



Weatherford®

Weatherford
2000 Oil Drive
Casper, WY 82604

Survey Certification

Operating Company:	Anadarko Petroleum Corp.
Well Name:	Haymaker 4C-9HZ
State:	Colorado
County:	Weld
API Number:	51-233-5662
Datum:	NAD 83
Survey Calculation Method:	Minimum Curvature
North Reference:	True North

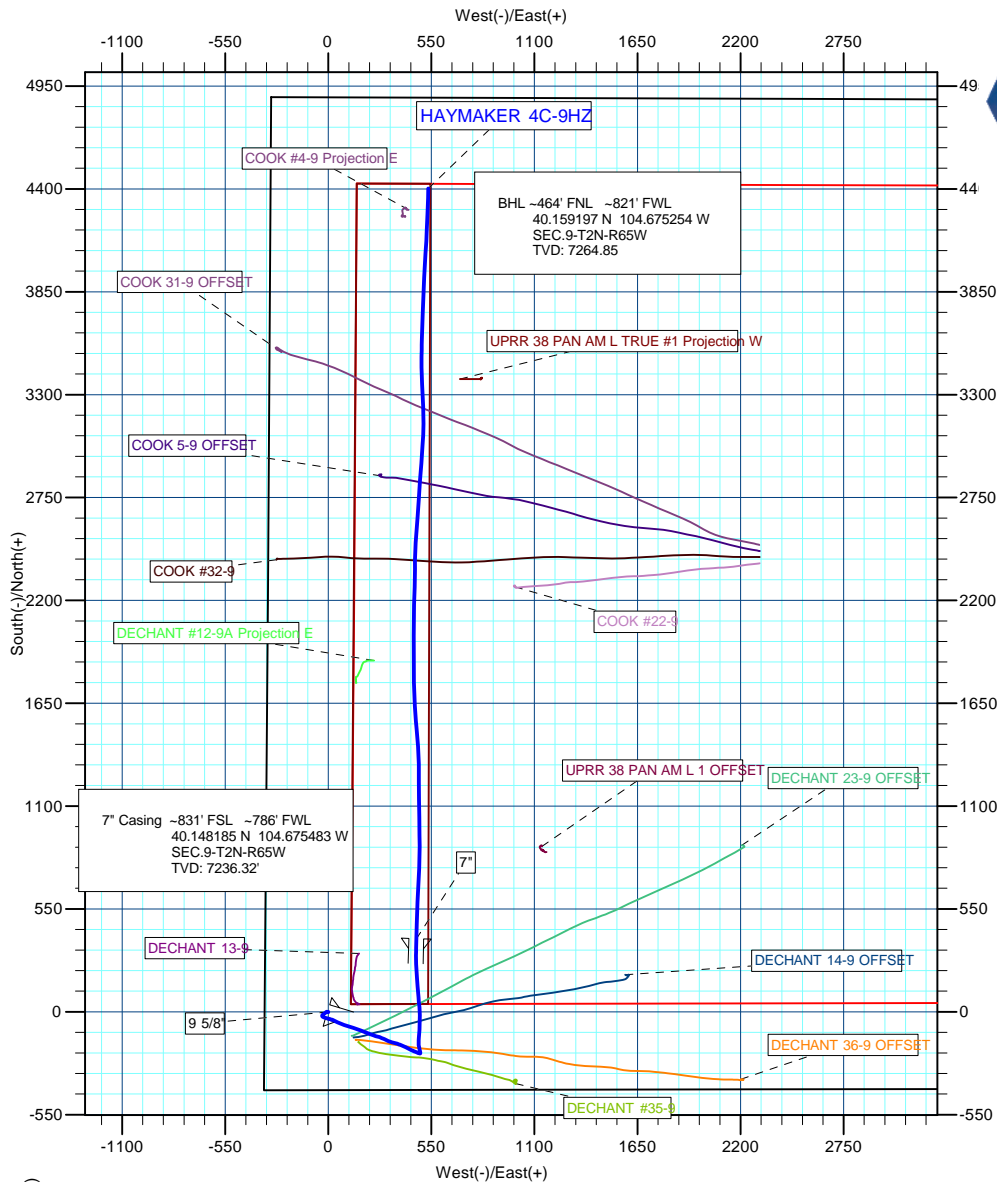
I, John R. Morgan, hereby certify the attached
directional survey run from the measure depth of 1,323.00 feet
to the measured depth of 11,615.00 feet as accurate and true
to the best of my knowledge.

Signature

19-Nov-12

Date

John Morgan
Directional Planning
Weatherford - Rockies District



Weatherford

Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HAYMAKER 13-9HZ PAD
Well: HAYMAKER 4C-9HZ
Wellbore: HAYMAKER 4C-9HZ
Section: SEC.9-T2N-R65W
SHL: 419' FSL 340' FWL
Design: HAYMAKER 4C-9HZ
Latitude: 40.147113
Longitude: -104.677164
GL: 4897.00
KB: 25'RKB+4897'gl @ 4922.00ft



Azimuths to True North
Magnetic North: 8.64°

Magnetic Field
Strength: 52886.1snT
Dip Angle: 66.82°
Date: 8/8/2012
Model: IGRF2010

WELL DETAILS: HAYMAKER 4C-9HZ

+N/-S	+E/-W	Northing	Ground Level: Easting	4897.00 Latitude	Longitude	Slot
0.00	0.00	1297503.89	3230019.89	40.147113	-104.677164	

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	V Sect	Departure	Annotation
875.99	876.00	0.43	286.44	-1.19	-4.05	-1.67	5.00	LAST GYRO SURVEY
1190.97	1191.00	1.04	287.00	0.22	-6.87	-0.61	8.19	TIE ON
1322.86	1323.00	3.53	234.80	-1.77	-11.34	-3.12	13.45	FIRST MWD SURVEY
7236.31	7650.50	88.69	1.51	390.63	469.92	444.36	1223.36	SET 7" CASING
7263.60	11615.00	88.52	2.03	4350.89	531.92	4383.28	5187.41	LAST MWD SURVEY
7264.85	11666.00	88.67	2.16	4401.84	533.79	4434.09	5238.39	PROJECTION TO TD

