

BISON OIL & GAS II

WELD COUNTY

SEC 11-T5N-61W

GROTHER 5-61 11A-2-1

OWB

Design: FINAL SURVEY

Standard Survey Report

25 August, 2022

Project: WELD COUNTY
Site: SEC 11-T5N-61W
Well: GROTHEER 5-61 11A-2-1
Wellbore: OWB
Design: FINAL SURVEY

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

WELL DETAILS: GROTHEER 5-61 11A-2-1

+N/-S	+E/-W	Northing	Ground Level: Easting	4705.20 Latitude	Longitude	Slot
0.00	0.00	1394851.01	3367249.41	40.409771°N	104.181141°W	

ANNOTATIONS

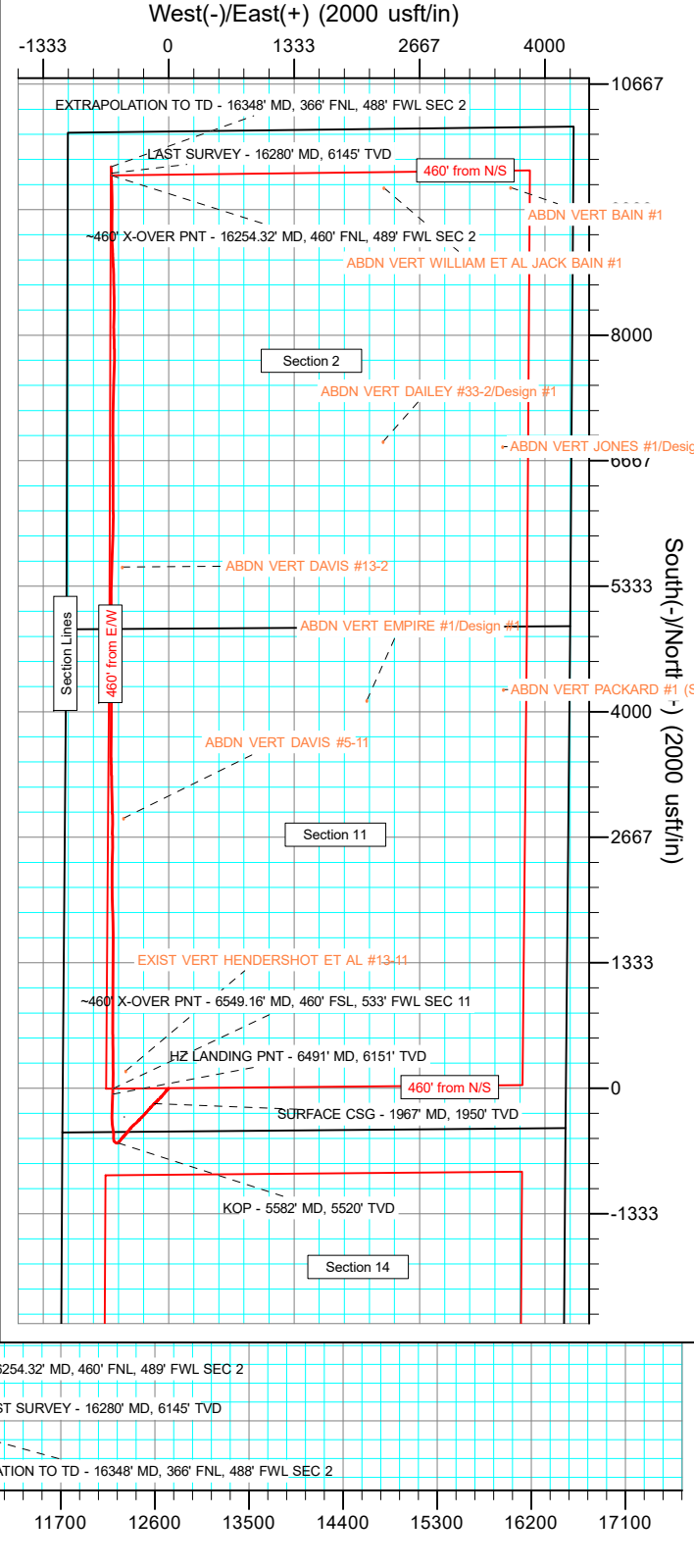
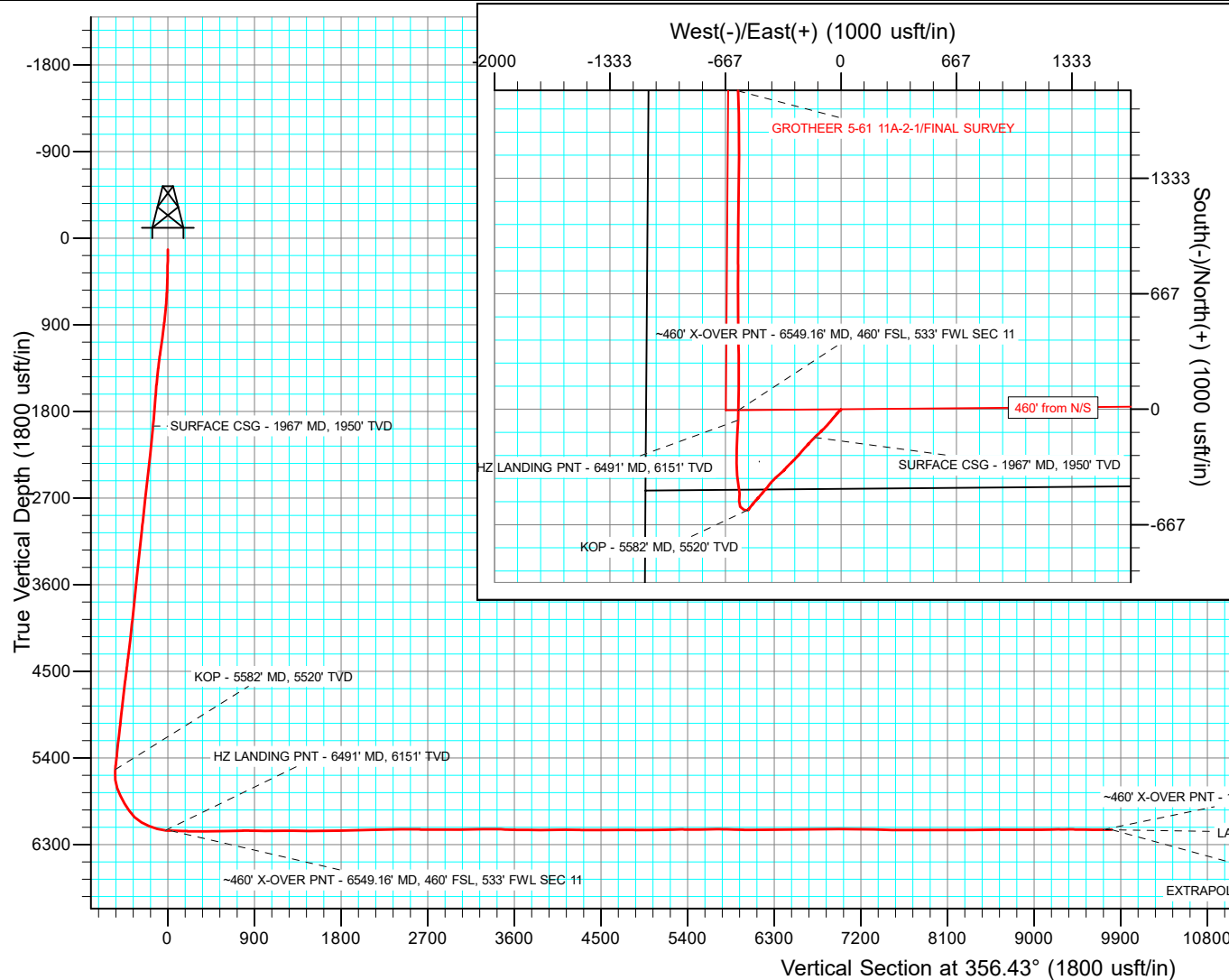
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
1967.00	7.85	224.76	1950.32	-162.90	-152.31	-153.10	224.66	SURFACE CSG - 1967' MD, 1950' TVD
5582.00	8.56	229.45	5520.21	-580.17	-536.67	-545.65	792.88	KOP - 5582' MD, 5520' TVD
6491.00	85.29	2.59	6151.43	-63.44	-594.11	-26.35	1352.69	HZ LANDING PNT - 6491' MD, 6151' TVD
6549.16	87.38	1.43	6155.01	-5.43	-592.05	31.42	1410.72	~460' X-OVER PNT - 6549.16' MD, 460' FSL, 533' FWL SEC 11
16254.32	90.11	359.19	6144.96	9696.22	-609.10	9715.33	11114.59	~460' X-OVER PNT - 16254.32' MD, 460' FNL, 489' FWL SEC 2
16280.00	90.28	359.28	6144.88	9721.90	-609.45	9740.98	11140.27	LAST SURVEY - 16280' MD, 6145' TVD
16348.00	90.28	359.28	6144.54	9789.89	-610.30	9808.90	11208.27	EXTRAPOLATION TO TD - 16348' MD, 366' FNL, 488' FWL SEC 2

