

SPERRY-SUN DRILLING SERVICES

CERTIFIED SURVEY WORK SHEET

OPERATOR:	Anadarko Petroleum Corp
WELL:	Milk State 29C-21HZ
FIELD:	Wattenberg
RIG:	Ensign 145
LEGALS:	Sec 3N-65W-21
COUNTY:	Weld
STATE:	Colorado
CAL. METHOD:	Minimum Curvature
MAG. DECL. APPLIED:	8.51
VERTICAL SEC. DIR. :	359.73

SSDS Job Number :	902260576
Start Date of Job :	26-May-15
End Date of Job :	2-Jun-15
Lead Directional Driller:	Ryan White
Other SSDS DD's :	Omar Dominguez
SSDS MWD Engineers :	Evan Leblanc
	Scott Trowbridge
	Matt Busche

	Main Hole =====>	1st Side Track =====>	2nd Side Track =====>	3rd Side Track =====>	4th Side Track =====>
Tie On Point	1187.00 MWD	Tie On	Tie On	Tie On	Tie On
First Survey	1284.00 MWD				
KOP Depth	6696.00 KOP	KOP-ST1	KOP-ST2	KOP-ST3	KOP-ST4
Last Survey Depth	12708.00 MWD				
Bit Extrapolation to TD	12750.00 Projection	MWD	MWD	MWD	MWD
		T.D.	T.D.	T.D.	T.D.

The following personnel listed below, certify the above survey information to be accurate to the their knowledge. :

Print Name : Ryan White

Print Name : Omar Dominguez

Print Name :

Sign Name :

Sign Name :

Sign Name :

Print Name : Evan Leblanc

Print Name : Matt Busche

Print Name :

Sign Name :

Sign Name :

Sign Name :

Examples of Survey Types:

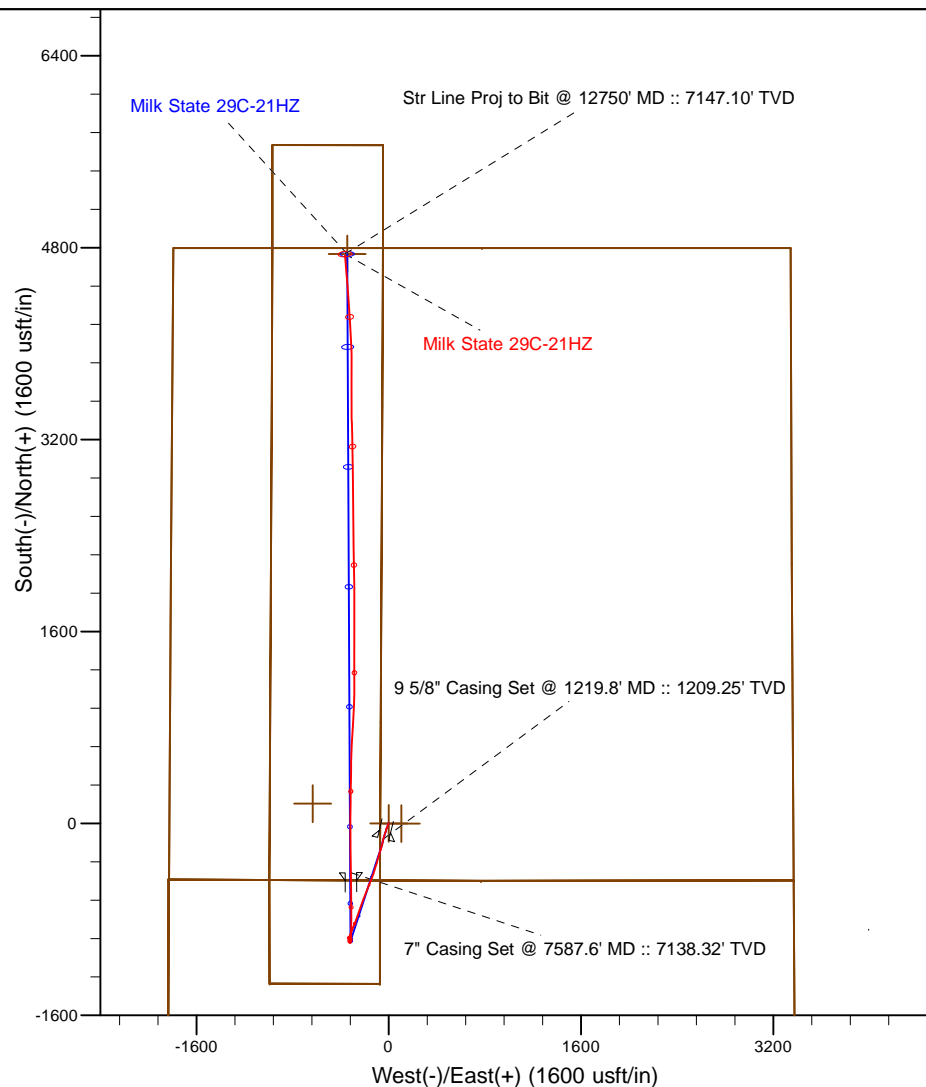
TieOn
MWD
ESS
Gyro
SS

Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
Gyro Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Project: WELD-NAD83-UTMFT13N
 Site: 3N-65W-21 Milk 4-21HZ Pad
 Well: Milk State 29C-21HZ
 Wellbore: Plan B
 Design: Actual Surveys

