

BISON OIL & GAS II

WELD COUNTY

SEC 11-T5N-61W

GROTHER 5-61 11A-2-3

OWB

Design: FINAL SURVEY

Standard Survey Report

25 August, 2022

PROJECT DETAILS: WELD COUNTY

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone

System Datum: Mean Sea Level



Azimuths to True North
Magnetic North: 7.43°
Magnetic Field
Strength: 51911.3snT
Dip Angle: 66.70°
Date: 6/23/2022
Model: IGRF2020

SHL:
460' FSL, 1153' FWL
Sec 11-T5N-R61W

~460' X-OVER PNT:
460' FSL, 1372' FWL
Sec 11-T5N-R61W

~460' X-OVER PNT:
460' FNL, 1373' FWL
Sec 2-T5N-R61W

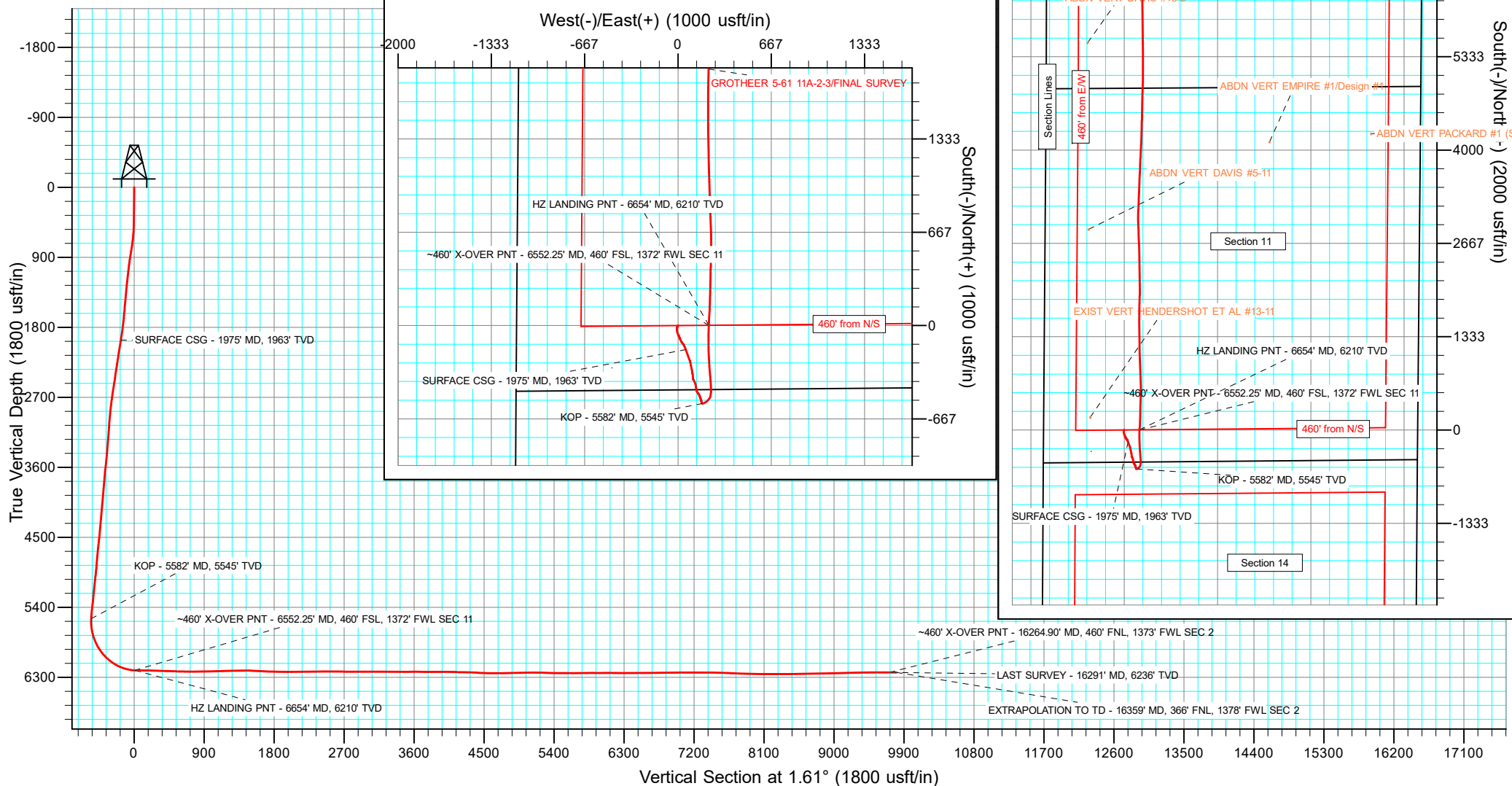
BHL:
366' FNL, 1378' FWL
Sec 2-T5N-R61W

WELL DETAILS: GROTHEER 5-61 11A-2-3

+N/-S	+E/-W	Northing	Ground Level:	4706.70		
0.00	0.00	1394851.80	Easting	Latitude	Longitude	Slot
			3367277.53	40.409772°N	104.181040°W	

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
1975.00	9.63	159.83	1962.86	-171.73	55.95	-170.08	193.89	SURFACE CSG - 1975' MD, 1963' TVD
5582.00	4.46	121.74	5245.44	-556.44	173.40	-551.33	600.99	KOP - 5582' MD, 5545' TVD
6552.25	86.73	3.14	6209.58	1.85	219.16	8.03	1194.38	460' X-OVER PNT - 6552.25' MD, 460' FSL, 1372' FWL SEC 11
6554.00	86.91	3.21	6209.68	3.60	219.16	9.77	1196.12	4Z HANDLING PNT - 6654' MD, 6210' TVD
16264.90	90.32	3.22	6236.09	9707.15	271.26	9710.94	10904.74	460' X-OVER PNT - 16264.90' MD, 460' FNL, 1373' FWL SEC 2
16291.00	90.19	3.07	6235.97	9733.21	272.59	9737.03	10930.84	LAST SURVEY - 16291' MD, 6236' TVD
16359.00	90.19	3.07	6235.75	9801.12	276.23	9805.01	10998.84	EXTRAPOLATION TO TD - 16359' MD, 366' FNL, 1378' FWL SEC 2



Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11A-2-3
Project:	WELD COUNTY	TVD Reference:	KB 24' @ 4730.70usft
