

30-015-42618



Weatherford®

Evaluation, Drilling & Intervention
10000 West County Rd. 116
P.O. Box 61028
Midland, TX USA 79711
Tel. (432) 561-8892 Fax (432) 561-8895

Devon Energy
333 W. Sheridan Ave
Oklahoma City, OK, 73102

Date: May 26, 2015

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 27 2015

Attention: Art Alarcon

Re: Devon Energy
Well: Arcturus 18 Fed 7H
Eddy County, New Mexico

RECEIVED

Enclosed, please find the original survey performed on the referenced well by Precision Energy Services, Inc. (P-5 No. 676004), a Weatherford company. Other information required by your office is as follows:

Name & Title Of Surveyor	Well Number	Surveyed Depths	Dates Performed	Type of Survey
Brent Tyler	7H	7290 MD	5/11/2015	Measurement
MWD Supervisor		12544 MD	5/20/2015	While Drilling

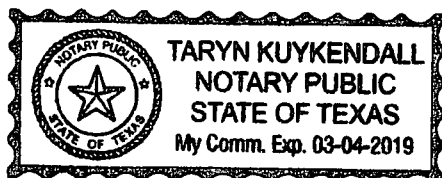
A notarized plan vs. actual is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Jesse Aguilar
MWD Ops Coordinator

On this, the 27th day of May, 2015, before me a notary public, the undersigned officer, personally appeared Jesse Aguilar, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same for the purposes therein contained.

In witness hereof, I hereunto set my hand and official seal.

Notary Public



5D Survey Report**Devon Energy****Field Name:** *Eddy Co, NM (Nad 83 NME)***Site Name:** *Arcturus 18 Fed 7H***Well Name:** *Arcturus 18 Fed 7H***Survey:** *Wft MWD Svy*

20 May 2015

**Weatherford®**

Arcturus 18 Fed 7H

Field Name Eddy Co. NM (Nad 83 NME)	Map Units : US ft		Company Name : Devon Energy	
	Vertical Reference Datum (VRD) : Mean Sea Level			
	Projected Coordinate System : NAD83 / New Mexico East (ftUS)			
	Comment :			
Site Name Arcturus 18 Fed 7H	Units : US ft	North Reference : Grid	Convergence Angle : 0.23	
	Position	Northing : 603697.38 US ft	Latitude : 32° 39' 31.91"	
		Easting : 674703.59 US ft	Longitude : -103° 53' 59.92"	
	Elevation above Mean Sea Level: 3424.00 US ft			
	Comment :			
Slot Name Arcturus 18 Fed 7H	Position (Offsets relative to Site Centre)			
	+N / -S : 0.00 US ft		Northing : 603697.38 US ft	Latitude : 32° 39' 31.91"
	+E / -W : 0.00 US ft		Easting : 674703.59 US ft	Longitude : -103° 53' 59.92"
	Slot TVD Reference : Ground Elevation			
	Elevation above Mean Sea Level : 3424.00 US ft			
	Comment :			
Well Name Arcturus 18 Fed 7H	Type : Main well		UWI :	
	Rig Height Kelly Bushing : 25.00 US ft		Comment :	
	Relative to Mean Sea Level: 3449.00 US ft			
	Closure Distance : 4929.74 US ft		Closure Azimuth : 269.664°	
	Vertical Section (Position of Origin Relative to Slot)			
	+N / -S : 0.00 US ft		+E / -W : 0.00 US ft	Az : 269.54°

Survey Name: Wft MWD Svy				
Date : 16/May/2015	Survey Tool : MWD	Comment :	Company : Wft	
Magnetic Model:				
Model Name: BGGM	Date: 10/May/2015	Field Strength: 48419.3 nT	Declination: 7.48°	Dip: 60.43°
Tie Point				
MD: 7275	Inclination: 1.09	Azimuth: 249.47	TVD: 7273.08	North Offset: -4.54354 East Offset: 57.4983

Well path created using minimum curvature

Survey Points (Relative to Slot centre, TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	Northing (US ft)	Easting (US ft)	Comment
7290.00	1.09	248.40	7288.07	-4.65	57.23	-57.19	0.00	603692.73	674760.82	First Wft Svy
7322.00	1.82	266.39	7320.06	-4.79	56.44	-56.40	2.66	603692.59	674760.03	
7354.00	4.63	269.75	7352.01	-4.83	54.64	-54.60	8.80	603692.55	674758.23	
7385.00	7.96	269.20	7382.82	-4.86	51.24	-51.20	10.74	603692.52	674754.83	
7417.00	11.41	268.85	7414.36	-4.96	45.86	-45.82	10.78	603692.42	674749.45	
7449.00	14.76	269.21	7445.52	-5.08	38.62	-38.58	10.47	603692.30	674742.21	
7480.00	17.22	270.10	7475.32	-5.12	30.08	-30.04	7.97	603692.26	674733.67	
7512.00	20.20	268.63	7505.63	-5.25	19.82	-19.78	9.43	603692.13	674723.41	
7544.00	23.28	266.35	7535.35	-5.78	7.98	-7.94	9.98	603691.60	674711.57	
7576.00	26.58	265.06	7564.36	-6.80	-5.46	5.52	10.45	603690.58	674698.13	
7608.00	30.00	265.37	7592.54	-8.06	-20.58	20.64	10.70	603689.32	674683.01	
7639.00	33.33	266.39	7618.92	-9.23	-36.80	36.88	10.88	603688.15	674666.79	
7671.00	36.14	266.88	7645.21	-10.29	-55.00	55.09	8.82	603687.09	674648.59	

