

300542514



January 15, 2015

NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 06 2015

RECEIVED

Devon Energy
333 West Sheridan Ave
Oklahoma City, Oklahoma 73102-5010

Attn: David Cook

Re: **Cotton Draw Unit 221H**

Please find enclosed a copy of the survey from 0.00' to 4323.00' ran on the above referenced well.

If I can be of any further service please do not hesitate to call me at 800-606-4976.

Sincerely,

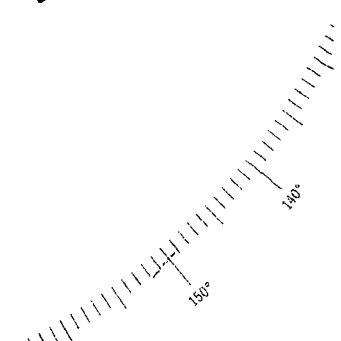
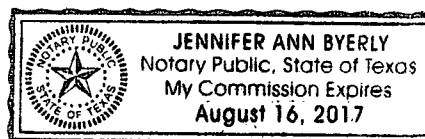
A handwritten signature in black ink, appearing to read "KH", written over a horizontal line.

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 15 day of January, A.D., 2015, by Keith Havelka.

A handwritten signature in black ink, appearing to read "Jennifer Ann Byerly", written over a horizontal line.
Jennifer Ann Byerly
Notary Public, State of Texas





Company: Devon Energy
Lease/Well: Cotton Draw Unit/221H

Rig Name: HP 223
State/County: New Mexico/Eddy
Latitude: 32.15, Longitude: -103.74
GRID North is 0.32 Degrees East of True North
VS-Azi: 0.00 Degrees



NM OIL CONSERVATION
ARTESIA DISTRICT
MAY 06 2015
RECEIVED

Depth Reference : RKB = 25 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 1/15/2015 / 08:51

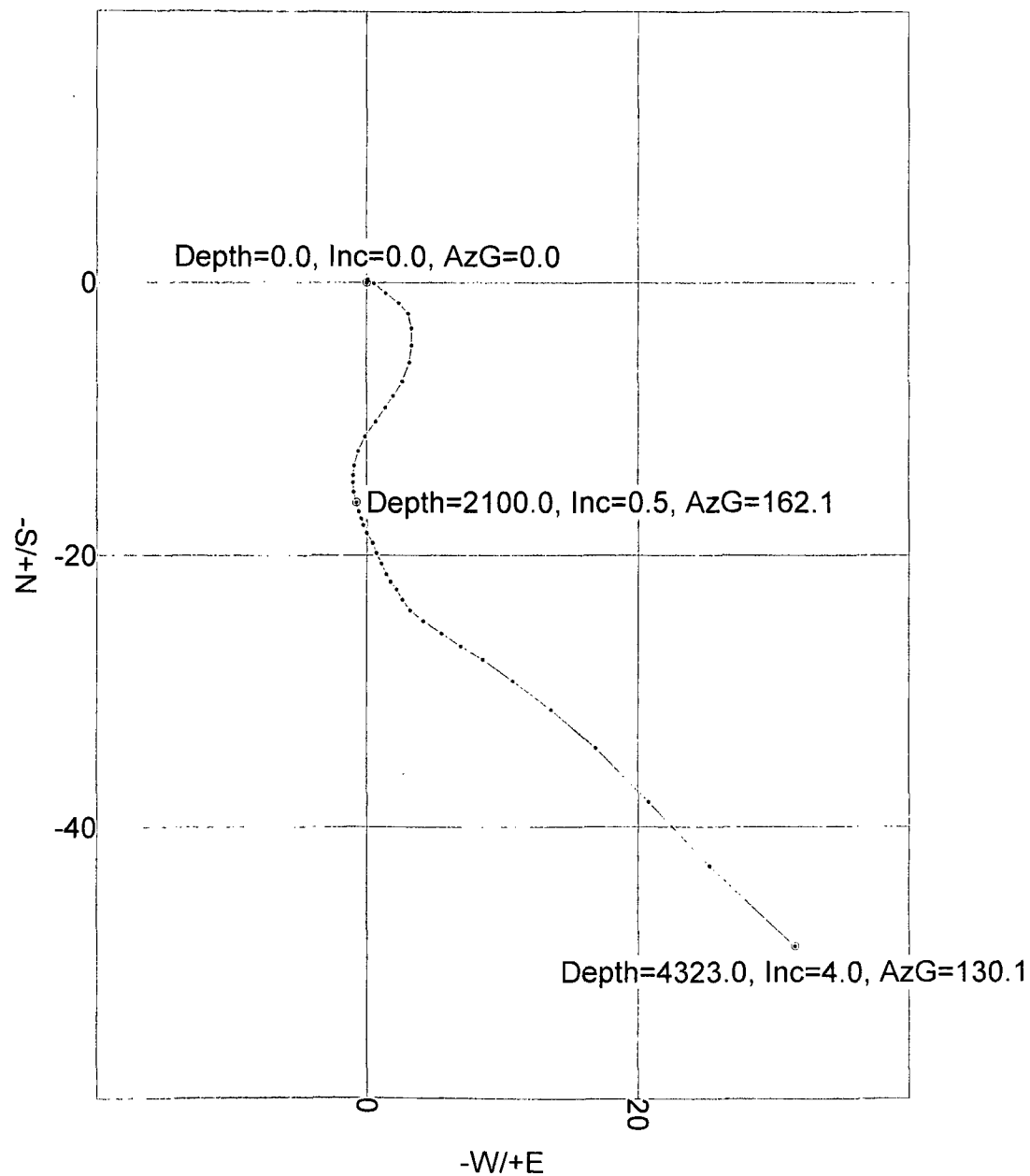
VES Survey International
Midland, Texas
432-563-5444
Surveyor: Adam Askew
Cotton Draw Unit 221H / API 30-015-42514

