

Chama Oil & Minerals

Cheyenne County, Colorado (NAD83)
Sec 28-T15S-R48W (Grid)
API#
Larsen 28-15-48 #1H
600 FNL, 1980 FWL
Job#
Plan 1
Nomac 14 (25')



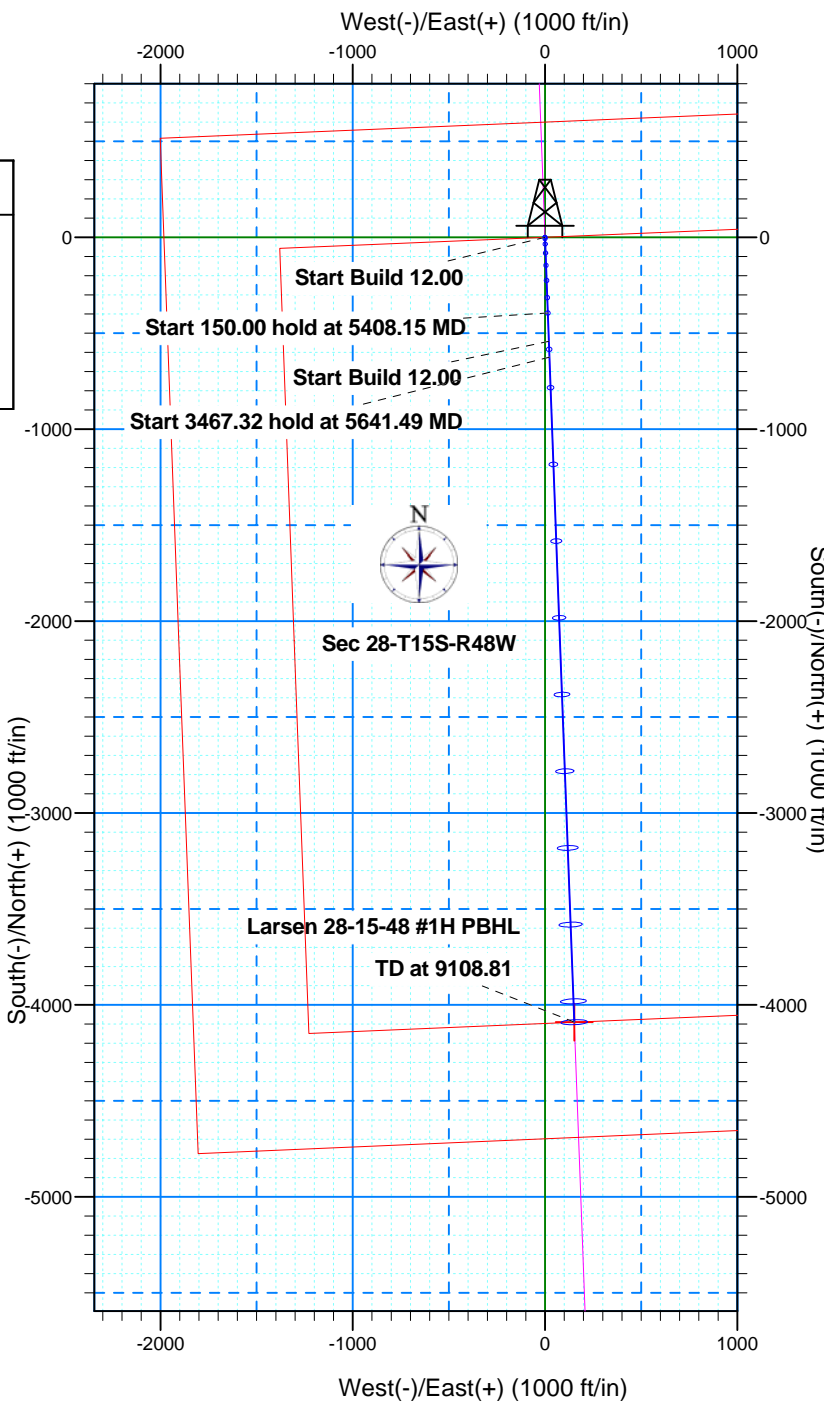
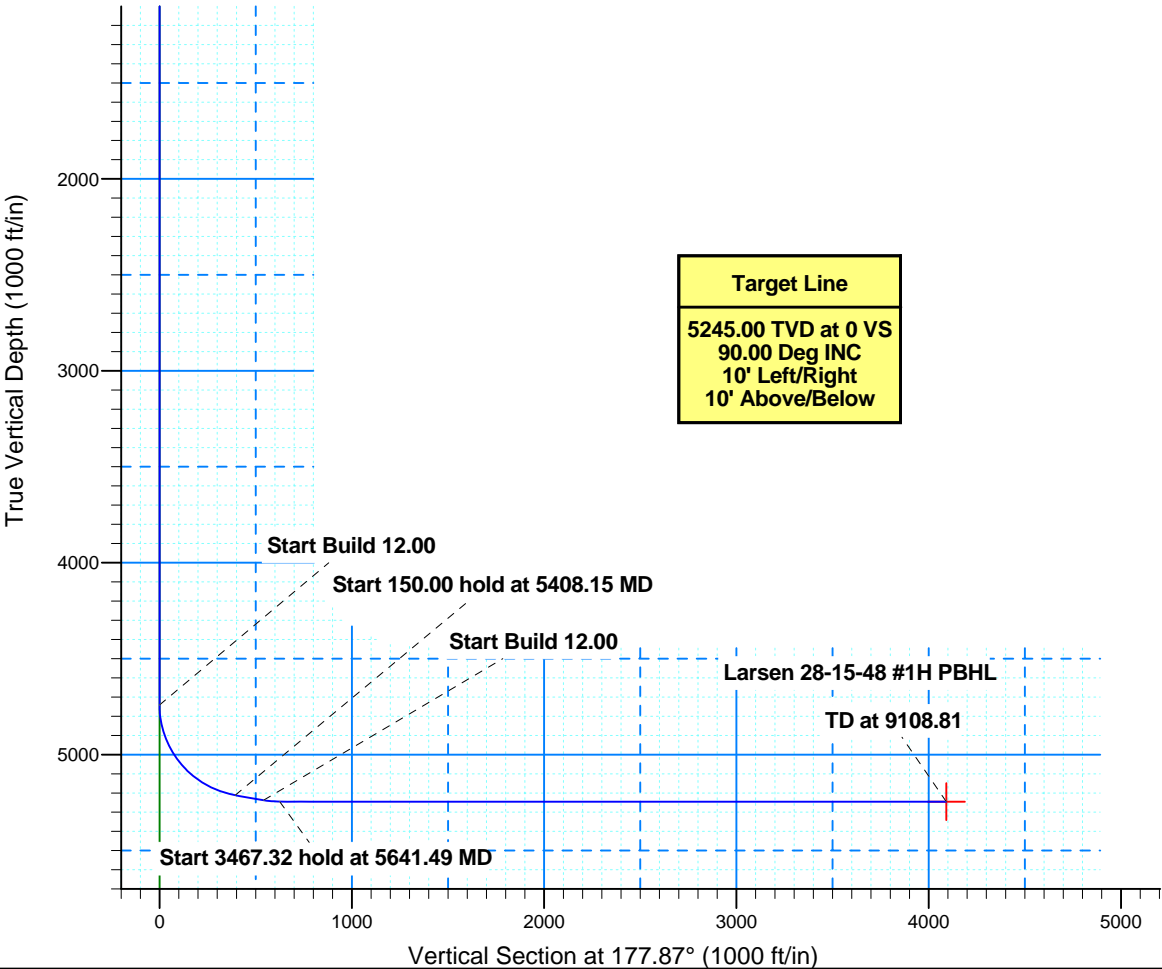
WELL DETAILS: Larsen 28-15-48 #1H

