

30-015-38953

DEVON ENERGY

Hackberry (Nad 83)
Eddy County, NM
Arcturus "18" Federal #3H
VH - Job #32K10111050

Survey: Gyro

SDI Standard Survey Report

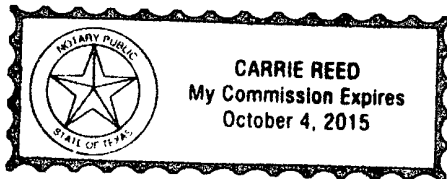
This survey is correct to the best of my knowledge and is supported by actual field data.

Robert

Notarized this date 12th of December, 2011.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling
Directional Drilling Operations

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well Arcturus "18" Federal #3H
Project:	Hackberry (Nad 83)	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Arcturus "18" Federal #3H	North Reference:	Grid
Wellbore:	VH - Job #32K10111050	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K10111050	Database:	EDM-Regulatory

Project: Hackberry (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	Eddy County, NM				
Site Position:		Northing:	602,783 73 usft	Latitude:	32° 39' 23 058 N
From:	Lat/Long	Easting:	669,825 44 usft	Longitude:	103° 54' 57 024 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 23 °

Well	Arcturus "18" Federal #3H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	602,783 73 usft	Latitude:	32° 39' 23 058 N
	+E/-W	0 0 usft	Easting:	669,825 44 usft	Longitude:	103° 54' 57 024 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore	VH - Job #32K10111050				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/31/2011	7 73	60 52	48,827

Design:	VH - Job #32K10111050				
Audit Notes:					
Version:	1 0	Phase:	ACTUAL	Tie On Depth:	0 0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0 0	0 0	0 0	73 51	

Survey Program		Date	12/29/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 0	8,242 0	Gyro (VH - Job #32K10111050)	Keeper	Keeper Gyro	

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0	
100 0	0 60	195 55	100 0	-0 5	-0 1	195 55	0	
200 0	2 00	197 35	200 0	-2 7	-0 8	196 67	2	
300 0	1 91	202 64	299 9	-5 9	-2 0	198 47	6	
400 0	2 05	196 65	399 9	-9 1	-3 1	198 85	9	
500 0	1 91	196 26	499 8	-12 4	-4 1	198 22	13	
600 0	1 73	200 96	599 7	-15 5	-5 1	198 27	16	
700 0	1 81	200 04	699 7	-18 3	-6 2	198 63	19	
800 0	1 34	195 17	799 7	-21 0	-7 0	198 55	22	
900 0	1 18	191 26	899 6	-23 1	-7 5	198 08	24	
1,000 0	0 80	191 30	999 6	-24 8	-7 9	197 62	26	
1,100 0	0 55	168 64	1,099 6	-25 9	-7 9	196 97	27	

Scientific Drilling International, Inc.

SDI Standard Survey Report



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Project:	Hackberry (Nad 83)	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Arcturus "18" Federal #3H	North Reference:	Grid
Wellbore:	VH - Job #32K10111050	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K10111050	Database:	EDM-Regulatory

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
1,200 0	0 53	94 18	1,199 6	-26 5	-7 4	195 55	27 5	
1,300 0	1 00	70 62	1,299 6	-26 2	-6 1	193 06	26 9	
1,400 0	1 11	70 64	1,399 6	-25 6	-4 3	189 63	25 9	
1,500 0	1 17	76 63	1,499 6	-25 0	-2 4	185 55	25 1	
1,600 0	1 19	79 39	1,599 5	-24 6	-0 4	180 98	24 6	
1,700 0	1 16	82 11	1,699 5	-24 3	1 6	176 22	24 3	
1,800 0	1 33	79 27	1,799 5	-23 9	3 7	171 10	24 2	
1,900 0	1 15	84 66	1,899 5	-23 6	5 9	166 00	24 3	
2,000 0	0 96	96 26	1,999 5	-23 6	7 7	161 89	24 8	
2,100 0	0 69	107 90	2,099 4	-23 9	9 1	159 09	25 6	
2,200 0	0 69	108 23	2,199 4	-24 3	10 3	157 05	26 3	
2,300 0	0 60	124 16	2,299 4	-24 7	11 3	155 50	27 2	
2,400 0	0 54	153 11	2,399 4	-25 4	11 9	154 90	28 1	
2,500 0	0 68	174 75	2,499 4	-26 5	12 2	155 27	29 1	
2,600 0	0 67	156 27	2,599 4	-27 6	12 5	155 66	30 3	
2,700 0	0 57	144 69	2,699 4	-28 5	13 0	155 50	31 3	
2,800 0	0 46	138 09	2,799 4	-29 2	13 6	155 12	32 2	
2,900 0	0 37	137 66	2,899 4	-29 8	14 0	154 75	32 9	
3,000 0	0 45	132 76	2,999 4	-30 3	14 5	154 34	33 6	
3,100 0	0 65	115 37	3,099 4	-30 8	15 3	153 50	34 4	
3,200 0	0 97	106 30	3,199 4	-31 3	16 7	151 93	35 4	
3,300 0	0 69	106 42	3,299 4	-31 7	18 1	150 30	36 5	
3,400 0	0 54	122 86	3,399 4	-32 1	19 0	149 33	37 3	
3,500 0	0 78	143 60	3,499 4	-32 9	19 8	148 92	38 4	
3,600 0	0 82	137 54	3,599 4	-34 0	20 7	148 62	39 8	
3,700 0	0 67	109 37	3,699 3	-34 7	21 8	147 91	41 0	
3,800 0	0 43	117 30	3,799 3	-35 1	22 6	147 15	41 7	
3,900 0	0 32	137 43	3,899 3	-35 4	23 2	146 83	42 3	
4,000 0	0 19	103 86	3,999 3	-35 7	23 5	146 62	42 7	
4,100 0	0 20	31 41	4,099 3	-35 6	23 8	146 26	42 8	
4,200 0	0 27	348 79	4,199 3	-35 2	23 8	145 92	42 5	
4,300 0	0 22	343 71	4,299 3	-34 8	23 7	145 72	42 1	
4,400 0	0 15	335 66	4,399 3	-34 5	23 6	145 61	41 8	
4,500 0	0 66	97 41	4,499 3	-34 4	24 1	144 99	42 0	
4,600 0	1 04	98 46	4,599 3	-34 6	25 6	143 55	43 1	
4,700 0	0 40	71 93	4,699 3	-34 7	26 8	142 27	43 8	
4,800 0	0 20	313 57	4,799 3	-34 4	27 0	141 88	43 8	
4,900 0	0 26	274 60	4,899 3	-34 3	26 7	142 13	43 5	
5,000 0	0 34	229 69	4,999 3	-34 5	26 2	142 75	43 3	
5,100 0	0 41	260 12	5,099 3	-34 7	25 6	143 56	43 2	
5,200 0	0 46	254 40	5,199 3	-34 9	24 9	144 49	42 9	
5,300 0	0 68	277 46	5,299 3	-34 9	23 9	145 59	42 3	
5,400 0	0 45	233 83	5,399 3	-35 1	23 0	146 73	42 0	
5,500 0	0 84	211 98	5,499 3	-35 9	22 3	148 16	42 3	

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Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Arcturus "18" Federal #3H	North Reference:	Grid
Wellbore:	VH - Job #32K10111050	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K10111050	Database:	EDM-Regulatory

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
5,600 0	0 92	202 13	5,599 3	-37 3	21 6	149 90	43 1	
5,700 0	0 96	209 00	5,699 3	-38 8	20 9	151 66	44 1	
5,800 0	0 76	208 34	5,799 3	-40 1	20 2	153 27	44 9	
5,900 0	0 53	216 64	5,899 2	-41 1	19 6	154 47	45 5	
6,000 0	0 31	218 47	5,999 2	-41 6	19 2	155 29	45 8	
6,100 0	0 43	278 94	6,099 2	-41 8	18 6	155 98	45 7	
6,200 0	0 62	286 46	6,199 2	-41 6	17 7	156 90	45 2	
6,300 0	0 98	295 76	6,299 2	-41 1	16 4	158 17	44 2	
6,400 0	1 09	302 14	6,399 2	-40 2	14 9	159 69	42 8	
6,500 0	1 22	307 77	6,499 2	-39 0	13 2	161 28	41 2	
6,600 0	1 27	309 48	6,599 2	-37 7	11 5	162 98	39 4	
6,700 0	1 34	295 07	6,699 1	-36 5	9 6	165 23	37 7	
6,800 0	1 44	286 64	6,799 1	-35 6	7 3	168 34	36 4	
6,900 0	1 33	270 83	6,899 1	-35 2	5 0	171 95	35 6	
7,000 0	1 50	262 83	6,999 1	-35 4	2 5	175 92	35 5	
7,100 0	2 17	273 24	7,099 0	-35 4	-0 7	181 08	35 4	
7,200 0	1 98	270 40	7,198 9	-35 3	-4 3	186 92	35 6	
7,300 0	1 79	266 54	7,298 9	-35 4	-7 6	192 07	36 2	
7,400 0	1 62	266 08	7,398 8	-35 6	-10 5	196 50	37 1	
7,500 0	1 66	253 19	7,498 8	-36 1	-13 3	200 28	38 5	
7,600 0	1 71	251 07	7,598 8	-37 0	-16 1	203 56	40 4	
7,700 0	1 98	245 54	7,698 7	-38 2	-19 1	206 59	42 7	
7,800 0	2 17	240 52	7,798 6	-39 8	-22 3	209 27	45 7	
7,900 0	1 95	244 89	7,898 6	-41 5	-25 5	211 59	48 7	
8,000 0	1 49	239 29	7,998 5	-42 9	-28 2	213 31	51 3	
8,100 0	1 38	229 09	8,098 5	-44 3	-30 2	214 27	53 7	
8,200 0	1 02	222 40	8,198 5	-45 8	-31 7	214 72	55 7	
8,242 0	0 52	244 06	8,240 5	-46 1	-32 1	214 86	56 2	



