



**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.	Strong 2-8
County & State	Weld County, CO
SDI Job No.	411113K85704
Rig	Ground Level
Survey Date	25-Nov-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 7100 feet is true and correct as determined from all available records.


Signature

6-Jan-2014
Date

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

KP Kauffman Co, Inc.

Weld County, CO

Strong

Strong 2-8

OH

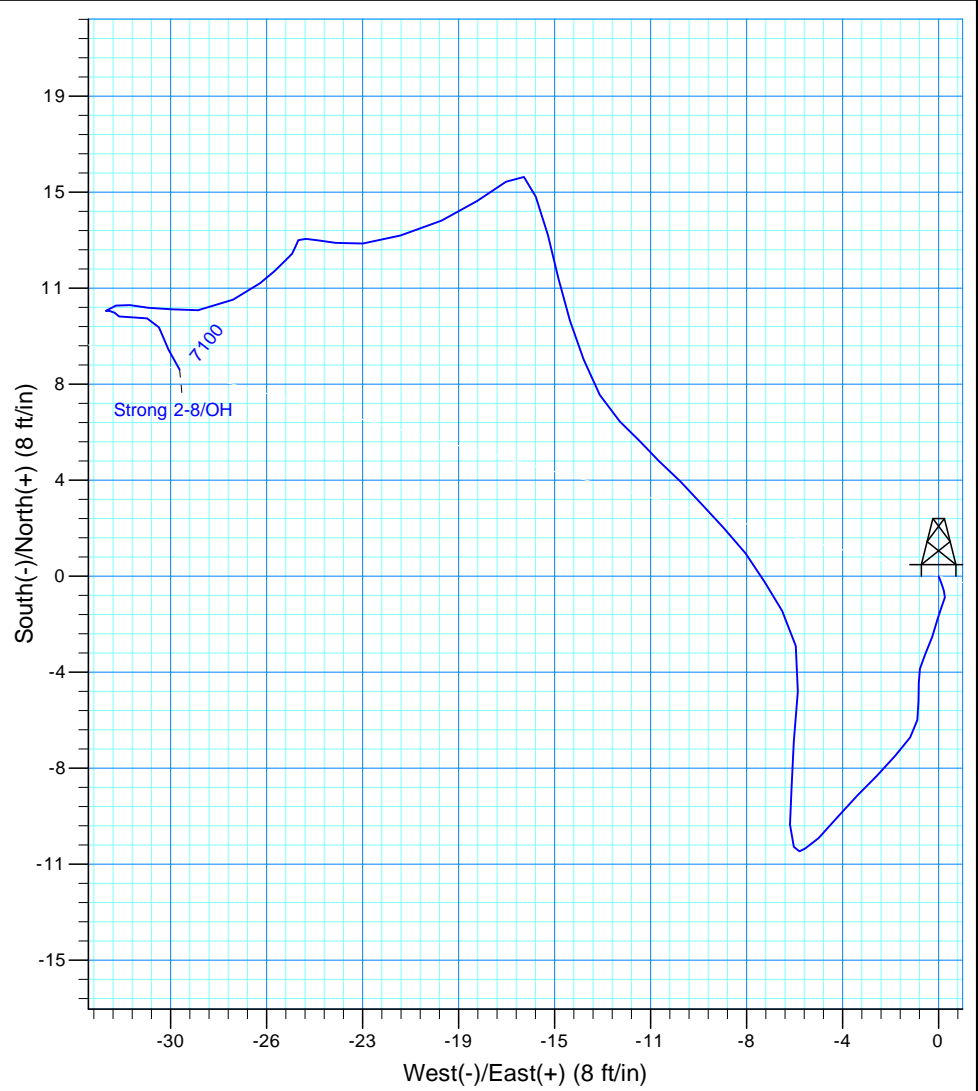
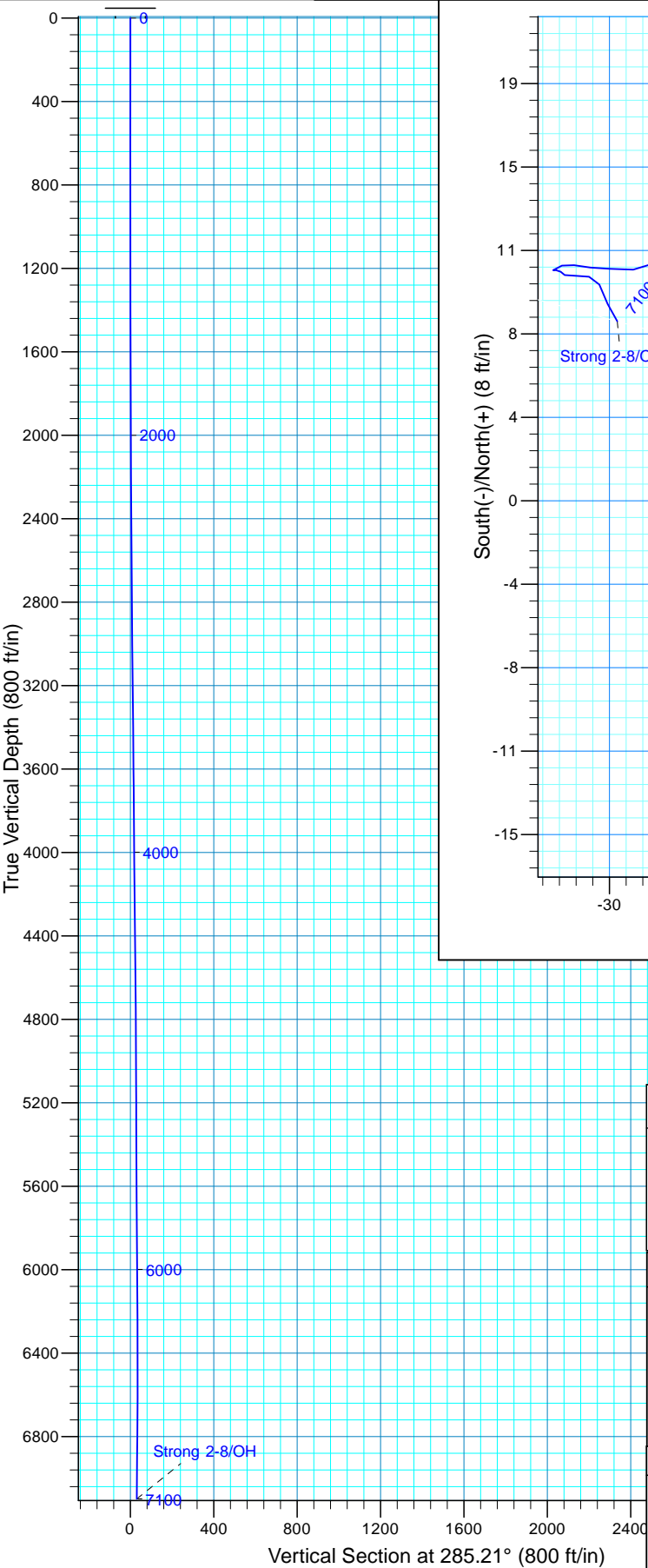
Design: OH

