



HOBBS OCD

OCT 11 2016

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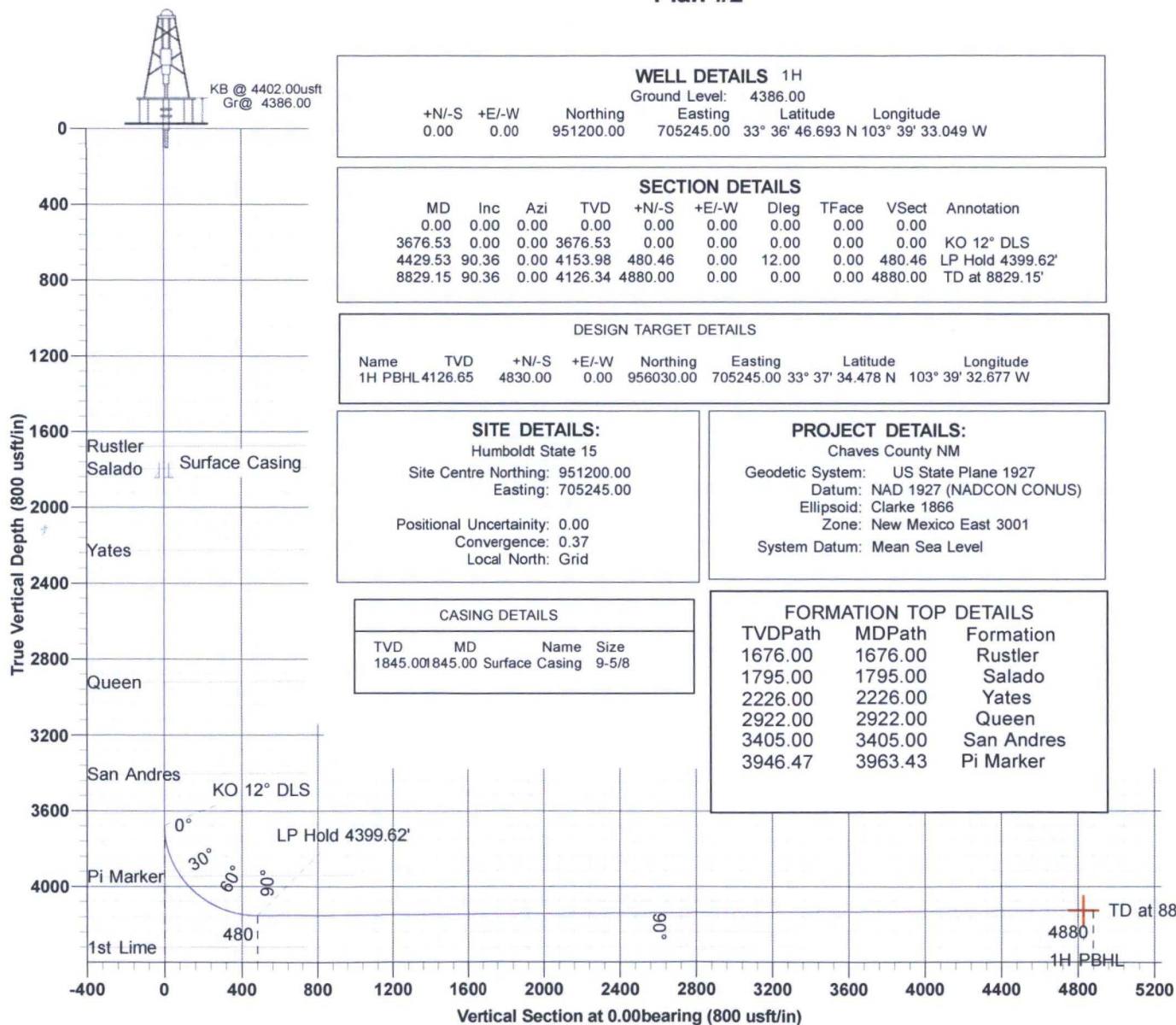
1H
Chaves County NM
Northing: 951200.00
Easting: 705245.00
Plan #2