Scientific Drilling
Directional Drilling Operations

Project: Hackberry (Nad 83)
Eddy County, NM
Well: Arcturus "18" Federal #3H
Wellbore: VH - Job #32K10111050
Design: VH - Job #32K10111050

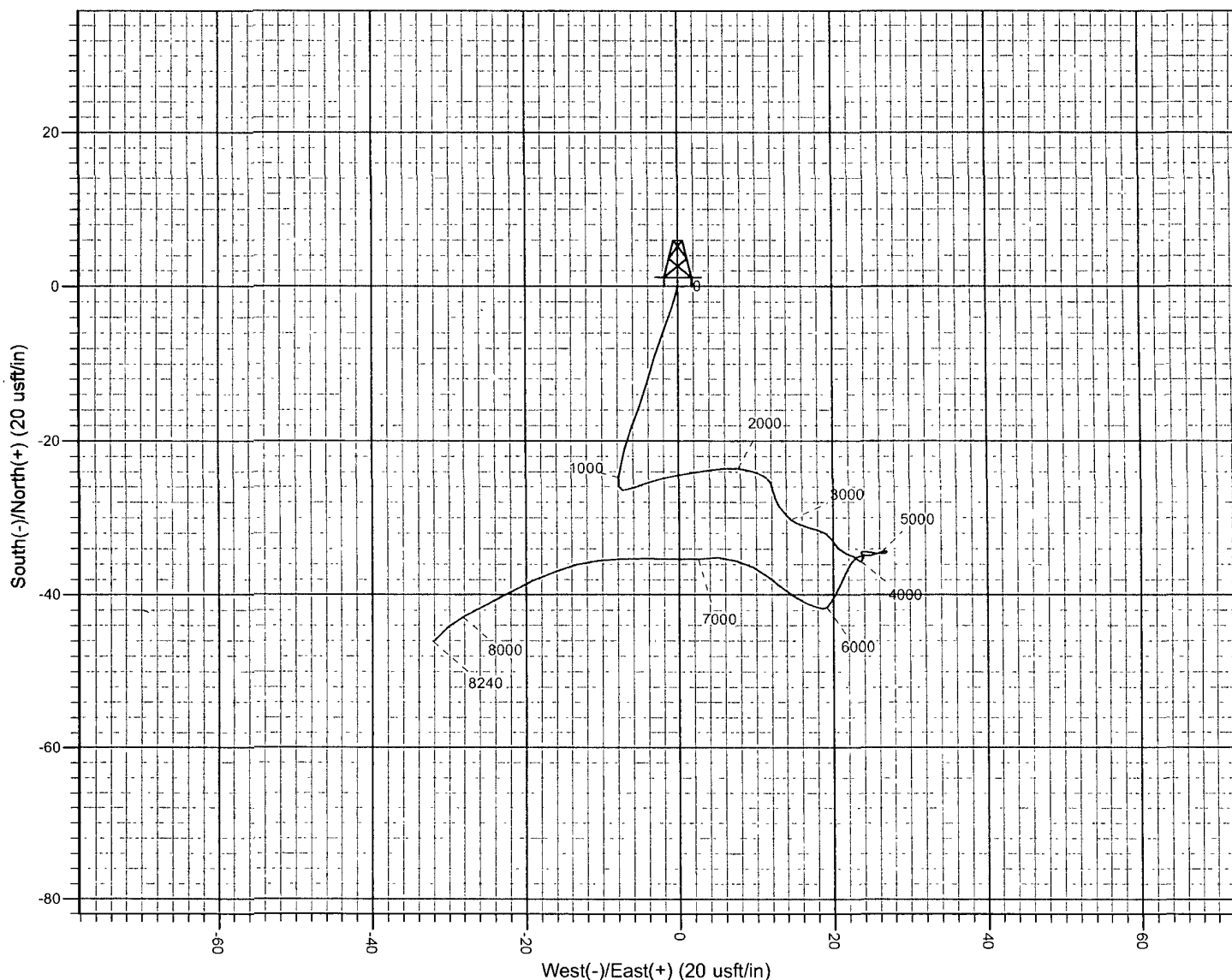


Azimuths to Grid North
True North -0 23°
Magnetic North: 7 51°

Magnetic Field
Strength 48826.9nT
Dip Angle 60 52°
Date 10/31/2011
Model IGRF2010

WELL DETAILS: Arcturus "18" Federal #3H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	602783.73	669825.44	32° 39' 23.058 N	103° 54' 57.024 W	



PROJECT DETAILS: Hackberry (Nad 83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: 32° 39' 23 058 N
Longitude: 103° 54' 57.024 W
Positional Uncertainty: 0.0
Convergence: 0.23
Local North: Grid

DEVON ENERGY

Hackberry (Nad 83)
Eddy County, NM
Arcturus "18" Federal #3H
VH - Job #32K10111050

Survey: Gyro

SDI Standard Survey Report

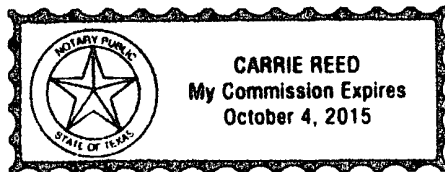
This survey is correct to the best of my knowledge and is supported by actual field data.

R. M. Carter

Notarized this date 12th of December, 2011.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling
Directional Drilling Operations

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well Arcturus "18" Federal #3H
Project:	Hackberry (Nad 83)	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Arcturus "18" Federal #3H	North Reference:	Grid
Wellbore:	VH - Job #32K10111050	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K10111050	Database:	EDM-Regulatory

Project:	Hackberry (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:		Eddy County, NM			
Site Position:		Northing:	602,783 73 usft	Latitude:	32° 39' 23 058 N
From:	Lat/Long	Easting:	669,825 44 usft	Longitude:	103° 54' 57 024 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 23 °

Well:	Arcturus "18" Federal #3H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	602,783 73 usft	Latitude:	32° 39' 23 058 N
	+E/-W	0 0 usft	Easting:	669,825 44 usft	Longitude:	103° 54' 57.024 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore						VH - Job #32K10111050
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)	
	IGRF2010	10/31/2011	7 73	60 52	48,827	

Design:	VH - Job #32K10111050				
Audit Notes:					
Version:	1 0	Phase:	ACTUAL	Tie On Depth:	0 0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0 0	0 0	0 0	73 51	

Survey Program		Date 12/29/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 0	8,242 0	Gyro (VH - Job #32K10111050)	Keeper	Keeper Gyro

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0 0	
100 0	0 60	195 55	100 0	-0 5	-0 1	195 55	0 5	
200 0	2 00	197.35	200 0	-2 7	-0 8	196 67	2 8	
300 0	1 91	202 64	299 9	-5 9	-2 0	198 47	6 2	
400 0	2 05	196 65	399.9	-9 1	-3 1	198 85	9 6	
500 0	1 91	196 26	499 8	-12 4	-4 1	198 22	13 1	
600 0	1 73	200 96	599 7	-15 5	-5 1	198 27	16 3	
700 0	1 81	200 04	699 7	-18 3	-6 2	198 63	19 4	
800 0	1 34	195 17	799 7	-21 0	-7 0	198 55	22 1	
900 0	1 18	191 26	899 6	-23 1	-7 5	198 08	24 3	
1,000 0	0 80	191 30	999 6	-24 8	-7 9	197 62	26 0	
1,100 0	0 55	168 64	1,099 6	-25 9	-7 9	196 97	27 1	