Nomac 14 @ 4281.00ft (Nomac 14 (25'))			
Ground Level: 4256.00			
Northing	Easting	Latitude	Longitude
1334128.54	3773747.41	38° 43' 8.609 N	102° 47' 15.698 W

SECTION DETAILS

Plan 1

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4741.49	0.00	0.00	4741.49	0.00	0.00	0.00	0.00	0.00
3	5408.15	80.00	177.87	5211.70	-394.28	14.67	12.00	177.87	394.55
4	5558.15	80.00	177.87	5237.75	-541.90	20.16	0.00	0.00	542.28
5	5641.49	90.00	177.87	5245.00	-624.75	23.24	12.00	0.00	625.19
6	9108.81	90.00	177.87	5245.00	-4089.68	152.11	0.00	0.00	4092.51



Job#
Nomac 14 (25')

Chama Oil & Minerals

Cheyenne County, Colorado (NAD83) Sec 28-T15S-R48W (Grid)

API#

Larsen 28-15-48 #1H (600 FNL, 1980 FWL)

Wellbore #1

Plan: Plan 1

Sperry Drilling Services Combo Report

26 June, 2013

Well Coordinates: 38° 43' 08.61" N
102° 47' 15.70" W

North American Datum 1983
Colorado Central Zone
1,334,128.54 N
3,773,747.41 E

Ground Level: 4,256.00 ft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well Larsen 28-15-48 #1H
Nomac 14 @ 4281.00ft (Nomac 14 (25'))

N

Grid

API US New

Version: 2003.21 Build: 46

Report Version: Midcon Combo v1.20

HALLIBURTON

Plan Report for Larsen 28-15-48 #1H - Plan 1

Measured Depth	Inclination	Grid Azimuth	True Azimuth	TVD below System	Vertical Depth	Local Coordinates		Map Coordinates		Dogleg Rate	Vertical Section	Comments
(ft)	(°)	(°)	(°)	(ft)	(ft)	Northing (ft)	Easting (ft)	Northing (ft)	Easting (ft)	(°/100ft)	(ft)	
0.00	0.00	0.00	1.71	-4,281.00	0.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
100.00	0.00	0.00	1.71	-4,181.00	100.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
200.00	0.00	0.00	1.71	-4,081.00	200.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
300.00	0.00	0.00	1.71	-3,981.00	300.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
400.00	0.00	0.00	1.71	-3,881.00	400.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
500.00	0.00	0.00	1.71	-3,781.00	500.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
600.00	0.00	0.00	1.71	-3,681.00	600.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
700.00	0.00	0.00	1.71	-3,581.00	700.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
800.00	0.00	0.00	1.71	-3,481.00	800.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
900.00	0.00	0.00	1.71	-3,381.00	900.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,000.00	0.00	0.00	1.71	-3,281.00	1,000.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,100.00	0.00	0.00	1.71	-3,181.00	1,100.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,200.00	0.00	0.00	1.71	-3,081.00	1,200.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,300.00	0.00	0.00	1.71	-2,981.00	1,300.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,400.00	0.00	0.00	1.71	-2,881.00	1,400.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,500.00	0.00	0.00	1.71	-2,781.00	1,500.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,600.00	0.00	0.00	1.71	-2,681.00	1,600.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,700.00	0.00	0.00	1.71	-2,581.00	1,700.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,800.00	0.00	0.00	1.71	-2,481.00	1,800.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
1,900.00	0.00	0.00	1.71	-2,381.00	1,900.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,000.00	0.00	0.00	1.71	-2,281.00	2,000.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,100.00	0.00	0.00	1.71	-2,181.00	2,100.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,200.00	0.00	0.00	1.71	-2,081.00	2,200.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,300.00	0.00	0.00	1.71	-1,981.00	2,300.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,400.00	0.00	0.00	1.71	-1,881.00	2,400.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,500.00	0.00	0.00	1.71	-1,781.00	2,500.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,600.00	0.00	0.00	1.71	-1,681.00	2,600.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,700.00	0.00	0.00	1.71	-1,581.00	2,700.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,800.00	0.00	0.00	1.71	-1,481.00	2,800.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
2,900.00	0.00	0.00	1.71	-1,381.00	2,900.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,000.00	0.00	0.00	1.71	-1,281.00	3,000.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,100.00	0.00	0.00	1.71	-1,181.00	3,100.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,200.00	0.00	0.00	1.71	-1,081.00	3,200.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,300.00	0.00	0.00	1.71	-981.00	3,300.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,400.00	0.00	0.00	1.71	-881.00	3,400.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,500.00	0.00	0.00	1.71	-781.00	3,500.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,600.00	0.00	0.00	1.71	-681.00	3,600.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,700.00	0.00	0.00	1.71	-581.00	3,700.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
3,800.00	0.00	0.00	1.71	-481.00	3,800.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	

