

# SPERRY-SUN DRILLING SERVICES

## CERTIFIED SURVEY WORK SHEET

<b>OPERATOR:</b>	Anadarko Petroleum Corp.
<b>WELL:</b>	GEE 16C-25HZ
<b>FIELD:</b>	DJ Basin
<b>RIG:</b>	H&P 308
<b>LEGALS:</b>	Sec. 24-T2N-R67W
<b>COUNTY:</b>	Weld
<b>STATE:</b>	Colorado
<b>CAL. METHOD:</b>	Min Curv / True North
<b>MAG. DECL. APPLIED:</b>	8.52
<b>VERTICAL SEC. DIR. :</b>	180.00

<b>SSDS Job Number :</b>	901807183
<b>Start Date of Job :</b>	11/27/2014
<b>End Date of Job :</b>	12/6/2014
<b>Lead Directional Driller:</b>	Jesse Kysar
<b>Other SSDS DD's :</b>	Brian Saunders
<b>SSDS MWD Engineers :</b>	James Ramsey
	Willson Holland

ESS Survey  
First Survey Depth  
Last Survey Depth

KOP Depth/Sidetrack MD

First Survey Depth  
Last Survey Depth  
Bit Extrapolation to TD

Main Hole =====>		1st Side Track =====>		2nd Side Track =====>		3rd Side Track =====>		4th Side Track =====>	
	Tie On		Tie On		Tie On		Tie On		Tie On
125.00	Gyro								
978.00									
6758.00	KOP		KOP-ST1		KOP-ST2		KOP-ST3		KOP-ST4
1101.00	MWD		MWD		MWD		MWD		MWD
16706.00	MWD		MWD		MWD		MWD		MWD
16754.00	T.D.		T.D.		T.D.		T.D.		T.D.

The following Sperry Sun Drilling Services personnel listed below, do certify the above survey information to be accurate :

Print Name : Jesse Kysar

Print Name :

James Ramsey

Print Name :

Sign Name :

Sign Name :

Sign Name :

Print Name : Brian Saunders

Print Name :

Willson Holland

Print Name :

Sign Name :

Sign Name :

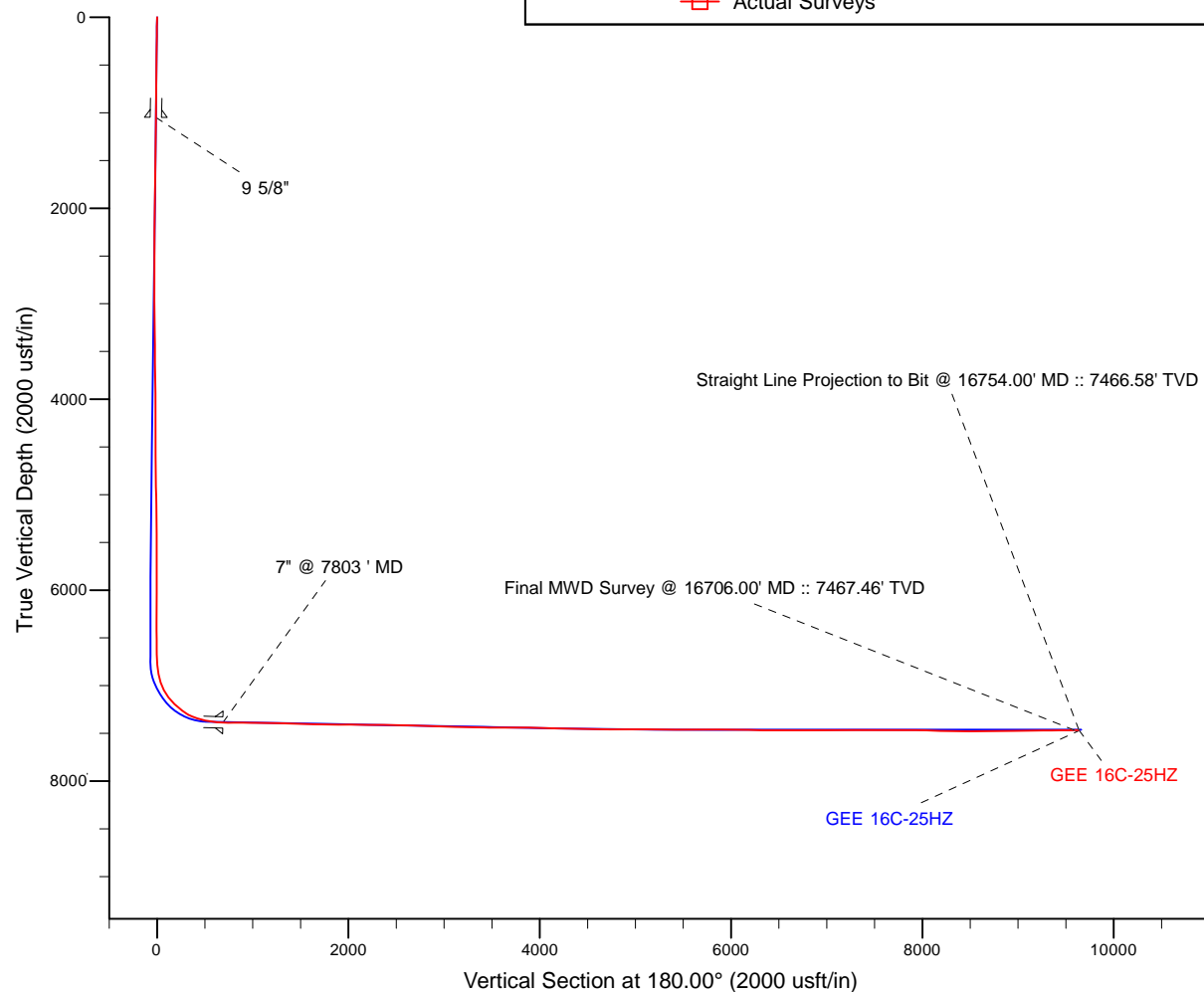
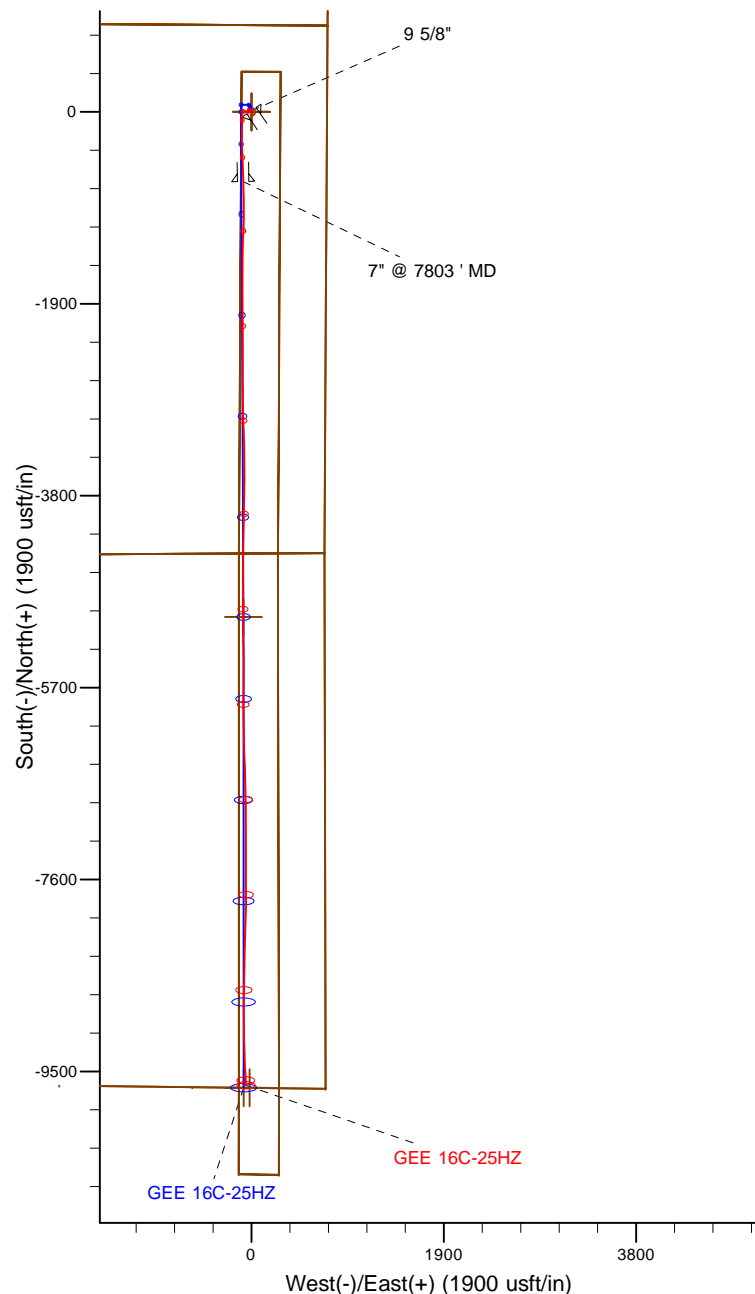
Sign Name :