SHL:
460' FSL, 1125' FWL
Sec 11-T5N-R61W

~460' X-OVER PNT:
460' FSL, 533' FWL
Sec 11-T5N-R61W

~460' X-OVER PNT:
460' FNL, 489' FWL
Sec 2-T5N-R61W

BHL:
366' FNL, 488' FWL
Sec 2-T5N-R61W



Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11A-2-1
Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4729.20usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4729.20usft
Well:	GROTHEER 5-61 11A-2-1	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-2-1					
Well Position	+N/-S	0.00 usft	Northing:	1,394,851.01 usft	Latitude:	40.409771°N
	+E/-W	0.00 usft	Easting:	3,367,249.40 usft	Longitude:	104.181141°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,705.20 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	6/23/2022	7.43	66.70	51,911.27074830

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	356.43	

Survey Program	Date	8/25/2022			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
210.00	1,926.00	SURFACE SURVEY (OWB)	MWD	OWSG MWD - Standard	
2,021.00	16,348.00	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)	
119.00	0.40	107.30	119.00	-0.11	0.37	-0.13	0.00	0.00	0.00	
210.00	0.40	145.20	210.00	-0.47	0.85	-0.52	0.29	0.00	41.65	
302.00	1.36	224.95	301.99	-1.50	0.27	-1.52	1.46	1.04	86.68	
376.00	1.97	230.00	375.96	-2.94	-1.33	-2.85	0.85	0.82	6.82	
463.00	3.42	230.30	462.86	-5.56	-4.47	-5.27	1.67	1.67	0.34	
550.00	4.13	223.72	549.67	-9.48	-8.63	-8.93	0.95	0.82	-7.56	
637.00	5.88	224.87	636.33	-14.90	-13.94	-14.01	2.01	2.01	1.32	
725.00	7.20	221.26	723.76	-22.24	-20.76	-20.91	1.57	1.50	-4.10	
812.00	8.30	219.30	809.96	-31.20	-28.33	-29.38	1.30	1.26	-2.25	
899.00	9.22	220.40	895.95	-41.37	-36.83	-39.00	1.07	1.06	1.26	