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SDI Standard Survey Report



Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well Arcturus "18" Federal #3H
Project:	Hackberry (Nad 83)	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Arcturus "18" Federal #3H	North Reference:	Grid
Wellbore:	VH - Job #32K10111050	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K10111050	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.0	0.53	94.18	1,199.6	-26.5	-7.4	195.55	27.5
1,300.0	1.00	70.62	1,299.6	-26.2	-6.1	193.06	26.9
1,400.0	1.11	70.64	1,399.6	-25.6	-4.3	189.63	25.9
1,500.0	1.17	76.63	1,499.6	-25.0	-2.4	185.55	25.1
1,600.0	1.19	79.39	1,599.5	-24.6	-0.4	180.98	24.6
1,700.0	1.16	82.11	1,699.5	-24.3	1.6	176.22	24.3
1,800.0	1.33	79.27	1,799.5	-23.9	3.7	171.10	24.2
1,900.0	1.15	84.66	1,899.5	-23.6	5.9	166.00	24.3
2,000.0	0.96	96.26	1,999.5	-23.6	7.7	161.89	24.8
2,100.0	0.69	107.90	2,099.4	-23.9	9.1	159.09	25.6
2,200.0	0.69	108.23	2,199.4	-24.3	10.3	157.05	26.3
2,300.0	0.60	124.16	2,299.4	-24.7	11.3	155.50	27.2
2,400.0	0.54	153.11	2,399.4	-25.4	11.9	154.90	28.1
2,500.0	0.68	174.75	2,499.4	-26.5	12.2	155.27	29.1
2,600.0	0.67	156.27	2,599.4	-27.6	12.5	155.66	30.3
2,700.0	0.57	144.69	2,699.4	-28.5	13.0	155.50	31.3
2,800.0	0.46	138.09	2,799.4	-29.2	13.6	155.12	32.2
2,900.0	0.37	137.66	2,899.4	-29.8	14.0	154.75	32.9
3,000.0	0.45	132.76	2,999.4	-30.3	14.5	154.34	33.6
3,100.0	0.65	115.37	3,099.4	-30.8	15.3	153.50	34.4
3,200.0	0.97	106.30	3,199.4	-31.3	16.7	151.93	35.4
3,300.0	0.69	106.42	3,299.4	-31.7	18.1	150.30	36.5
3,400.0	0.54	122.86	3,399.4	-32.1	19.0	149.33	37.3
3,500.0	0.78	143.60	3,499.4	-32.9	19.8	148.92	38.4
3,600.0	0.82	137.54	3,599.4	-34.0	20.7	148.62	39.8
3,700.0	0.67	109.37	3,699.3	-34.7	21.8	147.91	41.0
3,800.0	0.43	117.30	3,799.3	-35.1	22.6	147.15	41.7
3,900.0	0.32	137.43	3,899.3	-35.4	23.2	146.83	42.3
4,000.0	0.19	103.86	3,999.3	-35.7	23.5	146.62	42.7
4,100.0	0.20	31.41	4,099.3	-35.6	23.8	146.26	42.8
4,200.0	0.27	348.79	4,199.3	-35.2	23.8	145.92	42.5
4,300.0	0.22	343.71	4,299.3	-34.8	23.7	145.72	42.1
4,400.0	0.15	335.66	4,399.3	-34.5	23.6	145.61	41.8
4,500.0	0.66	97.41	4,499.3	-34.4	24.1	144.99	42.0
4,600.0	1.04	98.46	4,599.3	-34.6	25.6	143.55	43.1
4,700.0	0.40	71.93	4,699.3	-34.7	26.8	142.27	43.8
4,800.0	0.20	313.57	4,799.3	-34.4	27.0	141.88	43.8
4,900.0	0.26	274.60	4,899.3	-34.3	26.7	142.13	43.5
5,000.0	0.34	229.69	4,999.3	-34.5	26.2	142.75	43.3
5,100.0	0.41	260.12	5,099.3	-34.7	25.6	143.56	43.2
5,200.0	0.46	254.40	5,199.3	-34.9	24.9	144.49	42.9
5,300.0	0.68	277.46	5,299.3	-34.9	23.9	145.59	42.3
5,400.0	0.45	233.83	5,399.3	-35.1	23.0	146.73	42.0
5,500.0	0.84	211.98	5,499.3	-35.9	22.3	148.16	42.3

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Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
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Wellbore:	VH - Job #32K10111050	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K10111050	Database:	EDM-Regulatory

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
5,600 0	0 92	202 13	5,599 3	-37 3	21 6	149 90	43 1	
5,700 0	0 96	209 00	5,699 3	-38 8	20 9	151 66	44 1	
5,800 0	0 76	208 34	5,799 3	-40 1	20 2	153 27	44 9	
5,900 0	0 53	216 64	5,899 2	-41 1	19 6	154 47	45 5	
6,000 0	0 31	218 47	5,999 2	-41 6	19 2	155 29	45 8	
6,100 0	0 43	278 94	6,099 2	-41 8	18 6	155 98	45 7	
6,200 0	0 62	286 46	6,199 2	-41 6	17 7	156 90	45 2	
6,300 0	0 98	295 76	6,299 2	-41 1	16 4	158 17	44 2	
6,400 0	1 09	302 14	6,399 2	-40 2	14 9	159 69	42 8	
6,500 0	1 22	307 77	6,499 2	-39 0	13 2	161 28	41 2	
6,600 0	1 27	309 48	6,599 2	-37 7	11 5	162 98	39 4	
6,700 0	1 34	295 07	6,699 1	-36 5	9 6	165 23	37 7	
6,800 0	1 44	286 64	6,799 1	-35 6	7 3	168 34	36 4	
6,900 0	1 33	270 83	6,899 1	-35 2	5 0	171 95	35 6	
7,000 0	1 50	262 83	6,999 1	-35 4	2 5	175 92	35 5	
7,100 0	2 17	273 24	7,099 0	-35 4	-0 7	181 08	35 4	
7,200 0	1 98	270 40	7,198 9	-35 3	-4 3	186 92	35 6	
7,300 0	1 79	266 54	7,298 9	-35 4	-7 6	192 07	36 2	
7,400 0	1 62	266 08	7,398 8	-35 6	-10 5	196 50	37 1	
7,500 0	1 66	253 19	7,498 8	-36 1	-13 3	200 28	38 5	
7,600 0	1 71	251 07	7,598 8	-37 0	-16 1	203 56	40 4	
7,700 0	1 98	245 54	7,698 7	-38 2	-19 1	206 59	42 7	
7,800 0	2 17	240 52	7,798 6	-39 8	-22 3	209 27	45 7	
7,900 0	1 95	244 89	7,898 6	-41 5	-25 5	211 59	48 7	
8,000 0	1 49	239 29	7,998 5	-42 9	-28 2	213 31	51 3	
8,100 0	1 38	229 09	8,098 5	-44 3	-30 2	214 27	53 7	
8,200 0	1 02	222 40	8,198 5	-45 8	-31 7	214 72	55 7	
8,242 0	0 52	244 06	8,240 5	-46 1	-32 1	214 86	56 2	



Scientific Drilling
Directional Drilling Operations

Project: Hackberry (Nad 83)
Eddy County, NM
Well: Arcturus "18" Federal #3H
Wellbore: VH - Job #32K10111050
Design: VH - Job #32K10111050

