



**Scientific
Drilling**

Survey Certification

7327 West Barton Road
Casper, WY 82604
(307)-472-6621 Fax (307) 472-5439

Operator	KP Kauffman Co, Inc.
Well Name & No.	Ocoma 31-17
County & State	Weld County, CO
SDI Job No.	411013K73528
Rig	Halliburton 11014931
Survey Date	25-Oct-2013

I, Steven F. Gottschalk, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 0 feet to a measured depth of 4478 feet is true and correct as determined from all available records.


Signature

4-Dec-2013

Date

Steven F. Gottschalk
Rockies Region Well Planner
Scientific Drilling - Rocky Mountain District

KP Kauffman Co, Inc.

Weld County, CO

Ocoma

Ocoma 31-17

OH

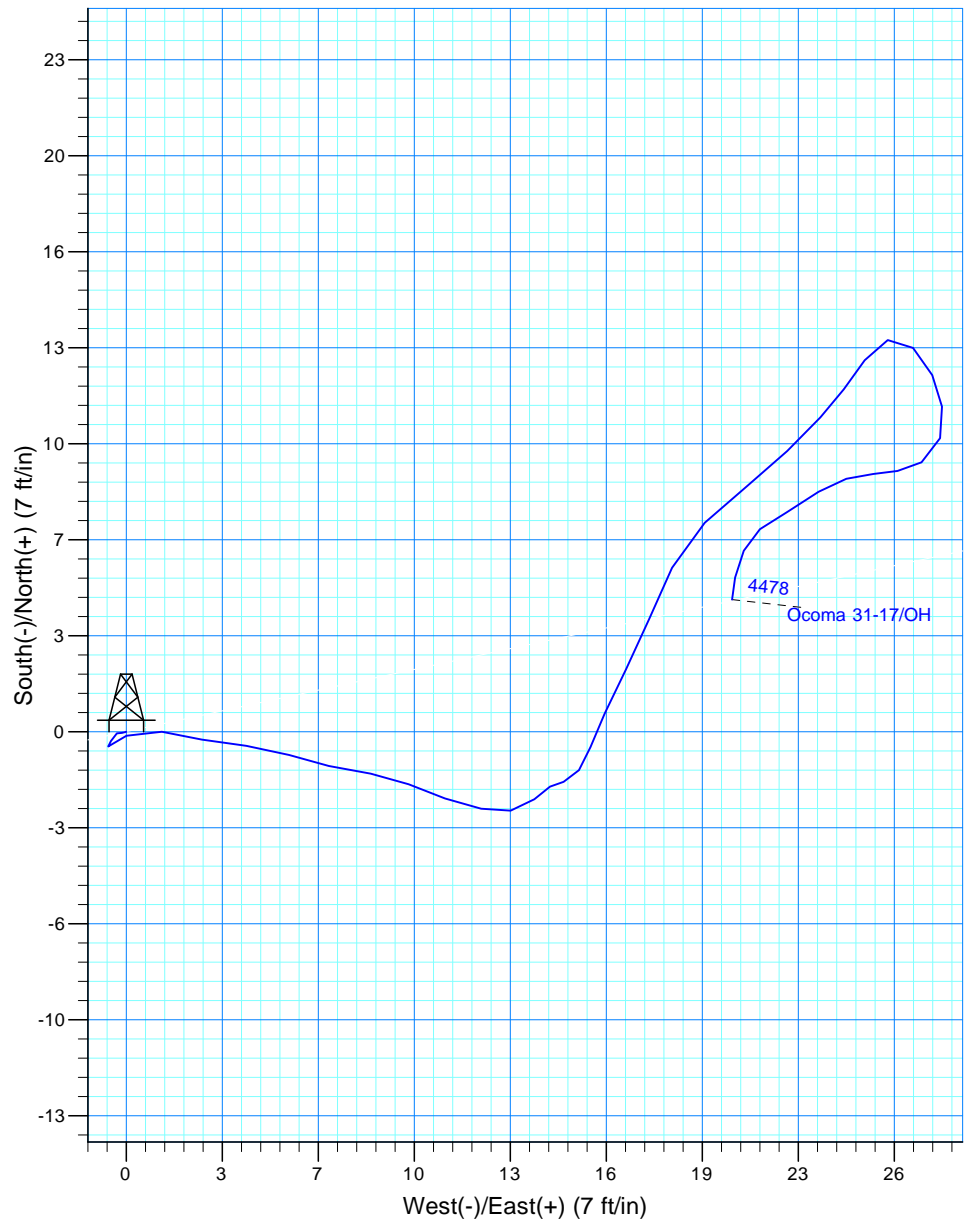
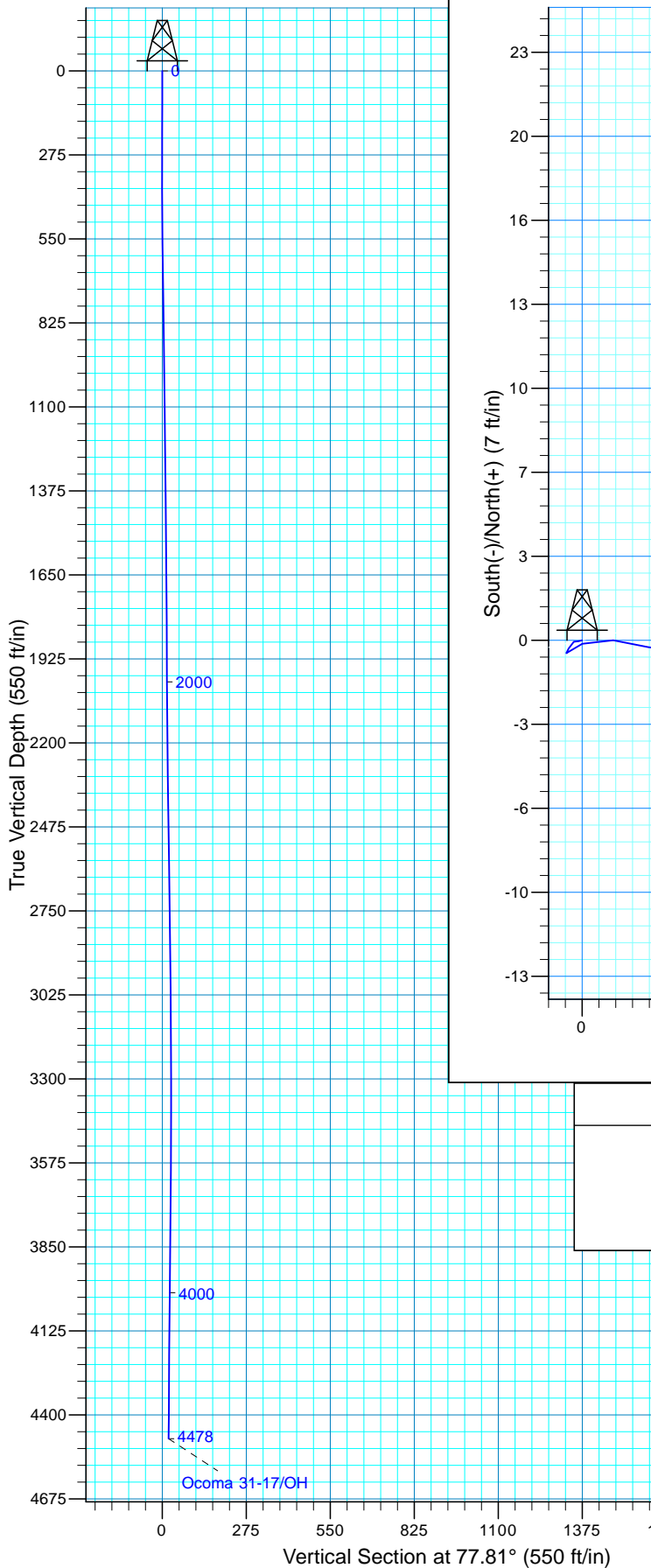
Design: OH

