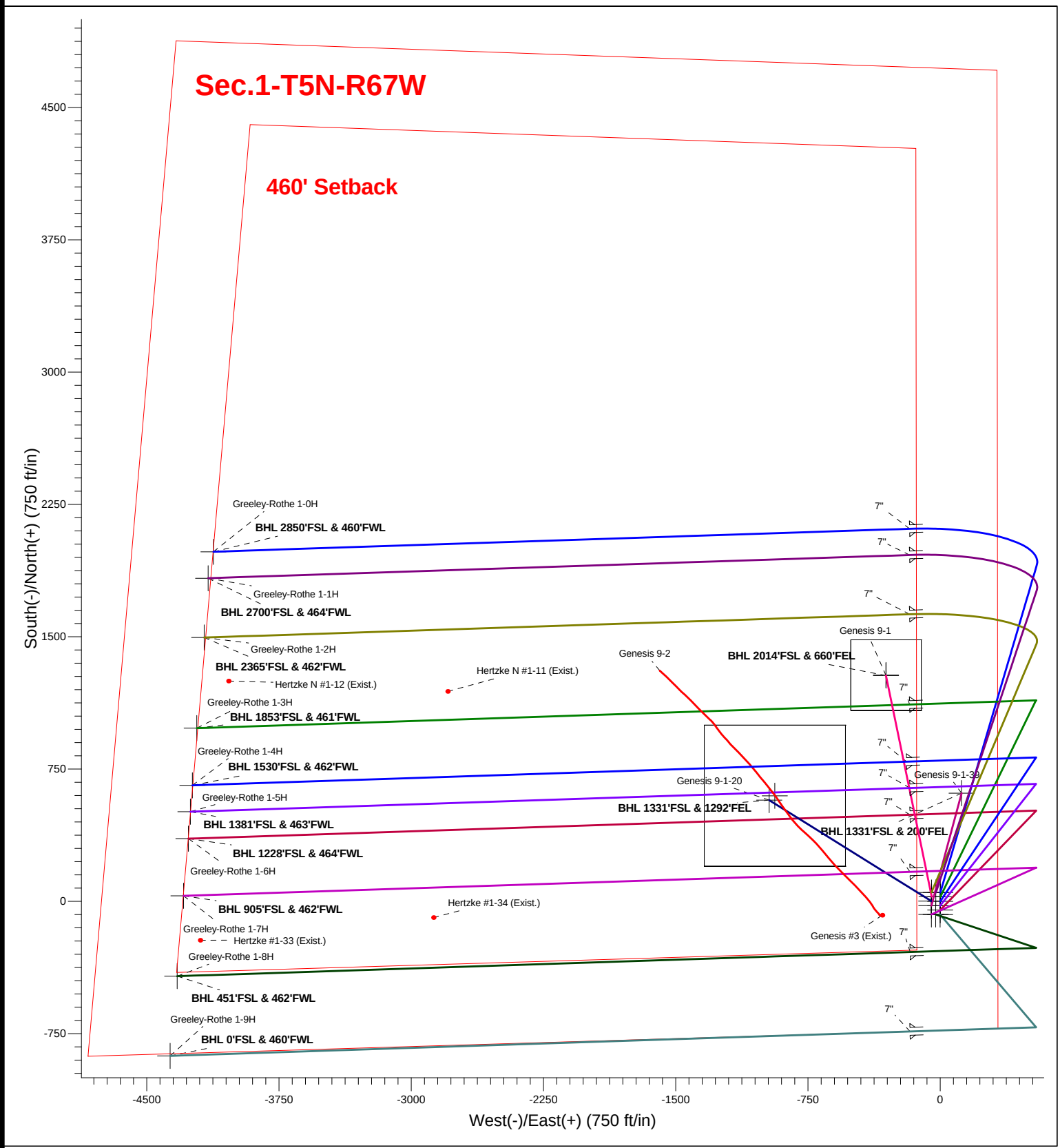
ENSIGN Directional

Surface Location: Greeley-Rothe Pad Sec.1-T5N-R67W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4876.0

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1397831.58	3185528.81	40.423536	-104.833615	

Design Version: Plan #2 (6-05-14)



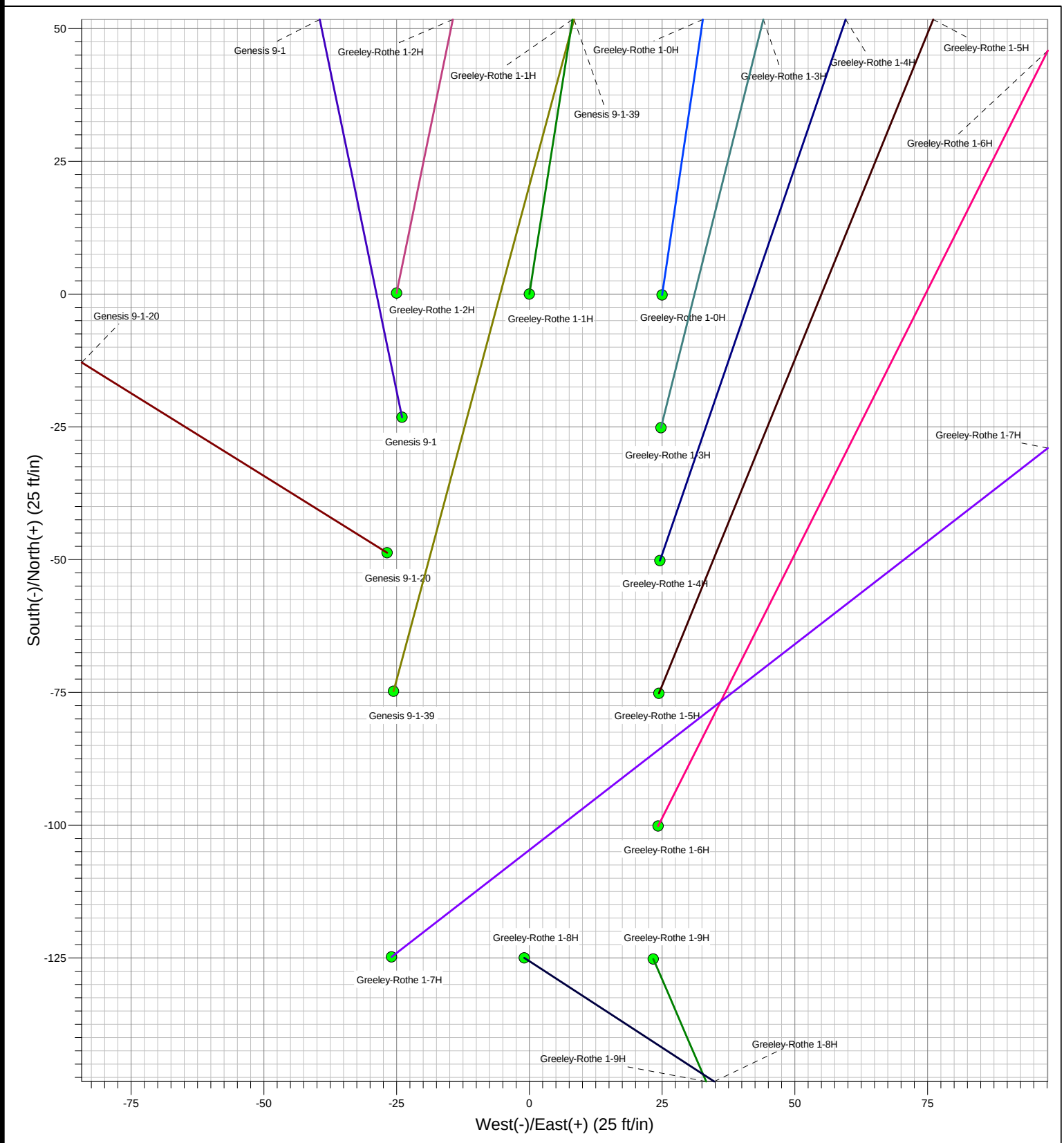
ENSIGN Directional

Surface Location: Greeley-Rothe Pad Sec.1-T5N-R67W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4875.0

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1397881.60	3185503.82	40.423674	-104.833704	

Design Version: Plan #2 (6-05-14)



KP KAUFFMAN

Well Name: **Greeley-Rothe 1-9H**

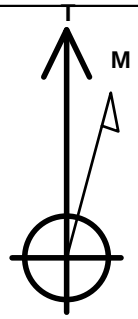
Surface Location: Greeley-Rothe Pad Sec.1-T5N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4877.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1397756.56	3185528.12	40.423330	-104.833620	

RKB - 15' WELL @ 4892.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 648'FSL & 329'FEL	1.0	0.0	0.0	Point
BHL 0'FSL & 460'FWL	7282.0	-801.1	-4365.9	Point



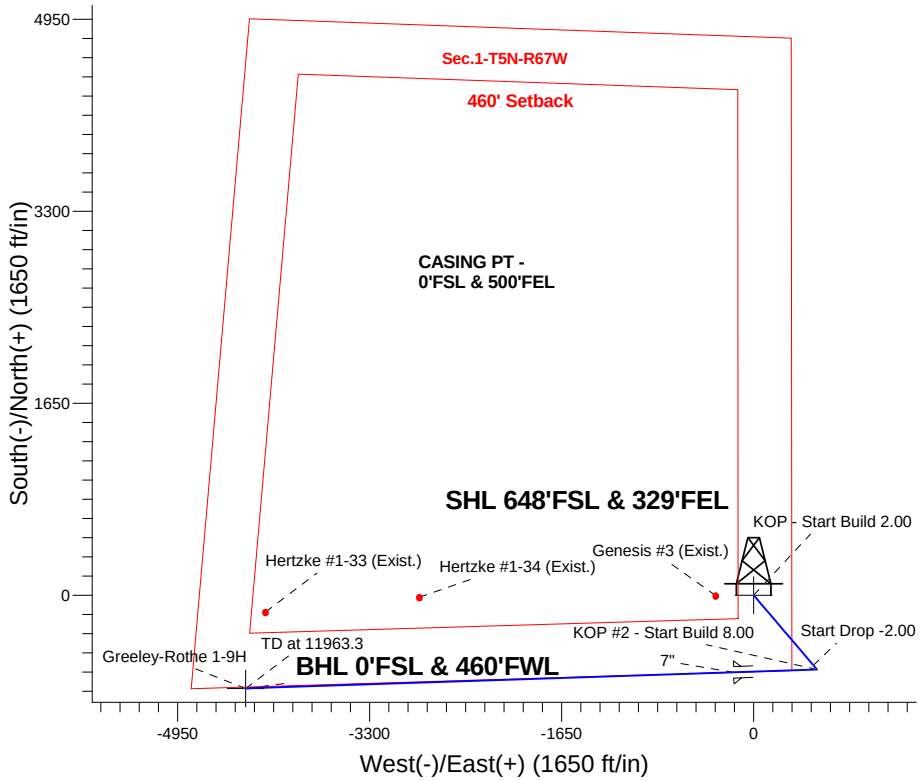
Azimuths to True North
Magnetic North: 8.50°

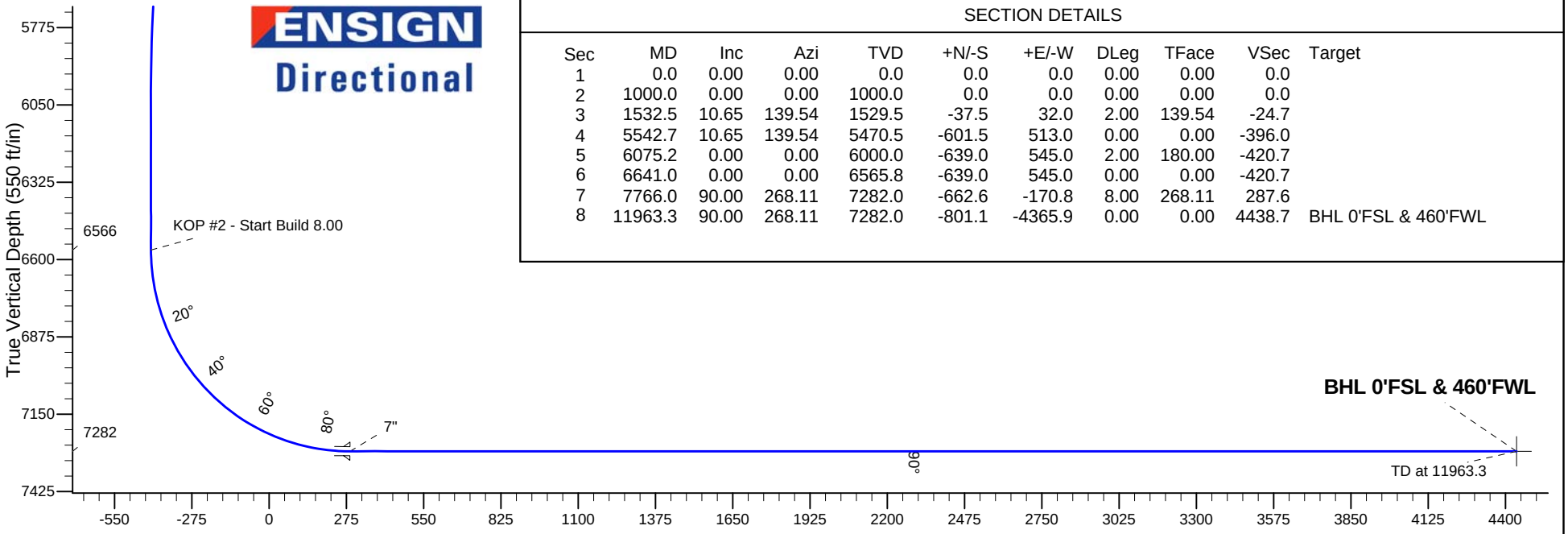
Magnetic Field
Strength: 52822.4snT
Dip Angle: 66.96°
Date: 6/6/2014
Model: IGRF2010