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Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4729.20usft
Well:	GROTHEER 5-61 11A-2-1	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	9.97	219.33	981.73	-52.50	-46.12	-49.53	0.89	0.86	-1.23
1,073.00	10.94	219.95	1,067.29	-64.66	-56.19	-61.04	1.12	1.11	0.71
1,161.00	11.60	220.47	1,153.59	-77.79	-67.30	-73.45	0.76	0.75	0.59
1,248.00	10.76	221.88	1,238.94	-90.49	-78.40	-85.44	1.02	-0.97	1.62
1,335.00	9.97	224.34	1,324.52	-101.92	-89.08	-96.18	1.04	-0.91	2.83
1,422.00	8.70	224.25	1,410.36	-112.02	-98.94	-105.65	1.46	-1.46	-0.10
1,510.00	9.05	224.52	1,497.31	-121.73	-108.43	-114.74	0.40	0.40	0.31
1,597.00	7.40	226.80	1,583.41	-130.44	-117.32	-122.89	1.93	-1.90	2.62
1,684.00	7.10	228.40	1,669.72	-137.85	-125.42	-129.78	0.42	-0.34	1.84
1,771.00	7.50	229.00	1,756.01	-145.14	-133.73	-136.54	0.47	0.46	0.69
1,858.00	7.50	225.70	1,842.27	-152.83	-142.08	-143.70	0.50	0.00	-3.79
1,926.00	7.50	225.60	1,909.68	-159.04	-148.42	-149.49	0.02	0.00	-0.15
1,967.00	7.85	224.76	1,950.32	-162.90	-152.31	-153.10	0.89	0.85	-2.04
SURFACE CSG - 1967' MD, 1950' TVD									
2,021.00	8.31	223.77	2,003.78	-168.33	-157.60	-158.20	0.89	0.85	-1.84
2,110.00	8.53	224.12	2,091.82	-177.71	-166.65	-167.00	0.25	0.25	0.39
2,199.00	8.40	223.42	2,179.85	-187.17	-175.71	-175.88	0.19	-0.15	-0.79
2,288.00	8.26	222.36	2,267.91	-196.62	-184.48	-184.76	0.23	-0.16	-1.19
2,377.00	9.85	223.37	2,355.80	-206.88	-194.02	-194.41	1.80	1.79	1.13
2,465.00	9.63	222.71	2,442.53	-217.76	-204.18	-204.63	0.28	-0.25	-0.75
2,554.00	9.10	221.52	2,530.35	-228.50	-213.90	-214.75	0.63	-0.60	-1.34
2,643.00	8.79	220.68	2,618.26	-238.93	-222.99	-224.59	0.38	-0.35	-0.94
2,732.00	8.44	220.20	2,706.26	-249.07	-231.64	-234.18	0.40	-0.39	-0.54
2,821.00	8.26	219.80	2,794.32	-258.97	-239.95	-243.54	0.21	-0.20	-0.45
2,910.00	9.59	223.28	2,882.24	-269.28	-249.13	-253.26	1.61	1.49	3.91
2,999.00	9.01	223.46	2,970.07	-279.74	-259.00	-263.08	0.65	-0.65	0.20
3,088.00	9.68	223.50	3,057.89	-290.22	-268.95	-272.93	0.75	0.75	0.04
3,177.00	9.19	224.91	3,145.68	-300.68	-279.11	-282.73	0.61	-0.55	1.58
3,266.00	8.53	225.71	3,233.62	-310.33	-288.86	-291.75	0.75	-0.74	0.90
3,355.00	8.53	226.63	3,321.63	-319.47	-298.38	-300.28	0.15	0.00	1.03
3,444.00	8.35	225.71	3,409.67	-328.51	-307.80	-308.73	0.25	-0.20	-1.03
3,533.00	9.15	221.08	3,497.64	-338.36	-317.08	-317.98	1.20	0.90	-5.20
3,622.00	9.37	218.74	3,585.48	-349.35	-326.26	-328.37	0.49	0.25	-2.63
3,711.00	9.63	228.13	3,673.26	-359.97	-336.34	-338.34	1.76	0.29	10.55
3,800.00	9.54	229.10	3,761.02	-369.76	-347.46	-347.43	0.21	-0.10	1.09
3,889.00	9.46	229.32	3,848.80	-379.36	-358.58	-356.31	0.10	-0.09	0.25
3,979.00	9.24	230.51	3,937.60	-388.78	-369.77	-365.02	0.33	-0.24	1.32
4,068.00	9.72	224.12	4,025.39	-398.71	-380.51	-374.27	1.30	0.54	-7.18
4,157.00	9.37	225.62	4,113.16	-409.17	-390.92	-384.06	0.48	-0.39	1.69
4,246.00	8.97	222.84	4,201.02	-419.33	-400.82	-393.58	0.67	-0.45	-3.12
4,335.00	9.81	217.86	4,288.83	-430.40	-410.19	-404.05	1.31	0.94	-5.60
4,424.00	8.93	216.23	4,376.64	-441.96	-418.92	-415.04	1.03	-0.99	-1.83
4,513.00	9.15	217.86	4,464.53	-453.12	-427.35	-425.65	0.38	0.25	1.83

