Petroleum Development Corp.

Mesa
NWNW Sec 24-T6S-R97W
Puckett 11A-24D

DD

Survey: Survey #1

Standard Survey Report

12 April, 2011

PHOENIX
TECHNOLOGY SERVICES

Company:	Petroleum Development Corp.	**Local Co-ordinate Reference:**	Well Puckett 11A-24D
Project:	Mesa	**TVD Reference:**	Puckett 11A-24D KBE @ 8399.0ft (Original Well Elev)
Site:	NWNW Sec 24-T6S-R97W	**MD Reference:**	Puckett 11A-24D KBE @ 8399.0ft (Original Well Elev)
Well:	Puckett 11A-24D	**North Reference:**	True
Wellbore:	DD	**Survey Calculation Method:**	Minimum Curvature
Design:	DD	**Database:**	Local

Project Mesa

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site NWNW Sec 24-T6S-R97W

Site Position:		**Northing:**		**Latitude:**	
From:	Lat/Long	**Easting:**		**Longitude:**	
Position Uncertainty:	0.0 ft	**Slot Radius:**		**Grid Convergence:**	1.00

Well Puckett 11A-24D

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,622,975.94 ft	**Latitude:**	39.513371
	+E/-W	0.0 ft	**Easting:**	2,245,702.55 ft	**Longitude:**	-108.173960
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	8,381.0 ft

Wellbore DD

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010-14	06/02/10	10.57	65.75	52,321

Design DD

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	324.39

Survey Program **Date** 04/12/11

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
165.0	9,235.0	Survey #1 (DD)	MWD	Geolink MWD

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Subsea Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	-8,399.0	0.0	0.0	0.0	0.00	0.00	0.00
165.0	0.70	210.00	165.0	-8,234.0	-0.9	-0.5	-0.4	0.42	0.42	0.00
243.0	0.60	202.50	243.0	-8,156.0	-1.7	-0.9	-0.8	0.17	-0.13	-9.62
335.0	1.00	210.20	335.0	-8,064.0	-2.8	-1.5	-1.4	0.45	0.43	8.37
427.0	0.90	254.80	427.0	-7,972.0	-3.7	-2.6	-1.5	0.79	-0.11	48.48
518.0	1.90	307.90	517.9	-7,881.1	-2.9	-4.5	0.2	1.69	1.10	58.35
610.0	3.60	328.10	609.8	-7,789.2	0.4	-7.2	4.6	2.10	1.85	21.96
703.0	4.50	317.50	702.6	-7,696.4	5.6	-11.2	11.1	1.25	0.97	-11.40
797.0	5.20	328.90	796.3	-7,602.7	12.0	-15.9	19.0	1.26	0.74	12.13

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Design:	DD	**Database:**	Local