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.07	45.25	100.00	0.05	0.05	0.05	0.06	45.25	0.07
200.00	0.09	317.68	200.00	0.15	0.04	0.15	0.15	15.92	0.11
300.00	0.13	59.74	300.00	0.26	0.09	0.26	0.27	18.65	0.17
400.00	0.59	133.26	400.00	-0.04	0.55	-0.04	0.55	93.97	0.56
500.00	0.69	126.27	499.99	-0.75	1.41	-0.75	1.60	117.85	0.13
600.00	0.70	127.27	599.98	-1.48	2.39	-1.48	2.81	121.70	0.01
700.00	0.52	152.81	699.98	-2.25	3.08	-2.25	3.82	126.15	0.32
800.00	0.78	176.73	799.97	-3.34	3.33	-3.34	4.72	135.06	0.37
900.00	0.63	182.89	899.96	-4.57	3.34	-4.57	5.66	143.80	0.17
1000.00	0.82	190.34	999.96	-5.82	3.19	-5.82	6.64	151.32	0.21
1100.00	0.90	209.79	1099.95	-7.21	2.67	-7.21	7.69	159.70	0.30
1200.00	0.58	220.20	1199.94	-8.28	1.95	-8.28	8.51	166.73	0.35
1300.00	0.60	207.98	1299.93	-9.13	1.38	-9.13	9.23	171.39	0.13
1400.00	0.85	219.04	1399.92	-10.17	0.67	-10.17	10.19	176.25	0.29
1500.00	0.69	210.36	1499.91	-11.27	-0.11	-11.27	11.27	180.54	0.20
1600.00	0.68	199.15	1599.91	-12.35	-0.61	-12.35	12.36	182.81	0.13
1700.00	0.59	191.04	1699.90	-13.41	-0.90	-13.41	13.44	183.84	0.13
1800.00	0.23	170.54	1799.90	-14.11	-0.97	-14.11	14.15	183.91	0.38