5D Survey Report

Survey Points (Relative to Slot A centre, TVD relative to Kelly Bushing)										
MD (US ft)	Inc. (°)	Az. (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	Northing (US ft)	Easting (US ft)	Comment
7703.00	40.14	267.48	7670.37	-11.26	-74.74	74.83	12.55	603686.12	674628.85	
7735.00	43.64	267.18	7694.19	-12.26	-96.08	96.17	10.96	603685.12	674607.51	
7766.00	47.05	267.33	7715.98	-13.31	-118.10	118.21	11.01	603684.07	674585.49	
7798.00	50.35	267.72	7737.09	-14.35	-142.12	142.23	10.35	603683.03	674561.47	
7830.00	53.02	269.11	7756.93	-15.04	-167.21	167.33	9.01	603682.34	674536.38	
7862.00	55.89	269.83	7775.53	-15.28	-193.25	193.36	9.15	603682.10	674510.34	
7893.00	59.15	270.25	7792.18	-15.26	-219.39	219.51	10.58	603682.12	674484.20	
7925.00	61.80	270.90	7807.95	-14.97	-247.23	247.35	8.47	603682.41	674456.36	
7957.00	64.10	271.82	7822.50	-14.30	-275.72	275.83	7.63	603683.08	674427.87	
7989.00	65.80	271.95	7836.05	-13.34	-304.70	304.79	5.33	603684.04	674398.89	
8021.00	68.14	271.00	7848.57	-12.59	-334.13	334.22	7.81	603684.79	674369.46	
8039.00	69.93	270.65	7855.01	-12.34	-350.94	351.03	10.10	603685.04	674352.65	Cross Prod. Box
8052.00	71.22	270.40	7859.33	-12.23	-363.20	363.28	10.10	603685.15	674340.39	
8084.00	74.65	269.67	7868.72	-12.22	-393.78	393.87	10.94	603685.16	674309.81	
8116.00	77.60	269.06	7876.39	-12.56	-424.84	424.93	9.40	603684.82	674278.75	
8147.00	78.93	268.18	7882.70	-13.29	-455.19	455.28	5.11	603684.09	674248.40	
8179.00	81.36	268.18	7888.17	-14.29	-486.70	486.80	7.59	603683.09	674216.89	
8211.00	83.06	268.32	7892.51	-15.26	-518.39	518.49	5.33	603682.12	674185.20	
8243.00	85.45	268.70	7895.71	-16.09	-550.21	550.32	7.56	603681.29	674153.38	
8256.00	86.08	269.22	7896.67	-16.33	-563.17	563.29	6.28	603681.05	674140.42	
8352.00	88.53	269.51	7901.19	-17.39	-659.05	659.17	2.57	603679.99	674044.54	
8447.00	89.65	269.91	7902.70	-17.87	-754.04	754.16	1.25	603679.51	673949.55	
8542.00	89.86	270.24	7903.10	-17.74	-849.04	849.15	0.41	603679.64	673854.55	
8637.00	89.93	270.52	7903.28	-17.11	-944.04	944.14	0.30	603680.27	673759.55	
8733.00	89.93	270.81	7903.39	-16.00	-1040.03	1040.12	0.30	603681.38	673663.56	
8828.00	89.86	270.85	7903.57	-14.62	-1135.02	1135.10	0.08	603682.76	673568.57	
8923.00	89.79	270.96	7903.86	-13.12	-1230.01	1230.07	0.14	603684.26	673473.58	
9017.00	91.89	271.01	7902.48	-11.51	-1323.98	1324.03	2.23	603685.87	673379.61	
9112.00	92.80	270.30	7898.59	-10.42	-1418.89	1418.93	1.21	603686.96	673284.70	
9205.00	93.29	270.05	7893.65	-10.14	-1511.76	1511.79	0.59	603687.24	673191.83	
9299.00	92.10	270.05	7889.23	-10.06	-1605.65	1605.68	1.27	603687.32	673097.94	
9394.00	92.10	270.19	7885.75	-9.86	-1700.59	1700.61	0.15	603687.52	673003.00	
9489.00	91.75	269.94	7882.56	-9.75	-1795.53	1795.55	0.45	603687.63	672908.06	
9583.00	91.89	270.44	7879.58	-9.44	-1889.49	1889.50	0.55	603687.94	672814.10	
9677.00	91.12	269.76	7877.11	-9.27	-1983.45	1983.46	1.09	603688.11	672720.14	
9771.00	91.26	269.31	7875.15	-10.04	-2077.43	2077.44	0.50	603687.34	672626.16	
9867.00	91.47	269.89	7872.87	-10.71	-2173.40	2173.41	0.64	603686.67	672530.19	
9963.00	91.68	269.09	7870.23	-11.56	-2269.36	2269.38	0.86	603685.82	672434.23	
10057.00	90.77	268.86	7868.22	-13.24	-2363.32	2363.35	1.00	603684.14	672340.27	
10153.00	90.63	269.27	7867.05	-14.81	-2459.30	2459.34	0.45	603682.57	672244.29	
10248.00	90.42	268.97	7866.18	-16.27	-2554.28	2554.33	0.39	603681.11	672149.31	
10343.00	90.49	269.36	7865.42	-17.65	-2649.27	2649.33	0.42	603679.73	672054.32	
10438.00	90.84	269.82	7864.32	-18.33	-2744.26	2744.32	0.61	603679.05	671959.33	
10533.00	90.98	269.90	7862.81	-18.56	-2839.25	2839.31	0.17	603678.82	671864.34	
10629.00	91.12	268.89	7861.05	-19.58	-2935.23	2935.29	1.06	603677.80	671768.36	
10724.00	90.98	268.81	7859.31	-21.48	-3030.19	3030.27	0.17	603675.90	671673.40	
10819.00	91.19	269.37	7857.51	-22.99	-3125.16	3125.25	0.63	603674.39	671578.43	
10914.00	91.40	269.58	7855.36	-23.86	-3220.13	3220.22	0.31	603673.52	671483.46	
11010.00	91.75	269.70	7852.73	-24.47	-3316.10	3316.19	0.39	603672.91	671387.49	
11106.00	91.75	270.21	7849.79	-24.54	-3412.05	3412.14	0.53	603672.84	671291.54	
11201.00	91.54	270.49	7847.07	-23.96	-3507.01	3507.09	0.37	603673.42	671196.58	
11297.00	91.47	270.40	7844.55	-23.22	-3602.97	3603.04	0.12	603674.16	671100.62	
11392.00	91.61	270.62	7841.99	-22.37	-3697.94	3698.00	0.27	603675.01	671005.65	
11487.00	91.12	270.57	7839.73	-21.38	-3792.90	3792.95	0.52	603676.00	670910.69	
11582.00	90.84	270.27	7838.10	-20.69	-3887.89	3887.93	0.43	603676.69	670815.70	
11678.00	90.77	270.29	7836.76	-20.22	-3983.88	3983.91	0.08	603677.16	670719.71	
11773.00	91.26	271.20	7835.07	-18.98	-4078.85	4078.87	1.09	603678.40	670624.74	
11868.00	91.68	269.87	7832.64	-18.10	-4173.81	4173.82	1.47	603679.28	670529.78	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	Northing (US ft)	Easting (US ft)	Comment
11964.00	91.33	269.27	7830.11	-18.82	-4269.78	4269.79	0.72	603678.56	670433.81	
12059.00	90.28	269.14	7828.78	-20.14	-4364.76	4364.78	1.11	603677.24	670338.83	
12154.00	90.63	269.58	7828.03	-21.20	-4459.75	4459.77	0.59	603676.18	670243.84	
12249.00	90.49	269.47	7827.10	-21.98	-4554.74	4554.77	0.19	603675.40	670148.85	
12345.00	90.56	269.46	7826.22	-22.88	-4650.73	4650.77	0.07	603674.50	670052.86	
12440.00	89.93	268.82	7825.81	-24.31	-4745.72	4745.76	0.95	603673.07	669957.87	
12544.00	90.42	268.46	7825.49	-26.77	-4849.69	4849.75	0.58	603670.61	669853.90	Last Wft Svy 7H
12584.50	90.42	268.46	7825.20	-27.86	-4890.17	4890.24	0.00	603669.52	669813.42	Cross Prod. Box
12624.00	90.42	268.46	7824.91	-28.92	-4929.66	4929.73	0.00	603668.46	669773.93	Proj. To Bit