Plan Report for Larsen 28-15-48 #1H - Plan 1

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates (ft)		Map Coordinates (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
						Northing	Easting	Northing	Easting			
3,900.00	0.00	0.00	1.71	-381.00	3,900.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,000.00	0.00	0.00	1.71	-281.00	4,000.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,100.00	0.00	0.00	1.71	-181.00	4,100.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,200.00	0.00	0.00	1.71	-81.00	4,200.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,300.00	0.00	0.00	1.71	19.00	4,300.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,400.00	0.00	0.00	1.71	119.00	4,400.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,500.00	0.00	0.00	1.71	219.00	4,500.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,600.00	0.00	0.00	1.71	319.00	4,600.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,700.00	0.00	0.00	1.71	419.00	4,700.00	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	
4,741.49	0.00	0.00	1.71	460.49	4,741.49	0.00 N	0.00 E	1,334,128.54	3,773,747.41	0.00	0.00	Start Build 12.00
4,750.00	1.02	177.87	179.58	469.00	4,750.00	0.08 S	0.00 E	1,334,128.47	3,773,747.42	12.00	0.08	
4,775.00	4.02	177.87	179.58	493.97	4,774.97	1.17 S	0.04 E	1,334,127.37	3,773,747.46	12.00	1.18	
4,800.00	7.02	177.87	179.58	518.85	4,799.85	3.58 S	0.13 E	1,334,124.96	3,773,747.55	12.00	3.58	
4,825.00	10.02	177.87	179.58	543.57	4,824.57	7.28 S	0.27 E	1,334,121.26	3,773,747.68	12.00	7.28	
4,850.00	13.02	177.87	179.58	568.07	4,849.07	12.27 S	0.46 E	1,334,116.27	3,773,747.87	12.00	12.28	
4,875.00	16.02	177.87	179.58	592.27	4,873.27	18.53 S	0.69 E	1,334,110.01	3,773,748.10	12.00	18.55	
4,900.00	19.02	177.87	179.58	616.10	4,897.10	26.05 S	0.97 E	1,334,102.49	3,773,748.38	12.00	26.07	
4,925.00	22.02	177.87	179.58	639.52	4,920.52	34.81 S	1.29 E	1,334,093.73	3,773,748.71	12.00	34.83	
4,950.00	25.02	177.87	179.58	662.44	4,943.44	44.78 S	1.67 E	1,334,083.76	3,773,749.08	12.00	44.81	
4,975.00	28.02	177.87	179.58	684.80	4,965.80	55.93 S	2.08 E	1,334,072.61	3,773,749.49	12.00	55.97	
5,000.00	31.02	177.87	179.58	706.55	4,987.55	68.24 S	2.54 E	1,334,060.30	3,773,749.95	12.00	68.29	
5,025.00	34.02	177.87	179.58	727.63	5,008.63	81.67 S	3.04 E	1,334,046.87	3,773,750.45	12.00	81.73	
5,050.00	37.02	177.87	179.58	747.98	5,028.98	96.19 S	3.58 E	1,334,032.36	3,773,750.99	12.00	96.25	
5,075.00	40.02	177.87	179.58	767.53	5,048.53	111.74 S	4.16 E	1,334,016.80	3,773,751.57	12.00	111.82	
5,100.00	43.02	177.87	179.58	786.25	5,067.25	128.30 S	4.77 E	1,334,000.24	3,773,752.18	12.00	128.39	
5,125.00	46.02	177.87	179.58	804.07	5,085.07	145.82 S	5.42 E	1,333,982.72	3,773,752.84	12.00	145.92	
5,150.00	49.02	177.87	179.58	820.95	5,101.95	164.24 S	6.11 E	1,333,964.30	3,773,753.52	12.00	164.36	
5,175.00	52.02	177.87	179.58	836.85	5,117.85	183.52 S	6.83 E	1,333,945.02	3,773,754.24	12.00	183.65	
5,200.00	55.02	177.87	179.58	851.71	5,132.71	203.61 S	7.57 E	1,333,924.93	3,773,754.99	12.00	203.75	
5,225.00	58.02	177.87	179.58	865.50	5,146.50	224.44 S	8.35 E	1,333,904.10	3,773,755.76	12.00	224.60	
5,250.00	61.02	177.87	179.58	878.17	5,159.17	245.97 S	9.15 E	1,333,882.57	3,773,756.56	12.00	246.14	
5,275.00	64.02	177.87	179.58	889.71	5,170.71	268.13 S	9.97 E	1,333,860.41	3,773,757.39	12.00	268.32	
5,300.00	67.02	177.87	179.58	900.07	5,181.07	290.87 S	10.82 E	1,333,837.67	3,773,758.23	12.00	291.07	
5,325.00	70.02	177.87	179.58	909.22	5,190.22	314.11 S	11.68 E	1,333,814.43	3,773,759.10	12.00	314.33	
5,350.00	73.02	177.87	179.58	917.14	5,198.14	337.81 S	12.56 E	1,333,790.74	3,773,759.98	12.00	338.04	
5,375.00	76.02	177.87	179.58	923.81	5,204.81	361.88 S	13.46 E	1,333,766.66	3,773,760.87	12.00	362.13	
5,400.00	79.02	177.87	179.58	929.21	5,210.21	386.27 S	14.37 E	1,333,742.27	3,773,761.78	12.00	386.54	
5,408.15	80.00	177.87	179.58	930.70	5,211.70	394.28 S	14.67 E	1,333,734.26	3,773,762.08	12.00	394.55	Start 150.00 hold at 5408.15 MD
5,500.00	80.00	177.87	179.58	946.65	5,227.65	484.67 S	18.03 E	1,333,643.87	3,773,765.44	0.00	485.00	