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 County, CO (NAD 83)  
 Site: Sec. 24-T2N-R67W  
 Well: GEE 16C-25HZ  
 Wellbore: Plan A  
 Design: Actual Surveys



# LEGEND

- ✕ GEE 16C-25HZ, Plan A, Rev A0 V0
- Actual Surveys

7" Casing: ~1547.96' FNL, ~823.04' FEL  
 Lat/Long: 40.126461 N, -104.832890 E  
 State Planes - CO Northern: 1,289,615.34' N, 3,186,545.14' E  
 Location: Sec. 24-T2N-R67W

BHL: ~25.28' FSL, ~785.89' FWL  
 Lat/Long: 40.101900 N, -104.832794 E  
 State Planes - CO Northern: 1,280,668.81' N, 3,186,639.21' E  
 Location: Sec. 25-T2N-R67W

WELL DETAILS: GEE 16C-25HZ	
Ground Level: 4858.00 RKB = 25' @ 4883.00usft (Drilling Rig)	
Design: Actual Surveys (GEE 16C-25HZ/Plan A)	
Created By: Katie Benner	Date: 1/27/2015
Reviewed: _____	Date: _____

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 24-T2N-R67W

GEE 16C-25HZ

API: 05-123-39236 :: Job #: 901807183

Plan A

Design: Actual Surveys

## Sperry Drilling Services

### Standard Report

27 January, 2015

Surface UWI : API: 05-123-39236 :: Job #: 901807183

Well Coordinates: 1,290,305.09 N, 3,186,621.40 E (40° 07' 42.07" N, 104° 49' 57.35" W)

Ground Level: 4,858.00 usft

Local Coordinate Origin:

Centered on Well GEE 16C-25HZ

Viewing Datum:

RKB = 25' @ 4883.00usft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

**HALLIBURTON**

**Design Report for GEE 16C-25HZ - 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
100.00	0.63	8.05	100.00	0.55	0.08	-0.55	0.63
<b>First VES Gyro Survey @100.00' MD</b>							
200.00	0.72	15.86	199.99	1.69	0.33	-1.69	0.13
300.00	0.74	5.10	299.98	2.94	0.55	-2.94	0.14
400.00	0.50	9.51	399.98	4.02	0.68	-4.02	0.24
500.00	0.53	2.00	499.97	4.91	0.77	-4.91	0.07
600.00	0.61	20.45	599.97	5.87	0.98	-5.87	0.20
700.00	0.66	15.60	699.96	6.93	1.32	-6.93	0.07
800.00	0.74	13.35	799.95	8.11	1.62	-8.11	0.08
900.00	0.54	350.76	899.95	9.20	1.69	-9.20	0.32
953.00	0.77	336.22	952.94	9.77	1.51	-9.77	0.53
<b>Last VES Gyro Survey @953.00' MD</b>							
978.00	0.77	336.22	977.94	10.08	1.37	-10.08	0.00
1,049.00	0.78	326.24	1,048.94	10.91	0.91	-10.91	0.19
<b>9 5/8"</b>							
1,101.00	0.80	319.23	1,100.93	11.48	0.48	-11.48	0.19
1,196.00	1.06	322.56	1,195.92	12.68	-0.49	-12.68	0.28
1,291.00	0.95	328.83	1,290.90	14.05	-1.43	-14.05	0.16
1,386.00	1.03	327.92	1,385.89	15.45	-2.29	-15.45	0.09
1,480.00	1.59	284.99	1,479.87	16.50	-4.00	-16.50	1.16
1,575.00	1.18	318.91	1,574.84	17.58	-5.91	-17.58	0.95
1,681.00	1.43	315.93	1,680.81	19.36	-7.55	-19.36	0.24
1,773.00	1.42	312.64	1,772.78	20.95	-9.19	-20.95	0.09
1,864.00	1.32	315.00	1,863.76	22.46	-10.76	-22.46	0.13
1,957.00	1.30	310.72	1,956.73	23.90	-12.32	-23.90	0.11
2,049.00	1.43	321.96	2,048.71	25.49	-13.81	-25.49	0.32
2,142.00	1.55	316.62	2,141.68	27.32	-15.39	-27.32	0.20
2,234.00	1.59	275.29	2,233.65	28.34	-17.52	-28.34	1.21
2,326.00	1.45	270.20	2,325.61	28.46	-19.95	-28.46	0.21
2,419.00	1.35	269.67	2,418.59	28.46	-22.23	-28.46	0.11
2,511.00	1.31	267.59	2,510.56	28.41	-24.36	-28.41	0.07
2,602.00	1.16	261.30	2,601.54	28.22	-26.31	-28.22	0.22
2,695.00	1.16	248.29	2,694.52	27.73	-28.12	-27.73	0.28
2,787.00	1.11	243.96	2,786.50	27.00	-29.78	-27.00	0.11
2,880.00	0.87	231.67	2,879.49	26.16	-31.14	-26.16	0.34
2,972.00	0.58	211.79	2,971.48	25.34	-31.94	-25.34	0.41
3,065.00	0.59	140.74	3,064.48	24.57	-31.88	-24.57	0.73
3,156.00	0.48	139.05	3,155.47	23.91	-31.34	-23.91	0.12
3,248.00	0.60	141.22	3,247.47	23.25	-30.78	-23.25	0.13
3,340.00	0.44	126.84	3,339.47	22.66	-30.20	-22.66	0.22
3,432.00	0.61	156.90	3,431.46	22.00	-29.72	-22.00	0.35
3,524.00	0.32	133.10	3,523.46	21.37	-29.34	-21.37	0.37
3,616.00	0.65	148.83	3,615.46	20.75	-28.89	-20.75	0.38
3,708.00	1.05	168.07	3,707.45	19.48	-28.44	-19.48	0.53
3,799.00	0.86	174.69	3,798.43	17.98	-28.21	-17.98	0.24
3,891.00	0.50	242.46	3,890.43	17.11	-28.50	-17.11	0.89
3,983.00	0.25	102.52	3,982.43	16.88	-28.66	-16.88	0.77
4,075.00	0.46	112.42	4,074.42	16.70	-28.12	-16.70	0.24
4,167.00	0.51	115.07	4,166.42	16.38	-27.41	-16.38	0.06

**Design Report for GEE 16C-25HZ - Actual Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,259.00	0.38	86.43	4,258.42	16.23	-26.73	-16.23	0.28
4,353.00	0.60	129.48	4,352.42	15.93	-26.04	-15.93	0.44
4,448.00	0.75	142.13	4,447.41	15.13	-25.28	-15.13	0.22
4,541.00	0.42	151.00	4,540.40	14.35	-24.74	-14.35	0.37
4,635.00	0.56	167.94	4,634.40	13.60	-24.47	-13.60	0.21
4,730.00	0.41	208.03	4,729.40	12.84	-24.54	-12.84	0.38
4,825.00	0.66	172.08	4,824.39	12.00	-24.62	-12.00	0.43
4,919.00	1.03	172.06	4,918.38	10.63	-24.43	-10.63	0.39
5,014.00	1.17	173.14	5,013.37	8.82	-24.20	-8.82	0.15
5,108.00	1.02	181.43	5,107.35	7.03	-24.10	-7.03	0.23
5,203.00	0.76	197.99	5,202.34	5.59	-24.32	-5.59	0.38
5,297.00	0.80	235.88	5,296.33	4.63	-25.05	-4.63	0.54
5,391.00	1.03	245.97	5,390.32	3.91	-26.37	-3.91	0.30
5,485.00	0.91	258.76	5,484.30	3.42	-27.87	-3.42	0.26
5,580.00	1.07	257.67	5,579.29	3.09	-29.48	-3.09	0.17
5,675.00	0.96	270.32	5,674.27	2.90	-31.14	-2.90	0.26
5,769.00	0.80	271.56	5,768.26	2.92	-32.58	-2.92	0.17
5,863.00	1.79	279.55	5,862.24	3.19	-34.69	-3.19	1.07
5,957.00	2.44	269.33	5,956.17	3.41	-38.14	-3.41	0.80
6,052.00	5.22	270.57	6,050.95	3.43	-44.48	-3.43	2.93
6,146.00	4.36	270.49	6,144.62	3.50	-52.33	-3.50	0.91
6,241.00	5.21	274.74	6,239.29	3.89	-60.24	-3.89	0.97
6,335.00	4.94	273.20	6,332.92	4.46	-68.53	-4.46	0.32
6,429.00	3.93	270.00	6,426.64	4.69	-75.80	-4.69	1.11
6,523.00	2.74	251.75	6,520.48	3.99	-81.15	-3.99	1.68
6,618.00	2.66	251.68	6,615.38	2.58	-85.40	-2.58	0.08
6,712.00	2.31	244.46	6,709.29	1.08	-89.18	-1.08	0.50
6,759.00	3.34	215.53	6,756.23	-0.44	-90.83	0.44	3.68
6,806.00	6.48	190.07	6,803.06	-4.17	-92.09	4.17	7.98
6,853.00	9.25	191.63	6,849.61	-10.48	-93.32	10.48	5.91
6,901.00	12.39	185.79	6,896.76	-19.39	-94.61	19.39	6.92
6,948.00	17.23	174.17	6,942.19	-31.34	-94.42	31.34	12.03
6,997.00	20.16	170.28	6,988.60	-46.88	-92.25	46.88	6.50
7,043.00	23.23	178.04	7,031.35	-63.77	-90.60	63.77	9.12
7,090.00	29.96	184.11	7,073.36	-84.77	-91.13	84.77	15.43
7,137.00	37.44	182.69	7,112.43	-110.78	-92.64	110.78	16.00
7,185.00	41.65	181.60	7,149.44	-141.31	-93.77	141.31	8.89
7,232.00	45.70	180.99	7,183.43	-173.75	-94.50	173.75	8.66
7,279.00	48.14	180.47	7,215.52	-208.08	-94.93	208.08	5.25
7,326.00	50.46	179.50	7,246.17	-243.71	-94.92	243.71	5.18
7,373.00	53.44	179.01	7,275.14	-280.71	-94.43	280.71	6.39
7,420.00	59.22	179.05	7,301.18	-319.80	-93.77	319.80	12.30
7,468.00	66.87	178.80	7,322.92	-362.55	-92.97	362.55	15.94
7,515.00	72.32	177.73	7,339.31	-406.56	-91.63	406.56	11.79
7,562.00	74.66	177.19	7,352.66	-451.58	-89.63	451.58	5.10
7,609.00	77.17	177.44	7,364.10	-497.11	-87.49	497.11	5.37
7,656.00	79.59	177.75	7,373.56	-543.10	-85.56	543.10	5.19
7,703.00	82.80	177.93	7,380.76	-589.51	-83.81	589.51	6.84
7,757.00	86.39	178.91	7,385.84	-643.24	-82.33	643.24	6.89
7,803.00	88.56	178.90	7,387.87	-689.18	-81.45	689.18	4.71
7" @ 7803 ' MD							