Standard Survey Report

06 January, 2014



Project: Weld County, CO
Site: Strong
Well: Strong 2-8
Wellbore: OH
Design: OH



WELL DETAILS: Strong 2-8

Northing	Easting	Ground Level: 4787.00 Latitude	Longitude
1381997.53	3206530.27	40° 22' 46.614 N	104° 45' 31.180 W

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Strong 2-8, True North
Vertical (TVD) Reference: GL 4787' @ 4787.00ft (Ground Level)
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: GL 4787' @ 4787.00ft (Ground Level)
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 (Strong 2-8/OH)

Created By: Steve Gottschalk
Date: 1:28, January 06 2014

Scientific Drilling International

Survey Report

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Strong 2-8
Project:	Weld County, CO	TVD Reference:	GL 4787' @ 4787.00ft (Ground Level)
Site:	Strong	MD Reference:	GL 4787' @ 4787.00ft (Ground Level)
Well:	Strong 2-8	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	Strong				
Site Position:		Northing:	1,381,997.54 usft	Latitude:	40° 22' 46.614 N
From:	Lat/Long	Easting:	3,206,530.27 usft	Longitude:	104° 45' 31.180 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.48 °

Well	Strong 2-8, 635' FSL, -627' FWL, SEC22 T5N R66W					
Well Position	+N/-S	0.00 ft	Northing:	1,381,997.53 usft	Latitude:	40° 22' 46.614 N
	+E/-W	0.00 ft	Easting:	3,206,530.27 usft	Longitude:	104° 45' 31.180 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,787.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	11/25/2013	8.56	66.94	52,790