Site:	SEC 11-T5N-61W	MD Reference:	KB 24' @ 4730.70usft
Well:	GROTHEER 5-61 11A-2-3	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Project	WELD COUNTY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		SEC 11-T5N-61W			
Site Position:		Northing:	1,395,071.08 usft	Latitude:	40.410254°N
From:	Lat/Long	Easting:	3,370,200.45 usft	Longitude:	104.170533°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.86 °

Well	GROTHEER 5-61 11A-2-3					
Well Position	+N/-S	0.00 usft	Northing:	1,394,851.80 usft	Latitude:	40.409772°N
	+E/-W	0.00 usft	Easting:	3,367,277.52 usft	Longitude:	104.181040°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,706.70 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	6/23/2022	7.43	66.70	51,911.26790977

Design	FINAL SURVEY				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	1.61	

Survey Program	Date	8/25/2022			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
210.00	1,925.00	SURFACE SURVEY (OWB)	MWD	OWSG MWD - Standard	
2,021.00	16,359.00	FINAL SURVEY (OWB)	MWD	OWSG MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
210.00	1.09	122.39	209.99	-1.07	1.69	-1.02	0.52	0.52	0.00	
302.00	1.01	270.57	301.98	-1.53	1.61	-1.48	2.20	-0.09	161.06	
376.00	1.80	272.20	375.96	-1.48	-0.20	-1.48	1.07	1.07	2.20	
463.00	2.02	221.35	462.92	-2.58	-2.58	-2.65	1.90	0.25	-58.45	
550.00	3.73	197.17	549.81	-6.43	-4.43	-6.56	2.37	1.97	-27.79	
637.00	5.49	191.12	636.52	-13.22	-6.06	-13.39	2.10	2.02	-6.95	
725.00	7.73	182.68	723.93	-23.27	-7.15	-23.46	2.77	2.55	-9.59	
812.00	9.53	176.70	809.95	-36.30	-7.01	-36.48	2.31	2.07	-6.87	
899.00	9.40	164.57	895.77	-50.34	-4.71	-50.45	2.29	-0.15	-13.94	