**Design Report for GEE 16C-25HZ - Actual Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7,822.00	89.45	178.89	7,388.20	-708.18	-81.09	708.18	4.71
7,916.00	90.15	177.95	7,388.53	-802.14	-78.49	802.14	1.25
8,011.00	89.41	178.87	7,388.90	-897.10	-75.86	897.10	1.24
8,105.00	88.52	180.46	7,390.59	-991.08	-75.31	991.08	1.94
8,199.00	90.65	181.49	7,391.27	-1,085.06	-76.91	1,085.06	2.52
8,293.00	89.57	182.63	7,391.09	-1,178.99	-80.29	1,178.99	1.67
8,387.00	86.85	181.38	7,394.03	-1,272.88	-83.57	1,272.88	3.18
8,481.00	87.57	181.34	7,398.61	-1,366.74	-85.80	1,366.74	0.77
8,575.00	88.06	181.33	7,402.19	-1,460.65	-87.99	1,460.65	0.52
8,669.00	88.86	180.91	7,404.72	-1,554.59	-89.83	1,554.59	0.96
8,764.00	89.32	180.34	7,406.22	-1,649.58	-90.86	1,649.58	0.77
8,858.00	89.85	179.44	7,406.91	-1,743.57	-90.68	1,743.57	1.11
8,952.00	90.55	179.03	7,406.58	-1,837.56	-89.43	1,837.56	0.86
9,046.00	88.92	179.21	7,407.01	-1,931.55	-87.98	1,931.55	1.74
9,140.00	88.80	179.88	7,408.88	-2,025.52	-87.24	2,025.52	0.72
9,235.00	88.95	180.38	7,410.75	-2,120.51	-87.45	2,120.51	0.55
9,329.00	89.23	180.08	7,412.24	-2,214.49	-87.83	2,214.49	0.44
9,423.00	89.54	179.78	7,413.25	-2,308.49	-87.72	2,308.49	0.46
9,517.00	90.22	180.76	7,413.45	-2,402.48	-88.16	2,402.48	1.27
9,611.00	88.43	179.11	7,414.55	-2,496.47	-88.05	2,496.47	2.59
9,706.00	88.58	179.57	7,417.03	-2,591.43	-86.96	2,591.43	0.51
9,800.00	88.03	180.03	7,419.81	-2,685.39	-86.63	2,685.39	0.76
9,894.00	88.43	179.56	7,422.72	-2,779.34	-86.29	2,779.34	0.66
9,988.00	88.77	179.00	7,425.01	-2,873.31	-85.11	2,873.31	0.70
10,080.00	87.94	178.79	7,427.65	-2,965.25	-83.34	2,965.25	0.93
10,172.00	88.03	178.30	7,430.89	-3,057.16	-81.01	3,057.16	0.54
10,264.00	88.43	177.91	7,433.73	-3,149.07	-77.97	3,149.07	0.61
10,355.00	88.71	177.08	7,436.00	-3,239.95	-73.99	3,239.95	0.96
10,447.00	88.89	178.64	7,437.93	-3,331.87	-70.55	3,331.87	1.71
10,539.00	88.74	180.64	7,439.83	-3,423.84	-69.98	3,423.84	2.18
10,631.00	89.85	180.48	7,440.96	-3,515.83	-70.88	3,515.83	1.22
10,723.00	90.59	180.20	7,440.61	-3,607.82	-71.42	3,607.82	0.86
10,814.00	90.03	180.02	7,440.12	-3,698.82	-71.60	3,698.82	0.65
10,907.00	89.88	180.51	7,440.19	-3,791.82	-72.03	3,791.82	0.55
11,001.00	89.88	180.64	7,440.39	-3,885.82	-72.97	3,885.82	0.14
11,095.00	88.67	180.52	7,441.58	-3,979.80	-73.92	3,979.80	1.29
11,190.00	87.63	181.85	7,444.64	-4,074.73	-75.88	4,074.73	1.78
11,284.00	88.18	181.61	7,448.08	-4,168.62	-78.72	4,168.62	0.64
11,378.00	88.12	181.69	7,451.11	-4,262.53	-81.43	4,262.53	0.11
11,473.00	88.30	180.76	7,454.08	-4,357.47	-83.46	4,357.47	1.00
11,567.00	89.14	180.03	7,456.18	-4,451.44	-84.10	4,451.44	1.18
11,661.00	89.97	179.75	7,456.91	-4,545.43	-83.92	4,545.43	0.93
11,756.00	90.65	179.25	7,456.40	-4,640.43	-83.09	4,640.43	0.89
11,850.00	89.23	179.48	7,456.50	-4,734.42	-82.05	4,734.42	1.53
11,944.00	89.17	181.38	7,457.81	-4,828.40	-82.76	4,828.40	2.02
12,039.00	89.63	180.65	7,458.80	-4,923.38	-84.44	4,923.38	0.91
12,115.62	90.00	179.64	7,459.05	-5,000.00	-84.63	5,000.00	1.41
<b>GEE 16C-25HZ_TARGET</b>							
12,133.00	90.09	179.41	7,459.03	-5,017.38	-84.49	5,017.38	1.41
12,228.00	89.01	179.28	7,459.78	-5,112.37	-83.40	5,112.37	1.15
12,322.00	89.78	179.08	7,460.77	-5,206.35	-82.06	5,206.35	0.85