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

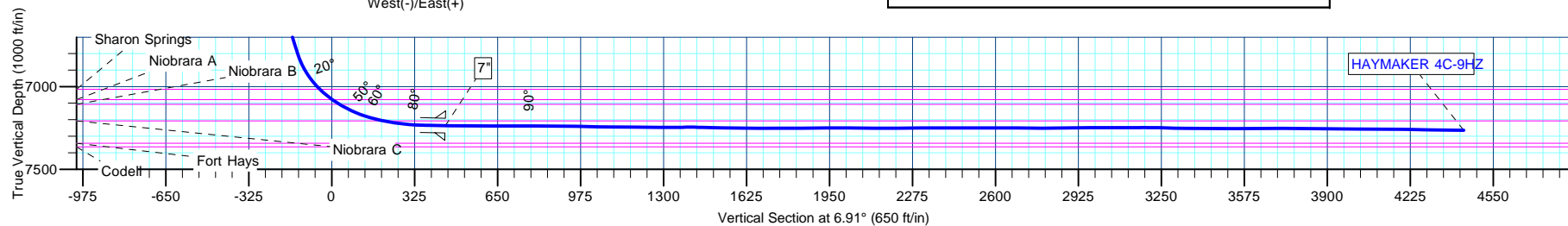
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
HAYMAKER 4C-9HZ BHL	7262.00	4427.36	530.00	40.159267	-104.675268	Point

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4085.00	4106.69	Parkman
4584.00	4612.13	Sussex
7016.00	7078.99	Sharon Springs
7079.00	7159.45	Niobrara A
7107.00	7198.99	Niobrara B
7207.00	7402.62	Niobrara C

CASING DETAILS

TVD	MD	Name	Size
941.58	941.60	9 5/8"	9-5/8
7236.31	7650.50	7"	7





Weatherford®

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HAYMAKER 13-9HZ PAD

HAYMAKER 4C-9HZ

HAYMAKER 4C-9HZ

Design: HAYMAKER 4C-9HZ

Standard Survey Report

19 November, 2012

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		WELD_HAYMAKER 13-9HZ PAD, SEC.9-T2N-R65W			
Site Position:		Northing:	1,297,482.61 usft	Latitude:	40.147054
From:	Lat/Long	Easting:	3,230,041.05 usft	Longitude:	-104.677089
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.53 °

Well	HAYMAKER 4C-9HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,297,503.89 usft	Latitude:	40.147113
	+E/-W	0.00 ft	Easting:	3,230,019.89 usft	Longitude:	-104.677164
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,897.00 ft

Wellbore	HAYMAKER 4C-9HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/8/2012	8.64	66.82	52,886

Design	HAYMAKER 4C-9HZ				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	244.16	

Survey Program	Date	11/16/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,125.00	Survey #1 (HAYMAKER 4C-9HZ)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
1,191.00	11,666.00	Survey #2 (HAYMAKER 4C-9HZ)	MWD+IFR	MWD + IFR CORRECTION	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.18	256.79	100.00	-0.04	-0.15	0.15	0.18	0.18	0.00	
200.00	0.38	252.87	200.00	-0.17	-0.62	0.63	0.20	0.20	-3.92	
300.00	0.32	228.17	300.00	-0.45	-1.14	1.23	0.16	-0.06	-24.70	
400.00	0.48	221.37	399.99	-0.95	-1.63	1.88	0.16	0.16	-6.80	
500.00	0.35	222.27	499.99	-1.49	-2.11	2.54	0.12	-0.12	0.91	
600.00	0.35	249.96	599.99	-1.82	-2.60	3.13	0.17	0.00	27.68	
700.00	0.34	314.51	699.99	-1.71	-3.09	3.53	0.37	-0.01	64.56	
800.00	0.35	296.60	799.99	-1.37	-3.57	3.81	0.11	0.01	-17.92	
876.00	0.43	286.44	875.99	-1.19	-4.05	4.16	0.14	0.10	-13.36	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
LAST GYRO SURVEY									
900.00	0.45	283.99	899.98	-1.14	-4.23	4.30	0.14	0.11	-10.21
1,000.00	0.33	292.05	999.98	-0.94	-4.88	4.80	0.13	-0.12	8.05
1,100.00	0.72	308.55	1,099.98	-0.43	-5.64	5.26	0.42	0.39	16.50
1,125.00	0.83	305.45	1,124.98	-0.23	-5.91	5.42	0.45	0.42	-12.40
1,191.00	1.04	287.00	1,190.97	0.22	-6.87	6.09	0.55	0.32	-27.96
TIE ON									
1,323.00	3.53	234.80	1,322.86	-1.77	-11.34	10.98	2.28	1.89	-39.55
FIRST MWD SURVEY									
1,415.00	3.76	231.75	1,414.67	-5.27	-16.02	16.72	0.33	0.25	-3.32
1,509.00	4.14	234.39	1,508.45	-9.16	-21.20	23.07	0.45	0.40	2.81
1,605.00	4.48	236.44	1,604.18	-13.25	-27.14	30.20	0.39	0.35	2.14
1,699.00	3.09	218.04	1,697.98	-17.27	-31.76	36.12	1.95	-1.48	-19.57
1,794.00	0.95	180.33	1,792.91	-20.08	-33.35	38.76	2.54	-2.25	-39.69
1,889.00	0.76	173.79	1,887.90	-21.49	-33.28	39.32	0.22	-0.20	-6.88
1,984.00	0.85	179.00	1,982.89	-22.82	-33.20	39.83	0.12	0.09	5.48
2,078.00	2.22	131.11	2,076.86	-24.72	-31.82	39.41	1.88	1.46	-50.95
2,173.00	4.16	119.45	2,171.71	-27.62	-27.43	36.73	2.14	2.04	-12.27
2,267.00	5.59	108.68	2,265.37	-30.76	-20.12	31.52	1.80	1.52	-11.46
2,362.00	6.86	107.00	2,359.81	-33.90	-10.31	24.06	1.35	1.34	-1.77
2,457.00	8.93	105.78	2,453.90	-37.57	2.21	14.39	2.19	2.18	-1.28
2,552.00	7.54	103.65	2,547.92	-41.04	15.36	4.06	1.50	-1.46	-2.24
2,646.00	8.63	112.39	2,640.99	-45.19	27.88	-5.39	1.74	1.16	9.30
2,741.00	10.00	116.24	2,734.73	-51.55	41.87	-15.21	1.58	1.44	4.05
2,836.00	9.50	115.30	2,828.36	-58.55	56.35	-25.20	0.55	-0.53	-0.99
2,932.00	9.01	116.27	2,923.11	-65.26	70.25	-34.79	0.54	-0.51	1.01
3,027.00	8.78	110.34	3,016.97	-71.07	83.72	-44.38	0.99	-0.24	-6.24
3,122.00	7.27	107.10	3,111.04	-75.36	96.27	-53.80	1.66	-1.59	-3.41
3,217.00	7.72	107.90	3,205.23	-79.09	108.09	-62.81	0.49	0.47	0.84
3,312.00	8.49	104.41	3,299.28	-82.79	120.95	-72.77	0.96	0.81	-3.67
3,407.00	7.07	103.80	3,393.40	-85.93	133.42	-82.63	1.50	-1.49	-0.64
3,502.00	8.25	111.22	3,487.55	-89.80	145.45	-91.77	1.62	1.24	7.81
3,597.00	9.45	111.45	3,581.42	-95.11	159.07	-101.70	1.26	1.26	0.24
3,692.00	7.26	110.08	3,675.41	-100.03	171.96	-111.17	2.31	-2.31	-1.44
3,787.00	7.64	110.41	3,769.61	-104.29	183.52	-119.71	0.40	0.40	0.35
3,882.00	8.52	110.93	3,863.66	-109.01	196.01	-128.90	0.93	0.93	0.55
3,976.00	9.71	110.84	3,956.47	-114.32	209.92	-139.11	1.27	1.27	-0.10
4,071.00	10.85	111.19	4,049.95	-120.40	225.75	-150.70	1.20	1.20	0.37
4,166.00	10.73	110.87	4,143.27	-126.78	242.35	-162.86	0.14	-0.13	-0.34
4,261.00	9.60	104.70	4,236.78	-131.94	258.28	-174.94	1.65	-1.19	-6.49
4,356.00	8.20	103.75	4,330.63	-135.56	272.52	-186.19	1.48	-1.47	-1.00
4,451.00	8.59	117.88	4,424.62	-140.49	285.37	-195.61	2.20	0.41	14.87
4,545.00	8.45	111.44	4,517.59	-146.30	298.01	-204.45	1.03	-0.15	-6.85