Greeley-Rothe Pad Sec.1-T5N-R67W
Greeley-Rothe 1-9H
Plan #2 (6-6-14)
15:55, June 06 2014

ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP - Start Build 2.00
5470.6	5542.7	Start Drop -2.00
6565.8	6641.0	KOP #2 - Start Build 8.00
7282.0	11963.3	TD at 11963.3





SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1532.5	10.65	139.54	1529.5	-37.5	32.0	2.00	139.54	-24.7	
4	5542.7	10.65	139.54	5470.5	-601.5	513.0	0.00	0.00	-396.0	
5	6075.2	0.00	0.00	6000.0	-639.0	545.0	2.00	180.00	-420.7	
6	6641.0	0.00	0.00	6565.8	-639.0	545.0	0.00	0.00	-420.7	
7	7766.0	90.00	268.11	7282.0	-662.6	-170.8	8.00	268.11	287.6	
8	11963.3	90.00	268.11	7282.0	-801.1	-4365.9	0.00	0.00	4438.7	BHL 0'FSL & 460'FWL

KP KAUFFMAN

SEC.1-T5N-R67W
Greeley-Rothe Pad Sec.1-T5N-R67W
Greeley-Rothe 1-9H

Wellbore #1

Plan: Plan #2 (6-6-14)

Standard Planning Report

06 June, 2014

Database:	landmark	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Company:	KP KAUFFMAN	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Project:	SEC.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**North Reference:**	True
Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (6-6-14)		

Project SEC.1-T5N-R67W, Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Greeley-Rothe Pad Sec.1-T5N-R67W

Site Position:		**Northing:**	1,397,880.45 ft	**Latitude:**	40.423670
From:	Lat/Long	**Easting:**	3,185,529.97 ft	**Longitude:**	-104.833610
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.43 °

Well Greeley-Rothe 1-9H

Well Position	**+N/-S**	-123.9 ft	**Northing:**	1,397,756.56 ft	**Latitude:**	40.423330
	+E/-W	-2.8 ft	**Easting:**	3,185,528.12 ft	**Longitude:**	-104.833620
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,877.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/6/2014	8.50	66.96	52,822

Design Plan #2 (6-6-14)

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	259.60

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,532.5	10.65	139.54	1,529.5	-37.5	32.0	2.00	2.00	0.00	139.54	
5,542.7	10.65	139.54	5,470.5	-601.5	513.0	0.00	0.00	0.00	0.00	
6,075.2	0.00	0.00	6,000.0	-639.0	545.0	2.00	-2.00	0.00	180.00	
6,641.0	0.00	0.00	6,565.8	-639.0	545.0	0.00	0.00	0.00	0.00	
7,766.0	90.00	268.11	7,282.0	-662.6	-170.8	8.00	8.00	0.00	268.11	
11,963.3	90.00	268.11	7,282.0	-801.1	-4,365.9	0.00	0.00	0.00	0.00	BHL 0'FSL & 460'F

Database:	landmark	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Company:	KP KAUFFMAN	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Project:	SEC.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**North Reference:**	True
Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (6-6-14)		

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)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 2.00									
1,100.0	2.00	139.54	1,100.0	-1.3	1.1	-0.9	2.00	2.00	0.00
1,200.0	4.00	139.54	1,199.8	-5.3	4.5	-3.5	2.00	2.00	0.00
1,300.0	6.00	139.54	1,299.5	-11.9	10.2	-7.9	2.00	2.00	0.00
1,400.0	8.00	139.54	1,398.7	-21.2	18.1	-14.0	2.00	2.00	0.00
1,500.0	10.00	139.54	1,497.5	-33.1	28.2	-21.8	2.00	2.00	0.00
1,532.5	10.65	139.54	1,529.5	-37.5	32.0	-24.7	2.00	2.00	0.00
1,600.0	10.65	139.54	1,595.8	-47.0	40.1	-31.0	0.00	0.00	0.00
1,700.0	10.65	139.54	1,694.1	-61.1	52.1	-40.2	0.00	0.00	0.00
1,800.0	10.65	139.54	1,792.3	-75.2	64.1	-49.5	0.00	0.00	0.00
1,900.0	10.65	139.54	1,890.6	-89.2	76.1	-58.7	0.00	0.00	0.00
2,000.0	10.65	139.54	1,988.9	-103.3	88.1	-68.0	0.00	0.00	0.00
2,100.0	10.65	139.54	2,087.2	-117.3	100.1	-77.3	0.00	0.00	0.00
2,200.0	10.65	139.54	2,185.4	-131.4	112.1	-86.5	0.00	0.00	0.00
2,300.0	10.65	139.54	2,283.7	-145.5	124.1	-95.8	0.00	0.00	0.00
2,400.0	10.65	139.54	2,382.0	-159.5	136.1	-105.0	0.00	0.00	0.00
2,500.0	10.65	139.54	2,480.3	-173.6	148.1	-114.3	0.00	0.00	0.00
2,600.0	10.65	139.54	2,578.5	-187.7	160.1	-123.6	0.00	0.00	0.00
2,700.0	10.65	139.54	2,676.8	-201.7	172.0	-132.8	0.00	0.00	0.00
2,800.0	10.65	139.54	2,775.1	-215.8	184.0	-142.1	0.00	0.00	0.00
2,900.0	10.65	139.54	2,873.4	-229.8	196.0	-151.3	0.00	0.00	0.00
3,000.0	10.65	139.54	2,971.7	-243.9	208.0	-160.6	0.00	0.00	0.00
3,100.0	10.65	139.54	3,069.9	-258.0	220.0	-169.8	0.00	0.00	0.00
3,200.0	10.65	139.54	3,168.2	-272.0	232.0	-179.1	0.00	0.00	0.00
3,300.0	10.65	139.54	3,266.5	-286.1	244.0	-188.4	0.00	0.00	0.00
3,400.0	10.65	139.54	3,364.8	-300.2	256.0	-197.6	0.00	0.00	0.00
3,500.0	10.65	139.54	3,463.0	-314.2	268.0	-206.9	0.00	0.00	0.00
3,600.0	10.65	139.54	3,561.3	-328.3	280.0	-216.1	0.00	0.00	0.00
3,700.0	10.65	139.54	3,659.6	-342.3	292.0	-225.4	0.00	0.00	0.00
3,800.0	10.65	139.54	3,757.9	-356.4	304.0	-234.7	0.00	0.00	0.00
3,900.0	10.65	139.54	3,856.2	-370.5	316.0	-243.9	0.00	0.00	0.00
4,000.0	10.65	139.54	3,954.4	-384.5	328.0	-253.2	0.00	0.00	0.00
4,100.0	10.65	139.54	4,052.7	-398.6	339.9	-262.4	0.00	0.00	0.00
4,200.0	10.65	139.54	4,151.0	-412.6	351.9	-271.7	0.00	0.00	0.00
4,300.0	10.65	139.54	4,249.3	-426.7	363.9	-280.9	0.00	0.00	0.00
4,400.0	10.65	139.54	4,347.5	-440.8	375.9	-290.2	0.00	0.00	0.00
4,500.0	10.65	139.54	4,445.8	-454.8	387.9	-299.5	0.00	0.00	0.00
4,600.0	10.65	139.54	4,544.1	-468.9	399.9	-308.7	0.00	0.00	0.00
4,700.0	10.65	139.54	4,642.4	-483.0	411.9	-318.0	0.00	0.00	0.00
4,800.0	10.65	139.54	4,740.6	-497.0	423.9	-327.2	0.00	0.00	0.00
4,900.0	10.65	139.54	4,838.9	-511.1	435.9	-336.5	0.00	0.00	0.00
5,000.0	10.65	139.54	4,937.2	-525.1	447.9	-345.8	0.00	0.00	0.00
5,100.0	10.65	139.54	5,035.5	-539.2	459.9	-355.0	0.00	0.00	0.00

Database:	landmark	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Company:	KP KAUFFMAN	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Project:	SEC.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**North Reference:**	True
Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (6-6-14)		

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)	Turn Rate (°/100ft)
5,200.0	10.65	139.54	5,133.8	-553.3	471.9	-364.3	0.00	0.00	0.00
5,300.0	10.65	139.54	5,232.0	-567.3	483.9	-373.5	0.00	0.00	0.00
5,400.0	10.65	139.54	5,330.3	-581.4	495.9	-382.8	0.00	0.00	0.00
5,500.0	10.65	139.54	5,428.6	-595.4	507.9	-392.1	0.00	0.00	0.00
5,542.7	10.65	139.54	5,470.6	-601.5	513.0	-396.0	0.00	0.00	0.00
Start Drop -2.00									
5,600.0	9.50	139.54	5,527.0	-609.1	519.5	-401.0	2.00	-2.00	0.00
5,700.0	7.50	139.54	5,625.9	-620.3	529.1	-408.4	2.00	-2.00	0.00
5,800.0	5.50	139.54	5,725.2	-629.0	536.4	-414.1	2.00	-2.00	0.00
5,900.0	3.50	139.54	5,824.9	-634.9	541.5	-418.0	2.00	-2.00	0.00
6,000.0	1.50	139.54	5,924.8	-638.2	544.4	-420.2	2.00	-2.00	0.00
6,075.2	0.00	0.00	6,000.0	-639.0	545.0	-420.7	2.00	-2.00	0.00
6,100.0	0.00	0.00	6,024.8	-639.0	545.0	-420.7	0.00	0.00	0.00
6,200.0	0.00	0.00	6,124.8	-639.0	545.0	-420.7	0.00	0.00	0.00
6,300.0	0.00	0.00	6,224.8	-639.0	545.0	-420.7	0.00	0.00	0.00
6,400.0	0.00	0.00	6,324.8	-639.0	545.0	-420.7	0.00	0.00	0.00
6,500.0	0.00	0.00	6,424.8	-639.0	545.0	-420.7	0.00	0.00	0.00
6,600.0	0.00	0.00	6,524.8	-639.0	545.0	-420.7	0.00	0.00	0.00
6,641.0	0.00	0.00	6,565.8	-639.0	545.0	-420.7	0.00	0.00	0.00
KOP #2 - Start Build 8.00									
6,700.0	4.72	268.11	6,624.7	-639.1	542.6	-418.3	8.00	8.00	0.00
6,800.0	12.72	268.11	6,723.5	-639.6	527.4	-403.3	8.00	8.00	0.00
6,900.0	20.72	268.11	6,819.2	-640.5	498.7	-374.9	8.00	8.00	0.00
7,000.0	28.72	268.11	6,909.9	-641.9	456.9	-333.6	8.00	8.00	0.00
7,100.0	36.72	268.11	6,994.0	-643.7	403.0	-280.2	8.00	8.00	0.00
7,200.0	44.72	268.11	7,069.7	-645.8	337.8	-215.7	8.00	8.00	0.00
7,300.0	52.72	268.11	7,135.7	-648.3	262.8	-141.5	8.00	8.00	0.00
7,400.0	60.72	268.11	7,190.5	-651.1	179.3	-58.8	8.00	8.00	0.00
7,500.0	68.72	268.11	7,233.2	-654.1	89.0	30.5	8.00	8.00	0.00
7,600.0	76.72	268.11	7,262.8	-657.2	-6.4	124.9	8.00	8.00	0.00
7,700.0	84.72	268.11	7,279.0	-660.5	-104.9	222.4	8.00	8.00	0.00
7,766.0	90.00	268.11	7,282.0	-662.6	-170.8	287.6	8.00	8.00	0.00
7"									
7,800.0	90.00	268.11	7,282.0	-663.7	-204.8	321.2	0.00	0.00	0.00
7,900.0	90.00	268.11	7,282.0	-667.0	-304.7	420.1	0.00	0.00	0.00
8,000.0	90.00	268.11	7,282.0	-670.3	-404.7	519.0	0.00	0.00	0.00
8,100.0	90.00	268.11	7,282.0	-673.6	-504.6	617.9	0.00	0.00	0.00
8,200.0	90.00	268.11	7,282.0	-676.9	-604.6	716.8	0.00	0.00	0.00
8,300.0	90.00	268.11	7,282.0	-680.2	-704.5	815.7	0.00	0.00	0.00
8,400.0	90.00	268.11	7,282.0	-683.5	-804.5	914.6	0.00	0.00	0.00
8,500.0	90.00	268.11	7,282.0	-686.8	-904.4	1,013.5	0.00	0.00	0.00
8,600.0	90.00	268.11	7,282.0	-690.1	-1,004.3	1,112.4	0.00	0.00	0.00
8,700.0	90.00	268.11	7,282.0	-693.4	-1,104.3	1,211.3	0.00	0.00	0.00
8,800.0	90.00	268.11	7,282.0	-696.7	-1,204.2	1,310.2	0.00	0.00	0.00
8,900.0	90.00	268.11	7,282.0	-700.0	-1,304.2	1,409.1	0.00	0.00	0.00
9,000.0	90.00	268.11	7,282.0	-703.3	-1,404.1	1,508.0	0.00	0.00	0.00
9,100.0	90.00	268.11	7,282.0	-706.6	-1,504.1	1,606.9	0.00	0.00	0.00
9,200.0	90.00	268.11	7,282.0	-709.9	-1,604.0	1,705.8	0.00	0.00	0.00
9,300.0	90.00	268.11	7,282.0	-713.2	-1,704.0	1,804.7	0.00	0.00	0.00
9,400.0	90.00	268.11	7,282.0	-716.5	-1,803.9	1,903.6	0.00	0.00	0.00
9,500.0	90.00	268.11	7,282.0	-719.8	-1,903.9	2,002.5	0.00	0.00	0.00
9,600.0	90.00	268.11	7,282.0	-723.1	-2,003.8	2,101.4	0.00	0.00	0.00
9,700.0	90.00	268.11	7,282.0	-726.4	-2,103.7	2,200.3	0.00	0.00	0.00