**Design Report for GEE 16C-25HZ - Actual Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,415.00	90.31	178.06	7,460.70	-5,299.32	-79.74	5,299.32	1.24
12,510.00	89.51	178.72	7,460.85	-5,394.29	-77.07	5,394.29	1.09
12,604.00	88.74	180.46	7,462.28	-5,488.27	-76.40	5,488.27	2.02
12,698.00	89.82	180.84	7,463.46	-5,582.25	-77.46	5,582.25	1.22
12,793.00	91.08	181.33	7,462.72	-5,677.23	-79.26	5,677.23	1.42
12,887.00	89.75	180.38	7,462.04	-5,771.21	-80.66	5,771.21	1.74
12,982.00	90.55	180.24	7,461.79	-5,866.21	-81.18	5,866.21	0.85
13,076.00	90.19	178.91	7,461.18	-5,960.20	-80.48	5,960.20	1.47
13,170.00	88.80	177.77	7,462.01	-6,054.16	-77.76	6,054.16	1.91
13,264.00	87.87	179.17	7,464.74	-6,148.08	-75.25	6,148.08	1.79
13,359.00	88.49	178.93	7,467.76	-6,243.02	-73.67	6,243.02	0.70
13,453.00	89.45	178.56	7,469.45	-6,336.98	-71.62	6,336.98	1.09
13,548.00	90.03	178.09	7,469.88	-6,431.94	-68.84	6,431.94	0.79
13,642.00	90.96	177.23	7,469.07	-6,525.85	-65.00	6,525.85	1.35
13,737.00	89.97	178.27	7,468.30	-6,620.78	-61.27	6,620.78	1.51
13,831.00	88.98	178.38	7,469.16	-6,714.73	-58.52	6,714.73	1.06
13,925.00	90.00	179.90	7,469.99	-6,808.71	-57.11	6,808.71	1.95
14,019.00	91.02	180.19	7,469.16	-6,902.71	-57.19	6,902.71	1.13
14,114.00	91.05	180.36	7,467.44	-6,997.69	-57.64	6,997.69	0.18
14,208.00	90.62	179.30	7,466.07	-7,091.68	-57.36	7,091.68	1.22
14,302.00	89.48	177.91	7,465.99	-7,185.65	-55.08	7,185.65	1.91
14,396.00	89.69	179.44	7,466.67	-7,279.62	-52.90	7,279.62	1.64
14,491.00	89.85	180.77	7,467.05	-7,374.61	-53.08	7,374.61	1.41
14,585.00	90.15	180.94	7,467.05	-7,468.60	-54.48	7,468.60	0.37
14,679.00	90.15	180.45	7,466.81	-7,562.60	-55.62	7,562.60	0.52
14,773.00	90.00	179.75	7,466.68	-7,656.59	-55.78	7,656.59	0.76
14,867.00	89.88	178.52	7,466.78	-7,750.58	-54.36	7,750.58	1.31
14,961.00	90.22	181.03	7,466.70	-7,844.57	-54.00	7,844.57	2.69
15,056.00	88.83	181.79	7,467.49	-7,939.54	-56.33	7,939.54	1.67
15,150.00	89.66	181.42	7,468.73	-8,033.49	-58.97	8,033.49	0.97
15,245.00	87.35	182.00	7,471.20	-8,128.41	-61.80	8,128.41	2.51
15,339.00	88.06	181.51	7,474.97	-8,222.29	-64.68	8,222.29	0.92
15,433.00	88.52	181.42	7,477.77	-8,316.22	-67.08	8,316.22	0.50
15,528.00	89.08	181.53	7,479.76	-8,411.17	-69.52	8,411.17	0.60
15,622.00	89.75	181.45	7,480.72	-8,505.13	-71.97	8,505.13	0.72
15,717.00	90.43	181.03	7,480.57	-8,600.10	-74.02	8,600.10	0.84
15,811.00	91.26	180.60	7,479.19	-8,694.08	-75.36	8,694.08	0.99
15,906.00	91.70	179.64	7,476.73	-8,789.05	-75.56	8,789.05	1.11
16,000.00	90.77	180.38	7,474.71	-8,883.03	-75.57	8,883.03	1.26
16,095.00	90.31	180.01	7,473.81	-8,978.02	-75.90	8,978.02	0.62
16,189.00	90.25	179.63	7,473.35	-9,072.02	-75.60	9,072.02	0.41
16,284.00	90.59	178.91	7,472.66	-9,167.01	-74.39	9,167.01	0.84
16,378.00	90.74	178.21	7,471.57	-9,260.97	-72.03	9,260.97	0.76
16,473.00	90.74	176.99	7,470.34	-9,355.88	-68.05	9,355.88	1.28
16,567.00	90.65	177.64	7,469.20	-9,449.77	-63.65	9,449.77	0.70
16,661.00	90.65	177.23	7,468.13	-9,543.67	-59.44	9,543.67	0.44
16,706.00	91.05	177.04	7,467.46	-9,588.61	-57.19	9,588.61	0.98
<b>Final MWD Survey @ 16706.00' MD :: 7467.46' TVD</b>							
16,754.00	91.05	177.04	7,466.58	-9,636.54	-54.72	9,636.54	0.00
<b>Straight Line Projection to Bit @ 16754.00' MD :: 7466.58' TVD - GEE 16C-25HZ_PBHL - GEE 16C-25HZ_BHL</b>							

## Design Report for GEE 16C-25HZ - Actual Surveys

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.55	0.08	First VES Gyro Survey @100.00' MD
953.00	952.94	9.77	1.51	Last VES Gyro Survey @953.00' MD
16,706.00	7,467.46	-9,588.61	-57.19	Final MWD Survey @ 16706.00' MD :: 7467.46' TVD
16,754.00	7,466.58	-9,636.54	-54.72	Straight Line Projection to Bit @ 16754.00' MD :: 7466.58' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
100.00	953.00	VES Surface Gyros	NS-GYRO-MS
978.00	7,137.00	Vertical/Build Surveys	MWD+IFR1+SC
7,185.00	16,754.00	MWD Horizontal Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,049.00	1,048.94	9 5/8"	9-5/8	13-1/2
7,803.00	7,387.87	7" @ 7803 ' MD	7	8-3/4



**Design Report for GEE 16C-25HZ - 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
GEE 16C-25HZ_LD	0.00	0.00	0.00	0.02	0.00	1,290,305.10	3,186,621.40	40.128353	-104.832598
- actual wellpath misses target center by 0.02usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	-4,370.90	-124.84	1,285,933.57	3,186,529.47	
Point 2				0.00	-3,063.39	-117.84	1,287,241.04	3,186,526.62	
Point 3				0.00	-1,757.92	-110.74	1,288,546.47	3,186,523.90	
Point 4				0.00	-452.83	-103.49	1,289,851.52	3,186,521.33	
Point 5				0.00	398.92	-98.75	1,290,703.25	3,186,519.66	
Point 6				0.00	396.80	287.64	1,290,704.04	3,186,906.04	
Point 7				0.00	-455.04	282.96	1,289,852.22	3,186,907.77	
Point 8				0.00	-1,756.00	275.54	1,288,551.30	3,186,910.14	
Point 9				0.00	-3,059.21	270.27	1,287,248.14	3,186,914.68	
Point 10				0.00	-4,369.17	260.44	1,285,938.19	3,186,914.71	
Point 11				0.00	-5,686.10	263.13	1,284,621.38	3,186,927.31	
Point 12				0.00	-7,016.03	265.84	1,283,291.56	3,186,940.03	
Point 13				0.00	-8,335.00	268.54	1,281,972.70	3,186,952.65	
Point 14				0.00	-9,665.50	271.25	1,280,642.31	3,186,965.38	
Point 15				0.00	-9,665.50	271.25	1,280,642.31	3,186,965.38	
Point 16				0.00	-10,523.69	269.62	1,279,784.17	3,186,970.20	
Point 17				0.00	-10,518.78	-127.21	1,279,786.09	3,186,573.36	
Point 18				0.00	-9,660.90	-125.36	1,280,643.93	3,186,568.76	
Point 19				0.00	-8,335.80	-125.31	1,281,968.94	3,186,558.84	
Point 20				0.00	-7,013.53	-125.25	1,283,291.12	3,186,548.94	
Point 21				0.00	-5,687.89	-125.07	1,284,616.66	3,186,539.15	
GEE 16C-25HZ_SEC	0.00	0.00	0.00	0.02	0.00	1,290,305.10	3,186,621.40	40.128353	-104.832598
- actual wellpath misses target center by 0.02usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	6,155.91	-4,453.09	1,296,427.07	3,182,122.29	
Point 2				0.00	8,793.64	-4,444.05	1,299,064.69	3,182,111.48	
Point 3				0.00	11,429.84	-4,431.39	1,301,700.80	3,182,104.30	
Point 4				0.00	11,361.26	-1,809.76	1,301,651.96	3,184,726.26	
Point 5				0.00	11,327.04	-499.01	1,301,627.60	3,186,037.18	
Point 6				0.00	11,292.62	811.80	1,301,603.05	3,187,348.16	
Point 7				0.00	8,683.52	795.17	1,298,994.01	3,187,351.16	
Point 8				0.00	6,075.00	778.90	1,296,385.54	3,187,354.53	
Point 9				0.00	6,114.70	-1,838.45	1,296,405.54	3,184,737.06	
Point 10				0.00	6,155.91	-4,453.09	1,296,427.07	3,182,122.29	
Point 11				0.00	6,114.70	-1,838.45	1,296,405.54	3,184,737.06	
Point 12				0.00	6,075.00	778.90	1,296,385.54	3,187,354.53	
Point 13				0.00	6,075.00	778.97	1,296,385.54	3,187,354.60	
Point 14				0.00	3,464.32	765.11	1,293,774.94	3,187,360.39	
Point 15				0.00	2,159.04	757.78	1,292,469.70	3,187,362.88	
Point 16				0.00	854.28	750.47	1,291,164.97	3,187,365.39	
Point 17				0.00	868.63	-1,862.85	1,291,159.65	3,184,752.14	
Point 18				0.00	884.05	-4,475.65	1,291,155.41	3,182,139.41	
Point 19				0.00	868.63	-1,862.85	1,291,159.65	3,184,752.14	
Point 20				0.00	854.28	750.47	1,291,164.97	3,187,365.39	
Point 21				0.00	-1,103.70	739.26	1,289,207.04	3,187,368.92	
Point 22				0.00	-1,756.37	735.49	1,288,554.39	3,187,370.06	
Point 23				0.00	-4,367.14	720.39	1,285,943.69	3,187,374.61	
Point 24				0.00	-4,378.81	-1,890.22	1,285,912.37	3,184,764.27	
Point 25				0.00	-4,377.90	-4,499.72	1,285,893.64	3,182,154.94	
Point 26				0.00	-4,378.81	-1,890.22	1,285,912.37	3,184,764.27	
Point 27				0.00	-4,367.14	720.39	1,285,943.69	3,187,374.61	
Point 28				0.00	-9,670.85	731.28	1,280,640.43	3,187,425.41	
Point 29				0.00	-9,655.66	-585.39	1,280,645.70	3,186,108.72	
Point 30				0.00	-9,640.62	-1,902.29	1,280,650.83	3,184,791.80	
Point 31				0.00	-9,625.01	-3,224.96	1,280,656.49	3,183,469.10	
Point 32				0.00	-9,609.12	-4,547.62	1,280,662.42	3,182,146.41	
Point 33				0.00	-8,289.90	-4,534.30	1,281,981.65	3,182,149.81	
Point 34				0.00	-6,970.84	-4,520.85	1,283,300.72	3,182,153.33	
Point 35				0.00	-4,377.90	-4,499.72	1,285,893.64	3,182,154.94	
Point 36				0.00	-4,377.90	-4,499.72	1,285,893.64	3,182,154.94	