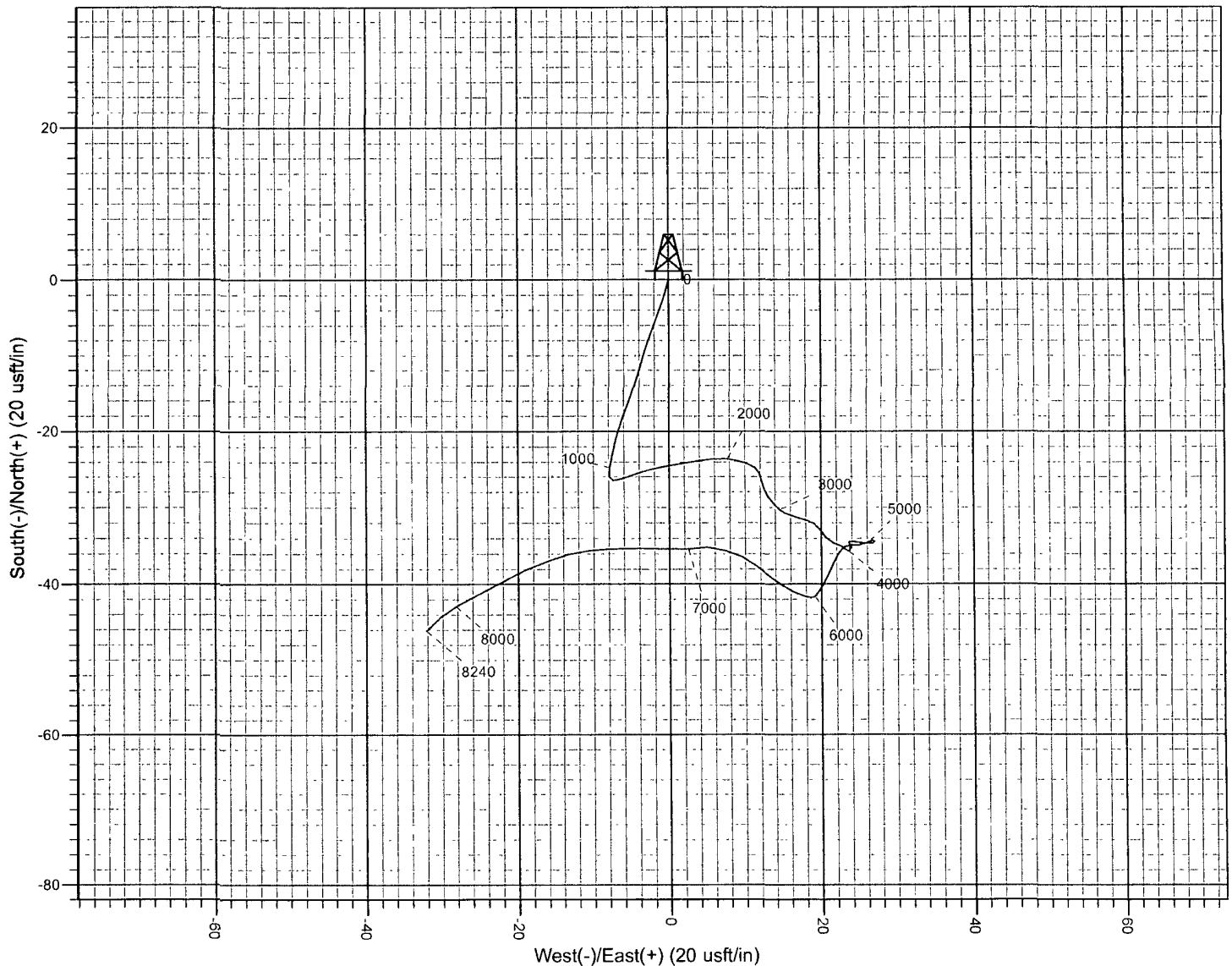


Azimuths to Grid North
True North -0.23°
Magnetic North 7.51°

Magnetic Field
Strength 48826.9nT
Dip Angle 60.52°
Date 10/31/2011
Model IGRF2010

WELL DETAILS: Arcturus "18" Federal #3H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	602783.73	669825.44	32° 39' 23.058 N	103° 54' 57.024 W	



PROJECT DETAILS: Hackberry (Nad 83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: 32° 39' 23.058 N
Longitude: 103° 54' 57.024 W
Positional Uncertainty: 0.0
Convergence: 0.23
Local North: Grid

Pathfinder,

6213 WGP 112
Midland, Texas 79706
Tel (432) 687-1647
Fax (432) 687-1544



November 22, 2011

Devon Energy
20 N. Broadway
Oklahoma City, OK

RE: Devon Energy
Arcturus 18 Fed 3H
API: 30-015-38953
Eddy County, NM
RIG: H & P 300
FIELD: Hackberry; Bone Spring NW
PES FILE NO.: 700004180-WT-WT

To whom it may concern:

We hereby certify that the enclosed Original Field Survey Data contained in this report represents to the best of our knowledge, a true and accurate survey of the well at the time the survey was run.

DIRECTIONAL SURVEY DATA
1 – Original survey report
2 – Survey report copies

We appreciate the opportunity to work with you and we look forward to your business support. If you have any questions, I can be reached at (432) 687-1647

Sincerely,

A handwritten signature in black ink that reads "Steve Bibb".

STEVE BIBB
M/LWD Service Coordinator
PathFinder Energy Services

ML:sh



A Schlumberger Company

DIRECTIONAL SURVEY REPORT

DEVON ENERGY

ACTURUS 18 FED 3H

EDDY COUNTY, NEW MEXICO

PREPARED BY: STEVE BIBB

Pathfinder

6213 WCR 112
Midland, Texas 79706
Tel (432) 687-1641
Fax (432) 687-1544



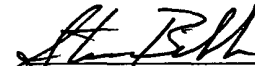
DIRECTIONAL SURVEY COMPANY REPORT:

1. NAME OF SURVEYING COMPANY: PATHFINDER ENERGY SERVICES
2. NAME OF PERSON(S) PERFORMING SURVEY:
A) MURAD ALIYEV
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 11-05-11 TO 11-12-11
5. STATE IN WHICH SURVEY WAS PERFORMED: NEW MEXICO
6. LOCATION OF WELL: EDDY COUNTY
7. TYPE OF SURVEY(S) PERFORMED: GAMMA-RAY
8. COMPLETE IDENTIFICATION OF WELL:

DEVON ENERGY
ARCTURUS 18 FED 3H
EDDY COUNTY, NM
RIG: H&P 300

9. SURVEY CERTIFIED FROM: 8253 TO 13500 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 4645.95 FEET ON A BEARING OF 76.09 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 13580.00 FEET, ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.



STEVE BIBB
M/LWD SERVICE COORDINATOR

PathFinder Energy Services, Inc.

BHL Report

Page 01/01
Tie-in Date: 11/04/2011
Date Completed: 11/12/2011

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY, NM
Rig:H&P 300
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers:MURAD ALIYEV
LUQMAN BISIRIYU
JEFF CORBETT

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.39.23.0580 N LON:103.54.57.0276 W
GRID Reference:NAD83 new mexico east Transverse Mercator
Ref GRID Coor: X: 669825.1400 Y: 602783.7200
North Aligned To:GRID NORTH
Total Magnetic Correction: 7.51°EAST TO GRID
Vertical Section Plane: 75.87
Survey Vert. Reference: 26.00' Kelly Bushing To Ground
Altitude:3410.20' Ground To MSL

Measured Depth	13580.00	(feet)
Inclination	87.49	(deg)
Azimuth	89.15	(deg)
True Vertical Depth	8859.78	(feet)
Vertical Section	4645.92	(feet)
Survey X cord	674334.88	(feet)
Survey Y cord	603900.48	(feet)
Survey Lat	32.65942496 N	(deg)
Survey Lon	103.90117317 W	(deg)
Rectangular Corr. N/S	1116.76 N	(feet)
Rectangular Corr. E/W	4509.74 E	(feet)
Closure Distance	4645.95	(feet)
Direction of Closure	76.09	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY CORP.

