



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Hepp #32-1H
Company:	K. P. Kauffman Company, Inc.	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Project:	Wattenberg	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site:	S32-T4N-R67W (Hepp)	North Reference:	True
Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Project	Wattenberg		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S32-T4N-R67W (Hepp)			
Site Position:		Northing:	1,343,963.15 ft	Latitude:	40.276130
From:	Lat/Long	Easting:	3,161,177.85 ft	Longitude:	-104.922360
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.37 °

Well	Hepp #32-1H					
Well Position	+N/-S	0.0 ft	Northing:	1,343,963.14 ft	Latitude:	40.276130
	+E/-W	0.0 ft	Easting:	3,161,177.85 ft	Longitude:	-104.922360
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,017.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/18/2013	8.66	66.85	52,828

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	87.04

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
450.8	2.51	320.19	450.7	4.2	-3.5	1.00	1.00	0.00	320.19	
6,673.1	2.51	320.19	6,667.1	213.4	-177.9	0.00	0.00	0.00	0.00	
7,598.7	90.95	90.00	7,255.7	233.5	404.4	10.00	9.56	14.03	129.75	
11,558.7	90.95	90.00	7,190.0	233.5	4,363.8	0.00	0.00	0.00	0.00	#32-1H PBHL

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Site:	S32-T4N-R67W (Hepp)	North Reference:	True
Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200'
300.0	1.00	320.19	300.0	0.7	-0.6	-0.5	1.00	1.00	
400.0	2.00	320.19	400.0	2.7	-2.2	-2.1	1.00	1.00	
450.8	2.51	320.19	450.7	4.2	-3.5	-3.3	1.00	1.00	EOB; Inc=2.51°
500.0	2.51	320.19	499.9	5.9	-4.9	-4.6	0.00	0.00	
600.0	2.51	320.19	599.8	9.2	-7.7	-7.2	0.00	0.00	
700.0	2.51	320.19	699.7	12.6	-10.5	-9.8	0.00	0.00	
800.0	2.51	320.19	799.6	16.0	-13.3	-12.5	0.00	0.00	
900.0	2.51	320.19	899.5	19.3	-16.1	-15.1	0.00	0.00	
1,000.0	2.51	320.19	999.4	22.7	-18.9	-17.7	0.00	0.00	
1,100.0	2.51	320.19	1,099.3	26.0	-21.7	-20.3	0.00	0.00	
1,200.0	2.51	320.19	1,199.2	29.4	-24.5	-23.0	0.00	0.00	
1,300.0	2.51	320.19	1,299.1	32.8	-27.3	-25.6	0.00	0.00	
1,400.0	2.51	320.19	1,399.0	36.1	-30.1	-28.2	0.00	0.00	
1,500.0	2.51	320.19	1,498.9	39.5	-32.9	-30.8	0.00	0.00	
1,600.0	2.51	320.19	1,598.8	42.9	-35.7	-33.5	0.00	0.00	
1,700.0	2.51	320.19	1,698.7	46.2	-38.5	-36.1	0.00	0.00	
1,800.0	2.51	320.19	1,798.6	49.6	-41.3	-38.7	0.00	0.00	
1,900.0	2.51	320.19	1,898.5	52.9	-44.1	-41.3	0.00	0.00	
2,000.0	2.51	320.19	1,998.4	56.3	-46.9	-43.9	0.00	0.00	
2,100.0	2.51	320.19	2,098.3	59.7	-49.7	-46.6	0.00	0.00	
2,200.0	2.51	320.19	2,198.2	63.0	-52.5	-49.2	0.00	0.00	
2,300.0	2.51	320.19	2,298.1	66.4	-55.3	-51.8	0.00	0.00	
2,400.0	2.51	320.19	2,398.1	69.7	-58.1	-54.4	0.00	0.00	
2,500.0	2.51	320.19	2,498.0	73.1	-60.9	-57.1	0.00	0.00	
2,600.0	2.51	320.19	2,597.9	76.5	-63.7	-59.7	0.00	0.00	
2,700.0	2.51	320.19	2,697.8	79.8	-66.5	-62.3	0.00	0.00	
2,800.0	2.51	320.19	2,797.7	83.2	-69.3	-64.9	0.00	0.00	
2,900.0	2.51	320.19	2,897.6	86.6	-72.1	-67.6	0.00	0.00	
3,000.0	2.51	320.19	2,997.5	89.9	-74.9	-70.2	0.00	0.00	
3,100.0	2.51	320.19	3,097.4	93.3	-77.7	-72.8	0.00	0.00	
3,200.0	2.51	320.19	3,197.3	96.6	-80.5	-75.4	0.00	0.00	
3,300.0	2.51	320.19	3,297.2	100.0	-83.3	-78.1	0.00	0.00	
3,400.0	2.51	320.19	3,397.1	103.4	-86.1	-80.7	0.00	0.00	
3,500.0	2.51	320.19	3,497.0	106.7	-88.9	-83.3	0.00	0.00	
3,600.0	2.51	320.19	3,596.9	110.1	-91.7	-85.9	0.00	0.00	
3,700.0	2.51	320.19	3,696.8	113.4	-94.6	-88.6	0.00	0.00	
3,800.0	2.51	320.19	3,796.7	116.8	-97.4	-91.2	0.00	0.00	
3,900.0	2.51	320.19	3,896.6	120.2	-100.2	-93.8	0.00	0.00	
4,000.0	2.51	320.19	3,996.5	123.5	-103.0	-96.4	0.00	0.00	
4,100.0	2.51	320.19	4,096.4	126.9	-105.8	-99.1	0.00	0.00	
4,200.0	2.51	320.19	4,196.3	130.3	-108.6	-101.7	0.00	0.00	
4,300.0	2.51	320.19	4,296.2	133.6	-111.4	-104.3	0.00	0.00	
4,400.0	2.51	320.19	4,396.1	137.0	-114.2	-106.9	0.00	0.00	
4,500.0	2.51	320.19	4,496.0	140.3	-117.0	-109.6	0.00	0.00	
4,600.0	2.51	320.19	4,595.9	143.7	-119.8	-112.2	0.00	0.00	
4,700.0	2.51	320.19	4,695.8	147.1	-122.6	-114.8	0.00	0.00	
4,800.0	2.51	320.19	4,795.8	150.4	-125.4	-117.4	0.00	0.00	
4,900.0	2.51	320.19	4,895.7	153.8	-128.2	-120.1	0.00	0.00	
5,000.0	2.51	320.19	4,995.6	157.2	-131.0	-122.7	0.00	0.00	

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Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
5,100.0	2.51	320.19	5,095.5	160.5	-133.8	-125.3	0.00	0.00	
5,200.0	2.51	320.19	5,195.4	163.9	-136.6	-127.9	0.00	0.00	
5,300.0	2.51	320.19	5,295.3	167.2	-139.4	-130.6	0.00	0.00	
5,400.0	2.51	320.19	5,395.2	170.6	-142.2	-133.2	0.00	0.00	
5,500.0	2.51	320.19	5,495.1	174.0	-145.0	-135.8	0.00	0.00	
5,600.0	2.51	320.19	5,595.0	177.3	-147.8	-138.4	0.00	0.00	
5,700.0	2.51	320.19	5,694.9	180.7	-150.6	-141.1	0.00	0.00	
5,800.0	2.51	320.19	5,794.8	184.0	-153.4	-143.7	0.00	0.00	
5,900.0	2.51	320.19	5,894.7	187.4	-156.2	-146.3	0.00	0.00	
6,000.0	2.51	320.19	5,994.6	190.8	-159.0	-148.9	0.00	0.00	
6,100.0	2.51	320.19	6,094.5	194.1	-161.8	-151.5	0.00	0.00	
6,200.0	2.51	320.19	6,194.4	197.5	-164.6	-154.2	0.00	0.00	
6,300.0	2.51	320.19	6,294.3	200.9	-167.4	-156.8	0.00	0.00	
6,400.0	2.51	320.19	6,394.2	204.2	-170.2	-159.4	0.00	0.00	
6,500.0	2.51	320.19	6,494.1	207.6	-173.0	-162.0	0.00	0.00	
6,600.0	2.51	320.19	6,594.0	210.9	-175.8	-164.7	0.00	0.00	
6,673.1	2.51	320.19	6,667.1	213.4	-177.9	-166.6	0.00	0.00	Start build/turn @ 6673' MD
6,700.0	2.21	29.33	6,693.9	214.3	-178.0	-166.7	10.00	-1.10	
6,800.0	11.25	80.22	6,793.2	217.7	-167.4	-155.9	10.00	9.04	
6,900.0	21.17	84.98	6,889.1	220.9	-139.7	-128.1	10.00	9.92	
7,000.0	31.14	86.77	6,978.8	223.9	-95.8	-84.1	10.00	9.97	
7,100.0	41.12	87.76	7,059.4	226.7	-37.0	-25.2	10.00	9.98	
7,200.0	51.11	88.41	7,128.7	229.1	35.0	46.7	10.00	9.99	
7,300.0	61.10	88.90	7,184.3	231.0	117.8	129.6	10.00	9.99	
7,400.0	71.10	89.31	7,224.8	232.4	209.1	220.9	10.00	9.99	
7,500.0	81.09	89.67	7,248.8	233.3	306.1	317.7	10.00	9.99	
7,598.7	90.95	90.00	7,255.7	233.5	404.4	415.9	10.00	9.99	LP @ 7255' TVD; 90.95°
7,600.0	90.95	90.00	7,255.6	233.5	405.7	417.2	0.00	0.00	
7,700.0	90.95	90.00	7,254.0	233.5	505.7	517.1	0.00	0.00	
7,800.0	90.95	90.00	7,252.3	233.5	605.7	616.9	0.00	0.00	
7,900.0	90.95	90.00	7,250.7	233.5	705.7	716.8	0.00	0.00	
8,000.0	90.95	90.00	7,249.0	233.5	805.7	816.6	0.00	0.00	
8,100.0	90.95	90.00	7,247.3	233.5	905.6	916.5	0.00	0.00	
8,200.0	90.95	90.00	7,245.7	233.5	1,005.6	1,016.4	0.00	0.00	
8,300.0	90.95	90.00	7,244.0	233.5	1,105.6	1,116.2	0.00	0.00	
8,400.0	90.95	90.00	7,242.4	233.5	1,205.6	1,216.1	0.00	0.00	
8,500.0	90.95	90.00	7,240.7	233.5	1,305.6	1,315.9	0.00	0.00	
8,600.0	90.95	90.00	7,239.1	233.5	1,405.6	1,415.8	0.00	0.00	
8,700.0	90.95	90.00	7,237.4	233.5	1,505.6	1,515.6	0.00	0.00	
8,800.0	90.95	90.00	7,235.7	233.5	1,605.5	1,615.5	0.00	0.00	
8,900.0	90.95	90.00	7,234.1	233.5	1,705.5	1,715.3	0.00	0.00	
9,000.0	90.95	90.00	7,232.4	233.5	1,805.5	1,815.2	0.00	0.00	
9,100.0	90.95	90.00	7,230.8	233.5	1,905.5	1,915.0	0.00	0.00	
9,200.0	90.95	90.00	7,229.1	233.5	2,005.5	2,014.9	0.00	0.00	
9,300.0	90.95	90.00	7,227.4	233.5	2,105.5	2,114.7	0.00	0.00	
9,400.0	90.95	90.00	7,225.8	233.5	2,205.5	2,214.6	0.00	0.00	
9,500.0	90.95	90.00	7,224.1	233.5	2,305.5	2,314.4	0.00	0.00	
9,600.0	90.95	90.00	7,222.5	233.5	2,405.4	2,414.3	0.00	0.00	
9,700.0	90.95	90.00	7,220.8	233.5	2,505.4	2,514.1	0.00	0.00	
9,800.0	90.95	90.00	7,219.2	233.5	2,605.4	2,614.0	0.00	0.00	
9,900.0	90.95	90.00	7,217.5	233.5	2,705.4	2,713.8	0.00	0.00	
10,000.0	90.95	90.00	7,215.8	233.5	2,805.4	2,813.7	0.00	0.00	

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Project:	Wattenberg	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site:	S32-T4N-R67W (Hepp)	North Reference:	True
Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
10,100.0	90.95	90.00	7,214.2	233.5	2,905.4	2,913.6	0.00	0.00	
10,200.0	90.95	90.00	7,212.5	233.5	3,005.4	3,013.4	0.00	0.00	
10,300.0	90.95	90.00	7,210.9	233.5	3,105.3	3,113.3	0.00	0.00	
10,400.0	90.95	90.00	7,209.2	233.5	3,205.3	3,213.1	0.00	0.00	
10,500.0	90.95	90.00	7,207.6	233.5	3,305.3	3,313.0	0.00	0.00	
10,600.0	90.95	90.00	7,205.9	233.5	3,405.3	3,412.8	0.00	0.00	
10,700.0	90.95	90.00	7,204.2	233.5	3,505.3	3,512.7	0.00	0.00	
10,800.0	90.95	90.00	7,202.6	233.5	3,605.3	3,612.5	0.00	0.00	
10,900.0	90.95	90.00	7,200.9	233.5	3,705.3	3,712.4	0.00	0.00	
11,000.0	90.95	90.00	7,199.3	233.5	3,805.2	3,812.2	0.00	0.00	
11,100.0	90.95	90.00	7,197.6	233.5	3,905.2	3,912.1	0.00	0.00	
11,200.0	90.95	90.00	7,195.9	233.5	4,005.2	4,011.9	0.00	0.00	
11,300.0	90.95	90.00	7,194.3	233.5	4,105.2	4,111.8	0.00	0.00	
11,400.0	90.95	90.00	7,192.6	233.5	4,205.2	4,211.6	0.00	0.00	
11,500.0	90.95	90.00	7,191.0	233.5	4,305.2	4,311.5	0.00	0.00	
11,558.7	90.95	90.00	7,190.0	233.5	4,363.8	4,370.1	0.00	0.00	TD at 11558.7 - #32-1H PBHL

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
#32-1H PBHL - plan hits target center - Point	0.00	0.00	7,190.0	233.5	4,363.8	1,344,225.10	3,165,540.07	40.276770	-104.906720

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200'
450.8	450.7	4.2	-3.5	EOB; Inc=2.51°
6,673.1	6,667.1	213.4	-177.9	Start build/turn @ 6673' MD
7,598.7	7,255.7	233.5	404.4	LP @ 7255' TVD; 90.95°
11,558.7	7,190.0	233.5	4,363.8	TD at 11558.7

K. P. Kauffman Company, Inc.

Wattenberg

S32-T4N-R67W (Hepp)

Hepp #32-1H

HZ

Plan #1

Anticollision Report

19 July, 2013

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,344.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	7/19/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,708.7	Plan #1 (HZ)	Geolink MWD	Geolink MWD