## Design Report for GEE 16C-25HZ - Actual Surveys

Point 37	0.00	-3,063.93	-4,493.50	1,287,207.57	3,182,151.27		
Point 38	0.00	-1,750.45	-4,487.32	1,288,521.00	3,182,147.57		
Point 39	0.00	884.02	-4,471.77	1,291,155.41	3,182,143.29		
Point 40	0.00	884.05	-4,475.65	1,291,155.41	3,182,139.41		
Point 41	0.00	3,520.60	-4,464.29	1,293,791.86	3,182,130.92		
Point 42	0.00	4,179.34	-4,461.62	1,294,450.57	3,182,128.64		
Point 43	0.00	4,838.19	-4,458.74	1,295,109.40	3,182,126.56		
Point 44	0.00	6,155.91	-4,453.09	1,296,427.07	3,182,122.29		
GEE 16C-25HZ_SHL	0.00	0.00	0.00	0.02	0.00	1,290,305.10	3,186,621.40
- actual wellpath misses target center by 0.02usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)							
- Point							
GEE 16C-25HZ_BHL	0.00	0.00	7,463.00	-9,661.05	-18.74	1,280,644.56	3,186,675.37
- actual wellpath misses target center by 43.68usft at 16754.00usft MD (7466.58 TVD, -9636.54 N, -54.72 E)							
- Point							
GEE 16C-25HZ_PBHL	0.00	0.00	7,463.00	-9,661.05	-78.74	1,280,644.12	3,186,615.38
- actual wellpath misses target center by 34.51usft at 16754.00usft MD (7466.58 TVD, -9636.54 N, -54.72 E)							
- Point							
GEE 16C-25HZ_TARC	0.00	0.00	7,463.00	-5,000.00	-79.00	1,285,304.84	3,186,580.04
- actual wellpath misses target center by 6.88usft at 12115.66usft MD (7459.05 TVD, -5000.04 N, -84.63 E)							
- Point							

Directional Difficulty Index

Average Dogleg over Survey:	1.32 °/100usft	Maximum Dogleg over Survey:	16.00 °/100usft at 7,137.00 usft
Net Tortousity applicable to Plans:	0.68 °/100usft	Directional Difficulty Index:	6.685

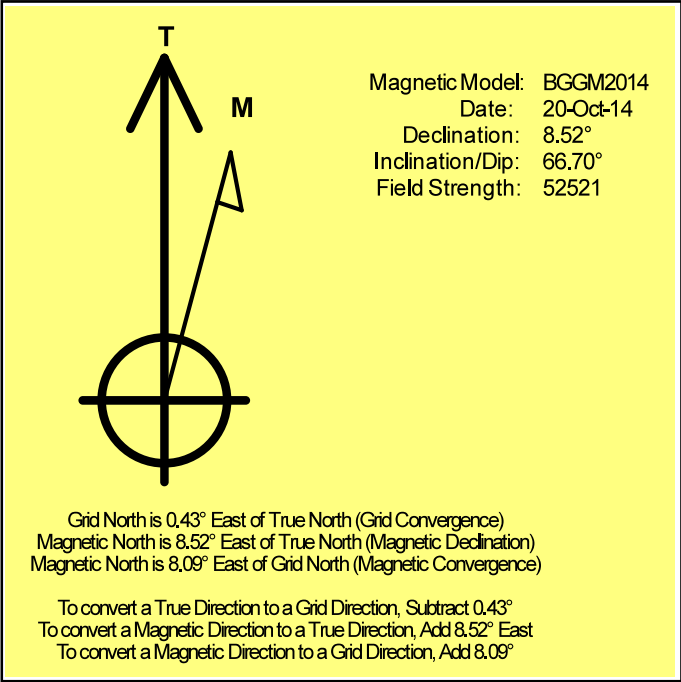
Audit Info

**North Reference Sheet for Sec. 24-T2N-R67W - GEE 16C-25HZ - Plan A**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.  
 Vertical Depths are relative to RKB = 25' @ 4883.00usft (Drilling Rig). Northing and Easting are relative to GEE 16C-25HZ  
 Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980  
 Projection method is Lambert Conformal Conic (2 parallel)  
 Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°  
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995912

Grid Coordinates of Well: 1,290,305.09 usft N, 3,186,621.40 usft E  
 Geographical Coordinates of Well: 40° 07' 42.07" N, 104° 49' 57.35" W  
 Grid Convergence at Surface is: 0.43°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,754.00usft  
 the Bottom Hole Displacement is 9,636.69usft in the Direction of 180.33° ( True).  
 Magnetic Convergence at surface is: -8.09° (20 October 2014, , BGGM2014)



# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 24-T2N-R67W

GEE 16C-25HZ

API: 05-123-39236 :: Job #: 901807183

Plan A

Design: Actual Surveys

## Sperry Drilling Services

### Geodetic Report

27 January, 2015

Well Coordinates: 1,290,305.09 N, 3,186,621.40 E (40° 07' 42.07" N, 104° 49' 57.35" W)

Ground Level: 4,858.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well GEE 16C-25HZ

RKB = 25' @ 4883.00usft (Drilling Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