Database:	landmark	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Company:	KP KAUFFMAN	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Project:	SEC.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**North Reference:**	True
Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (6-6-14)		

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)	Turn Rate (°/100ft)
9,800.0	90.00	268.11	7,282.0	-729.7	-2,203.7	2,299.2	0.00	0.00	0.00
9,900.0	90.00	268.11	7,282.0	-733.0	-2,303.6	2,398.1	0.00	0.00	0.00
10,000.0	90.00	268.11	7,282.0	-736.3	-2,403.6	2,497.0	0.00	0.00	0.00
10,100.0	90.00	268.11	7,282.0	-739.6	-2,503.5	2,595.9	0.00	0.00	0.00
10,200.0	90.00	268.11	7,282.0	-742.9	-2,603.5	2,694.8	0.00	0.00	0.00
10,300.0	90.00	268.11	7,282.0	-746.2	-2,703.4	2,793.7	0.00	0.00	0.00
10,400.0	90.00	268.11	7,282.0	-749.5	-2,803.4	2,892.6	0.00	0.00	0.00
10,500.0	90.00	268.11	7,282.0	-752.8	-2,903.3	2,991.5	0.00	0.00	0.00
10,600.0	90.00	268.11	7,282.0	-756.1	-3,003.3	3,090.4	0.00	0.00	0.00
10,700.0	90.00	268.11	7,282.0	-759.4	-3,103.2	3,189.3	0.00	0.00	0.00
10,800.0	90.00	268.11	7,282.0	-762.7	-3,203.1	3,288.2	0.00	0.00	0.00
10,900.0	90.00	268.11	7,282.0	-766.0	-3,303.1	3,387.1	0.00	0.00	0.00
11,000.0	90.00	268.11	7,282.0	-769.3	-3,403.0	3,486.0	0.00	0.00	0.00
11,100.0	90.00	268.11	7,282.0	-772.6	-3,503.0	3,584.9	0.00	0.00	0.00
11,200.0	90.00	268.11	7,282.0	-775.9	-3,602.9	3,683.8	0.00	0.00	0.00
11,300.0	90.00	268.11	7,282.0	-779.2	-3,702.9	3,782.7	0.00	0.00	0.00
11,400.0	90.00	268.11	7,282.0	-782.5	-3,802.8	3,881.6	0.00	0.00	0.00
11,500.0	90.00	268.11	7,282.0	-785.8	-3,902.8	3,980.5	0.00	0.00	0.00
11,600.0	90.00	268.11	7,282.0	-789.1	-4,002.7	4,079.4	0.00	0.00	0.00
11,700.0	90.00	268.11	7,282.0	-792.4	-4,102.7	4,178.3	0.00	0.00	0.00
11,800.0	90.00	268.11	7,282.0	-795.7	-4,202.6	4,277.2	0.00	0.00	0.00
11,900.0	90.00	268.11	7,282.0	-799.0	-4,302.5	4,376.1	0.00	0.00	0.00
11,963.3	90.00	268.11	7,282.0	-801.1	-4,365.8	4,438.7	0.00	0.00	0.00
TD at 11963.3									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,766.0	7,282.0	7"	7	7-1/2

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,000.0	1,000.0	0.0	0.0	KOP - Start Build 2.00
5,542.7	5,470.5	-37.5	32.0	Start Drop -2.00
6,641.0	6,565.8	-601.5	513.0	KOP #2 - Start Build 8.00
11,963.3	7,282.0	-610.7	520.8	TD at 11963.3

ENSIGN Directional

KP KAUFFMAN

SEC.1-T5N-R67W
Greeley-Rothe Pad Sec.1-T5N-R67W
Greeley-Rothe 1-9H

Wellbore #1
Plan #2 (6-6-14)

Anticollision Report

06 June, 2014

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Reference Plan #2 (6-6-14)

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 500.0ft	**Error Surface:**	Elliptical Conic

Warning Levels Evaluated at: 2.00 **Sigma**

Survey Tool Program **Date** 6/6/2014

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,963.3	Plan #2 (6-6-14) (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Genesis 9-1 Pad Sec.1-T5N-R67W						
Genesis #3 (Exist.) - Wellbore #1 - Wellbore #1	1,000.0	1,003.0	327.4	305.2	14.752	CC
Genesis #3 (Exist.) - Wellbore #1 - Wellbore #1	1,100.0	1,103.0	328.6	304.2	13.472	ES
Genesis #3 (Exist.) - Wellbore #1 - Wellbore #1	2,400.0	2,385.0	489.0	436.4	9.291	SF
Genesis 9-2 - Wellbore #1 - Wellbore #1	153.6	154.6	341.8	341.3	714.771	CC
Genesis 9-2 - Wellbore #1 - Wellbore #1	200.0	198.5	342.0	341.3	506.497	ES
Genesis 9-2 - Wellbore #1 - Wellbore #1	1,300.0	1,199.9	486.1	480.2	82.236	SF
Greeley-Rothe Pad Sec.1-T5N-R67W						
Genesis 9-1 - Wellbore #1 - Plan #2 (5-2-14)	800.0	799.0	112.5	109.1	33.378	CC, ES
Genesis 9-1 - Wellbore #1 - Plan #2 (5-2-14)	1,100.0	1,086.9	128.8	124.1	27.517	SF
Genesis 9-1-20 - Wellbore #1 - Plan #1 (5-02-14)	1,000.0	999.0	91.5	87.2	21.427	CC, ES
Genesis 9-1-20 - Wellbore #1 - Plan #1 (5-02-14)	1,100.0	1,096.1	94.7	90.0	20.228	SF
Genesis 9-1-39 - Wellbore #1 - Plan #2 (6-05-14)	1,000.0	999.0	70.3	66.0	16.460	CC, ES
Genesis 9-1-39 - Wellbore #1 - Plan #2 (6-05-14)	1,200.0	1,198.8	77.2	72.1	15.160	SF
Greeley-Rothe 1-1H - Wellbore #1 - Plan #2 (6-05-14)	400.0	398.0	127.4	125.8	81.192	CC, ES
Greeley-Rothe 1-1H - Wellbore #1 - Plan #2 (6-05-14)	1,000.0	968.1	181.7	177.4	42.407	SF
Greeley-Rothe 1-2H - Wellbore #1 - Plan #2 (6-05-14)	600.0	598.0	134.4	131.9	54.460	CC, ES
Greeley-Rothe 1-2H - Wellbore #1 - Plan #2 (6-05-14)	1,100.0	1,077.1	168.3	163.6	35.763	SF
Greeley-Rothe 1-3H - Wellbore #1 - Plan #2 (6-05-14)	800.0	798.0	100.1	96.7	29.716	CC, ES
Greeley-Rothe 1-3H - Wellbore #1 - Plan #2 (6-05-14)	1,100.0	1,087.8	115.0	110.4	24.588	SF
Greeley-Rothe 1-4H - Wellbore #1 - Plan #2 (6-05-14)	1,000.0	999.0	75.0	70.8	17.578	CC, ES
Greeley-Rothe 1-4H - Wellbore #1 - Plan #2 (6-05-14)	1,100.0	1,096.8	77.7	73.1	16.586	SF
Greeley-Rothe 1-5H - Wellbore #1 - Plan #2 (6-05-14)	1,000.0	999.0	50.0	45.8	11.723	CC, ES
Greeley-Rothe 1-5H - Wellbore #1 - Plan #2 (6-05-14)	1,200.0	1,198.8	55.4	50.3	10.874	SF
Greeley-Rothe 1-6H - Wellbore #1 - Plan #2 (6-05-14)	1,000.0	999.0	25.0	20.8	5.868	CC, ES
Greeley-Rothe 1-6H - Wellbore #1 - Plan #2 (6-05-14)	1,100.0	1,099.0	26.4	21.7	5.617	SF
Greeley-Rothe 1-7H - Wellbore #1 - Plan #2 (6-05-14)	1,000.0	999.0	49.3	45.0	11.553	CC, ES
Greeley-Rothe 1-7H - Wellbore #1 - Plan #2 (6-05-14)	1,200.0	1,198.8	54.1	49.0	10.625	SF
Greeley-Rothe 1-8H - Wellbore #1 - Plan #2 (6-05-14)	1,000.0	1,000.0	24.3	20.0	5.692	CC, ES
Greeley-Rothe 1-8H - Wellbore #1 - Plan #2 (6-05-14)	11,963.3	11,897.0	453.4	191.5	1.731	SF
Hertzke #1-33 (Exist.) - Wellbore #1 - Wellbore #1						Out of range
Hertzke #1-34 (Exist.) - Wellbore #1 - Wellbore #1						Out of range
Hertzke N #1-11 (Exist.) - Wellbore #1 - Wellbore #1						Out of range
Hertzke N #1-12 (Exist.) - Wellbore #1 - Wellbore #1						Out of range

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Genesis 9-1 Pad Sec.1-T5N-R67W - Genesis #3 (Exist.) - Wellbore #1 - Wellbore #1 — **Offset Site Error:** 0.0 ft

Survey Program: 7800-UNKNOWN — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	3.0	3.0	0.0	0.1	-90.64	-3.6	-327.4	327.4	327.4	0.06	5,439.140	
100.0	100.0	103.0	103.0	0.1	2.1	-90.64	-3.6	-327.4	327.4	325.3	2.17	150.713	
200.0	200.0	203.0	203.0	0.3	4.1	-90.64	-3.6	-327.4	327.4	323.0	4.40	74.462	
300.0	300.0	303.0	303.0	0.6	6.1	-90.64	-3.6	-327.4	327.4	320.8	6.62	49.446	
400.0	400.0	403.0	403.0	0.8	8.1	-90.64	-3.6	-327.4	327.4	318.6	8.85	37.011	
500.0	500.0	503.0	503.0	1.0	10.1	-90.64	-3.6	-327.4	327.4	316.4	11.07	29.574	
600.0	600.0	603.0	603.0	1.2	12.1	-90.64	-3.6	-327.4	327.4	314.1	13.30	24.626	
700.0	700.0	703.0	703.0	1.5	14.1	-90.64	-3.6	-327.4	327.4	311.9	15.52	21.096	
800.0	800.0	803.0	803.0	1.7	16.1	-90.64	-3.6	-327.4	327.4	309.7	17.75	18.451	
900.0	900.0	903.0	903.0	1.9	18.1	-90.64	-3.6	-327.4	327.4	307.5	19.97	16.396	
1,000.0	1,000.0	1,003.0	1,003.0	2.1	20.1	-90.64	-3.6	-327.4	327.4	305.2	22.20	14.752	CC
1,100.0	1,100.0	1,103.0	1,103.0	2.3	22.1	130.04	-3.6	-327.4	328.6	304.2	24.39	13.472	ES
1,200.0	1,199.8	1,202.8	1,202.8	2.5	24.1	130.68	-3.6	-327.4	331.9	305.4	26.55	12.504	
1,300.0	1,299.5	1,302.5	1,302.5	2.7	26.0	131.71	-3.6	-327.4	337.7	309.0	28.69	11.770	
1,400.0	1,398.7	1,401.7	1,401.7	2.9	28.0	133.09	-3.6	-327.4	346.0	315.1	30.82	11.226	
1,500.0	1,497.5	1,500.5	1,500.5	3.2	30.0	134.76	-3.6	-327.4	356.9	324.0	32.92	10.841	
1,600.0	1,595.8	1,598.8	1,598.8	3.5	32.0	136.70	-3.6	-327.4	370.1	335.0	35.07	10.554	
1,700.0	1,694.1	1,697.1	1,697.1	3.8	33.9	138.58	-3.6	-327.4	383.9	346.6	37.25	10.304	
1,800.0	1,792.3	1,795.3	1,795.3	4.2	35.9	140.33	-3.6	-327.4	398.0	358.6	39.45	10.089	
1,900.0	1,890.6	1,893.6	1,893.6	4.5	37.9	141.95	-3.6	-327.4	412.5	370.8	41.64	9.905	
2,000.0	1,988.9	1,991.9	1,991.9	4.9	39.8	143.47	-3.6	-327.4	427.3	383.4	43.84	9.746	
2,100.0	2,087.2	2,090.2	2,090.2	5.3	41.8	144.89	-3.6	-327.4	442.4	396.3	46.04	9.608	
2,200.0	2,185.4	2,188.4	2,188.4	5.7	43.8	146.21	-3.6	-327.4	457.7	409.5	48.24	9.488	
2,300.0	2,283.7	2,286.7	2,286.7	6.0	45.7	147.45	-3.6	-327.4	473.2	422.8	50.43	9.383	
2,400.0	2,382.0	2,385.0	2,385.0	6.4	47.7	148.61	-3.6	-327.4	489.0	436.4	52.63	9.291	SF