devon

Arcturus 18 Fed 7H
Eddy Co, NM



Weatherford

Plan Data for Arcturus 18 Fed 7H

Plan Point Information:

DogLeg Severity Unit: °/100.00ft Position offsets from Slot centre

MD	Inc	Az	TVD	+N/-S	+E/-W	Northing	Easting	VSec	DLS
(USft)	(°)	(°)	(USft)	(USft)	(USft)	(USft)	(USft)	(USft)	(DLSU)
8923.00	89.79	270.96	7903.86	-13.12	-1230.01	603684.26	673473.58	1230.07	0.14
9003.00	89.73	271.05	7904.19	-11.72	-1309.99	603685.66	673393.60	1310.05	0.14
9139.59	92.00	269.53	7902.13	-11.03	-1446.55	603686.35	673257.04	1446.59	2.00
10039.59	92.00	269.53	7870.72	-18.41	-2345.97	603678.97	672357.62	2346.04	0.00
10088.25	91.03	269.53	7869.44	-18.80	-2394.62	603678.58	672308.97	2394.69	2.00
12624.12	91.03	269.53	7824.00	-39.55	-4929.99	603657.83	669773.60	4930.15	0.00

Plan Data for Arcturus 18 Fed 7H

Well: Arcturus 18 Fed 7H
Type: Main-Well
File Number:
Plan Folder: PG Plan: PG:VL
Vertical Section: Position offset of origin from Slot centre:
+N/-S: 0.00USft Azimuth: 269.54°
+E/-W: 0.00USft
Magnetic Parameters:
Model: Field Strength: Declination: Dip: Date:
BGM 48419(nf) 7.48° 60.43° 2015-05-10

Plan Data for Arcturus 18 Fed 7H

Target Set Information:

Name: Arcturus 18 Fed 7H

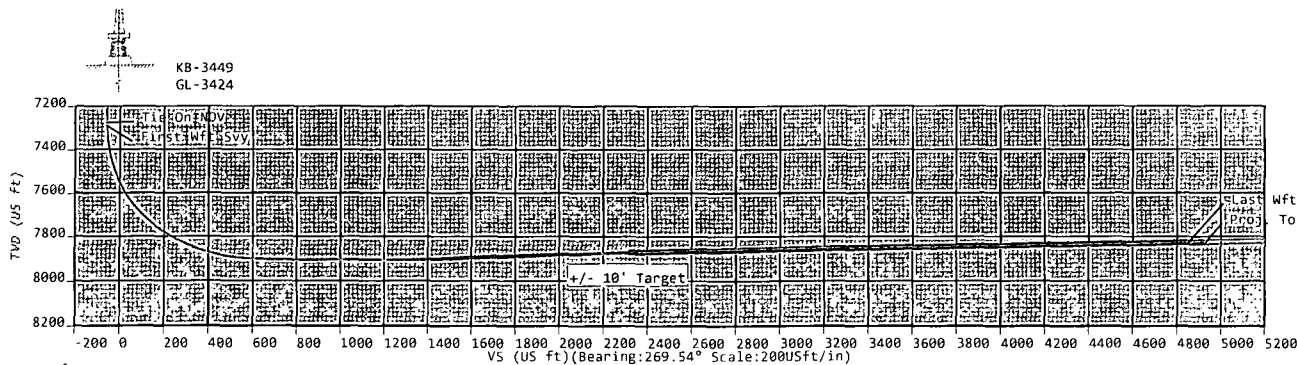
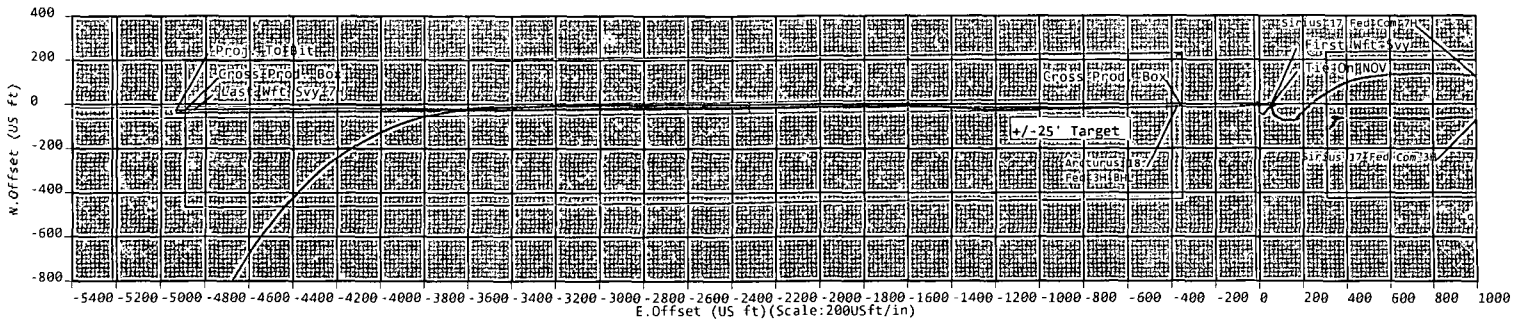
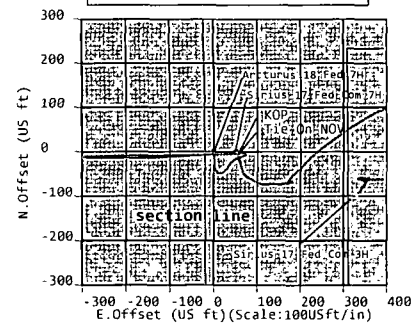
Position offsets from Slot centre