**HALLIBURTON**

## Design Report for GEE 16C-25HZ - Actual Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	+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	40.128353	-104.832598	1,290,305.09	3,186,621.40
100.00	0.63	8.05	100.00	0.55	0.08	40.128355	-104.832598	1,290,305.63	3,186,621.47
200.00	0.72	15.86	199.99	1.69	0.33	40.128358	-104.832597	1,290,306.78	3,186,621.71
300.00	0.74	5.10	299.98	2.94	0.55	40.128361	-104.832596	1,290,308.03	3,186,621.93
400.00	0.50	9.51	399.98	4.02	0.68	40.128364	-104.832596	1,290,309.11	3,186,622.06
500.00	0.53	2.00	499.97	4.91	0.77	40.128367	-104.832596	1,290,310.00	3,186,622.14
600.00	0.61	20.45	599.97	5.87	0.98	40.128369	-104.832595	1,290,310.96	3,186,622.33
700.00	0.66	15.60	699.96	6.93	1.32	40.128372	-104.832594	1,290,312.02	3,186,622.67
800.00	0.74	13.35	799.95	8.11	1.62	40.128375	-104.832592	1,290,313.21	3,186,622.96
900.00	0.54	350.76	899.95	9.20	1.69	40.128378	-104.832592	1,290,314.30	3,186,623.03
953.00	0.77	336.22	952.94	9.77	1.51	40.128380	-104.832593	1,290,314.87	3,186,622.84
978.00	0.77	336.22	977.94	10.08	1.37	40.128381	-104.832593	1,290,315.17	3,186,622.70
1,049.00	0.78	326.24	1,048.94	10.91	0.91	40.128383	-104.832595	1,290,316.01	3,186,622.23
1,101.00	0.80	319.23	1,100.93	11.48	0.48	40.128385	-104.832597	1,290,316.57	3,186,621.80
1,196.00	1.06	322.56	1,195.92	12.68	-0.49	40.128388	-104.832600	1,290,317.76	3,186,620.82
1,291.00	0.95	328.83	1,290.90	14.05	-1.43	40.128392	-104.832603	1,290,319.13	3,186,619.87
1,386.00	1.03	327.92	1,385.89	15.45	-2.29	40.128395	-104.832606	1,290,320.52	3,186,619.00
1,480.00	1.59	284.99	1,479.87	16.50	-4.00	40.128398	-104.832613	1,290,321.56	3,186,617.28
1,575.00	1.18	318.91	1,574.84	17.58	-5.91	40.128401	-104.832619	1,290,322.62	3,186,615.36
1,681.00	1.43	315.93	1,680.81	19.36	-7.55	40.128406	-104.832625	1,290,324.38	3,186,613.71
1,773.00	1.42	312.64	1,772.78	20.95	-9.19	40.128411	-104.832631	1,290,325.97	3,186,612.06
1,864.00	1.32	315.00	1,863.76	22.46	-10.76	40.128415	-104.832637	1,290,327.46	3,186,610.47
1,957.00	1.30	310.72	1,956.73	23.90	-12.32	40.128419	-104.832642	1,290,328.89	3,186,608.91
2,049.00	1.43	321.96	2,048.71	25.49	-13.81	40.128423	-104.832648	1,290,330.47	3,186,607.40
2,142.00	1.55	316.62	2,141.68	27.32	-15.39	40.128428	-104.832653	1,290,332.28	3,186,605.80
2,234.00	1.59	275.29	2,233.65	28.34	-17.52	40.128431	-104.832661	1,290,333.29	3,186,603.67
2,326.00	1.45	270.20	2,325.61	28.46	-19.95	40.128431	-104.832670	1,290,333.39	3,186,601.24
2,419.00	1.35	269.67	2,418.59	28.46	-22.23	40.128431	-104.832678	1,290,333.37	3,186,598.96
2,511.00	1.31	267.59	2,510.56	28.41	-24.36	40.128431	-104.832685	1,290,333.31	3,186,596.83
2,602.00	1.16	261.30	2,601.54	28.22	-26.31	40.128431	-104.832692	1,290,333.11	3,186,594.88
2,695.00	1.16	248.29	2,694.52	27.73	-28.12	40.128429	-104.832699	1,290,332.61	3,186,593.08
2,787.00	1.11	243.96	2,786.50	27.00	-29.78	40.128427	-104.832705	1,290,331.86	3,186,591.42
2,880.00	0.87	231.67	2,879.49	26.16	-31.14	40.128425	-104.832710	1,290,331.01	3,186,590.06
2,972.00	0.58	211.79	2,971.48	25.34	-31.94	40.128423	-104.832712	1,290,330.18	3,186,589.28
3,065.00	0.59	140.74	3,064.48	24.57	-31.88	40.128420	-104.832712	1,290,329.41	3,186,589.34
3,156.00	0.48	139.05	3,155.47	23.91	-31.34	40.128419	-104.832710	1,290,328.76	3,186,589.89
3,248.00	0.60	141.22	3,247.47	23.25	-30.78	40.128417	-104.832708	1,290,328.10	3,186,590.45
3,340.00	0.44	126.84	3,339.47	22.66	-30.20	40.128415	-104.832706	1,290,327.52	3,186,591.04
3,432.00	0.61	156.90	3,431.46	22.00	-29.72	40.128413	-104.832705	1,290,326.86	3,186,591.52
3,524.00	0.32	133.10	3,523.46	21.37	-29.34	40.128412	-104.832703	1,290,326.24	3,186,591.90
3,616.00	0.65	148.83	3,615.46	20.75	-28.89	40.128410	-104.832702	1,290,325.62	3,186,592.36
3,708.00	1.05	168.07	3,707.45	19.48	-28.44	40.128407	-104.832700	1,290,324.35	3,186,592.82

## Design Report for GEE 16C-25HZ - 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)
3,799.00	0.86	174.69	3,798.43	17.98	-28.21	40.128402	-104.832699	1,290,322.86	3,186,593.06
3,891.00	0.50	242.46	3,890.43	17.11	-28.50	40.128400	-104.832700	1,290,321.98	3,186,592.78
3,983.00	0.25	102.52	3,982.43	16.88	-28.66	40.128399	-104.832701	1,290,321.75	3,186,592.62
4,075.00	0.46	112.42	4,074.42	16.70	-28.12	40.128399	-104.832699	1,290,321.57	3,186,593.16
4,167.00	0.51	115.07	4,166.42	16.38	-27.41	40.128398	-104.832696	1,290,321.26	3,186,593.87
4,259.00	0.38	86.43	4,258.42	16.23	-26.73	40.128398	-104.832694	1,290,321.11	3,186,594.55
4,353.00	0.60	129.48	4,352.42	15.93	-26.04	40.128397	-104.832691	1,290,320.82	3,186,595.24
4,448.00	0.75	142.13	4,447.41	15.13	-25.28	40.128395	-104.832689	1,290,320.02	3,186,596.01
4,541.00	0.42	151.00	4,540.40	14.35	-24.74	40.128392	-104.832687	1,290,319.25	3,186,596.56
4,635.00	0.56	167.94	4,634.40	13.60	-24.47	40.128390	-104.832686	1,290,318.50	3,186,596.83
4,730.00	0.41	208.03	4,729.40	12.84	-24.54	40.128388	-104.832686	1,290,317.74	3,186,596.77
4,825.00	0.66	172.08	4,824.39	12.00	-24.62	40.128386	-104.832686	1,290,316.90	3,186,596.69
4,919.00	1.03	172.06	4,918.38	10.63	-24.43	40.128382	-104.832686	1,290,315.53	3,186,596.89
5,014.00	1.17	173.14	5,013.37	8.82	-24.20	40.128377	-104.832685	1,290,313.72	3,186,597.14
5,108.00	1.02	181.43	5,107.35	7.03	-24.10	40.128372	-104.832684	1,290,311.93	3,186,597.25
5,203.00	0.76	197.99	5,202.34	5.59	-24.32	40.128368	-104.832685	1,290,310.49	3,186,597.04
5,297.00	0.80	235.88	5,296.33	4.63	-25.05	40.128366	-104.832688	1,290,309.52	3,186,596.31
5,391.00	1.03	245.97	5,390.32	3.91	-26.37	40.128364	-104.832693	1,290,308.80	3,186,595.01
5,485.00	0.91	258.76	5,484.30	3.42	-27.87	40.128362	-104.832698	1,290,308.30	3,186,593.51
5,580.00	1.07	257.67	5,579.29	3.09	-29.48	40.128362	-104.832704	1,290,307.95	3,186,591.90
5,675.00	0.96	270.32	5,674.27	2.90	-31.14	40.128361	-104.832710	1,290,307.75	3,186,590.24
5,769.00	0.80	271.56	5,768.26	2.92	-32.58	40.128361	-104.832715	1,290,307.76	3,186,588.80
5,863.00	1.79	279.55	5,862.24	3.19	-34.69	40.128362	-104.832722	1,290,308.01	3,186,586.69
5,957.00	2.44	269.33	5,956.17	3.41	-38.14	40.128362	-104.832735	1,290,308.20	3,186,583.24
6,052.00	5.22	270.57	6,050.95	3.43	-44.48	40.128362	-104.832757	1,290,308.18	3,186,576.90
6,146.00	4.36	270.49	6,144.62	3.50	-52.33	40.128363	-104.832785	1,290,308.19	3,186,569.05
6,241.00	5.21	274.74	6,239.29	3.89	-60.24	40.128364	-104.832814	1,290,308.52	3,186,561.14
6,335.00	4.94	273.20	6,332.92	4.46	-68.53	40.128365	-104.832843	1,290,309.03	3,186,552.84
6,429.00	3.93	270.00	6,426.64	4.69	-75.80	40.128366	-104.832869	1,290,309.21	3,186,545.57
6,523.00	2.74	251.75	6,520.48	3.99	-81.15	40.128364	-104.832888	1,290,308.46	3,186,540.22
6,618.00	2.66	251.68	6,615.38	2.58	-85.40	40.128360	-104.832904	1,290,307.03	3,186,535.99
6,712.00	2.31	244.46	6,709.29	1.08	-89.18	40.128356	-104.832917	1,290,305.50	3,186,532.22
6,759.00	3.34	215.53	6,756.23	-0.44	-90.83	40.128352	-104.832923	1,290,303.96	3,186,530.58
6,806.00	6.48	190.07	6,803.06	-4.17	-92.09	40.128342	-104.832928	1,290,300.22	3,186,529.35
6,853.00	9.25	191.63	6,849.61	-10.48	-93.32	40.128324	-104.832932	1,290,293.90	3,186,528.17
6,901.00	12.39	185.79	6,896.76	-19.39	-94.61	40.128300	-104.832937	1,290,284.99	3,186,526.94
6,948.00	17.23	174.17	6,942.19	-31.34	-94.42	40.128267	-104.832936	1,290,273.04	3,186,527.23
6,997.00	20.16	170.28	6,988.60	-46.88	-92.25	40.128224	-104.832928	1,290,257.51	3,186,529.51
7,043.00	23.23	178.04	7,031.35	-63.77	-90.60	40.128178	-104.832922	1,290,240.64	3,186,531.28
7,090.00	29.96	184.11	7,073.36	-84.77	-91.13	40.128120	-104.832924	1,290,219.64	3,186,530.92
7,137.00	37.44	182.69	7,112.43	-110.78	-92.64	40.128049	-104.832930	1,290,193.62	3,186,529.60
7,185.00	41.65	181.60	7,149.44	-141.31	-93.77	40.127965	-104.832934	1,290,163.08	3,186,528.70