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Genesis 9-1 Pad Sec.1-T5N-R67W - Genesis 9-2 - Wellbore #1 - Wellbore #1 — **Offset Site Error:** 0.0 ft

Survey Program: 78-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.61	-3.7	-342.5	342.5				
100.0	100.0	103.0	103.0	0.1	0.1	-90.69	-4.1	-341.9	342.0	341.7	0.25	1,356.109	
153.6	153.6	154.6	154.6	0.2	0.2	-90.68	-4.1	-341.8	341.8	341.3	0.48	714.771	CC
200.0	200.0	198.5	198.5	0.3	0.3	-90.60	-3.6	-341.9	342.0	341.3	0.68	506.497	ES
300.0	300.0	291.6	291.5	0.6	0.5	-90.13	-0.8	-343.5	343.7	342.5	1.11	310.654	
400.0	400.0	383.3	383.0	0.8	0.8	-89.41	3.6	-347.1	347.6	346.1	1.54	225.415	
500.0	500.0	474.7	474.0	1.0	1.0	-88.38	10.0	-352.8	354.0	352.0	1.99	178.123	
600.0	600.0	570.0	568.7	1.2	1.3	-87.06	18.5	-360.6	362.5	360.1	2.44	148.513	
700.0	700.0	668.5	666.3	1.5	1.6	-85.67	27.9	-368.9	371.6	368.7	2.89	128.504	
800.0	800.0	766.0	762.7	1.7	1.9	-83.89	40.4	-377.2	381.3	377.9	3.35	113.897	
900.0	900.0	853.3	848.5	1.9	2.2	-81.97	54.4	-385.5	392.9	389.1	3.80	103.445	
1,000.0	1,000.0	937.5	930.6	2.1	2.6	-80.02	69.7	-395.9	408.1	403.9	4.24	96.164	
1,100.0	1,100.0	1,027.0	1,017.3	2.3	3.0	142.28	86.7	-410.2	428.9	423.9	4.97	86.247	
1,200.0	1,199.8	1,107.7	1,095.0	2.5	3.4	143.97	102.8	-424.9	455.3	449.9	5.43	83.790	
1,300.0	1,299.5	1,199.9	1,183.4	2.7	3.9	146.00	122.2	-442.1	486.1	480.2	5.91	82.236	SF