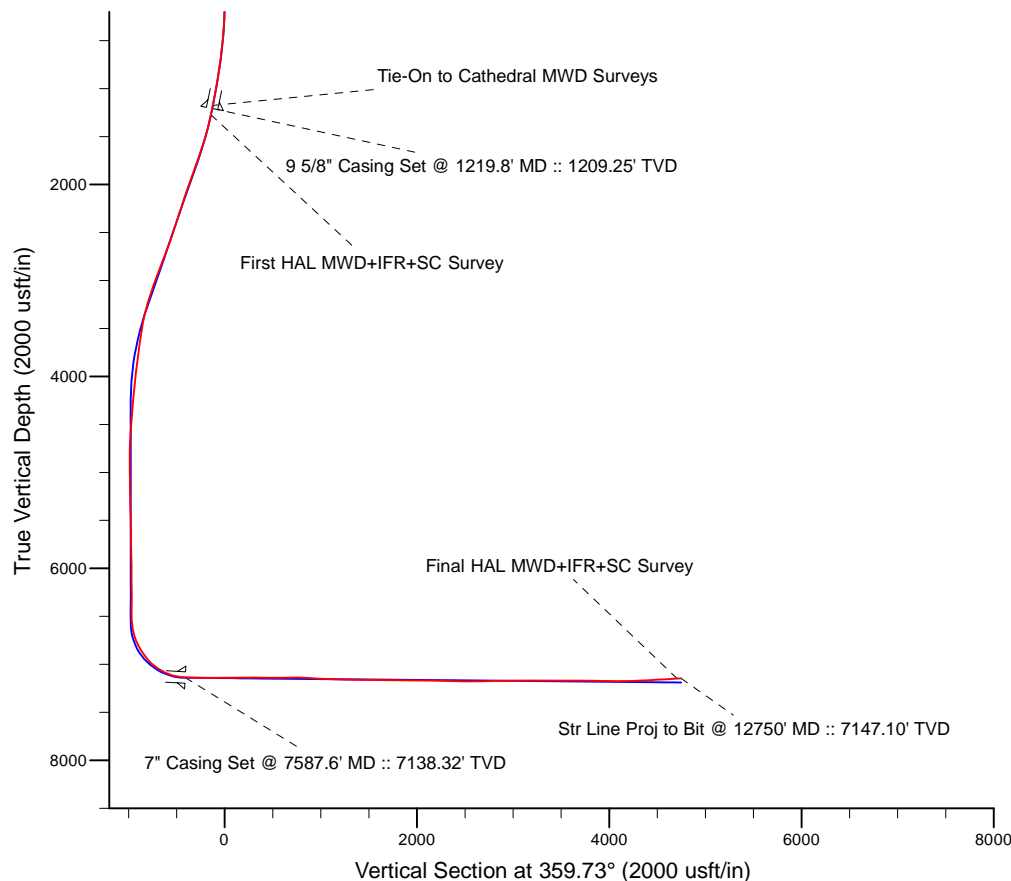


HALLIBURTON
 Sperry Drilling



LEGEND

- △ Milk State 29C-21HZ, Plan B, Rev B0 V0
- Actual Surveys



7" Casing: ~63.55' FSL, ~1519.65' FWL
 Lat/Long: 40.203869 N, -104.672465 E
 UTM - NAD 83 - Zone 13N: 14,601,140.47' N, 1,731,869.84' E
 Location: Sec. 21-T3N-R65W

BHL: ~50.32' FNL, ~1427.55' FWL
 Lat/Long: 40.218032 N, -104.672644 E
 UTM - NAD 83 - Zone 13N: 14,606,297.91' N, 1,731,800.86' E
 Location: Sec. 21-T3N-R65W

WELL DETAILS: Milk State 29C-21HZ	
Ground Level:	4838.00
RKB = 13' @ 4851.00usft (Ensign 145)	
Design: Actual Surveys (Milk State 29C-21HZ/Plan B)	
Created By: Clint Eshelman	Date: 6/02/2015
Reviewed: _____	Date: _____

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N
3N-65W-21 Milk 4-21HZ Pad
Milk State 29C-21HZ
05-123-40979

Design: Actual Surveys

Sperry Drilling Services Standard Report

02 June, 2015

Surface UWI : 05-123-40979

Well Coordinates: 14,601,552.02 N, 1,732,182.19 E (40° 12' 17.99" N, 104° 40' 16.83" W)
Ground Level: 4,838.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well Milk State 29C-21HZ

RKB = 13' @ 4851.00usft (Ensign 145)

N

True

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 73

HALLIBURTON

Design Report for Milk State 29C-21HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91.00	0.60	65.60	91.00	0.20	0.43	0.19	0.66
First Cathedral MWD Survey							
154.00	0.70	184.50	154.00	-0.05	0.70	-0.05	1.78
213.00	1.80	204.50	212.98	-1.25	0.29	-1.25	1.98
273.00	2.60	207.30	272.94	-3.32	-0.72	-3.32	1.34
332.00	3.70	210.80	331.85	-6.14	-2.31	-6.13	1.89
396.00	5.30	206.20	395.65	-10.57	-4.67	-10.55	2.56
459.00	5.20	202.90	458.38	-15.81	-7.07	-15.78	0.50
522.00	6.30	202.40	521.07	-21.64	-9.50	-21.59	1.75
586.00	6.80	202.20	584.65	-28.39	-12.27	-28.33	0.78
650.00	6.50	204.20	648.22	-35.20	-15.18	-35.13	0.59
713.00	7.30	199.50	710.76	-42.23	-17.98	-42.14	1.55
808.00	10.00	194.40	804.67	-55.91	-22.05	-55.81	2.95
903.00	9.70	197.70	898.27	-71.52	-26.53	-71.40	0.67
995.00	10.60	197.70	988.83	-86.97	-31.46	-86.82	0.98
1,092.00	11.30	196.60	1,084.07	-104.58	-36.89	-104.40	0.75
1,187.00	11.80	193.90	1,177.14	-122.93	-41.88	-122.73	0.77
Tie-On to Cathedral MWD Surveys							
1,219.80	11.87	193.67	1,209.25	-129.46	-43.49	-129.25	0.27
9 5/8" Casing Set @ 1219.8' MD :: 1209.25' TVD							
1,284.00	12.02	193.22	1,272.05	-142.39	-46.58	-142.16	0.27
First HAL MWD+IFR+SC Survey							
1,378.00	13.73	192.91	1,363.69	-162.79	-51.31	-162.55	1.82
1,471.00	16.66	196.62	1,453.43	-186.33	-57.59	-186.05	3.32
1,565.00	18.32	198.60	1,543.08	-213.24	-66.15	-212.93	1.88
1,658.00	17.79	197.47	1,631.50	-240.65	-75.08	-240.29	0.68
1,752.00	19.18	193.64	1,720.65	-269.35	-83.03	-268.96	1.96
1,845.00	21.38	195.64	1,807.88	-300.53	-91.21	-300.09	2.48
1,939.00	20.33	194.54	1,895.72	-332.83	-99.93	-332.36	1.19
2,032.00	20.99	197.71	1,982.75	-364.34	-109.05	-363.82	1.40
2,126.00	20.22	198.69	2,070.73	-395.77	-119.38	-395.20	0.90
2,219.00	18.65	197.82	2,158.43	-425.15	-129.08	-424.54	1.72
2,312.00	20.42	202.04	2,246.08	-454.35	-139.72	-453.68	2.43
2,406.00	19.00	202.01	2,334.57	-483.74	-151.61	-483.02	1.51
2,499.00	18.79	202.96	2,422.56	-511.56	-163.12	-510.79	0.40
2,593.00	20.04	203.01	2,511.21	-540.33	-175.32	-539.49	1.33
2,780.00	21.79	200.01	2,685.89	-602.44	-199.73	-601.49	1.10
2,873.00	22.31	199.73	2,772.08	-635.27	-211.59	-634.27	0.57
2,963.00	22.19	199.42	2,855.38	-667.38	-223.01	-666.32	0.19
3,054.00	22.02	199.49	2,939.69	-699.67	-234.42	-698.56	0.19
3,144.00	21.23	199.38	3,023.36	-730.95	-245.45	-729.78	0.88
3,234.00	19.25	199.49	3,107.80	-760.31	-255.81	-759.09	2.20
3,323.00	18.14	199.79	3,192.10	-787.18	-265.40	-785.92	1.25
3,414.00	15.99	200.37	3,279.09	-812.26	-274.56	-810.95	2.37
3,504.00	13.62	200.84	3,366.09	-833.78	-282.64	-832.44	2.64
3,594.00	11.95	201.76	3,453.86	-852.34	-289.87	-850.97	1.87
3,684.00	10.22	201.79	3,542.18	-868.41	-296.29	-867.01	1.92
3,774.00	8.82	202.77	3,630.94	-882.19	-301.92	-880.76	1.57
3,864.00	7.80	203.43	3,719.99	-894.15	-307.02	-892.70	1.14