Plan Report for Larsen 28-15-48 #1H - Plan 1

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates (ft)		Map Coordinates (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
5,558.15	80.00	177.87	179.58	956.75	5,237.75	541.90 S	20.16 E	1,333,586.64	3,773,767.57	0.00	542.28	Start Build 12.00
5,575.00	82.02	177.87	179.58	959.38	5,240.38	558.53 S	20.77 E	1,333,570.02	3,773,768.19	12.00	558.91	
5,600.00	85.02	177.87	179.58	962.20	5,243.20	583.35 S	21.70 E	1,333,545.19	3,773,769.11	12.00	583.75	
5,625.00	88.02	177.87	179.58	963.72	5,244.72	608.28 S	22.62 E	1,333,520.26	3,773,770.04	12.00	608.70	
5,641.49	90.00	177.87	179.58	964.00	5,245.00	624.75 S	23.24 E	1,333,503.79	3,773,770.65	12.00	625.19	Start 3467.32 hold at 5641.49 MD
5,700.00	90.00	177.87	179.58	964.00	5,245.00	683.23 S	25.41 E	1,333,445.32	3,773,772.83	0.00	683.70	
5,800.00	90.00	177.87	179.58	964.00	5,245.00	783.16 S	29.13 E	1,333,345.39	3,773,776.54	0.00	783.70	
5,900.00	90.00	177.87	179.58	964.00	5,245.00	883.09 S	32.85 E	1,333,245.46	3,773,780.26	0.00	883.70	
6,000.00	90.00	177.87	179.58	964.00	5,245.00	983.02 S	36.56 E	1,333,145.52	3,773,783.98	0.00	983.70	
6,100.00	90.00	177.87	179.58	964.00	5,245.00	1,082.95 S	40.28 E	1,333,045.59	3,773,787.69	0.00	1,083.70	
6,200.00	90.00	177.87	179.58	964.00	5,245.00	1,182.88 S	44.00 E	1,332,945.66	3,773,791.41	0.00	1,183.70	
6,300.00	90.00	177.87	179.58	964.00	5,245.00	1,282.81 S	47.71 E	1,332,845.73	3,773,795.13	0.00	1,283.70	
6,400.00	90.00	177.87	179.58	964.00	5,245.00	1,382.74 S	51.43 E	1,332,745.80	3,773,798.84	0.00	1,383.70	
6,500.00	90.00	177.87	179.58	964.00	5,245.00	1,482.67 S	55.15 E	1,332,645.87	3,773,802.56	0.00	1,483.70	
6,600.00	90.00	177.87	179.58	964.00	5,245.00	1,582.60 S	58.86 E	1,332,545.94	3,773,806.28	0.00	1,583.70	
6,700.00	90.00	177.87	179.58	964.00	5,245.00	1,682.54 S	62.58 E	1,332,446.01	3,773,809.99	0.00	1,683.70	
6,800.00	90.00	177.87	179.58	964.00	5,245.00	1,782.47 S	66.30 E	1,332,346.08	3,773,813.71	0.00	1,783.70	
6,900.00	90.00	177.87	179.58	964.00	5,245.00	1,882.40 S	70.02 E	1,332,246.15	3,773,817.43	0.00	1,883.70	
7,000.00	90.00	177.87	179.58	964.00	5,245.00	1,982.33 S	73.73 E	1,332,146.22	3,773,821.14	0.00	1,983.70	