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,641.00	8.35	114.72	4,612.56	-151.79	310.90	-213.66	0.51	-0.10	3.42
4,736.00	10.46	112.90	4,706.28	-158.03	325.12	-223.73	2.24	2.22	-1.92
4,831.00	9.65	107.09	4,799.82	-163.73	340.67	-235.25	1.37	-0.85	-6.12
4,926.00	8.39	102.99	4,893.64	-167.63	355.04	-246.48	1.49	-1.33	-4.32
5,021.00	8.62	105.49	4,987.60	-171.08	368.65	-257.22	0.46	0.24	2.63
5,116.00	8.94	113.02	5,081.49	-175.87	382.30	-267.42	1.25	0.34	7.93
5,211.00	10.63	115.00	5,175.10	-182.46	397.04	-277.82	1.81	1.78	2.08
5,307.00	8.85	114.64	5,269.72	-189.28	411.78	-288.11	1.86	-1.85	-0.38
5,402.00	9.15	116.32	5,363.55	-195.68	425.19	-297.39	0.42	0.32	1.77
5,496.00	7.55	116.24	5,456.55	-201.72	437.43	-305.77	1.70	-1.70	-0.09
5,591.00	6.14	114.78	5,550.87	-206.61	447.64	-312.83	1.50	-1.48	-1.54
5,686.00	4.75	112.25	5,645.44	-210.23	455.90	-318.68	1.48	-1.46	-2.66
5,780.00	5.70	114.01	5,739.04	-213.61	463.76	-324.29	1.02	1.01	1.87
5,875.00	4.87	112.02	5,833.64	-217.04	471.81	-330.04	0.89	-0.87	-2.09
5,970.00	4.86	108.44	5,928.30	-219.82	479.37	-335.63	0.32	-0.01	-3.77
6,065.00	2.83	106.93	6,023.08	-221.78	485.43	-340.23	2.14	-2.14	-1.59
6,160.00	1.09	112.54	6,118.02	-222.81	488.51	-342.55	1.84	-1.83	5.91
6,254.00	0.29	67.29	6,212.01	-223.06	489.55	-343.38	0.97	-0.85	-48.14
6,349.00	0.36	40.70	6,307.01	-222.74	489.97	-343.90	0.17	0.07	-27.99
6,444.00	0.25	24.58	6,402.01	-222.32	490.25	-344.33	0.15	-0.12	-16.97
6,540.00	0.29	8.18	6,498.01	-221.89	490.37	-344.63	0.09	0.04	-17.08
6,615.00	0.30	346.78	6,573.01	-221.51	490.35	-344.78	0.15	0.01	-28.53
6,635.00	0.44	354.48	6,593.01	-221.39	490.33	-344.81	0.74	0.70	38.50
6,666.00	0.98	351.87	6,624.01	-221.01	490.28	-344.94	1.74	1.74	-8.42
6,697.00	3.86	3.23	6,654.97	-219.70	490.31	-345.52	9.37	9.29	36.65
6,729.00	7.45	0.14	6,686.81	-216.55	490.37	-346.96	11.26	11.22	-9.66
6,761.00	10.95	349.60	6,718.40	-211.49	489.83	-348.68	12.10	10.94	-32.94
6,792.00	13.63	343.11	6,748.69	-205.09	488.23	-350.03	9.71	8.65	-20.94
6,825.00	14.18	341.79	6,780.72	-197.53	485.84	-351.17	1.92	1.67	-4.00
6,856.00	13.92	347.37	6,810.79	-190.29	483.84	-352.53	4.45	-0.84	18.00
6,888.00	14.62	357.56	6,841.81	-182.49	482.83	-355.01	8.14	2.19	31.84
6,919.00	16.58	358.51	6,871.67	-174.16	482.54	-358.39	6.38	6.32	3.06
6,952.00	20.21	359.37	6,902.98	-163.75	482.36	-362.76	11.03	11.00	2.61
6,984.00	23.57	1.71	6,932.67	-151.83	482.49	-368.07	10.85	10.50	7.31
7,015.00	26.60	2.69	6,960.74	-138.70	483.00	-374.26	9.87	9.77	3.16
7,047.00	30.15	4.18	6,988.89	-123.52	483.92	-381.70	11.31	11.09	4.66
7,078.00	33.81	4.47	7,015.18	-107.15	485.16	-389.95	11.82	11.81	0.94
7,109.00	37.32	4.09	7,040.39	-89.17	486.51	-398.99	11.34	11.32	-1.23
7,141.00	40.79	3.33	7,065.24	-69.06	487.80	-408.93	10.95	10.84	-2.38
7,172.00	44.12	0.36	7,088.11	-48.15	488.46	-418.64	12.54	10.74	-9.58
7,204.00	47.59	359.05	7,110.40	-25.19	488.34	-428.53	11.23	10.84	-4.09
7,236.00	51.55	357.22	7,131.14	-0.85	487.53	-438.41	13.12	12.38	-5.72
7,267.00	55.60	355.45	7,149.55	24.03	485.93	-447.82	13.85	13.06	-5.71
7,299.00	59.90	354.90	7,166.62	50.99	483.65	-457.52	13.52	13.44	-1.72