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S32-T4N-R67W (Hepp)						
Hepp #32-2H - HZ - Plan #1	200.0	200.0	21.9	21.2	33.300	CC, ES
Hepp #32-2H - HZ - Plan #1	11,708.7	11,699.4	309.6	80.8	1.353	Level 3, SF
Hepp #32-3H - HZ - Plan #1	200.0	201.0	43.7	43.1	66.430	CC, ES
Hepp #32-3H - HZ - Plan #1	11,708.7	11,705.1	619.3	390.5	2.707	SF
Hepp #32-4H - HZ - Plan #1	200.0	201.0	69.2	68.6	105.185	CC, ES
Hepp #32-4H - HZ - Plan #1	11,708.7	11,723.0	928.9	700.1	4.060	SF
Hepp #32-5H - HZ - Plan #1	200.0	201.0	91.1	90.5	138.468	CC, ES
Hepp #32-5H - HZ - Plan #1	11,708.7	11,836.7	1,093.5	867.9	4.847	SF
Hepp #32-6H - HZ - Plan #1	200.0	202.0	113.0	112.3	171.220	CC, ES
Hepp #32-6H - HZ - Plan #1	11,708.7	11,744.9	1,227.7	998.9	5.366	SF
Hepp #32-7H - HZ - Plan #1	166.0	168.0	134.8	134.3	249.187	CC
Hepp #32-7H - HZ - Plan #1	200.0	202.0	134.8	134.2	204.365	ES
Hepp #32-7H - HZ - Plan #1	6,400.0	6,247.3	1,335.3	1,312.7	58.980	SF

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-2H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-21.9	0.0	21.9					
100.0	100.0	100.0	100.0	0.2	0.2	180.00	-21.9	0.0	21.9	21.5	0.31	71.142		
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-21.9	0.0	21.9	21.2	0.66	33.300 CC, ES		
300.0	300.0	300.0	300.0	0.5	0.5	-141.61	-21.9	0.0	22.5	21.5	1.01	22.405		
400.0	400.0	400.0	400.0	0.7	0.7	-145.38	-21.9	0.0	24.6	23.3	1.36	18.168		
500.0	499.9	499.9	499.9	0.9	0.9	-150.18	-21.9	0.0	28.2	26.4	1.71	16.494		
600.0	599.8	599.8	599.8	1.1	1.0	-154.07	-21.9	0.0	32.0	30.0	2.06	15.568		
700.0	699.7	699.7	699.7	1.2	1.2	-157.12	-21.9	0.0	36.0	33.6	2.41	14.962		
800.0	799.6	799.6	799.6	1.4	1.4	-158.31	-22.1	-0.8	40.0	37.3	2.76	14.520		
900.0	899.5	899.5	899.5	1.6	1.6	-157.09	-22.8	-3.3	44.0	40.9	3.11	14.147		
1,000.0	999.4	999.5	999.4	1.8	1.7	-155.49	-23.6	-6.2	48.0	44.5	3.47	13.848		
1,100.0	1,099.3	1,099.4	1,099.2	2.0	1.9	-154.14	-24.5	-9.1	52.0	48.2	3.82	13.607		
1,200.0	1,199.2	1,199.3	1,199.1	2.2	2.1	-152.98	-25.3	-12.1	56.1	51.9	4.18	13.411		
1,300.0	1,299.1	1,299.2	1,299.0	2.4	2.3	-151.98	-26.1	-15.0	60.2	55.6	4.54	13.248		
1,400.0	1,399.0	1,399.1	1,398.8	2.6	2.4	-151.10	-27.0	-17.9	64.3	59.4	4.90	13.110		
1,500.0	1,498.9	1,499.0	1,498.7	2.8	2.6	-150.33	-27.8	-20.8	68.4	63.1	5.26	12.992		
1,600.0	1,598.8	1,598.9	1,598.6	2.9	2.8	-149.65	-28.6	-23.8	72.5	66.9	5.62	12.891		
1,700.0	1,698.7	1,698.8	1,698.4	3.1	3.0	-149.04	-29.5	-26.7	76.6	70.6	5.98	12.803		
1,800.0	1,798.6	1,798.8	1,798.3	3.3	3.2	-148.49	-30.3	-29.6	80.7	74.4	6.35	12.725		
1,900.0	1,898.5	1,898.7	1,898.2	3.5	3.3	-148.00	-31.2	-32.5	84.9	78.2	6.71	12.656		
2,000.0	1,998.4	1,998.6	1,998.0	3.7	3.5	-147.55	-32.0	-35.5	89.0	82.0	7.07	12.595		
2,100.0	2,098.3	2,098.5	2,097.9	3.9	3.7	-147.14	-32.8	-38.4	93.2	85.8	7.43	12.540		
2,200.0	2,198.2	2,198.4	2,197.8	4.1	3.9	-146.77	-33.7	-41.3	97.3	89.5	7.79	12.491		
2,300.0	2,298.1	2,298.3	2,297.6	4.3	4.1	-146.43	-34.5	-44.2	101.5	93.3	8.15	12.446		
2,400.0	2,398.1	2,398.2	2,397.5	4.5	4.3	-146.11	-35.3	-47.2	105.7	97.1	8.52	12.405		
2,500.0	2,498.0	2,498.1	2,497.4	4.7	4.4	-145.82	-36.2	-50.1	109.8	100.9	8.88	12.368		
2,600.0	2,597.9	2,598.1	2,597.2	4.9	4.6	-145.55	-37.0	-53.0	114.0	104.7	9.24	12.334		
2,700.0	2,697.8	2,698.0	2,697.1	5.0	4.8	-145.30	-37.8	-55.9	118.2	108.6	9.60	12.303		
2,800.0	2,797.7	2,797.9	2,797.0	5.2	5.0	-145.07	-38.7	-58.9	122.3	112.4	9.97	12.274		
2,900.0	2,897.6	2,897.8	2,896.8	5.4	5.2	-144.85	-39.5	-61.8	126.5	116.2	10.33	12.247		
3,000.0	2,997.5	2,997.7	2,996.7	5.6	5.3	-144.64	-40.4	-64.7	130.7	120.0	10.69	12.222		
3,100.0	3,097.4	3,097.6	3,096.6	5.8	5.5	-144.45	-41.2	-67.6	134.9	123.8	11.05	12.199		
3,200.0	3,197.3	3,197.5	3,196.4	6.0	5.7	-144.27	-42.0	-70.6	139.0	127.6	11.42	12.178		
3,300.0	3,297.2	3,297.4	3,296.3	6.2	5.9	-144.10	-42.9	-73.5	143.2	131.4	11.78	12.157		
3,400.0	3,397.1	3,397.3	3,396.1	6.4	6.1	-143.94	-43.7	-76.4	147.4	135.2	12.14	12.138		
3,500.0	3,497.0	3,497.3	3,496.0	6.6	6.3	-143.79	-44.5	-79.3	151.6	139.1	12.51	12.121		
3,600.0	3,596.9	3,597.2	3,595.9	6.8	6.4	-143.64	-45.4	-82.3	155.8	142.9	12.87	12.104		
3,700.0	3,696.8	3,697.1	3,695.7	6.9	6.6	-143.51	-46.2	-85.2	159.9	146.7	13.23	12.088		
3,800.0	3,796.7	3,797.0	3,795.6	7.1	6.8	-143.38	-47.0	-88.1	164.1	150.5	13.59	12.073		
3,900.0	3,896.6	3,896.9	3,895.5	7.3	7.0	-143.26	-47.9	-91.0	168.3	154.3	13.96	12.059		
4,000.0	3,996.5	3,996.8	3,995.3	7.5	7.2	-143.14	-48.7	-94.0	172.5	158.2	14.32	12.046		
4,100.0	4,096.4	4,096.7	4,095.2	7.7	7.3	-143.03	-49.6	-96.9	176.7	162.0	14.68	12.033		
4,200.0	4,196.3	4,196.6	4,195.1	7.9	7.5	-142.92	-50.4	-99.8	180.9	165.8	15.05	12.021		
4,300.0	4,296.2	4,296.6	4,294.9	8.1	7.7	-142.82	-51.2	-102.7	185.1	169.6	15.41	12.010		
4,400.0	4,396.1	4,396.5	4,394.8	8.3	7.9	-142.73	-52.1	-105.7	189.2	173.5	15.77	11.999		
4,500.0	4,496.0	4,496.4	4,494.7	8.5	8.1	-142.63	-52.9	-108.6	193.4	177.3	16.13	11.989		
4,600.0	4,595.9	4,596.3	4,594.5	8.7	8.3	-142.54	-53.7	-111.5	197.6	181.1	16.50	11.979		
4,700.0	4,695.8	4,696.2	4,694.4	8.9	8.4	-142.46	-54.6	-114.4	201.8	184.9	16.86	11.970		
4,800.0	4,795.8	4,796.1	4,794.3	9.0	8.6	-142.38	-55.4	-117.4	206.0	188.8	17.22	11.961		
4,900.0	4,895.7	4,896.0	4,894.1	9.2	8.8	-142.30	-56.2	-120.3	210.2	192.6	17.59	11.952		
5,000.0	4,995.6	4,995.9	4,994.0	9.4	9.0	-142.23	-57.1	-123.2	214.4	196.4	17.95	11.944		
5,100.0	5,095.5	5,095.8	5,093.9	9.6	9.2	-142.15	-57.9	-126.2	218.6	200.3	18.31	11.936		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-2H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,200.0	5,195.4	5,195.8	5,193.7	9.8	9.4	-142.08	-58.8	-129.1	222.8	204.1	18.68	11.928		
5,300.0	5,295.3	5,295.7	5,293.6	10.0	9.5	-142.02	-59.6	-132.0	227.0	207.9	19.04	11.921		
5,400.0	5,395.2	5,395.6	5,393.5	10.2	9.7	-141.95	-60.4	-134.9	231.1	211.7	19.40	11.914		
5,500.0	5,495.1	5,495.5	5,493.3	10.4	9.9	-141.89	-61.3	-137.9	235.3	215.6	19.76	11.907		