7,100.00	90.00	177.87	179.58	964.00	5,245.00	2,082.26 S	77.45 E	1,332,046.29	3,773,824.86	0.00	2,083.70	
7,200.00	90.00	177.87	179.58	964.00	5,245.00	2,182.19 S	81.17 E	1,331,946.36	3,773,828.58	0.00	2,183.70	
7,300.00	90.00	177.87	179.58	964.00	5,245.00	2,282.12 S	84.88 E	1,331,846.43	3,773,832.30	0.00	2,283.70	
7,400.00	90.00	177.87	179.58	964.00	5,245.00	2,382.05 S	88.60 E	1,331,746.49	3,773,836.01	0.00	2,383.70	
7,500.00	90.00	177.87	179.58	964.00	5,245.00	2,481.98 S	92.32 E	1,331,646.56	3,773,839.73	0.00	2,483.70	
7,600.00	90.00	177.87	179.58	964.00	5,245.00	2,581.91 S	96.03 E	1,331,546.63	3,773,843.45	0.00	2,583.70	
7,700.00	90.00	177.87	179.58	964.00	5,245.00	2,681.84 S	99.75 E	1,331,446.70	3,773,847.16	0.00	2,683.70	
7,800.00	90.00	177.87	179.58	964.00	5,245.00	2,781.77 S	103.47 E	1,331,346.77	3,773,850.88	0.00	2,783.70	
7,900.00	90.00	177.87	179.58	964.00	5,245.00	2,881.71 S	107.18 E	1,331,246.84	3,773,854.60	0.00	2,883.70	
8,000.00	90.00	177.87	179.58	964.00	5,245.00	2,981.64 S	110.90 E	1,331,146.91	3,773,858.31	0.00	2,983.70	
8,100.00	90.00	177.87	179.58	964.00	5,245.00	3,081.57 S	114.62 E	1,331,046.98	3,773,862.03	0.00	3,083.70	
8,200.00	90.00	177.87	179.58	964.00	5,245.00	3,181.50 S	118.33 E	1,330,947.05	3,773,865.75	0.00	3,183.70	
8,300.00	90.00	177.87	179.58	964.00	5,245.00	3,281.43 S	122.05 E	1,330,847.12	3,773,869.46	0.00	3,283.70	
8,400.00	90.00	177.87	179.58	964.00	5,245.00	3,381.36 S	125.77 E	1,330,747.19	3,773,873.18	0.00	3,383.70	
8,500.00	90.00	177.87	179.58	964.00	5,245.00	3,481.29 S	129.49 E	1,330,647.26	3,773,876.90	0.00	3,483.70	
8,600.00	90.00	177.87	179.58	964.00	5,245.00	3,581.22 S	133.20 E	1,330,547.33	3,773,880.61	0.00	3,583.70	
8,700.00	90.00	177.87	179.58	964.00	5,245.00	3,681.15 S	136.92 E	1,330,447.40	3,773,884.33	0.00	3,683.70	
8,800.00	90.00	177.87	179.58	964.00	5,245.00	3,781.08 S	140.64 E	1,330,347.46	3,773,888.05	0.00	3,783.70	
8,900.00	90.00	177.87	179.58	964.00	5,245.00	3,881.01 S	144.35 E	1,330,247.53	3,773,891.77	0.00	3,883.70	
9,000.00	90.00	177.87	179.58	964.00	5,245.00	3,980.95 S	148.07 E	1,330,147.60	3,773,895.48	0.00	3,983.70	

