.162	
11,200.00	8,986.79	8,779.82	8,772.63	63.78	9.70	-56.48	784.76	8,370.97	6,165.31	6,134.88	30.43	202.608	
11,300.00	8,987.66	8,783.91	8,776.72	66.26	9.71	-56.92	784.67	8,371.11	6,065.57	6,035.10	30.47	199.039	
11,400.00	8,988.54	8,788.01	8,780.81	68.79	9.72	-57.36	784.59	8,371.24	5,965.84	5,935.32	30.52	195.455	
11,500.00	8,989.41	8,792.11	8,784.91	71.31	9.72	-57.81	784.50	8,371.37	5,866.11	5,835.54	30.58	191.856	
11,600.00	8,990.28	8,796.20	8,789.00	73.84	9.73	-58.26	784.41	8,371.50	5,766.39	5,735.76	30.63	188.242	
11,700.00	8,991.16	8,800.30	8,793.09	76.38	9.74	-58.72	784.33	8,371.64	5,666.68	5,635.98	30.69	184.613	
11,800.00	8,992.03	8,804.39	8,797.18	78.92	9.74	-59.18	784.24	8,371.77	5,566.97	5,536.21	30.76	180.969	
11,900.00	8,992.90	8,808.49	8,801.28	81.47	9.75	-59.65	784.15	8,371.90	5,467.27	5,436.44	30.83	177.311	
12,000.00	8,993.77	8,812.59	8,805.37	84.02	9.76	-60.12	784.07	8,372.03	5,367.58	5,336.67	30.91	173.637	
12,100.00	8,994.65	8,816.68	8,809.46	86.58	9.77	-60.59	783.98	8,372.16	5,267.90	5,236.90	31.00	169.949	
12,200.00	8,995.52	8,820.78	8,813.56	89.15	9.77	-61.07	783.89	8,372.30	5,168.23	5,137.14	31.09	166.246	
12,300.00	8,996.39	8,824.87	8,817.65	91.72	9.78	-61.56	783.81	8,372.43	5,068.56	5,037.38	31.19	162.529	
12,400.00	8,997.26	8,828.97	8,821.74	94.29	9.79	-62.05	783.72	8,372.56	4,968.81	4,937.62	31.29	158.796	
12,500.00	8,998.14	8,833.07	8,825.84	96.86	9.79	-62.54	783.63	8,372.69	4,869.27	4,837.86	31.40	155.049	
12,600.00	8,999.01	8,837.16	8,829.93	99.44	9.80	-63.04	783.55	8,372.82	4,769.84	4,738.11	31.53	151.287	
12,700.00	8,999.88	8,841.26	8,834.02	102.02	9.81	-63.54	783.46	8,372.96	4,670.02	4,638.36	31.66	147.510	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #6 (offset) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 3400-ISCWSA-GYRO-3													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
12,800.00	9,000.75	8,845.35	8,838.11	104.61	9.82	-84.05	783.37	8,373.09	4,570.41	4,538.61	31.80	143.718		
12,900.00	9,001.63	8,849.45	8,842.21	107.19	9.82	-84.56	783.29	8,373.22	4,470.82	4,438.86	31.95	139.911		
13,000.00	9,002.50	8,853.55	8,846.30	109.78	9.83	-85.08	783.20	8,373.35	4,371.24	4,339.12	32.12	136.090		
13,100.00	9,003.37	8,857.64	8,850.39	112.37	9.84	-85.60	783.11	8,373.48	4,271.68	4,239.38	32.30	132.254		
13,200.00	9,004.25	8,861.74	8,854.49	114.97	9.84	-86.13	783.03	8,373.62	4,172.13	4,139.84	32.49	128.404		
13,300.00	9,005.12	8,865.83	8,858.58	117.56	9.85	-86.66	782.94	8,373.75	4,072.61	4,039.91	32.70	124.540		
13,400.00	9,005.99	8,869.93	8,862.67	120.16	9.86	-87.20	782.85	8,373.88	3,973.10	3,940.17	32.93	120.662		
13,500.00	9,006.86	8,874.03	8,866.77	122.76	9.87	-87.74	782.77	8,374.01	3,873.62	3,840.44	33.17	116.771		
13,600.00	9,007.74	8,878.12	8,870.86	125.36	9.87	-88.28	782.68	8,374.14	3,774.15	3,740.71	33.44	112.868		
13,700.00	9,008.61	8,882.22	8,874.95	127.96	9.88	-88.83	782.59	8,374.28	3,674.71	3,640.99	33.73	108.952		