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	285.21	

Survey Program	Date	1/6/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	7,100.00	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	0.11	158.76	100.00	-0.09	0.03	-0.06	0.11	0.11	0.00
First SDI Gyro Survey									
200.00	0.18	160.31	200.00	-0.33	0.12	-0.20	0.07	0.07	1.55
300.00	0.13	163.26	300.00	-0.58	0.21	-0.35	0.05	-0.05	2.95
400.00	0.16	178.00	400.00	-0.83	0.25	-0.46	0.05	0.03	14.74
500.00	0.25	212.32	500.00	-1.16	0.13	-0.43	0.15	0.09	34.32
600.00	0.40	191.15	600.00	-1.68	-0.05	-0.39	0.19	0.15	-21.17
700.00	0.43	200.76	699.99	-2.38	-0.25	-0.38	0.08	0.03	9.61
800.00	0.43	203.90	799.99	-3.07	-0.54	-0.29	0.02	0.00	3.14
900.00	0.24	190.63	899.99	-3.62	-0.73	-0.25	0.20	-0.19	-13.27

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Survey Report

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Strong 2-8
Project:	Weld County, CO	TVD Reference:	GL 4787' @ 4787.00ft (Ground Level)
Site:	Strong	MD Reference:	GL 4787' @ 4787.00ft (Ground Level)
Well:	Strong 2-8	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	0.39	181.74	999.99	-4.16	-0.78	-0.34	0.16	0.15	-8.89
1,100.00	0.44	180.50	1,099.99	-4.89	-0.79	-0.52	0.05	0.05	-1.24
1,200.00	0.40	187.24	1,199.98	-5.62	-0.84	-0.67	0.06	-0.04	6.74
1,300.00	0.47	214.54	1,299.98	-6.30	-1.11	-0.58	0.22	0.07	27.30
1,400.00	0.59	222.93	1,399.98	-7.02	-1.70	-0.20	0.14	0.12	8.39
1,500.00	0.64	221.80	1,499.97	-7.81	-2.42	0.29	0.05	0.05	-1.13
1,600.00	0.60	228.38	1,599.96	-8.58	-3.18	0.82	0.08	-0.04	6.58
1,700.00	0.69	217.13	1,699.96	-9.40	-3.94	1.33	0.15	0.09	-11.25
1,800.00	0.60	227.82	1,799.95	-10.23	-4.69	1.84	0.15	-0.09	10.69
1,900.00	0.17	248.80	1,899.95	-10.64	-5.22	2.24	0.45	-0.43	20.98
2,000.00	0.12	235.72	1,999.95	-10.75	-5.44	2.43	0.06	-0.05	-13.08
2,100.00	0.31	331.17	2,099.95	-10.57	-5.66	2.68	0.34	0.19	95.45
2,200.00	0.72	358.49	2,199.94	-9.71	-5.80	3.05	0.47	0.41	27.32
2,300.00	0.96	4.94	2,299.93	-8.25	-5.75	3.38	0.26	0.24	6.45
2,400.00	1.11	1.19	2,399.92	-6.44	-5.66	3.77	0.16	0.15	-3.75
2,500.00	1.12	7.92	2,499.90	-4.51	-5.50	4.13	0.13	0.01	6.73
2,600.00	0.97	345.09	2,599.88	-2.72	-5.58	4.68	0.44	-0.15	-22.83
2,700.00	0.72	330.14	2,699.87	-1.36	-6.12	5.54	0.33	-0.25	-14.95
2,800.00	0.79	327.68	2,799.86	-0.23	-6.80	6.50	0.08	0.07	-2.46
2,900.00	0.76	324.68	2,899.85	0.89	-7.55	7.52	0.05	-0.03	-3.00
3,000.00	0.76	314.03	2,999.84	1.89	-8.41	8.61	0.14	0.00	-10.65
3,100.00	0.69	320.61	3,099.84	2.82	-9.27	9.68	0.11	-0.07	6.58
3,200.00	0.70	312.91	3,199.83	3.70	-10.10	10.72	0.09	0.01	-7.70
3,300.00	0.62	314.75	3,299.82	4.50	-10.93	11.73	0.08	-0.08	1.84
3,400.00	0.61	317.39	3,399.82	5.27	-11.67	12.65	0.03	-0.01	2.64
3,500.00	0.65	311.76	3,499.81	6.04	-12.46	13.61	0.07	0.04	-5.63
3,600.00	0.86	331.17	3,599.80	7.08	-13.24	14.63	0.33	0.21	19.41
3,700.00	0.89	339.91	3,699.79	8.46	-13.87	15.61	0.14	0.03	8.74
3,800.00	0.94	341.19	3,799.78	9.97	-14.40	16.51	0.05	0.05	1.28
3,900.00	1.02	348.01	3,899.76	11.62	-14.85	17.38	0.14	0.08	6.82
4,000.00	1.00	344.67	3,999.75	13.33	-15.27	18.23	0.06	-0.02	-3.34
4,100.00	0.80	340.09	4,099.74	14.83	-15.74	19.07	0.21	-0.20	-4.58
4,200.00	0.29	295.87	4,199.73	15.59	-16.20	19.72	0.63	-0.51	-44.22
4,300.00	0.64	237.30	4,299.73	15.40	-16.90	20.35	0.55	0.35	-58.57
4,400.00	0.91	235.95	4,399.72	14.66	-18.03	21.24	0.27	0.27	-1.35
4,500.00	0.92	246.01	4,499.71	13.88	-19.42	22.38	0.16	0.01	10.06
4,600.00	1.04	253.89	4,599.69	13.31	-21.02	23.78	0.18	0.12	7.88
4,700.00	0.69	264.61	4,699.68	13.00	-22.49	25.12	0.38	-0.35	10.72
4,800.00	0.53	279.79	4,799.67	13.02	-23.55	26.14	0.23	-0.16	15.18
4,900.00	0.29	274.48	4,899.67	13.12	-24.26	26.85	0.24	-0.24	-5.31
5,000.00	0.25	280.33	4,999.67	13.18	-24.73	27.32	0.05	-0.04	5.85
5,100.00	0.14	219.01	5,099.67	13.12	-25.02	27.58	0.22	-0.11	-61.32
5,200.00	0.17	188.89	5,199.67	12.88	-25.12	27.62	0.09	0.03	-30.12