Azimuths to Grid North
True North: -0.37°
Magnetic North: 6.74°

Magnetic Field
Strength: 48860.2snT
Dip Angle: 61.42°
Date: 9/22/2016
Model: HDGM

To convert Magnetic North to Grid, Add 6.74°
To convert True North to Grid, Subtract 0.37°



WELL DETAILS 1H						
Ground Level: 4386.00						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	951200.00	705245.00	33° 36' 46.693 N	103° 39' 33.049 W	

SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3676.53	0.00	0.00	3676.53	0.00	0.00	0.00	0.00	0.00	KO 12° DLS
4429.53	90.36	0.00	4153.98	480.46	0.00	12.00	0.00	480.46	LP Hold 4399.62'
8829.15	90.36	0.00	4126.34	4880.00	0.00	0.00	0.00	4880.00	TD at 8829.15'

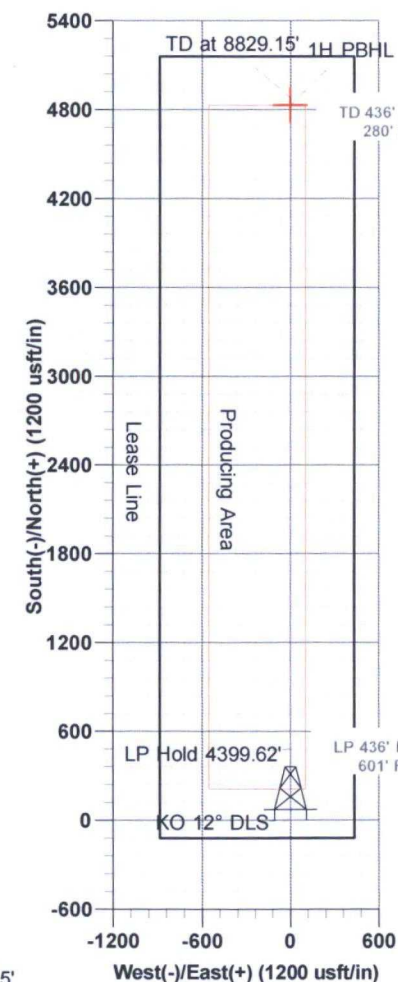
DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
1H PBHL	4126.65	4830.00	0.00	956030.00	705245.00	33° 37' 34.478 N	103° 39' 32.677 W

SITE DETAILS:	
Humboldt State 15	
Site Centre Northing: 951200.00	
Easting: 705245.00	
Positional Uncertainty: 0.00	
Convergence: 0.37	
Local North: Grid	

PROJECT DETAILS:	
Chaves County NM	
Geodetic System: US State Plane 1927	
Datum: NAD 1927 (NADCON CONUS)	
Ellipsoid: Clarke 1866	
Zone: New Mexico East 3001	
System Datum: Mean Sea Level	

CASING DETAILS			
TVD	MD	Name	Size
1845.00	1845.00	Surface Casing	9-5/8

FORMATION TOP DETAILS		
TVDPATH	MDPATH	FORMATION
1676.00	1676.00	Rustler
1795.00	1795.00	Salado
2226.00	2226.00	Yates
2922.00	2922.00	Queen
3405.00	3405.00	San Andres
3946.47	3963.43	Pi Marker



Planning Report

HOBBS OCD
OCT 11 2016
RECEIVED

Database:	Midland District	Local Co-ordinate Reference:	Well 1H
Company:	Rockcliff Energy	TVD Reference:	KB @ 4402.00usft
Project:	Chaves County NM	MD Reference:	KB @ 4402.00usft
Site:	Humboldt State 15	North Reference:	Grid
Well:	1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

Project	Chaves County NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Humboldt State 15				
Site Position:		Northing:	951,200.00 usft	Latitude:	33° 36' 46.693 N
From:	Map	Easting:	705,245.00 usft	Longitude:	103° 39' 33.049 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.37 °

Well	1H					
Well Position	+N/-S	0.00 usft	Northing:	951,200.00 usft	Latitude:	33° 36' 46.693 N
	+E/-W	0.00 usft	Easting:	705,245.00 usft	Longitude:	103° 39' 33.049 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,386.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/22/2016	7.12	61.42	48,860