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.36	187.90	1899.90	-14.62	-0.98	-14.62	14.65	183.82	0.16
2000.00	0.46	168.08	1999.89	-15.33	-0.94	-15.33	15.36	183.50	0.17
2100.00	0.46	162.14	2099.89	-16.10	-0.73	-16.10	16.12	182.60	0.05
2200.00	0.33	169.36	2199.89	-16.76	-0.56	-16.76	16.77	181.90	0.13
2300.00	0.31	153.76	2299.89	-17.29	-0.38	-17.29	17.29	181.28	0.09
2400.00	0.26	176.28	2399.89	-17.75	-0.25	-17.75	17.75	180.81	0.12
2500.00	0.49	145.76	2499.88	-18.33	0.00	-18.33	18.33	179.99	0.30
2600.00	0.48	152.83	2599.88	-19.06	0.43	-19.06	19.06	178.69	0.06
2700.00	0.43	166.14	2699.88	-19.79	0.72	-19.79	19.81	177.93	0.12
2800.00	0.57	146.86	2799.87	-20.58	1.08	-20.58	20.61	177.00	0.22
2900.00	0.43	165.71	2899.87	-21.37	1.45	-21.37	21.42	176.12	0.22
3000.00	0.30	132.20	2999.87	-21.91	1.74	-21.91	21.98	175.46	0.25
3100.00	0.56	145.78	3099.87	-22.49	2.21	-22.49	22.60	174.39	0.27
3200.00	0.45	153.55	3199.86	-23.25	2.66	-23.25	23.40	173.48	0.13
3300.00	0.64	137.71	3299.86	-24.01	3.21	-24.01	24.23	172.39	0.24
3400.00	0.81	122.47	3399.85	-24.81	4.18	-24.81	25.16	170.43	0.25
3500.00	1.05	124.92	3499.84	-25.71	5.53	-25.71	26.30	167.87	0.24
3600.00	0.89	122.38	3599.82	-26.65	6.93	-26.65	27.54	165.42	0.16
3700.00	1.27	119.98	3699.80	-27.62	8.55	-27.62	28.91	162.79	0.38
3800.00	1.86	129.59	3799.77	-29.21	10.77	-29.21	31.13	159.77	0.64
3900.00	2.20	124.31	3899.70	-31.33	13.60	-31.33	34.15	156.53	0.38
4000.00	2.81	135.53	3999.61	-34.15	16.90	-34.15	38.11	153.67	0.78
4100.00	3.53	135.43	4099.45	-38.10	20.78	-38.10	43.39	151.39	0.72
4200.00	4.01	136.97	4199.24	-42.85	25.32	-42.85	49.77	149.41	0.49
4323.00	4.02	130.06	4321.94	-48.77	31.56	-48.77	58.09	147.09	0.39



VES Survey International
Midland, Texas
432-563-5444
Surveyor: Adam Askew
Cotton Draw Unit 221H / API 30-015-42514