5,600.0	5,595.0	5,595.4	5,593.2	10.6	10.1	-141.83	-62.1	-140.8	239.5	219.4	20.13	11.901		
5,700.0	5,694.9	5,695.3	5,693.1	10.8	10.3	-141.77	-62.9	-143.7	243.7	223.2	20.49	11.895		
5,800.0	5,794.8	5,795.2	5,792.9	10.9	10.4	-141.72	-63.8	-146.6	247.9	227.1	20.85	11.889		
5,900.0	5,894.7	5,895.1	5,892.8	11.1	10.6	-141.66	-64.6	-149.6	252.1	230.9	21.22	11.883		
6,000.0	5,994.6	5,995.1	5,992.6	11.3	10.8	-141.61	-65.4	-152.5	256.3	234.7	21.58	11.877		
6,100.0	6,094.5	6,095.0	6,092.5	11.5	11.0	-141.56	-66.3	-155.4	260.5	238.6	21.94	11.872		
6,200.0	6,194.4	6,194.9	6,192.4	11.7	11.2	-141.51	-67.1	-158.3	264.7	242.4	22.31	11.867		
6,300.0	6,294.3	6,294.8	6,292.2	11.9	11.4	-141.46	-68.0	-161.3	268.9	246.2	22.67	11.862		
6,400.0	6,394.2	6,394.7	6,392.1	12.1	11.5	-141.42	-68.8	-164.2	273.1	250.1	23.03	11.857		
6,500.0	6,494.1	6,494.6	6,492.0	12.3	11.7	-141.37	-69.6	-167.1	277.3	253.9	23.40	11.852		
6,600.0	6,594.0	6,594.5	6,591.8	12.5	11.9	-141.33	-70.5	-170.0	281.5	257.7	23.76	11.847		
6,700.0	6,693.9	6,694.2	6,691.5	12.7	12.1	149.52	-71.3	-172.4	285.7	261.6	24.11	11.849		
6,800.0	6,793.2	6,793.2	6,789.8	12.8	12.2	98.49	-72.1	-162.4	289.8	265.5	24.32	11.917		
6,900.0	6,889.1	6,892.2	6,885.1	12.8	12.2	93.64	-72.9	-135.6	293.9	269.4	24.44	12.026		
7,000.0	6,978.8	6,991.5	6,974.4	12.9	12.3	91.81	-73.7	-92.7	297.7	273.1	24.56	12.120		
7,100.0	7,059.4	7,090.8	7,055.1	13.0	12.4	90.86	-74.4	-35.0	301.1	276.2	24.85	12.116		
7,200.0	7,128.7	7,190.4	7,124.8	13.2	12.8	90.31	-75.0	36.0	304.0	278.5	25.52	11.912		
7,300.0	7,184.3	7,290.2	7,181.3	13.8	13.4	90.01	-75.4	118.1	306.4	279.7	26.78	11.441		
7,400.0	7,224.8	7,390.1	7,222.7	14.7	14.4	89.88	-75.8	208.9	308.2	279.4	28.76	10.715		
7,500.0	7,248.8	7,490.3	7,247.8	16.0	15.7	89.88	-76.0	305.8	309.3	277.8	31.45	9.834		
7,600.0	7,255.6	7,590.7	7,255.7	17.6	17.3	90.01	-76.1	405.7	309.6	275.0	34.69	8.926		
7,700.0	7,254.0	7,690.7	7,254.1	19.4	19.1	90.02	-76.1	505.7	309.6	271.3	38.31	8.082		
7,800.0	7,252.3	7,790.7	7,252.4	21.3	21.1	90.02	-76.1	605.7	309.6	267.4	42.20	7.338		
7,900.0	7,250.7	7,890.7	7,250.8	23.4	23.1	90.02	-76.1	705.7	309.6	263.4	46.29	6.689		
8,000.0	7,249.0	7,990.7	7,249.1	25.5	25.2	90.02	-76.1	805.7	309.6	259.1	50.53	6.128		
8,100.0	7,247.3	8,090.7	7,247.4	27.6	27.4	90.02	-76.1	905.6	309.6	254.8	54.89	5.641		
8,200.0	7,245.7	8,190.7	7,245.8	29.9	29.6	90.02	-76.1	1,005.6	309.6	250.3	59.35	5.218		
8,300.0	7,244.0	8,290.7	7,244.1	32.1	31.9	90.02	-76.1	1,105.6	309.6	245.8	63.87	4.848		
8,400.0	7,242.4	8,390.7	7,242.5	34.4	34.2	90.02	-76.1	1,205.6	309.6	241.2	68.46	4.523		
8,500.0	7,240.7	8,490.7	7,240.8	36.7	36.5	90.02	-76.1	1,305.6	309.6	236.6	73.09	4.236		
8,600.0	7,239.1	8,590.7	7,239.1	39.0	38.9	90.02	-76.1	1,405.6	309.6	231.9	77.76	3.982		
8,700.0	7,237.4	8,690.7	7,237.5	41.4	41.2	90.02	-76.1	1,505.6	309.6	227.2	82.46	3.755		
8,800.0	7,235.7	8,790.7	7,235.8	43.7	43.6	90.02	-76.1	1,605.5	309.6	222.4	87.20	3.551		
8,900.0	7,234.1	8,890.7	7,234.2	46.1	45.9	90.02	-76.1	1,705.5	309.6	217.7	91.95	3.368		
9,000.0	7,232.4	8,990.7	7,232.5	48.5	48.3	90.02	-76.1	1,805.5	309.6	212.9	96.72	3.201		
9,100.0	7,230.8	9,090.7	7,230.9	50.9	50.7	90.02	-76.1	1,905.5	309.6	208.1	101.51	3.050		
9,200.0	7,229.1	9,190.7	7,229.2	53.3	53.1	90.02	-76.1	2,005.5	309.6	203.3	106.32	2.913		
9,300.0	7,227.4	9,290.7	7,227.5	55.7	55.5	90.02	-76.1	2,105.5	309.6	198.5	111.13	2.786		
9,400.0	7,225.8	9,390.7	7,225.9	58.1	57.9	90.02	-76.1	2,205.5	309.6	193.7	115.96	2.670		
9,500.0	7,224.1	9,490.7	7,224.2	60.5	60.4	90.02	-76.1	2,305.5	309.6	188.8	120.80	2.563		
9,600.0	7,222.5	9,590.7	7,222.6	62.9	62.8	90.02	-76.1	2,405.4	309.6	184.0	125.64	2.464		
9,700.0	7,220.8	9,690.7	7,220.9	65.4	65.2	90.02	-76.1	2,505.4	309.6	179.1	130.50	2.373		
9,800.0	7,219.2	9,790.7	7,219.3	67.8	67.6	90.02	-76.1	2,605.4	309.6	174.3	135.36	2.288		
9,900.0	7,217.5	9,890.7	7,217.6	70.2	70.1	90.02	-76.1	2,705.4	309.6	169.4	140.22	2.208		
10,000.0	7,215.8	9,990.7	7,215.9	72.6	72.5	90.02	-76.1	2,805.4	309.6	164.5	145.10	2.134		
10,100.0	7,214.2	10,090.7	7,214.3	75.1	75.0	90.02	-76.1	2,905.4	309.6	159.7	149.97	2.065		
10,200.0	7,212.5	10,190.7	7,212.6	77.5	77.4	90.02	-76.1	3,005.4	309.6	154.8	154.86	2.000		
10,300.0	7,210.9	10,290.7	7,211.0	80.0	79.8	90.02	-76.1	3,105.3	309.6	149.9	159.74	1.938		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-2H - HZ - Plan #1											Offset Site Error:		0.0 ft	
Survey Program: 0-Geolink MWD											Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)				
10,400.0	7,209.2	10,390.7	7,209.3	82.4	82.3	90.02	-76.1	3,205.3	309.6	145.0	164.63	1.881		
10,500.0	7,207.6	10,490.7	7,207.6	84.9	84.7	90.02	-76.1	3,305.3	309.6	140.1	169.52	1.827		
10,600.0	7,205.9	10,590.7	7,206.0	87.3	87.2	90.02	-76.1	3,405.3	309.6	135.2	174.42	1.775		
10,700.0	7,204.2	10,690.7	7,204.3	89.7	89.6	90.02	-76.1	3,505.3	309.6	130.3	179.32	1.727		
10,800.0	7,202.6	10,790.7	7,202.7	92.2	92.1	90.02	-76.1	3,605.3	309.6	125.4	184.22	1.681		
10,900.0	7,200.9	10,890.7	7,201.0	94.6	94.5	90.02	-76.1	3,705.3	309.6	120.5	189.12	1.637		
11,000.0	7,199.3	10,990.7	7,199.4	97.1	97.0	90.02	-76.1	3,805.2	309.6	115.6	194.03	1.596		
11,100.0	7,197.6	11,090.7	7,197.7	99.6	99.4	90.02	-76.1	3,905.2	309.6	110.7	198.94	1.556		
11,200.0	7,195.9	11,190.7	7,196.0	102.0	101.9	90.02	-76.1	4,005.2	309.6	105.8	203.85	1.519		
11,300.0	7,194.3	11,290.7	7,194.4	104.5	104.3	90.02	-76.1	4,105.2	309.6	100.9	208.76	1.483	Level 3	
11,400.0	7,192.6	11,390.7	7,192.7	106.9	106.8	90.02	-76.1	4,205.2	309.6	96.0	213.67	1.449	Level 3	
11,500.0	7,191.0	11,490.7	7,191.1	109.4	109.3	90.02	-76.1	4,305.2	309.6	91.1	218.59	1.417	Level 3	
11,600.0	7,189.3	11,590.7	7,189.4	111.8	111.7	90.02	-76.1	4,405.2	309.6	86.1	223.50	1.385	Level 3	
11,700.0	7,187.7	11,690.7	7,187.8	114.3	114.2	90.02	-76.1	4,505.2	309.6	81.2	228.42	1.356	Level 3	
11,708.7	7,187.5	11,699.4	7,187.6	114.5	114.4	90.02	-76.1	4,513.8	309.6	80.8	228.85	1.353	Level 3, SF	