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (bearing)
	0.00	0.00	0.00	0.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,676.53	0.00	0.00	3,676.53	0.00	0.00	0.00	0.00	0.00	0.00	
4,429.53	90.36	0.00	4,153.98	480.46	0.00	12.00	12.00	0.00	0.00	
8,829.15	90.36	0.00	4,126.34	4,880.00	0.00	0.00	0.00	0.00	0.00	

Planning Report

Database:	Midland District	Local Co-ordinate Reference:	Well 1H
Company:	Rockcliff Energy	TVD Reference:	KB @ 4402.00usft
Project:	Chaves County NM	MD Reference:	KB @ 4402.00usft
Site:	Humboldt State 15	North Reference:	Grid
Well:	1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,676.00	0.00	0.00	1,676.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,795.00	0.00	0.00	1,795.00	0.00	0.00	0.00	0.00	0.00	0.00
Salado									
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,845.00	0.00	0.00	1,845.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Casing									
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,226.00	0.00	0.00	2,226.00	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,922.00	0.00	0.00	2,922.00	0.00	0.00	0.00	0.00	0.00	0.00
Queen									
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,405.00	0.00	0.00	3,405.00	0.00	0.00	0.00	0.00	0.00	0.00
San Andres									
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,676.53	0.00	0.00	3,676.53	0.00	0.00	0.00	0.00	0.00	0.00
KO 12° DLS									
3,700.00	2.82	0.00	3,699.99	0.58	0.00	0.58	12.00	12.00	0.00
3,725.00	5.82	0.00	3,724.92	2.46	0.00	2.46	12.00	12.00	0.00