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Genesis 9-1 - Wellbore #1 - Plan #2 (5-2-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-24.89	102.0	-47.3	112.5				
100.0	100.0	99.0	99.0	0.1	0.1	-24.89	102.0	-47.3	112.5	112.2	0.22	502.843	
200.0	200.0	199.0	199.0	0.3	0.3	-24.89	102.0	-47.3	112.5	111.8	0.67	167.335	
300.0	300.0	299.0	299.0	0.6	0.6	-24.89	102.0	-47.3	112.5	111.3	1.12	100.267	
400.0	400.0	399.0	399.0	0.8	0.8	-24.89	102.0	-47.3	112.5	110.9	1.57	71.578	
500.0	500.0	499.0	499.0	1.0	1.0	-24.89	102.0	-47.3	112.5	110.4	2.02	55.654	
600.0	600.0	599.0	599.0	1.2	1.2	-24.89	102.0	-47.3	112.5	110.0	2.47	45.526	
700.0	700.0	699.0	699.0	1.5	1.5	-24.89	102.0	-47.3	112.5	109.5	2.92	38.517	
800.0	800.0	799.0	799.0	1.7	1.7	-24.89	102.0	-47.3	112.5	109.1	3.37	33.378	CC, ES
900.0	900.0	895.3	895.3	1.9	1.9	-24.71	103.6	-47.7	114.1	110.3	3.81	29.931	
1,000.0	1,000.0	991.4	991.2	2.1	2.1	-24.19	108.3	-48.6	118.9	114.7	4.25	27.954	
1,100.0	1,100.0	1,086.9	1,086.4	2.3	2.3	-163.11	116.1	-50.2	128.8	124.1	4.68	27.517	SF
1,200.0	1,199.8	1,181.1	1,180.0	2.5	2.6	-162.68	126.8	-52.5	145.1	140.0	5.08	28.537	
1,300.0	1,299.5	1,273.5	1,271.4	2.7	2.8	-162.41	140.3	-55.2	167.9	162.4	5.49	30.554	
1,400.0	1,398.7	1,363.6	1,360.0	2.9	3.1	-162.27	156.1	-58.5	196.8	190.9	5.90	33.343	
1,500.0	1,497.5	1,450.9	1,445.3	3.2	3.4	-162.18	174.1	-62.2	231.8	225.5	6.31	36.730	
1,600.0	1,595.8	1,535.2	1,527.2	3.5	3.7	-162.26	193.9	-66.3	271.9	265.2	6.73	40.393	
1,700.0	1,694.1	1,617.7	1,606.6	3.8	4.1	-162.29	215.5	-70.8	314.8	307.6	7.17	43.888	
1,800.0	1,792.3	1,707.5	1,692.8	4.2	4.5	-162.27	240.2	-75.9	358.8	351.2	7.62	47.098	
1,900.0	1,890.6	1,797.3	1,779.0	4.5	4.9	-162.25	264.8	-81.0	402.8	394.7	8.07	49.885	
2,000.0	1,988.9	1,887.1	1,865.2	4.9	5.4	-162.24	289.5	-86.1	446.8	438.3	8.54	52.323	
2,100.0	2,087.2	1,976.9	1,951.4	5.3	5.8	-162.23	314.2	-91.2	490.9	481.8	9.01	54.466	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Genesis 9-1-20 - Wellbore #1 - Plan #1 (5-02-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-33.23	76.5	-50.1	91.5				
100.0	100.0	99.0	99.0	0.1	0.1	-33.23	76.5	-50.1	91.5	91.2	0.22	408.935	
200.0	200.0	199.0	199.0	0.3	0.3	-33.23	76.5	-50.1	91.5	90.8	0.67	136.085	
300.0	300.0	299.0	299.0	0.6	0.6	-33.23	76.5	-50.1	91.5	90.3	1.12	81.542	
400.0	400.0	399.0	399.0	0.8	0.8	-33.23	76.5	-50.1	91.5	89.9	1.57	58.211	
500.0	500.0	499.0	499.0	1.0	1.0	-33.23	76.5	-50.1	91.5	89.4	2.02	45.261	
600.0	600.0	599.0	599.0	1.2	1.2	-33.23	76.5	-50.1	91.5	89.0	2.47	37.024	
700.0	700.0	699.0	699.0	1.5	1.5	-33.23	76.5	-50.1	91.5	88.5	2.92	31.324	
800.0	800.0	799.0	799.0	1.7	1.7	-33.23	76.5	-50.1	91.5	88.1	3.37	27.144	
900.0	900.0	899.0	899.0	1.9	1.9	-33.23	76.5	-50.1	91.5	87.6	3.82	23.949	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	-33.23	76.5	-50.1	91.5	87.2	4.27	21.427	CC, ES
1,100.0	1,100.0	1,096.1	1,096.1	2.3	2.3	-173.30	77.4	-51.5	94.7	90.0	4.68	20.228	SF
1,200.0	1,199.8	1,192.5	1,192.4	2.5	2.6	-174.71	79.9	-55.6	104.5	99.4	5.07	20.598	
1,300.0	1,299.5	1,287.6	1,287.1	2.7	2.8	-176.55	84.1	-62.4	120.9	115.4	5.47	22.094	
1,400.0	1,398.7	1,380.8	1,379.7	2.9	3.0	-178.41	89.9	-71.6	143.9	138.0	5.87	24.499	
1,500.0	1,497.5	1,471.5	1,469.4	3.2	3.2	179.93	97.0	-83.0	173.3	167.0	6.27	27.627	
1,600.0	1,595.8	1,559.5	1,555.9	3.5	3.5	178.53	105.3	-96.3	208.2	201.5	6.68	31.150	
1,700.0	1,694.1	1,645.4	1,639.9	3.8	3.8	177.36	114.8	-111.6	246.0	238.9	7.10	34.632	
1,800.0	1,792.3	1,731.1	1,723.2	4.2	4.1	176.36	125.5	-128.8	286.6	279.0	7.53	38.047	
1,900.0	1,890.6	1,822.1	1,811.4	4.5	4.5	175.52	137.3	-147.7	327.9	319.9	7.97	41.118	
2,000.0	1,988.9	1,913.1	1,899.7	4.9	4.9	174.87	149.0	-166.6	369.2	360.8	8.42	43.854	
2,100.0	2,087.2	2,004.1	1,987.9	5.3	5.3	174.35	160.8	-185.5	410.6	401.7	8.87	46.292	
2,200.0	2,185.4	2,095.0	2,076.1	5.7	5.7	173.92	172.6	-204.4	452.0	442.7	9.33	48.460	
2,300.0	2,283.7	2,186.0	2,164.3	6.0	6.1	173.57	184.3	-223.3	493.4	483.6	9.79	50.398	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Genesis 9-1-39 - Wellbore #1 - Plan #2 (6-05-14) — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-44.13	50.4	-48.9	70.3				
100.0	100.0	99.0	99.0	0.1	0.1	-44.13	50.4	-48.9	70.3	70.0	0.22	314.138	
200.0	200.0	199.0	199.0	0.3	0.3	-44.13	50.4	-48.9	70.3	69.6	0.67	104.539	
300.0	300.0	299.0	299.0	0.6	0.6	-44.13	50.4	-48.9	70.3	69.1	1.12	62.639	
400.0	400.0	399.0	399.0	0.8	0.8	-44.13	50.4	-48.9	70.3	68.7	1.57	44.717	
500.0	500.0	499.0	499.0	1.0	1.0	-44.13	50.4	-48.9	70.3	68.2	2.02	34.769	
600.0	600.0	599.0	599.0	1.2	1.2	-44.13	50.4	-48.9	70.3	67.8	2.47	28.441	
700.0	700.0	699.0	699.0	1.5	1.5	-44.13	50.4	-48.9	70.3	67.3	2.92	24.062	
800.0	800.0	799.0	799.0	1.7	1.7	-44.13	50.4	-48.9	70.3	66.9	3.37	20.852	
900.0	900.0	899.0	899.0	1.9	1.9	-44.13	50.4	-48.9	70.3	66.4	3.82	18.397	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	-44.13	50.4	-48.9	70.3	66.0	4.27	16.460	CC, ES
1,100.0	1,100.0	1,099.0	1,099.0	2.3	2.4	176.42	50.4	-48.9	72.0	67.3	4.69	15.344	
1,200.0	1,199.8	1,198.8	1,198.8	2.5	2.6	176.65	50.4	-48.9	77.2	72.1	5.09	15.160	SF
1,300.0	1,299.5	1,298.5	1,298.5	2.7	2.8	176.98	50.4	-48.9	85.9	80.4	5.50	15.630	
1,400.0	1,398.7	1,397.7	1,397.7	2.9	3.0	177.35	50.4	-48.9	98.1	92.2	5.90	16.624	
1,500.0	1,497.5	1,496.5	1,496.5	3.2	3.3	177.70	50.4	-48.9	113.7	107.4	6.30	18.040	
1,600.0	1,595.8	1,594.8	1,594.8	3.5	3.5	178.01	50.4	-48.9	132.0	125.3	6.72	19.632	
1,700.0	1,694.1	1,693.1	1,693.1	3.8	3.7	178.26	50.4	-48.9	150.5	143.3	7.16	21.021	
1,800.0	1,792.3	1,791.3	1,791.3	4.2	3.9	178.45	50.4	-48.9	169.0	161.4	7.60	22.234	
1,900.0	1,890.6	1,889.6	1,889.6	4.5	4.1	178.60	50.4	-48.9	187.4	179.4	8.04	23.301	
2,000.0	1,988.9	1,987.9	1,987.9	4.9	4.4	178.73	50.4	-48.9	205.9	197.4	8.49	24.246	
2,100.0	2,087.2	2,086.2	2,086.2	5.3	4.6	178.83	50.4	-48.9	224.4	215.4	8.94	25.086	
2,200.0	2,185.4	2,184.4	2,184.4	5.7	4.8	178.92	50.4	-48.9	242.9	233.5	9.40	25.838	
2,300.0	2,283.7	2,278.7	2,278.7	6.0	5.0	179.19	51.5	-48.6	262.0	252.1	9.85	26.602	
2,400.0	2,382.0	2,371.5	2,371.4	6.4	5.2	179.94	55.4	-47.6	282.9	272.6	10.30	27.474	
2,500.0	2,480.3	2,463.3	2,462.9	6.8	5.4	-178.95	62.1	-45.8	305.6	294.9	10.74	28.445	
2,600.0	2,578.5	2,553.9	2,553.0	7.2	5.6	-177.58	71.5	-43.3	330.3	319.1	11.20	29.505	
2,700.0	2,676.8	2,643.2	2,641.5	7.6	5.8	-176.04	83.5	-40.0	357.1	345.4	11.65	30.640	
2,800.0	2,775.1	2,731.1	2,728.0	8.0	6.1	-174.40	97.8	-36.2	386.0	373.8	12.12	31.844	
2,900.0	2,873.4	2,817.3	2,812.5	8.5	6.3	-172.71	114.4	-31.7	417.1	404.5	12.60	33.108	
3,000.0	2,971.7	2,901.9	2,894.9	8.9	6.5	-171.02	133.0	-26.7	450.5	437.4	13.09	34.420	
3,100.0	3,069.9	2,992.6	2,982.8	9.3	6.8	-169.28	154.8	-20.9	485.6	472.0	13.61	35.674	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-1H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-10.57	125.2	-23.4	127.4				
100.0	100.0	98.0	98.0	0.1	0.1	-10.57	125.2	-23.4	127.4	127.2	0.22	572.432	
200.0	200.0	198.0	198.0	0.3	0.3	-10.57	125.2	-23.4	127.4	126.7	0.67	190.174	
300.0	300.0	298.0	298.0	0.6	0.6	-10.57	125.2	-23.4	127.4	126.3	1.12	113.799	
400.0	400.0	398.0	398.0	0.8	0.8	-10.57	125.2	-23.4	127.4	125.8	1.57	81.192	CC, ES
500.0	500.0	494.3	494.3	1.0	1.0	-10.23	126.7	-22.9	128.8	126.8	2.01	64.054	
600.0	600.0	590.3	590.2	1.2	1.2	-9.25	131.2	-21.4	133.2	130.7	2.46	54.201	
700.0	700.0	685.9	685.4	1.5	1.4	-7.74	138.7	-18.8	140.6	137.7	2.91	48.371	
800.0	800.0	780.8	779.7	1.7	1.7	-5.88	149.2	-15.4	151.1	147.7	3.36	44.979	
900.0	900.0	875.0	872.8	1.9	2.0	-3.84	162.5	-10.9	164.8	161.0	3.82	43.166	
1,000.0	1,000.0	968.1	964.3	2.1	2.3	-1.79	178.5	-5.6	181.7	177.4	4.28	42.407	SF
1,100.0	1,100.0	1,059.7	1,053.9	2.3	2.6	-139.39	197.0	0.6	203.1	198.4	4.74	42.836	
1,200.0	1,199.8	1,149.5	1,141.0	2.5	3.0	-138.02	217.7	7.5	230.1	225.0	5.17	44.482	
1,300.0	1,299.5	1,236.9	1,225.0	2.7	3.4	-137.10	240.3	15.1	262.5	256.9	5.61	46.757	
1,400.0	1,398.7	1,325.7	1,309.8	2.9	3.9	-136.51	265.5	23.5	299.7	293.6	6.07	49.331	
1,500.0	1,497.5	1,417.4	1,397.2	3.2	4.4	-136.29	291.9	32.3	339.5	333.0	6.54	51.881	
1,600.0	1,595.8	1,508.2	1,483.8	3.5	4.9	-136.70	317.9	41.0	381.2	374.1	7.05	54.076	
1,700.0	1,694.1	1,599.0	1,570.3	3.8	5.5	-137.20	344.0	49.7	423.0	415.4	7.58	55.806	
1,800.0	1,792.3	1,689.8	1,656.8	4.2	6.0	-137.62	370.1	58.4	464.8	456.7	8.13	57.196	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-2H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-21.09	125.4	-48.4	134.4				
100.0	100.0	98.0	98.0	0.1	0.1	-21.09	125.4	-48.4	134.4	134.2	0.22	604.000	
200.0	200.0	198.0	198.0	0.3	0.3	-21.09	125.4	-48.4	134.4	133.7	0.67	200.661	
300.0	300.0	298.0	298.0	0.6	0.6	-21.09	125.4	-48.4	134.4	133.3	1.12	120.074	
400.0	400.0	398.0	398.0	0.8	0.8	-21.09	125.4	-48.4	134.4	132.8	1.57	85.669	
500.0	500.0	498.0	498.0	1.0	1.0	-21.09	125.4	-48.4	134.4	132.4	2.02	66.589	
600.0	600.0	598.0	598.0	1.2	1.2	-21.09	125.4	-48.4	134.4	131.9	2.47	54.460	CC, ES
700.0	700.0	694.8	694.7	1.5	1.4	-20.63	126.8	-47.8	135.6	132.7	2.91	46.586	