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,330.00	64.49	354.91	7,181.08	78.30	481.21	-467.23	14.81	14.81	0.03
7,362.00	69.05	354.87	7,193.70	107.58	478.60	-477.63	14.25	14.25	-0.13
7,393.00	71.86	354.78	7,204.07	136.67	475.96	-487.94	9.07	9.06	-0.29
7,425.00	74.36	355.80	7,213.36	167.18	473.45	-498.98	8.39	7.81	3.19
7,458.00	77.81	356.80	7,221.30	199.14	471.38	-511.05	10.86	10.45	3.03
7,489.00	81.50	357.18	7,226.86	229.59	469.78	-522.88	11.96	11.90	1.23
7,521.00	83.83	358.11	7,230.95	261.30	468.48	-535.53	7.83	7.28	2.91
7,552.00	87.34	359.79	7,233.33	292.20	467.91	-548.49	12.55	11.32	5.42
7,584.00	88.46	1.60	7,234.51	324.17	468.30	-562.77	6.65	3.50	5.66
7,600.00	88.25	1.25	7,234.97	340.16	468.70	-570.10	2.55	-1.31	-2.19
7,650.50	88.69	1.51	7,236.32	390.63	469.92	-593.19	1.01	0.87	0.52
SET 7" CASING									
7,730.00	89.38	1.92	7,237.65	470.08	472.30	-629.96	1.01	0.87	0.52
7,825.00	89.69	2.21	7,238.43	565.01	475.72	-674.42	0.45	0.33	0.31
7,920.00	89.69	2.33	7,238.94	659.94	479.48	-719.18	0.13	0.00	0.13
8,014.00	90.80	3.06	7,238.54	753.83	483.90	-764.08	1.41	1.18	0.78
8,109.00	88.52	0.45	7,239.10	848.77	486.81	-808.08	3.65	-2.40	-2.75
8,204.00	87.96	358.75	7,242.02	943.72	486.15	-848.87	1.88	-0.59	-1.79
8,300.00	89.07	359.56	7,244.51	1,039.67	484.73	-889.42	1.43	1.16	0.84
8,395.00	89.44	359.72	7,245.74	1,134.66	484.14	-930.28	0.42	0.39	0.17
8,490.00	89.57	359.62	7,246.56	1,229.66	483.59	-971.19	0.17	0.14	-0.11
8,585.00	90.99	359.52	7,246.10	1,324.65	482.88	-1,011.95	1.50	1.49	-0.11
8,680.00	87.72	355.31	7,247.17	1,419.52	478.59	-1,049.45	5.61	-3.44	-4.43
8,774.00	88.64	355.42	7,250.15	1,513.16	471.00	-1,083.43	0.99	0.98	0.12
8,869.00	89.81	355.51	7,251.44	1,607.85	463.49	-1,117.94	1.24	1.23	0.09
8,964.00	90.06	358.03	7,251.55	1,702.69	458.14	-1,154.46	2.67	0.26	2.65
9,059.00	90.44	0.11	7,251.13	1,797.67	456.60	-1,194.47	2.23	0.40	2.19
9,153.00	90.12	359.11	7,250.67	1,891.67	455.96	-1,234.87	1.12	-0.34	-1.06
9,248.00	89.75	0.89	7,250.78	1,986.67	455.96	-1,276.27	1.91	-0.39	1.87
9,342.00	89.51	0.01	7,251.39	2,080.66	456.70	-1,317.90	0.97	-0.26	-0.94
9,437.00	90.31	1.33	7,251.54	2,175.65	457.81	-1,360.31	1.62	0.84	1.39
9,532.00	90.49	1.74	7,250.87	2,270.61	460.35	-1,403.99	0.47	0.19	0.43
9,627.00	90.06	1.03	7,250.42	2,365.58	462.65	-1,447.45	0.87	-0.45	-0.75
9,721.00	89.51	0.88	7,250.77	2,459.57	464.21	-1,489.82	0.61	-0.59	-0.16
9,816.00	90.56	4.84	7,250.71	2,554.43	468.95	-1,535.43	4.31	1.11	4.17
9,911.00	89.81	4.28	7,250.41	2,649.13	476.51	-1,583.50	0.99	-0.79	-0.59
10,006.00	89.38	3.31	7,251.08	2,743.92	482.79	-1,630.48	1.12	-0.45	-1.02
10,101.00	91.30	4.21	7,250.51	2,838.71	489.02	-1,677.40	2.23	2.02	0.95
10,196.00	90.80	4.23	7,248.77	2,933.43	496.01	-1,724.98	0.53	-0.53	0.02
10,292.00	89.81	4.24	7,248.26	3,029.17	503.10	-1,773.08	1.03	-1.03	0.01
10,387.00	90.49	1.09	7,248.01	3,124.05	507.52	-1,818.41	3.39	0.72	-3.32
10,481.00	87.66	357.40	7,249.53	3,218.01	506.28	-1,858.25	4.95	-3.01	-3.93
10,576.00	88.83	357.20	7,252.44	3,312.85	501.81	-1,895.57	1.25	1.23	-0.21