Design Report for Milk State 29C-21HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
3,954.00	6.92	201.67	3,809.25	-904.80	-311.45	-903.32	1.01
4,043.00	6.97	201.65	3,897.59	-914.80	-315.42	-913.30	0.06
4,133.00	7.17	201.20	3,986.91	-925.11	-319.47	-923.60	0.23
4,223.00	6.89	202.74	4,076.23	-935.33	-323.59	-933.79	0.38
4,313.00	6.17	203.19	4,165.65	-944.75	-327.58	-943.20	0.80
4,403.00	5.82	206.06	4,255.16	-953.30	-331.49	-951.72	0.51
4,492.00	5.41	188.33	4,343.74	-961.50	-334.08	-959.92	1.99
4,582.00	5.08	187.58	4,433.36	-969.65	-335.22	-968.06	0.37
4,672.00	3.46	175.44	4,523.11	-976.31	-335.53	-974.71	2.05
4,762.00	3.59	176.77	4,612.94	-981.83	-335.15	-980.24	0.17
4,852.00	2.32	128.44	4,702.83	-985.77	-333.57	-984.19	2.98
4,941.00	2.20	114.44	4,791.76	-987.60	-330.60	-986.03	0.63
5,031.00	2.31	98.89	4,881.69	-988.60	-327.24	-987.04	0.69
5,121.00	0.99	55.17	4,971.66	-988.43	-324.81	-986.89	1.93
5,210.00	1.01	37.93	5,060.64	-987.37	-323.69	-985.84	0.34
5,300.00	1.06	29.67	5,150.63	-986.02	-322.79	-984.49	0.17
5,390.00	1.11	21.62	5,240.61	-984.49	-322.06	-982.96	0.18
5,480.00	1.14	17.98	5,330.59	-982.83	-321.46	-981.30	0.09
5,571.00	1.26	12.07	5,421.57	-980.99	-320.97	-979.47	0.19
5,660.00	1.34	8.81	5,510.55	-979.00	-320.61	-977.48	0.12
5,750.00	1.51	7.12	5,600.52	-976.79	-320.30	-975.27	0.19
5,840.00	1.38	8.83	5,690.49	-974.54	-319.99	-973.02	0.15
5,930.00	0.90	352.23	5,780.48	-972.77	-319.92	-971.25	0.64
6,020.00	0.53	355.28	5,870.47	-971.65	-320.05	-970.13	0.41
6,110.00	0.61	35.31	5,960.47	-970.85	-319.80	-969.33	0.44
6,200.00	0.45	58.22	6,050.46	-970.27	-319.23	-968.76	0.29
6,290.00	0.35	30.89	6,140.46	-969.85	-318.79	-968.34	0.24
6,470.00	0.99	75.88	6,320.45	-969.00	-317.00	-967.49	0.43
6,650.00	1.40	76.17	6,500.41	-968.09	-313.35	-966.61	0.23
6,740.00	6.02	353.38	6,590.23	-963.14	-312.83	-961.65	6.67
6,830.00	13.82	0.52	6,678.82	-947.68	-313.28	-946.19	8.76
6,920.00	24.18	1.73	6,763.80	-918.42	-312.62	-916.94	11.52
7,010.00	30.65	1.47	6,843.65	-877.02	-311.47	-875.55	7.19
7,100.00	36.45	0.80	6,918.62	-827.31	-310.51	-825.84	6.46
7,190.00	45.27	357.16	6,986.63	-768.53	-311.72	-767.05	10.15
7,280.00	56.69	0.74	7,043.21	-698.75	-312.83	-697.27	13.06
7,370.00	65.84	359.82	7,086.44	-619.92	-312.47	-618.44	10.21
7,460.00	71.79	359.14	7,118.95	-536.04	-313.24	-534.56	6.65
7,547.00	85.81	0.13	7,135.80	-450.91	-313.76	-449.43	16.15
7,587.60	87.07	359.57	7,138.32	-410.39	-313.87	-408.91	3.41
7" Casing Set @ 7587.6' MD :: 7138.32' TVD							
7,637.00	88.61	358.88	7,140.18	-361.03	-314.54	-359.55	3.41
7,727.00	90.03	358.91	7,141.25	-271.06	-316.28	-269.57	1.58
7,817.00	89.82	358.93	7,141.37	-181.08	-317.97	-179.58	0.23
7,907.00	90.00	358.87	7,141.51	-91.09	-319.70	-89.59	0.21
8,087.00	90.77	1.69	7,140.30	88.88	-318.82	90.38	1.62
8,177.00	89.29	1.27	7,140.26	178.85	-316.50	180.34	1.71
8,267.00	91.36	0.23	7,139.74	268.83	-315.32	270.32	2.57
8,357.00	88.77	0.74	7,139.64	358.82	-314.56	360.30	2.93
8,447.00	89.20	0.63	7,141.24	448.80	-313.48	450.27	0.49
8,537.00	91.94	1.40	7,140.34	538.77	-311.89	540.24	3.16