800.0	800.0	791.3	791.1	1.7	1.7	-19.26	131.3	-45.9	139.2	135.9	3.36	41.496	
900.0	900.0	887.3	886.8	1.9	1.9	-17.14	138.7	-42.8	145.5	141.7	3.80	38.270	
1,000.0	1,000.0	982.7	981.6	2.1	2.1	-14.47	148.9	-38.4	154.7	150.4	4.25	36.375	
1,100.0	1,100.0	1,077.1	1,074.9	2.3	2.4	-151.18	161.9	-32.9	168.3	163.6	4.71	35.763	SF
1,200.0	1,199.8	1,170.1	1,166.3	2.5	2.7	-148.71	177.5	-26.3	188.0	182.9	5.14	36.583	
1,300.0	1,299.5	1,261.1	1,255.2	2.7	3.0	-146.69	195.3	-18.8	213.5	207.9	5.58	38.242	
1,400.0	1,398.7	1,349.9	1,341.3	2.9	3.4	-145.07	215.3	-10.4	244.5	238.5	6.04	40.501	
1,500.0	1,497.5	1,441.4	1,429.6	3.2	3.8	-143.84	237.7	-0.9	280.2	273.7	6.51	43.011	
1,600.0	1,595.8	1,534.0	1,518.8	3.5	4.2	-143.35	260.4	8.7	318.0	311.0	7.01	45.336	
1,700.0	1,694.1	1,626.5	1,608.0	3.8	4.7	-143.11	283.1	18.3	356.0	348.4	7.55	47.174	
1,800.0	1,792.3	1,719.0	1,697.1	4.2	5.2	-142.92	305.8	27.9	393.9	385.8	8.09	48.698	
1,900.0	1,890.6	1,811.5	1,786.3	4.5	5.6	-142.76	328.6	37.5	431.9	423.2	8.65	49.953	
2,000.0	1,988.9	1,904.0	1,875.5	4.9	6.1	-142.63	351.3	47.1	469.8	460.6	9.21	50.997	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-3H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.83	100.0	1.4	100.1				
100.0	100.0	98.0	98.0	0.1	0.1	0.83	100.0	1.4	100.1	99.8	0.22	449.640	
200.0	200.0	198.0	198.0	0.3	0.3	0.83	100.0	1.4	100.1	99.4	0.67	149.380	
300.0	300.0	298.0	298.0	0.6	0.6	0.83	100.0	1.4	100.1	98.9	1.12	89.388	
400.0	400.0	398.0	398.0	0.8	0.8	0.83	100.0	1.4	100.1	98.5	1.57	63.775	
500.0	500.0	498.0	498.0	1.0	1.0	0.83	100.0	1.4	100.1	98.0	2.02	49.572	
600.0	600.0	598.0	598.0	1.2	1.2	0.83	100.0	1.4	100.1	97.6	2.47	40.542	
700.0	700.0	698.0	698.0	1.5	1.5	0.83	100.0	1.4	100.1	97.1	2.92	34.295	
800.0	800.0	798.0	798.0	1.7	1.7	0.83	100.0	1.4	100.1	96.7	3.37	29.716	CC, ES
900.0	900.0	895.0	894.9	1.9	1.9	1.21	101.5	2.1	101.5	97.7	3.81	26.656	
1,000.0	1,000.0	991.6	991.5	2.1	2.1	2.30	105.8	4.3	106.1	101.8	4.25	24.952	
1,100.0	1,100.0	1,087.8	1,087.3	2.3	2.3	-136.07	113.0	7.8	115.0	110.4	4.68	24.588	SF
1,200.0	1,199.8	1,183.0	1,181.8	2.5	2.6	-135.50	123.0	12.6	129.6	124.5	5.09	25.456	
1,300.0	1,299.5	1,276.7	1,274.5	2.7	2.8	-135.39	135.6	18.8	149.6	144.1	5.51	27.124	
1,400.0	1,398.7	1,368.7	1,364.9	2.9	3.1	-135.56	150.6	26.1	174.9	169.0	5.95	29.380	
1,500.0	1,497.5	1,458.4	1,452.6	3.2	3.4	-135.84	167.7	34.4	205.5	199.1	6.41	32.051	
1,600.0	1,595.8	1,548.4	1,539.9	3.5	3.8	-136.42	187.2	43.9	240.4	233.5	6.90	34.820	
1,700.0	1,694.1	1,641.8	1,630.5	3.8	4.2	-136.97	207.9	54.0	275.9	268.5	7.42	37.210	
1,800.0	1,792.3	1,735.2	1,721.1	4.2	4.6	-137.40	228.5	64.1	311.5	303.5	7.95	39.183	
1,900.0	1,890.6	1,828.7	1,811.6	4.5	5.0	-137.74	249.2	74.1	347.0	338.6	8.49	40.862	
2,000.0	1,988.9	1,922.1	1,902.2	4.9	5.4	-138.02	269.8	84.2	382.6	373.6	9.05	42.273	
2,100.0	2,087.2	2,015.6	1,992.8	5.3	5.8	-138.25	290.5	94.3	418.2	408.6	9.62	43.475	
2,200.0	2,185.4	2,109.0	2,083.4	5.7	6.3	-138.45	311.1	104.3	453.8	443.6	10.20	44.505	
2,300.0	2,283.7	2,202.5	2,173.9	6.0	6.7	-138.61	331.8	114.4	489.4	478.6	10.78	45.395	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-4H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.96	75.0	1.3	75.0				
100.0	100.0	99.0	99.0	0.1	0.1	0.96	75.0	1.3	75.0	74.8	0.22	335.474	
200.0	200.0	199.0	199.0	0.3	0.3	0.96	75.0	1.3	75.0	74.4	0.67	111.639	
300.0	300.0	299.0	299.0	0.6	0.6	0.96	75.0	1.3	75.0	73.9	1.12	66.894	
400.0	400.0	399.0	399.0	0.8	0.8	0.96	75.0	1.3	75.0	73.5	1.57	47.754	
500.0	500.0	499.0	499.0	1.0	1.0	0.96	75.0	1.3	75.0	73.0	2.02	37.130	
600.0	600.0	599.0	599.0	1.2	1.2	0.96	75.0	1.3	75.0	72.6	2.47	30.373	
700.0	700.0	699.0	699.0	1.5	1.5	0.96	75.0	1.3	75.0	72.1	2.92	25.697	
800.0	800.0	799.0	799.0	1.7	1.7	0.96	75.0	1.3	75.0	71.7	3.37	22.268	
900.0	900.0	899.0	899.0	1.9	1.9	0.96	75.0	1.3	75.0	71.2	3.82	19.647	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	0.96	75.0	1.3	75.0	70.8	4.27	17.578	CC, ES
1,100.0	1,100.0	1,096.8	1,096.8	2.3	2.4	-138.73	76.4	2.2	77.7	73.1	4.69	16.586	SF
1,200.0	1,199.8	1,194.1	1,194.0	2.5	2.6	-139.07	80.5	4.9	85.9	80.8	5.09	16.881	
1,300.0	1,299.5	1,290.6	1,290.1	2.7	2.8	-139.50	87.3	9.4	99.6	94.1	5.51	18.081	
1,400.0	1,398.7	1,385.8	1,384.6	2.9	3.0	-139.88	96.6	15.6	118.6	112.6	5.94	19.970	
1,500.0	1,497.5	1,479.3	1,477.0	3.2	3.3	-140.17	108.3	23.4	142.8	136.4	6.39	22.366	
1,600.0	1,595.8	1,570.9	1,567.2	3.5	3.5	-140.45	122.2	32.7	171.6	164.8	6.86	25.003	
1,700.0	1,694.1	1,661.1	1,655.2	3.8	3.8	-140.27	138.2	43.4	203.0	195.7	7.37	27.547	
1,800.0	1,792.3	1,749.6	1,741.1	4.2	4.2	-139.72	156.2	55.3	236.9	229.0	7.90	29.985	
1,900.0	1,890.6	1,836.4	1,824.6	4.5	4.5	-138.97	175.9	68.5	273.1	264.6	8.45	32.321	
2,000.0	1,988.9	1,925.8	1,910.0	4.9	5.0	-138.12	198.0	83.3	311.3	302.2	9.03	34.472	
2,100.0	2,087.2	2,018.1	1,998.0	5.3	5.4	-137.41	221.0	98.6	349.7	340.1	9.62	36.339	
2,200.0	2,185.4	2,110.3	2,086.0	5.7	5.9	-136.84	244.0	113.9	388.1	377.9	10.23	37.944	
2,300.0	2,283.7	2,202.6	2,174.0	6.0	6.4	-136.38	267.0	129.3	426.6	415.8	10.85	39.331	
2,400.0	2,382.0	2,294.8	2,262.0	6.4	6.9	-135.99	290.1	144.6	465.2	453.7	11.47	40.538	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-5H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	1.21	50.0	1.1	50.0				
100.0	100.0	99.0	99.0	0.1	0.1	1.21	50.0	1.1	50.0	49.8	0.22	223.728	
200.0	200.0	199.0	199.0	0.3	0.3	1.21	50.0	1.1	50.0	49.4	0.67	74.452	
300.0	300.0	299.0	299.0	0.6	0.6	1.21	50.0	1.1	50.0	48.9	1.12	44.612	
400.0	400.0	399.0	399.0	0.8	0.8	1.21	50.0	1.1	50.0	48.5	1.57	31.847	
500.0	500.0	499.0	499.0	1.0	1.0	1.21	50.0	1.1	50.0	48.0	2.02	24.762	
600.0	600.0	599.0	599.0	1.2	1.2	1.21	50.0	1.1	50.0	47.6	2.47	20.256	
700.0	700.0	699.0	699.0	1.5	1.5	1.21	50.0	1.1	50.0	47.1	2.92	17.137	
800.0	800.0	799.0	799.0	1.7	1.7	1.21	50.0	1.1	50.0	46.7	3.37	14.851	
900.0	900.0	899.0	899.0	1.9	1.9	1.21	50.0	1.1	50.0	46.2	3.82	13.103	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	1.21	50.0	1.1	50.0	45.8	4.27	11.723	CC, ES
1,100.0	1,100.0	1,099.0	1,099.0	2.3	2.4	-139.61	50.0	1.1	51.4	46.7	4.69	10.942	
1,200.0	1,199.8	1,198.8	1,198.8	2.5	2.6	-143.06	50.0	1.1	55.4	50.3	5.10	10.874	SF
1,300.0	1,299.5	1,297.0	1,296.9	2.7	2.8	-146.62	51.3	2.1	63.8	58.3	5.51	11.587	
1,400.0	1,398.7	1,394.3	1,394.2	2.9	3.0	-148.73	55.2	5.1	77.6	71.7	5.92	13.106	
1,500.0	1,497.5	1,490.5	1,490.0	3.2	3.2	-149.63	61.6	10.2	96.6	90.3	6.35	15.229	
1,600.0	1,595.8	1,585.4	1,584.2	3.5	3.5	-149.74	70.4	17.1	120.1	113.3	6.80	17.667	
1,700.0	1,694.1	1,679.1	1,676.9	3.8	3.7	-148.95	81.4	25.8	145.8	138.6	7.28	20.032	
1,800.0	1,792.3	1,771.6	1,767.8	4.2	4.0	-147.64	94.7	36.2	173.7	165.9	7.79	22.303	
1,900.0	1,890.6	1,864.6	1,858.7	4.5	4.3	-146.09	110.1	48.4	203.6	195.3	8.33	24.451	
2,000.0	1,988.9	1,959.8	1,951.7	4.9	4.6	-144.82	126.3	61.1	234.0	225.1	8.88	26.337	
2,100.0	2,087.2	2,055.0	2,044.6	5.3	4.9	-143.84	142.4	73.8	264.4	254.9	9.46	27.958	
2,200.0	2,185.4	2,150.1	2,137.5	5.7	5.3	-143.07	158.6	86.5	294.9	284.8	10.04	29.379	
2,300.0	2,283.7	2,245.3	2,230.4	6.0	5.7	-142.43	174.7	99.2	325.4	314.8	10.63	30.614	
2,400.0	2,382.0	2,340.5	2,323.4	6.4	6.1	-141.91	190.9	112.0	356.0	344.7	11.23	31.698	
2,500.0	2,480.3	2,435.6	2,416.3	6.8	6.5	-141.47	207.1	124.7	386.5	374.7	11.84	32.654	
2,600.0	2,578.5	2,530.8	2,509.2	7.2	6.8	-141.10	223.2	137.4	417.1	404.7	12.45	33.502	
2,700.0	2,676.8	2,626.0	2,602.1	7.6	7.2	-140.77	239.4	150.1	447.8	434.7	13.07	34.257	
2,800.0	2,775.1	2,721.2	2,695.0	8.0	7.7	-140.49	255.5	162.9	478.4	464.7	13.69	34.934	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-6H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	2.04	25.0	0.9	25.1				
100.0	100.0	99.0	99.0	0.1	0.1	2.04	25.0	0.9	25.0	24.8	0.22	112.001	
200.0	200.0	199.0	199.0	0.3	0.3	2.04	25.0	0.9	25.0	24.4	0.67	37.271	
300.0	300.0	299.0	299.0	0.6	0.6	2.04	25.0	0.9	25.0	23.9	1.12	22.333	
400.0	400.0	399.0	399.0	0.8	0.8	2.04	25.0	0.9	25.0	23.5	1.57	15.943	
500.0	500.0	499.0	499.0	1.0	1.0	2.04	25.0	0.9	25.0	23.0	2.02	12.396	
600.0	600.0	599.0	599.0	1.2	1.2	2.04	25.0	0.9	25.0	22.6	2.47	10.140	
700.0	700.0	699.0	699.0	1.5	1.5	2.04	25.0	0.9	25.0	22.1	2.92	8.579	
800.0	800.0	799.0	799.0	1.7	1.7	2.04	25.0	0.9	25.0	21.7	3.37	7.434	
900.0	900.0	899.0	899.0	1.9	1.9	2.04	25.0	0.9	25.0	21.2	3.82	6.559	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	2.04	25.0	0.9	25.0	20.8	4.27	5.868	CC, ES
1,100.0	1,100.0	1,099.0	1,099.0	2.3	2.4	-140.05	25.0	0.9	26.4	21.7	4.69	5.617	SF
1,200.0	1,199.8	1,198.8	1,198.8	2.5	2.6	-146.31	25.0	0.9	30.6	25.5	5.10	5.994	
1,300.0	1,299.5	1,298.5	1,298.5	2.7	2.8	-153.52	25.0	0.9	38.1	32.6	5.51	6.924	
1,400.0	1,398.7	1,397.7	1,397.7	2.9	3.0	-159.76	25.0	0.9	49.3	43.4	5.91	8.344	
1,500.0	1,497.5	1,496.5	1,496.5	3.2	3.3	-164.51	25.0	0.9	64.3	57.9	6.32	10.170	
1,600.0	1,595.8	1,594.8	1,594.8	3.5	3.5	-167.90	25.0	0.9	82.1	75.3	6.74	12.176	
1,700.0	1,694.1	1,692.2	1,692.2	3.8	3.7	-169.27	26.1	1.9	100.6	93.4	7.17	14.032	
1,800.0	1,792.3	1,789.2	1,789.1	4.2	3.9	-168.66	29.5	5.2	120.1	112.5	7.61	15.783	