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-3H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis			
0.0	0.0	1.0	1.0	0.0	0.0	180.00	-43.7	0.0	43.7					
100.0	100.0	101.0	101.0	0.2	0.2	180.00	-43.7	0.0	43.7	43.4	0.31	141.493		
200.0	200.0	201.0	201.0	0.3	0.3	180.00	-43.7	0.0	43.7	43.1	0.66	66.430 CC, ES		
300.0	300.0	301.0	301.0	0.5	0.5	-140.91	-43.7	0.0	44.4	43.4	1.01	44.060		
400.0	400.0	401.0	401.0	0.7	0.7	-142.93	-43.7	0.0	46.4	45.1	1.36	34.201		
500.0	499.9	500.9	500.9	0.9	0.9	-145.80	-43.7	0.0	49.8	48.1	1.71	29.141		
600.0	599.8	600.8	600.8	1.1	1.0	-148.44	-43.7	0.0	53.5	51.4	2.06	25.955		
700.0	699.7	700.0	700.0	1.2	1.2	-150.17	-44.5	-0.4	58.0	55.5	2.41	24.033		
800.0	799.6	798.9	798.9	1.4	1.4	-150.66	-46.7	-1.7	63.8	61.0	2.76	23.089		
900.0	899.5	897.7	897.6	1.6	1.6	-150.18	-50.5	-3.7	71.0	67.9	3.12	22.770		
1,000.0	999.4	996.9	996.6	1.8	1.7	-149.14	-55.6	-6.5	79.3	75.8	3.47	22.830		
1,100.0	1,099.3	1,096.6	1,096.1	2.0	1.9	-148.22	-60.8	-9.3	87.8	84.0	3.83	22.911		
1,200.0	1,199.2	1,196.2	1,195.5	2.2	2.1	-147.46	-66.0	-12.2	96.3	92.1	4.19	22.979		
1,300.0	1,299.1	1,295.8	1,295.0	2.4	2.3	-146.83	-71.3	-15.0	104.9	100.3	4.55	23.036		
1,400.0	1,399.0	1,395.4	1,394.4	2.6	2.5	-146.29	-76.5	-17.9	113.4	108.5	4.91	23.086		
1,500.0	1,498.9	1,495.1	1,493.9	2.8	2.7	-145.83	-81.7	-20.7	122.0	116.7	5.27	23.130		
1,600.0	1,598.8	1,594.7	1,593.3	2.9	2.9	-145.42	-87.0	-23.6	130.6	124.9	5.64	23.168		
1,700.0	1,698.7	1,694.3	1,692.8	3.1	3.1	-145.07	-92.2	-26.5	139.1	133.1	6.00	23.202		
1,800.0	1,798.6	1,794.0	1,792.2	3.3	3.3	-144.76	-97.5	-29.3	147.7	141.4	6.36	23.233		
1,900.0	1,898.5	1,893.6	1,891.7	3.5	3.5	-144.48	-102.7	-32.2	156.3	149.6	6.72	23.261		
2,000.0	1,998.4	1,993.2	1,991.1	3.7	3.7	-144.23	-107.9	-35.0	164.9	157.8	7.08	23.286		
2,100.0	2,098.3	2,092.8	2,090.6	3.9	3.9	-144.01	-113.2	-37.9	173.5	166.0	7.44	23.309		
2,200.0	2,198.2	2,192.5	2,190.0	4.1	4.1	-143.81	-118.4	-40.7	182.1	174.2	7.80	23.330		
2,300.0	2,298.1	2,292.1	2,289.5	4.3	4.3	-143.62	-123.7	-43.6	190.6	182.5	8.16	23.349		
2,400.0	2,398.1	2,391.7	2,388.9	4.5	4.5	-143.45	-128.9	-46.5	199.2	190.7	8.53	23.367		
2,500.0	2,498.0	2,491.4	2,488.4	4.7	4.7	-143.30	-134.1	-49.3	207.8	198.9	8.89	23.383		
2,600.0	2,597.9	2,591.0	2,587.8	4.9	4.9	-143.15	-139.4	-52.2	216.4	207.2	9.25	23.399		
2,700.0	2,697.8	2,690.6	2,687.3	5.0	5.1	-143.02	-144.6	-55.0	225.0	215.4	9.61	23.413		
2,800.0	2,797.7	2,790.2	2,786.7	5.2	5.3	-142.90	-149.8	-57.9	233.6	223.6	9.97	23.426		
2,900.0	2,897.6	2,889.9	2,886.2	5.4	5.5	-142.79	-155.1	-60.7	242.2	231.9	10.33	23.438		
3,000.0	2,997.5	2,989.5	2,985.6	5.6	5.7	-142.68	-160.3	-63.6	250.8	240.1	10.70	23.450		
3,100.0	3,097.4	3,089.1	3,085.1	5.8	5.9	-142.58	-165.6	-66.5	259.4	248.4	11.06	23.461		
3,200.0	3,197.3	3,188.8	3,184.5	6.0	6.1	-142.49	-170.8	-69.3	268.0	256.6	11.42	23.471		
3,300.0	3,297.2	3,288.4	3,284.0	6.2	6.3	-142.40	-176.0	-72.2	276.6	264.8	11.78	23.481		
3,400.0	3,397.1	3,388.0	3,383.4	6.4	6.5	-142.32	-181.3	-75.0	285.2	273.1	12.14	23.490		
3,500.0	3,497.0	3,487.6	3,482.9	6.6	6.7	-142.25	-186.5	-77.9	293.8	281.3	12.50	23.499		
3,600.0	3,596.9	3,587.3	3,582.3	6.8	6.9	-142.17	-191.7	-80.7	302.4	289.6	12.87	23.507		
3,700.0	3,696.8	3,686.9	3,681.8	6.9	7.1	-142.11	-197.0	-83.6	311.0	297.8	13.23	23.515		
3,800.0	3,796.7	3,786.5	3,781.2	7.1	7.3	-142.04	-202.2	-86.5	319.6	306.1	13.59	23.522		
3,900.0	3,896.6	3,886.2	3,880.7	7.3	7.5	-141.98	-207.5	-89.3	328.3	314.3	13.95	23.529		
4,000.0	3,996.5	3,985.8	3,980.1	7.5	7.7	-141.92	-212.7	-92.2	336.9	322.5	14.31	23.536		
4,100.0	4,096.4	4,085.4	4,079.6	7.7	7.9	-141.87	-217.9	-95.0	345.5	330.8	14.67	23.542		
4,200.0	4,196.3	4,185.0	4,179.0	7.9	8.1	-141.82	-223.2	-97.9	354.1	339.0	15.04	23.548		
4,300.0	4,296.2	4,284.7	4,278.5	8.1	8.3	-141.77	-228.4	-100.7	362.7	347.3	15.40	23.554		
4,400.0	4,396.1	4,384.3	4,377.9	8.3	8.5	-141.72	-233.7	-103.6	371.3	355.5	15.76	23.559		
4,500.0	4,496.0	4,483.9	4,477.4	8.5	8.7	-141.67	-238.9	-106.4	379.9	363.8	16.12	23.565		
4,600.0	4,595.9	4,583.6	4,576.8	8.7	8.9	-141.63	-244.1	-109.3	388.5	372.0	16.48	23.570		
4,700.0	4,695.8	4,683.2	4,676.3	8.9	9.1	-141.59	-249.4	-112.2	397.1	380.3	16.84	23.575		
4,800.0	4,795.8	4,782.8	4,775.7	9.0	9.3	-141.55	-254.6	-115.0	405.7	388.5	17.21	23.579		
4,900.0	4,895.7	4,882.4	4,875.2	9.2	9.5	-141.51	-259.8	-117.9	414.3	396.8	17.57	23.584		
5,000.0	4,995.6	4,982.1	4,974.6	9.4	9.7	-141.47	-265.1	-120.7	422.9	405.0	17.93	23.588		
5,100.0	5,095.5	5,081.7	5,074.1	9.6	10.0	-141.44	-270.3	-123.6	431.5	413.2	18.29	23.592		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-3H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,200.0	5,195.4	5,181.3	5,173.5		9.8	10.2	-141.40	-275.6	-126.4	440.1	421.5	18.65	23.596	
5,300.0	5,295.3	5,281.0	5,273.0		10.0	10.4	-141.37	-280.8	-129.3	448.8	429.7	19.01	23.600	
5,400.0	5,395.2	5,380.6	5,372.4		10.2	10.6	-141.34	-286.0	-132.2	457.4	438.0	19.38	23.604	
5,500.0	5,495.1	5,480.2	5,471.9		10.4	10.8	-141.31	-291.3	-135.0	466.0	446.2	19.74	23.608	
5,600.0	5,595.0	5,579.8	5,571.3		10.6	11.0	-141.28	-296.5	-137.9	474.6	454.5	20.10	23.611	
5,700.0	5,694.9	5,679.5	5,670.8		10.8	11.2	-141.25	-301.7	-140.7	483.2	462.7	20.46	23.614	
5,800.0	5,794.8	5,779.1	5,770.2		10.9	11.4	-141.23	-307.0	-143.6	491.8	471.0	20.82	23.618	
5,900.0	5,894.7	5,878.7	5,869.7		11.1	11.6	-141.20	-312.2	-146.4	500.4	479.2	21.18	23.621	
6,000.0	5,994.6	5,978.4	5,969.1		11.3	11.8	-141.18	-317.5	-149.3	509.0	487.5	21.55	23.624	
6,100.0	6,094.5	6,078.0	6,068.6		11.5	12.0	-141.15	-322.7	-152.2	517.6	495.7	21.91	23.627	
6,200.0	6,194.4	6,177.6	6,168.0		11.7	12.2	-141.13	-327.9	-155.0	526.2	504.0	22.27	23.630	
6,300.0	6,294.3	6,277.2	6,267.5		11.9	12.4	-141.10	-333.2	-157.9	534.8	512.2	22.63	23.632	
6,400.0	6,394.2	6,376.9	6,366.9		12.1	12.6	-141.08	-338.4	-160.7	543.5	520.5	22.99	23.635	
6,500.0	6,494.1	6,476.5	6,466.4		12.3	12.8	-141.06	-343.7	-163.6	552.1	528.7	23.36	23.638	
6,600.0	6,594.0	6,576.1	6,565.8		12.5	13.0	-141.04	-348.9	-166.4	560.7	537.0	23.72	23.640	
6,700.0	6,693.9	6,675.7	6,665.2		12.7	13.2	149.72	-354.1	-169.3	569.3	545.2	24.07	23.646	
6,800.0	6,793.2	6,774.1	6,763.2		12.8	13.3	98.67	-359.3	-164.0	577.8	553.5	24.31	23.766	
6,900.0	6,889.1	6,873.4	6,859.8		12.8	13.4	93.80	-364.4	-141.8	586.1	561.6	24.44	23.979	
7,000.0	6,978.8	6,973.7	6,951.9		12.9	13.5	91.94	-369.3	-102.7	593.9	569.4	24.56	24.186	
7,100.0	7,059.4	7,075.1	7,036.6		13.0	13.6	90.95	-373.8	-47.5	601.1	576.2	24.82	24.221	
7,200.0	7,128.7	7,177.5	7,111.1		13.2	13.8	90.37	-377.8	22.5	607.3	581.8	25.44	23.871	
7,300.0	7,184.3	7,281.0	7,172.4		13.8	14.3	90.02	-381.1	105.6	612.3	585.7	26.65	22.974	
7,400.0	7,224.8	7,385.3	7,218.2		14.7	15.1	89.85	-383.6	199.1	616.1	587.5	28.62	21.529	
7,500.0	7,248.8	7,490.4	7,246.4		16.0	16.3	89.82	-385.2	300.2	618.5	587.1	31.34	19.734	
7,600.0	7,255.6	7,596.0	7,255.7		17.6	17.9	89.92	-385.7	405.3	619.3	584.6	34.67	17.864	
7,700.0	7,254.0	7,696.5	7,254.1		19.4	19.6	89.92	-385.7	505.7	619.3	581.0	38.29	16.175	
7,800.0	7,252.3	7,796.5	7,252.5		21.3	21.5	89.92	-385.7	605.7	619.3	577.1	42.17	14.685	
7,900.0	7,250.7	7,896.5	7,250.8		23.4	23.5	89.92	-385.7	705.7	619.3	573.0	46.26	13.387	
8,000.0	7,249.0	7,996.5	7,249.1		25.5	25.6	89.92	-385.7	805.6	619.3	568.8	50.50	12.262	
8,100.0	7,247.3	8,096.5	7,247.5		27.6	27.8	89.92	-385.7	905.6	619.3	564.4	54.86	11.288	
8,200.0	7,245.7	8,196.5	7,245.8		29.9	30.0	89.92	-385.7	1,005.6	619.3	560.0	59.32	10.440	
8,300.0	7,244.0	8,296.5	7,244.2		32.1	32.2	89.92	-385.7	1,105.6	619.3	555.4	63.84	9.700	
8,400.0	7,242.4	8,396.5	7,242.5		34.4	34.5	89.92	-385.7	1,205.6	619.3	550.9	68.43	9.050	
8,500.0	7,240.7	8,496.5	7,240.9		36.7	36.8	89.92	-385.7	1,305.6	619.3	546.2	73.06	8.476	
8,600.0	7,239.1	8,596.5	7,239.2		39.0	39.1	89.92	-385.7	1,405.6	619.3	541.6	77.73	7.967	
8,700.0	7,237.4	8,696.5	7,237.5		41.4	41.4	89.92	-385.7	1,505.5	619.3	536.9	82.43	7.513	
8,800.0	7,235.7	8,796.5	7,235.9		43.7	43.8	89.92	-385.7	1,605.5	619.3	532.1	87.16	7.105	
8,900.0	7,234.1	8,896.5	7,234.2		46.1	46.1	89.92	-385.7	1,705.5	619.3	527.4	91.92	6.737	
9,000.0	7,232.4	8,996.5	7,232.6		48.5	48.5	89.92	-385.7	1,805.5	619.3	522.6	96.69	6.405	
9,100.0	7,230.8	9,096.5	7,230.9		50.9	50.9	89.92	-385.7	1,905.5	619.3	517.8	101.48	6.103	
9,200.0	7,229.1	9,196.5	7,229.2		53.3	53.3	89.92	-385.7	2,005.5	619.3	513.0	106.28	5.827	
9,300.0	7,227.4	9,296.5	7,227.6		55.7	55.7	89.92	-385.7	2,105.5	619.3	508.2	111.10	5.574	
9,400.0	7,225.8	9,396.5	7,225.9		58.1	58.1	89.92	-385.7	2,205.5	619.3	503.4	115.93	5.342	
9,500.0	7,224.1	9,496.5	7,224.3		60.5	60.5	89.92	-385.7	2,305.4	619.3	498.5	120.77	5.128	
9,600.0	7,222.5	9,596.5	7,222.6		62.9	62.9	89.92	-385.7	2,405.4	619.3	493.7	125.61	4.930	
9,700.0	7,220.8	9,696.5	7,221.0		65.4	65.3	89.92	-385.7	2,505.4	619.3	488.8	130.47	4.747	
9,800.0	7,219.2	9,796.5	7,219.3		67.8	67.8	89.92	-385.7	2,605.4	619.3	484.0	135.33	4.576	
9,900.0	7,217.5	9,896.5	7,217.6		70.2	70.2	89.92	-385.7	2,705.4	619.3	479.1	140.19	4.417	
10,000.0	7,215.8	9,996.5	7,216.0		72.6	72.6	89.92	-385.7	2,805.4	619.3	474.2	145.06	4.269	
10,100.0	7,214.2	10,096.5	7,214.3		75.1	75.1	89.92	-385.7	2,905.4	619.3	469.3	149.94	4.130	
10,200.0	7,212.5	10,196.5	7,212.7		77.5	77.5	89.92	-385.7	3,005.3	619.3	464.5	154.82	4.000	
10,300.0	7,210.9	10,296.5	7,211.0		80.0	79.9	89.92	-385.7	3,105.3	619.3	459.6	159.71	3.878	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-3H - HZ - Plan #1												Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
10,400.0	7,209.2	10,396.5	7,209.4	82.4	82.4	89.92	-385.7	3,205.3	619.3	454.7	164.60	3.762	
10,500.0	7,207.6	10,496.5	7,207.7	84.9	84.8	89.92	-385.7	3,305.3	619.3	449.8	169.49	3.654	
10,600.0	7,205.9	10,596.5	7,206.0	87.3	87.3	89.92	-385.7	3,405.3	619.3	444.9	174.39	3.551	
10,700.0	7,204.2	10,696.5	7,204.4	89.7	89.7	89.92	-385.7	3,505.3	619.3	440.0	179.29	3.454	
10,800.0	7,202.6	10,796.5	7,202.7	92.2	92.2	89.92	-385.7	3,605.3	619.3	435.1	184.19	3.362	
10,900.0	7,200.9	10,896.5	7,201.1	94.6	94.6	89.92	-385.7	3,705.2	619.3	430.2	189.09	3.275	
11,000.0	7,199.3	10,996.5	7,199.4	97.1	97.1	89.92	-385.7	3,805.2	619.3	425.3	194.00	3.192	
11,100.0	7,197.6	11,096.5	7,197.7	99.6	99.5	89.92	-385.7	3,905.2	619.3	420.4	198.90	3.113	
11,200.0	7,195.9	11,196.5	7,196.1	102.0	102.0	89.92	-385.7	4,005.2	619.3	415.5	203.81	3.038	
11,300.0	7,194.3	11,296.5	7,194.4	104.5	104.4	89.92	-385.7	4,105.2	619.3	410.6	208.73	2.967	
11,400.0	7,192.6	11,396.5	7,192.8	106.9	106.9	89.92	-385.7	4,205.2	619.3	405.6	213.64	2.899	
11,500.0	7,191.0	11,496.5	7,191.1	109.4	109.3	89.92	-385.7	4,305.2	619.3	400.7	218.55	2.834	
11,600.0	7,189.3	11,596.5	7,189.5	111.8	111.8	89.92	-385.7	4,405.1	619.3	395.8	223.47	2.771	
11,700.0	7,187.7	11,696.5	7,187.8	114.3	114.2	89.92	-385.7	4,505.1	619.3	390.9	228.39	2.712	
11,708.7	7,187.5	11,705.1	7,187.7	114.5	114.4	89.92	-385.7	4,513.8	619.3	390.5	228.82	2.707 SF	