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Project:	Chaves County NM	MD Reference:	KB @ 4402.00usft
Site:	Humboldt State 15	North Reference:	Grid
Well:	1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,750.00	8.82	0.00	3,749.71	5.64	0.00	5.64	12.00	12.00	0.00
3,775.00	11.82	0.00	3,774.30	10.12	0.00	10.12	12.00	12.00	0.00
3,800.00	14.82	0.00	3,798.63	15.88	0.00	15.88	12.00	12.00	0.00
3,825.00	17.82	0.00	3,822.62	22.90	0.00	22.90	12.00	12.00	0.00
3,850.00	20.82	0.00	3,846.21	31.17	0.00	31.17	12.00	12.00	0.00
3,875.00	23.82	0.00	3,869.33	40.66	0.00	40.66	12.00	12.00	0.00
3,900.00	26.82	0.00	3,891.93	51.35	0.00	51.35	12.00	12.00	0.00
3,925.00	29.82	0.00	3,913.94	63.21	0.00	63.21	12.00	12.00	0.00
3,950.00	32.82	0.00	3,935.29	76.20	0.00	76.20	12.00	12.00	0.00
3,963.43	34.43	0.00	3,946.47	83.64	0.00	83.64	12.00	12.00	0.00
Pi Marker									
3,975.00	35.82	0.00	3,955.94	90.29	0.00	90.29	12.00	12.00	0.00
4,000.00	38.82	0.00	3,975.82	105.45	0.00	105.45	12.00	12.00	0.00
4,025.00	41.82	0.00	3,994.88	121.62	0.00	121.62	12.00	12.00	0.00
4,050.00	44.82	0.00	4,013.06	138.77	0.00	138.77	12.00	12.00	0.00
4,075.00	47.82	0.00	4,030.33	156.84	0.00	156.84	12.00	12.00	0.00
4,100.00	50.82	0.00	4,046.62	175.80	0.00	175.80	12.00	12.00	0.00
4,125.00	53.82	0.00	4,061.91	195.58	0.00	195.58	12.00	12.00	0.00
4,150.00	56.82	0.00	4,076.13	216.14	0.00	216.14	12.00	12.00	0.00
4,175.00	59.82	0.00	4,089.26	237.41	0.00	237.41	12.00	12.00	0.00
4,200.00	62.82	0.00	4,101.26	259.34	0.00	259.34	12.00	12.00	0.00
4,225.00	65.82	0.00	4,112.09	281.87	0.00	281.87	12.00	12.00	0.00
4,250.00	68.82	0.00	4,121.73	304.93	0.00	304.93	12.00	12.00	0.00
4,275.00	71.82	0.00	4,130.15	328.47	0.00	328.47	12.00	12.00	0.00
4,300.00	74.82	0.00	4,137.33	352.41	0.00	352.41	12.00	12.00	0.00
4,325.00	77.82	0.00	4,143.24	376.70	0.00	376.70	12.00	12.00	0.00
4,350.00	80.82	0.00	4,147.87	401.26	0.00	401.26	12.00	12.00	0.00
4,375.00	83.82	0.00	4,151.22	426.04	0.00	426.04	12.00	12.00	0.00
4,400.00	86.82	0.00	4,153.26	450.95	0.00	450.95	12.00	12.00	0.00
4,425.00	89.82	0.00	4,153.99	475.94	0.00	475.94	12.00	12.00	0.00
4,429.53	90.36	0.00	4,153.98	480.46	0.00	480.46	12.00	12.00	0.00
LP Hold 4399.62'									
4,500.00	90.36	0.00	4,153.54	550.94	0.00	550.94	0.00	0.00	0.00
4,600.00	90.36	0.00	4,152.91	650.93	0.00	650.93	0.00	0.00	0.00
4,700.00	90.36	0.00	4,152.28	750.93	0.00	750.93	0.00	0.00	0.00
4,800.00	90.36	0.00	4,151.66	850.93	0.00	850.93	0.00	0.00	0.00
4,900.00	90.36	0.00	4,151.03	950.93	0.00	950.93	0.00	0.00	0.00
5,000.00	90.36	0.00	4,150.40	1,050.93	0.00	1,050.93	0.00	0.00	0.00
5,100.00	90.36	0.00	4,149.77	1,150.92	0.00	1,150.92	0.00	0.00	0.00
5,200.00	90.36	0.00	4,149.14	1,250.92	0.00	1,250.92	0.00	0.00	0.00
5,300.00	90.36	0.00	4,148.51	1,350.92	0.00	1,350.92	0.00	0.00	0.00
5,400.00	90.36	0.00	4,147.89	1,450.92	0.00	1,450.92	0.00	0.00	0.00
5,500.00	90.36	0.00	4,147.26	1,550.92	0.00	1,550.92	0.00	0.00	0.00
5,600.00	90.36	0.00	4,146.63	1,650.91	0.00	1,650.91	0.00	0.00	0.00
5,700.00	90.36	0.00	4,146.00	1,750.91	0.00	1,750.91	0.00	0.00	0.00
5,800.00	90.36	0.00	4,145.37	1,850.91	0.00	1,850.91	0.00	0.00	0.00
5,900.00	90.36	0.00	4,144.74	1,950.91	0.00	1,950.91	0.00	0.00	0.00
6,000.00	90.36	0.00	4,144.12	2,050.91	0.00	2,050.91	0.00	0.00	0.00
6,100.00	90.36	0.00	4,143.49	2,150.90	0.00	2,150.90	0.00	0.00	0.00
6,200.00	90.36	0.00	4,142.86	2,250.90	0.00	2,250.90	0.00	0.00	0.00
6,300.00	90.36	0.00	4,142.23	2,350.90	0.00	2,350.90	0.00	0.00	0.00
6,400.00	90.36	0.00	4,141.60	2,450.90	0.00	2,450.90	0.00	0.00	0.00
6,500.00	90.36	0.00	4,140.97	2,550.90	0.00	2,550.90	0.00	0.00	0.00
6,600.00	90.36	0.00	4,140.35	2,650.89	0.00	2,650.89	0.00	0.00	0.00