13,800.00	9,009.48	8,886.31	8,879.04	130.56	9.89	-89.38	782.51	8,374.41	3,575.30	3,541.26	34.04	105.026		
13,900.00	9,010.35	8,890.41	8,883.14	133.17	9.90	-89.94	782.42	8,374.54	3,475.82	3,441.53	34.38	101.090		
14,000.00	9,011.23	8,894.51	8,887.23	135.78	9.90	-90.50	782.33	8,374.67	3,376.57	3,341.81	34.76	97.146		
14,100.00	9,012.10	8,898.60	8,891.32	138.38	9.91	-91.07	782.25	8,374.80	3,277.25	3,242.09	35.17	93.195		
14,200.00	9,012.97	8,902.70	8,895.42	140.99	9.92	-91.64	782.16	8,374.94	3,177.97	3,142.38	35.61	89.240		
14,300.00	9,013.84	8,906.79	8,899.51	143.60	9.92	-92.21	782.07	8,375.07	3,078.73	3,042.63	36.10	85.284		
14,400.00	9,014.72	8,910.89	8,903.60	146.21	9.93	-92.79	781.99	8,375.20	2,979.54	2,942.90	36.64	81.328		
14,500.00	9,015.59	8,914.99	8,907.70	148.82	9.94	-93.37	781.90	8,375.33	2,880.40	2,843.17	37.23	77.377		
14,600.00	9,016.46	8,919.08	8,911.79	151.43	9.95	-93.96	781.81	8,375.47	2,781.31	2,743.43	37.87	73.435		
14,700.00	9,017.34	8,923.18	8,915.88	154.05	9.95	-94.55	781.73	8,375.60	2,682.28	2,643.69	38.59	69.505		
14,800.00	9,018.21	8,927.27	8,919.97	156.66	9.96	-95.14	781.64	8,375.73	2,583.32	2,543.94	39.38	65.595		
14,900.00	9,019.08	8,931.37	8,924.07	159.28	9.97	-95.74	781.55	8,375.86	2,484.44	2,444.18	40.26	61.708		
15,000.00	9,019.95	8,935.47	8,928.16	161.89	9.97	-96.34	781.47	8,375.99	2,385.65	2,344.41	41.24	57.853		
15,100.00	9,020.83	8,939.56	8,932.25	164.51	9.98	-96.95	781.38	8,376.13	2,286.95	2,244.63	42.32	54.038		
15,200.00	9,021.70	8,943.66	8,936.35	167.12	9.99	-97.55	781.29	8,376.26	2,188.36	2,144.83	43.54	50.268		
15,300.00	9,022.57	8,947.76	8,940.44	169.74	10.00	-98.16	781.21	8,376.39	2,089.90	2,045.01	44.89	46.552		
15,400.00	9,023.44	8,951.85	8,944.53	172.36	10.00	-98.78	781.12	8,376.52	1,991.59	1,945.17	46.42	42.904		
15,500.00	9,024.32	8,955.95	8,948.63	174.98	10.01	-99.39	781.03	8,376.65	1,893.44	1,845.30	48.14	39.332		
15,600.00	9,025.19	8,960.04	8,952.72	177.60	10.02	-80.01	780.95	8,376.79	1,795.49	1,745.40	50.09	35.848		
15,700.00	9,026.06	8,964.14	8,956.81	180.22	10.02	-80.63	780.86	8,376.92	1,697.76	1,645.46	52.30	32.464		
15,800.00	9,026.93	8,968.24	8,960.90	182.84	10.03	-81.26	780.77	8,377.05	1,600.31	1,545.49	54.82	29.192		
15,900.00	9,027.81	8,972.33	8,965.00	185.46	10.04	-81.88	780.69	8,377.18	1,503.18	1,445.46	57.72	26.045		
16,000.00	9,028.68	8,976.43	8,969.09	188.08	10.05	-82.51	780.60	8,377.31	1,406.44	1,345.38	61.06	23.035		
16,100.00	9,029.55	8,980.52	8,973.18	190.70	10.05	-83.14	780.51	8,377.45	1,310.18	1,245.24	64.93	20.177		
16,200.00	9,030.42	8,984.62	8,977.28	193.32	10.06	-83.78	780.43	8,377.58	1,214.50	1,145.03	69.47	17.483		
16,300.00	9,031.30	8,988.72	8,981.37	195.94	10.07	-84.41	780.34	8,377.71	1,119.57	1,044.76	74.81	14.965		
16,400.00	9,032.17	8,992.81	8,985.46	198.57	10.07	-85.05	780.25	8,377.84	1,025.59	944.42	81.17	12.636		
16,500.00	9,033.04	8,996.91	8,989.56	201.19	10.08	-85.69	780.17	8,377.97	932.84	844.05	88.79	10.506		