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-4H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	1.0	1.0	0.0	0.0	180.00	-69.2	0.0	69.2					
100.0	100.0	101.0	101.0	0.2	0.2	180.00	-69.2	0.0	69.2	68.9	0.31	224.038		
200.0	200.0	201.0	201.0	0.3	0.3	180.00	-69.2	0.0	69.2	68.6	0.66	105.185 CC, ES		
300.0	300.0	301.0	301.0	0.5	0.5	-140.65	-69.2	0.0	69.9	68.9	1.01	69.372		
400.0	400.0	401.0	401.0	0.7	0.7	-141.95	-69.2	0.0	71.9	70.6	1.36	52.961		
500.0	499.9	500.9	500.9	0.9	0.9	-143.89	-69.2	0.0	75.2	73.5	1.71	43.996		
600.0	599.8	600.0	600.0	1.1	1.0	-145.52	-70.0	-0.2	79.6	77.6	2.06	38.633		
700.0	699.7	698.0	698.0	1.2	1.2	-146.52	-72.5	-1.0	85.7	83.3	2.41	35.532		
800.0	799.6	796.3	796.2	1.4	1.4	-146.97	-76.6	-2.2	93.3	90.5	2.76	33.777		
900.0	899.5	894.3	894.0	1.6	1.6	-146.98	-82.2	-3.8	102.5	99.4	3.11	32.909		
1,000.0	999.4	992.0	991.4	1.8	1.8	-146.65	-89.5	-5.9	113.3	109.8	3.47	32.654		
1,100.0	1,099.3	1,089.7	1,088.7	2.0	2.0	-146.09	-98.3	-8.5	125.6	121.7	3.82	32.838		
1,200.0	1,199.2	1,188.8	1,187.3	2.2	2.2	-145.53	-107.8	-11.3	138.5	134.3	4.18	33.101		
1,300.0	1,299.1	1,288.0	1,286.0	2.4	2.4	-145.06	-117.4	-14.1	151.4	146.8	4.54	33.322		
1,400.0	1,399.0	1,387.2	1,384.6	2.6	2.7	-144.66	-126.9	-16.9	164.3	159.4	4.90	33.511		
1,500.0	1,498.9	1,486.3	1,483.3	2.8	2.9	-144.33	-136.4	-19.7	177.2	171.9	5.26	33.674		
1,600.0	1,598.8	1,585.5	1,581.9	2.9	3.1	-144.04	-146.0	-22.5	190.1	184.5	5.62	33.817		
1,700.0	1,698.7	1,684.6	1,680.6	3.1	3.4	-143.78	-155.5	-25.3	203.1	197.1	5.98	33.943		
1,800.0	1,798.6	1,783.8	1,779.3	3.3	3.6	-143.56	-165.0	-28.1	216.0	209.7	6.34	34.055		
1,900.0	1,898.5	1,882.9	1,877.9	3.5	3.8	-143.36	-174.6	-30.9	228.9	222.2	6.70	34.154		
2,000.0	1,998.4	1,982.1	1,976.6	3.7	4.1	-143.18	-184.1	-33.6	241.9	234.8	7.06	34.244		
2,100.0	2,098.3	2,081.3	2,075.2	3.9	4.3	-143.02	-193.7	-36.4	254.8	247.4	7.42	34.326		
2,200.0	2,198.2	2,180.4	2,173.9	4.1	4.5	-142.88	-203.2	-39.2	267.8	260.0	7.78	34.400		
2,300.0	2,298.1	2,279.6	2,272.5	4.3	4.8	-142.75	-212.7	-42.0	280.7	272.6	8.14	34.468		
2,400.0	2,398.1	2,378.7	2,371.2	4.5	5.0	-142.63	-222.3	-44.8	293.6	285.1	8.50	34.530		
2,500.0	2,498.0	2,477.9	2,469.9	4.7	5.3	-142.52	-231.8	-47.6	306.6	297.7	8.86	34.587		
2,600.0	2,597.9	2,577.0	2,568.5	4.9	5.5	-142.42	-241.3	-50.4	319.5	310.3	9.22	34.639		
2,700.0	2,697.8	2,676.2	2,667.2	5.0	5.8	-142.33	-250.9	-53.2	332.5	322.9	9.58	34.688		
2,800.0	2,797.7	2,775.4	2,765.8	5.2	6.0	-142.24	-260.4	-56.0	345.4	335.5	9.95	34.734		
2,900.0	2,897.6	2,874.5	2,864.5	5.4	6.2	-142.16	-270.0	-58.8	358.4	348.1	10.31	34.776		
3,000.0	2,997.5	2,973.7	2,963.1	5.6	6.5	-142.09	-279.5	-61.6	371.3	360.7	10.67	34.815		
3,100.0	3,097.4	3,072.8	3,061.8	5.8	6.7	-142.02	-289.0	-64.4	384.3	373.3	11.03	34.852		
3,200.0	3,197.3	3,172.0	3,160.5	6.0	7.0	-141.96	-298.6	-67.2	397.2	385.8	11.39	34.887		
3,300.0	3,297.2	3,271.1	3,259.1	6.2	7.2	-141.90	-308.1	-70.0	410.2	398.4	11.75	34.920		
3,400.0	3,397.1	3,370.3	3,357.8	6.4	7.5	-141.84	-317.6	-72.7	423.1	411.0	12.11	34.950		
3,500.0	3,497.0	3,469.5	3,456.4	6.6	7.7	-141.79	-327.2	-75.5	436.1	423.6	12.47	34.979		
3,600.0	3,596.9	3,568.6	3,555.1	6.8	7.9	-141.74	-336.7	-78.3	449.0	436.2	12.83	35.007		
3,700.0	3,696.8	3,667.8	3,653.7	6.9	8.2	-141.69	-346.2	-81.1	462.0	448.8	13.19	35.033		
3,800.0	3,796.7	3,766.9	3,752.4	7.1	8.4	-141.64	-355.8	-83.9	475.0	461.4	13.55	35.057		
3,900.0	3,896.6	3,866.1	3,851.1	7.3	8.7	-141.60	-365.3	-86.7	487.9	474.0	13.91	35.080		
4,000.0	3,996.5	3,965.2	3,949.7	7.5	8.9	-141.56	-374.9	-89.5	500.9	486.6	14.27	35.103		
4,100.0	4,096.4	4,064.4	4,048.4	7.7	9.2	-141.52	-384.4	-92.3	513.8	499.2	14.63	35.124		
4,200.0	4,196.3	4,163.6	4,147.0	7.9	9.4	-141.49	-393.9	-95.1	526.8	511.8	14.99	35.144		
4,300.0	4,296.2	4,262.7	4,245.7	8.1	9.6	-141.45	-403.5	-97.9	539.7	524.4	15.35	35.163		
4,400.0	4,396.1	4,361.9	4,344.4	8.3	9.9	-141.42	-413.0	-100.7	552.7	537.0	15.71	35.181		
4,500.0	4,496.0	4,461.0	4,443.0	8.5	10.1	-141.39	-422.5	-103.5	565.6	549.6	16.07	35.199		
4,600.0	4,595.9	4,560.2	4,541.7	8.7	10.4	-141.36	-432.1	-106.3	578.6	562.2	16.43	35.215		
4,700.0	4,695.8	4,659.3	4,640.3	8.9	10.6	-141.33	-441.6	-109.1	591.5	574.8	16.79	35.231		
4,800.0	4,795.8	4,758.5	4,739.0	9.0	10.9	-141.30	-451.2	-111.8	604.5	587.4	17.15	35.247		
4,900.0	4,895.7	4,857.6	4,837.6	9.2	11.1	-141.28	-460.7	-114.6	617.5	599.9	17.51	35.261		
5,000.0	4,995.6	4,956.8	4,936.3	9.4	11.4	-141.25	-470.2	-117.4	630.4	612.5	17.87	35.275		
5,100.0	5,095.5	5,056.0	5,035.0	9.6	11.6	-141.23	-479.8	-120.2	643.4	625.1	18.23	35.289		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-4H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,200.0	5,195.4	5,155.1	5,133.6		9.8	11.8	-141.20	-489.3	-123.0	656.3	637.7	18.59	35.302	
5,300.0	5,295.3	5,254.3	5,232.3	10.0	12.1	12.1	-141.18	-498.8	-125.8	669.3	650.3	18.95	35.315	
5,400.0	5,395.2	5,353.4	5,330.9	10.2	12.3	12.3	-141.16	-508.4	-128.6	682.2	662.9	19.31	35.327	
5,500.0	5,495.1	5,452.6	5,429.6	10.4	12.6	12.6	-141.14	-517.9	-131.4	695.2	675.5	19.67	35.339	
5,600.0	5,595.0	5,551.7	5,528.2	10.6	12.8	12.8	-141.12	-527.4	-134.2	708.2	688.1	20.03	35.350	
5,700.0	5,694.9	5,650.9	5,626.9	10.8	13.1	13.1	-141.10	-537.0	-137.0	721.1	700.7	20.39	35.361	
5,800.0	5,794.8	5,750.1	5,725.6	10.9	13.3	13.3	-141.08	-546.5	-139.8	734.1	713.3	20.75	35.371	
5,900.0	5,894.7	5,849.2	5,824.2	11.1	13.6	13.6	-141.06	-556.1	-142.6	747.0	725.9	21.11	35.381	
6,000.0	5,994.6	5,948.4	5,922.9	11.3	13.8	13.8	-141.05	-565.6	-145.4	760.0	738.5	21.47	35.391	
6,100.0	6,094.5	6,047.5	6,021.5	11.5	14.0	14.0	-141.03	-575.1	-148.1	772.9	751.1	21.83	35.401	
6,200.0	6,194.4	6,146.7	6,120.2	11.7	14.3	14.3	-141.01	-584.7	-150.9	785.9	763.7	22.19	35.410	
6,300.0	6,294.3	6,245.8	6,218.8	11.9	14.5	14.5	-141.00	-594.2	-153.7	798.9	776.3	22.55	35.419	
6,400.0	6,394.2	6,345.0	6,317.5	12.1	14.8	14.8	-140.98	-603.7	-156.5	811.8	788.9	22.91	35.427	
6,500.0	6,494.1	6,444.2	6,416.2	12.3	15.0	15.0	-140.97	-613.3	-159.3	824.8	801.5	23.28	35.436	
6,600.0	6,594.0	6,543.3	6,514.8	12.5	15.3	15.3	-140.95	-622.8	-162.1	837.7	814.1	23.64	35.444	
6,700.0	6,693.9	6,642.5	6,613.5	12.7	15.5	15.5	149.66	-632.4	-164.9	850.7	826.7	24.00	35.446	
6,800.0	6,793.2	6,740.4	6,711.0	12.8	15.7	15.7	98.44	-641.8	-166.1	863.5	839.2	24.29	35.555	
6,900.0	6,889.1	6,839.4	6,808.4	12.8	15.9	15.9	93.58	-651.2	-153.2	876.0	851.6	24.45	35.833	
7,000.0	6,978.8	6,941.1	6,904.8	12.9	16.1	16.1	91.74	-660.6	-122.6	888.1	863.5	24.56	36.154	
7,100.0	7,059.4	7,045.8	6,996.9	13.0	16.2	16.2	90.79	-669.6	-73.8	899.3	874.5	24.78	36.294	
7,200.0	7,128.7	7,153.7	7,080.8	13.2	16.4	16.4	90.25	-677.8	-6.7	909.1	883.8	25.31	35.924	
7,300.0	7,184.3	7,264.7	7,152.6	13.8	16.8	16.8	89.95	-684.9	77.5	917.3	890.9	26.43	34.715	
7,400.0	7,224.8	7,378.6	7,207.9	14.7	17.3	17.3	89.83	-690.4	176.6	923.5	895.2	28.35	32.580	
7,500.0	7,248.8	7,494.8	7,243.3	16.0	18.3	18.3	89.83	-694.0	287.0	927.5	896.3	31.13	29.793	
7,600.0	7,255.6	7,612.5	7,255.7	17.6	19.6	19.6	89.94	-695.4	403.9	928.9	894.3	34.64	26.819	
7,700.0	7,254.0	7,714.3	7,254.2	19.4	21.1	21.1	89.95	-695.4	505.7	928.9	890.6	38.29	24.263	
7,800.0	7,252.3	7,814.3	7,252.5	21.3	22.8	22.8	89.95	-695.4	605.7	928.9	886.8	42.17	22.030	
7,900.0	7,250.7	7,914.3	7,250.8	23.4	24.7	24.7	89.95	-695.4	705.7	928.9	882.7	46.25	20.084	
8,000.0	7,249.0	8,014.3	7,249.2	25.5	26.6	26.6	89.95	-695.4	805.6	928.9	878.4	50.49	18.397	
8,100.0	7,247.3	8,114.3	7,247.5	27.6	28.7	28.7	89.95	-695.4	905.6	928.9	874.1	54.85	16.935	
8,200.0	7,245.7	8,214.3	7,245.9	29.9	30.8	30.8	89.95	-695.4	1,005.6	928.9	869.6	59.30	15.664	
8,300.0	7,244.0	8,314.3	7,244.2	32.1	33.0	33.0	89.95	-695.4	1,105.6	928.9	865.1	63.83	14.553	
8,400.0	7,242.4	8,414.3	7,242.6	34.4	35.2	35.2	89.95	-695.4	1,205.6	928.9	860.5	68.41	13.578	
8,500.0	7,240.7	8,514.3	7,240.9	36.7	37.4	37.4	89.95	-695.4	1,305.6	928.9	855.9	73.04	12.718	
8,600.0	7,239.1	8,614.3	7,239.2	39.0	39.7	39.7	89.95	-695.4	1,405.6	928.9	851.2	77.71	11.953	
8,700.0	7,237.4	8,714.3	7,237.6	41.4	42.0	42.0	89.95	-695.4	1,505.5	928.9	846.5	82.42	11.271	
8,800.0	7,235.7	8,814.3	7,235.9	43.7	44.3	44.3	89.95	-695.4	1,605.5	928.9	841.8	87.15	10.659	
8,900.0	7,234.1	8,914.3	7,234.3	46.1	46.6	46.6	89.95	-695.4	1,705.5	928.9	837.0	91.90	10.108	
9,000.0	7,232.4	9,014.3	7,232.6	48.5	49.0	49.0	89.95	-695.4	1,805.5	928.9	832.3	96.67	9.609	
9,100.0	7,230.8	9,114.3	7,231.0	50.9	51.4	51.4	89.95	-695.4	1,905.5	928.9	827.5	101.46	9.156	
9,200.0	7,229.1	9,214.3	7,229.3	53.3	53.7	53.7	89.95	-695.4	2,005.5	928.9	822.7	106.26	8.742	
9,300.0	7,227.4	9,314.3	7,227.6	55.7	56.1	56.1	89.95	-695.4	2,105.5	928.9	817.9	111.08	8.363	
9,400.0	7,225.8	9,414.3	7,226.0	58.1	58.5	58.5	89.95	-695.4	2,205.5	928.9	813.0	115.91	8.014	
9,500.0	7,224.1	9,514.3	7,224.3	60.5	60.9	60.9	89.95	-695.4	2,305.4	928.9	808.2	120.75	7.693	
9,600.0	7,222.5	9,614.3	7,222.7	62.9	63.3	63.3	89.95	-695.4	2,405.4	928.9	803.3	125.59	7.396	
9,700.0	7,220.8	9,714.3	7,221.0	65.4	65.7	65.7	89.95	-695.4	2,505.4	928.9	798.5	130.44	7.121	
9,800.0	7,219.2	9,814.3	7,219.3	67.8	68.1	68.1	89.95	-695.4	2,605.4	928.9	793.6	135.30	6.865	
9,900.0	7,217.5	9,914.3	7,217.7	70.2	70.5	70.5	89.95	-695.4	2,705.4	928.9	788.8	140.17	6.627	
10,000.0	7,215.8	10,014.3	7,216.0	72.6	72.9	72.9	89.95	-695.4	2,805.4	928.9	783.9	145.04	6.405	
10,100.0	7,214.2	10,114.3	7,214.4	75.1	75.4	75.4	89.95	-695.4	2,905.4	928.9	779.0	149.92	6.196	
10,200.0	7,212.5	10,214.3	7,212.7	77.5	77.8	77.8	89.95	-695.4	3,005.3	928.9	774.1	154.80	6.001	
10,300.0	7,210.9	10,314.3	7,211.1	80.0	80.2	80.2	89.95	-695.4	3,105.3	928.9	769.2	159.69	5.817	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-4H - HZ - Plan #1												Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)			
10,400.0	7,209.2	10,414.3	7,209.4	82.4	82.6	89.95	-695.4	3,205.3	928.9	764.4	164.58	5.644	
10,500.0	7,207.6	10,514.3	7,207.7	84.9	85.1	89.95	-695.4	3,305.3	928.9	759.5	169.47	5.481	
10,600.0	7,205.9	10,614.3	7,206.1	87.3	87.5	89.95	-695.4	3,405.3	928.9	754.6	174.36	5.328	
10,700.0	7,204.2	10,714.3	7,204.4	89.7	90.0	89.95	-695.4	3,505.3	928.9	749.7	179.26	5.182	
10,800.0	7,202.6	10,814.3	7,202.8	92.2	92.4	89.95	-695.4	3,605.3	928.9	744.8	184.16	5.044	
10,900.0	7,200.9	10,914.3	7,201.1	94.6	94.8	89.95	-695.4	3,705.2	928.9	739.9	189.07	4.913	
11,000.0	7,199.3	11,014.3	7,199.5	97.1	97.3	89.95	-695.4	3,805.2	928.9	735.0	193.97	4.789	
11,100.0	7,197.6	11,114.3	7,197.8	99.6	99.7	89.95	-695.4	3,905.2	928.9	730.1	198.88	4.671	
11,200.0	7,195.9	11,214.3	7,196.1	102.0	102.2	89.95	-695.4	4,005.2	928.9	725.1	203.79	4.558	
11,300.0	7,194.3	11,314.3	7,194.5	104.5	104.6	89.95	-695.4	4,105.2	928.9	720.2	208.70	4.451	
11,400.0	7,192.6	11,414.3	7,192.8	106.9	107.1	89.95	-695.4	4,205.2	928.9	715.3	213.62	4.349	
11,500.0	7,191.0	11,514.3	7,191.2	109.4	109.5	89.95	-695.4	4,305.2	928.9	710.4	218.53	4.251	
11,600.0	7,189.3	11,614.3	7,189.5	111.8	112.0	89.95	-695.4	4,405.1	928.9	705.5	223.45	4.157	
11,700.0	7,187.7	11,714.3	7,187.8	114.3	114.4	89.95	-695.4	4,505.1	928.9	700.6	228.37	4.068	
11,708.7	7,187.5	11,723.0	7,187.7	114.5	114.6	89.95	-695.4	4,513.8	928.9	700.1	228.79	4.060 SF	