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape	Comment
(USft)	(USft)	(USft)	(USft)	(USft)	(USft)		
LP Tgt	7904.00	-2.91	-420.00	603694.47	674283.59	Cuboid	
PBHL 7H	7824.00	-39.55	-4929.99	603657.83	669773.60	Cuboid	

Plan Data for Arcturus 18 Fed 7H

Slot: Arcturus 18 Fed 7H
Position:
Offset is from Site centre
+N/-S: 0.00USft Northing: 603697.38USft Latitude: 32°39'31.9"
+E/-W: 0.00USft Easting: 674703.59USft Longitude: -103°53'59.9"
Elevation Above VRD: 3424.00USft

Arcturus 18 Fed 7H	_____
Sirius 17 Fed Com 7H	_____
Arcturus 18 Fed 3H	_____
Sirius 17 Fed Com 3H	_____
Arcturus 18 Fed 7H	_____
Arcturus 18 Fed 7H	_____



Sign Off: Russell Joyner



Directional Survey

RECEIVED

Well Name: ARCTURUS 18 FED 7H

Sub-Division DELAWARE BASIN		Region DELAWARE SLOPE EAST		Field Name HACKBERRY NORTHWEST		County EDDY		State/Province NM					
Surface Legal Location SEC 17 T19S R31E		API/UWI 3001542618		Latitude (°) 32° 39' 31.475" N		Longitude (°) 103° 53' 57.39" W		Orig KB Elevation (ft) 3,448.90		Ground Elev MSL (ft) 3,423.90		KB - GL (ft) 25.00	
Wellbores													
Wellbore Name OH		Parent Wellbore OH				SAP Well ID 38340				Vertical Section Direction (°)			
Kick Offs & Key Depths													
Date 5/15/2015				Type Kick Off				Top Depth (ftKB) 7,323.0					
Actual Deviation Survey NOV-FLO DRIFT				Definitive? No		Proposed? No		Proposed Deviation Survey					
Deviation Survey													
Date 4/30/2015		Description NOV-FLO DRIFT											
MD Tie In (ftKB)		TVD Tie In (ftKB)		Inclination Tie In (°)		Azimuth Tie In (°)		NSTie In (ft)		EWtie In (ft)			
Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	EW (ft)	DLS (ft/100ft)	Survey Tool	Survey Company			
4/30/2015	195.00	0.20	358.00	195.00	0.01	0.34	0.01	0.10	MWD	NOV- FLO DRIFT			
4/30/2015	257.00	0.10	324.00	257.00	0.04	0.49	0.05	0.21	MWD	NOV- FLO DRIFT			
4/30/2015	317.00	1.00	166.00	317.00	-0.05	0.03	0.05	1.82	MWD	NOV- FLO DRIFT			
5/1/2015	376.00	1.80	178.00	375.98	-0.20	-1.40	0.21	1.44	MWD	NOV- FLO DRIFT			
5/1/2015	437.00	1.70	177.00	436.95	-0.26	-3.26	0.29	0.17	MWD	NOV- FLO DRIFT			
5/1/2015	634.00	2.80	179.00	633.80	-0.44	-10.99	0.52	0.56	MWD	NOV- FLO DRIFT			
5/3/2015	692.00	2.60	174.00	691.73	-0.59	-13.71	0.69	0.53	MWD	NOV- FLO DRIFT			
5/3/2015	711.00	2.80	177.00	710.71	-0.65	-14.61	0.75	1.29	MWD	NOV- FLO DRIFT			
5/3/2015	795.00	2.80	177.00	794.61	-0.84	-18.70	0.97	0.00	MWD	NOV- FLO DRIFT			
5/4/2015	887.00	2.70	176.00	886.50	-1.07	-23.11	1.24	0.12	MWD	NOV- FLO DRIFT			
5/4/2015	879.00	2.40	177.00	878.41	-1.30	-27.20	1.49	0.33	MWD	NOV- FLO DRIFT			
5/4/2015	1,071.00	2.30	174.00	1,070.34	-1.56	-30.95	1.78	0.17	MWD	NOV- FLO DRIFT			
5/4/2015	1,163.00	2.10	179.00	1,162.27	-1.76	-34.48	2.01	0.30	MWD	NOV- FLO DRIFT			
5/4/2015	1,256.00	1.90	175.00	1,255.21	-1.90	-37.72	2.17	0.26	MWD	NOV- FLO DRIFT			
5/4/2015	1,439.00	1.40	150.00	1,438.14	-3.25	-42.67	3.55	0.47	MWD	NOV- FLO DRIFT			
5/4/2015	1,533.00	1.40	135.00	1,532.11	-4.62	-44.48	4.94	0.39	MWD	NOV- FLO DRIFT			
5/4/2015	1,617.00	1.50	122.00	1,616.08	-6.27	-45.79	6.60	0.41	MWD	NOV- FLO DRIFT			
5/4/2015	1,713.00	1.30	110.00	1,712.05	-8.35	-46.83	8.69	0.37	MWD	NOV- FLO DRIFT			
5/4/2015	1,808.00	1.40	111.00	1,807.03	-10.44	-47.61	10.78	0.11	MWD	NOV- FLO DRIFT			
5/4/2015	1,903.00	1.40	99.00	1,902.00	-12.67	-48.21	13.01	0.31	MWD	NOV- FLO DRIFT			
5/4/2015	1,998.00	1.70	92.00	1,996.96	-15.22	-48.44	15.57	0.37	MWD	NOV- FLO DRIFT			
5/4/2015	2,093.00	1.30	79.00	2,091.93	-17.69	-48.28	18.03	0.55	MWD	NOV- FLO DRIFT			
5/4/2015	2,114.00	0.80	63.00	2,112.93	-18.05	-48.17	18.40	2.74	MWD	NOV- FLO DRIFT			
5/4/2015	2,210.00	0.70	48.00	2,208.92	-19.09	-47.47	19.43	0.23	MWD	NOV- FLO DRIFT			