16,600.00	9,033.92	9,001.00	8,993.65	203.81	10.09	-86.33	780.08	8,378.11	841.73	743.70	98.03	8.587		
16,700.00	9,034.79	9,005.10	8,997.74	206.44	10.10	-86.97	779.99	8,378.24	752.86	643.54	109.32	6.887		
16,800.00	9,035.66	9,009.20	9,001.83	209.06	10.10	-87.61	779.91	8,378.37	667.12	543.89	123.24	5.413		
16,900.00	9,036.53	9,013.29	9,005.93	211.69	10.11	-88.25	779.82	8,378.50	585.90	445.51	140.39	4.173		
17,000.00	9,037.41	9,017.39	9,010.02	214.31	10.12	-88.89	779.73	8,378.63	511.34	350.11	161.23	3.171		
17,100.00	9,038.28	9,021.48	9,014.11	216.94	10.12	-89.54	779.65	8,378.77	446.79	261.44	185.35	2.410		
17,200.00	9,039.15	9,025.58	9,018.21	219.56	10.13	-90.18	779.56	8,378.90	397.17	187.15	210.02	1.891		
17,300.00	9,040.02	9,029.68	9,022.30	222.19	10.14	-90.83	779.47	8,379.03	368.55	139.82	228.73	1.611		
17,359.74	9,040.55	9,032.12	9,024.75	223.76	10.14	-91.21	779.42	8,379.11	363.68	129.99	233.70	1.556 CC, ES, SF		
17,400.00	9,040.90	9,033.77	9,026.39	224.81	10.15	-91.47	779.39	8,379.16	365.90	132.15	233.75	1.565		
17,500.00	9,041.77	9,037.87	9,030.49	227.44	10.15	-92.12	779.30	8,379.29	369.75	166.26	223.49	1.744		
17,600.00	9,042.64	9,041.96	9,034.58	230.07	10.16	-92.76	779.21	8,379.43	435.77	231.56	204.21	2.134		
17,700.00	9,043.51	9,046.06	9,038.67	232.69	10.17	-93.41	779.13	8,379.56	497.84	314.83	183.01	2.720		
17,800.00	9,044.39	9,050.16	9,042.76	235.32	10.17	-94.05	779.04	8,379.69	570.76	407.09	163.67	3.487		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Emerald PWU 20-21 - PWU #6 (offset) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 3400-ISCWSA-GYRO-3												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
17,900.00	9,045.26	9,054.25	9,048.86	237.95	10.18	-94.69	778.95	8,379.82	650.89	503.59	147.29	4.419	
18,000.00	9,046.13	9,058.35	9,050.95	240.57	10.19	-95.33	778.87	8,379.96	735.87	602.09	133.78	5.501	
18,100.00	9,047.01	9,062.44	9,055.04	243.20	10.20	-95.98	778.78	8,380.09	824.21	701.53	122.68	6.718	
18,200.00	9,047.88	9,066.54	9,059.14	245.83	10.20	-96.61	778.69	8,380.22	914.94	801.40	113.54	8.058	
18,300.00	9,048.75	9,070.64	9,063.23	248.46	10.21	-97.25	778.61	8,380.35	1,007.40	901.46	105.95	9.508	
18,400.00	9,049.62	9,074.73	9,067.32	251.09	10.22	-97.89	778.52	8,380.48	1,101.17	1,001.59	99.58	11.058	
18,500.00	9,050.50	9,078.83	9,071.42	253.71	10.22	-98.53	778.43	8,380.62	1,195.94	1,101.74	94.20	12.696	
18,600.00	9,051.37	9,082.92	9,075.51	256.34	10.23	-99.16	778.35	8,380.75	1,291.48	1,201.88	89.60	14.414	
18,700.00	9,052.24	9,087.02	9,079.60	258.97	10.24	-99.79	778.26	8,380.88	1,387.64	1,301.99	85.65	16.202	
18,800.00	9,053.11	9,091.12	9,083.69	261.60	10.25	-100.42	778.17	8,381.01	1,484.29	1,402.07	82.22	18.053	
18,900.00	9,053.99	9,095.21	9,087.79	264.23	10.25	-101.05	778.09	8,381.14	1,581.35	1,502.12	79.23	19.960	
18,958.87	9,054.50	9,097.62	9,090.20	265.78	10.26	-101.41	778.04	8,381.22	1,638.65	1,561.01	77.64	21.105	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