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
10,672.00	89.57	359.01	7,253.78	3,408.79	498.63	-1,934.52	2.04	0.77	1.89	
10,767.00	89.75	0.29	7,254.34	3,503.78	498.05	-1,975.40	1.36	0.19	1.35	
10,861.00	91.60	1.89	7,253.24	3,597.75	499.84	-2,017.97	2.60	1.97	1.70	
10,957.00	89.26	1.69	7,252.52	3,693.70	502.84	-2,062.49	2.45	-2.44	-0.21	
11,052.00	88.58	1.35	7,254.31	3,788.64	505.36	-2,106.14	0.80	-0.72	-0.36	
11,147.00	89.74	3.46	7,255.70	3,883.54	509.34	-2,151.09	2.53	1.22	2.22	
11,242.00	89.32	3.01	7,256.48	3,978.39	514.71	-2,197.25	0.65	-0.44	-0.47	
11,337.00	89.32	3.61	7,257.61	4,073.22	520.19	-2,243.52	0.63	0.00	0.63	
11,433.00	89.07	2.58	7,258.96	4,169.07	525.37	-2,289.96	1.10	-0.26	-1.07	
11,528.00	88.27	1.81	7,261.16	4,263.98	529.01	-2,334.60	1.17	-0.84	-0.81	
11,615.00	88.52	2.03	7,263.60	4,350.89	531.92	-2,375.11	0.38	0.29	0.25	
LAST MWD SURVEY										
11,666.00	88.67	2.16	7,264.85	4,401.84	533.79	-2,398.99	0.39	0.29	0.25	
PROJECTION TO TD										

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (")	Hole Diameter (")
941.60	941.58	9 5/8"			9-5/8	12-1/4
7,650.50	7,236.32	7"			7	8-3/4

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
876.00	875.99	-1.19	-4.05	LAST GYRO SURVEY	
1,191.00	1,190.97	0.22	-6.87	TIE ON	
1,323.00	1,322.86	-1.77	-11.34	FIRST MWD SURVEY	
7,650.50	7,236.32	390.63	469.92	SET 7" CASING	
11,615.00	7,263.60	4,350.89	531.92	LAST MWD SURVEY	
11,666.00	7,264.85	4,401.84	533.79	PROJECTION TO TD	

Checked By: _____	Approved By: _____	Date: _____
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Weatherford®

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HAYMAKER 13-9HZ PAD

HAYMAKER 4C-9HZ

HAYMAKER 4C-9HZ

Design: HAYMAKER 4C-9HZ

Survey Report - Geographic

19 November, 2012



Weatherford

Andarko Petroleum Corporation

Survey Report - Geographic



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		WELD_HAYMAKER 13-9HZ PAD, SEC.9-T2N-R65W			
Site Position:		Northing:	1,297,482.61 usft	Latitude:	40.147054
From:	Lat/Long	Easting:	3,230,041.05 usft	Longitude:	-104.677089
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.53 °

Well	HAYMAKER 4C-9HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,297,503.89 usft	Latitude:	40.147113
	+E/-W	0.00 ft	Easting:	3,230,019.89 usft	Longitude:	-104.677164
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,897.00 ft

Wellbore	HAYMAKER 4C-9HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/8/2012	8.64	66.82	52,886

Design	HAYMAKER 4C-9HZ				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	244.16	

Survey Program	Date	11/16/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,125.00	Survey #1 (HAYMAKER 4C-9HZ)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
1,191.00	11,666.00	Survey #2 (HAYMAKER 4C-9HZ)	MWD+IFR	MWD + IFR CORRECTION	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	1,297,503.89	3,230,019.89	40.147113	-104.677164
100.00	0.18	256.79	100.00	-0.04	-0.15	1,297,503.85	3,230,019.74	40.147113	-104.677165
200.00	0.38	252.87	200.00	-0.17	-0.62	1,297,503.71	3,230,019.27	40.147113	-104.677166
300.00	0.32	228.17	300.00	-0.45	-1.14	1,297,503.42	3,230,018.75	40.147112	-104.677168
400.00	0.48	221.37	399.99	-0.95	-1.63	1,297,502.92	3,230,018.27	40.147110	-104.677170
500.00	0.35	222.27	499.99	-1.49	-2.11	1,297,502.38	3,230,017.80	40.147109	-104.677172
600.00	0.35	249.96	599.99	-1.82	-2.60	1,297,502.05	3,230,017.31	40.147108	-104.677174
700.00	0.34	314.51	699.99	-1.71	-3.09	1,297,502.14	3,230,016.81	40.147108	-104.677175
800.00	0.35	296.60	799.99	-1.37	-3.57	1,297,502.48	3,230,016.33	40.147109	-104.677177
876.00	0.43	286.44	875.99	-1.19	-4.05	1,297,502.66	3,230,015.85	40.147110	-104.677179
LAST GYRO SURVEY									