5/5/2015	2,350.00	0.60	48.00	2,348.91	-20.28	-46.41	20.61	0.07	MWD	NOV- FLO DRIFT			
5/8/2015	2,399.00	0.70	308.00	2,397.91	-20.24	-46.06	20.56	2.04	MWD	NOV- FLO DRIFT			
5/8/2015	2,494.00	0.90	41.00	2,492.90	-20.28	-45.14	20.60	1.23	MWD	NOV- FLO DRIFT			
5/8/2015	2,590.00	0.70	45.00	2,588.89	-21.19	-44.15	21.51	0.22	MWD	NOV- FLO DRIFT			
5/8/2015	2,685.00	0.60	46.00	2,683.89	-21.97	-43.40	22.27	0.11	MWD	NOV- FLO DRIFT			
5/8/2015	2,780.00	0.60	46.00	2,778.88	-22.69	-42.70	22.99	0.00	MWD	NOV- FLO DRIFT			
5/8/2015	2,876.00	0.80	51.00	2,874.88	-23.57	-41.93	23.87	0.22	MWD	NOV- FLO DRIFT			
5/8/2015	2,971.00	0.70	52.00	2,969.87	-24.55	-41.16	24.84	0.11	MWD	NOV- FLO DRIFT			
5/8/2015	3,066.00	0.90	41.00	3,064.86	-25.50	-40.24	25.79	0.26	MWD	NOV- FLO DRIFT			
5/8/2015	3,162.00	1.00	39.00	3,160.84	-26.54	-39.02	26.81	0.11	MWD	NOV- FLO DRIFT			
5/9/2015	3,258.00	0.90	37.00	3,256.83	-27.53	-37.77	27.79	0.11	MWD	NOV- FLO DRIFT			
5/9/2015	3,353.00	0.80	38.00	3,351.82	-28.39	-36.65	28.65	0.11	MWD	NOV- FLO DRIFT			
5/9/2015	3,448.00	0.80	35.00	3,446.81	-29.19	-35.58	29.44	0.04	MWD	NOV- FLO DRIFT			
5/9/2015	3,554.00	0.90	36.00	3,552.80	-30.11	-34.30	30.35	0.10	MWD	NOV- FLO DRIFT			
5/9/2015	3,639.00	0.80	45.00	3,637.79	-30.93	-33.34	31.17	0.20	MWD	NOV- FLO DRIFT			
5/9/2015	3,734.00	0.70	39.00	3,732.78	-31.77	-32.42	32.00	0.13	MWD	NOV- FLO DRIFT			
5/9/2015	3,830.00	0.60	41.00	3,828.78	-32.47	-31.59	32.70	0.11	MWD	NOV- FLO DRIFT			
5/9/2015	3,925.00	1.00	42.00	3,923.77	-33.36	-30.60	33.58	0.42	MWD	NOV- FLO DRIFT			
5/9/2015	4,063.00	0.90	51.00	4,061.75	-35.02	-29.02	35.23	0.13	MWD	NOV- FLO DRIFT			
5/13/2015	4,156.00	1.10	54.00	4,154.73	-36.32	-28.03	36.52	0.22	MWD	NOV- FLO DRIFT			
5/13/2015	4,250.00	1.10	53.00	4,248.72	-37.78	-26.96	37.97	0.02	MWD	NOV- FLO DRIFT			
5/13/2015	4,345.00	1.00	57.00	4,343.70	-39.21	-25.98	39.39	0.13	MWD	NOV- FLO DRIFT			
5/13/2015	4,432.00	1.00	58.00	4,430.69	-40.49	-25.14	40.67	0.02	MWD	NOV- FLO DRIFT			
5/13/2015	4,534.00	0.90	61.00	4,532.67	-41.95	-24.28	42.13	0.11	MWD	NOV- FLO DRIFT			
5/13/2015	4,629.00	0.80	58.00	4,627.66	-43.17	-23.57	43.34	0.12	MWD	NOV- FLO DRIFT			
5/13/2015	4,723.00	0.50	57.00	4,721.66	-44.08	-23.00	44.24	0.32	MWD	NOV- FLO DRIFT			
5/13/2015	4,818.00	0.60	61.00	4,816.65	-44.86	-22.53	45.03	0.11	MWD	NOV- FLO DRIFT			
5/13/2015	4,914.00	0.80	74.00	4,912.64	-45.95	-22.10	46.11	0.26	MWD	NOV- FLO DRIFT			
5/13/2015	5,008.00	1.20	81.00	5,006.63	-47.56	-21.77	47.71	0.44	MWD	NOV- FLO DRIFT			
5/13/2015	5,104.00	1.20	81.00	5,102.61	-49.54	-21.46	49.70	0.00	MWD	NOV- FLO DRIFT			
5/13/2015	5,199.00	1.29	71.76	5,197.59	-51.55	-20.97	51.70	0.23	MWD	NOV- FLO DRIFT			
5/13/2015	5,294.00	1.62	64.94	5,292.56	-53.79	-20.06	53.93	0.39	MWD	NOV- FLO DRIFT			
5/13/2015	5,390.00	1.70	66.64	5,388.52	-56.33	-18.92	56.47	0.10	MWD	NOV- FLO DRIFT			
5/13/2015	5,485.00	1.56	71.48	5,483.48	-58.86	-17.95	58.99	0.21	MWD	NOV- FLO DRIFT			
5/13/2015	5,580.00	1.37	72.42	5,578.45	-61.17	-17.20	61.29	0.20	MWD	NOV- FLO DRIFT			
5/13/2015	5,675.00	1.11	67.83	5,673.42	-63.11	-16.51	63.23	0.29	MWD	NOV- FLO DRIFT			
5/13/2015	5,771.00	1.06	67.82	5,769.41	-64.80	-15.82	64.91	0.05	MWD	NOV- FLO DRIFT			
5/13/2015	5,866.00	0.82	68.74	5,864.39	-66.25	-15.24	66.36	0.25	MWD	NOV- FLO DRIFT			
5/13/2015	5,961.00	0.66	67.63	5,959.39	-67.39	-14.79	67.50	0.17	MWD	NOV- FLO DRIFT			
5/13/2015	6,057.00	0.59	50.47	6,055.38	-68.29	-14.26	68.39	0.21	MWD	NOV- FLO DRIFT			
5/13/2015	6,152.00	0.33	18.86	6,150.38	-68.76	-13.69	68.86	0.37	MWD	NOV- FLO DRIFT			
5/13/2015	6,248.00	0.25	337.13	6,246.38	-68.77	-13.24	68.87	0.23	MWD	NOV- FLO DRIFT			