LEAM Drilling Systems LLC

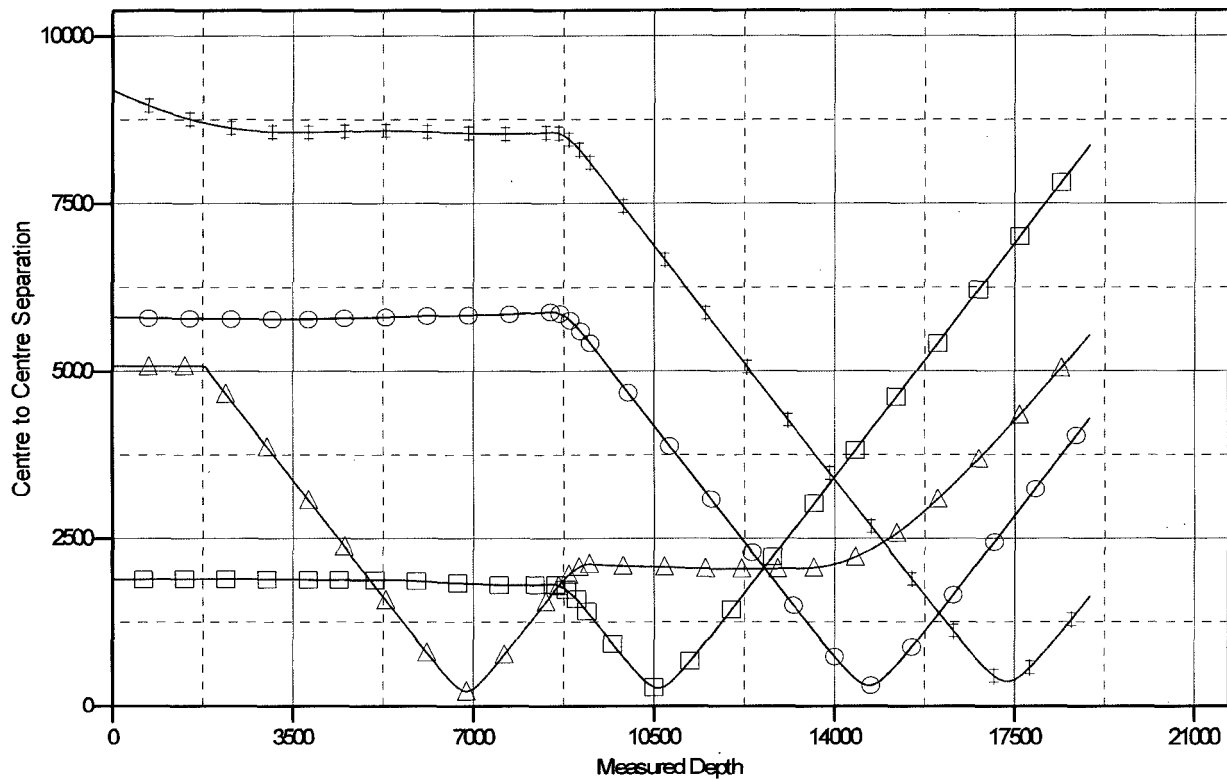
Anticollision Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 12H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Reference Site:	Emerald PWU 20-21	MD Reference:	3313.8' GE + 23.5' KB @ 3337.30usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	12H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 3313.8' GE + 23.5' KB @ 3337.30usft
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 12H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.12°