Survey Report

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Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4729.20usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4729.20usft
Well:	GROTHEER 5-61 11A-2-1	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)	
4,602.00	10.91	223.28	4,552.17	-464.84	-437.47	-436.72	2.24	1.98	6.09	
4,691.00	9.81	221.04	4,639.72	-476.69	-448.22	-447.88	1.32	-1.24	-2.52	
4,780.00	8.48	218.61	4,727.59	-487.54	-457.29	-458.14	1.56	-1.49	-2.73	
4,868.00	8.71	221.48	4,814.60	-497.60	-465.76	-467.66	0.55	0.26	3.26	
4,958.00	9.72	218.96	4,903.44	-508.61	-475.05	-478.07	1.21	1.12	-2.80	
5,047.00	8.44	226.19	4,991.32	-518.98	-484.48	-487.83	1.92	-1.44	8.12	
5,136.00	9.24	222.18	5,079.27	-528.79	-494.00	-497.03	1.13	0.90	-4.51	
5,225.00	9.50	218.13	5,167.08	-539.87	-503.33	-507.50	0.80	0.29	-4.55	
5,314.00	8.00	219.41	5,255.04	-550.43	-511.80	-517.52	1.70	-1.69	1.44	
5,425.00	8.09	219.41	5,364.95	-562.43	-521.66	-528.89	0.08	0.08	0.00	
5,514.00	8.79	216.81	5,452.98	-572.72	-529.71	-538.65	0.90	0.79	-2.92	
5,582.00	8.56	229.45	5,520.21	-580.17	-536.67	-545.65	2.82	-0.34	18.58	
KOP - 5582' MD, 5520' TVD										
5,603.00	8.57	233.42	5,540.98	-582.11	-539.11	-547.44	2.82	0.06	18.92	
5,693.00	19.44	287.93	5,628.48	-581.50	-558.87	-545.60	17.78	12.08	60.57	
5,782.00	22.14	328.52	5,712.10	-562.53	-581.84	-525.24	16.15	3.03	45.61	
5,871.00	25.72	10.31	5,794.01	-528.99	-587.18	-491.43	19.07	4.02	46.95	
5,960.00	31.20	355.53	5,872.32	-486.92	-585.52	-449.54	9.99	6.16	-16.61	
6,049.00	34.20	350.02	5,947.23	-439.28	-591.65	-401.62	4.75	3.37	-6.19	
6,138.00	45.52	354.30	6,015.45	-382.86	-599.17	-344.84	13.08	12.72	4.81	
6,227.00	60.54	359.32	6,068.84	-312.09	-602.80	-273.98	17.46	16.88	5.64	
6,316.00	68.18	2.10	6,107.33	-231.93	-601.75	-194.04	9.03	8.58	3.12	
6,405.00	74.11	2.84	6,136.08	-147.82	-598.11	-110.32	6.71	6.66	0.83	
6,491.00	85.29	2.59	6,151.43	-63.44	-594.11	-26.35	13.00	13.00	-0.29	
HZ LANDING PNT - 6491' MD, 6151' TVD										
6,494.00	85.68	2.58	6,151.67	-60.45	-593.98	-23.37	13.00	13.00	-0.28	
6,549.16	87.38	1.43	6,155.01	-5.43	-592.05	31.42	3.71	3.08	-2.08	
~460' X-OVER PNT - 6549.16' MD, 460' FSL, 533' FWL SEC 11										
6,583.00	88.42	0.73	6,156.25	28.38	-591.41	65.13	3.71	3.08	-2.08	
6,672.00	88.25	0.64	6,158.83	117.34	-590.35	153.84	0.22	-0.19	-0.10	
6,761.00	89.70	359.54	6,160.42	206.32	-590.21	242.64	2.04	1.63	-1.24	
6,851.00	89.48	359.85	6,161.07	296.32	-590.69	332.50	0.42	-0.24	0.34	
6,940.00	90.01	359.23	6,161.46	385.31	-591.40	421.36	0.92	0.60	-0.70	
7,029.00	91.12	359.45	6,160.59	474.30	-592.43	510.24	1.27	1.25	0.25	
7,118.00	91.47	358.70	6,158.58	563.27	-593.87	599.13	0.93	0.39	-0.84	
7,207.00	91.12	0.29	6,156.56	652.24	-594.65	687.97	1.83	-0.39	1.79	
7,296.00	91.30	0.73	6,154.68	741.21	-593.86	776.73	0.53	0.20	0.49	
7,385.00	88.29	359.19	6,155.00	830.20	-593.92	865.55	3.80	-3.38	-1.73	
7,474.00	88.82	359.76	6,157.25	919.17	-594.73	954.39	0.87	0.60	0.64	
7,563.00	90.10	0.82	6,158.09	1,008.16	-594.28	1,043.18	1.87	1.44	1.19	
7,652.00	90.85	1.08	6,157.35	1,097.14	-592.81	1,131.90	0.89	0.84	0.29	
7,741.00	90.81	1.57	6,156.06	1,186.11	-590.75	1,220.57	0.55	-0.04	0.55	
7,830.00	88.91	0.07	6,156.28	1,275.09	-589.48	1,309.30	2.72	-2.13	-1.69	
7,919.00	89.26	0.20	6,157.70	1,364.08	-589.27	1,398.10	0.42	0.39	0.15	