## Design Report for GEE 16C-25HZ - 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)
7,232.00	45.70	180.99	7,183.43	-173.75	-94.50	40.127876	-104.832936	1,290,130.63	3,186,528.22
7,279.00	48.14	180.47	7,215.52	-208.08	-94.93	40.127782	-104.832938	1,290,096.31	3,186,528.04
7,326.00	50.46	179.50	7,246.17	-243.71	-94.92	40.127684	-104.832938	1,290,060.68	3,186,528.32
7,373.00	53.44	179.01	7,275.14	-280.71	-94.43	40.127582	-104.832936	1,290,023.68	3,186,529.09
7,420.00	59.22	179.05	7,301.18	-319.80	-93.77	40.127475	-104.832934	1,289,984.60	3,186,530.04
7,468.00	66.87	178.80	7,322.92	-362.55	-92.97	40.127358	-104.832931	1,289,941.86	3,186,531.17
7,515.00	72.32	177.73	7,339.31	-406.56	-91.63	40.127237	-104.832926	1,289,897.86	3,186,532.84
7,562.00	74.66	177.19	7,352.66	-451.58	-89.63	40.127113	-104.832919	1,289,852.87	3,186,535.18
7,609.00	77.17	177.44	7,364.10	-497.11	-87.49	40.126988	-104.832911	1,289,807.35	3,186,537.65
7,656.00	79.59	177.75	7,373.56	-543.10	-85.56	40.126862	-104.832904	1,289,761.38	3,186,539.93
7,703.00	82.80	177.93	7,380.76	-589.51	-83.81	40.126735	-104.832898	1,289,714.99	3,186,542.03
7,757.00	86.39	178.91	7,385.84	-643.24	-82.33	40.126587	-104.832893	1,289,661.27	3,186,543.92
7,803.00	88.56	178.90	7,387.87	-689.18	-81.45	40.126461	-104.832890	1,289,615.34	3,186,545.14
7,822.00	89.45	178.89	7,388.20	-708.18	-81.09	40.126409	-104.832888	1,289,596.35	3,186,545.65
7,916.00	90.15	177.95	7,388.53	-802.14	-78.49	40.126151	-104.832879	1,289,502.41	3,186,548.95
8,011.00	89.41	178.87	7,388.90	-897.10	-75.86	40.125890	-104.832870	1,289,407.48	3,186,552.30
8,105.00	88.52	180.46	7,390.59	-991.08	-75.31	40.125632	-104.832868	1,289,313.51	3,186,553.56
8,199.00	90.65	181.49	7,391.27	-1,085.06	-76.91	40.125375	-104.832873	1,289,219.52	3,186,552.66
8,293.00	89.57	182.63	7,391.09	-1,178.99	-80.29	40.125117	-104.832885	1,289,125.57	3,186,549.99
8,387.00	86.85	181.38	7,394.03	-1,272.88	-83.57	40.124859	-104.832897	1,289,031.67	3,186,547.41
8,481.00	87.57	181.34	7,398.61	-1,366.74	-85.80	40.124601	-104.832905	1,288,937.79	3,186,545.89
8,575.00	88.06	181.33	7,402.19	-1,460.65	-87.99	40.124344	-104.832913	1,288,843.88	3,186,544.41
8,669.00	88.86	180.91	7,404.72	-1,554.59	-89.83	40.124086	-104.832919	1,288,749.92	3,186,543.28
8,764.00	89.32	180.34	7,406.22	-1,649.58	-90.86	40.123825	-104.832923	1,288,654.94	3,186,542.96
8,858.00	89.85	179.44	7,406.91	-1,743.57	-90.68	40.123567	-104.832923	1,288,560.95	3,186,543.85
8,952.00	90.55	179.03	7,406.58	-1,837.56	-89.43	40.123309	-104.832918	1,288,466.98	3,186,545.81
9,046.00	88.92	179.21	7,407.01	-1,931.55	-87.98	40.123051	-104.832913	1,288,373.01	3,186,547.96
9,140.00	88.80	179.88	7,408.88	-2,025.52	-87.24	40.122793	-104.832910	1,288,279.05	3,186,549.41
9,235.00	88.95	180.38	7,410.75	-2,120.51	-87.45	40.122532	-104.832911	1,288,184.07	3,186,549.91
9,329.00	89.23	180.08	7,412.24	-2,214.49	-87.83	40.122274	-104.832912	1,288,090.09	3,186,550.24
9,423.00	89.54	179.78	7,413.25	-2,308.49	-87.72	40.122016	-104.832912	1,287,996.10	3,186,551.06
9,517.00	90.22	180.76	7,413.45	-2,402.48	-88.16	40.121758	-104.832913	1,287,902.10	3,186,551.33
9,611.00	88.43	179.11	7,414.55	-2,496.47	-88.05	40.121500	-104.832913	1,287,808.13	3,186,552.14
9,706.00	88.58	179.57	7,417.03	-2,591.43	-86.96	40.121239	-104.832909	1,287,713.18	3,186,553.95
9,800.00	88.03	180.03	7,419.81	-2,685.39	-86.63	40.120982	-104.832908	1,287,619.23	3,186,554.99
9,894.00	88.43	179.56	7,422.72	-2,779.34	-86.29	40.120724	-104.832907	1,287,525.29	3,186,556.03
9,988.00	88.77	179.00	7,425.01	-2,873.31	-85.11	40.120466	-104.832903	1,287,431.34	3,186,557.92
10,080.00	87.94	178.79	7,427.65	-2,965.25	-83.34	40.120213	-104.832896	1,287,339.41	3,186,560.38
10,172.00	88.03	178.30	7,430.89	-3,057.16	-81.01	40.119961	-104.832888	1,287,247.52	3,186,563.41
10,264.00	88.43	177.91	7,433.73	-3,149.07	-77.97	40.119709	-104.832877	1,287,155.65	3,186,567.14
10,355.00	88.71	177.08	7,436.00	-3,239.95	-73.99	40.119459	-104.832863	1,287,064.80	3,186,571.80
10,447.00	88.89	178.64	7,437.93	-3,331.87	-70.55	40.119207	-104.832851	1,286,972.92	3,186,575.93

## Design Report for GEE 16C-25HZ - 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)
10,539.00	88.74	180.64	7,439.83	-3,423.84	-69.98	40.118954	-104.832848	1,286,880.96	3,186,577.20
10,631.00	89.85	180.48	7,440.96	-3,515.83	-70.88	40.118702	-104.832852	1,286,788.97	3,186,576.99
10,723.00	90.59	180.20	7,440.61	-3,607.82	-71.42	40.118449	-104.832854	1,286,696.97	3,186,577.14
10,814.00	90.03	180.02	7,440.12	-3,698.82	-71.60	40.118200	-104.832854	1,286,605.98	3,186,577.65
10,907.00	89.88	180.51	7,440.19	-3,791.82	-72.03	40.117944	-104.832856	1,286,512.98	3,186,577.92
11,001.00	89.88	180.64	7,440.39	-3,885.82	-72.97	40.117686	-104.832859	1,286,418.99	3,186,577.68
11,095.00	88.67	180.52	7,441.58	-3,979.80	-73.92	40.117428	-104.832863	1,286,325.00	3,186,577.44
11,190.00	87.63	181.85	7,444.64	-4,074.73	-75.88	40.117168	-104.832870	1,286,230.07	3,186,576.19
11,284.00	88.18	181.61	7,448.08	-4,168.62	-78.72	40.116910	-104.832880	1,286,136.16	3,186,574.06
11,378.00	88.12	181.69	7,451.11	-4,262.53	-81.43	40.116652	-104.832889	1,286,042.23	3,186,572.06
11,473.00	88.30	180.76	7,454.08	-4,357.47	-83.46	40.116392	-104.832897	1,285,947.29	3,186,570.75
11,567.00	89.14	180.03	7,456.18	-4,451.44	-84.10	40.116134	-104.832899	1,285,853.32	3,186,570.81
11,661.00	89.97	179.75	7,456.91	-4,545.43	-83.92	40.115876	-104.832898	1,285,759.33	3,186,571.69
11,756.00	90.65	179.25	7,456.40	-4,640.43	-83.09	40.115615	-104.832895	1,285,664.35	3,186,573.24
11,850.00	89.23	179.48	7,456.50	-4,734.42	-82.05	40.115357	-104.832892	1,285,570.38	3,186,574.99
11,944.00	89.17	181.38	7,457.81	-4,828.40	-82.76	40.115099	-104.832894	1,285,476.39	3,186,574.99
12,039.00	89.63	180.65	7,458.80	-4,923.38	-84.44	40.114838	-104.832900	1,285,381.41	3,186,574.02
12,115.62	90.00	179.64	7,459.05	-5,000.00	-84.63	40.114628	-104.832901	1,285,304.79	3,186,574.40
12,133.00	90.09	179.41	7,459.03	-5,017.38	-84.49	40.114580	-104.832900	1,285,287.42	3,186,574.68
12,228.00	89.01	179.28	7,459.78	-5,112.37	-83.40	40.114319	-104.832896	1,285,192.44	3,186,576.48
12,322.00	89.78	179.08	7,460.77	-5,206.35	-82.06	40.114061	-104.832892	1,285,098.47	3,186,578.53
12,415.00	90.31	178.06	7,460.70	-5,299.32	-79.74	40.113806	-104.832883	1,285,005.53	3,186,581.55
12,510.00	89.51	178.72	7,460.85	-5,394.29	-77.07	40.113546	-104.832874	1,284,910.59	3,186,584.94
12,604.00	88.74	180.46	7,462.28	-5,488.27	-76.40	40.113288	-104.832871	1,284,816.62	3,186,586.32
12,698.00	89.82	180.84	7,463.46	-5,582.25	-77.46	40.113030	-104.832875	1,284,722.64	3,186,585.96
12,793.00	91.08	181.33	7,462.72	-5,677.23	-79.26	40.112769	-104.832882	1,284,627.65	3,186,584.87
12,887.00	89.75	180.38	7,462.04	-5,771.21	-80.66	40.112511	-104.832887	1,284,533.66	3,186,584.18
12,982.00	90.55	180.24	7,461.79	-5,866.21	-81.18	40.112250	-104.832888	1,284,438.67	3,186,584.38
13,076.00	90.19	178.91	7,461.18	-5,960.20	-80.48	40.111992	-104.832886	1,284,344.69	3,186,585.78
13,170.00	88.80	177.77	7,462.01	-6,054.16	-77.76	40.111734	-104.832876	1,284,250.76	3,186,589.21
13,264.00	87.87	179.17	7,464.74	-6,148.08	-75.25	40.111476	-104.832867	1,284,156.86	3,186,592.43
13,359.00	88.49	178.93	7,467.76	-6,243.02	-73.67	40.111216	-104.832862	1,284,061.94	3,186,594.72
13,453.00	89.45	178.56	7,469.45	-6,336.98	-71.62	40.110958	-104.832854	1,283,968.00	3,186,597.48
13,548.00	90.03	178.09	7,469.88	-6,431.94	-68.84	40.110697	-104.832844	1,283,873.07	3,186,600.97
13,642.00	90.96	177.23	7,469.07	-6,525.85	-65.00	40.110439	-104.832831	1,283,779.19	3,186,605.52
13,737.00	89.97	178.27	7,468.30	-6,620.78	-61.27	40.110179	-104.832817	1,283,684.31	3,186,609.96
13,831.00	88.98	178.38	7,469.16	-6,714.73	-58.52	40.109921	-104.832807	1,283,590.38	3,186,613.42
13,925.00	90.00	179.90	7,469.99	-6,808.71	-57.11	40.109663	-104.832802	1,283,496.41	3,186,615.53
14,019.00	91.02	180.19	7,469.16	-6,902.71	-57.19	40.109405	-104.832803	1,283,402.43	3,186,616.17
14,114.00	91.05	180.36	7,467.44	-6,997.69	-57.64	40.109144	-104.832804	1,283,307.45	3,186,616.43
14,208.00	90.62	179.30	7,466.07	-7,091.68	-57.36	40.108886	-104.832803	1,283,213.47	3,186,617.41
14,302.00	89.48	177.91	7,465.99	-7,185.65	-55.08	40.108628	-104.832795	1,283,119.52	3,186,620.41