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Site:	SEC 11-T5N-61W	MD Reference:	KB 24' @ 4730.70usft
Well:	GROTHEER 5-61 11A-2-3	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
986.00	8.50	152.70	981.72	-62.90	0.13	-62.88	2.36	-1.03	-13.64
1,073.00	6.70	154.38	1,067.95	-73.20	5.28	-73.02	2.08	-2.07	1.93
1,161.00	7.73	156.31	1,155.25	-83.24	9.87	-82.93	1.20	1.17	2.19
1,248.00	6.60	159.10	1,241.57	-93.27	14.01	-92.84	1.36	-1.30	3.21
1,335.00	5.40	155.35	1,328.09	-101.66	17.50	-101.13	1.45	-1.38	-4.31
1,422.00	6.70	154.10	1,414.61	-109.95	21.42	-109.30	1.50	1.49	-1.44
1,510.00	5.50	148.60	1,502.11	-118.17	25.86	-117.39	1.52	-1.36	-6.25
1,597.00	6.50	142.50	1,588.63	-125.63	31.03	-124.71	1.36	1.15	-7.01
1,684.00	7.03	138.03	1,675.03	-133.50	37.59	-132.39	0.86	0.61	-5.14
1,771.00	7.70	154.60	1,761.32	-142.72	43.65	-141.44	2.55	0.77	19.05
1,858.00	8.90	155.90	1,847.41	-154.13	48.90	-152.69	1.40	1.38	1.49
1,925.00	9.44	158.69	1,913.55	-163.98	53.02	-162.42	1.04	0.81	4.16
1,975.00	9.63	159.83	1,962.86	-171.73	55.95	-170.08	0.54	0.38	2.28
SURFACE CSG - 1975' MD, 1963' TVD									
2,021.00	9.81	160.84	2,008.20	-179.04	58.56	-177.32	0.54	0.39	2.20
2,110.00	9.81	160.80	2,095.90	-193.37	63.54	-191.50	0.01	0.00	-0.04
2,199.00	9.59	160.49	2,183.62	-207.51	68.51	-205.50	0.25	-0.25	-0.35
2,288.00	9.37	159.65	2,271.41	-221.29	73.51	-219.14	0.29	-0.25	-0.94
2,377.00	9.19	158.86	2,359.24	-234.72	78.59	-232.41	0.25	-0.20	-0.89
2,466.00	8.88	157.14	2,447.14	-247.67	83.82	-245.21	0.46	-0.35	-1.93
2,554.00	9.19	170.67	2,534.06	-260.87	87.60	-258.30	2.43	0.35	15.37
2,643.00	8.84	169.08	2,621.96	-274.60	90.05	-271.95	0.48	-0.39	-1.79
2,732.00	8.44	168.29	2,709.95	-287.71	92.67	-284.98	0.47	-0.45	-0.89
2,821.00	6.63	168.29	2,798.18	-299.13	95.04	-296.34	2.03	-2.03	0.00
2,910.00	6.14	168.07	2,886.62	-308.82	97.06	-305.96	0.55	-0.55	-0.25
3,088.00	4.37	168.11	3,063.87	-324.77	100.43	-321.81	0.99	-0.99	0.02
3,177.00	4.07	169.08	3,152.63	-331.19	101.73	-328.19	0.35	-0.34	1.09
3,266.00	3.76	171.33	3,241.42	-337.18	102.76	-334.15	0.39	-0.35	2.53
3,355.00	5.52	168.42	3,330.12	-344.26	104.06	-341.19	1.99	1.98	-3.27
3,444.00	5.74	173.62	3,418.70	-352.87	105.42	-349.76	0.62	0.25	5.84
3,533.00	5.83	174.59	3,507.24	-361.80	106.34	-358.66	0.15	0.10	1.09
3,622.00	5.66	174.99	3,595.80	-370.67	107.15	-367.50	0.20	-0.19	0.45
3,711.00	5.52	175.87	3,684.37	-379.31	107.84	-376.12	0.18	-0.16	0.99
3,800.00	5.57	150.44	3,772.97	-387.34	110.28	-384.08	2.74	0.06	-28.57
3,889.00	5.57	149.96	3,861.55	-394.83	114.57	-391.45	0.05	0.00	-0.54
3,979.00	5.44	154.63	3,951.13	-402.47	118.59	-398.97	0.52	-0.14	5.19
4,068.00	5.39	157.27	4,039.74	-410.14	122.01	-406.54	0.29	-0.06	2.97
4,157.00	5.35	162.87	4,128.35	-417.96	124.85	-414.27	0.59	-0.04	6.29
4,246.00	5.21	169.48	4,216.97	-425.90	126.81	-422.15	0.70	-0.16	7.43
4,335.00	4.95	172.08	4,305.62	-433.67	128.07	-429.89	0.39	-0.29	2.92
4,513.00	5.74	176.57	4,482.85	-450.16	129.66	-446.33	0.50	0.44	2.52
4,602.00	6.85	166.44	4,571.31	-459.77	131.17	-455.89	1.76	1.25	-11.38
4,691.00	6.76	154.45	4,659.69	-469.65	134.68	-465.67	1.60	-0.10	-13.47