Survey Report

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Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4729.20usft
Well:	GROTHEER 5-61 11A-2-1	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)	
8,008.00	90.54	0.38	6,157.85	1,453.08	-588.82	1,486.90	1.45	1.44	0.20	
8,098.00	89.79	0.02	6,157.59	1,543.08	-588.50	1,576.70	0.92	-0.83	-0.40	
8,187.00	91.30	359.23	6,156.75	1,632.07	-589.09	1,665.56	1.91	1.70	-0.89	
8,275.00	90.85	359.01	6,155.10	1,720.04	-590.44	1,753.45	0.57	-0.51	-0.25	
8,364.00	90.28	357.51	6,154.22	1,808.99	-593.14	1,842.39	1.80	-0.64	-1.69	
8,454.00	92.22	358.35	6,152.26	1,898.91	-596.39	1,932.34	2.35	2.16	0.93	
8,543.00	92.49	359.01	6,148.60	1,987.81	-598.44	2,021.19	0.80	0.30	0.74	
8,632.00	91.47	359.10	6,145.52	2,076.74	-599.90	2,110.05	1.15	-1.15	0.10	
8,721.00	90.94	359.72	6,143.65	2,165.72	-600.82	2,198.90	0.92	-0.60	0.70	
8,810.00	90.23	0.38	6,142.74	2,254.71	-600.74	2,287.72	1.09	-0.80	0.74	
8,899.00	91.16	359.89	6,141.66	2,343.70	-600.53	2,376.53	1.18	1.04	-0.55	
8,988.00	90.10	1.26	6,140.68	2,432.69	-599.64	2,465.29	1.95	-1.19	1.54	
9,077.00	89.35	1.43	6,141.11	2,521.66	-597.55	2,553.96	0.86	-0.84	0.19	
9,166.00	89.13	359.10	6,142.29	2,610.65	-597.14	2,642.75	2.63	-0.25	-2.62	
9,255.00	89.44	359.76	6,143.40	2,699.64	-598.02	2,731.62	0.82	0.35	0.74	
9,345.00	90.81	0.64	6,143.21	2,789.63	-597.71	2,821.42	1.81	1.52	0.98	
9,434.00	90.06	359.58	6,142.53	2,878.63	-597.54	2,910.23	1.46	-0.84	-1.19	
9,523.00	90.01	357.95	6,142.48	2,967.61	-599.46	2,999.15	1.83	-0.06	-1.83	
9,612.00	90.41	359.19	6,142.15	3,056.58	-601.68	3,088.09	1.46	0.45	1.39	
9,701.00	91.12	358.09	6,140.96	3,145.54	-603.79	3,177.01	1.47	0.80	-1.24	
9,790.00	90.19	358.66	6,139.94	3,234.50	-606.31	3,265.96	1.23	-1.04	0.64	
9,879.00	90.59	359.23	6,139.34	3,323.48	-607.95	3,354.87	0.78	0.45	0.64	
9,968.00	88.38	358.83	6,140.14	3,412.46	-609.46	3,443.77	2.52	-2.48	-0.45	
10,057.00	87.54	358.13	6,143.31	3,501.37	-611.82	3,532.65	1.23	-0.94	-0.79	
10,146.00	89.40	0.51	6,145.68	3,590.32	-612.87	3,621.50	3.39	2.09	2.67	
10,235.00	89.13	0.82	6,146.83	3,679.31	-611.84	3,710.25	0.46	-0.30	0.35	
10,324.00	89.57	0.86	6,147.84	3,768.29	-610.54	3,798.98	0.50	0.49	0.04	
10,413.00	90.32	0.73	6,147.92	3,857.28	-609.30	3,887.72	0.86	0.84	-0.15	
10,502.00	91.07	0.16	6,146.84	3,946.27	-608.61	3,976.49	1.06	0.84	-0.64	
10,591.00	91.56	359.80	6,144.80	4,035.25	-608.64	4,065.30	0.68	0.55	-0.40	
10,680.00	88.42	359.32	6,144.81	4,124.23	-609.32	4,154.16	3.57	-3.53	-0.54	
10,807.00	89.35	359.32	6,147.29	4,251.20	-610.83	4,280.97	0.73	0.73	0.00	
10,896.00	89.09	358.75	6,148.50	4,340.18	-612.33	4,369.87	0.70	-0.29	-0.64	
10,985.00	89.79	358.53	6,149.37	4,429.15	-614.44	4,458.80	0.82	0.79	-0.25	
11,074.00	92.36	3.33	6,147.70	4,518.09	-613.00	4,547.47	6.12	2.89	5.39	
11,163.00	89.79	0.91	6,146.03	4,607.00	-609.71	4,636.01	3.97	-2.89	-2.72	
11,252.00	90.01	2.01	6,146.18	4,695.97	-607.44	4,724.66	1.26	0.25	1.24	
11,342.00	89.17	358.88	6,146.83	4,785.95	-606.74	4,814.43	3.60	-0.93	-3.48	
11,431.00	89.48	358.92	6,147.87	4,874.93	-608.45	4,903.34	0.35	0.35	0.04	
11,520.00	90.41	359.89	6,147.96	4,963.92	-609.38	4,992.22	1.51	1.04	1.09	
11,609.00	90.94	359.50	6,146.91	5,052.91	-609.85	5,081.07	0.74	0.60	-0.44	
11,698.00	91.78	358.61	6,144.80	5,141.87	-611.32	5,169.95	1.37	0.94	-1.00	
11,787.00	91.21	1.04	6,142.48	5,230.84	-611.59	5,258.75	2.80	-0.64	2.73	

Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11A-2-1
Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4729.20usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4729.20usft
Well:	GROTHEER 5-61 11A-2-1	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)	
11,877.00	89.53	0.69	6,141.90	5,320.82	-610.23	5,348.48	1.91	-1.87	-0.39	
11,966.00	89.26	0.47	6,142.84	5,409.81	-609.33	5,437.24	0.39	-0.30	-0.25	
12,055.00	91.25	2.45	6,142.44	5,498.77	-607.06	5,525.89	3.15	2.24	2.22	
12,144.00	91.47	2.32	6,140.33	5,587.67	-603.36	5,614.38	0.29	0.25	-0.15	
12,233.00	89.44	2.18	6,139.62	5,676.59	-599.87	5,702.92	2.29	-2.28	-0.16	
12,322.00	89.17	2.18	6,140.70	5,765.52	-596.48	5,791.46	0.30	-0.30	0.00	
12,411.00	88.56	1.48	6,142.46	5,854.46	-593.64	5,880.05	1.04	-0.69	-0.79	
12,500.00	87.89	1.48	6,145.22	5,943.39	-591.34	5,968.66	0.75	-0.75	0.00	
12,589.00	90.15	0.38	6,146.74	6,032.35	-589.90	6,057.37	2.82	2.54	-1.24	
12,678.00	91.03	359.63	6,145.82	6,121.35	-589.89	6,146.19	1.30	0.99	-0.84	
12,767.00	89.00	359.14	6,145.80	6,210.34	-590.84	6,235.07	2.35	-2.28	-0.55	
12,856.00	90.37	0.02	6,146.29	6,299.33	-591.50	6,323.93	1.83	1.54	0.99	
12,945.00	91.56	0.24	6,144.79	6,388.32	-591.29	6,412.73	1.36	1.34	0.25	
13,034.00	91.38	0.38	6,142.51	6,477.29	-590.81	6,501.50	0.26	-0.20	0.16	
13,123.00	90.68	359.80	6,140.91	6,566.27	-590.67	6,590.30	1.02	-0.79	-0.65	
13,212.00	91.43	359.85	6,139.27	6,655.25	-590.95	6,679.13	0.84	0.84	0.06	
13,301.00	90.32	359.98	6,137.91	6,744.24	-591.08	6,767.95	1.26	-1.25	0.15	
13,390.00	88.86	359.63	6,138.55	6,833.24	-591.38	6,856.79	1.69	-1.64	-0.39	
13,479.00	89.40	359.01	6,139.90	6,922.22	-592.44	6,945.67	0.92	0.61	-0.70	
13,568.00	90.68	358.97	6,139.84	7,011.20	-594.01	7,034.58	1.44	1.44	-0.04	
13,657.00	89.66	1.35	6,139.57	7,100.20	-593.76	7,123.38	2.91	-1.15	2.67	
13,746.00	89.13	1.57	6,140.51	7,189.16	-591.49	7,212.03	0.64	-0.60	0.25	
13,835.00	88.91	1.48	6,142.04	7,278.12	-589.12	7,300.67	0.27	-0.25	-0.10	
13,924.00	88.47	1.39	6,144.07	7,367.07	-586.89	7,389.31	0.50	-0.49	-0.10	
14,013.00	87.76	1.21	6,147.00	7,455.99	-584.87	7,477.94	0.82	-0.80	-0.20	
14,102.00	89.57	359.98	6,149.07	7,544.96	-583.95	7,566.67	2.46	2.03	-1.38	
14,191.00	90.81	2.80	6,148.78	7,633.92	-581.79	7,655.33	3.46	1.39	3.17	
14,281.00	90.46	2.45	6,147.78	7,723.82	-577.67	7,744.80	0.55	-0.39	-0.39	
14,370.00	89.48	358.35	6,147.82	7,812.80	-577.05	7,833.57	4.74	-1.10	-4.61	
14,459.00	90.41	359.63	6,147.91	7,901.78	-578.62	7,922.47	1.78	1.04	1.44	
14,548.00	89.62	356.72	6,147.89	7,990.73	-581.45	8,011.42	3.39	-0.89	-3.27	
14,637.00	90.10	359.98	6,148.10	8,079.68	-584.01	8,100.36	3.70	0.54	3.66	
14,726.00	89.79	2.62	6,148.19	8,168.65	-582.00	8,189.03	2.99	-0.35	2.97	
14,815.00	90.54	1.70	6,147.93	8,257.58	-578.64	8,277.59	1.33	0.84	-1.03	
14,904.00	90.23	358.75	6,147.34	8,346.57	-578.29	8,366.38	3.33	-0.35	-3.31	
14,993.00	90.90	358.57	6,146.46	8,435.54	-580.37	8,455.31	0.78	0.75	-0.20	
15,082.00	91.52	358.04	6,144.58	8,524.48	-583.01	8,544.24	0.92	0.70	-0.60	
15,171.00	89.62	359.32	6,143.69	8,613.45	-585.06	8,633.16	2.57	-2.13	1.44	
15,260.00	90.06	357.73	6,143.94	8,702.41	-587.35	8,722.10	1.85	0.49	-1.79	
15,349.00	89.62	356.54	6,144.19	8,791.30	-591.79	8,811.09	1.43	-0.49	-1.34	
15,439.00	90.01	357.73	6,144.48	8,881.19	-596.29	8,901.08	1.39	0.43	1.32	
15,528.00	89.97	357.29	6,144.50	8,970.10	-600.16	8,990.06	0.50	-0.04	-0.49	
15,617.00	90.41	359.76	6,144.20	9,059.06	-602.45	9,079.00	2.82	0.49	2.78	
15,706.00	91.34	359.80	6,142.84	9,148.05	-602.79	9,167.83	1.05	1.04	0.04	

Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11A-2-1
Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4729.20usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4729.20usft
Well:	GROTHEER 5-61 11A-2-1	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)
15,795.00	89.84	0.95	6,141.93	9,237.04	-602.21	9,256.61	2.12	-1.69	1.29
15,884.00	90.28	0.38	6,141.83	9,326.03	-601.18	9,345.37	0.81	0.49	-0.64
15,973.00	89.35	359.14	6,142.12	9,415.03	-601.55	9,434.22	1.74	-1.04	-1.39
16,062.00	89.26	358.66	6,143.20	9,504.01	-603.26	9,523.13	0.55	-0.10	-0.54
16,151.00	89.22	357.47	6,144.38	9,592.95	-606.26	9,612.08	1.34	-0.04	-1.34
16,240.00	90.01	359.14	6,144.98	9,681.90	-608.89	9,701.03	2.08	0.89	1.88
16,254.32	90.11	359.19	6,144.96	9,696.22	-609.10	9,715.33	0.76	0.67	0.35
~460' X-OVER PNT - 16254.32' MD, 460' FNL, 489' FWL SEC 2									
16,280.00	90.28	359.28	6,144.88	9,721.90	-609.45	9,740.98	0.76	0.67	0.35
LAST SURVEY - 16280' MD, 6145' TVD									
16,348.00	90.28	359.28	6,144.54	9,789.89	-610.30	9,808.90	0.00	0.00	0.00
EXTRAPOLATION TO TD - 16348' MD, 366' FNL, 488' FWL SEC 2									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
EPI - GROTHEER 5-61	0.00	0.00	6,138.00	9,696.22	-613.53	1,404,536.66	3,366,491.76	40.436386°N	104.183345°W
- hit/miss target									
- Shape									
- actual wellpath misses target center by 8.25usft at 16254.41usft MD (6144.96 TVD, 9696.31 N, -609.10 E)									
- Point									
PBHL - GROTHEER 5-6	0.00	0.00	6,138.00	9,796.05	-613.25	1,404,636.47	3,366,490.56	40.436660°N	104.183344°W
- actual wellpath misses target center by 9.46usft at 16348.00usft MD (6144.54 TVD, 9789.89 N, -610.30 E)									
- Point									
LP - GROTHEER 5-61 1	0.00	0.00	6,165.00	-5.43	-614.61	1,394,836.44	3,366,634.97	40.409756°N	104.183348°W
- actual wellpath misses target center by 24.67usft at 6548.97usft MD (6155.00 TVD, -5.62 N, -592.06 E)									
- Point									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,967.00	1,950.32	-162.90	-152.31	SURFACE CSG - 1967' MD, 1950' TVD
5,582.00	5,520.21	-580.17	-536.67	KOP - 5582' MD, 5520' TVD
6,491.00	6,151.43	-63.44	-594.11	HZ LANDING PNT - 6491' MD, 6151' TVD
6,549.16	6,155.01	-5.43	-592.05	~460' X-OVER PNT - 6549.16' MD, 460' FSL, 533' FWL SEC 11
16,254.32	6,144.96	9,696.22	-609.10	~460' X-OVER PNT - 16254.32' MD, 460' FNL, 489' FWL SEC 2
16,280.00	6,144.88	9,721.90	-609.45	LAST SURVEY - 16280' MD, 6145' TVD
16,348.00	6,144.54	9,789.89	-610.30	EXTRAPOLATION TO TD - 16348' MD, 366' FNL, 488' FWL SEC 2

Checked By: _____ Approved By: _____ Date: _____