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
900.00	0.45	283.99	899.98	-1.14	-4.23	1,297,502.71	3,230,015.67	40.147110	-104.677179
1,000.00	0.33	292.05	999.98	-0.94	-4.88	1,297,502.91	3,230,015.02	40.147110	-104.677182
1,100.00	0.72	308.55	1,099.98	-0.43	-5.64	1,297,503.40	3,230,014.25	40.147112	-104.677184
1,125.00	0.83	305.45	1,124.98	-0.23	-5.91	1,297,503.60	3,230,013.98	40.147112	-104.677185
1,191.00	1.04	287.00	1,190.97	0.22	-6.87	1,297,504.04	3,230,013.02	40.147114	-104.677189
TIE ON									
1,323.00	3.53	234.80	1,322.86	-1.77	-11.34	1,297,502.01	3,230,008.57	40.147108	-104.677205
FIRST MWD SURVEY									
1,415.00	3.76	231.75	1,414.67	-5.27	-16.02	1,297,498.47	3,230,003.92	40.147099	-104.677222
1,509.00	4.14	234.39	1,508.45	-9.16	-21.20	1,297,494.53	3,229,998.77	40.147088	-104.677240
1,605.00	4.48	236.44	1,604.18	-13.25	-27.14	1,297,490.39	3,229,992.87	40.147077	-104.677261
1,699.00	3.09	218.04	1,697.98	-17.27	-31.76	1,297,486.32	3,229,988.29	40.147066	-104.677278
1,794.00	0.95	180.33	1,792.91	-20.08	-33.35	1,297,483.50	3,229,986.73	40.147058	-104.677284
1,889.00	0.76	173.79	1,887.90	-21.49	-33.28	1,297,482.09	3,229,986.81	40.147054	-104.677283
1,984.00	0.85	179.00	1,982.89	-22.82	-33.20	1,297,480.76	3,229,986.90	40.147050	-104.677283
2,078.00	2.22	131.11	2,076.86	-24.72	-31.82	1,297,478.88	3,229,988.30	40.147045	-104.677278
2,173.00	4.16	119.45	2,171.71	-27.62	-27.43	1,297,476.01	3,229,992.72	40.147037	-104.677262
2,267.00	5.59	108.68	2,265.37	-30.76	-20.12	1,297,472.94	3,230,000.05	40.147029	-104.677236
2,362.00	6.86	107.00	2,359.81	-33.90	-10.31	1,297,469.89	3,230,009.89	40.147020	-104.677201
2,457.00	8.93	105.78	2,453.90	-37.57	2.21	1,297,466.34	3,230,022.44	40.147010	-104.677156
2,552.00	7.54	103.65	2,547.92	-41.04	15.36	1,297,462.99	3,230,035.63	40.147000	-104.677109
2,646.00	8.63	112.39	2,640.99	-45.19	27.88	1,297,458.96	3,230,048.18	40.146989	-104.677065
2,741.00	10.00	116.24	2,734.73	-51.55	41.87	1,297,452.73	3,230,062.23	40.146972	-104.677015
2,836.00	9.50	115.30	2,828.36	-58.55	56.35	1,297,445.87	3,230,076.78	40.146952	-104.676963
2,932.00	9.01	116.27	2,923.11	-65.26	70.25	1,297,439.28	3,230,090.75	40.146934	-104.676913
3,027.00	8.78	110.34	3,016.97	-71.07	83.72	1,297,433.60	3,230,104.27	40.146918	-104.676865
3,122.00	7.27	107.10	3,111.04	-75.36	96.27	1,297,429.42	3,230,116.85	40.146906	-104.676820
3,217.00	7.72	107.90	3,205.23	-79.09	108.09	1,297,425.81	3,230,128.70	40.146896	-104.676778
3,312.00	8.49	104.41	3,299.28	-82.79	120.95	1,297,422.22	3,230,141.60	40.146886	-104.676732
3,407.00	7.07	103.80	3,393.40	-85.93	133.42	1,297,419.19	3,230,154.10	40.146877	-104.676687
3,502.00	8.25	111.22	3,487.55	-89.80	145.45	1,297,415.45	3,230,166.17	40.146867	-104.676644
3,597.00	9.45	111.45	3,581.42	-95.11	159.07	1,297,410.25	3,230,179.83	40.146852	-104.676595
3,692.00	7.26	110.08	3,675.41	-100.03	171.96	1,297,405.46	3,230,192.77	40.146838	-104.676549
3,787.00	7.64	110.41	3,769.61	-104.29	183.52	1,297,401.30	3,230,204.37	40.146827	-104.676508
3,882.00	8.52	110.93	3,863.66	-109.01	196.01	1,297,396.70	3,230,216.90	40.146814	-104.676463
3,976.00	9.71	110.84	3,956.47	-114.32	209.92	1,297,391.52	3,230,230.86	40.146799	-104.676413
4,071.00	10.85	111.19	4,049.95	-120.40	225.75	1,297,385.59	3,230,246.74	40.146783	-104.676357
4,166.00	10.73	110.87	4,143.27	-126.78	242.35	1,297,379.36	3,230,263.40	40.146765	-104.676297
4,261.00	9.60	104.70	4,236.78	-131.94	258.28	1,297,374.35	3,230,279.38	40.146751	-104.676240
4,356.00	8.20	103.75	4,330.63	-135.56	272.52	1,297,370.86	3,230,293.65	40.146741	-104.676189
4,451.00	8.59	117.88	4,424.62	-140.49	285.37	1,297,366.05	3,230,306.55	40.146727	-104.676143
4,545.00	8.45	111.44	4,517.59	-146.30	298.01	1,297,360.36	3,230,319.24	40.146711	-104.676098
4,641.00	8.35	114.72	4,612.56	-151.79	310.90	1,297,354.99	3,230,332.19	40.146696	-104.676052
4,736.00	10.46	112.90	4,706.28	-158.03	325.12	1,297,348.88	3,230,346.46	40.146679	-104.676001
4,831.00	9.65	107.09	4,799.82	-163.73	340.67	1,297,343.33	3,230,362.06	40.146664	-104.675946
4,926.00	8.39	102.99	4,893.64	-167.63	355.04	1,297,339.56	3,230,376.46	40.146653	-104.675894
5,021.00	8.62	105.49	4,987.60	-171.08	368.65	1,297,336.23	3,230,390.11	40.146643	-104.675846
5,116.00	8.94	113.02	5,081.49	-175.87	382.30	1,297,331.57	3,230,403.81	40.146630	-104.675797
5,211.00	10.63	115.00	5,175.10	-182.46	397.04	1,297,325.12	3,230,418.60	40.146612	-104.675744
5,307.00	8.85	114.64	5,269.72	-189.28	411.78	1,297,318.43	3,230,433.40	40.146593	-104.675691
5,402.00	9.15	116.32	5,363.55	-195.68	425.19	1,297,312.16	3,230,446.88	40.146576	-104.675643
5,496.00	7.55	116.24	5,456.55	-201.72	437.43	1,297,306.23	3,230,459.17	40.146559	-104.675600
5,591.00	6.14	114.78	5,550.87	-206.61	447.64	1,297,301.44	3,230,469.43	40.146546	-104.675563
5,686.00	4.75	112.25	5,645.44	-210.23	455.90	1,297,297.89	3,230,477.71	40.146536	-104.675533
5,780.00	5.70	114.01	5,739.04	-213.61	463.76	1,297,294.59	3,230,485.61	40.146527	-104.675505