ARCTURUS 18 FED #3H

EDDY COUNTY, NM

Rig:H&P 300

PathFinder Office Supervisor: FRANCISCO SINISTERRA

PathFinder Field Engineers: MURAD ALIYEV

LUQMAN BISIRIYU

JEFF CORBETT

Survey Calculations by RX5 V6.03E using Minimum Curvature

Survey Horiz. Reference:WELLHEAD

Ref Coordinates: LAT:32.39.23.0580 N LON:103.54.57.0276 W

GRID Reference:NAD83 new mexico east Transverse Mercator

Ref GRID Coord: X: 669825.1400 Y: 602783.7200

North Aligned To:GRID NORTH

Total Magnetic Correction: 7.51°EAST TO GRID

Vertical Section Plane: 75.87

Survey Vert. Reference: 26.00' Kelly Bushing To Ground

Altitude:3410.20' Ground To MSL

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL		Closure		DLS
						Rectangular (ft)	Offsets (ft)	Dist (ft)	Dir (deg)	
THE FOLLOWING ARE SCIENTIFIC DRILLING GYRO SURVEYS.										
0.00	0.00	0.00	-0.00	0.00	0.00	0.00 N	0.00 E	0.00@	85.92	0.00
100.00	0.60	195.55	100.00	100.00	-0.26	0.50 S	0.14 W	0.52@	195.25	0.60
200.00	2.00	197.35	199.97	100.00	-1.43	2.67 S	0.80 W	2.79@	196.62	1.40
300.00	1.91	202.64	299.91	100.00	-3.34	5.88 S	1.96 W	6.20@	198.44	0.20
400.00	2.05	196.65	399.85	100.00	-5.25	9.13 S	3.11 W	9.65@	198.83	0.25
500.00	1.91	196.26	499.79	100.00	-7.01	12.44 S	4.09 W	13.10@	198.21	0.14
600.00	1.73	200.96	599.74	100.00	-8.72	15.45 S	5.10 W	16.27@	198.26	0.23
700.00	1.81	200.04	699.69	100.00	-10.47	18.35 S	6.18 W	19.36@	198.62	0.09
800.00	1.34	195.17	799.65	100.00	-11.93	20.96 S	7.03 W	22.10@	198.54	0.49
900.00	1.18	191.26	899.63	100.00	-12.95	23.10 S	7.54 W	24.29@	198.07	0.18
1000.00	0.80	191.30	999.61	100.00	-13.69	24.79 S	7.87 W	26.01@	197.62	0.38
1100.00	0.55	168.64	1099.61	100.00	-14.01	25.95 S	7.92 W	27.13@	196.97	0.36
1200.00	0.53	94.18	1199.60	100.00	-13.59	26.45 S	7.36 W	27.45@	195.55	0.65
1300.00	1.00	70.62	1299.59	100.00	-12.29	26.19 S	6.07 W	26.89@	193.06	0.56
1400.00	1.11	70.64	1399.58	100.00	-10.45	25.58 S	4.34 W	25.95@	189.62	0.11
1500.00	1.17	76.63	1499.56	100.00	-8.47	25.03 S	2.43 W	25.14@	185.55	0.13
1600.00	1.19	79.39	1599.54	100.00	-6.41	24.60 S	0.42 W	24.60@	180.97	0.06
1700.00	1.16	82.11	1699.52	100.00	-4.37	24.27 S	1.61 E	24.32@	176.21	0.06
1800.00	1.33	79.27	1799.49	100.00	-2.20	23.91 S	3.75 E	24.21@	171.09	0.18
1900.00	1.15	84.66	1899.47	100.00	-0.05	23.60 S	5.89 E	24.33@	165.99	0.21
2000.00	0.96	96.26	1999.45	100.00	1.72	23.60 S	7.72 E	24.83@	161.89	0.28
2100.00	0.69	107.90	2099.44	100.00	3.02	23.88 S	9.13 E	25.56@	159.08	0.32
2200.00	0.69	108.23	2199.43	100.00	4.04	24.25 S	10.27 E	26.34@	157.05	0.00
2300.00	0.60	124.16	2299.43	100.00	4.90	24.73 S	11.28 E	27.18@	155.49	0.20
2400.00	0.54	153.11	2399.42	100.00	5.35	25.45 S	11.92 E	28.10@	154.90	0.29

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY, NM
RIG:H&P 300

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
2500.00	0.68	174.75	2499.42	100.00	5.36	26.46 S	12.19 E	29.13@	155.26	0.27
2600.00	0.67	156.27	2599.41	100.00	5.37	27.59 S	12.48 E	30.28@	155.66	0.22
2700.00	0.57	144.69	2699.41	100.00	5.64	28.53 S	13.00 E	31.35@	155.50	0.16
2800.00	0.46	138.09	2799.40	100.00	6.01	29.23 S	13.56 E	32.22@	155.12	0.12
2900.00	0.37	137.66	2899.40	100.00	6.35	29.77 S	14.04 E	32.92@	154.74	0.09
3000.00	0.45	132.76	2999.40	100.00	6.72	30.27 S	14.55 E	33.59@	154.33	0.09
3100.00	0.65	115.37	3099.39	100.00	7.37	30.78 S	15.35 E	34.40@	153.50	0.26
3200.00	0.97	106.30	3199.38	100.00	8.54	31.27 S	16.68 E	35.43@	151.93	0.34
3300.00	0.69	106.42	3299.37	100.00	9.79	31.67 S	18.07 E	36.46@	150.30	0.28
3400.00	0.54	122.86	3399.36	100.00	10.63	32.10 S	19.04 E	37.32@	149.33	0.23
3500.00	0.78	143.60	3499.36	100.00	11.21	32.90 S	19.84 E	38.42@	148.91	0.34
3600.00	0.82	137.54	3599.35	100.00	11.80	33.98 S	20.73 E	39.80@	148.62	0.09
3700.00	0.67	109.37	3699.34	100.00	12.63	34.70 S	21.76 E	40.96@	147.91	0.39
3800.00	0.43	117.30	3799.34	100.00	13.40	35.07 S	22.65 E	41.74@	147.15	0.25
3900.00	0.32	137.43	3899.33	100.00	13.81	35.44 S	23.17 E	42.34@	146.83	0.17
4000.00	0.19	103.86	3999.33	100.00	14.09	35.69 S	23.52 E	42.74@	146.62	0.19
4100.00	0.20	31.41	4099.33	100.00	14.36	35.58 S	23.77 E	42.79@	146.25	0.23
4200.00	0.27	348.79	4199.33	100.00	14.50	35.20 S	23.81 E	42.50@	145.92	0.18
4300.00	0.22	343.71	4299.33	100.00	14.51	34.78 S	23.71 E	42.10@	145.72	0.05
4400.00	0.15	335.66	4399.33	100.00	14.48	34.48 S	23.61 E	41.79@	145.60	0.08
4500.00	0.66	97.41	4499.33	100.00	14.99	34.44 S	24.12 E	42.05@	144.99	0.75
4600.00	1.04	98.46	4599.32	100.00	16.36	34.64 S	25.59 E	43.07@	143.54	0.38
4700.00	0.40	71.93	4699.31	100.00	17.55	34.67 S	26.82 E	43.83@	142.27	0.71
4800.00	0.20	313.57	4799.31	100.00	17.80	34.44 S	27.03 E	43.78@	141.88	0.53
4900.00	0.26	274.60	4899.31	100.00	17.49	34.30 S	26.68 E	43.45@	142.13	0.16
5000.00	0.34	229.69	4999.31	100.00	17.01	34.48 S	26.22 E	43.32@	142.74	0.24
5100.00	0.41	260.12	5099.30	100.00	16.39	34.73 S	25.64 E	43.17@	143.56	0.21
5200.00	0.46	254.40	5199.30	100.00	15.63	34.90 S	24.90 E	42.87@	144.49	0.07

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY, NM
RIG:H&P 300

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
5300.00	0.68	277.46	5299.30	100.00	14.68	34.93 S	23.93 E	42.34@	145.58	0.31
5400.00	0.45	233.83	5399.29	100.00	13.76	35.08 S	23.02 E	41.96@	146.72	0.47
5500.00	0.84	211.98	5499.28	100.00	12.87	35.94 S	22.32 E	42.30@	148.16	0.45
5600.00	0.92	202.13	5599.27	100.00	11.87	37.30 S	21.63 E	43.12@	149.89	0.17
5700.00	0.96	209.00	5699.26	100.00	10.82	38.78 S	20.92 E	44.06@	151.65	0.12
5800.00	0.76	208.34	5799.25	100.00	9.80	40.10 S	20.20 E	44.90@	153.26	0.20
5900.00	0.53	216.64	5899.24	100.00	8.99	41.05 S	19.61 E	45.49@	154.47	0.25
6000.00	0.31	218.47	5999.24	100.00	8.42	41.63 S	19.16 E	45.83@	155.28	0.22
6100.00	0.43	278.94	6099.24	100.00	7.86	41.79 S	18.62 E	45.75@	155.98	0.39
6200.00	0.62	286.46	6199.23	100.00	7.05	41.58 S	17.74 E	45.20@	156.90	0.20
6300.00	0.98	295.76	6299.22	100.00	5.93	41.05 S	16.45 E	44.22@	158.17	0.38
6400.00	1.09	302.14	6399.21	100.00	4.61	40.17 S	14.87 E	42.84@	159.69	0.16
6500.00	1.22	307.77	6499.19	100.00	3.30	39.01 S	13.22 E	41.19@	161.28	0.17
6600.00	1.27	309.48	6599.16	100.00	1.99	37.66 S	11.53 E	39.38@	162.98	0.06
6700.00	1.34	295.07	6699.14	100.00	0.42	36.46 S	9.61 E	37.70@	165.23	0.34
6800.00	1.44	286.64	6799.11	100.00	-1.56	35.60 S	7.35 E	36.35@	168.34	0.23
6900.00	1.33	270.83	6899.08	100.00	-3.77	35.23 S	4.99 E	35.58@	171.94	0.40
7000.00	1.50	262.83	6999.05	100.00	-6.19	35.37 S	2.53 E	35.46@	175.92	0.26
7100.00	2.17	273.24	7099.00	100.00	-9.29	35.43 S	0.66 W	35.44@	181.07	0.75
7200.00	1.98	270.40	7198.93	100.00	-12.77	35.31 S	4.28 W	35.57@	186.91	0.22
7300.00	1.79	266.54	7298.88	100.00	-15.98	35.39 S	7.57 W	36.19@	192.07	0.23
7400.00	1.62	266.08	7398.83	100.00	-18.90	35.58 S	10.54 W	37.11@	196.49	0.17
7500.00	1.66	253.19	7498.79	100.00	-21.74	36.10 S	13.33 W	38.48@	200.27	0.37
7600.00	1.71	251.07	7598.75	100.00	-24.68	37.00 S	16.13 W	40.36@	203.55	0.08
7700.00	1.98	245.54	7698.70	100.00	-27.86	38.20 S	19.11 W	42.72@	206.58	0.32
7800.00	2.17	240.52	7798.63	100.00	-31.39	39.85 S	22.34 W	45.68@	209.27	0.26
7900.00	1.95	244.89	7898.57	100.00	-34.88	41.50 S	25.52 W	48.72@	211.59	0.27
8000.00	1.49	239.29	7998.52	100.00	-37.80	42.89 S	28.18 W	51.32@	213.31	0.49