Plan Report for Larsen 28-15-48 #1H - Plan 1

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
						Northing (ft)	Easting (ft)	Northing (ft)	Easting (ft)			
9,108.81	90.00	177.87	179.58	964.00	5,245.00	4,089.68 S	152.11 E	1,330,038.87	3,773,899.53	0.00	4,092.51	TD at 9108.81

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
+N/-S (ft)	+E/-W (ft)			
4,741.49	4,741.49	0.00	0.00	Start Build 12.00
5,408.15	5,211.70	-394.28	14.67	Start 150.00 hold at 5408.15 MD
5,558.15	5,237.75	-541.90	20.16	Start Build 12.00
5,641.49	5,245.00	-624.75	23.24	Start 3467.32 hold at 5641.49 MD
9,108.81	5,245.00	-4,089.68	152.11	TD at 9108.81

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
TD	No Target (Freehand)	177.87	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	9,108.81	Plan 1	MWD+SC

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Larsen 28-15-48 #1H PBHL (600 FSL, 1980 FWL)	0.00	0.00	5,245.00	-4,089.68	152.11	1,330,038.87	3,773,899.53	38° 42' 28.156 N	102° 47' 15.320 W
- plan hits target center									
- Point									

Plan Report for Larsen 28-15-48 #1H - Plan 1

Directional Difficulty Index

Average Dogleg over Survey: 0.99 °/100ft

Maximum Dogleg over Survey: 12.00 °/100ft at 5,408.15 ft

Net Tortosity applicable to Plans: 0.99 °/100ft

Directional Difficulty Index: 5.972

North Reference Sheet for Sec 28-T15S-R48W (Grid) - Larsen 28-15-48 #1H - Wellbore #1

All data is in Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to Nomac 14 @ 4281.00ft (Nomac 14 (25')). Northing and Easting are relative to Larsen 28-15-48 #1H

Coordinate System is US State Plane 1983, Colorado Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995800

Grid Coordinates of Well: 1,334,128.54 ft N, 3,773,747.41 ft E

Geographical Coordinates of Well: 38° 43' 08.61" N, 102° 47' 15.70" W

Grid Convergence at Surface is: 1.71°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,108.81ft
the Bottom Hole Displacement is 4,092.51ft in the Direction of 177.87° (Grid).

Magnetic Convergence at surface is: -5.75° (26 June 2013, , BGGM2013)