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Subsea Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
891.0	5.30	326.40	889.9	-7,509.1	19.2	-20.5	27.6	0.27	0.11	-2.66
986.0	5.60	330.50	984.4	-7,414.6	26.9	-25.2	36.6	0.52	0.32	4.32
1,080.0	6.60	322.10	1,077.9	-7,321.1	35.2	-30.8	46.5	1.42	1.06	-8.94
1,174.0	6.50	325.40	1,171.3	-7,227.7	43.8	-37.1	57.3	0.41	-0.11	3.51
1,269.0	6.20	336.80	1,265.7	-7,133.3	53.0	-42.2	67.6	1.36	-0.32	12.00
1,363.0	6.90	341.60	1,359.1	-7,039.9	63.0	-46.0	78.0	0.94	0.74	5.11
1,457.0	7.60	337.20	1,452.4	-6,946.7	74.1	-50.2	89.4	0.95	0.74	-4.68
1,552.0	7.80	331.20	1,546.5	-6,852.5	85.5	-55.7	102.0	0.87	0.21	-6.32
1,646.0	7.90	330.10	1,639.6	-6,759.4	96.7	-62.0	114.7	0.19	0.11	-1.17
1,741.0	8.20	327.30	1,733.7	-6,665.3	108.1	-68.9	128.0	0.52	0.32	-2.95
1,835.0	8.30	323.20	1,826.7	-6,572.3	119.1	-76.6	141.5	0.63	0.11	-4.36
1,929.0	8.00	324.60	1,919.8	-6,479.3	129.9	-84.5	154.8	0.38	-0.32	1.49
2,024.0	7.90	323.70	2,013.9	-6,385.2	140.6	-92.2	167.9	0.17	-0.11	-0.95
2,118.0	7.70	319.80	2,107.0	-6,292.0	150.6	-100.0	180.7	0.60	-0.21	-4.15
2,212.0	7.40	320.00	2,200.2	-6,198.8	160.0	-108.0	193.0	0.32	-0.32	0.21
2,307.0	8.10	319.80	2,294.3	-6,104.7	169.8	-116.3	205.8	0.74	0.74	-0.21
2,401.0	8.60	318.50	2,387.3	-6,011.7	180.1	-125.2	219.3	0.57	0.53	-1.38
2,495.0	8.50	316.20	2,480.3	-5,918.8	190.4	-134.7	233.2	0.38	-0.11	-2.45
2,583.0	8.40	313.30	2,567.3	-5,831.7	199.5	-143.8	246.0	0.50	-0.11	-3.30
2,676.0	7.40	315.10	2,659.4	-5,739.6	208.4	-153.0	258.5	1.11	-1.08	1.94
2,770.0	8.10	324.90	2,752.6	-5,646.5	218.1	-161.1	271.1	1.59	0.74	10.43
2,864.0	8.60	326.50	2,845.6	-5,553.4	229.4	-168.8	284.8	0.59	0.53	1.70
2,959.0	8.30	332.10	2,939.5	-5,459.5	241.4	-175.9	298.7	0.92	-0.32	5.89
3,053.0	8.70	333.50	3,032.5	-5,366.5	253.8	-182.2	312.4	0.48	0.43	1.49
3,147.0	9.20	334.30	3,125.4	-5,273.7	266.9	-188.7	326.8	0.55	0.53	0.85
3,241.0	8.80	334.10	3,218.2	-5,180.8	280.1	-195.1	341.3	0.43	-0.43	-0.21
3,335.0	9.50	331.80	3,311.0	-5,088.0	293.4	-201.9	356.1	0.84	0.74	-2.45
3,430.0	8.60	331.50	3,404.8	-4,994.2	306.6	-209.0	370.9	0.95	-0.95	-0.32
3,523.0	9.20	326.90	3,496.7	-4,902.3	318.9	-216.4	385.3	1.00	0.65	-4.95
3,617.0	8.50	323.60	3,589.6	-4,809.4	330.8	-224.6	399.7	0.92	-0.74	-3.51
3,711.0	9.10	322.90	3,682.5	-4,716.5	342.3	-233.2	414.1	0.65	0.64	-0.74
3,805.0	9.10	326.10	3,775.3	-4,623.7	354.4	-241.8	429.0	0.54	0.00	3.40
3,899.0	8.50	324.40	3,868.2	-4,530.8	366.2	-250.0	443.3	0.70	-0.64	-1.81
3,994.0	8.80	325.20	3,962.1	-4,436.9	377.9	-258.2	457.6	0.34	0.32	0.84
4,088.0	9.80	328.00	4,054.9	-4,344.1	390.6	-266.6	472.8	1.17	1.06	2.98
4,182.0	9.90	326.90	4,147.5	-4,251.5	404.2	-275.2	488.8	0.23	0.11	-1.17
4,276.0	9.50	328.80	4,240.1	-4,158.9	417.6	-283.7	504.7	0.54	-0.43	2.02
4,371.0	8.80	329.20	4,333.9	-4,065.1	430.5	-291.5	519.7	0.74	-0.74	0.42
4,465.0	9.30	327.70	4,426.8	-3,972.3	443.1	-299.2	534.5	0.59	0.53	-1.60
4,559.0	9.70	327.50	4,519.5	-3,879.5	456.2	-307.5	550.0	0.43	0.43	-0.21
4,654.0	8.20	324.10	4,613.3	-3,785.7	468.5	-315.8	564.7	1.67	-1.58	-3.58