PathFinder Energy Services, Inc. Survey Report

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY, NM
RIG:H&P 300

Page 04/06

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft)	Closure Dist Dir (ft) (deg)	DLS (dg/100ft)
** TIED INTO SCIENTIFIC DRILLING GYRO SURVEY AT 8100' MD.								
8100.00	1.38	229.09	8098.49	100.00	-40.12	44.34 S	53.65@ 214.27	0.28
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.								
8253.00	10.82	28.76	8250.68	153.00	-31.96	32.91 S	41.13@ 216.85	7.92
8284.00	13.89	30.22	8280.96	31.00	-27.38	27.15 S	34.57@ 218.25	9.95
8316.00	16.44	31.46	8311.84	32.00	-21.46	19.96 S	26.29@ 220.58	8.03
8347.00	18.73	34.26	8341.39	31.00	-14.60	12.11 S	17.05@ 224.77	7.87
8378.00	21.02	35.20	8370.54	31.00	-6.66	3.45 S	6.92@ 240.11	7.46
8410.00	23.39	35.86	8400.16	32.00	2.56	6.39 N	6.47@ 9.14	7.45
8441.00	25.24	35.54	8428.41	31.00	12.31	16.76 N	18.78@ 26.83	5.98
8473.00	26.73	35.14	8457.18	32.00	22.96	28.19 N	32.71@ 30.47	4.69
8505.00	28.93	33.74	8485.48	32.00	34.16	40.52 N	47.62@ 31.70	7.17
8536.00	32.10	33.06	8512.18	31.00	45.77	53.66 N	63.35@ 32.12	10.29
8568.00	35.26	31.90	8538.80	32.00	58.65	68.63 N	81.10@ 32.19	10.08
8599.00	37.20	32.36	8563.81	31.00	71.89	84.14 N	99.42@ 32.18	6.32
8631.00	37.90	32.13	8589.18	32.00	86.01	100.64 N	118.92@ 32.19	2.23
8662.00	40.01	32.12	8613.28	31.00	100.09	117.14 N	138.41@ 32.18	6.81
8694.00	43.62	31.81	8637.13	32.00	115.46	135.24 N	159.74@ 32.15	11.30
8726.00	47.31	31.34	8659.57	32.00	131.78	154.67 N	182.55@ 32.08	11.58
8757.00	50.91	31.23	8679.86	31.00	148.47	174.70 N	205.98@ 31.99	11.62
8789.00	55.05	30.82	8699.12	32.00	166.57	196.59 N	231.52@ 31.88	12.98
8820.00	58.56	31.46	8716.09	31.00	185.00	218.79 N	257.45@ 31.81	11.45
8852.00	61.99	32.23	8731.96	32.00	204.98	242.39 N	285.24@ 31.81	10.92
8883.00	65.42	32.33	8745.69	31.00	225.11	265.88 N	313.02@ 31.85	11.07
8915.00	69.03	32.37	8758.07	32.00	246.50	290.80 N	342.52@ 31.90	11.28
8947.00	72.46	32.27	8768.62	32.00	268.39	316.33 N	372.73@ 31.93	10.72
8978.00	76.24	32.76	8776.99	31.00	290.10	341.49 N	402.57@ 31.97	12.29
9010.00	78.61	32.31	8783.95	32.00	312.81	367.82 N	433.80@ 32.02	7.53

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY, NM
RIG:H&P 300

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
9041.00	81.95	32.95	8789.19	31.00	335.07	393.55 N	246.45 E	464.35@	32.06	10.97
9073.00	84.94	32.91	8792.84	32.00	358.34	420.23 N	263.73 E	496.13@	32.11	9.34
9104.00	88.02	32.77	8794.74	31.00	380.95	446.22 N	280.51 E	527.07@	32.15	9.95
9136.00	88.64	33.39	8795.67	32.00	404.43	473.03 N	297.96 E	559.05@	32.21	2.74
9167.00	89.34	35.74	8796.22	31.00	427.71	498.55 N	315.55 E	590.02@	32.33	7.91
9199.00	91.19	37.52	8796.07	32.00	452.49	524.23 N	334.64 E	621.93@	32.55	8.02
9230.00	91.28	37.03	8795.40	31.00	476.71	548.89 N	353.41 E	652.82@	32.78	1.61
9274.00	89.16	37.40	8795.23	44.00	511.07	583.93 N	380.02 E	696.69@	33.06	4.89
9369.00	88.20	40.85	8797.42	95.00	587.16	657.59 N	439.94 E	791.19@	33.78	3.77
9463.00	87.76	43.51	8800.74	94.00	665.32	727.20 N	503.01 E	884.22@	34.67	2.87
9558.00	88.64	46.95	8803.72	95.00	747.00	794.06 N	570.41 E	977.70@	35.69	3.74
9652.00	88.99	51.10	8805.67	94.00	830.84	855.67 N	641.35 E	1069.35@	36.85	4.43
9747.00	90.48	57.06	8806.11	95.00	919.01	911.38 N	718.25 E	1160.38@	38.24	6.47
9841.00	90.48	61.68	8805.32	94.00	1009.11	959.26 N	799.11 E	1248.50@	39.80	4.91
9936.00	88.72	64.70	8805.98	95.00	1101.77	1002.10 N	883.88 E	1336.20@	41.41	3.68
10030.00	87.67	69.78	8808.95	94.00	1194.63	1038.43 N	970.49 E	1421.33@	43.06	5.52
10125.00	87.93	75.02	8812.59	95.00	1289.35	1067.13 N	1060.94 E	1504.78@	44.83	5.52
10219.00	87.85	80.02	8816.06	94.00	1383.22	1087.42 N	1152.63 E	1584.63@	46.67	5.32
10314.00	88.55	81.50	8819.04	95.00	1477.83	1102.67 N	1246.35 E	1664.11@	48.50	1.72
10408.00	89.96	86.20	8820.27	94.00	1570.88	1112.73 N	1339.77 E	1741.60@	50.29	5.22
10502.00	90.31	89.64	8820.04	94.00	1662.79	1116.14 N	1433.69 E	1816.94@	52.10	3.68
10597.00	89.69	89.36	8820.04	95.00	1755.12	1116.97 N	1528.69 E	1893.28@	53.85	0.72
10691.00	89.78	88.90	8820.48	94.00	1846.61	1118.40 N	1622.68 E	1970.76@	55.42	0.50
10786.00	89.60	88.93	8820.99	95.00	1939.16	1120.20 N	1717.66 E	2050.66@	56.89	0.19
10881.00	88.90	88.74	8822.24	95.00	2031.73	1122.13 N	1812.63 E	2131.86@	58.24	0.76
10975.00	89.34	90.06	8823.68	94.00	2123.10	1123.11 N	1906.61 E	2212.82@	59.50	1.48
11070.00	89.60	91.55	8824.56	95.00	2214.89	1121.78 N	2001.60 E	2294.51@	60.73	1.59
11164.00	88.55	90.76	8826.08	94.00	2305.55	1119.88 N	2095.56 E	2376.03@	61.88	1.40