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-5H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	1.0	1.0	0.0	0.0	-178.25	-91.1	-2.8	91.1					
100.0	100.0	101.0	101.0	0.2	0.2	-178.25	-91.1	-2.8	91.1	90.8	0.31	294.930		
200.0	200.0	201.0	201.0	0.3	0.3	-178.25	-91.1	-2.8	91.1	90.5	0.66	138.468 CC, ES		
300.0	300.0	301.0	301.0	0.5	0.5	-138.79	-91.1	-2.8	91.8	90.8	1.01	91.092		
400.0	400.0	400.9	400.9	0.7	0.7	-139.83	-91.1	-2.8	93.8	92.4	1.36	69.019		
500.0	499.9	500.0	500.0	0.9	0.9	-141.27	-91.9	-3.0	97.8	96.1	1.71	57.219		
600.0	599.8	597.4	597.3	1.1	1.0	-142.42	-94.4	-3.5	103.8	101.7	2.06	50.410		
700.0	699.7	695.3	695.2	1.2	1.2	-143.21	-98.5	-4.4	111.4	109.0	2.41	46.245		
800.0	799.6	792.9	792.6	1.4	1.4	-143.69	-104.2	-5.7	120.7	117.9	2.76	43.729		
900.0	899.5	890.3	889.7	1.6	1.6	-143.88	-111.5	-7.3	131.6	128.5	3.11	42.297		
1,000.0	999.4	987.3	986.2	1.8	1.8	-143.86	-120.4	-9.3	144.1	140.7	3.46	41.614		
1,100.0	1,099.3	1,084.4	1,082.7	2.0	2.0	-143.68	-130.9	-11.6	158.2	154.4	3.82	41.454		
1,200.0	1,199.2	1,183.3	1,181.0	2.2	2.3	-143.48	-142.0	-14.1	172.8	168.7	4.17	41.403		
1,300.0	1,299.1	1,282.2	1,279.3	2.4	2.5	-143.31	-153.2	-16.5	187.4	182.9	4.53	41.358		
1,400.0	1,399.0	1,381.1	1,377.5	2.6	2.8	-143.17	-164.4	-19.0	202.0	197.2	4.89	41.317		
1,500.0	1,498.9	1,480.1	1,475.8	2.8	3.0	-143.04	-175.5	-21.5	216.7	211.4	5.25	41.281		
1,600.0	1,598.8	1,579.0	1,574.1	2.9	3.3	-142.93	-186.7	-23.9	231.3	225.7	5.61	41.249		
1,700.0	1,698.7	1,677.9	1,672.3	3.1	3.5	-142.84	-197.8	-26.4	245.9	239.9	5.97	41.220		
1,800.0	1,798.6	1,776.8	1,770.6	3.3	3.8	-142.75	-209.0	-28.9	260.5	254.2	6.32	41.193		
1,900.0	1,898.5	1,875.8	1,868.8	3.5	4.0	-142.67	-220.1	-31.3	275.1	268.4	6.68	41.170		
2,000.0	1,998.4	1,974.7	1,967.1	3.7	4.3	-142.61	-231.3	-33.8	289.7	282.7	7.04	41.148		
2,100.0	2,098.3	2,073.6	2,065.4	3.9	4.6	-142.54	-242.5	-36.3	304.3	296.9	7.40	41.128		
2,200.0	2,198.2	2,172.5	2,163.6	4.1	4.8	-142.49	-253.6	-38.7	318.9	311.2	7.76	41.111		
2,300.0	2,298.1	2,271.5	2,261.9	4.3	5.1	-142.43	-264.8	-41.2	333.5	325.4	8.12	41.094		
2,400.0	2,398.1	2,370.4	2,360.2	4.5	5.3	-142.39	-275.9	-43.7	348.2	339.7	8.48	41.079		
2,500.0	2,498.0	2,469.3	2,458.4	4.7	5.6	-142.34	-287.1	-46.1	362.8	353.9	8.83	41.065		
2,600.0	2,597.9	2,568.2	2,556.7	4.9	5.9	-142.30	-298.2	-48.6	377.4	368.2	9.19	41.052		
2,700.0	2,697.8	2,667.2	2,655.0	5.0	6.1	-142.27	-309.4	-51.1	392.0	382.4	9.55	41.040		
2,800.0	2,797.7	2,766.1	2,753.2	5.2	6.4	-142.23	-320.6	-53.5	406.6	396.7	9.91	41.028		
2,900.0	2,897.6	2,865.0	2,851.5	5.4	6.6	-142.20	-331.7	-56.0	421.2	411.0	10.27	41.018		
3,000.0	2,997.5	2,964.0	2,949.8	5.6	6.9	-142.17	-342.9	-58.5	435.8	425.2	10.63	41.008		
3,100.0	3,097.4	3,062.9	3,048.0	5.8	7.2	-142.14	-354.0	-60.9	450.4	439.5	10.99	40.999		
3,200.0	3,197.3	3,161.8	3,146.3	6.0	7.4	-142.12	-365.2	-63.4	465.1	453.7	11.35	40.990		
3,300.0	3,297.2	3,260.7	3,244.5	6.2	7.7	-142.09	-376.3	-65.9	479.7	468.0	11.70	40.982		
3,400.0	3,397.1	3,359.7	3,342.8	6.4	8.0	-142.07	-387.5	-68.3	494.3	482.2	12.06	40.975		
3,500.0	3,497.0	3,458.6	3,441.1	6.6	8.2	-142.05	-398.7	-70.8	508.9	496.5	12.42	40.967		
3,600.0	3,596.9	3,557.5	3,539.3	6.8	8.5	-142.03	-409.8	-73.3	523.5	510.7	12.78	40.961		
3,700.0	3,696.8	3,656.4	3,637.6	6.9	8.7	-142.01	-421.0	-75.7	538.1	525.0	13.14	40.954		
3,800.0	3,796.7	3,755.4	3,735.9	7.1	9.0	-141.99	-432.1	-78.2	552.7	539.2	13.50	40.948		
3,900.0	3,896.6	3,854.3	3,834.1	7.3	9.3	-141.97	-443.3	-80.7	567.4	553.5	13.86	40.942		
4,000.0	3,996.5	3,953.2	3,932.4	7.5	9.5	-141.95	-454.4	-83.1	582.0	567.8	14.22	40.937		
4,100.0	4,096.4	4,052.1	4,030.7	7.7	9.8	-141.94	-465.6	-85.6	596.6	582.0	14.58	40.931		
4,200.0	4,196.3	4,151.1	4,128.9	7.9	10.1	-141.92	-476.8	-88.1	611.2	596.3	14.93	40.926		
4,300.0	4,296.2	4,250.0	4,227.2	8.1	10.3	-141.91	-487.9	-90.5	625.8	610.5	15.29	40.922		
4,400.0	4,396.1	4,348.9	4,325.4	8.3	10.6	-141.89	-499.1	-93.0	640.4	624.8	15.65	40.917		
4,500.0	4,496.0	4,447.8	4,423.7	8.5	10.8	-141.88	-510.2	-95.5	655.0	639.0	16.01	40.913		
4,600.0	4,595.9	4,546.8	4,522.0	8.7	11.1	-141.87	-521.4	-98.0	669.7	653.3	16.37	40.909		
4,700.0	4,695.8	4,645.7	4,620.2	8.9	11.4	-141.86	-532.5	-100.4	684.3	667.5	16.73	40.905		
4,800.0	4,795.8	4,744.6	4,718.5	9.0	11.6	-141.85	-543.7	-102.9	698.9	681.8	17.09	40.901		
4,900.0	4,895.7	4,843.6	4,816.8	9.2	11.9	-141.83	-554.9	-105.4	713.5	696.1	17.45	40.897		
5,000.0	4,995.6	4,942.5	4,915.0	9.4	12.2	-141.82	-566.0	-107.8	728.1	710.3	17.81	40.894		
5,100.0	5,095.5	5,041.4	5,013.3	9.6	12.4	-141.81	-577.2	-110.3	742.7	724.6	18.16	40.890		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-5H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,200.0	5,195.4	5,140.3	5,111.6		9.8	12.7	-141.80	-588.3	-112.8	757.3	738.8	18.52	40.887	
5,300.0	5,295.3	5,239.3	5,209.8	10.0	12.9		-141.79	-599.5	-115.2	772.0	753.1	18.88	40.884	
5,400.0	5,395.2	5,338.2	5,308.1	10.2	13.2		-141.79	-610.6	-117.7	786.6	767.3	19.24	40.881	
5,500.0	5,495.1	5,437.1	5,406.4	10.4	13.5		-141.78	-621.8	-120.2	801.2	781.6	19.60	40.878	
5,600.0	5,595.0	5,536.0	5,504.6	10.6	13.7		-141.77	-633.0	-122.6	815.8	795.8	19.96	40.875	
5,700.0	5,694.9	5,635.0	5,602.9	10.8	14.0		-141.76	-644.1	-125.1	830.4	810.1	20.32	40.872	
5,800.0	5,794.8	5,733.9	5,701.1	10.9	14.3		-141.75	-655.3	-127.6	845.0	824.4	20.68	40.870	
5,900.0	5,894.7	5,832.8	5,799.4	11.1	14.5		-141.74	-666.4	-130.0	859.6	838.6	21.04	40.867	
6,000.0	5,994.6	5,931.7	5,897.7	11.3	14.8		-141.74	-677.6	-132.5	874.3	852.9	21.39	40.865	
6,100.0	6,094.5	6,030.7	5,995.9	11.5	15.1		-141.73	-688.7	-135.0	888.9	867.1	21.75	40.862	
6,200.0	6,194.4	6,129.6	6,094.2	11.7	15.3		-141.72	-699.9	-137.4	903.5	881.4	22.11	40.860	
6,300.0	6,294.3	6,228.5	6,192.5	11.9	15.6		-141.72	-711.1	-139.9	918.1	895.6	22.47	40.858	
6,400.0	6,394.2	6,327.4	6,290.7	12.1	15.8		-141.71	-722.2	-142.4	932.7	909.9	22.83	40.856	
6,500.0	6,494.1	6,426.4	6,389.0	12.3	16.1		-141.70	-733.4	-144.8	947.3	924.1	23.19	40.854	
6,600.0	6,594.0	6,525.3	6,487.3	12.5	16.4		-141.70	-744.5	-147.3	961.9	938.4	23.55	40.852	
6,700.0	6,693.9	6,624.2	6,585.5	12.7	16.6		148.85	-755.7	-149.8	976.5	952.6	23.91	40.836	
6,800.0	6,793.2	6,722.2	6,682.8	12.8	16.9	97.47		-766.7	-152.2	990.8	966.5	24.23	40.892	
6,900.0	6,889.1	6,816.4	6,776.4	12.8	17.1	93.12		-777.4	-154.6	1,004.8	980.4	24.45	41.093	
7,000.0	6,978.8	6,912.6	6,871.8	12.9	17.4	92.25		-788.2	-150.5	1,019.3	994.7	24.61	41.415	
7,100.0	7,059.4	7,017.0	6,973.0	13.0	17.6	92.32		-799.7	-128.1	1,034.1	1,009.3	24.81	41.688	
7,200.0	7,128.7	7,131.6	7,077.4	13.2	17.8	92.83		-811.5	-82.8	1,048.5	1,023.3	25.20	41.615	
7,300.0	7,184.3	7,258.6	7,180.0	13.8	18.0	93.62		-823.2	-9.3	1,061.8	1,035.8	26.03	40.797	
7,400.0	7,224.8	7,399.6	7,272.0	14.7	18.5	94.53		-833.6	96.5	1,072.9	1,045.3	27.64	38.816	
7,500.0	7,248.8	7,554.5	7,340.2	16.0	19.3	95.38		-841.4	234.9	1,080.8	1,050.3	30.41	35.534	
7,600.0	7,255.6	7,720.1	7,369.6	17.6	20.9	95.97		-844.7	397.2	1,084.2	1,049.8	34.40	31.515	
7,700.0	7,254.0	7,828.6	7,370.0	19.4	22.3	96.09		-844.7	505.7	1,084.4	1,046.3	38.12	28.445	
7,800.0	7,252.3	7,928.6	7,370.0	21.3	23.8	96.18		-844.7	605.7	1,084.6	1,042.6	41.96	25.848	
7,900.0	7,250.7	8,028.5	7,370.0	23.4	25.5	96.26		-844.7	705.7	1,084.8	1,038.8	46.00	23.580	
8,000.0	7,249.0	8,128.5	7,370.0	25.5	27.4	96.35		-844.7	805.7	1,084.9	1,034.7	50.20	21.612	
8,100.0	7,247.3	8,228.5	7,370.0	27.6	29.3	96.44		-844.7	905.6	1,085.1	1,030.6	54.52	19.905	
8,200.0	7,245.7	8,328.5	7,370.0	29.9	31.4	96.52		-844.7	1,005.6	1,085.3	1,026.4	58.92	18.420	
8,300.0	7,244.0	8,428.5	7,370.0	32.1	33.5	96.61		-844.7	1,105.6	1,085.5	1,022.1	63.40	17.121	
8,400.0	7,242.4	8,528.5	7,370.0	34.4	35.6	96.70		-844.7	1,205.6	1,085.7	1,017.8	67.94	15.981	
8,500.0	7,240.7	8,628.5	7,370.0	36.7	37.9	96.78		-844.7	1,305.6	1,085.9	1,013.4	72.52	14.974	
8,600.0	7,239.1	8,728.5	7,370.0	39.0	40.1	96.87		-844.7	1,405.6	1,086.1	1,009.0	77.14	14.079	
8,700.0	7,237.4	8,828.4	7,370.0	41.4	42.4	96.96		-844.7	1,505.6	1,086.3	1,004.5	81.79	13.281	
8,800.0	7,235.7	8,928.4	7,370.0	43.7	44.7	97.04		-844.7	1,605.5	1,086.5	1,000.0	86.47	12.565	
8,900.0	7,234.1	9,028.4	7,370.0	46.1	47.0	97.13		-844.7	1,705.5	1,086.7	995.5	91.17	11.920	
9,000.0	7,232.4	9,128.4	7,370.0	48.5	49.3	97.22		-844.7	1,805.5	1,086.9	991.0	95.88	11.336	
9,100.0	7,230.8	9,228.4	7,370.0	50.9	51.6	97.30		-844.7	1,905.5	1,087.1	986.5	100.61	10.805	
9,200.0	7,229.1	9,328.4	7,370.0	53.3	54.0	97.39		-844.7	2,005.5	1,087.3	982.0	105.36	10.321	
9,300.0	7,227.4	9,428.4	7,370.0	55.7	56.3	97.48		-844.7	2,105.5	1,087.5	977.4	110.11	9.877	
9,400.0	7,225.8	9,528.3	7,370.0	58.1	58.7	97.56		-844.7	2,205.5	1,087.8	972.9	114.87	9.469	
9,500.0	7,224.1	9,628.3	7,370.0	60.5	61.1	97.65		-844.7	2,305.5	1,088.0	968.3	119.64	9.094	
9,600.0	7,222.5	9,728.3	7,370.0	62.9	63.5	97.74		-844.7	2,405.4	1,088.2	963.8	124.42	8.746	
9,700.0	7,220.8	9,828.3	7,370.0	65.4	65.9	97.82		-844.7	2,505.4	1,088.4	959.2	129.20	8.424	
9,800.0	7,219.2	9,928.3	7,370.0	67.8	68.3	97.91		-844.7	2,605.4	1,088.7	954.7	133.99	8.125	
9,900.0	7,217.5	10,028.3	7,370.0	70.2	70.7	98.00		-844.7	2,705.4	1,088.9	950.1	138.78	7.846	
10,000.0	7,215.8	10,128.3	7,370.0	72.6	73.1	98.08		-844.7	2,805.4	1,089.1	945.5	143.57	7.586	
10,100.0	7,214.2	10,228.2	7,370.0	75.1	75.5	98.17		-844.7	2,905.4	1,089.3	941.0	148.37	7.342	
10,200.0	7,212.5	10,328.2	7,370.0	77.5	77.9	98.26		-844.7	3,005.4	1,089.6	936.4	153.17	7.114	
10,300.0	7,210.9	10,428.2	7,370.0	80.0	80.4	98.34		-844.7	3,105.3	1,089.8	931.9	157.97	6.899	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-5H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
10,400.0	7,209.2	10,528.2	7,370.0	82.4	82.8	98.43	-844.7	3,205.3	1,090.1	927.3	162.77	6.697		
10,500.0	7,207.6	10,628.2	7,370.0	84.9	85.2	98.51	-844.7	3,305.3	1,090.3	922.7	167.58	6.506		
10,600.0	7,205.9	10,728.2	7,370.0	87.3	87.6	98.60	-844.7	3,405.3	1,090.6	918.2	172.38	6.327		
10,700.0	7,204.2	10,828.2	7,370.0	89.7	90.1	98.69	-844.7	3,505.3	1,090.8	913.6	177.18	6.156		
10,800.0	7,202.6	10,928.2	7,370.0	92.2	92.5	98.77	-844.7	3,605.3	1,091.1	909.1	181.99	5.995		
10,900.0	7,200.9	11,028.1	7,370.0	94.6	94.9	98.86	-844.7	3,705.3	1,091.3	904.5	186.79	5.842		
11,000.0	7,199.3	11,128.1	7,370.0	97.1	97.4	98.94	-844.7	3,805.2	1,091.6	900.0	191.59	5.697		
11,100.0	7,197.6	11,228.1	7,370.0	99.6	99.8	99.03	-844.7	3,905.2	1,091.8	895.4	196.40	5.559		
11,200.0	7,195.9	11,328.1	7,370.0	102.0	102.3	99.12	-844.7	4,005.2	1,092.1	890.9	201.20	5.428		
11,300.0	7,194.3	11,428.1	7,370.0	104.5	104.7	99.20	-844.7	4,105.2	1,092.4	886.4	206.00	5.303		
11,400.0	7,192.6	11,528.1	7,370.0	106.9	107.2	99.29	-844.7	4,205.2	1,092.6	881.8	210.80	5.183		
11,500.0	7,191.0	11,628.1	7,370.0	109.4	109.6	99.37	-844.7	4,305.2	1,092.9	877.3	215.60	5.069		
11,600.0	7,189.3	11,728.0	7,370.0	111.8	112.0	99.46	-844.7	4,405.2	1,093.2	872.8	220.40	4.960		
11,700.0	7,187.7	11,828.0	7,370.0	114.3	114.5	99.55	-844.7	4,505.1	1,093.4	868.2	225.19	4.856		
11,708.7	7,187.5	11,836.7	7,370.0	114.5	114.7	99.55	-844.7	4,513.8	1,093.5	867.9	225.61	4.847 SF		