VES Survey Date: 12/22/2014



COTTON DRAW UNIT 221H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County EDDY	Field Name PADUCA	Region DELAWARE BASIN WEST	State/Province NM
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Surface Legal Location SEC1 T25S R31E	API/UWI 3001542514	Latitude (°) 32° 9' 8.715" N	Longitude (°) 103° 44' 5.667" W	Ground Elev M... 3,451.80	Orig KB Elev (ft) 3,476.80	Tubing Head Elevation (ft)
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Wellbores	Wellbore Name OH	Parent Wellbore OH	SAP Well ID 37581	Vertical Section Direction (°)
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Kick Offs & Key Depths	Date	Type	Top Depth (ftKB)
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Actual Deviation Survey GYRO/MWD, Proposed? No	Definitive? Yes	Proposed? No	Proposed Deviation Survey
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Deviation Survey	Date 12/22/2014	Description GYRO/MWD
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MD Tie In (ftKB) 0.00	TVD Tie In (ftKB) 0.00	Inclination Tie In (°) 0.00	Azimuth Tie In (°) 0.00	NSTie In (ft) 0.00	EW Tie In (ft) 0.00
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Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
12/22/2...	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	GYRO	VAUHG ENERGY SERVICES
12/22/2...	100.00	0.07	45.25	100.00	0.04	0.04	0.04	0.07	GYRO	VAUHG ENERGY SERVICES
12/22/2...	200.00	0.09	317.68	200.00	0.14	0.14	0.03	0.11	GYRO	VAUHG ENERGY SERVICES
12/22/2...	300.00	0.13	59.74	300.00	0.24	0.26	0.08	0.17	GYRO	VAUHG ENERGY SERVICES
12/22/2...	400.00	0.59	133.26	400.00	-0.13	-0.04	0.55	-0.57	GYRO	VAUHG ENERGY SERVICES
12/22/2...	500.00	0.69	126.27	499.99	-0.97	-0.75	1.41	-0.13	GYRO	VAUHG ENERGY SERVICES
12/22/2...	600.00	0.70	127.27	599.98	-1.85	-1.47	2.38	-0.02	GYRO	VAUHG ENERGY SERVICES
12/22/2...	700.00	0.52	152.81	699.98	-2.73	-2.25	3.08	-0.32	GYRO	VAUHG ENERGY SERVICES
12/22/2...	800.00	0.78	176.73	799.97	-3.84	-3.33	3.32	-0.37	GYRO	VAUHG ENERGY SERVICES
12/22/2...	900.00	0.63	182.89	899.96	-5.05	-4.56	3.33	-0.17	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,000.00	0.82	190.34	999.96	-6.26	-5.81	3.18	-0.21	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,100.00	0.90	209.79	1,099.95	-7.54	-7.20	2.66	-0.30	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,200.00	0.58	220.20	1,199.94	-8.47	-8.26	1.94	-0.35	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,300.00	0.60	207.98	1,299.93	-9.21	-9.11	1.37	-0.13	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,400.00	0.85	219.04	1,399.92	-10.12	-10.15	0.66	-0.29	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,500.00	0.69	210.36	1,499.91	-11.07	-11.25	0.11	-0.20	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,600.00	0.68	199.15	1,599.91	-12.05	-12.33	0.61	-0.13	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,700.00	0.59	191.04	1,699.90	-13.05	-13.39	0.91	-0.13	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,800.00	0.23	170.54	1,799.90	-13.74	-14.10	0.97	-0.38	GYRO	VAUHG ENERGY SERVICES
12/22/2...	1,900.00	0.36	187.90	1,899.90	-14.24	-14.61	0.98	-0.16	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,000.00	0.46	168.08	1,999.90	-14.94	-15.31	0.94	-0.17	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,100.00	0.46	162.14	2,099.89	-15.74	-16.08	0.74	0.05	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,200.00	0.33	169.36	2,199.89	-16.42	-16.75	0.56	-0.14	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,300.00	0.31	153.76	2,299.89	-16.97	-17.27	0.39	0.09	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,400.00	0.26	176.28	2,399.89	-17.45	-17.74	0.25	0.12	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,500.00	0.49	145.76	2,499.88	-18.07	-18.32	0.00	0.30	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,600.00	0.48	152.83	2,599.88	-18.86	-19.05	0.43	0.06	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,700.00	0.43	166.14	2,699.88	-19.63	-19.79	0.72	0.12	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,800.00	0.57	146.86	2,799.87	-20.46	-20.57	1.08	0.22	GYRO	VAUHG ENERGY SERVICES
12/22/2...	2,900.00	0.43	165.71	2,899.87	-21.29	-21.35	1.44	0.21	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,000.00	0.30	132.20	2,999.87	-21.87	-21.89	1.73	0.24	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,100.00	0.56	145.78	3,099.87	-22.52	-22.47	2.20	0.28	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,200.00	0.45	153.55	3,199.86	-23.34	-23.22	2.65	0.13	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,300.00	0.64	137.71	3,299.86	-24.19	-23.99	3.20	0.24	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,400.00	0.81	122.47	3,399.85	-25.13	-24.78	4.17	0.26	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,500.00	1.05	124.92	3,499.84	-26.24	-25.68	5.52	0.24	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,600.00	0.89	122.38	3,599.82	-27.41	-26.62	6.92	0.17	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,700.00	1.27	119.98	3,699.80	-28.63	-27.59	8.54	0.38	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,800.00	1.86	129.59	3,799.77	-30.57	-29.18	10.75	0.64	GYRO	VAUHG ENERGY SERVICES
12/22/2...	3,900.00	2.20	124.31	3,899.70	-33.13	-31.30	13.59	0.39	GYRO	VAUHG ENERGY SERVICES
12/22/2...	4,000.00	2.81	135.53	3,999.61	-36.47	-34.13	16.89	0.78	GYRO	VAUHG ENERGY SERVICES
12/22/2...	4,100.00	3.53	135.43	4,099.45	-41.00	-38.07	20.77	0.72	GYRO	VAUHG ENERGY SERVICES
12/22/2...	4,200.00	4.01	136.97	4,199.24	-46.44	-42.82	25.31	0.49	GYRO	VAUHG ENERGY SERVICES
12/22/2...	4,323.00	4.02	130.06	4,321.94	-53.32	-48.74	31.55	0.39	GYRO	VAUHG ENERGY SERVICES