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY, NM
RIG:H&P 300

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
11259.00	87.93	90.46	8828.99	95.00	2397.38	1118.87 N	2190.51 E	2459.72@	62.94	0.72
11354.00	89.52	89.65	8831.11	95.00	2489.46	1118.78 N	2285.49 E	2544.63@	63.92	1.88
11448.00	90.22	89.16	8831.32	94.00	2580.84	1119.76 N	2379.48 E	2629.79@	64.80	0.91
11543.00	89.69	90.40	8831.39	95.00	2673.06	1120.12 N	2474.48 E	2716.19@	65.65	1.42
11637.00	88.46	92.62	8832.91	94.00	2763.56	1117.65 N	2568.42 E	2801.06@	66.48	2.70
11732.00	87.93	92.08	8835.91	95.00	2854.61	1113.75 N	2663.30 E	2886.80@	67.31	0.80
11826.00	87.49	89.04	8839.66	94.00	2945.45	1112.84 N	2757.20 E	2973.31@	68.02	3.27
11921.00	87.93	88.80	8843.46	95.00	3037.92	1114.62 N	2852.11 E	3062.18@	68.65	0.53
12015.00	90.04	87.68	8845.12	94.00	3129.72	1117.51 N	2946.05 E	3150.88@	69.23	2.54
12109.00	91.01	86.71	8844.26	94.00	3221.89	1122.11 N	3039.93 E	3240.42@	69.74	1.46
12203.00	91.19	88.09	8842.46	94.00	3313.97	1126.37 N	3133.81 E	3330.09@	70.23	1.48
12297.00	90.48	91.48	8841.09	94.00	3405.19	1126.73 N	3227.79 E	3418.79@	70.76	3.68
12392.00	90.66	92.70	8840.14	95.00	3496.40	1123.26 N	3322.72 E	3507.44@	71.32	1.30
12488.00	90.66	94.21	8839.04	96.00	3587.90	1117.48 N	3418.53 E	3596.54@	71.90	1.57
12580.00	90.31	93.97	8838.26	92.00	3675.29	1110.92 N	3510.29 E	3681.89@	72.44	0.46
12674.00	89.69	91.94	8838.26	94.00	3765.14	1106.07 N	3604.16 E	3770.07@	72.94	2.26
12769.00	88.99	89.50	8839.35	95.00	3856.95	1104.88 N	3699.14 E	3860.62@	73.37	2.67
12863.00	89.25	89.68	8840.80	94.00	3948.26	1105.55 N	3793.13 E	3950.96@	73.75	0.34
12957.00	89.25	89.46	8842.03	94.00	4039.57	1106.25 N	3887.12 E	4041.47@	74.11	0.23
13051.00	89.08	89.17	8843.40	94.00	4130.99	1107.38 N	3981.10 E	4132.25@	74.46	0.36
13145.00	88.99	88.92	8844.98	94.00	4222.50	1108.94 N	4075.08 E	4223.27@	74.78	0.28
13240.00	88.46	88.75	8847.09	95.00	4315.05	1110.88 N	4170.03 E	4315.46@	75.08	0.59
13334.00	88.11	88.89	8849.91	94.00	4406.62	1112.81 N	4263.97 E	4406.79@	75.37	0.40
13428.00	87.76	89.09	8853.29	94.00	4498.11	1114.47 N	4357.89 E	4498.14@	75.65	0.43
13500.00	87.49	89.15	8856.28	72.00	4568.13	1115.57 N	4429.82 E	4568.13@	75.87	0.38
STRAIGHT LINE PROJECTION TO BIT @ 13580'MD										
13580.00	87.49	89.15	8859.78	80.00	4645.92	1116.76 N	4509.74 E	4645.95@	76.09	0.00

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY, NM
RIG:H&P 300

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** The survey data at tie-in point was furnished by a recognized survey company and entered as submitted. Survey stations above the tie-in point represent recalculated data by PathFinder Energy Services, Inc. and may reflect minor changes due to rounding differences between survey programs. Only survey stations taken by qualified PathFinder personnel are subject to certification.



A Schlumberger Company

TIE-IN SURVEY INFORMATION SHEET

CLIENT INFORMATION

CLIENT:	DEVON ENERGY CORP		
LEASE / WELL No.:	ARCTURUS 18 FED	3H	
WELL LOCATION:	EDDY COUNTY, NM		
COUNTY / STATE / COUNTRY:	EDDY	NM	USA
RIG:	H & P 300		
API WELL No:	30-015-38953		
JOB No:	700004180 WT-WT		
P.O. / AFE No.	157246		
DIRECTIONAL COMPANY:	PATHFINDER		

WELL SITE INFORMATION

TOTAL MAGNETIC CORRECTION (TMC):			
On Wall Plat:	7.5	LWD Calculated:	7.505927
		Agreed Upon:	7.505927
X =	669825.140000	Feet	Y = 602783.720000
			Feet
SITE LATITUDE:	32° 39' 20.9194" N	SITE LONGITUDE:	103° 54' 57.0780" W
GRID SYSTEM:	TRUE ☐ UTM ☒ LAMBERT ☐	ZONE:	NEW MEXICO EAST
PROPOSED DRIFT DIRECTION:	75.87		
KELLY BUSHING ELEVATION:	26		
ALTITUDE:	3410.6	Feet	WATER DEPTH: N/A
			Feet

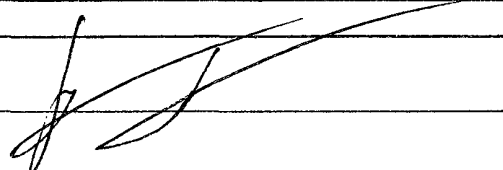
TIE-IN SURVEY

MEASURED DEPTH:	8100		
DRIFT ANGLE:	1.38		
DRIFT DIRECTION:	229.09		
TRUE VERTICAL DEPTH:	8098.49		
VERTICAL SECTION:	-41.55		
RECTANGULAR COORDINATE (N / S) :	44.34 S		
RECTANGULAR COORDINATE (E / W) :	30.21 W		
CLOSURE DISTANCE / DIRECTION:	53.65	214.27	
SURVEY CALCULATION METHOD:	AA ☐	MC ☒	RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):	SCIENTIFIC DRILLING		
COPY OF TIE-IN SURVEY REPORT	☒ YES ☐ NO		

WELL PLAN

KICKOFF DEPTH:	8175	TOTAL DEPTH:	13601.8
KICKOFF ANGLE:	1.11	MAX ANGLE:	89.44

PES Engineers:

**Signature of both field engineers required if applicable

Directional Driller:

DATE: 11/5/2011

Scientific Drilling

Gyroscopic Survey Report for DEVON

Well Location	EDDY COUNTY, NEW MEXICO
Well Name	ARCTURUS 18 FED 3H
Rig Name	H&P FLEX 300
Survey Date	11/3/2011
Latitude	32.66 deg
North Reference	Grid North
Grid Correction	-0.23 deg
Depth Reference	RKB
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 73.51Azim (deg)
Definitive Survey	FINAL GYRO SURVEY
Operator	J.PENA

Comments

KB 26 FT

Scientific Drilling Survey Report

Well Name:		ARCTURUS 18 FED 3H							
Survey:		FINAL GYRO SURVEY							
Survey Date:		11/3/2011							
MD	Inc	Azim	TVD	VS	Northing	Easting	DLS	Closure Distance	Closure Angle
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
100.00	0.60	195.55	100.00	-0.28	-0.50	-0.14	0.60	0.52	195.55
200.00	2.00	197.35	199.97	-1.53	-2.68	-0.80	1.40	2.79	196.67
300.00	1.91	202.64	299.91	-3.55	-5.88	-1.96	0.20	6.20	198.47
400.00	2.05	196.65	399.85	-5.58	-9.13	-3.12	0.25	9.65	198.85
500.00	1.91	196.26	499.79	-7.46	-12.45	-4.10	0.13	13.10	198.22
600.00	1.73	200.96	599.74	-9.28	-15.46	-5.10	0.23	16.28	198.28
700.00	1.81	200.04	699.69	-11.14	-18.35	-6.19	0.08	19.36	198.63
800.00	1.34	195.17	799.66	-12.69	-20.96	-7.03	0.48	22.11	198.54
900.00	1.18	191.26	899.63	-13.79	-23.10	-7.54	0.19	24.30	198.07
1000.00	0.80	191.30	999.62	-14.59	-24.79	-7.88	0.38	26.01	197.62
1100.00	0.55	168.64	1099.61	-14.96	-25.94	-7.92	0.36	27.13	196.97
1200.00	0.53	94.18	1199.61	-14.57	-26.45	-7.37	0.65	27.45	195.56
1300.00	1.00	70.62	1299.60	-13.27	-26.19	-6.08	0.56	26.89	193.08
1400.00	1.11	70.64	1399.58	-11.43	-25.58	-4.35	0.11	25.95	189.64
1500.00	1.17	76.63	1499.56	-9.44	-25.02	-2.43	0.13	25.14	185.56
1600.00	1.19	79.39	1599.54	-7.38	-24.59	-0.42	0.06	24.60	180.97
1700.00	1.16	82.11	1699.52	-5.34	-24.26	1.61	0.06	24.32	176.20
1800.00	1.33	79.27	1799.49	-3.19	-23.91	3.76	0.18	24.20	171.07
1900.00	1.15	84.66	1899.47	-1.05	-23.60	5.89	0.22	24.32	165.98
2000.00	0.96	96.26	1999.45	0.71	-23.60	7.72	0.28	24.83	161.88
2100.00	0.69	107.90	2099.44	1.98	-23.87	9.13	0.32	25.56	159.07
2200.00	0.69	108.23	2199.44	2.96	-24.24	10.27	0.00	26.33	157.05
2300.00	0.60	124.16	2299.43	3.79	-24.72	11.27	0.20	27.17	155.50
2400.00	0.54	153.11	2399.43	4.20	-25.44	11.91	0.29	28.09	154.90
2500.00	0.68	174.75	2499.42	4.17	-26.45	12.18	0.27	29.12	155.27
2600.00	0.67	156.27	2599.41	4.13	-27.58	12.47	0.22	30.27	155.67
2700.00	0.57	144.69	2699.41	4.36	-28.51	12.99	0.16	31.33	155.51
2800.00	0.46	138.09	2799.40	4.69	-29.21	13.54	0.12	32.20	155.13
2900.00	0.37	137.66	2899.40	5.00	-29.75	14.03	0.09	32.89	154.76
3000.00	0.45	132.76	2999.40	5.35	-30.26	14.53	0.09	33.57	154.34
3100.00	0.65	115.37	3099.39	5.97	-30.77	15.33	0.25	34.38	153.51
3200.00	0.97	106.30	3199.38	7.10	-31.25	16.65	0.35	35.41	151.94
3300.00	0.69	106.42	3299.37	8.32	-31.65	18.04	0.28	36.43	150.32
3400.00	0.54	122.86	3399.37	9.13	-32.08	19.01	0.23	37.29	149.34
3500.00	0.78	143.60	3499.36	9.66	-32.88	19.81	0.34	38.39	148.93
3600.00	0.82	137.54	3599.35	10.21	-33.96	20.70	0.10	39.77	148.63
3700.00	0.67	109.37	3699.34	11.00	-34.68	21.74	0.39	40.93	147.92
3800.00	0.43	117.30	3799.34	11.75	-35.05	22.63	0.25	41.72	147.15