Standard Survey Report

04 December, 2013



Project: Weld County, CO
Site: Ocoma
Well: Ocoma 31-17
Wellbore: OH
Design: OH



WELL DETAILS: Ocoma 31-17

Northing	Easting	Ground Level: 4855.00 Latitude	Longitude
1342674.66	3251024.55	40° 16' 13.965 N	104° 36' 1.408 W

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Ocoma 31-17, True North
Vertical (TVD) Reference: GL 4855' @ 4855.00ft (Halliburton 11014931)
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: GL 4855' @ 4855.00ft (Halliburton 11014931)
Calculation Method: Minimum Curvature
Local North: True
Location:

PROJECT DETAILS: Weld County, CO

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone

Design: OH (Ocoma 31-17/OH)

Created By: Steve Gottschalk 22:23, December 04 2013

Scientific Drilling International

Survey Report

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Ocoma 31-17
Project:	Weld County, CO	TVD Reference:	GL 4855' @ 4855.00ft (Halliburton 11014931)
Site:	Ocoma	MD Reference:	GL 4855' @ 4855.00ft (Halliburton 11014931)
Well:	Ocoma 31-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Ocoma				
Site Position:		Northing:	1,342,674.67 usft	Latitude:	40° 16' 13.966 N
From:	Lat/Long	Easting:	3,251,024.55 usft	Longitude:	104° 36' 1.408 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.58 °

Well	Ocoma 31-17, 1320' FSL, 600' FWL, SEC 31 T4N R64W					
Well Position	+N/-S	0.00 ft	Northing:	1,342,674.66 usft	Latitude:	40° 16' 13.965 N
	+E/-W	0.00 ft	Easting:	3,251,024.55 usft	Longitude:	104° 36' 1.408 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,855.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	12/4/2013	8.47	66.88	52,744