Survey Report

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Site:	SEC 11-T5N-61W	MD Reference:	KB 24' @ 4730.70usft
Well:	GROTHEER 5-61 11A-2-3	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,780.00	5.83	147.44	4,748.15	-478.19	139.37	-474.07	1.35	-1.04	-7.88
4,869.00	5.35	142.86	4,836.73	-485.31	144.31	-481.05	0.74	-0.54	-5.15
4,958.00	6.94	146.12	4,925.21	-493.08	149.81	-488.66	1.83	1.79	3.66
5,047.00	7.29	159.87	5,013.54	-502.84	154.75	-498.29	1.95	0.39	15.45
5,136.00	5.79	157.14	5,101.95	-512.28	158.44	-507.62	1.72	-1.69	-3.07
5,225.00	6.63	166.97	5,190.43	-521.43	161.34	-516.67	1.52	0.94	11.04
5,314.00	5.70	158.50	5,278.92	-530.54	164.12	-525.71	1.46	-1.04	-9.52
5,403.00	7.11	167.80	5,367.36	-540.04	166.90	-535.12	1.96	1.58	10.45
5,514.00	5.61	161.37	5,477.68	-551.90	170.09	-546.89	1.49	-1.35	-5.79
5,582.00	4.46	121.74	5,545.44	-556.44	173.40	-551.33	5.26	-1.68	-58.28
KOP - 5582' MD, 5545' TVD									
5,603.00	4.64	107.96	5,566.37	-557.13	174.91	-551.98	5.26	0.84	-65.61
5,693.00	13.52	61.03	5,655.24	-553.15	187.61	-547.64	12.09	9.87	-52.14
5,782.00	20.95	55.25	5,740.19	-539.02	209.82	-532.89	8.56	8.35	-6.49
5,871.00	23.51	22.20	5,822.89	-513.41	229.68	-506.74	14.16	2.88	-37.13
5,960.00	28.81	0.07	5,902.94	-475.41	236.43	-468.56	12.38	5.96	-24.87
6,049.00	38.67	356.63	5,976.86	-426.08	234.82	-419.30	11.28	11.08	-3.87
6,138.00	46.05	355.57	6,042.58	-366.30	230.71	-359.66	8.33	8.29	-1.19
6,227.00	51.70	355.27	6,101.09	-299.50	225.35	-293.04	6.35	6.35	-0.34
6,316.00	63.50	356.59	6,148.70	-224.68	220.08	-218.39	13.32	13.26	1.48
6,405.00	72.16	359.19	6,182.26	-142.40	217.11	-136.23	10.10	9.73	2.92
6,495.00	80.73	0.86	6,203.33	-54.99	217.17	-48.85	9.69	9.52	1.86
6,552.25	86.73	3.14	6,209.58	1.85	219.16	8.03	11.20	10.48	3.98
~460' X-OVER PNT - 6552.25' MD, 460' FSL, 1372' FWL SEC 11									
6,554.00	86.91	3.21	6,209.68	3.60	219.26	9.77	11.20	10.49	3.94
HZ LANDING PNT - 6654' MD, 6210' TVD									
6,584.00	90.06	4.39	6,210.47	33.52	221.24	39.74	11.20	10.49	3.94
6,673.00	89.66	2.32	6,210.69	122.36	226.45	128.69	2.37	-0.45	-2.33
6,762.00	88.25	1.08	6,212.31	211.30	229.09	217.67	2.11	-1.58	-1.39
6,851.00	88.33	1.43	6,214.97	300.24	231.04	306.63	0.40	0.09	0.39
6,940.00	88.11	1.39	6,217.73	389.17	233.23	395.58	0.25	-0.25	-0.04
7,029.00	87.76	2.10	6,220.94	478.07	235.94	484.53	0.89	-0.39	0.80
7,118.00	89.09	0.42	6,223.39	567.01	237.89	573.49	2.41	1.49	-1.89
7,207.00	88.64	357.87	6,225.15	655.97	236.57	662.38	2.91	-0.51	-2.87
7,296.00	90.10	358.09	6,226.13	744.91	233.43	751.19	1.66	1.64	0.25
7,385.00	91.21	357.73	6,225.11	833.84	230.18	840.00	1.31	1.25	-0.40
7,474.00	90.77	357.16	6,223.57	922.74	226.22	928.75	0.81	-0.49	-0.64
7,563.00	91.65	359.45	6,221.69	1,011.68	223.59	1,017.57	2.76	0.99	2.57
7,652.00	91.25	357.82	6,219.44	1,100.62	221.47	1,106.42	1.89	-0.45	-1.83
7,741.00	91.12	359.41	6,217.60	1,189.57	219.31	1,195.28	1.79	-0.15	1.79
7,830.00	91.21	359.45	6,215.79	1,278.55	218.43	1,284.19	0.11	0.10	0.04
7,919.00	91.25	358.66	6,213.88	1,367.52	216.96	1,373.08	0.89	0.04	-0.89
8,008.00	89.70	359.85	6,213.14	1,456.50	215.81	1,462.00	2.20	-1.74	1.34
8,098.00	86.70	359.10	6,215.97	1,546.44	214.98	1,551.88	3.44	-3.33	-0.83