## Design Report for GEE 16C-25HZ - 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)
14,396.00	89.69	179.44	7,466.67	-7,279.62	-52.90	40.108370	-104.832787	1,283,025.57	3,186,623.29
14,491.00	89.85	180.77	7,467.05	-7,374.61	-53.08	40.108109	-104.832788	1,282,930.58	3,186,623.83
14,585.00	90.15	180.94	7,467.05	-7,468.60	-54.48	40.107851	-104.832793	1,282,836.59	3,186,623.13
14,679.00	90.15	180.45	7,466.81	-7,562.60	-55.62	40.107593	-104.832797	1,282,742.60	3,186,622.70
14,773.00	90.00	179.75	7,466.68	-7,656.59	-55.78	40.107335	-104.832798	1,282,648.60	3,186,623.25
14,867.00	89.88	178.52	7,466.78	-7,750.58	-54.36	40.107077	-104.832793	1,282,554.63	3,186,625.37
14,961.00	90.22	181.03	7,466.70	-7,844.57	-54.00	40.106819	-104.832791	1,282,460.65	3,186,626.45
15,056.00	88.83	181.79	7,467.49	-7,939.54	-56.33	40.106559	-104.832800	1,282,365.67	3,186,624.83
15,150.00	89.66	181.42	7,468.73	-8,033.49	-58.97	40.106301	-104.832809	1,282,271.71	3,186,622.90
15,245.00	87.35	182.00	7,471.20	-8,128.41	-61.80	40.106040	-104.832819	1,282,176.77	3,186,620.78
15,339.00	88.06	181.51	7,474.97	-8,222.29	-64.68	40.105783	-104.832829	1,282,082.88	3,186,618.61
15,433.00	88.52	181.42	7,477.77	-8,316.22	-67.08	40.105525	-104.832838	1,281,988.94	3,186,616.92
15,528.00	89.08	181.53	7,479.76	-8,411.17	-69.52	40.105264	-104.832847	1,281,893.98	3,186,615.19
15,622.00	89.75	181.45	7,480.72	-8,505.13	-71.97	40.105006	-104.832856	1,281,800.00	3,186,613.45
15,717.00	90.43	181.03	7,480.57	-8,600.10	-74.02	40.104745	-104.832863	1,281,705.02	3,186,612.11
15,811.00	91.26	180.60	7,479.19	-8,694.08	-75.36	40.104487	-104.832868	1,281,611.04	3,186,611.48
15,906.00	91.70	179.64	7,476.73	-8,789.05	-75.56	40.104227	-104.832868	1,281,516.07	3,186,612.00
16,000.00	90.77	180.38	7,474.71	-8,883.03	-75.57	40.103969	-104.832868	1,281,422.10	3,186,612.69
16,095.00	90.31	180.01	7,473.81	-8,978.02	-75.90	40.103708	-104.832870	1,281,327.11	3,186,613.08
16,189.00	90.25	179.63	7,473.35	-9,072.02	-75.60	40.103450	-104.832869	1,281,233.12	3,186,614.08
16,284.00	90.59	178.91	7,472.66	-9,167.01	-74.39	40.103189	-104.832864	1,281,138.15	3,186,616.01
16,378.00	90.74	178.21	7,471.57	-9,260.97	-72.03	40.102931	-104.832856	1,281,044.21	3,186,619.07
16,473.00	90.74	176.99	7,470.34	-9,355.88	-68.05	40.102671	-104.832842	1,280,949.34	3,186,623.77
16,567.00	90.65	177.64	7,469.20	-9,449.77	-63.65	40.102413	-104.832826	1,280,855.49	3,186,628.88
16,661.00	90.65	177.23	7,468.13	-9,543.67	-59.44	40.102155	-104.832811	1,280,761.63	3,186,633.79
16,706.00	91.05	177.04	7,467.46	-9,588.61	-57.19	40.102032	-104.832803	1,280,716.71	3,186,636.38
16,754.00	91.05	177.04	7,466.58	-9,636.54	-54.72	40.101900	-104.832794	1,280,668.81	3,186,639.21

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.55	0.08	First VES Gyro Survey @100.00' MD
953.00	952.94	9.77	1.51	Last VES Gyro Survey @953.00' MD
16,706.00	7,467.46	-9,588.61	-57.19	Final MWD Survey @ 16706.00' MD :: 7467.46' TVD
16,754.00	7,466.58	-9,636.54	-54.72	Straight Line Projection to Bit @ 16754.00' MD :: 7466.58' TVD

## Design Report for GEE 16C-25HZ - Actual Surveys

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
100.00	953.00	VES Surface Gyros	NS-GYRO-MS
978.00	7,137.00	Vertical/Build Surveys	MWD+IFR1+SC
7,185.00	16,754.00	MWD Horizontal Surveys	MWD+IFR1+SC

**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,049.00	1,048.94	9 5/8"	9-5/8	13-1/2
7,803.00	7,387.87	7" @ 7803' MD	7	8-3/4

**Design Targets**

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated
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**Directional Difficulty Index**

Average Dogleg over Survey:	1.32 °/100usft	Maximum Dogleg over Survey:	16.00 °/100usft at 7,137.00 usft
Net Tortousity applicable to Plans:	0.68 °/100usft	Directional Difficulty Index:	6.685

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**Design Report for GEE 16C-25HZ - Actual Surveys**

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*Audit Info*

**North Reference Sheet for Sec. 24-T2N-R67W - GEE 16C-25HZ - Plan A**

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

Vertical Depths are relative to RKB = 25' @ 4883.00usft (Drilling Rig). Northing and Easting are relative to GEE 16C-25HZ

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

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995912

Grid Coordinates of Well: 1,290,305.09 usft N, 3,186,621.40 usft E

Geographical Coordinates of Well: 40° 07' 42.07" N, 104° 49' 57.35" W

Grid Convergence at Surface is: 0.43°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,754.00usft

the Bottom Hole Displacement is 9,636.69usft in the Direction of 180.33° (True).

Magnetic Convergence at surface is: -8.09° (20 October 2014, , BGGM2014)