Directional Survey

Well Name: ARCTURUS 18 FED 7H

Sub-Division: DELAWARE BASIN		Region DELAWARE SLOPE EAST		Field Name HACKBERRY NORTHWEST			County EDDY		State/Province NM	
Surface Legal Location SEC 17 T.19S R.31E		API/UWJ 3001542618		Latitude (°) 32° 39' 31.475" N		Longitude (°) 103° 53' 57.39" W		Orig KB Elevation (ft) 3,448.90		Ground Elev MSL (ft) 3,423.90
										KB - GL (ft) 25.00
Survey Data										
Date	MD (NKB)	Incl (°)	Azm (°)	STVD (NKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS ("/100ft)	Survey #/Tool	Survey Company
5/13/2015	6,344.00	0.53	326.53	6,342.37	-68.45	-12.68	68.54	0.30	MWD	NOV- FLO DRIFT
5/13/2015	6,438.00	0.66	305.76	6,436.37	-67.77	-12.00	67.86	0.27	MWD	NOV- FLO DRIFT
5/13/2015	6,534.00	0.70	303.78	6,532.36	-66.84	-11.35	66.92	0.05	MWD	NOV- FLO DRIFT
5/13/2015	6,629.00	0.81	293.51	6,627.35	-65.75	-10.76	65.83	0.18	MWD	NOV- FLO DRIFT
5/13/2015	6,724.00	1.29	282.67	6,722.34	-64.09	-10.26	64.17	0.54	MWD	NOV- FLO DRIFT
5/13/2015	6,820.00	1.45	280.73	6,818.31	-61.65	-9.79	61.92	0.17	MWD	NOV- FLO DRIFT
5/13/2015	6,915.00	1.17	276.56	6,913.29	-59.71	-9.46	59.77	0.31	MWD	NOV- FLO DRIFT
5/13/2015	7,010.00	0.89	272.37	7,008.27	-58.01	-9.32	58.07	0.31	MWD	NOV- FLO DRIFT
5/13/2015	7,106.00	1.15	255.86	7,104.26	-56.33	-9.52	56.39	0.41	MWD	NOV- FLO DRIFT
5/13/2015	7,201.00	1.20	258.00	7,199.24	-54.42	-9.96	54.50	0.07	MWD	NOV- FLO DRIFT
5/14/2015	7,275.00	1.09	249.47	7,273.22	-53.00	-10.37	53.08	0.27	MWD	NOV- FLO DRIFT
5/15/2015	7,290.00	1.09	248.40	7,288.22	-52.74	-10.47	52.81	0.14	MWD	WEATHERFORD MWD
5/15/2015	7,322.00	1.82	266.39	7,320.21	-51.95	-10.62	52.02	2.66	MWD	WEATHERFORD MWD
5/15/2015	7,354.00	4.63	269.75	7,352.15	-50.15	-10.65	50.22	8.80	MWD	WEATHERFORD MWD
5/15/2015	7,385.00	7.96	269.20	7,382.96	-46.75	-10.69	46.83	10.74	MWD	WEATHERFORD MWD
5/15/2015	7,417.00	11.41	268.85	7,414.50	-41.37	-10.78	41.44	10.78	MWD	WEATHERFORD MWD
5/15/2015	7,449.00	14.76	269.21	7,445.67	-34.12	-10.90	34.20	10.47	MWD	WEATHERFORD MWD
5/15/2015	7,480.00	17.22	270.10	7,475.46	-25.58	-10.95	25.66	7.97	MWD	WEATHERFORD MWD
5/15/2015	7,512.00	20.20	268.63	7,505.77	-15.32	-11.07	15.40	9.43	MWD	WEATHERFORD MWD
5/15/2015	7,544.00	23.28	266.35	7,535.49	-3.48	-11.61	3.56	9.98	MWD	WEATHERFORD MWD
5/15/2015	7,576.00	26.58	265.06	7,564.51	9.97	-12.63	-9.88	10.45	MWD	WEATHERFORD MWD
5/16/2015	7,608.00	30.00	265.37	7,592.68	25.09	-13.89	-24.99	10.70	MWD	WEATHERFORD MWD
5/16/2015	7,639.00	33.33	266.39	7,619.06	41.33	-15.05	-41.22	10.88	MWD	WEATHERFORD MWD
5/16/2015	7,671.00	36.14	266.88	7,645.36	59.54	-16.12	-59.42	8.82	MWD	WEATHERFORD MWD
5/16/2015	7,703.00	40.14	267.48	7,670.52	79.28	-17.09	-79.16	12.55	MWD	WEATHERFORD MWD
5/16/2015	7,735.00	43.64	267.18	7,694.34	100.62	-18.08	-100.50	10.96	MWD	WEATHERFORD MWD
5/16/2015	7,766.00	47.05	267.33	7,716.12	122.65	-19.14	-122.52	11.01	MWD	WEATHERFORD MWD
5/16/2015	7,798.00	50.35	267.72	7,737.24	146.68	-20.17	-146.54	10.35	MWD	WEATHERFORD MWD
5/16/2015	7,830.00	53.02	269.11	7,757.08	171.77	-20.86	-171.63	9.01	MWD	WEATHERFORD MWD
5/16/2015	7,862.00	55.89	269.83	7,775.68	197.81	-21.10	-197.66	9.15	MWD	WEATHERFORD MWD
5/16/2015	7,893.00	59.15	270.25	7,792.32	223.96	-21.08	-223.81	10.58	MWD	WEATHERFORD MWD
5/16/2015	7,925.00	61.80	270.90	7,808.09	251.79	-20.80	-251.65	8.47	MWD	WEATHERFORD MWD
5/16/2015	7,957.00	64.10	271.82	7,822.64	280.28	-20.12	-280.14	7.63	MWD	WEATHERFORD MWD
5/16/2015	7,989.00	65.80	271.95	7,836.19	309.24	-19.17	-309.11	5.33	MWD	WEATHERFORD MWD
5/16/2015	8,021.00	68.14	271.00	7,848.71	338.67	-18.41	-338.55	7.81	MWD	WEATHERFORD MWD
5/16/2015	8,052.00	71.22	270.40	7,859.47	367.74	-18.06	-367.62	10.10	MWD	WEATHERFORD MWD
5/16/2015	8,084.00	74.65	269.67	7,868.86	398.32	-18.04	-398.20	10.94	MWD	WEATHERFORD MWD