Survey Report

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Site:	SEC 11-T5N-61W	MD Reference:	KB 24' @ 4730.70usft
Well:	GROTHEER 5-61 11A-2-3	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
8,187.00	87.19	0.82	6,220.71	1,635.31	214.92	1,640.72	2.01	0.55	1.93	
8,276.00	87.98	0.91	6,224.46	1,724.22	216.26	1,729.63	0.89	0.89	0.10	
8,365.00	89.17	1.96	6,226.68	1,813.16	218.49	1,818.60	1.78	1.34	1.18	
8,454.00	88.38	1.79	6,228.58	1,902.09	221.40	1,907.58	0.91	-0.89	-0.19	
8,543.00	90.28	359.98	6,229.62	1,991.07	222.78	1,996.56	2.95	2.13	-2.03	
8,632.00	89.62	358.70	6,229.70	2,080.06	221.75	2,085.48	1.62	-0.74	-1.44	
8,721.00	91.21	359.45	6,229.05	2,169.04	220.31	2,174.39	1.98	1.79	0.84	
8,810.00	92.22	359.06	6,226.39	2,258.00	219.16	2,263.27	1.22	1.13	-0.44	
8,899.00	90.94	0.64	6,223.93	2,346.96	218.93	2,352.19	2.28	-1.44	1.78	
8,988.00	89.66	358.44	6,223.47	2,435.95	218.21	2,441.13	2.86	-1.44	-2.47	
9,078.00	89.79	357.95	6,223.90	2,525.90	215.38	2,530.96	0.56	0.14	-0.54	
9,167.00	89.17	357.87	6,224.71	2,614.84	212.13	2,619.77	0.70	-0.70	-0.09	
9,256.00	88.47	356.85	6,226.54	2,703.72	208.03	2,708.51	1.39	-0.79	-1.15	
9,345.00	89.48	359.32	6,228.13	2,792.65	205.06	2,797.32	3.00	1.13	2.78	
9,434.00	90.32	356.94	6,228.29	2,881.59	202.15	2,886.15	2.84	0.94	-2.67	
9,523.00	90.32	359.10	6,227.79	2,970.53	199.08	2,974.96	2.43	0.00	2.43	
9,612.00	89.70	0.77	6,227.78	3,059.53	198.98	3,063.92	2.00	-0.70	1.88	
9,701.00	90.41	2.98	6,227.69	3,148.48	201.89	3,152.91	2.61	0.80	2.48	
9,790.00	90.63	2.05	6,226.88	3,237.39	205.80	3,241.90	1.07	0.25	-1.04	
9,879.00	88.82	2.40	6,227.31	3,326.31	209.25	3,330.89	2.07	-2.03	0.39	
9,968.00	89.22	1.79	6,228.83	3,415.24	212.50	3,419.87	0.82	0.45	-0.69	
10,057.00	90.77	2.54	6,228.84	3,504.17	215.87	3,508.87	1.93	1.74	0.84	
10,146.00	90.32	2.18	6,227.99	3,593.09	219.53	3,597.85	0.65	-0.51	-0.40	
10,235.00	88.82	2.58	6,228.66	3,682.01	223.23	3,686.84	1.74	-1.69	0.45	
10,324.00	88.95	2.23	6,230.39	3,770.92	226.96	3,775.81	0.42	0.15	-0.39	
10,413.00	91.16	2.54	6,230.31	3,859.83	230.66	3,864.80	2.51	2.48	0.35	
10,502.00	89.97	3.37	6,229.43	3,948.71	235.25	3,953.77	1.63	-1.34	0.93	
10,591.00	89.70	2.80	6,229.69	4,037.58	240.04	4,042.74	0.71	-0.30	-0.64	
10,680.00	88.20	1.92	6,231.32	4,126.49	243.71	4,131.71	1.95	-1.69	-0.99	
10,769.00	89.26	1.92	6,233.29	4,215.41	246.69	4,220.69	1.19	1.19	0.00	
10,847.00	86.70	1.13	6,239.56	4,303.22	251.42	4,398.56	1.51	-1.44	-0.44	
11,037.00	88.56	1.57	6,243.29	4,483.12	253.54	4,488.48	2.12	2.07	0.49	
11,126.00	89.13	1.13	6,245.08	4,572.07	255.64	4,577.46	0.81	0.64	-0.49	
11,215.00	88.86	1.08	6,246.64	4,661.04	257.35	4,666.44	0.31	-0.30	-0.06	
11,304.00	89.93	1.79	6,247.58	4,750.01	259.58	4,755.44	1.44	1.20	0.80	
11,393.00	92.09	1.79	6,246.01	4,838.95	262.36	4,844.42	2.43	2.43	0.00	
11,482.00	92.14	1.48	6,242.73	4,927.85	264.90	4,933.36	0.35	0.06	-0.35	
11,571.00	92.62	0.73	6,239.03	5,016.75	266.61	5,022.27	1.00	0.54	-0.84	
11,660.00	89.26	359.76	6,237.57	5,105.73	266.99	5,111.22	3.93	-3.78	-1.09	
11,750.00	88.73	359.54	6,239.15	5,195.71	266.44	5,201.16	0.64	-0.59	-0.24	
11,839.00	88.07	359.23	6,241.63	5,284.67	265.49	5,290.05	0.82	-0.74	-0.35	
11,928.00	89.17	0.16	6,243.78	5,373.64	265.02	5,378.98	1.62	1.24	1.04	
12,017.00	89.35	359.89	6,244.93	5,462.63	265.05	5,467.93	0.36	0.20	-0.30	

Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11A-2-3
Project:	WELD COUNTY	TVD Reference:	KB 24' @ 4730.70usft
Site:	SEC 11-T5N-61W	MD Reference:	KB 24' @ 4730.70usft
Well:	GROTHEER 5-61 11A-2-3	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,106.00	89.17	359.19	6,246.08	5,551.62	264.34	5,556.87	0.81	-0.20	-0.79
12,195.00	90.23	0.42	6,246.54	5,640.62	264.04	5,645.82	1.82	1.19	1.38
12,284.00	90.90	359.85	6,245.67	5,729.61	264.25	5,734.78	0.99	0.75	-0.64
12,373.00	91.60	359.63	6,243.72	5,818.59	263.84	5,823.71	0.82	0.79	-0.25
12,462.00	89.62	359.54	6,242.78	5,907.58	263.20	5,912.65	2.23	-2.22	-0.10
12,551.00	90.23	358.53	6,242.89	5,996.56	261.70	6,001.56	1.33	0.69	-1.13
12,640.00	90.77	357.60	6,242.12	6,085.51	258.69	6,090.38	1.21	0.61	-1.04
12,729.00	90.32	358.83	6,241.27	6,174.46	255.92	6,179.22	1.47	-0.51	1.38
12,818.00	89.79	0.29	6,241.18	6,263.45	255.24	6,268.16	1.75	-0.60	1.64
12,907.00	89.22	359.63	6,241.95	6,352.45	255.18	6,357.12	0.98	-0.64	-0.74
12,996.00	88.20	359.85	6,243.96	6,441.43	254.77	6,446.05	1.17	-1.15	0.25
13,085.00	89.70	0.55	6,245.59	6,530.41	255.08	6,535.00	1.86	1.69	0.79
13,174.00	91.03	0.02	6,245.02	6,619.40	255.53	6,623.97	1.61	1.49	-0.60
13,263.00	91.74	0.07	6,242.87	6,708.38	255.60	6,712.91	0.80	0.80	0.06
13,352.00	90.28	0.82	6,241.30	6,797.36	256.29	6,801.88	1.84	-1.64	0.84
13,441.00	91.07	0.77	6,240.25	6,886.34	257.52	6,890.86	0.89	0.89	-0.06
13,530.00	89.40	0.73	6,239.89	6,975.33	258.69	6,979.85	1.88	-1.88	-0.04
13,619.00	90.54	0.55	6,239.93	7,064.32	259.68	7,068.83	1.30	1.28	-0.20
13,708.00	91.16	0.02	6,238.61	7,153.31	260.12	7,157.80	0.92	0.70	-0.60
13,797.00	89.62	0.64	6,238.01	7,242.30	260.64	7,246.77	1.87	-1.73	0.70