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-6H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis			
0.0	0.0	2.0	2.0	0.0	0.0	-178.58	-112.9	-2.8	113.0					
100.0	100.0	102.0	102.0	0.2	0.2	-178.58	-112.9	-2.8	113.0	112.6	0.31	363.602		
200.0	200.0	202.0	202.0	0.3	0.3	-178.58	-112.9	-2.8	113.0	112.3	0.66	171.220 CC, ES		
300.0	300.0	302.0	302.0	0.5	0.5	-139.06	-112.9	-2.8	113.6	112.6	1.01	112.597		
400.0	400.0	400.0	400.0	0.7	0.7	-139.80	-113.8	-3.0	116.5	115.1	1.36	85.857		
500.0	499.9	497.8	497.7	0.9	0.9	-140.79	-116.3	-3.5	122.2	120.5	1.71	71.651		
600.0	599.8	595.4	595.2	1.1	1.0	-141.60	-120.4	-4.3	129.8	127.8	2.06	63.162		
700.0	699.7	692.7	692.4	1.2	1.2	-142.17	-126.1	-5.4	139.1	136.7	2.41	57.829		
800.0	799.6	789.7	789.1	1.4	1.4	-142.51	-133.4	-6.8	150.1	147.3	2.76	54.443		
900.0	899.5	886.4	885.4	1.6	1.6	-142.67	-142.3	-8.6	162.6	159.5	3.11	52.340		
1,000.0	999.4	982.6	981.0	1.8	1.9	-142.68	-152.8	-10.6	176.8	173.4	3.46	51.125		
1,100.0	1,099.3	1,078.4	1,076.0	2.0	2.1	-142.58	-164.7	-13.0	192.6	188.8	3.81	50.555		
1,200.0	1,199.2	1,177.0	1,173.7	2.2	2.4	-142.43	-177.8	-15.6	209.2	205.1	4.17	50.204		
1,300.0	1,299.1	1,275.6	1,271.4	2.4	2.7	-142.30	-190.9	-18.2	225.8	221.3	4.52	49.906		
1,400.0	1,399.0	1,374.2	1,369.1	2.6	2.9	-142.19	-204.0	-20.7	242.4	237.5	4.88	49.649		
1,500.0	1,498.9	1,472.8	1,466.8	2.8	3.2	-142.10	-217.1	-23.3	259.0	253.8	5.24	49.427		
1,600.0	1,598.8	1,571.4	1,564.5	2.9	3.5	-142.02	-230.2	-25.9	275.6	270.0	5.60	49.232		
1,700.0	1,698.7	1,670.0	1,662.2	3.1	3.8	-141.94	-243.3	-28.5	292.2	286.3	5.96	49.060		
1,800.0	1,798.6	1,768.6	1,759.9	3.3	4.1	-141.88	-256.4	-31.1	308.8	302.5	6.31	48.906		
1,900.0	1,898.5	1,867.3	1,857.6	3.5	4.3	-141.82	-269.5	-33.6	325.4	318.7	6.67	48.769		
2,000.0	1,998.4	1,965.9	1,955.3	3.7	4.6	-141.77	-282.5	-36.2	342.0	335.0	7.03	48.646		
2,100.0	2,098.3	2,064.5	2,053.0	3.9	4.9	-141.72	-295.6	-38.8	358.6	351.2	7.39	48.535		
2,200.0	2,198.2	2,163.1	2,150.7	4.1	5.2	-141.67	-308.7	-41.4	375.2	367.5	7.75	48.433		
2,300.0	2,298.1	2,261.7	2,248.4	4.3	5.5	-141.63	-321.8	-44.0	391.8	383.7	8.11	48.341		
2,400.0	2,398.1	2,360.3	2,346.1	4.5	5.8	-141.60	-334.9	-46.5	408.4	399.9	8.46	48.256		
2,500.0	2,498.0	2,458.9	2,443.8	4.7	6.1	-141.56	-348.0	-49.1	425.0	416.2	8.82	48.178		
2,600.0	2,597.9	2,557.5	2,541.5	4.9	6.3	-141.53	-361.1	-51.7	441.6	432.4	9.18	48.106		
2,700.0	2,697.8	2,656.2	2,639.3	5.0	6.6	-141.50	-374.2	-54.3	458.2	448.7	9.54	48.040		
2,800.0	2,797.7	2,754.8	2,737.0	5.2	6.9	-141.47	-387.3	-56.9	474.8	464.9	9.90	47.978		
2,900.0	2,897.6	2,853.4	2,834.7	5.4	7.2	-141.45	-400.4	-59.5	491.4	481.1	10.25	47.920		
3,000.0	2,997.5	2,952.0	2,932.4	5.6	7.5	-141.42	-413.5	-62.0	508.0	497.4	10.61	47.867		
3,100.0	3,097.4	3,050.6	3,030.1	5.8	7.8	-141.40	-426.6	-64.6	524.6	513.6	10.97	47.816		
3,200.0	3,197.3	3,149.2	3,127.8	6.0	8.1	-141.38	-439.7	-67.2	541.2	529.9	11.33	47.769		
3,300.0	3,297.2	3,247.8	3,225.5	6.2	8.4	-141.36	-452.7	-69.8	557.8	546.1	11.69	47.725		
3,400.0	3,397.1	3,346.4	3,323.2	6.4	8.6	-141.34	-465.8	-72.4	574.4	562.4	12.05	47.684		
3,500.0	3,497.0	3,445.1	3,420.9	6.6	8.9	-141.33	-478.9	-74.9	591.0	578.6	12.40	47.645		
3,600.0	3,596.9	3,543.7	3,518.6	6.8	9.2	-141.31	-492.0	-77.5	607.6	594.8	12.76	47.608		
3,700.0	3,696.8	3,642.3	3,616.3	6.9	9.5	-141.29	-505.1	-80.1	624.2	611.1	13.12	47.573		
3,800.0	3,796.7	3,740.9	3,714.0	7.1	9.8	-141.28	-518.2	-82.7	640.8	627.3	13.48	47.540		
3,900.0	3,896.6	3,839.5	3,811.7	7.3	10.1	-141.26	-531.3	-85.3	657.4	643.6	13.84	47.508		
4,000.0	3,996.5	3,938.1	3,909.4	7.5	10.4	-141.25	-544.4	-87.8	674.0	659.8	14.20	47.478		
4,100.0	4,096.4	4,036.7	4,007.1	7.7	10.7	-141.24	-557.5	-90.4	690.6	676.1	14.55	47.450		
4,200.0	4,196.3	4,135.3	4,104.8	7.9	11.0	-141.23	-570.6	-93.0	707.2	692.3	14.91	47.423		
4,300.0	4,296.2	4,234.0	4,202.5	8.1	11.2	-141.22	-583.7	-95.6	723.8	708.5	15.27	47.397		
4,400.0	4,396.1	4,332.6	4,300.2	8.3	11.5	-141.20	-596.8	-98.2	740.4	724.8	15.63	47.373		
4,500.0	4,496.0	4,431.2	4,397.9	8.5	11.8	-141.19	-609.9	-100.7	757.0	741.0	15.99	47.349		
4,600.0	4,595.9	4,529.8	4,495.6	8.7	12.1	-141.18	-622.9	-103.3	773.6	757.3	16.35	47.327		
4,700.0	4,695.8	4,628.4	4,593.4	8.9	12.4	-141.17	-636.0	-105.9	790.2	773.5	16.70	47.305		
4,800.0	4,795.8	4,727.0	4,691.1	9.0	12.7	-141.16	-649.1	-108.5	806.8	789.8	17.06	47.285		
4,900.0	4,895.7	4,825.6	4,788.8	9.2	13.0	-141.16	-662.2	-111.1	823.4	806.0	17.42	47.265		
5,000.0	4,995.6	4,924.2	4,886.5	9.4	13.3	-141.15	-675.3	-113.7	840.0	822.2	17.78	47.246		
5,100.0	5,095.5	5,022.8	4,984.2	9.6	13.6	-141.14	-688.4	-116.2	856.6	838.5	18.14	47.228		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-6H - HZ - Plan #1												Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
5,200.0	5,195.4	5,121.5	5,081.9	9.8	13.8	-141.13	-701.5	-118.8	873.2	854.7	18.50	47.211	
5,300.0	5,295.3	5,220.1	5,179.6	10.0	14.1	-141.12	-714.6	-121.4	889.8	871.0	18.85	47.194	
5,400.0	5,395.2	5,318.7	5,277.3	10.2	14.4	-141.12	-727.7	-124.0	906.4	887.2	19.21	47.178	
5,500.0	5,495.1	5,417.3	5,375.0	10.4	14.7	-141.11	-740.8	-126.6	923.0	903.5	19.57	47.162	
5,600.0	5,595.0	5,515.9	5,472.7	10.6	15.0	-141.10	-753.9	-129.1	939.6	919.7	19.93	47.147	
5,700.0	5,694.9	5,614.5	5,570.4	10.8	15.3	-141.10	-767.0	-131.7	956.2	935.9	20.29	47.132	
5,800.0	5,794.8	5,713.1	5,668.1	10.9	15.6	-141.09	-780.1	-134.3	972.8	952.2	20.65	47.118	
5,900.0	5,894.7	5,811.7	5,765.8	11.1	15.9	-141.08	-793.1	-136.9	989.4	968.4	21.01	47.105	
6,000.0	5,994.6	5,910.4	5,863.5	11.3	16.2	-141.08	-806.2	-139.5	1,006.0	984.7	21.36	47.092	
6,100.0	6,094.5	6,009.0	5,961.2	11.5	16.4	-141.07	-819.3	-142.0	1,022.6	1,000.9	21.72	47.079	
6,200.0	6,194.4	6,107.6	6,058.9	11.7	16.7	-141.07	-832.4	-144.6	1,039.2	1,017.2	22.08	47.067	
6,300.0	6,294.3	6,206.2	6,156.6	11.9	17.0	-141.06	-845.5	-147.2	1,055.8	1,033.4	22.44	47.055	
6,400.0	6,394.2	6,304.8	6,254.3	12.1	17.3	-141.05	-858.6	-149.8	1,072.4	1,049.7	22.80	47.044	
6,500.0	6,494.1	6,403.4	6,352.0	12.3	17.6	-141.05	-871.7	-152.4	1,089.0	1,065.9	23.16	47.033	
6,600.0	6,594.0	6,502.0	6,449.8	12.5	17.9	-141.04	-884.8	-154.9	1,105.7	1,082.1	23.51	47.022	
6,700.0	6,693.9	6,600.6	6,547.5	12.7	18.2	149.45	-897.9	-157.5	1,122.2	1,098.4	23.89	46.984	
6,800.0	6,793.2	6,698.3	6,644.2	12.8	18.5	97.75	-910.8	-160.1	1,138.6	1,114.4	24.22	47.004	
6,900.0	6,889.1	6,794.2	6,739.2	12.8	18.7	92.82	-923.6	-158.7	1,154.7	1,130.2	24.45	47.231	
7,000.0	6,978.8	6,894.4	6,836.8	12.9	19.0	91.00	-936.7	-141.0	1,170.4	1,145.8	24.59	47.588	
7,100.0	7,059.4	7,000.4	6,935.1	13.0	19.2	90.10	-950.0	-104.0	1,185.3	1,160.5	24.78	47.827	
7,200.0	7,128.7	7,112.9	7,030.1	13.2	19.4	89.66	-962.8	-45.4	1,198.8	1,173.6	25.21	47.555	
7,300.0	7,184.3	7,232.6	7,116.6	13.8	19.7	89.50	-974.6	36.1	1,210.4	1,184.2	26.17	46.258	
7,400.0	7,224.8	7,359.4	7,187.9	14.7	20.2	89.54	-984.4	140.2	1,219.4	1,191.4	27.96	43.619	
7,500.0	7,248.8	7,492.5	7,236.4	16.0	21.0	89.69	-991.2	263.6	1,225.3	1,194.5	30.79	39.800	
7,600.0	7,255.6	7,630.2	7,255.6	17.6	22.2	89.90	-994.1	399.6	1,227.6	1,193.1	34.56	35.523	
7,700.0	7,254.0	7,736.3	7,254.3	19.4	23.4	89.92	-994.1	505.7	1,227.7	1,189.4	38.28	32.070	
7,800.0	7,252.3	7,836.3	7,252.6	21.3	24.8	89.92	-994.1	605.7	1,227.7	1,185.5	42.16	29.121	
7,900.0	7,250.7	7,936.3	7,250.9	23.4	26.4	89.92	-994.1	705.6	1,227.7	1,181.4	46.24	26.550	
8,000.0	7,249.0	8,036.3	7,249.3	25.5	28.2	89.92	-994.1	805.6	1,227.7	1,177.2	50.48	24.321	
8,100.0	7,247.3	8,136.3	7,247.6	27.6	30.1	89.92	-994.1	905.6	1,227.7	1,172.8	54.83	22.388	
8,200.0	7,245.7	8,236.3	7,246.0	29.9	32.1	89.92	-994.1	1,005.6	1,227.7	1,168.4	59.28	20.708	
8,300.0	7,244.0	8,336.3	7,244.3	32.1	34.1	89.92	-994.1	1,105.6	1,227.7	1,163.8	63.81	19.240	
8,400.0	7,242.4	8,436.3	7,242.7	34.4	36.2	89.92	-994.1	1,205.6	1,227.7	1,159.3	68.39	17.951	
8,500.0	7,240.7	8,536.3	7,241.0	36.7	38.4	89.92	-994.1	1,305.6	1,227.7	1,154.6	73.02	16.812	
8,600.0	7,239.1	8,636.3	7,239.3	39.0	40.6	89.92	-994.1	1,405.5	1,227.7	1,150.0	77.69	15.802	
8,700.0	7,237.4	8,736.3	7,237.7	41.4	42.8	89.92	-994.1	1,505.5	1,227.7	1,145.3	82.39	14.900	
8,800.0	7,235.7	8,836.3	7,236.0	43.7	45.1	89.92	-994.1	1,605.5	1,227.7	1,140.5	87.12	14.091	
8,900.0	7,234.1	8,936.3	7,234.4	46.1	47.4	89.92	-994.1	1,705.5	1,227.7	1,135.8	91.87	13.362	
9,000.0	7,232.4	9,036.3	7,232.7	48.5	49.7	89.92	-994.1	1,805.5	1,227.7	1,131.0	96.65	12.703	
9,100.0	7,230.8	9,136.3	7,231.0	50.9	52.0	89.92	-994.1	1,905.5	1,227.7	1,126.2	101.43	12.103	
9,200.0	7,229.1	9,236.3	7,229.4	53.3	54.4	89.92	-994.1	2,005.5	1,227.7	1,121.4	106.24	11.556	
9,300.0	7,227.4	9,336.3	7,227.7	55.7	56.7	89.92	-994.1	2,105.5	1,227.7	1,116.6	111.05	11.055	
9,400.0	7,225.8	9,436.3	7,226.1	58.1	59.1	89.92	-994.1	2,205.4	1,227.7	1,111.8	115.88	10.594	
9,500.0	7,224.1	9,536.3	7,224.4	60.5	61.4	89.92	-994.1	2,305.4	1,227.7	1,106.9	120.72	10.170	
9,600.0	7,222.5	9,636.3	7,222.8	62.9	63.8	89.92	-994.1	2,405.4	1,227.7	1,102.1	125.56	9.777	
9,700.0	7,220.8	9,736.3	7,221.1	65.4	66.2	89.92	-994.1	2,505.4	1,227.7	1,097.2	130.42	9.413	
9,800.0	7,219.2	9,836.3	7,219.4	67.8	68.6	89.92	-994.1	2,605.4	1,227.7	1,092.4	135.28	9.075	
9,900.0	7,217.5	9,936.3	7,217.8	70.2	71.0	89.92	-994.1	2,705.4	1,227.7	1,087.5	140.14	8.760	
10,000.0	7,215.8	10,036.3	7,216.1	72.6	73.4	89.92	-994.1	2,805.4	1,227.7	1,082.6	145.01	8.466	
10,100.0	7,214.2	10,136.3	7,214.5	75.1	75.8	89.92	-994.1	2,905.3	1,227.7	1,077.8	149.89	8.190	
10,200.0	7,212.5	10,236.3	7,212.8	77.5	78.2	89.92	-994.1	3,005.3	1,227.7	1,072.9	154.77	7.932	
10,300.0	7,210.9	10,336.3	7,211.2	80.0	80.6	89.92	-994.1	3,105.3	1,227.7	1,068.0	159.66	7.689	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-6H - HZ - Plan #1										Offset Site Error:		0.0 ft	
Survey Program: 0-Geolink MWD										Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)			
10,400.0	7,209.2	10,436.3	7,209.5	82.4	83.0	89.92	-994.1	3,205.3	1,227.7	1,063.1	164.55	7.461	
10,500.0	7,207.6	10,536.3	7,207.8	84.9	85.5	89.92	-994.1	3,305.3	1,227.7	1,058.2	169.44	7.245	
10,600.0	7,205.9	10,636.3	7,206.2	87.3	87.9	89.92	-994.1	3,405.3	1,227.7	1,053.3	174.34	7.042	
10,700.0	7,204.2	10,736.3	7,204.5	89.7	90.3	89.92	-994.1	3,505.3	1,227.7	1,048.4	179.23	6.849	
10,800.0	7,202.6	10,836.3	7,202.9	92.2	92.7	89.92	-994.1	3,605.2	1,227.7	1,043.5	184.14	6.667	
10,900.0	7,200.9	10,936.3	7,201.2	94.6	95.2	89.92	-994.1	3,705.2	1,227.7	1,038.6	189.04	6.494	
11,000.0	7,199.3	11,036.3	7,199.5	97.1	97.6	89.92	-994.1	3,805.2	1,227.7	1,033.7	193.94	6.330	
11,100.0	7,197.6	11,136.3	7,197.9	99.6	100.0	89.92	-994.1	3,905.2	1,227.7	1,028.8	198.85	6.174	
11,200.0	7,195.9	11,236.3	7,196.2	102.0	102.5	89.92	-994.1	4,005.2	1,227.7	1,023.9	203.76	6.025	
11,300.0	7,194.3	11,336.3	7,194.6	104.5	104.9	89.92	-994.1	4,105.2	1,227.7	1,019.0	208.67	5.883	
11,400.0	7,192.6	11,436.3	7,192.9	106.9	107.4	89.92	-994.1	4,205.2	1,227.7	1,014.1	213.59	5.748	
11,500.0	7,191.0	11,536.3	7,191.3	109.4	109.8	89.92	-994.1	4,305.1	1,227.7	1,009.1	218.50	5.618	
11,600.0	7,189.3	11,636.3	7,189.6	111.8	112.2	89.92	-994.1	4,405.1	1,227.7	1,004.2	223.42	5.495	
11,700.0	7,187.7	11,736.3	7,187.9	114.3	114.7	89.92	-994.1	4,505.1	1,227.7	999.3	228.34	5.376	
11,708.7	7,187.5	11,744.9	7,187.8	114.5	114.9	89.92	-994.1	4,513.8	1,227.7	998.9	228.76	5.366 SF	