Planning Report

Database:	Midland District	Local Co-ordinate Reference:	Well 1H
Company:	Rockcliff Energy	TVD Reference:	KB @ 4402.00usft
Project:	Chaves County NM	MD Reference:	KB @ 4402.00usft
Site:	Humboldt State 15	North Reference:	Grid
Well:	1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,700.00	90.36	0.00	4,139.72	2,750.89	0.00	2,750.89	0.00	0.00	0.00
6,800.00	90.36	0.00	4,139.09	2,850.89	0.00	2,850.89	0.00	0.00	0.00
6,900.00	90.36	0.00	4,138.46	2,950.89	0.00	2,950.89	0.00	0.00	0.00
7,000.00	90.36	0.00	4,137.83	3,050.89	0.00	3,050.89	0.00	0.00	0.00
7,100.00	90.36	0.00	4,137.20	3,150.88	0.00	3,150.88	0.00	0.00	0.00
7,200.00	90.36	0.00	4,136.58	3,250.88	0.00	3,250.88	0.00	0.00	0.00
7,300.00	90.36	0.00	4,135.95	3,350.88	0.00	3,350.88	0.00	0.00	0.00
7,400.00	90.36	0.00	4,135.32	3,450.88	0.00	3,450.88	0.00	0.00	0.00
7,500.00	90.36	0.00	4,134.69	3,550.88	0.00	3,550.88	0.00	0.00	0.00
7,600.00	90.36	0.00	4,134.06	3,650.87	0.00	3,650.87	0.00	0.00	0.00
7,700.00	90.36	0.00	4,133.43	3,750.87	0.00	3,750.87	0.00	0.00	0.00
7,800.00	90.36	0.00	4,132.81	3,850.87	0.00	3,850.87	0.00	0.00	0.00
7,900.00	90.36	0.00	4,132.18	3,950.87	0.00	3,950.87	0.00	0.00	0.00
8,000.00	90.36	0.00	4,131.55	4,050.87	0.00	4,050.87	0.00	0.00	0.00
8,100.00	90.36	0.00	4,130.92	4,150.86	0.00	4,150.86	0.00	0.00	0.00
8,200.00	90.36	0.00	4,130.29	4,250.86	0.00	4,250.86	0.00	0.00	0.00
8,300.00	90.36	0.00	4,129.66	4,350.86	0.00	4,350.86	0.00	0.00	0.00
8,400.00	90.36	0.00	4,129.04	4,450.86	0.00	4,450.86	0.00	0.00	0.00
8,500.00	90.36	0.00	4,128.41	4,550.86	0.00	4,550.86	0.00	0.00	0.00
8,600.00	90.36	0.00	4,127.78	4,650.85	0.00	4,650.85	0.00	0.00	0.00
8,700.00	90.36	0.00	4,127.15	4,750.85	0.00	4,750.85	0.00	0.00	0.00
8,800.00	90.36	0.00	4,126.52	4,850.85	0.00	4,850.85	0.00	0.00	0.00
8,829.15	90.36	0.00	4,126.34	4,880.00	0.00	4,880.00	0.00	0.00	0.00
TD at 8829.15'									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (bearing)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
1H PBHL - plan hits target center - Point	0.00	0.00	4,126.65	4,830.00	0.00	956,030.00	705,245.00	33° 37' 34.478 N	103° 39' 32.677 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,845.00	1,845.00	Surface Casing	9-5/8	12-1/4

Planning Report

Database:	Midland District	Local Co-ordinate Reference:	Well 1H
Company:	Rockcliff Energy	TVD Reference:	KB @ 4402.00usft
Project:	Chaves County NM	MD Reference:	KB @ 4402.00usft
Site:	Humboldt State 15	North Reference:	Grid
Well:	1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (bearing)	
1,676.00	1,676.00	Rustler		-0.36	0.00	
1,795.00	1,795.00	Salado		-0.36	0.00	
2,226.00	2,226.00	Yates		-0.36	0.00	
2,922.00	2,922.00	Queen		-0.36	0.00	
3,405.00	3,405.00	San Andres		-0.36	0.00	
3,963.43	3,946.47	Pi Marker		-0.36	0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,676.53	3,676.53	0.00	0.00	KO 12° DLS	
4,429.53	4,153.98	480.46	0.00	LP Hold 4399.62'	
8,829.15	4,126.34	4,880.00	0.00	TD at 8829.15'	