Scientific Drilling Survey Report

Well Name:		ARCTURUS 18 FED 3H							
Survey:		FINAL GYRO SURVEY							
Survey Date:		11/3/2011							
MD	Inc	Azim	TVD	VS	Northing	Easting	DLS	Closure Distance	Closure Angle
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	deg
3900.00	0.32	137.43	3899.34	12.15	-35.43	23.15	0.17	42.32	146.83
4000.00	0.19	103.86	3999.34	12.41	-35.68	23.51	0.19	42.72	146.62
4100.00	0.20	31.41	4099.34	12.69	-35.57	23.76	0.23	42.77	146.26
4200.00	0.27	348.79	4199.33	12.84	-35.19	23.80	0.19	42.48	145.92
4300.00	0.22	343.71	4299.33	12.86	-34.77	23.70	0.06	42.08	145.72
4400.00	0.15	335.66	4399.33	12.84	-34.46	23.59	0.08	41.77	145.60
4500.00	0.66	97.41	4499.33	13.35	-34.42	24.11	0.75	42.03	144.99
4600.00	1.04	98.46	4599.32	14.70	-34.63	25.58	0.38	43.05	143.54
4700.00	0.40	71.93	4699.31	15.87	-34.65	26.81	0.71	43.82	142.27
4800.00	0.20	313.57	4799.31	16.13	-34.42	27.02	0.53	43.76	141.88
4900.00	0.26	274.60	4899.31	15.84	-34.28	26.66	0.16	43.43	142.13
5000.00	0.34	229.69	4999.31	15.36	-34.46	26.22	0.24	43.30	142.73
5100.00	0.41	260.12	5099.31	14.73	-34.71	25.64	0.21	43.15	143.55
5200.00	0.46	254.40	5199.30	13.97	-34.88	24.89	0.06	42.85	144.48
5300.00	0.68	277.46	5299.30	13.03	-34.91	23.92	0.32	42.32	145.58
5400.00	0.45	233.83	5399.29	12.11	-35.07	23.01	0.47	41.94	146.73
5500.00	0.84	211.98	5499.29	11.19	-35.92	22.30	0.45	42.28	148.17
5600.00	0.92	202.13	5599.28	10.14	-37.28	21.61	0.17	43.09	149.90
5700.00	0.96	209.00	5699.26	9.04	-38.76	20.90	0.12	44.03	151.66
5800.00	0.76	208.34	5799.25	7.98	-40.07	20.18	0.20	44.87	153.27
5900.00	0.53	216.64	5899.24	7.13	-41.03	19.59	0.25	45.47	154.48
6000.00	0.31	218.47	5999.24	6.54	-41.62	19.14	0.22	45.81	155.30
6100.00	0.43	278.94	6099.24	5.98	-41.78	18.60	0.39	45.73	156.00
6200.00	0.62	286.46	6199.24	5.19	-41.56	17.71	0.20	45.18	156.92
6300.00	0.98	295.76	6299.23	4.10	-41.04	16.43	0.38	44.21	158.18
6400.00	1.09	302.14	6399.21	2.84	-40.17	14.86	0.16	42.82	159.70
6500.00	1.22	307.77	6499.19	1.60	-39.01	13.21	0.17	41.18	161.29
6600.00	1.27	309.48	6599.17	0.35	-37.65	11.51	0.07	39.37	163.00
6700.00	1.34	295.07	6699.14	-1.14	-36.45	9.60	0.33	37.69	165.24
6800.00	1.44	286.64	6799.11	-3.06	-35.60	7.35	0.23	36.35	168.34
6900.00	1.33	270.83	6899.08	-5.22	-35.22	4.98	0.39	35.57	171.95
7000.00	1.50	262.83	6999.05	-7.62	-35.37	2.52	0.26	35.46	175.92
7100.00	2.17	273.24	7099.00	-10.69	-35.43	-0.66	0.74	35.43	181.07
7200.00	1.98	270.40	7198.94	-14.12	-35.31	-4.27	0.22	35.56	186.90
7300.00	1.79	266.54	7298.88	-17.30	-35.39	-7.56	0.22	36.19	192.06
7400.00	1.62	266.08	7398.84	-20.20	-35.58	-10.53	0.18	37.11	196.49
7500.00	1.66	253.19	7498.80	-23.03	-36.10	-13.33	0.37	38.48	200.27
7600.00	1.71	251.07	7598.75	-25.97	-37.00	-16.13	0.08	40.37	203.56

Scientific Drilling Survey Report

Well Name:		ARCTURUS 18 FED 3H							
Survey:		FINAL GYRO SURVEY							
Survey Date:		11/3/2011							
MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
7700.00	1.98	245.54	7698.70	-29.17	-38.20	-19.12	0.32	42.72	206.58
7800.00	2.17	240.52	7798.64	-32.72	-39.85	-22.33	0.26	45.68	209.27
7900.00	1.95	244.89	7898.57	-36.25	-41.50	-25.52	0.27	48.72	211.59
8000.00	1.49	239.29	7998.53	-39.20	-42.89	-28.18	0.50	51.32	213.31
8100.00	1.38	229.09	8098.49	-41.55	-44.34	-30.21	0.28	53.65	214.27
8200.00	1.02	222.40	8198.47	-43.41	-45.78	-31.72	0.38	55.69	214.71
8242.00	0.52	244.06	8240.47	-43.91	-46.14	-32.14	1.36	56.23	214.86

Field Station

PathFinder Energy Services, Inc. Magnetic & Grid Calculations

DEVON ENERGY CORP.
ARCTURUS 18 FED #3H
EDDY COUNTY NM
Rig:H_P 300

Tue Nov 01 00:15:57 2011

Coordinates

Latitude:	32.656405 N (32 deg. 39 min. 23.0580 sec.)
Longitude:	103.915841 W (-103 deg. 54 min. 57.0276 sec.)
Elevation:	3436.20 feet.
Calculation Date:	Oct/30/2011

Magnetic Calculations

Model:	IGRF2010
Dip Angle:	60.5186 degrees
Total Magnetic Field:	0.48801 gauss
Magnetic Declination:	7.731238 degrees
Horizontal Intensity:	0.240171 gauss

To Convert a Magnetic Dir. to a TRUE North Dir. Add 7.731238 Degr

Transverse Mercator Grid Calculations NAD83

Grid System:	Transverse Mercator: new mexico east
Ellipsoid:	GRS80
X:	669825.1400 feet
Y:	602783.7200 feet
True to Grid: (convergence)	-0.225282 degrees
Magnetic to Grid:	7.505956 degrees

To Convert a Magnetic Dir. to a GRID dir. Add 7.505956 Degr.