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-7H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.0	0.0	2.0	2.0	0.0	0.0	-178.81	-134.8	-2.8	134.8					
100.0	100.0	102.0	102.0	0.2	0.2	-178.81	-134.8	-2.8	134.8	134.5	0.31	433.939		
166.0	166.0	168.0	168.0	0.3	0.3	-178.81	-134.8	-2.8	134.8	134.3	0.54	249.187 CC		
200.0	200.0	202.0	202.0	0.3	0.3	-178.81	-134.8	-2.8	134.8	134.2	0.66	204.365 ES		
300.0	300.0	300.0	300.0	0.5	0.5	-139.19	-135.6	-2.9	136.4	135.3	1.01	135.585		
400.0	400.0	397.2	397.2	0.7	0.7	-139.72	-138.1	-3.2	140.9	139.6	1.35	104.239		
500.0	499.9	494.5	494.3	0.9	0.9	-140.50	-142.3	-3.8	148.3	146.6	1.70	87.256		
600.0	599.8	591.4	591.1	1.1	1.1	-141.19	-148.0	-4.6	157.6	155.6	2.05	76.941		
700.0	699.7	688.1	687.5	1.2	1.3	-141.71	-155.4	-5.6	168.6	166.2	2.40	70.325		
800.0	799.6	784.4	783.4	1.4	1.5	-142.07	-164.3	-6.8	181.3	178.5	2.75	65.993		
900.0	899.5	880.3	878.7	1.6	1.7	-142.31	-174.8	-8.2	195.6	192.5	3.10	63.168		
1,000.0	999.4	975.7	973.3	1.8	2.0	-142.43	-186.7	-9.9	211.5	208.0	3.44	61.389		
1,100.0	1,099.3	1,070.5	1,067.2	2.0	2.3	-142.47	-200.2	-11.7	229.0	225.2	3.79	60.365		
1,200.0	1,199.2	1,164.8	1,160.3	2.2	2.5	-142.44	-215.1	-13.7	248.1	244.0	4.14	59.902		
1,300.0	1,299.1	1,260.1	1,254.1	2.4	2.9	-142.35	-231.6	-16.0	268.7	264.2	4.49	59.812		
1,400.0	1,399.0	1,357.9	1,350.3	2.6	3.2	-142.27	-248.8	-18.3	289.6	284.8	4.85	59.742		
1,500.0	1,498.9	1,455.7	1,446.5	2.8	3.5	-142.19	-266.0	-20.6	310.5	305.3	5.20	59.680		
1,600.0	1,598.8	1,553.5	1,542.8	2.9	3.9	-142.13	-283.2	-23.0	331.5	325.9	5.56	59.625		
1,700.0	1,698.7	1,651.2	1,639.0	3.1	4.2	-142.07	-300.5	-25.3	352.4	346.5	5.91	59.576		
1,800.0	1,798.6	1,749.0	1,735.2	3.3	4.5	-142.02	-317.7	-27.7	373.3	367.0	6.27	59.533		
1,900.0	1,898.5	1,846.8	1,831.5	3.5	4.9	-141.97	-334.9	-30.0	394.2	387.6	6.63	59.493		
2,000.0	1,998.4	1,944.6	1,927.7	3.7	5.2	-141.93	-352.1	-32.3	415.1	408.1	6.98	59.457		
2,100.0	2,098.3	2,042.4	2,023.9	3.9	5.6	-141.90	-369.3	-34.7	436.0	428.7	7.34	59.425		
2,200.0	2,198.2	2,140.2	2,120.2	4.1	5.9	-141.86	-386.6	-37.0	456.9	449.2	7.69	59.395		
2,300.0	2,298.1	2,238.0	2,216.4	4.3	6.2	-141.83	-403.8	-39.4	477.8	469.8	8.05	59.368		
2,400.0	2,398.1	2,335.8	2,312.6	4.5	6.6	-141.80	-421.0	-41.7	498.8	490.4	8.40	59.343		
2,500.0	2,498.0	2,433.6	2,408.9	4.7	6.9	-141.78	-438.2	-44.1	519.7	510.9	8.76	59.320		
2,600.0	2,597.9	2,531.3	2,505.1	4.9	7.3	-141.75	-455.5	-46.4	540.6	531.5	9.12	59.298		
2,700.0	2,697.8	2,629.1	2,601.3	5.0	7.6	-141.73	-472.7	-48.7	561.5	552.0	9.47	59.279		
2,800.0	2,797.7	2,726.9	2,697.5	5.2	8.0	-141.71	-489.9	-51.1	582.4	572.6	9.83	59.260		
2,900.0	2,897.6	2,824.7	2,793.8	5.4	8.3	-141.69	-507.1	-53.4	603.3	593.1	10.18	59.243		
3,000.0	2,997.5	2,922.5	2,890.0	5.6	8.7	-141.68	-524.3	-55.8	624.2	613.7	10.54	59.227		
3,100.0	3,097.4	3,020.3	2,986.2	5.8	9.0	-141.66	-541.6	-58.1	645.1	634.3	10.90	59.212		
3,200.0	3,197.3	3,118.1	3,082.5	6.0	9.4	-141.64	-558.8	-60.5	666.1	654.8	11.25	59.198		
3,300.0	3,297.2	3,215.9	3,178.7	6.2	9.7	-141.63	-576.0	-62.8	687.0	675.4	11.61	59.185		
3,400.0	3,397.1	3,313.7	3,274.9	6.4	10.0	-141.61	-593.2	-65.1	707.9	695.9	11.96	59.172		
3,500.0	3,497.0	3,411.4	3,371.2	6.6	10.4	-141.60	-610.5	-67.5	728.8	716.5	12.32	59.161		
3,600.0	3,596.9	3,509.2	3,467.4	6.8	10.7	-141.59	-627.7	-69.8	749.7	737.0	12.67	59.150		
3,700.0	3,696.8	3,607.0	3,563.6	6.9	11.1	-141.58	-644.9	-72.2	770.6	757.6	13.03	59.139		
3,800.0	3,796.7	3,704.8	3,659.9	7.1	11.4	-141.57	-662.1	-74.5	791.5	778.2	13.39	59.129		
3,900.0	3,896.6	3,802.6	3,756.1	7.3	11.8	-141.56	-679.3	-76.8	812.5	798.7	13.74	59.120		
4,000.0	3,996.5	3,900.4	3,852.3	7.5	12.1	-141.55	-696.6	-79.2	833.4	819.3	14.10	59.111		
4,100.0	4,096.4	3,998.2	3,948.6	7.7	12.5	-141.54	-713.8	-81.5	854.3	839.8	14.45	59.102		
4,200.0	4,196.3	4,096.0	4,044.8	7.9	12.8	-141.53	-731.0	-83.9	875.2	860.4	14.81	59.094		
4,300.0	4,296.2	4,193.7	4,141.0	8.1	13.2	-141.52	-748.2	-86.2	896.1	880.9	15.17	59.087		
4,400.0	4,396.1	4,291.5	4,237.3	8.3	13.5	-141.51	-765.5	-88.6	917.0	901.5	15.52	59.079		
4,500.0	4,496.0	4,389.3	4,333.5	8.5	13.9	-141.50	-782.7	-90.9	937.9	922.1	15.88	59.072		
4,600.0	4,595.9	4,487.1	4,429.7	8.7	14.2	-141.50	-799.9	-93.2	958.9	942.6	16.23	59.065		
4,700.0	4,695.8	4,584.9	4,525.9	8.9	14.6	-141.49	-817.1	-95.6	979.8	963.2	16.59	59.059		
4,800.0	4,795.8	4,682.7	4,622.2	9.0	14.9	-141.48	-834.3	-97.9	1,000.7	983.7	16.95	59.053		
4,900.0	4,895.7	4,780.5	4,718.4	9.2	15.3	-141.48	-851.6	-100.3	1,021.6	1,004.3	17.30	59.047		
5,000.0	4,995.6	4,878.3	4,814.6	9.4	15.6	-141.47	-868.8	-102.6	1,042.5	1,024.9	17.66	59.041		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S32-T4N-R67W (Hepp) - Hepp #32-7H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,100.0	5,095.5	4,976.1	4,910.9	9.6	15.9	-141.46	-886.0	-104.9	1,063.4	1,045.4	18.01	59.036		
5,200.0	5,195.4	5,073.8	5,007.1	9.8	16.3	-141.46	-903.2	-107.3	1,084.3	1,066.0	18.37	59.030		
5,300.0	5,295.3	5,171.6	5,103.3	10.0	16.6	-141.45	-920.5	-109.6	1,105.3	1,086.5	18.73	59.025		
5,400.0	5,395.2	5,269.4	5,199.6	10.2	17.0	-141.45	-937.7	-112.0	1,126.2	1,107.1	19.08	59.020		
5,500.0	5,495.1	5,367.2	5,295.8	10.4	17.3	-141.44	-954.9	-114.3	1,147.1	1,127.6	19.44	59.016		
5,600.0	5,595.0	5,465.0	5,392.0	10.6	17.7	-141.44	-972.1	-116.7	1,168.0	1,148.2	19.79	59.011		
5,700.0	5,694.9	5,562.8	5,488.3	10.8	18.0	-141.43	-989.3	-119.0	1,188.9	1,168.8	20.15	59.007		
5,800.0	5,794.8	5,660.6	5,584.5	10.9	18.4	-141.43	-1,006.6	-121.3	1,209.8	1,189.3	20.50	59.003		
5,900.0	5,894.7	5,758.4	5,680.7	11.1	18.7	-141.42	-1,023.8	-123.7	1,230.7	1,209.9	20.86	58.998		
6,000.0	5,994.6	5,856.2	5,777.0	11.3	19.1	-141.42	-1,041.0	-126.0	1,251.7	1,230.4	21.22	58.994		
6,100.0	6,094.5	5,953.9	5,873.2	11.5	19.4	-141.41	-1,058.2	-128.4	1,272.6	1,251.0	21.57	58.991		
6,200.0	6,194.4	6,051.7	5,969.4	11.7	19.8	-141.41	-1,075.5	-130.7	1,293.5	1,271.6	21.93	58.987		
6,300.0	6,294.3	6,149.5	6,065.7	11.9	20.1	-141.41	-1,092.7	-133.1	1,314.4	1,292.1	22.28	58.983		
6,400.0	6,394.2	6,247.3	6,161.9	12.1	20.5	-141.40	-1,109.9	-135.4	1,335.3	1,312.7	22.64	58.980 SF		

Anticollision Report

Company:	K. P. Kauffman Company, Inc.	Local Co-ordinate Reference:	Well Hepp #32-1H
Project:	Wattenberg	TVD Reference:	WELL @ 5029.0ft (Original Well Elev)
Reference Site:	S32-T4N-R67W (Hepp)	MD Reference:	WELL @ 5029.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hepp #32-1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5029.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Hepp #32-1H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.37°