COTTON DRAW UNIT 221H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County EDDY	Field Name PADUCA	Region DELAWARE BASIN WEST	State/Province NM		
Surface Legal Location SEC1 T25S R31E	API/UWI 3001542514	Latitude (°) 32° 9' 8.715" N	Longitude (°) 103° 44' 5.667" W	Ground Elev M... 3,451.80	Orig KB Elev (ft) 3,476.80	Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
12/25/2...	4,566.00	2.90	144.00	4,564.49	-65.32	-59.20	41.68	0.57	MWD	LEAM DRILLING SYSTEMS
12/25/2...	4,661.00	1.50	176.20	4,659.42	-68.71	-62.38	43.18	1.91	MWD	LEAM DRILLING SYSTEMS
12/25/2...	4,755.00	1.80	204.80	4,753.39	-71.15	-64.95	42.64	0.92	MWD	LEAM DRILLING SYSTEMS
12/25/2...	4,850.00	2.10	215.20	4,848.33	-73.61	-67.73	41.01	0.49	MWD	LEAM DRILLING SYSTEMS
12/25/2...	4,944.00	2.60	246.70	4,942.26	-75.34	-69.98	38.06	1.45	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,038.00	4.00	269.00	5,036.10	-75.36	-70.88	32.82	1.99	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,133.00	5.60	283.20	5,130.77	-73.07	-69.88	25.00	2.09	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,227.00	7.90	284.60	5,224.11	-68.64	-67.20	14.28	2.45	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,322.00	8.70	284.10	5,318.12	-63.08	-63.80	0.99	0.85	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,417.00	8.10	287.50	5,412.10	-57.14	-60.04	12.36	0.82	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,511.00	8.20	288.00	5,505.15	-51.02	-55.98	25.05	0.13	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,605.00	7.70	289.40	5,598.24	-44.86	-51.81	37.37	0.57	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,701.00	7.60	288.90	5,693.39	-38.71	-47.62	49.44	0.13	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,795.00	7.70	287.80	5,786.55	-32.85	-43.68	61.32	0.19	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,889.00	7.80	289.40	5,879.69	-26.86	-39.64	73.33	0.25	MWD	LEAM DRILLING SYSTEMS
12/25/2...	5,984.00	7.30	289.40	5,973.87	-20.81	-35.49	85.10	0.53	MWD	LEAM DRILLING SYSTEMS
12/25/2...	6,078.00	7.10	289.90	6,067.13	-15.05	-31.53	96.20	0.22	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,173.00	7.10	289.40	6,161.40	-9.31	-27.58	107.26	0.07	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,267.00	7.00	292.00	6,254.69	-3.50	-23.51	118.05	0.36	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,362.00	6.70	291.50	6,349.01	-2.40	-19.31	128.57	0.32	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,455.00	7.40	287.80	6,441.31	-7.96	-15.49	139.32	0.90	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,550.00	7.30	283.20	6,535.53	-13.11	-12.24	151.02	0.63	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,645.00	7.70	280.80	6,629.72	-17.67	-9.67	163.15	0.53	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,740.00	7.80	278.50	6,723.85	-21.89	-7.53	175.78	0.34	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,834.00	7.30	281.50	6,817.03	-26.02	-5.39	187.94	0.68	MWD	LEAM DRILLING SYSTEMS
12/26/2...	6,929.00	6.60	275.30	6,911.34	-29.60	-3.68	199.29	1.08	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,023.00	7.40	276.60	7,004.64	-32.67	-2.49	210.68	0.87	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,118.00	6.60	277.10	7,098.93	-35.95	-1.11	222.18	0.84	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,212.00	6.90	274.10	7,192.28	-38.84	-0.04	233.17	0.49	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,307.00	6.50	275.30	7,286.63	-41.57	0.86	244.21	0.45	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,401.00	6.70	275.10	7,380.00	-44.33	1.84	254.97	0.21	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,495.00	6.70	269.00	7,473.36	-46.54	2.24	265.92	0.76	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,590.00	6.40	269.30	7,567.74	-48.19	2.07	276.75	0.32	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,685.00	7.20	267.40	7,662.07	-49.74	1.74	288.00	0.87	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,780.00	7.10	265.50	7,756.33	-50.98	1.01	299.80	0.27	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,874.00	6.40	266.70	7,849.68	-52.07	0.25	310.82	0.76	MWD	LEAM DRILLING SYSTEMS
12/26/2...	7,968.00	6.10	267.80	7,943.12	-53.29	-0.24	321.04	0.34	MWD	LEAM DRILLING SYSTEMS
12/26/2...	8,063.00	6.50	265.70	8,037.55	-54.44	-0.84	331.44	0.49	MWD	LEAM DRILLING SYSTEMS
12/26/2...	8,158.00	7.50	264.80	8,131.84	-55.41	-1.80	342.98	1.06	MWD	LEAM DRILLING SYSTEMS
12/26/2...	8,252.00	6.50	265.30	8,225.14	-56.34	-2.80	354.39	1.07	MWD	LEAM DRILLING SYSTEMS
12/27/2...	8,347.00	7.30	265.30	8,319.45	-57.31	-3.73	365.77	0.84	MWD	LEAM DRILLING SYSTEMS
12/27/2...	8,442.00	7.10	265.50	8,413.70	-58.35	-4.69	377.64	0.21	MWD	LEAM DRILLING SYSTEMS
12/27/2...	8,536.00	7.40	271.60	8,506.95	-60.04	-4.97	389.48	0.88	MWD	LEAM DRILLING SYSTEMS
12/27/2...	8,631.00	7.70	272.30	8,601.13	-62.54	-4.55	401.95	0.33	MWD	LEAM DRILLING SYSTEMS
12/27/2...	8,725.00	7.20	271.60	8,694.33	-64.98	-4.13	414.13	0.54	MWD	LEAM DRILLING SYSTEMS
12/27/2...	8,820.00	5.80	280.20	8,788.72	-67.76	-3.11	424.81	1.79	MWD	LEAM DRILLING SYSTEMS
12/27/2...	8,914.00	5.50	280.80	8,882.27	-70.94	-1.43	433.91	0.33	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,009.00	4.60	266.50	8,976.90	-72.93	-0.81	442.19	1.62	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,104.00	3.70	257.60	9,071.65	-73.19	-1.70	448.98	1.16	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,197.00	3.50	265.30	9,164.47	-73.28	-2.58	454.74	0.56	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,292.00	2.80	274.40	9,259.32	-74.09	-2.63	459.95	0.90	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,387.00	2.60	273.00	9,354.22	-75.12	-2.34	464.41	0.22	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,481.00	1.10	267.80	9,448.17	-75.71	-2.27	467.44	1.60	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,576.00	1.20	283.20	9,543.15	-76.21	-2.08	469.32	0.34	MWD	LEAM DRILLING SYSTEMS
12/28/2...	9,670.00	0.50	277.40	9,637.14	-76.71	-1.80	470.69	0.75	MWD	LEAM DRILLING SYSTEMS