Design	OH				
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	77.81	

Survey Program	Date	12/4/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	4,478.00	Survey #1 Surface Gyros (OH)	SDI Standard Keeper 103	SDI Standard Wireline Keeper ver 1.0.3	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.17	254.58	100.00	-0.04	-0.14	-0.15	0.17	0.17	0.00
First SDI Gyro Survey									
200.00	0.04	303.29	200.00	-0.06	-0.32	-0.32	0.15	-0.13	48.71
300.00	0.38	211.93	300.00	-0.32	-0.52	-0.58	0.38	0.34	-91.36
400.00	0.15	41.38	400.00	-0.51	-0.61	-0.70	0.53	-0.23	-170.55
500.00	0.68	63.12	500.00	-0.14	0.01	-0.02	0.54	0.53	21.74
600.00	0.78	101.00	599.99	0.00	1.20	1.18	0.48	0.10	37.88
700.00	0.81	101.35	699.98	-0.27	2.57	2.45	0.03	0.03	0.35
800.00	0.93	95.05	799.97	-0.48	4.07	3.87	0.15	0.12	-6.30
900.00	0.78	110.32	899.96	-0.79	5.51	5.22	0.27	-0.15	15.27

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Site:	Ocoma	MD Reference:	GL 4855' @ 4855.00ft (Halliburton 11014931)
Well:	Ocoma 31-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,000.00	0.83	101.39	999.95	-1.17	6.86	6.46	0.13	0.05	-8.93
1,100.00	0.83	99.33	1,099.94	-1.43	8.29	7.80	0.03	0.00	-2.06
1,200.00	0.69	113.08	1,199.93	-1.78	9.56	8.96	0.23	-0.14	13.75
1,300.00	0.83	109.96	1,299.92	-2.26	10.79	10.07	0.15	0.14	-3.12
1,400.00	0.64	100.23	1,399.91	-2.61	12.02	11.20	0.23	-0.19	-9.73
1,500.00	0.51	84.89	1,499.90	-2.67	13.01	12.16	0.20	-0.13	-15.34
1,600.00	0.57	46.69	1,599.90	-2.29	13.82	13.02	0.36	0.06	-38.20
1,700.00	0.22	62.01	1,699.90	-1.86	14.35	13.63	0.36	-0.35	15.32
1,800.00	0.34	76.66	1,799.90	-1.70	14.81	14.12	0.14	0.12	14.65
1,900.00	0.46	35.13	1,899.89	-1.30	15.33	14.71	0.31	0.12	-41.53
2,000.00	0.55	19.70	1,999.89	-0.52	15.72	15.26	0.16	0.09	-15.43
2,100.00	0.85	24.68	2,099.88	0.60	16.19	15.95	0.31	0.30	4.98
2,200.00	1.08	26.85	2,199.87	2.12	16.93	16.99	0.23	0.23	2.17
2,300.00	1.06	22.42	2,299.85	3.81	17.71	18.11	0.09	-0.02	-4.43
2,400.00	1.12	25.72	2,399.83	5.55	18.48	19.24	0.09	0.06	3.30
2,500.00	1.07	46.61	2,499.82	7.07	19.59	20.64	0.40	-0.05	20.89
2,600.00	1.07	51.61	2,599.80	8.29	21.00	22.27	0.09	0.00	5.00
2,700.00	1.03	46.19	2,699.78	9.49	22.38	23.88	0.11	-0.04	-5.42
2,800.00	0.81	42.55	2,799.77	10.64	23.50	25.22	0.23	-0.22	-3.64
2,900.00	0.61	36.18	2,899.76	11.59	24.30	26.19	0.21	-0.20	-6.37
3,000.00	0.78	34.91	2,999.75	12.58	25.00	27.09	0.17	0.17	-1.27
3,100.00	0.47	72.76	3,099.75	13.26	25.78	28.00	0.50	-0.31	37.85
3,200.00	0.69	129.50	3,199.74	12.99	26.64	28.78	0.58	0.22	56.74
3,300.00	0.66	160.60	3,299.74	12.07	27.29	29.23	0.36	-0.03	31.10
3,400.00	0.62	165.20	3,399.73	11.00	27.62	29.32	0.07	-0.04	4.60
3,500.00	0.66	200.53	3,499.72	9.94	27.56	29.04	0.39	0.04	35.33
3,600.00	0.59	236.40	3,599.72	9.11	26.93	28.25	0.39	-0.07	35.87
3,700.00	0.44	269.44	3,699.72	8.83	26.11	27.39	0.33	-0.15	33.04
3,800.00	0.52	256.95	3,799.71	8.72	25.29	26.56	0.13	0.08	-12.49
3,900.00	0.54	262.77	3,899.71	8.56	24.38	25.64	0.06	0.02	5.82
4,000.00	0.69	231.59	3,999.70	8.12	23.44	24.63	0.36	0.15	-31.18
4,100.00	0.77	241.68	4,099.69	7.43	22.38	23.44	0.15	0.08	10.09
4,200.00	0.48	232.49	4,199.69	6.86	21.45	22.42	0.31	-0.29	-9.19
4,300.00	0.60	203.72	4,299.68	6.12	20.91	21.73	0.29	0.12	-28.77
4,400.00	0.50	191.10	4,399.68	5.22	20.62	21.25	0.16	-0.10	-12.62
4,478.00	0.61	185.50	4,477.68	4.47	20.51	20.99	0.16	0.14	-7.18
Last SDI Gyro Survey									

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Survey Report

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Checked By: _____	Approved By: _____	Date: _____
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