

# **BISON OIL & GAS II**

**WELD COUNTY**

**SEC 11-T5N-61W**

**GROTHER 5-61 11B-2-3**

**OWB**

**Design: FINAL SURVEY**

## **Standard Survey Report**

**03 October, 2022**

Project: WELD COUNTY  
Site: SEC 11-T5N-61W  
Well: GROTHEER 5-61 11B-2-3  
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: 51912.5nT  
Dip Angle: 66.70° XTRAPOLATION TO TD - 16253' MD, 360' FNL, 1369' FEL SEC 2  
Date: 6/23/2022  
Model: IGRF2020

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

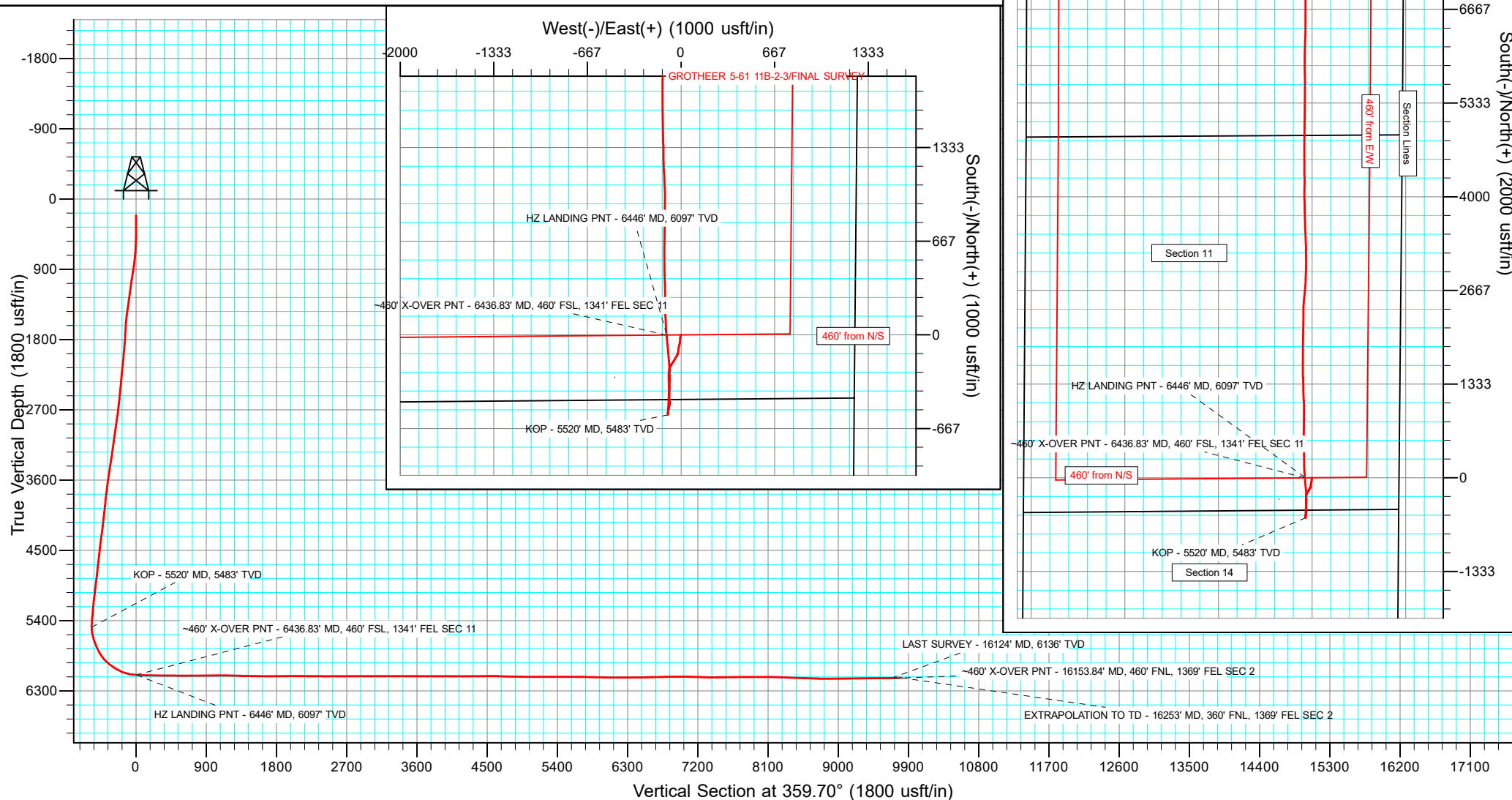
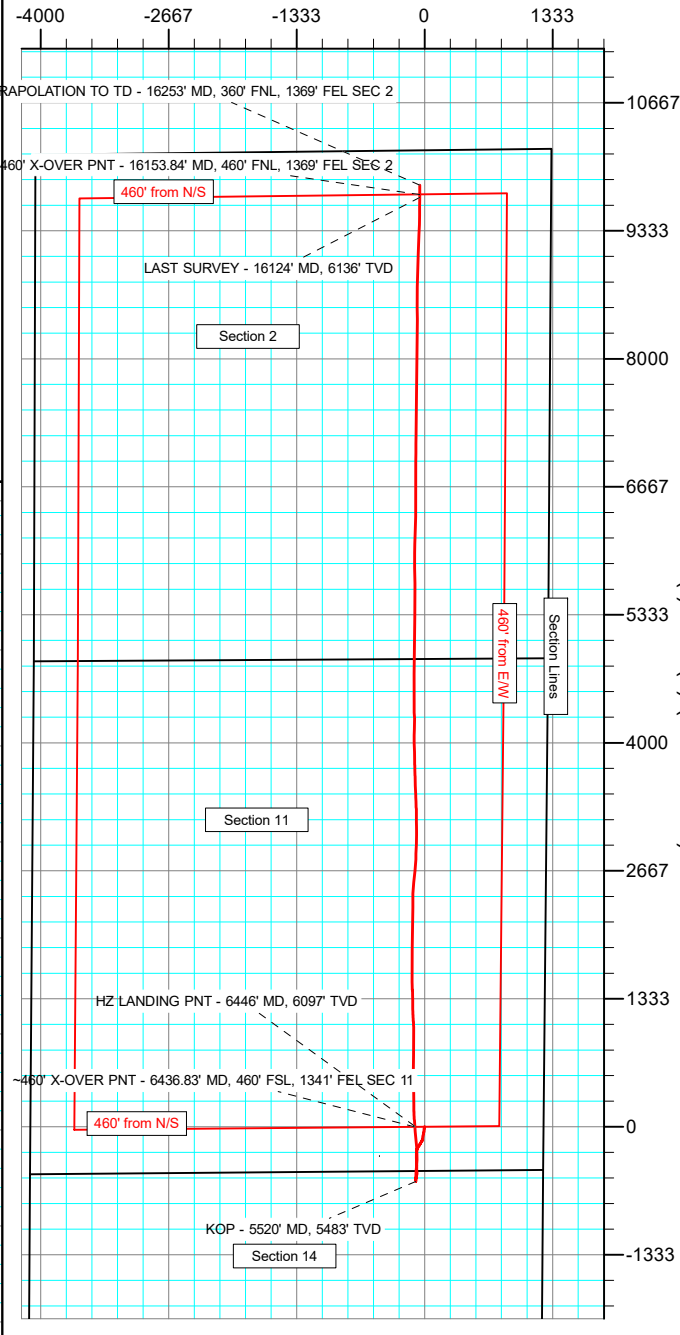
+N/-S	+E/-W	Northing	Ground Level: Easting	4691.60 Latitude	Longitude	Slot
0.00	0.00	1394921.78	3370232.21	40.409843°N	104.170427°W	