COTTON DRAW UNIT 221H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County EDDY	Field Name PADUCA	Region DELAWARE BASIN WEST	State/Province NM
Surface Legal Location SEC1 T25S R31E	API/UWI 3001542514	Latitude (°) 32° 9' 8.715" N	Longitude (°) 103° 44' 5.667" W	Ground Elev M. 3,451.80
				Orig KB Elev (ft) 3,476.80
				Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Incl. (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
12/28/2...	9,764.00	0.40	276.90	9,731.13	76.92	1.71	471.42	0.11	MWD	LEAM DRILLING SYSTEMS
1/10/2015	9,788.00	0.80	275.90	9,755.13	76.99	1.68	471.67	1.67	MWD	LEAM DRILLING SYSTEMS
12/29/2...	9,819.00	0.80	267.90	9,786.13	77.08	1.66	472.10	0.36	MWD	LEAM DRILLING SYSTEMS
12/29/2...	9,851.00	1.10	298.30	9,818.13	77.30	1.53	472.59	1.80	MWD	LEAM DRILLING SYSTEMS
12/29/2...	9,883.00	2.60	344.90	9,850.11	78.21	0.68	473.05	6.28	MWD	LEAM DRILLING SYSTEMS
12/29/2...	9,914.00	5.10	348.60	9,881.04	80.28	1.35	473.51	8.10	MWD	LEAM DRILLING SYSTEMS
12/29/2...	9,945.00	8.20	350.00	9,911.82	83.87	4.88	474.17	10.01	MWD	LEAM DRILLING SYSTEMS
12/29/2...	9,977.00	11.00	354.60	9,943.37	89.20	10.17	474.85	9.07	MWD	LEAM DRILLING SYSTEMS
12/29/2...	10,008.00	13.30	357.40	9,973.68	95.69	16.67	475.29	7.66	MWD	LEAM DRILLING SYSTEMS
12/30/2...	10,040.00	15.30	355.80	10,004.68	103.55	24.56	475.77	6.37	MWD	LEAM DRILLING SYSTEMS
12/30/2...	10,071.00	17.70	353.90	10,034.41	112.33	33.33	476.57	7.93	MWD	LEAM DRILLING SYSTEMS
12/30/2...	10,103.00	20.80	353.50	10,064.61	122.86	43.81	477.73	9.70	MWD	LEAM DRILLING SYSTEMS
12/30/2...	10,134.00	23.50	352.30	10,093.32	134.53	55.41	479.18	8.83	MWD	LEAM DRILLING SYSTEMS
12/30/2...	10,166.00	25.10	350.70	10,122.49	147.70	68.43	481.13	5.41	MWD	LEAM DRILLING SYSTEMS
1/10/2015	10,197.00	27.50	349.00	10,150.28	161.43	81.95	483.56	8.11	MWD	LEAM DRILLING SYSTEMS
12/30/2...	10,229.00	30.20	348.40	10,178.30	176.86	97.09	486.59	8.49	MWD	LEAM DRILLING SYSTEMS
12/30/2...	10,261.00	33.00	348.80	10,205.56	193.62	113.52	489.90	8.77	MWD	LEAM DRILLING SYSTEMS
12/31/2...	10,292.00	36.60	349.70	10,231.01	211.30	130.90	493.19	11.73	MWD	LEAM DRILLING SYSTEMS
12/31/2...	10,324.00	40.00	350.40	10,256.12	231.13	150.43	496.61	10.71	MWD	LEAM DRILLING SYSTEMS
12/31/2...	10,355.00	43.20	350.90	10,279.29	251.71	170.74	499.95	10.38	MWD	LEAM DRILLING SYSTEMS
12/31/2...	10,387.00	47.20	351.40	10,301.84	274.41	193.17	503.44	12.55	MWD	LEAM DRILLING SYSTEMS
12/31/2...	10,418.00	50.60	352.30	10,322.21	297.76	216.29	506.75	11.18	MWD	LEAM DRILLING SYSTEMS
1/10/2015	10,452.00	55.00	353.40	10,342.77	324.81	243.16	510.11	13.19	MWD	LEAM DRILLING SYSTEMS
12/31/2...	10,486.00	60.30	353.50	10,360.95	353.48	271.68	513.39	15.59	MWD	LEAM DRILLING SYSTEMS
12/31/2...	10,515.00	65.20	354.40	10,374.23	379.21	297.31	516.10	17.12	MWD	LEAM DRILLING SYSTEMS
1/2/2015	10,547.00	70.30	356.50	10,386.34	408.70	326.83	518.44	17.05	MWD	LEAM DRILLING SYSTEMS
1/2/2015	10,578.00	73.50	358.10	10,395.97	437.94	356.25	519.82	11.43	MWD	LEAM DRILLING SYSTEMS