1,900.0	1,890.6	1,885.7	1,885.2	4.5	4.1	-166.93	35.3	10.8	140.7	132.6	8.07	17.436	
2,000.0	1,988.9	1,981.4	1,980.2	4.9	4.3	-164.55	43.3	18.5	162.4	153.9	8.54	19.008	
2,100.0	2,087.2	2,076.1	2,073.9	5.3	4.6	-161.82	53.4	28.3	185.6	176.6	9.05	20.515	
2,200.0	2,185.4	2,171.4	2,167.7	5.7	4.8	-159.00	65.5	40.0	210.4	200.8	9.59	21.947	
2,300.0	2,283.7	2,267.7	2,262.4	6.0	5.1	-156.67	78.0	52.1	235.7	225.5	10.14	23.237	
2,400.0	2,382.0	2,364.0	2,357.2	6.4	5.4	-154.79	90.5	64.2	261.3	250.5	10.71	24.384	
2,500.0	2,480.3	2,460.4	2,452.0	6.8	5.7	-153.24	103.0	76.2	287.1	275.8	11.29	25.419	
2,600.0	2,578.5	2,556.7	2,546.7	7.2	6.0	-151.95	115.5	88.3	313.0	301.2	11.88	26.343	
2,700.0	2,676.8	2,653.1	2,641.5	7.6	6.4	-150.85	128.0	100.4	339.1	326.7	12.48	27.174	
2,800.0	2,775.1	2,749.4	2,736.3	8.0	6.7	-149.92	140.5	112.4	365.3	352.3	13.08	27.923	
2,900.0	2,873.4	2,845.8	2,831.0	8.5	7.0	-149.10	153.0	124.5	391.6	377.9	13.69	28.602	
3,000.0	2,971.7	2,942.1	2,925.8	8.9	7.4	-148.39	165.5	136.6	418.0	403.7	14.31	29.217	
3,100.0	3,069.9	3,038.5	3,020.6	9.3	7.7	-147.77	177.9	148.7	444.4	429.4	14.92	29.778	
3,200.0	3,168.2	3,134.8	3,115.3	9.7	8.1	-147.21	190.4	160.7	470.8	455.2	15.54	30.291	
3,300.0	3,266.5	3,231.2	3,210.1	10.1	8.4	-146.71	202.9	172.8	497.3	481.1	16.17	30.761	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-7H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-89.53	0.4	-49.3	49.3				
100.0	100.0	99.0	99.0	0.1	0.1	-89.53	0.4	-49.3	49.3	49.1	0.22	220.488	
200.0	200.0	199.0	199.0	0.3	0.3	-89.53	0.4	-49.3	49.3	48.6	0.67	73.374	
300.0	300.0	299.0	299.0	0.6	0.6	-89.53	0.4	-49.3	49.3	48.2	1.12	43.965	
400.0	400.0	399.0	399.0	0.8	0.8	-89.53	0.4	-49.3	49.3	47.7	1.57	31.386	
500.0	500.0	499.0	499.0	1.0	1.0	-89.53	0.4	-49.3	49.3	47.3	2.02	24.404	
600.0	600.0	599.0	599.0	1.2	1.2	-89.53	0.4	-49.3	49.3	46.8	2.47	19.962	
700.0	700.0	699.0	699.0	1.5	1.5	-89.53	0.4	-49.3	49.3	46.4	2.92	16.889	
800.0	800.0	799.0	799.0	1.7	1.7	-89.53	0.4	-49.3	49.3	45.9	3.37	14.636	
900.0	900.0	899.0	899.0	1.9	1.9	-89.53	0.4	-49.3	49.3	45.5	3.82	12.913	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	-89.53	0.4	-49.3	49.3	45.0	4.27	11.553	CC, ES
1,100.0	1,100.0	1,099.0	1,099.0	2.3	2.4	132.41	0.4	-49.3	50.5	45.8	4.69	10.757	
1,200.0	1,199.8	1,198.8	1,198.8	2.5	2.6	136.45	0.4	-49.3	54.1	49.0	5.10	10.625	SF
1,300.0	1,299.5	1,298.5	1,298.5	2.7	2.8	142.03	0.4	-49.3	60.8	55.3	5.50	11.037	
1,400.0	1,398.7	1,397.7	1,397.7	2.9	3.0	147.99	0.4	-49.3	70.8	64.9	5.92	11.962	
1,500.0	1,497.5	1,496.5	1,496.5	3.2	3.3	153.49	0.4	-49.3	84.5	78.2	6.33	13.348	
1,600.0	1,595.8	1,594.8	1,594.8	3.5	3.5	158.06	0.4	-49.3	101.2	94.5	6.76	14.986	
1,700.0	1,694.1	1,693.1	1,693.1	3.8	3.7	161.40	0.4	-49.3	118.6	111.4	7.19	16.491	
1,800.0	1,792.3	1,791.3	1,791.3	4.2	3.9	163.87	0.4	-49.3	136.3	128.6	7.63	17.851	
1,900.0	1,890.6	1,892.1	1,892.1	4.5	4.1	166.30	1.0	-48.0	153.4	145.3	8.07	19.001	
2,000.0	1,988.9	1,993.2	1,993.1	4.9	4.3	169.31	3.1	-43.4	169.2	160.7	8.51	19.888	
2,100.0	2,087.2	2,094.3	2,093.7	5.3	4.6	172.81	6.5	-35.5	183.8	174.9	8.94	20.558	
2,200.0	2,185.4	2,194.9	2,193.7	5.7	4.8	176.73	11.5	-24.5	197.9	188.5	9.39	21.061	
2,300.0	2,283.7	2,295.0	2,292.6	6.0	5.1	-179.00	17.8	-10.3	211.7	201.8	9.88	21.434	
2,400.0	2,382.0	2,394.2	2,390.0	6.4	5.3	-174.44	25.4	6.8	225.8	215.4	10.40	21.707	
2,500.0	2,480.3	2,491.5	2,485.2	6.8	5.6	-170.13	33.5	25.0	241.0	230.0	10.98	21.953	
2,600.0	2,578.5	2,588.8	2,580.4	7.2	5.9	-166.33	41.6	43.3	257.3	245.7	11.59	22.207	
2,700.0	2,676.8	2,686.0	2,675.5	7.6	6.3	-162.99	49.8	61.5	274.7	262.5	12.23	22.460	
2,800.0	2,775.1	2,783.3	2,770.7	8.0	6.6	-160.04	57.9	79.7	292.9	280.0	12.90	22.708	
2,900.0	2,873.4	2,880.5	2,865.9	8.5	7.0	-157.44	66.0	98.0	311.7	298.2	13.58	22.950	
3,000.0	2,971.7	2,977.8	2,961.1	8.9	7.3	-155.14	74.1	116.2	331.2	316.9	14.28	23.184	
3,100.0	3,069.9	3,075.0	3,056.3	9.3	7.7	-153.08	82.2	134.4	351.0	336.0	15.00	23.410	
3,200.0	3,168.2	3,172.3	3,151.5	9.7	8.1	-151.25	90.4	152.7	371.3	355.6	15.71	23.628	
3,300.0	3,266.5	3,269.6	3,246.7	10.1	8.5	-149.61	98.5	170.9	391.9	375.5	16.44	23.837	
3,400.0	3,364.8	3,366.8	3,341.9	10.5	8.9	-148.13	106.6	189.2	412.8	395.6	17.17	24.038	
3,500.0	3,463.0	3,464.1	3,437.1	10.9	9.2	-146.79	114.7	207.4	433.9	416.0	17.91	24.230	
3,600.0	3,561.3	3,561.3	3,532.2	11.3	9.6	-145.57	122.9	225.6	455.3	436.6	18.65	24.415	
3,700.0	3,659.6	3,658.6	3,627.4	11.8	10.0	-144.47	131.0	243.9	476.8	457.4	19.39	24.591	
3,800.0	3,757.9	3,755.9	3,722.6	12.2	10.4	-143.46	139.1	262.1	498.4	478.3	20.13	24.760	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-8H - Wellbore #1 - Plan #2 (6-05-14) — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-89.48	0.2	-24.3	24.3				
100.0	100.0	100.0	100.0	0.1	0.1	-89.48	0.2	-24.3	24.3	24.1	0.22	108.146	
200.0	200.0	200.0	200.0	0.3	0.3	-89.48	0.2	-24.3	24.3	23.6	0.67	36.049	
300.0	300.0	300.0	300.0	0.6	0.6	-89.48	0.2	-24.3	24.3	23.2	1.12	21.629	
400.0	400.0	400.0	400.0	0.8	0.8	-89.48	0.2	-24.3	24.3	22.7	1.57	15.449	
500.0	500.0	500.0	500.0	1.0	1.0	-89.48	0.2	-24.3	24.3	22.3	2.02	12.016	
600.0	600.0	600.0	600.0	1.2	1.2	-89.48	0.2	-24.3	24.3	21.8	2.47	9.831	
700.0	700.0	700.0	700.0	1.5	1.5	-89.48	0.2	-24.3	24.3	21.4	2.92	8.319	
800.0	800.0	800.0	800.0	1.7	1.7	-89.48	0.2	-24.3	24.3	20.9	3.37	7.210	
900.0	900.0	900.0	900.0	1.9	1.9	-89.48	0.2	-24.3	24.3	20.5	3.82	6.362	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-89.48	0.2	-24.3	24.3	20.0	4.27	5.692	CC, ES
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	133.93	0.2	-24.3	25.5	20.8	4.69	5.429	
1,200.0	1,199.8	1,199.8	1,199.8	2.5	2.6	141.25	0.2	-24.3	29.4	24.3	5.10	5.760	
1,300.0	1,299.5	1,300.7	1,300.7	2.7	2.8	149.91	-0.3	-22.6	34.8	29.3	5.49	6.348	
1,400.0	1,398.7	1,401.7	1,401.5	2.9	3.0	158.77	-2.0	-17.6	40.6	34.7	5.86	6.931	
1,500.0	1,497.5	1,502.7	1,502.2	3.2	3.2	167.63	-4.8	-9.1	47.1	40.9	6.23	7.560	
1,600.0	1,595.8	1,603.9	1,602.5	3.5	3.4	176.14	-8.7	2.7	54.0	47.4	6.64	8.131	
1,700.0	1,694.1	1,704.5	1,702.0	3.8	3.7	-175.64	-13.7	17.6	59.2	52.1	7.09	8.349	
1,800.0	1,792.3	1,804.1	1,800.2	4.2	4.0	-168.50	-18.8	33.0	64.9	57.3	7.59	8.544	
1,900.0	1,890.6	1,903.6	1,898.4	4.5	4.3	-162.57	-23.9	48.4	71.4	63.2	8.14	8.770	
2,000.0	1,988.9	2,003.1	1,996.6	4.9	4.6	-157.68	-29.0	63.8	78.5	69.8	8.73	8.997	
2,100.0	2,087.2	2,102.7	2,094.8	5.3	4.9	-153.62	-34.1	79.3	86.1	76.8	9.35	9.213	
2,200.0	2,185.4	2,202.2	2,193.0	5.7	5.2	-150.23	-39.2	94.7	94.1	84.1	10.00	9.412	
2,300.0	2,283.7	2,301.8	2,291.2	6.0	5.6	-147.37	-44.3	110.1	102.4	91.7	10.67	9.593	
2,400.0	2,382.0	2,401.3	2,389.4	6.4	5.9	-144.95	-49.5	125.5	110.8	99.5	11.36	9.758	
2,500.0	2,480.3	2,500.8	2,487.6	6.8	6.3	-142.87	-54.6	140.9	119.5	107.4	12.06	9.906	
2,600.0	2,578.5	2,600.4	2,585.8	7.2	6.6	-141.08	-59.7	156.4	128.2	115.5	12.77	10.040	
2,700.0	2,676.8	2,699.9	2,684.0	7.6	7.0	-139.51	-64.8	171.8	137.1	123.6	13.49	10.162	
2,800.0	2,775.1	2,799.5	2,782.2	8.0	7.3	-138.14	-69.9	187.2	146.1	131.9	14.22	10.272	
2,900.0	2,873.4	2,899.0	2,880.4	8.5	7.7	-136.93	-75.0	202.6	155.1	140.2	14.95	10.372	
3,000.0	2,971.7	2,998.5	2,978.6	8.9	8.1	-135.85	-80.1	218.1	164.2	148.5	15.69	10.464	
3,100.0	3,069.9	3,098.1	3,076.8	9.3	8.4	-134.88	-85.3	233.5	173.4	156.9	16.44	10.548	
3,200.0	3,168.2	3,197.6	3,175.0	9.7	8.8	-134.01	-90.4	248.9	182.6	165.4	17.18	10.625	
3,300.0	3,266.5	3,297.2	3,273.2	10.1	9.2	-133.23	-95.5	264.3	191.8	173.9	17.93	10.696	
3,400.0	3,364.8	3,396.7	3,371.4	10.5	9.5	-132.51	-100.6	279.8	201.1	182.4	18.68	10.762	
3,500.0	3,463.0	3,496.2	3,469.6	10.9	9.9	-131.86	-105.7	295.2	210.4	190.9	19.44	10.823	
3,600.0	3,561.3	3,595.8	3,567.8	11.3	10.3	-131.27	-110.8	310.6	219.7	199.5	20.19	10.879	
3,700.0	3,659.6	3,695.3	3,666.0	11.8	10.7	-130.72	-115.9	326.0	229.0	208.1	20.95	10.931	
3,800.0	3,757.9	3,794.9	3,764.2	12.2	11.0	-130.21	-121.1	341.5	238.4	216.7	21.71	10.980	
3,900.0	3,856.2	3,894.4	3,862.4	12.6	11.4	-129.75	-126.2	356.9	247.8	225.3	22.47	11.026	
4,000.0	3,954.4	3,993.9	3,960.7	13.0	11.8	-129.32	-131.3	372.3	257.2	233.9	23.23	11.069	
4,100.0	4,052.7	4,093.5	4,058.9	13.4	12.2	-128.91	-136.4	387.7	266.6	242.6	24.00	11.109	
4,200.0	4,151.0	4,193.0	4,157.1	13.9	12.5	-128.54	-141.5	403.2	276.0	251.2	24.76	11.147	
4,300.0	4,249.3	4,292.6	4,255.3	14.3	12.9	-128.19	-146.6	418.6	285.4	259.9	25.53	11.182	
4,400.0	4,347.5	4,392.1	4,353.5	14.7	13.3	-127.86	-151.7	434.0	294.9	268.6	26.29	11.215	
4,500.0	4,445.8	4,491.6	4,451.7	15.1	13.7	-127.56	-156.9	449.4	304.3	277.3	27.06	11.247	
4,600.0	4,544.1	4,591.2	4,549.9	15.5	14.1	-127.27	-162.0	464.9	313.8	285.9	27.82	11.277	
4,700.0	4,642.4	4,690.7	4,648.1	16.0	14.4	-127.00	-167.1	480.3	323.2	294.6	28.59	11.305	
4,800.0	4,740.6	4,790.3	4,746.3	16.4	14.8	-126.74	-172.2	495.7	332.7	303.3	29.36	11.332	
4,900.0	4,838.9	4,889.6	4,844.4	16.8	15.2	-126.50	-177.3	511.1	342.2	312.1	30.12	11.360	
5,000.0	4,937.2	4,988.0	4,941.7	17.2	15.5	-126.62	-181.7	524.3	351.9	321.1	30.74	11.446	
5,100.0	5,035.5	5,086.1	5,039.2	17.7	15.7	-127.26	-185.0	534.4	361.9	330.7	31.27	11.574	