Design Report for Milk State 29C-21HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,717.00	89.48	3.35	7,138.11	718.58	-304.43	720.01	1.74
8,807.00	88.00	4.22	7,140.09	808.36	-298.49	809.76	1.91
8,897.00	85.87	3.48	7,144.90	898.02	-292.46	899.39	2.51
8,987.00	87.23	1.45	7,150.32	987.77	-288.59	989.12	2.71
9,076.00	87.66	1.46	7,154.29	1,076.65	-286.34	1,077.99	0.48
9,166.00	87.78	0.01	7,157.87	1,166.57	-285.18	1,167.90	1.62
9,256.00	88.37	359.66	7,160.89	1,256.52	-285.44	1,257.85	0.76
9,346.00	88.95	359.77	7,162.99	1,346.49	-285.89	1,347.83	0.66
9,436.00	90.83	359.87	7,163.17	1,436.49	-286.17	1,437.82	2.09
9,525.00	88.37	359.76	7,163.79	1,525.48	-286.46	1,526.81	2.77
9,615.00	89.78	0.35	7,165.24	1,615.47	-286.37	1,616.80	1.70
9,705.00	88.83	0.15	7,166.33	1,705.46	-285.98	1,706.79	1.08
9,794.00	89.57	359.95	7,167.58	1,794.45	-285.90	1,795.78	0.86
9,884.00	89.91	0.31	7,167.98	1,884.45	-285.70	1,885.77	0.55
9,974.00	90.00	358.85	7,168.05	1,974.44	-286.36	1,975.77	1.63
10,064.00	89.32	359.16	7,168.59	2,064.43	-287.92	2,065.76	0.83
10,154.00	89.14	359.36	7,169.80	2,154.41	-289.08	2,155.75	0.30
10,244.00	88.61	359.21	7,171.57	2,244.39	-290.21	2,245.73	0.61
10,334.00	88.18	358.90	7,174.09	2,334.34	-291.69	2,335.69	0.59
10,424.00	88.18	359.22	7,176.94	2,424.28	-293.17	2,425.63	0.36
10,514.00	90.18	359.31	7,178.23	2,514.26	-294.32	2,515.62	2.22
10,603.00	90.40	358.93	7,177.78	2,603.25	-295.69	2,604.61	0.49
10,693.00	90.80	359.00	7,176.84	2,693.23	-297.31	2,694.60	0.45
10,783.00	91.48	359.62	7,175.05	2,783.20	-298.40	2,784.58	1.02
10,963.00	90.74	0.21	7,171.56	2,963.17	-298.66	2,964.54	0.53
11,053.00	90.31	358.81	7,170.74	3,053.16	-299.43	3,054.53	1.63
11,143.00	90.03	358.94	7,170.47	3,143.14	-301.20	3,144.52	0.34
11,233.00	89.42	358.11	7,170.90	3,233.11	-303.52	3,234.50	1.14
11,336.00	90.15	358.39	7,171.29	3,336.06	-306.66	3,337.46	0.76
11,413.00	89.85	359.78	7,171.29	3,413.04	-307.89	3,414.46	1.85
11,503.00	90.12	359.11	7,171.31	3,503.04	-308.76	3,504.46	0.80
11,593.00	90.68	0.57	7,170.68	3,593.03	-309.01	3,594.45	1.74
11,683.00	89.07	0.22	7,170.88	3,683.03	-308.39	3,684.44	1.83
11,774.00	88.86	0.20	7,172.52	3,774.01	-308.06	3,775.42	0.23
11,864.00	89.66	359.79	7,173.69	3,864.01	-308.07	3,865.41	1.00
12,044.00	88.36	356.49	7,176.80	4,043.85	-313.91	4,045.29	1.97
12,224.00	92.56	356.44	7,175.35	4,223.47	-325.00	4,224.95	2.33
12,314.00	92.74	356.08	7,171.19	4,313.18	-330.87	4,314.69	0.45
12,404.00	93.15	355.92	7,166.57	4,402.84	-337.14	4,404.38	0.49
12,494.00	93.06	355.61	7,161.69	4,492.46	-343.77	4,494.03	0.36
12,584.00	93.08	355.37	7,156.87	4,582.06	-350.84	4,583.66	0.27
12,708.00	93.55	355.63	7,149.70	4,705.47	-360.55	4,707.11	0.43
Final HAL MWD+IFR+SC Survey							
12,750.00	93.55	355.63	7,147.10	4,747.26	-363.75	4,748.92	0.00
Str Line Proj to Bit @ 12750' MD :: 7147.10' TVD							

Design Report for Milk State 29C-21HZ - Actual Surveys

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
91.00	91.00	0.20	0.43	First Cathedral MWD Survey
1,187.00	1,177.14	-122.93	-41.88	Tie-On to Cathedral MWD Surveys
1,284.00	1,272.05	-142.39	-46.58	First HAL MWD+IFR+SC Survey
12,708.00	7,149.70	4,705.47	-360.55	Final HAL MWD+IFR+SC Survey
12,750.00	7,147.10	4,747.26	-363.75	Str Line Proj to Bit @ 12750' MD :: 7147.10' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.73	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
91.00	1,187.00	CES Surface Surveys	APC_ISCWSA REV 2 MWD
1,284.00	7,637.00	HAL MWD+IFR+SC Vertical/Build	APC_ISCWSA REV 2 MWD+IFR1+SC
7,727.00	12,708.00	HAL MWD+IFR+SC Lateral	APC_ISCWSA REV 2 MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,219.80	1,209.25	9 5/8" Casing Set @ 1219.8' MD :: 1209.25' TVD	9-5/8	13-1/2
7,587.60	7,138.32	7" Casing Set @ 7587.6' MD :: 7138.32' TVD	7	8-3/4

Design Report for Milk State 29C-21HZ - Actual Surveys

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Milk State 29C-21HZ_! - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,601,552.02	1,732,182.19	40.204996	-104.671341
Milk State 29C-21HZ_ - actual wellpath misses target center by 104.99usft at 0.50usft MD (0.50 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	0.00	-0.73	104.98	14,601,551.69	1,732,287.18	40.204994	-104.670965
Point 1				0.00	5,656.58	-152.28	14,607,207.66	1,732,113.95	
Point 2				0.00	4,798.37	-152.08	14,606,349.46	1,732,117.33	
Point 3				0.00	3,482.09	-158.53	14,605,033.16	1,732,115.75	
Point 4				0.00	2,165.81	-164.99	14,603,716.87	1,732,114.17	
Point 5				0.00	845.81	-171.46	14,602,396.85	1,732,112.58	
Point 6				0.00	-474.19	-177.94	14,601,076.84	1,732,110.99	
Point 7				0.00	-1,336.34	-177.12	14,600,214.70	1,732,115.01	
Point 8				0.00	-1,333.90	-1,096.80	14,600,213.73	1,731,195.32	
Point 9				0.00	-470.45	-1,097.62	14,601,077.17	1,731,191.31	
Point 10				0.00	847.61	-1,091.15	14,602,395.25	1,731,192.89	
Point 11				0.00	2,165.66	-1,084.68	14,603,713.31	1,731,194.48	
Point 12				0.00	3,481.93	-1,078.22	14,605,029.60	1,731,196.07	
Point 13				0.00	4,798.21	-1,071.75	14,606,345.89	1,731,197.66	
Point 14				0.00	5,657.33	-1,071.96	14,607,205.01	1,731,194.27	
Point 15				0.00	5,656.58	-152.28	14,607,207.66	1,732,113.95	
Sec. 28 and 21-T3N-R - actual wellpath misses target center by 654.80usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	-13.00	166.06	-633.25	14,601,715.74	1,731,548.32	40.205452	-104.673609
Point 1				-13.00	4,631.20	-1,157.80	14,606,342.62	1,730,373.38	
Point 2				-13.00	4,631.80	1,410.20	14,606,352.73	1,732,941.36	
Point 3				-13.00	4,632.30	3,978.20	14,606,362.74	1,735,509.34	
Point 4				-13.00	1,999.70	3,987.10	14,603,730.19	1,735,527.99	
Point 5				-13.00	-640.90	4,004.20	14,601,089.67	1,735,554.87	
Point 6				-13.00	-644.40	1,401.70	14,601,076.54	1,732,952.40	
Point 7				-13.00	-633.90	-1,200.80	14,601,077.40	1,730,349.88	
Point 8				-13.00	-644.40	1,401.70	14,601,076.54	1,732,952.40	
Point 9				-13.00	-640.90	4,004.20	14,601,089.67	1,735,554.87	
Point 10				-13.00	-3,289.10	4,016.60	14,598,441.54	1,735,577.08	
Point 11				-13.00	-5,929.10	4,028.80	14,595,801.60	1,735,599.05	
Point 12				-13.00	-5,930.40	1,413.40	14,595,790.62	1,732,983.68	
Point 13				-13.00	-5,931.80	-1,202.00	14,595,779.53	1,730,368.30	
Point 14				-13.00	-3,282.80	-1,201.40	14,598,428.52	1,730,359.09	
Point 15				-13.00	-633.90	-1,200.80	14,601,077.40	1,730,349.88	
Point 16				-13.00	1,998.70	-1,179.30	14,603,710.06	1,730,361.63	
Milk State 29C-21HZ_ - actual wellpath misses target center by 46.75usft at 12746.16usft MD (7147.34 TVD, 4743.44 N, -363.45 E) - Point	0.00	0.00	7,190.00	4,747.52	-344.77	14,606,298.24	1,731,819.85	40.218033	-104.672576