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Project:	Weld County, CO	TVD Reference:	GL 4787' @ 4787.00ft (Ground Level)
Site:	Strong	MD Reference:	GL 4787' @ 4787.00ft (Ground Level)
Well:	Strong 2-8	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)	
5,300.00	0.21	220.15	5,299.67	12.59	-25.26	27.68	0.11	0.04	31.26	
5,400.00	0.26	229.21	5,399.67	12.31	-25.55	27.88	0.06	0.05	9.06	
5,500.00	0.37	221.56	5,499.67	11.92	-25.93	28.15	0.12	0.11	-7.65	
5,600.00	0.49	237.51	5,599.66	11.44	-26.51	28.58	0.17	0.12	15.95	
5,700.00	0.93	239.00	5,699.66	10.80	-27.56	29.43	0.44	0.44	1.49	
5,800.00	0.77	270.52	5,799.65	10.38	-28.93	30.64	0.49	-0.16	31.52	
5,900.00	0.43	274.97	5,899.64	10.42	-29.98	31.66	0.34	-0.34	4.45	
6,000.00	0.58	273.18	5,999.64	10.48	-30.86	32.53	0.15	0.15	-1.79	
6,100.00	0.28	288.26	6,099.63	10.59	-31.59	33.27	0.32	-0.30	15.08	
6,200.00	0.38	252.16	6,199.63	10.56	-32.14	33.79	0.23	0.10	-36.10	
6,300.00	0.14	215.90	6,299.63	10.36	-32.53	34.11	0.28	-0.24	-36.26	
6,400.00	0.26	63.20	6,399.63	10.37	-32.40	33.98	0.39	0.12	-152.70	
6,500.00	0.20	179.03	6,499.63	10.29	-32.19	33.77	0.39	-0.06	115.83	
6,600.00	0.21	81.89	6,599.63	10.15	-32.01	33.55	0.31	0.01	-97.14	
6,700.00	0.44	99.58	6,699.63	10.11	-31.45	33.00	0.25	0.23	17.69	
6,800.00	0.18	78.73	6,799.63	10.07	-30.92	32.48	0.28	-0.26	-20.85	
6,900.00	0.56	142.28	6,899.62	9.72	-30.46	31.95	0.51	0.38	63.55	
7,000.00	0.57	170.83	6,999.62	8.84	-30.08	31.35	0.28	0.01	28.55	
7,100.00	0.52	127.98	7,099.62	8.07	-29.65	30.73	0.40	-0.05	-42.85	
Last SDI Gyro Survey										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
100.00	100.00	-0.09	0.03	First SDI Gyro Survey	
7,100.00	7,099.62	8.07	-29.65	Last SDI Gyro Survey	

Checked By: _____ Approved By: _____ Date: _____