13,886.00	90.19	0.33	6,238.16	7,331.30	261.39	7,335.75	0.73	0.64	-0.35
13,975.00	89.09	2.18	6,238.71	7,420.27	263.34	7,424.75	2.42	-1.24	2.08
14,065.00	88.95	2.23	6,240.25	7,510.19	266.80	7,514.73	0.17	-0.16	0.06
14,154.00	87.98	2.36	6,242.64	7,599.09	270.36	7,603.69	1.10	-1.09	0.15
14,243.00	87.10	1.30	6,246.46	7,687.96	273.20	7,692.60	1.55	-0.99	-1.19
14,332.00	87.76	0.42	6,250.45	7,776.86	274.54	7,781.50	1.24	0.74	-0.99
14,421.00	88.69	359.98	6,253.21	7,865.81	274.85	7,870.43	1.16	1.04	-0.49
14,510.00	87.85	359.80	6,255.89	7,954.77	274.68	7,959.35	0.97	-0.94	-0.20
14,599.00	90.01	359.10	6,257.55	8,043.75	273.82	8,048.27	2.55	2.43	-0.79
14,688.00	89.62	358.75	6,257.84	8,132.73	272.15	8,137.17	0.59	-0.44	-0.39
14,777.00	90.15	358.17	6,258.02	8,221.70	269.76	8,226.03	0.88	0.60	-0.65
14,866.00	89.62	358.26	6,258.20	8,310.65	266.99	8,314.88	0.60	-0.60	0.10
14,955.00	91.12	358.48	6,257.62	8,399.61	264.46	8,403.73	1.70	1.69	0.25
15,044.00	90.23	354.96	6,256.58	8,488.45	259.37	8,492.38	4.08	-1.00	-3.96
15,134.00	90.99	353.77	6,255.62	8,578.00	250.53	8,581.66	1.57	0.84	-1.32
15,223.00	90.59	355.31	6,254.39	8,666.59	242.06	8,669.97	1.79	-0.45	1.73
15,312.00	91.56	358.48	6,252.72	8,755.43	237.24	8,758.64	3.72	1.09	3.56
15,401.00	91.65	358.39	6,250.23	8,844.36	234.81	8,847.47	0.14	0.10	-0.10
15,490.00	91.87	1.88	6,247.49	8,933.30	235.02	8,936.38	3.93	0.25	3.92
15,579.00	91.43	2.67	6,244.93	9,022.20	238.55	9,025.34	1.02	-0.49	0.89
15,668.00	91.12	3.73	6,242.95	9,111.03	243.52	9,114.28	1.24	-0.35	1.19
15,757.00	91.03	3.15	6,241.28	9,199.86	248.86	9,203.22	0.66	-0.10	-0.65
15,846.00	91.12	3.33	6,239.61	9,288.70	253.89	9,292.17	0.23	0.10	0.20
15,935.00	90.99	3.37	6,237.97	9,377.53	259.09	9,381.11	0.15	-0.15	0.04

Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11A-2-3
Project:	WELD COUNTY	TVD Reference:	KB 24' @ 4730.70usft
Site:	SEC 11-T5N-61W	MD Reference:	KB 24' @ 4730.70usft
Well:	GROTHEER 5-61 11A-2-3	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,024.00	89.88	1.17	6,237.30	9,466.45	262.61	9,470.10	2.77	-1.25	-2.47
16,114.00	90.19	0.73	6,237.24	9,556.44	264.11	9,560.09	0.60	0.34	-0.49
16,202.00	90.63	3.59	6,236.61	9,644.37	267.42	9,648.07	3.29	0.50	3.25
16,264.90	90.32	3.22	6,236.09	9,707.15	271.16	9,710.94	0.77	-0.49	-0.58
~460' X-OVER PNT - 16264.90' MD, 460' FNL, 1373' FWL SEC 2									
16,291.00	90.19	3.07	6,235.97	9,733.21	272.59	9,737.03	0.77	-0.49	-0.58
LAST SURVEY - 16291' MD, 6236' TVD									
16,359.00	90.19	3.07	6,235.75	9,801.12	276.23	9,805.01	0.00	0.00	0.00
EXTRAPOLATION TO TD - 16359' MD, 366' FNL, 1378' FWL SEC 2									

Design 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
EPI - GROTHEER 5-61 - actual wellpath misses target center by 17.93usft at 16264.56usft MD (6236.09 TVD, 9706.81 N, 271.14 E) - Point	0.00	0.00	6,220.00	9,707.15	263.25	1,404,561.41	3,367,396.36	40.436417°N	104.180095°W
LP - GROTHEER 5-61 1 - actual wellpath misses target center by 17.00usft at 6552.25usft MD (6209.58 TVD, 1.85 N, 219.16 E) - Point	0.00	0.00	6,220.00	1.85	205.73	1,394,856.70	3,367,483.19	40.409777°N	104.180302°W
PBHL - GROTHEER 5-6 - actual wellpath misses target center by 21.17usft at 16359.00usft MD (6235.75 TVD, 9801.12 N, 276.23 E) - Point	0.00	0.00	6,220.00	9,807.34	263.53	1,404,661.58	3,367,395.15	40.436692°N	104.180094°W

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,975.00	1,962.86	-171.73	55.95	SURFACE CSG - 1975' MD, 1963' TVD	
5,582.00	5,545.44	-556.44	173.40	KOP - 5582' MD, 5545' TVD	
6,552.25	6,209.58	1.85	219.16	~460' X-OVER PNT - 6552.25' MD, 460' FSL, 1372' FWL SEC 11	
6,554.00	6,209.68	3.60	219.26	HZ LANDING PNT - 6654' MD, 6210' TVD	
16,264.90	6,236.09	9,707.15	271.16	~460' X-OVER PNT - 16264.90' MD, 460' FNL, 1373' FWL SEC 2	
16,291.00	6,235.97	9,733.21	272.59	LAST SURVEY - 16291' MD, 6236' TVD	
16,359.00	6,235.75	9,801.12	276.23	EXTRAPOLATION TO TD - 16359' MD, 366' FNL, 1378' FWL SEC 2	

Checked By: _____ Approved By: _____ Date: _____