Directional Difficulty Index

Average Dogleg over Survey:	1.76 °/100usft	Maximum Dogleg over Survey:	16.15 °/100usft at 7,547.00 usft
Net Tortousity applicable to Plans:	0.71 °/100usft	Directional Difficulty Index:	6.433

Audit Info

North Reference Sheet for 3N-65W-21 Milk 4-21HZ Pad - Milk State 29C-21HZ - Plan B

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

Vertical Depths are relative to RKB = 13' @ 4851.00usft (Ensign 145). Northing and Easting are relative to Milk State 29C-21HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.000000°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960963

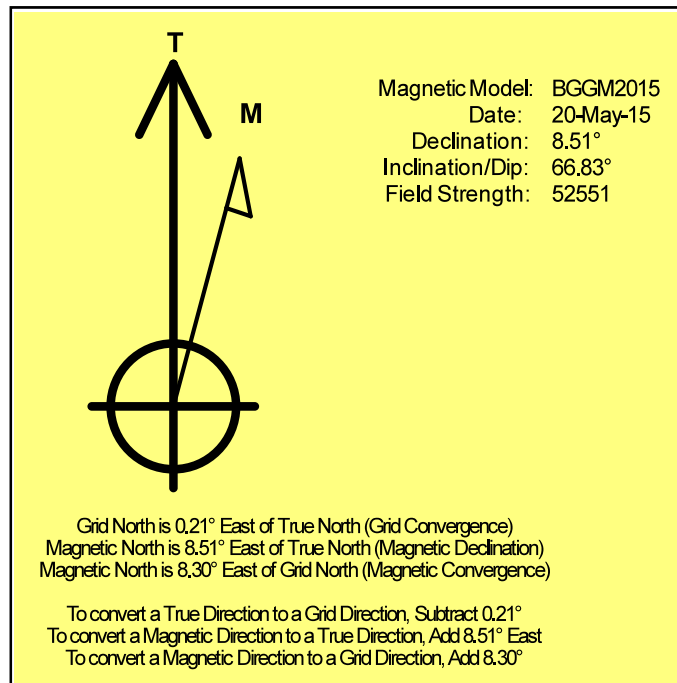
Grid Coordinates of Well: 14,601,552.02 usft N, 1,732,182.19 usft E

Geographical Coordinates of Well: 40° 12' 17.99" N, 104° 40' 16.83" W

Grid Convergence at Surface is: 0.21°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,750.00usft
the Bottom Hole Displacement is 4,761.18usft in the Direction of 355.62° (True).

Magnetic Convergence at surface is: -8.30° (20 May 2015, , BGGM2015)



US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

3N-65W-21 Milk 4-21HZ Pad

Milk State 29C-21HZ

05-123-40979

Plan B

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

02 June, 2015

Well Coordinates: 14,601,552.02 N, 1,732,182.19 E (40° 12' 17.99" N, 104° 40' 16.83" W)

Ground Level: 4,838.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well Milk State 29C-21HZ

RKB = 13' @ 4851.00usft (Ensign 145)