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Survey

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4,748.0	8.40	324.80	4,706.3	-3,692.7	479.5	-323.7	578.3	0.24	0.21	0.74
4,842.0	9.80	329.70	4,799.1	-3,599.9	492.0	-331.7	593.1	1.70	1.49	5.21
4,936.0	8.40	325.50	4,892.0	-3,507.1	504.6	-339.6	608.0	1.65	-1.49	-4.47
5,031.0	7.20	321.20	4,986.1	-3,412.9	514.9	-347.2	620.8	1.40	-1.26	-4.53
5,125.0	7.20	304.10	5,079.4	-3,319.7	522.8	-355.8	632.2	2.27	0.00	-18.19
5,220.0	8.50	313.70	5,173.5	-3,225.6	531.0	-365.8	644.7	1.94	1.37	10.11
5,314.0	9.20	322.50	5,266.3	-3,132.7	541.8	-375.4	659.1	1.62	0.74	9.36
5,408.0	9.60	327.40	5,359.1	-3,039.9	554.3	-384.2	674.4	0.95	0.43	5.21
5,503.0	9.30	331.40	5,452.8	-2,946.2	567.8	-392.2	689.9	0.76	-0.32	4.21
5,597.0	9.40	331.80	5,545.6	-2,853.5	581.2	-399.4	705.1	0.13	0.11	0.43
5,691.0	9.50	330.10	5,638.3	-2,760.7	594.7	-406.9	720.4	0.32	0.11	-1.81
5,786.0	9.80	332.60	5,731.9	-2,667.1	608.7	-414.5	736.2	0.54	0.32	2.63
5,880.0	9.40	332.70	5,824.6	-2,574.4	622.6	-421.8	751.7	0.43	-0.43	0.11
5,974.0	9.20	330.30	5,917.4	-2,481.6	635.9	-429.0	766.8	0.46	-0.21	-2.55
6,069.0	8.50	338.80	6,011.3	-2,387.8	649.1	-435.3	781.2	1.56	-0.74	8.95
6,163.0	7.80	339.10	6,104.3	-2,294.7	661.5	-440.1	794.1	0.75	-0.74	0.32
6,257.0	7.30	335.60	6,197.5	-2,201.5	672.9	-444.8	806.1	0.72	-0.53	-3.72
6,352.0	6.90	333.00	6,291.8	-2,107.3	683.5	-449.9	817.6	0.54	-0.42	-2.74
6,446.0	6.20	339.80	6,385.1	-2,013.9	693.3	-454.2	828.1	1.11	-0.74	7.23
6,540.0	6.10	334.40	6,478.6	-1,920.4	702.6	-458.1	837.9	0.62	-0.11	-5.74
6,634.0	4.20	336.80	6,572.2	-1,826.8	710.2	-461.7	846.2	2.03	-2.02	2.55
6,728.0	2.70	336.30	6,666.0	-1,733.0	715.4	-463.9	851.7	1.60	-1.60	-0.53
6,823.0	2.00	324.30	6,761.0	-1,638.0	718.8	-465.8	855.6	0.90	-0.74	-12.63
6,917.0	0.60	278.50	6,854.9	-1,544.1	720.2	-467.2	857.6	1.74	-1.49	-48.72
7,011.0	1.40	231.10	6,948.9	-1,450.1	719.6	-468.6	857.8	1.16	0.85	-50.43
7,106.0	1.40	152.10	7,043.9	-1,355.1	717.8	-468.9	856.6	1.87	0.00	-83.16
7,200.0	2.00	127.50	7,137.9	-1,261.1	715.8	-467.1	853.9	0.99	0.64	-26.17
7,295.0	1.70	100.70	7,232.8	-1,166.2	714.5	-464.4	851.3	0.95	-0.32	-28.21
7,389.0	1.80	82.70	7,326.8	-1,072.2	714.5	-461.6	849.6	0.59	0.11	-19.15
7,483.0	1.30	79.20	7,420.7	-978.3	714.8	-459.1	848.5	0.54	-0.53	-3.72
7,577.0	1.20	81.90	7,514.7	-884.3	715.2	-457.0	847.6	0.12	-0.11	2.87
7,672.0	1.30	65.50	7,609.7	-789.3	715.8	-455.1	846.9	0.39	0.11	-17.26
7,766.0	1.00	49.50	7,703.7	-695.3	716.7	-453.5	846.8	0.46	-0.32	-17.02
7,860.0	1.10	36.20	7,797.7	-601.4	718.0	-452.3	847.1	0.28	0.11	-14.15
7,955.0	0.70	34.20	7,892.7	-506.4	719.2	-451.5	847.6	0.42	-0.42	-2.11
8,049.0	0.20	323.40	7,986.7	-412.4	719.8	-451.2	848.0	0.70	-0.53	-75.32
8,144.0	0.30	311.90	8,081.6	-317.4	720.1	-451.5	848.4	0.12	0.11	-12.11
8,238.0	1.00	269.70	8,175.6	-223.4	720.3	-452.5	849.1	0.85	0.74	-44.89
8,332.0	1.30	263.80	8,269.6	-129.4	720.2	-454.4	850.1	0.34	0.32	-6.28
8,427.0	1.70	268.40	8,364.6	-34.4	720.0	-456.9	851.4	0.44	0.42	4.84
8,521.0	2.00	268.70	8,458.5	59.5	719.9	-459.9	853.1	0.32	0.32	0.32
8,615.0	2.20	263.60	8,552.5	153.5	719.7	-463.4	854.9	0.29	0.21	-5.43

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8,710.0	2.40	237.70	8,647.4	248.4	718.4	-466.8	855.9	1.10	0.21	-27.26
8,804.0	2.70	243.00	8,741.3	342.3	716.4	-470.5	856.4	0.41	0.32	5.64
8,899.0	1.80	240.10	8,836.2	437.2	714.6	-473.8	856.8	0.95	-0.95	-3.05
8,993.0	3.30	244.10	8,930.1	531.1	712.7	-477.5	857.4	1.61	1.60	4.26
9,087.0	3.40	242.20	9,024.0	625.0	710.2	-482.4	858.3	0.16	0.11	-2.02
9,170.0	3.50	243.90	9,106.8	707.8	707.9	-486.8	859.0	0.17	0.12	2.05
Projection to Bit										
9,235.0	3.50	243.90	9,171.7	772.7	706.2	-490.4	859.7	0.00	0.00	0.00

Survey Annotations

Measured Depth ()	Vertical Depth ()	Local Coordinates +N/-S ()	Local Coordinates +E/-W ()	Comment
9,235.0	9,171.7	706.2	-490.4	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____