1/2/2015	10,610.00	77.40	358.30	10,404.01	468.62	387.21	520.79	12.20	MWD	LEAM DRILLING SYSTEMS
1/3/2015	10,630.00	80.60	358.30	10,407.82	488.07	406.83	521.38	16.00	MWD	LEAM DRILLING SYSTEMS
1/3/2015	10,672.00	86.80	358.60	10,412.43	529.38	448.54	522.50	14.78	MWD	LEAM DRILLING SYSTEMS
1/4/2015	10,735.00	89.10	358.10	10,414.68	591.73	511.47	524.32	3.74	MWD	LEAM DRILLING SYSTEMS
1/4/2015	10,767.00	90.60	357.40	10,414.77	623.47	543.44	525.57	5.17	MWD	LEAM DRILLING SYSTEMS
1/4/2015	10,830.00	89.60	357.60	10,414.66	685.99	606.38	528.32	1.62	MWD	LEAM DRILLING SYSTEMS
1/4/2015	10,924.00	91.20	357.10	10,414.00	779.29	700.28	532.67	1.78	MWD	LEAM DRILLING SYSTEMS
1/4/2015	11,019.00	93.20	356.70	10,410.36	873.60	795.06	537.80	2.15	MWD	LEAM DRILLING SYSTEMS
1/4/2015	11,113.00	92.70	356.50	10,405.52	966.93	888.77	543.37	0.57	MWD	LEAM DRILLING SYSTEMS
1/4/2015	11,208.00	93.50	356.70	10,400.38	1,061.24	983.46	548.99	0.87	MWD	LEAM DRILLING SYSTEMS
1/4/2015	11,303.00	90.00	355.80	10,397.48	1,155.68	1,078.20	555.20	3.80	MWD	LEAM DRILLING SYSTEMS
1/4/2015	11,397.00	90.00	355.70	10,397.48	1,249.27	1,171.94	562.17	0.11	MWD	LEAM DRILLING SYSTEMS
1/4/2015	11,492.00	90.70	355.30	10,396.90	1,343.89	1,266.65	569.62	0.85	MWD	LEAM DRILLING SYSTEMS
1/4/2015	11,586.00	90.80	355.30	10,395.67	1,437.54	1,360.32	577.32	0.11	MWD	LEAM DRILLING SYSTEMS
1/5/2015	11,681.00	91.70	355.80	10,393.60	1,532.14	1,455.01	584.69	1.08	MWD	LEAM DRILLING SYSTEMS
1/5/2015	11,775.00	92.80	356.50	10,389.91	1,625.59	1,548.73	591.00	1.39	MWD	LEAM DRILLING SYSTEMS
1/5/2015	11,870.00	90.20	356.40	10,387.42	1,720.02	1,643.50	596.88	2.74	MWD	LEAM DRILLING SYSTEMS
1/5/2015	11,964.00	88.00	356.00	10,388.90	1,813.52	1,737.28	603.11	2.38	MWD	LEAM DRILLING SYSTEMS
1/6/2015	12,059.00	88.30	356.00	10,391.96	1,908.02	1,832.00	609.73	0.32	MWD	LEAM DRILLING SYSTEMS
1/6/2015	12,153.00	88.40	355.70	10,394.67	2,001.56	1,925.71	616.53	0.34	MWD	LEAM DRILLING SYSTEMS
1/6/2015	12,248.00	88.80	355.80	10,396.99	2,096.11	2,020.42	623.57	0.43	MWD	LEAM DRILLING SYSTEMS
1/6/2015	12,342.00	89.80	355.50	10,398.14	2,189.71	2,114.14	630.70	1.11	MWD	LEAM DRILLING SYSTEMS
1/6/2015	12,437.00	91.50	355.70	10,397.06	2,284.31	2,208.85	637.99	1.80	MWD	LEAM DRILLING SYSTEMS
1/7/2015	12,532.00	90.00	355.70	10,395.82	2,378.89	2,303.58	645.11	1.58	MWD	LEAM DRILLING SYSTEMS
1/8/2015	12,626.00	88.20	355.30	10,397.29	2,472.51	2,397.27	652.48	1.96	MWD	LEAM DRILLING SYSTEMS
1/8/2015	12,713.00	89.30	354.40	10,399.19	2,559.22	2,483.90	660.29	1.63	MWD	LEAM DRILLING SYSTEMS
1/8/2015	12,808.00	92.70	355.00	10,397.53	2,653.93	2,578.46	669.06	3.63	MWD	LEAM DRILLING SYSTEMS
1/9/2015	12,902.00	93.00	354.60	10,392.86	2,747.53	2,671.96	677.57	0.53	MWD	LEAM DRILLING SYSTEMS
1/9/2015	12,997.00	93.50	354.60	10,387.48	2,842.13	2,766.39	686.50	0.53	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,091.00	93.30	354.80	10,381.90	2,935.70	2,859.82	695.17	0.30	MWD	LEAM DRILLING SYSTEMS