N

True

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 73

HALLIBURTON

Design Report for Milk State 29C-21HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.204996	-104.671341	14,601,552.02	1,732,182.19
91.00	0.60	65.60	91.00	0.20	0.43	40.204997	-104.671340	14,601,552.22	1,732,182.62
154.00	0.70	184.50	154.00	-0.05	0.70	40.204996	-104.671339	14,601,551.98	1,732,182.89
213.00	1.80	204.50	212.98	-1.25	0.29	40.204993	-104.671340	14,601,550.77	1,732,182.49
273.00	2.60	207.30	272.94	-3.32	-0.72	40.204987	-104.671344	14,601,548.70	1,732,181.48
332.00	3.70	210.80	331.85	-6.14	-2.31	40.204979	-104.671350	14,601,545.87	1,732,179.90
396.00	5.30	206.20	395.65	-10.57	-4.67	40.204967	-104.671358	14,601,541.44	1,732,177.55
459.00	5.20	202.90	458.38	-15.81	-7.07	40.204953	-104.671367	14,601,536.19	1,732,175.18
522.00	6.30	202.40	521.07	-21.64	-9.50	40.204937	-104.671375	14,601,530.35	1,732,172.77
586.00	6.80	202.20	584.65	-28.39	-12.27	40.204918	-104.671385	14,601,523.59	1,732,170.03
650.00	6.50	204.20	648.22	-35.20	-15.18	40.204899	-104.671396	14,601,516.76	1,732,167.13
713.00	7.30	199.50	710.76	-42.23	-17.98	40.204880	-104.671406	14,601,509.73	1,732,164.36
808.00	10.00	194.40	804.67	-55.91	-22.05	40.204843	-104.671420	14,601,496.03	1,732,160.35
903.00	9.70	197.70	898.27	-71.52	-26.53	40.204800	-104.671436	14,601,480.40	1,732,155.92
995.00	10.60	197.70	988.83	-86.97	-31.46	40.204757	-104.671454	14,601,464.94	1,732,151.05
1,092.00	11.30	196.60	1,084.07	-104.58	-36.89	40.204709	-104.671473	14,601,447.31	1,732,145.69
1,187.00	11.80	193.90	1,177.14	-122.93	-41.88	40.204659	-104.671491	14,601,428.94	1,732,140.76
1,219.80	11.87	193.67	1,209.25	-129.46	-43.49	40.204641	-104.671497	14,601,422.40	1,732,139.18
1,284.00	12.02	193.22	1,272.05	-142.39	-46.58	40.204605	-104.671508	14,601,409.47	1,732,136.14
1,378.00	13.73	192.91	1,363.69	-162.79	-51.31	40.204549	-104.671525	14,601,389.05	1,732,131.49
1,471.00	16.66	196.62	1,453.43	-186.33	-57.59	40.204484	-104.671548	14,601,365.49	1,732,125.29
1,565.00	18.32	198.60	1,543.08	-213.24	-66.15	40.204411	-104.671578	14,601,338.54	1,732,116.83
1,658.00	17.79	197.47	1,631.50	-240.65	-75.08	40.204335	-104.671610	14,601,311.10	1,732,108.00
1,752.00	19.18	193.64	1,720.65	-269.35	-83.03	40.204256	-104.671639	14,601,282.37	1,732,100.15
1,845.00	21.38	195.64	1,807.88	-300.53	-91.21	40.204171	-104.671668	14,601,251.16	1,732,092.09
1,939.00	20.33	194.54	1,895.72	-332.83	-99.93	40.204082	-104.671699	14,601,218.82	1,732,083.50
2,032.00	20.99	197.71	1,982.75	-364.34	-109.05	40.203996	-104.671732	14,601,187.28	1,732,074.49
2,126.00	20.22	198.69	2,070.73	-395.77	-119.38	40.203909	-104.671769	14,601,155.82	1,732,064.28
2,219.00	18.65	197.82	2,158.43	-425.15	-129.08	40.203829	-104.671804	14,601,126.40	1,732,054.69
2,312.00	20.42	202.04	2,246.08	-454.35	-139.72	40.203748	-104.671842	14,601,097.16	1,732,044.15
2,406.00	19.00	202.01	2,334.57	-483.74	-151.61	40.203668	-104.671884	14,601,067.73	1,732,032.37
2,499.00	18.79	202.96	2,422.56	-511.56	-163.12	40.203591	-104.671925	14,601,039.86	1,732,020.96
2,593.00	20.04	203.01	2,511.21	-540.33	-175.32	40.203512	-104.671969	14,601,011.05	1,732,008.87
2,780.00	21.79	200.01	2,685.89	-602.44	-199.73	40.203342	-104.672057	14,600,948.85	1,731,984.69
2,873.00	22.31	199.73	2,772.08	-635.27	-211.59	40.203252	-104.672099	14,600,915.97	1,731,972.95
2,963.00	22.19	199.42	2,855.38	-667.38	-223.01	40.203163	-104.672140	14,600,883.82	1,731,961.65
3,054.00	22.02	199.49	2,939.69	-699.67	-234.42	40.203075	-104.672181	14,600,851.49	1,731,950.36
3,144.00	21.23	199.38	3,023.36	-730.95	-245.45	40.202989	-104.672220	14,600,820.17	1,731,939.44
3,234.00	19.25	199.49	3,107.80	-760.31	-255.81	40.202908	-104.672257	14,600,790.78	1,731,929.19
3,323.00	18.14	199.79	3,192.10	-787.18	-265.40	40.202834	-104.672292	14,600,763.87	1,731,919.71
3,414.00	15.99	200.37	3,279.09	-812.26	-274.56	40.202766	-104.672325	14,600,738.76	1,731,910.64
3,504.00	13.62	200.84	3,366.09	-833.78	-282.64	40.202706	-104.672354	14,600,717.20	1,731,902.63

Design Report for Milk State 29C-21HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
3,594.00	11.95	201.76	3,453.86	-852.34	-289.87	40.202656	-104.672379	14,600,698.61	1,731,895.48
3,684.00	10.22	201.79	3,542.18	-868.41	-296.29	40.202611	-104.672402	14,600,682.52	1,731,889.12
3,774.00	8.82	202.77	3,630.94	-882.19	-301.92	40.202574	-104.672423	14,600,668.72	1,731,883.54
3,864.00	7.80	203.43	3,719.99	-894.15	-307.02	40.202541	-104.672441	14,600,656.74	1,731,878.48
3,954.00	6.92	201.67	3,809.25	-904.80	-311.45	40.202511	-104.672457	14,600,646.08	1,731,874.09
4,043.00	6.97	201.65	3,897.59	-914.80	-315.42	40.202484	-104.672471	14,600,636.06	1,731,870.16
4,133.00	7.17	201.20	3,986.91	-925.11	-319.47	40.202456	-104.672485	14,600,625.74	1,731,866.15
4,223.00	6.89	202.74	4,076.23	-935.33	-323.59	40.202428	-104.672500	14,600,615.51	1,731,862.07
4,313.00	6.17	203.19	4,165.65	-944.75	-327.58	40.202402	-104.672514	14,600,606.07	1,731,858.11
4,403.00	5.82	206.06	4,255.16	-953.30	-331.49	40.202378	-104.672528	14,600,597.51	1,731,854.23
4,492.00	5.41	188.33	4,343.74	-961.50	-334.08	40.202356	-104.672538	14,600,589.29	1,731,851.67
4,582.00	5.08	187.58	4,433.36	-969.65	-335.22	40.202333	-104.672542	14,600,581.14	1,731,850.56
4,672.00	3.46	175.44	4,523.11	-976.31	-335.53	40.202315	-104.672543	14,600,574.48	1,731,850.28
4,762.00	3.59	176.77	4,612.94	-981.83	-335.15	40.202300	-104.672542	14,600,568.96	1,731,850.67
4,852.00	2.32	128.44	4,702.83	-985.77	-333.57	40.202289	-104.672536	14,600,565.02	1,731,852.27
4,941.00	2.20	114.44	4,791.76	-987.60	-330.60	40.202284	-104.672525	14,600,563.21	1,731,855.25
5,031.00	2.31	98.89	4,881.69	-988.60	-327.24	40.202281	-104.672513	14,600,562.22	1,731,858.62
5,121.00	0.99	55.17	4,971.66	-988.43	-324.81	40.202282	-104.672505	14,600,562.40	1,731,861.05
5,210.00	1.01	37.93	5,060.64	-987.37	-323.69	40.202285	-104.672501	14,600,563.46	1,731,862.16
5,300.00	1.06	29.67	5,150.63	-986.02	-322.79	40.202288	-104.672497	14,600,564.81	1,731,863.05
5,390.00	1.11	21.62	5,240.61	-984.49	-322.06	40.202293	-104.672495	14,600,566.35	1,731,863.78
5,480.00	1.14	17.98	5,330.59	-982.83	-321.46	40.202297	-104.672493	14,600,568.01	1,731,864.37
5,571.00	1.26	12.07	5,421.57	-980.99	-320.97	40.202302	-104.672491	14,600,569.85	1,731,864.85
5,660.00	1.34	8.81	5,510.55	-979.00	-320.61	40.202308	-104.672489	14,600,571.84	1,731,865.21
5,750.00	1.51	7.12	5,600.52	-976.79	-320.30	40.202314	-104.672488	14,600,574.06	1,731,865.51
5,840.00	1.38	8.83	5,690.49	-974.54	-319.99	40.202320	-104.672487	14,600,576.31	1,731,865.81
5,930.00	0.90	352.23	5,780.48	-972.77	-319.92	40.202325	-104.672487	14,600,578.08	1,731,865.88
6,020.00	0.53	355.28	5,870.47	-971.65	-320.05	40.202328	-104.672487	14,600,579.19	1,731,865.74
6,110.00	0.61	35.31	5,960.47	-970.85	-319.80	40.202330	-104.672487	14,600,580.00	1,731,865.98
6,200.00	0.45	58.22	6,050.46	-970.27	-319.23	40.202332	-104.672485	14,600,580.58	1,731,866.56
6,290.00	0.35	30.89	6,140.46	-969.85	-318.79	40.202333	-104.672483	14,600,581.00	1,731,867.00
6,470.00	0.99	75.88	6,320.45	-969.00	-317.00	40.202335	-104.672477	14,600,581.86	1,731,868.78
6,650.00	1.40	76.17	6,500.41	-968.09	-313.35	40.202338	-104.672463	14,600,582.78	1,731,872.42
6,740.00	6.02	353.38	6,590.23	-963.14	-312.83	40.202351	-104.672462	14,600,587.74	1,731,872.93
6,830.00	13.82	0.52	6,678.82	-947.68	-313.28	40.202394	-104.672463	14,600,603.19	1,731,872.43
6,920.00	24.18	1.73	6,763.80	-918.42	-312.62	40.202474	-104.672461	14,600,632.45	1,731,872.97
7,010.00	30.65	1.47	6,843.65	-877.02	-311.47	40.202588	-104.672457	14,600,673.85	1,731,873.97
7,100.00	36.45	0.80	6,918.62	-827.31	-310.51	40.202724	-104.672453	14,600,723.57	1,731,874.74
7,190.00	45.27	357.16	6,986.63	-768.53	-311.72	40.202886	-104.672458	14,600,782.35	1,731,873.31
7,280.00	56.69	0.74	7,043.21	-698.75	-312.83	40.203077	-104.672462	14,600,852.12	1,731,871.95
7,370.00	65.84	359.82	7,086.44	-619.92	-312.47	40.203294	-104.672460	14,600,930.95	1,731,872.02
7,460.00	71.79	359.14	7,118.95	-536.04	-313.24	40.203524	-104.672463	14,601,014.83	1,731,870.94