5/16/2015	8,116.00	77.60	269.06	7,876.54	429.38	-18.39	-429.26	9.40	MWD	WEATHERFORD MWD
5/16/2015	8,147.00	78.93	268.18	7,882.84	459.73	-19.12	-459.61	5.11	MWD	WEATHERFORD MWD
5/16/2015	8,179.00	81.36	268.18	7,888.32	491.25	-20.12	-491.11	7.59	MWD	WEATHERFORD MWD
5/16/2015	8,211.00	83.06	268.32	7,892.66	522.94	-21.09	-522.80	5.33	MWD	WEATHERFORD MWD
5/16/2015	8,243.00	85.45	268.70	7,895.86	554.77	-21.91	-554.63	7.56	MWD	WEATHERFORD MWD
5/16/2015	8,243.00	85.45	268.70	7,895.86	554.77	-21.91	-554.63	7.56	MWD	WEATHERFORD MWD
5/16/2015	8,256.00	86.08	269.22	7,896.82	567.74	-22.15	-567.59	6.28	MWD	WEATHERFORD MWD
5/16/2015	8,352.00	88.53	269.51	7,901.33	663.62	-23.21	-663.47	2.57	MWD	WEATHERFORD MWD
5/16/2015	8,447.00	89.65	269.91	7,902.84	758.61	-23.69	-758.46	1.25	MWD	WEATHERFORD MWD
5/16/2015	8,542.00	89.86	270.24	7,903.25	853.60	-23.57	-853.46	0.41	MWD	WEATHERFORD MWD
5/16/2015	8,637.00	89.93	270.52	7,903.42	948.59	-22.94	-948.45	0.30	MWD	WEATHERFORD MWD
5/16/2015	8,733.00	89.93	270.81	7,903.54	1,044.58	-21.82	-1,044.45	0.30	MWD	WEATHERFORD MWD
5/16/2015	8,828.00	89.86	270.85	7,903.71	1,139.55	-20.45	-1,139.44	0.08	MWD	WEATHERFORD MWD
5/16/2015	8,923.00	89.79	270.96	7,904.00	1,234.53	-18.95	-1,234.43	0.14	MWD	WEATHERFORD MWD
5/16/2015	9,017.00	91.89	271.01	7,902.62	1,328.49	-17.33	-1,328.40	2.23	MWD	WEATHERFORD MWD
5/17/2015	9,112.00	92.80	270.30	7,898.74	1,423.39	-16.25	-1,423.31	1.21	MWD	WEATHERFORD MWD
5/17/2015	9,205.00	93.29	270.05	7,893.80	1,516.25	-15.96	-1,516.18	0.59	MWD	WEATHERFORD MWD
5/17/2015	9,299.00	92.10	270.05	7,889.38	1,610.14	-15.88	-1,610.07	1.27	MWD	WEATHERFORD MWD
5/17/2015	9,394.00	92.10	270.19	7,885.90	1,705.08	-15.68	-1,705.01	0.15	MWD	WEATHERFORD MWD
5/17/2015	9,489.00	91.75	269.94	7,882.71	1,800.02	-15.57	-1,799.95	0.45	MWD	WEATHERFORD MWD
5/17/2015	9,583.00	91.89	270.44	7,879.72	1,893.97	-15.26	-1,893.90	0.55	MWD	WEATHERFORD MWD
5/18/2015	9,677.00	91.12	269.76	7,877.25	1,987.93	-15.10	-1,987.87	1.09	MWD	WEATHERFORD MWD
5/18/2015	9,771.00	91.26	269.31	7,875.30	2,081.91	-15.86	-2,081.85	0.50	MWD	WEATHERFORD MWD
5/18/2015	9,867.00	91.47	269.89	7,873.01	2,177.88	-16.53	-2,177.82	0.64	MWD	WEATHERFORD MWD
5/18/2015	9,963.00	91.68	269.09	7,870.37	2,273.84	-17.39	-2,273.78	0.86	MWD	WEATHERFORD MWD
5/18/2015	10,057.00	90.77	268.86	7,868.36	2,367.81	-19.07	-2,367.74	1.00	MWD	WEATHERFORD MWD
5/18/2015	10,153.00	90.63	269.27	7,867.19	2,463.80	-20.63	-2,463.72	0.45	MWD	WEATHERFORD MWD
5/18/2015	10,248.00	90.42	268.97	7,866.32	2,558.80	-22.09	-2,558.70	0.39	MWD	WEATHERFORD MWD
5/18/2015	10,343.00	90.49	269.36	7,865.57	2,653.79	-23.48	-2,653.69	0.42	MWD	WEATHERFORD MWD
5/18/2015	10,438.00	90.84	269.82	7,864.46	2,748.78	-24.16	-2,748.68	0.61	MWD	WEATHERFORD MWD
5/18/2015	10,533.00	90.98	269.90	7,862.95	2,843.77	-24.39	-2,843.67	0.17	MWD	WEATHERFORD MWD
5/18/2015	10,629.00	91.12	268.89	7,861.20	2,939.75	-25.40	-2,939.65	1.06	MWD	WEATHERFORD MWD
5/18/2015	10,724.00	90.98	268.81	7,859.45	3,034.73	-27.31	-3,034.61	0.17	MWD	WEATHERFORD MWD
5/18/2015	10,819.00	91.19	269.37	7,857.66	3,129.71	-28.82	-3,129.58	0.63	MWD	WEATHERFORD MWD
5/18/2015	10,914.00	91.40	269.58	7,855.51	3,224.68	-29.69	-3,224.55	0.31	MWD	WEATHERFORD MWD
5/18/2015	11,010.00	91.75	269.70	7,852.87	3,320.65	-30.29	-3,320.51	0.39	MWD	WEATHERFORD MWD
5/18/2015	11,106.00	91.75	270.21	7,849.94	3,416.60	-30.37	-3,416.47	0.53	MWD	WEATHERFORD MWD
5/18/2015	11,201.00	91.54	270.49	7,847.21	3,511.55	-29.79	-3,511.43	0.37	MWD	WEATHERFORD MWD
5/18/2015	11,297.00	91.47	270.40	7,844.69	3,607.51	-29.04	-3,607.39	0.12	MWD	WEATHERFORD MWD
5/18/2015	11,392.00	91.61	270.62	7,842.14	3,702.46	-28.20	-3,702.35	0.27	MWD	WEATHERFORD MWD