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

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-8H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,200.0	5,133.8	5,183.7	5,136.6	18.1	15.9	-128.38	-187.3	541.3	372.5	340.8	31.71	11.746	
5,300.0	5,232.0	5,280.7	5,233.5	18.5	16.0	-129.92	-188.5	545.0	383.7	351.6	32.06	11.969	
5,400.0	5,330.3	5,377.6	5,330.3	18.9	16.2	-131.81	-188.8	545.7	395.8	363.4	32.32	12.245	
5,500.0	5,428.6	5,475.8	5,428.6	19.3	16.3	-133.73	-188.8	545.7	408.4	375.9	32.56	12.543	
5,600.0	5,527.0	5,574.2	5,527.0	19.7	16.5	-135.58	-188.8	545.7	421.1	388.3	32.80	12.841	
5,700.0	5,625.9	5,673.1	5,625.9	20.0	16.6	-137.09	-188.8	545.7	431.9	398.9	33.00	13.087	
5,800.0	5,725.2	5,772.5	5,725.2	20.2	16.8	-138.20	-188.8	545.7	440.3	407.0	33.23	13.251	
5,900.0	5,824.9	5,872.1	5,824.9	20.4	16.9	-138.95	-188.8	545.7	446.2	412.7	33.47	13.332	
6,000.0	5,924.8	5,972.0	5,924.8	20.6	17.1	-139.36	-188.8	545.7	449.5	415.8	33.72	13.330	
6,100.0	6,024.8	6,072.0	6,024.8	20.7	17.3	0.09	-188.8	545.7	450.2	418.3	31.90	14.114	
6,200.0	6,124.8	6,172.0	6,124.8	20.8	17.4	0.09	-188.8	545.7	450.2	418.0	32.23	13.971	
6,300.0	6,224.8	6,272.0	6,224.8	21.0	17.6	0.09	-188.8	545.7	450.2	417.7	32.56	13.830	
6,400.0	6,324.8	6,372.0	6,324.8	21.1	17.7	0.09	-188.8	545.7	450.2	417.3	32.89	13.690	
6,500.0	6,424.8	6,472.0	6,424.8	21.2	17.9	0.09	-188.8	545.7	450.2	417.0	33.22	13.552	
6,600.0	6,524.8	6,572.0	6,524.8	21.3	18.1	0.09	-188.8	545.7	450.2	416.7	33.56	13.416	
6,700.0	6,624.7	6,673.3	6,626.0	21.4	18.2	91.97	-188.9	543.2	450.2	414.4	35.86	12.555	
6,800.0	6,723.5	6,775.5	6,726.9	21.5	18.2	91.93	-189.4	527.4	450.2	414.3	35.91	12.537	
6,900.0	6,819.2	6,877.6	6,824.4	21.4	18.2	91.85	-190.4	497.4	450.2	414.4	35.78	12.584	
7,000.0	6,909.9	6,979.6	6,916.6	21.3	18.1	91.73	-191.8	454.0	450.2	414.6	35.54	12.667	
7,100.0	6,994.0	7,081.5	7,001.5	21.2	18.0	91.58	-193.6	398.0	450.1	414.8	35.32	12.745	
7,200.0	7,069.7	7,183.1	7,077.6	21.0	18.0	91.40	-195.9	330.6	450.1	414.8	35.27	12.762	
7,300.0	7,135.7	7,284.5	7,143.2	20.9	18.1	91.18	-198.4	253.4	450.1	414.5	35.57	12.653	
7,400.0	7,190.5	7,385.7	7,197.1	20.8	18.4	90.95	-201.2	168.0	450.0	413.6	36.39	12.367	
7,500.0	7,233.2	7,486.6	7,238.3	20.7	19.1	90.70	-204.3	76.0	450.0	412.2	37.84	11.892	
7,600.0	7,262.8	7,587.2	7,266.2	20.8	20.1	90.43	-207.4	-20.5	450.0	410.0	39.95	11.264	
7,700.0	7,279.0	7,687.5	7,280.2	21.4	21.5	90.16	-210.7	-119.7	450.0	407.3	42.65	10.552	
7,712.5	7,280.0	7,700.1	7,281.0	21.5	21.7	90.12	-211.1	-132.2	450.0	407.0	43.03	10.458	
7,800.0	7,282.0	7,787.6	7,282.0	22.8	23.1	90.00	-214.0	-219.6	450.0	404.2	45.81	9.823	
7,900.0	7,282.0	7,887.6	7,282.0	24.5	24.9	90.00	-217.3	-319.5	450.0	400.6	49.39	9.111	
8,000.0	7,282.0	7,987.6	7,282.0	26.5	26.8	90.00	-220.6	-419.5	450.0	396.7	53.32	8.439	
8,100.0	7,282.0	8,087.6	7,282.0	28.7	28.9	90.00	-223.9	-519.4	450.0	392.5	57.53	7.822	
8,200.0	7,282.0	8,187.6	7,282.0	30.9	31.2	90.00	-227.2	-619.4	450.0	388.1	61.96	7.263	
8,300.0	7,282.0	8,287.6	7,282.0	33.2	33.5	90.00	-230.5	-719.3	450.0	383.5	66.56	6.761	
8,400.0	7,282.0	8,387.6	7,282.0	35.6	35.8	90.00	-233.8	-819.3	450.0	378.7	71.31	6.311	
8,500.0	7,282.0	8,487.6	7,282.0	38.0	38.3	90.00	-237.1	-919.2	450.0	373.9	76.18	5.908	
8,600.0	7,282.0	8,587.6	7,282.0	40.5	40.8	90.00	-240.3	-1,019.2	450.0	368.9	81.14	5.547	
8,700.0	7,282.0	8,687.6	7,282.0	43.1	43.3	90.00	-243.6	-1,119.1	450.0	363.9	86.17	5.223	
8,800.0	7,282.0	8,787.6	7,282.0	45.6	45.8	90.00	-246.9	-1,219.1	450.0	358.8	91.28	4.931	
8,900.0	7,282.0	8,887.6	7,282.0	48.2	48.4	90.00	-250.2	-1,319.0	450.0	353.6	96.44	4.667	
9,000.0	7,282.0	8,987.6	7,282.0	50.8	51.0	90.00	-253.5	-1,419.0	450.1	348.4	101.64	4.428	
9,100.0	7,282.0	9,087.6	7,282.0	53.4	53.6	90.00	-256.8	-1,518.9	450.1	343.2	106.89	4.211	
9,200.0	7,282.0	9,187.6	7,282.0	56.1	56.3	90.00	-260.1	-1,618.8	450.1	337.9	112.17	4.012	
9,300.0	7,282.0	9,287.6	7,282.0	58.7	58.9	90.00	-263.4	-1,718.8	450.1	332.6	117.48	3.831	
9,400.0	7,282.0	9,387.6	7,282.0	61.4	61.6	90.00	-266.7	-1,818.7	450.1	327.3	122.81	3.665	
9,500.0	7,282.0	9,487.6	7,282.0	64.1	64.3	90.00	-270.0	-1,918.7	450.1	321.9	128.17	3.512	
9,600.0	7,282.0	9,587.6	7,282.0	66.7	67.0	90.00	-273.3	-2,018.6	450.1	316.5	133.55	3.370	
9,700.0	7,282.0	9,687.6	7,282.0	69.4	69.7	90.00	-276.6	-2,118.6	450.1	311.1	138.94	3.239	
9,800.0	7,282.0	9,787.6	7,282.0	72.1	72.4	90.00	-279.9	-2,218.5	450.1	305.7	144.36	3.118	
9,900.0	7,282.0	9,887.6	7,282.0	74.8	75.1	90.00	-283.2	-2,318.5	450.1	300.3	149.78	3.005	
10,000.0	7,282.0	9,987.6	7,282.0	77.6	77.8	90.00	-286.5	-2,418.4	450.1	294.9	155.22	2.900	
10,100.0	7,282.0	10,087.6	7,282.0	80.3	80.5	90.00	-289.8	-2,518.4	450.1	289.4	160.67	2.801	
10,200.0	7,282.0	10,187.6	7,282.0	83.0	83.3	90.00	-293.0	-2,618.3	450.1	284.0	166.13	2.709	

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Offset Design Greeley-Rothe Pad Sec.1-T5N-R67W - Greeley-Rothe 1-8H - Wellbore #1 - Plan #2 (6-05-14)

Offset Site Error: 0.0 ft

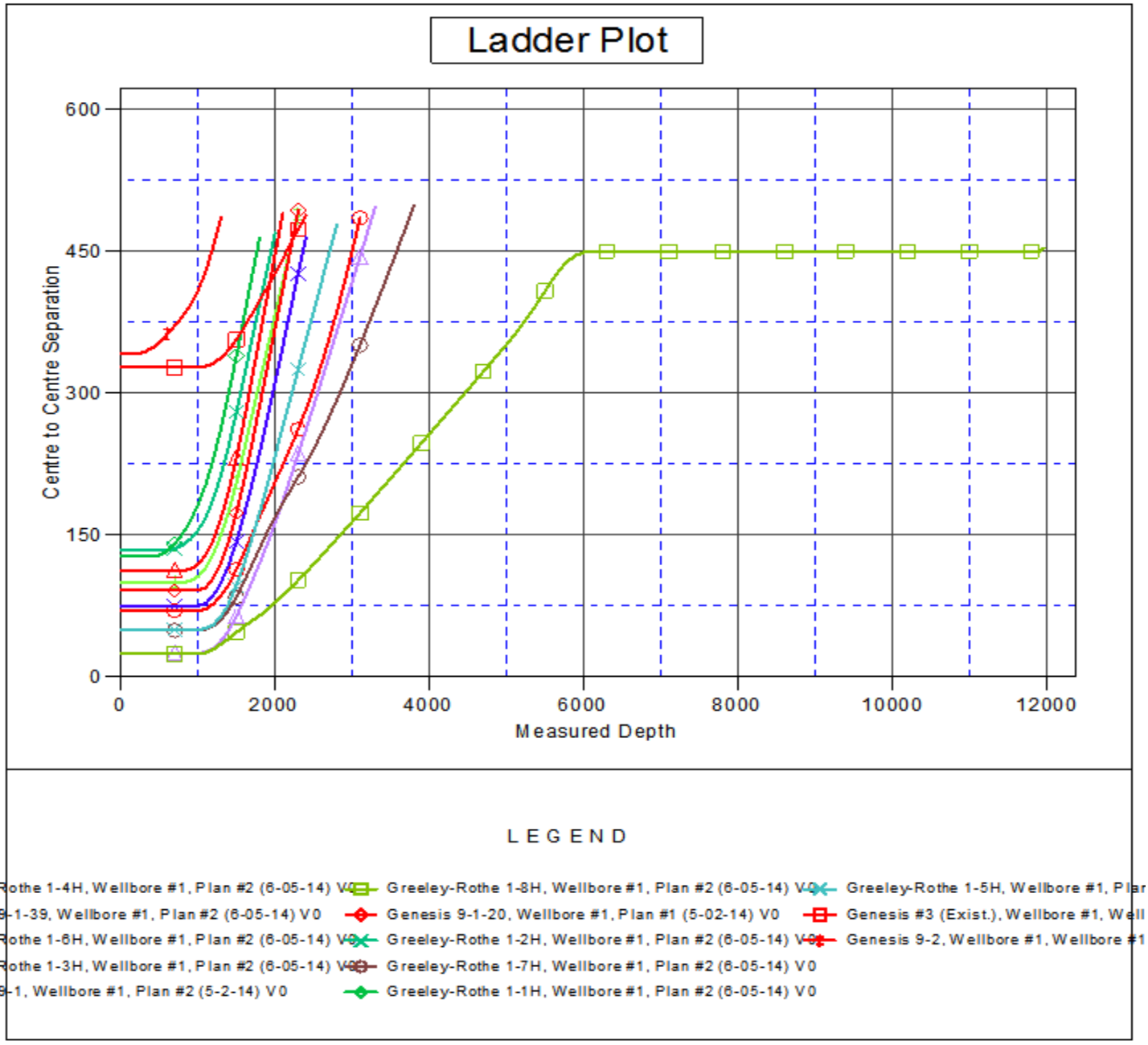
Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,300.0	7,282.0	10,287.6	7,282.0	85.7	86.0	90.00	-296.3	-2,718.2	450.1	278.5	171.60	2.623	
10,400.0	7,282.0	10,387.6	7,282.0	88.5	88.7	90.00	-299.6	-2,818.2	450.1	273.1	177.07	2.542	
10,500.0	7,282.0	10,487.6	7,282.0	91.2	91.5	90.00	-302.9	-2,918.1	450.1	267.6	182.56	2.466	
10,600.0	7,282.0	10,587.6	7,282.0	94.0	94.2	90.00	-306.2	-3,018.1	450.1	262.1	188.05	2.394	
10,700.0	7,282.0	10,687.6	7,282.0	96.7	97.0	90.00	-309.5	-3,118.0	450.1	256.6	193.55	2.326	
10,800.0	7,282.0	10,787.6	7,282.0	99.5	99.7	90.00	-312.8	-3,218.0	450.1	251.1	199.05	2.261	
10,900.0	7,282.0	10,887.6	7,282.0	102.2	102.5	90.00	-316.1	-3,317.9	450.2	245.6	204.56	2.201	
11,000.0	7,282.0	10,987.6	7,282.0	105.0	105.2	90.00	-319.4	-3,417.9	450.2	240.1	210.07	2.143	
11,100.0	7,282.0	11,087.6	7,282.0	107.7	108.0	90.00	-322.7	-3,517.8	450.2	234.6	215.59	2.088	
11,200.0	7,282.0	11,187.6	7,282.0	110.5	110.7	90.00	-326.0	-3,617.8	450.2	229.1	221.11	2.036	
11,300.0	7,282.0	11,287.6	7,282.0	113.2	113.5	90.00	-329.3	-3,717.7	450.2	223.5	226.64	1.986	
11,400.0	7,282.0	11,387.6	7,282.0	116.0	116.3	90.00	-332.6	-3,817.6	450.2	218.0	232.16	1.939	
11,500.0	7,282.0	11,487.6	7,282.0	118.8	119.0	90.00	-335.9	-3,917.6	450.2	212.5	237.70	1.894	
11,600.0	7,282.0	11,587.6	7,282.0	121.5	121.8	90.00	-339.2	-4,017.5	450.2	207.0	243.23	1.851	
11,700.0	7,282.0	11,687.6	7,282.0	124.3	124.6	90.00	-342.5	-4,117.5	450.2	201.4	248.77	1.810	
11,800.0	7,282.0	11,787.6	7,282.0	127.1	127.3	90.00	-345.7	-4,217.4	450.2	195.9	254.31	1.770	
11,900.0	7,282.0	11,887.6	7,282.0	129.8	130.1	90.00	-349.0	-4,317.4	450.2	190.3	259.86	1.732	
11,963.3	7,282.0	11,897.0	7,282.0	131.6	130.4	90.00	-349.4	-4,326.8	453.4	191.5	261.88	1.731	SF

Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4892.0ft (RKB - 15')	Coordinates are relative to: Greeley-Rothe 1-9H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.43°



Company:	KP KAUFFMAN	**Local Co-ordinate Reference:**	Well Greeley-Rothe 1-9H
Project:	SEC.1-T5N-R67W	**TVD Reference:**	WELL @ 4892.0ft (RKB - 15')
Reference Site:	Greeley-Rothe Pad Sec.1-T5N-R67W	**MD Reference:**	WELL @ 4892.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Greeley-Rothe 1-9H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	landmark
Reference Design:	Plan #2 (6-6-14)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4892.0ft (RKB - 15')	Coordinates are relative to: Greeley-Rothe 1-9H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.43°