Design Report for Milk State 29C-21HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
7,547.00	85.81	0.13	7,135.80	-450.91	-313.76	40.203758	-104.672465	14,601,099.95	1,731,870.10
7,587.60	87.07	359.57	7,138.32	-410.39	-313.87	40.203869	-104.672465	14,601,140.47	1,731,869.84
7,637.00	88.61	358.88	7,140.18	-361.03	-314.54	40.204005	-104.672468	14,601,189.83	1,731,868.99
7,727.00	90.03	358.91	7,141.25	-271.06	-316.28	40.204252	-104.672474	14,601,279.80	1,731,866.92
7,817.00	89.82	358.93	7,141.37	-181.08	-317.97	40.204499	-104.672480	14,601,369.77	1,731,864.89
7,907.00	90.00	358.87	7,141.51	-91.09	-319.70	40.204746	-104.672486	14,601,459.75	1,731,862.83
8,087.00	90.77	1.69	7,140.30	88.88	-318.82	40.205240	-104.672483	14,601,639.72	1,731,863.04
8,177.00	89.29	1.27	7,140.26	178.85	-316.50	40.205487	-104.672475	14,601,729.70	1,731,865.03
8,267.00	91.36	0.23	7,139.74	268.83	-315.32	40.205734	-104.672471	14,601,819.69	1,731,865.88
8,357.00	88.77	0.74	7,139.64	358.82	-314.56	40.205981	-104.672468	14,601,909.68	1,731,866.30
8,447.00	89.20	0.63	7,141.24	448.80	-313.48	40.206229	-104.672464	14,601,999.66	1,731,867.05
8,537.00	91.94	1.40	7,140.34	538.77	-311.89	40.206476	-104.672458	14,602,089.64	1,731,868.31
8,717.00	89.48	3.35	7,138.11	718.58	-304.43	40.206969	-104.672432	14,602,269.47	1,731,875.10
8,807.00	88.00	4.22	7,140.09	808.36	-298.49	40.207216	-104.672410	14,602,359.27	1,731,880.71
8,897.00	85.87	3.48	7,144.90	898.02	-292.46	40.207462	-104.672389	14,602,448.96	1,731,886.41
8,987.00	87.23	1.45	7,150.32	987.77	-288.59	40.207709	-104.672375	14,602,538.72	1,731,889.94
9,076.00	87.66	1.46	7,154.29	1,076.65	-286.34	40.207953	-104.672367	14,602,627.61	1,731,891.87
9,166.00	87.78	0.01	7,157.87	1,166.57	-285.18	40.208200	-104.672363	14,602,717.53	1,731,892.69
9,256.00	88.37	359.66	7,160.89	1,256.52	-285.44	40.208447	-104.672364	14,602,807.48	1,731,892.10
9,346.00	88.95	359.77	7,162.99	1,346.49	-285.89	40.208694	-104.672365	14,602,897.45	1,731,891.32
9,436.00	90.83	359.87	7,163.17	1,436.49	-286.17	40.208941	-104.672366	14,602,987.44	1,731,890.70
9,525.00	88.37	359.76	7,163.79	1,525.48	-286.46	40.209185	-104.672367	14,603,076.43	1,731,890.08
9,615.00	89.78	0.35	7,165.24	1,615.47	-286.37	40.209432	-104.672367	14,603,166.42	1,731,889.84
9,705.00	88.83	0.15	7,166.33	1,705.46	-285.98	40.209679	-104.672366	14,603,256.41	1,731,889.90
9,794.00	89.57	359.95	7,167.58	1,794.45	-285.90	40.209924	-104.672365	14,603,345.40	1,731,889.64
9,884.00	89.91	0.31	7,167.98	1,884.45	-285.70	40.210171	-104.672365	14,603,435.40	1,731,889.51
9,974.00	90.00	358.85	7,168.05	1,974.44	-286.36	40.210418	-104.672367	14,603,525.39	1,731,888.52
10,064.00	89.32	359.16	7,168.59	2,064.43	-287.92	40.210665	-104.672373	14,603,615.37	1,731,886.63
10,154.00	89.14	359.36	7,169.80	2,154.41	-289.08	40.210912	-104.672377	14,603,705.35	1,731,885.13
10,244.00	88.61	359.21	7,171.57	2,244.39	-290.21	40.211159	-104.672381	14,603,795.32	1,731,883.67
10,334.00	88.18	358.90	7,174.09	2,334.34	-291.69	40.211406	-104.672386	14,603,885.27	1,731,881.86
10,424.00	88.18	359.22	7,176.94	2,424.28	-293.17	40.211653	-104.672391	14,603,975.20	1,731,880.05
10,514.00	90.18	359.31	7,178.23	2,514.26	-294.32	40.211900	-104.672395	14,604,065.18	1,731,878.56
10,603.00	90.40	358.93	7,177.78	2,603.25	-295.69	40.212145	-104.672400	14,604,154.16	1,731,876.86
10,693.00	90.80	359.00	7,176.84	2,693.23	-297.31	40.212392	-104.672406	14,604,244.13	1,731,874.91
10,783.00	91.48	359.62	7,175.05	2,783.20	-298.40	40.212639	-104.672410	14,604,334.10	1,731,873.49
10,963.00	90.74	0.21	7,171.56	2,963.17	-298.66	40.213133	-104.672411	14,604,514.06	1,731,872.56
11,053.00	90.31	358.81	7,170.74	3,053.16	-299.43	40.213380	-104.672414	14,604,604.05	1,731,871.45
11,143.00	90.03	358.94	7,170.47	3,143.14	-301.20	40.213627	-104.672420	14,604,694.03	1,731,869.35
11,233.00	89.42	358.11	7,170.90	3,233.11	-303.52	40.213874	-104.672428	14,604,783.98	1,731,866.70
11,336.00	90.15	358.39	7,171.29	3,336.06	-306.66	40.214157	-104.672440	14,604,866.92	1,731,863.18
11,413.00	89.85	359.78	7,171.29	3,413.04	-307.89	40.214369	-104.672444	14,604,956.91	1,731,861.66