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,875.00	4.87	112.02	5,833.64	-217.04	471.81	1,297,291.24	3,230,493.69	40.146517	-104.675477	
5,970.00	4.86	108.44	5,928.30	-219.82	479.37	1,297,288.52	3,230,501.27	40.146510	-104.675450	
6,065.00	2.83	106.93	6,023.08	-221.78	485.43	1,297,286.62	3,230,507.35	40.146504	-104.675428	
6,160.00	1.09	112.54	6,118.02	-222.81	488.51	1,297,285.62	3,230,510.44	40.146501	-104.675417	
6,254.00	0.29	67.29	6,212.01	-223.06	489.55	1,297,285.38	3,230,511.49	40.146501	-104.675413	
6,349.00	0.36	40.70	6,307.01	-222.74	489.97	1,297,285.70	3,230,511.90	40.146502	-104.675412	
6,444.00	0.25	24.58	6,402.01	-222.32	490.25	1,297,286.12	3,230,512.18	40.146503	-104.675411	
6,540.00	0.29	8.18	6,498.01	-221.89	490.37	1,297,286.55	3,230,512.30	40.146504	-104.675410	
6,615.00	0.30	346.78	6,573.01	-221.51	490.35	1,297,286.93	3,230,512.27	40.146505	-104.675410	
6,635.00	0.44	354.48	6,593.01	-221.39	490.33	1,297,287.06	3,230,512.25	40.146505	-104.675410	
6,666.00	0.98	351.87	6,624.01	-221.01	490.28	1,297,287.44	3,230,512.20	40.146506	-104.675410	
6,697.00	3.86	3.23	6,654.97	-219.70	490.31	1,297,288.74	3,230,512.21	40.146510	-104.675410	
6,729.00	7.45	0.14	6,686.81	-216.55	490.37	1,297,291.90	3,230,512.25	40.146519	-104.675410	
6,761.00	10.95	349.60	6,718.40	-211.49	489.83	1,297,296.96	3,230,511.66	40.146532	-104.675412	
6,792.00	13.63	343.11	6,748.69	-205.09	488.23	1,297,303.33	3,230,510.00	40.146550	-104.675418	
6,825.00	14.18	341.79	6,780.72	-197.53	485.84	1,297,310.87	3,230,507.54	40.146571	-104.675426	
6,856.00	13.92	347.37	6,810.79	-190.29	483.84	1,297,318.10	3,230,505.47	40.146591	-104.675433	
6,888.00	14.62	357.56	6,841.81	-182.49	482.83	1,297,325.88	3,230,504.39	40.146612	-104.675437	
6,919.00	16.58	358.51	6,871.67	-174.16	482.54	1,297,334.21	3,230,504.03	40.146635	-104.675438	
6,952.00	20.21	359.37	6,902.98	-163.75	482.36	1,297,344.62	3,230,503.74	40.146663	-104.675439	
6,984.00	23.57	1.71	6,932.67	-151.83	482.49	1,297,356.54	3,230,503.76	40.146696	-104.675438	
7,015.00	26.60	2.69	6,960.74	-138.70	483.00	1,297,369.68	3,230,504.15	40.146732	-104.675436	
7,047.00	30.15	4.18	6,988.89	-123.52	483.92	1,297,384.86	3,230,504.93	40.146774	-104.675433	
7,078.00	33.81	4.47	7,015.18	-107.15	485.16	1,297,401.24	3,230,506.02	40.146819	-104.675429	
7,109.00	37.32	4.09	7,040.39	-89.17	486.51	1,297,419.23	3,230,507.20	40.146868	-104.675424	
7,141.00	40.79	3.33	7,065.24	-69.06	487.80	1,297,439.36	3,230,508.31	40.146923	-104.675419	
7,172.00	44.12	0.36	7,088.11	-48.15	488.46	1,297,460.27	3,230,508.77	40.146981	-104.675417	
7,204.00	47.59	359.05	7,110.40	-25.19	488.34	1,297,483.23	3,230,508.43	40.147044	-104.675417	
7,236.00	51.55	357.22	7,131.14	-0.85	487.53	1,297,507.56	3,230,507.41	40.147111	-104.675420	
7,267.00	55.60	355.45	7,149.55	24.03	485.93	1,297,532.42	3,230,505.57	40.147179	-104.675426	
7,299.00	59.90	354.90	7,166.62	50.99	483.65	1,297,559.36	3,230,503.04	40.147253	-104.675434	
7,330.00	64.49	354.91	7,181.08	78.30	481.21	1,297,586.64	3,230,500.35	40.147328	-104.675443	
7,362.00	69.05	354.87	7,193.70	107.58	478.60	1,297,615.90	3,230,497.46	40.147408	-104.675452	
7,393.00	71.86	354.78	7,204.07	136.67	475.96	1,297,644.97	3,230,494.56	40.147488	-104.675462	
7,425.00	74.36	355.80	7,213.36	167.18	473.45	1,297,675.45	3,230,491.76	40.147572	-104.675471	
7,458.00	77.81	356.80	7,221.30	199.14	471.38	1,297,707.39	3,230,489.40	40.147660	-104.675478	
7,489.00	81.50	357.18	7,226.86	229.59	469.78	1,297,737.83	3,230,487.52	40.147743	-104.675484	
7,521.00	83.83	358.11	7,230.95	261.30	468.48	1,297,769.52	3,230,485.92	40.147830	-104.675488	
7,552.00	87.34	359.79	7,233.33	292.20	467.91	1,297,800.41	3,230,485.07	40.147915	-104.675490	
7,584.00	88.46	1.60	7,234.51	324.17	468.30	1,297,832.39	3,230,485.16	40.148003	-104.675489	
7,600.00	88.25	1.25	7,234.97	340.16	468.70	1,297,848.38	3,230,485.41	40.148047	-104.675488	
7,650.50	88.69	1.51	7,236.32	390.63	469.92	1,297,898.86	3,230,486.16	40.148185	-104.675483	
SET 7" CASING										
7,730.00	89.38	1.92	7,237.65	470.08	472.30	1,297,978.33	3,230,487.80	40.148403	-104.675475	
7,825.00	89.69	2.21	7,238.43	565.01	475.72	1,298,073.29	3,230,490.34	40.148664	-104.675462	
7,920.00	89.69	2.33	7,238.94	659.94	479.48	1,298,168.24	3,230,493.22	40.148925	-104.675449	
8,014.00	90.80	3.06	7,238.54	753.83	483.90	1,298,262.17	3,230,496.77	40.149182	-104.675433	
8,109.00	88.52	0.45	7,239.10	848.77	486.81	1,298,357.14	3,230,498.80	40.149443	-104.675423	
8,204.00	87.96	358.75	7,242.02	943.72	486.15	1,298,452.07	3,230,497.26	40.149704	-104.675425	
8,300.00	89.07	359.56	7,244.51	1,039.67	484.73	1,298,548.01	3,230,494.95	40.149967	-104.675430	
8,395.00	89.44	359.72	7,245.74	1,134.66	484.14	1,298,642.99	3,230,493.47	40.150228	-104.675432	
8,490.00	89.57	359.62	7,246.56	1,229.66	483.59	1,298,737.98	3,230,492.04	40.150489	-104.675434	
8,585.00	90.99	359.52	7,246.10	1,324.65	482.88	1,298,832.96	3,230,490.45	40.150749	-104.675437	
8,680.00	87.72	355.31	7,247.17	1,419.52	478.59	1,298,927.78	3,230,485.29	40.151010	-104.675452	
8,774.00	88.64	355.42	7,250.15	1,513.16	471.00	1,299,021.35	3,230,476.83	40.151267	-104.675479	