Ladder Plot



LEGEND

- ▲ Emerald 20 8H (offset), OH, OH V0
- PWU #6 (offset), OH, OH V0
- PWU #5 (offset), OH, OH V0
- ◆ PWU #24 (offset), OH, OH V0

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

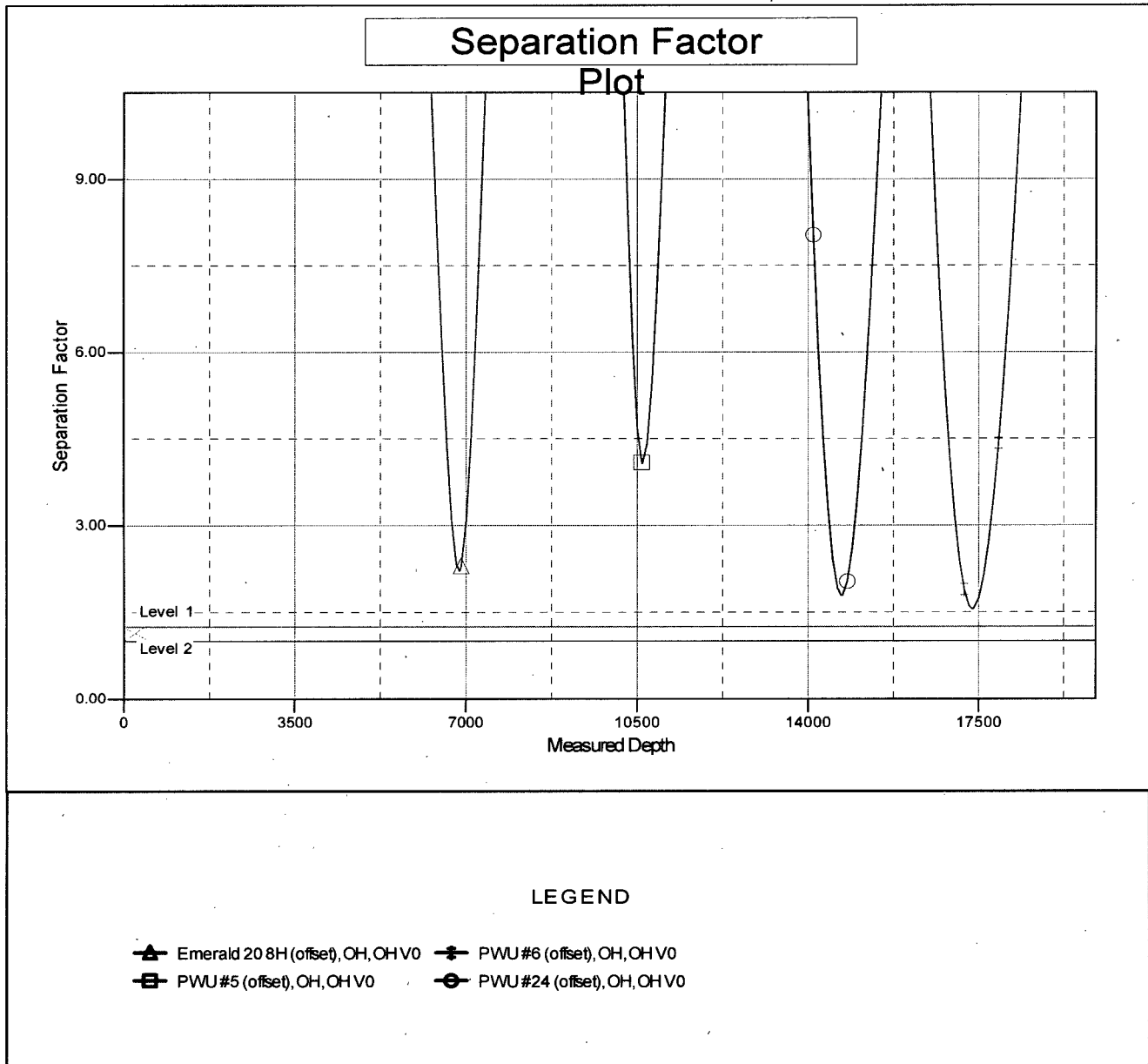
LEAM Drilling Systems LLC

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MAR 06 2017

Devon Energy, Emerald PWU 20-21 12H

1. Geologic Formations

RECEIVED

TVD of target	9,056'	Pilot hole depth	N/A
MD at TD:	18,958	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Top of Salt	439		
Base of Salt	900		
Delaware	2920		
Bone Spring	4520		
1BSSS	6752		
2BSLM	6891		
2BSSS	7486		
3BSLM	7842		
3BSSS	8609		
G Sand Target	8931		
WFMP	9006		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

Devon Energy, Emerald PWU 20-21 12H

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.
	From	To				
17.5"	0	350	13.375"	48	H-40	STC
12.25"	0	3,450'	9.625"	40	J-55	BTC
8.75"	0	18,958'	5.5	17	P-110	BTC
BLM Minimum Safety Factor				1.125	1.00	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Must have table for contingency casing

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

Devon Energy, Emerald PWU 20-21 12H

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	H ₂ O gal/sk	Yld ft ³ / sack	500# Comp. Strength (hours)	Slurry Description
13-3/8"						
Surface	395	14.8	395	14.8	6.368	C + Adds
9-5/8"	655	12.6	10.654	1.95	31 hr 40 mn	35:65 Poz:C + Adds
Inter.	438	14.8	6.352	1.33	5 hr 29 mn	C + Adds
5-1/2"	851	11.2	15.442	2.59	19 hr 3 mn	TXI + Adds
Prod	1967	14.5	5.175	1.18	9 hr 6 mn	50:50 Poz:H + Adds

If a DV tool is used, depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
13-3/8" Surface	0'	25%
9-5/8" Intermediate	0'	25%
5-1/2" Production Casing	2450'	10%

Devon Energy, Emerald PWU 20-21 12H

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	3M	Annular	x	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	x	
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% testing pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	x	
			Other*		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		

*Specify if additional ram is utilized.

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
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Devon Energy, Emerald PWU 20-21 12H

Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	Y Are anchors required by manufacturer?
Y	A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. Devon proposes using a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 3000 (3M) psi. • Wellhead will be installed by wellhead representatives. • If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal. • Wellhead representative will install the test plug for the initial BOP test. • Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 3M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time. • If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted. • Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating. • Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2. After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2. After running the 9-5/8' intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 3M will already be installed on the wellhead. The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 3,000 psi WP.

Devon Energy, Emerald PWU 20-21 12H

	Devon's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.
	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.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	350'	FW Gel	8.6-8.8	28-34	N/C
350'	3,450'	Saturated Brine	10.0-10.2	28-34	N/C
3,450'	18,958'	Cut Brine	8.5-9.0	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
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6. Logging and Testing Procedures

Logging, Coring and Testing.	
x	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	Int. shoe to KOP
	Density	Int. shoe to KOP
X	CBL	Production casing
X	Mud log	Intermediate shoe to TD
	PEX	

Devon Energy, Emerald PWU 20-21 12H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4238 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other facets of operation

Is this a walking operation? No.

Will be pre-setting casing? No.

Attachments

☒ Directional Plan

☐ Other, describe