Well Name: ARCTURUS 18 FED 7H

Sub-Division		Region		Field Name		County		State/Province		
DELAWARE BASIN		DELAWARE SLOPE EAST		HACKBERRY NORTHWEST		EDDY		NM		
Surface Legal Location		API/UWI	Latitude (°)	Longitude (°)		Orig KB Elevation (ft)		Ground Elev MSL (ft)	KB - GL (ft)	
SEC 17 T19S R31E		3001542618	32° 39' 31.475" N	103° 53' 57.39" W		3,448.90		3,423.90	25.00	
Survey Data										
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
5/18/2015	11,487.00	91.12	270.57	7,839.87	3,797.42	-27.21	-3,797.32	0.52	MWD	WEATHERFORD MWD
5/18/2015	11,584.00	90.84	270.27	7,838.21	3,894.39	-26.50	-3,894.30	0.42	MWD	WEATHERFORD MWD
5/18/2015	11,678.00	90.77	270.29	7,836.89	3,988.38	-26.04	-3,988.29	0.08	MWD	WEATHERFORD MWD
5/18/2015	11,773.00	91.26	271.20	7,835.21	4,083.34	-24.80	-4,083.27	1.09	MWD	WEATHERFORD MWD
5/18/2015	11,868.00	91.68	269.87	7,832.77	4,178.30	-23.92	-4,178.23	1.47	MWD	WEATHERFORD MWD
5/19/2015	11,964.00	91.33	269.27	7,830.25	4,274.26	-24.64	-4,274.20	0.72	MWD	WEATHERFORD MWD
5/19/2015	12,059.00	90.28	269.14	7,828.92	4,369.25	-25.96	-4,369.18	1.11	MWD	WEATHERFORD MWD
5/19/2015	12,154.00	90.63	269.58	7,828.16	4,464.25	-27.02	-4,464.17	0.59	MWD	WEATHERFORD MWD
5/19/2015	12,249.00	90.49	269.47	7,827.23	4,559.24	-27.80	-4,559.16	0.19	MWD	WEATHERFORD MWD
5/19/2015	12,345.00	90.56	269.46	7,826.36	4,655.24	-28.70	-4,655.15	0.07	MWD	WEATHERFORD MWD
5/19/2015	12,440.00	89.93	268.82	7,825.95	4,750.23	-30.13	-4,750.14	0.95	MWD	WEATHERFORD MWD
5/19/2015	12,544.00	90.42	268.46	7,825.63	4,854.22	-32.59	-4,854.11	0.58	MWD	WEATHERFORD MWD
5/19/2015	12,624.00	90.42	268.46	7,825.04	4,934.20	-34.74	-4,934.08	0.00	BIT	WEATHERFORD MWD