Weatherford®

Andarko Petroleum Corporation

Survey Report - Geographic



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25°RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25°RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,869.00	89.81	355.51	7,251.44	1,607.85	463.49	1,299,115.97	3,230,468.44	40.151527	-104.675506
8,964.00	90.06	358.03	7,251.55	1,702.69	458.14	1,299,210.75	3,230,462.21	40.151787	-104.675525
9,059.00	90.44	0.11	7,251.13	1,797.67	456.60	1,299,305.72	3,230,459.78	40.152048	-104.675531
9,153.00	90.12	359.11	7,250.67	1,891.67	455.96	1,299,399.70	3,230,458.27	40.152306	-104.675533
9,248.00	89.75	0.89	7,250.78	1,986.67	455.96	1,299,494.69	3,230,457.39	40.152567	-104.675533
9,342.00	89.51	0.01	7,251.39	2,080.66	456.70	1,299,588.69	3,230,457.26	40.152825	-104.675530
9,437.00	90.31	1.33	7,251.54	2,175.65	457.81	1,299,683.69	3,230,457.49	40.153085	-104.675526
9,532.00	90.49	1.74	7,250.87	2,270.61	460.35	1,299,778.67	3,230,459.15	40.153346	-104.675517
9,627.00	90.06	1.03	7,250.42	2,365.58	462.65	1,299,873.66	3,230,460.56	40.153607	-104.675509
9,721.00	89.51	0.88	7,250.77	2,459.57	464.21	1,299,967.65	3,230,461.26	40.153865	-104.675504
9,816.00	90.56	4.84	7,250.71	2,554.43	468.95	1,300,062.55	3,230,465.12	40.154125	-104.675487
9,911.00	89.81	4.28	7,250.41	2,649.13	476.51	1,300,157.32	3,230,471.79	40.154385	-104.675460
10,006.00	89.38	3.31	7,251.08	2,743.92	482.79	1,300,252.16	3,230,477.20	40.154645	-104.675437
10,101.00	91.30	4.21	7,250.51	2,838.71	489.02	1,300,347.00	3,230,482.55	40.154906	-104.675415
10,196.00	90.80	4.23	7,248.77	2,933.43	496.01	1,300,441.79	3,230,488.66	40.155166	-104.675390
10,292.00	89.81	4.24	7,248.26	3,029.17	503.10	1,300,537.59	3,230,494.86	40.155428	-104.675364
10,387.00	90.49	1.09	7,248.01	3,124.05	507.52	1,300,632.51	3,230,498.39	40.155689	-104.675349
10,481.00	87.66	357.40	7,249.53	3,218.01	506.28	1,300,726.45	3,230,496.29	40.155947	-104.675353
10,576.00	88.83	357.20	7,252.44	3,312.85	501.81	1,300,821.25	3,230,490.93	40.156207	-104.675369
10,672.00	89.57	359.01	7,253.78	3,408.79	498.63	1,300,917.15	3,230,486.87	40.156471	-104.675380
10,767.00	89.75	0.29	7,254.34	3,503.78	498.05	1,301,012.13	3,230,485.41	40.156731	-104.675382
10,861.00	91.60	1.89	7,253.24	3,597.75	499.84	1,301,106.11	3,230,486.32	40.156989	-104.675376
10,957.00	89.26	1.69	7,252.52	3,693.70	502.84	1,301,202.08	3,230,488.43	40.157253	-104.675365
11,052.00	88.58	1.35	7,254.31	3,788.64	505.36	1,301,297.05	3,230,490.07	40.157513	-104.675356
11,147.00	89.74	3.46	7,255.70	3,883.54	509.34	1,301,391.98	3,230,493.17	40.157774	-104.675342
11,242.00	89.32	3.01	7,256.48	3,978.39	514.71	1,301,486.87	3,230,497.65	40.158034	-104.675323
11,337.00	89.32	3.61	7,257.61	4,073.22	520.19	1,301,581.75	3,230,502.26	40.158295	-104.675303
11,433.00	89.07	2.58	7,258.96	4,169.07	525.37	1,301,677.65	3,230,506.55	40.158558	-104.675285
11,528.00	88.27	1.81	7,261.16	4,263.98	529.01	1,301,772.58	3,230,509.31	40.158818	-104.675272
11,615.00	88.52	2.03	7,263.60	4,350.89	531.92	1,301,859.52	3,230,511.42	40.159057	-104.675261
LAST MWD SURVEY									
11,666.00	88.67	2.16	7,264.85	4,401.84	533.79	1,301,910.48	3,230,512.81	40.159197	-104.675254
PROJECTION TO TD									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
941.60	941.58	9 5/8"	9-5/8	12-1/4	
7,650.50	7,236.32	7"	7	8-3/4	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well HAYMAKER 4C-9HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25'RKB+4897'gl @ 4922.00ft
Site:	WELD_HAYMAKER 13-9HZ PAD	MD Reference:	25'RKB+4897'gl @ 4922.00ft
Well:	HAYMAKER 4C-9HZ	North Reference:	True
Wellbore:	HAYMAKER 4C-9HZ	Survey Calculation Method:	Minimum Curvature
Design:	HAYMAKER 4C-9HZ	Database:	edmp

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
876.00	875.99	-1.19	-4.05	LAST GYRO SURVEY
1,191.00	1,190.97	0.22	-6.87	TIE ON
1,323.00	1,322.86	-1.77	-11.34	FIRST MWD SURVEY
7,650.50	7,236.32	390.63	469.92	SET 7" CASING
11,615.00	7,263.60	4,350.89	531.92	LAST MWD SURVEY
11,666.00	7,264.85	4,401.84	533.79	PROJECTION TO TD

Checked By: _____ Approved By: _____ Date: _____