COTTON DRAW UNIT 221H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County EDDY	Field Name PADUCA	Region DELAWARE BASIN WEST	State/Province NM
Surface Legal Location SEC1 T25S R31E	API/UMI 3001542514	Latitude (°) 32° 9' 8.715" N	Longitude (°) 103° 44' 5.667" W	Ground Elev M... 3,451.80
				Orig KB Elev (ft) 3,476.80
				Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
1/9/2015	13,186.00	92.20	355.30	10,377.34	3,030.27	2,954.35	703.35	1.27	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,280.00	92.40	355.00	10,373.57	3,123.87	3,047.94	711.29	0.38	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,375.00	92.70	354.80	10,369.34	3,218.49	3,142.47	719.73	0.38	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,469.00	92.40	354.40	10,365.16	3,312.14	3,235.96	728.57	0.53	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,564.00	91.60	355.00	10,361.85	3,406.82	3,330.50	737.34	1.05	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,658.00	91.00	355.70	10,359.71	3,500.44	3,424.16	744.96	0.98	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,752.00	90.90	356.00	10,358.15	3,594.00	3,517.90	751.76	0.34	MWD	LEAM DRILLING SYSTEMS
1/9/2015	13,847.00	90.40	355.80	10,357.08	3,688.56	3,612.65	758.55	0.57	MWD	LEAM DRILLING SYSTEMS
1/10/2015	13,941.00	89.40	355.30	10,357.24	3,782.18	3,706.37	765.84	1.19	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,036.00	89.60	354.10	10,358.07	3,876.91	3,800.96	774.62	1.28	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,130.00	89.10	355.80	10,359.14	3,970.60	3,894.58	782.89	1.88	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,225.00	89.30	357.10	10,360.46	4,065.06	3,989.39	788.77	1.38	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,320.00	90.20	357.40	10,360.88	4,159.38	4,084.28	793.33	1.00	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,414.00	90.00	356.70	10,360.71	4,252.75	4,178.15	798.17	0.77	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,509.00	89.90	358.50	10,360.80	4,346.99	4,273.06	802.15	1.90	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,603.00	91.30	359.20	10,359.81	4,439.97	4,367.04	804.03	1.67	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,698.00	90.80	359.30	10,358.07	4,533.82	4,462.01	805.28	0.54	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,793.00	91.60	359.30	10,356.08	4,627.66	4,556.98	806.44	0.84	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,887.00	90.00	359.20	10,354.77	4,720.52	4,650.96	807.67	1.71	MWD	LEAM DRILLING SYSTEMS
1/10/2015	14,976.00	90.50	358.60	10,354.38	4,808.55	4,739.95	809.37	0.88	MWD	LEAM DRILLING SYSTEMS
1/10/2015	15,030.00	90.50	358.60	10,353.91	4,861.99	4,793.93	810.69	0.00	BIT	LEAM DRILLING SYSTEMS