Design Report for Milk State 29C-21HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
11,503.00	90.12	359.11	7,171.31	3,503.04	-308.76	40.214616	-104.672447	14,605,053.90	1,731,860.46
11,593.00	90.68	0.57	7,170.68	3,593.03	-309.01	40.214863	-104.672448	14,605,143.89	1,731,859.87
11,683.00	89.07	0.22	7,170.88	3,683.03	-308.39	40.215110	-104.672446	14,605,233.89	1,731,860.16
11,774.00	88.86	0.20	7,172.52	3,774.01	-308.06	40.215360	-104.672445	14,605,324.87	1,731,860.16
11,864.00	89.66	359.79	7,173.69	3,864.01	-308.07	40.215607	-104.672445	14,605,414.86	1,731,859.81
12,044.00	88.36	356.49	7,176.80	4,043.85	-313.91	40.216101	-104.672466	14,605,594.69	1,731,853.31
12,224.00	92.56	356.44	7,175.35	4,223.47	-325.00	40.216594	-104.672505	14,605,774.26	1,731,841.55
12,314.00	92.74	356.08	7,171.19	4,313.18	-330.87	40.216840	-104.672526	14,605,863.95	1,731,835.35
12,404.00	93.15	355.92	7,166.57	4,402.84	-337.14	40.217087	-104.672549	14,605,953.59	1,731,828.75
12,494.00	93.06	355.61	7,161.69	4,492.46	-343.77	40.217333	-104.672573	14,606,043.18	1,731,821.78
12,584.00	93.08	355.37	7,156.87	4,582.06	-350.84	40.217579	-104.672598	14,606,132.75	1,731,814.38
12,708.00	93.55	355.63	7,149.70	4,705.47	-360.55	40.217918	-104.672633	14,606,256.12	1,731,804.21
12,750.00	93.55	355.63	7,147.10	4,747.26	-363.75	40.218032	-104.672644	14,606,297.91	1,731,800.86

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
91.00	91.00	0.20	0.43	First Cathedral MWD Survey
1,187.00	1,177.14	-122.93	-41.88	Tie-On to Cathedral MWD Surveys
1,284.00	1,272.05	-142.39	-46.58	First HAL MWD+IFR+SC Survey
12,708.00	7,149.70	4,705.47	-360.55	Final HAL MWD+IFR+SC Survey
12,750.00	7,147.10	4,747.26	-363.75	Str Line Proj to Bit @ 12750' MD :: 7147.10' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.73	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
91.00	1,187.00	CES Surface Surveys	APC_ISCWSA REV 2 MWD
1,284.00	7,637.00	HAL MWD+IFR+SC Vertical/Build	APC_ISCWSA REV 2 MWD+IFR1+SC

Design Report for Milk State 29C-21HZ - Actual Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
7,727.00	12,708.00	HAL MWD+IFR+SC Lateral	APC_ISCWSA REV 2 MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,219.80	1,209.25	9 5/8" Casing Set @ 1219.8' MD :: 1209.25' TVD	9-5/8	13-1/2
7,587.60	7,138.32	7" Casing Set @ 7587.6' MD :: 7138.32' TVD	7	8-3/4

Design Targets

Shape	Target Name	TVD (usft)	Northing (usft)	Easting (usft)	+N/-S usft	+E/-W usft	Created	Updated
Point	Milk State 29C-21HZ_SHL	0.00	14,601,552.02	1,732,182.19	0.00	0.00	5/20/2015	5/20/2015
Polygon	Milk State 29C-21HZ_Harc	0.00	14,601,551.69	1,732,287.18	-0.73	104.98	3/25/2015	3/25/2015
Polygon	Sec. 28 and 21-T3N-R65V	-13.00	14,601,715.74	1,731,548.32	166.06	-633.25	10/10/2014	10/10/2014
Point	Milk State 29C-21HZ_BHL	7,190.00	14,606,298.24	1,731,819.85	4,747.52	-344.77	3/24/2015	5/20/2015

Directional Difficulty Index

Average Dogleg over Survey:	1.76 °/100usft	Maximum Dogleg over Survey:	16.15 °/100usft at 7,547.00 usft
Net Tortousity applicable to Plans:	0.71 °/100usft	Directional Difficulty Index:	6.433

Audit Info

North Reference Sheet for 3N-65W-21 Milk 4-21HZ Pad - Milk State 29C-21HZ - Plan B

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

Vertical Depths are relative to RKB = 13' @ 4851.00usft (Ensign 145). Northing and Easting are relative to Milk State 29C-21HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.000000°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960963

Grid Coordinates of Well: 14,601,552.02 usft N, 1,732,182.19 usft E

Geographical Coordinates of Well: 40° 12' 17.99" N, 104° 40' 16.83" W

Grid Convergence at Surface is: 0.21°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,750.00usft

the Bottom Hole Displacement is 4,761.18usft in the Direction of 355.62° (True).

Magnetic Convergence at surface is: -8.30° (20 May 2015, , BGGM2015)