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
5520.00	0.65	167.63	5483.30	-569.41	-93.34	-568.92	595.03	KOP - 5520' MD, 5483' TVD
6436.83	87.67	356.49	6096.23	-1.79	-103.53	-1.25	1166.97	~460' X-OVER PNT - 6436.83' MD, 460' FSL, 1341' FEL SEC 11
6446.00	88.65	356.91	6096.52	7.36	-104.05	7.90	1176.07	HZ LANDING PNT - 6446' MD, 6097' TVD
16124.00	91.39	0.18	6135.69	9680.24	-51.48	9680.37	10852.70	LAST SURVEY - 16124' MD, 6136' TVD
16153.84	91.39	0.18	6134.97	9710.07	-51.38	9710.20	10882.53	~460' X-OVER PNT - 16153.84' MD, 460' FNL, 1369' FEL SEC 2
16253.00	91.39	0.18	6132.56	9809.20	-51.07	9809.33	10981.66	EXTRAPOLATION TO TD - 16253' MD, 360' FNL, 1369' FEL SEC 2

SHL:  
460' FSL, 1238' FEL  
Sec 11-T5N-R61W  
~460' X-OVER PNT:  
460' FSL, 1341' FEL  
Sec 11-T5N-R61W  
~460' X-OVER PNT:  
460' FNL, 1369' FEL  
Sec 2-T5N-R61W  
BHL:  
360' FNL, 1369' FEL  
Sec 2-T5N-R61W

West(-)/East(+) (2000 usft/in)



## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-2-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KBE 24' @ 4715.60usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KBE 24' @ 4715.60usft
<b>Well:</b>	GROTHEER 5-61 11B-2-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

<b>Project</b>	WELD COUNTY		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	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 11B-2-3				
Well Position	+N/-S	0.00 usft	Northing:	1,394,921.78 usft	Latitude:	40.409843°N
	+E/-W	0.00 usft	Easting:	3,370,232.21 usft	Longitude:	104.170427°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,691.60 usft

<b>Wellbore</b>	OWB				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	6/23/2022	7.43	66.70	51,912.48992899

<b>Design</b>	FINAL SURVEY				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		359.70

<b>Survey Program</b>	<b>Date</b>	10/3/2022			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
302.00	1,925.00	SURFACE SURVEY (OWB)	MWD	OWSG MWD - Standard	
2,055.00	16,253.00	FINAL SURVEY (OWB)	MWD	OWSG MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
210.00	0.60	0.46	210.00	0.73	0.76	0.73	0.00	0.00	0.00	
302.00	0.40	192.10	301.99	0.90	0.70	0.89	1.08	-0.22	-183.00	
376.00	0.40	201.00	375.99	0.40	0.55	0.40	0.08	0.00	12.03	
463.00	0.30	209.30	462.99	-0.08	0.33	-0.08	0.13	-0.11	9.54	
550.00	1.90	207.40	549.97	-1.56	-0.45	-1.56	1.84	1.84	-2.18	
637.00	3.80	202.50	636.86	-5.50	-2.21	-5.49	2.20	2.18	-5.63	
725.00	5.50	194.50	724.57	-12.28	-4.38	-12.26	2.06	1.93	-9.09	
812.00	7.10	183.70	811.04	-21.68	-5.78	-21.65	2.28	1.84	-12.41	
899.00	8.60	182.50	897.23	-33.55	-6.41	-33.51	1.73	1.72	-1.38	
986.00	9.70	187.30	983.12	-47.32	-7.62	-47.28	1.54	1.26	5.52	

## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-2-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KBE 24' @ 4715.60usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KBE 24' @ 4715.60usft
<b>Well:</b>	GROTHEER 5-61 11B-2-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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)
1,073.00	8.30	190.10	1,069.05	-60.77	-9.65	-60.72	1.69	-1.61	3.22
1,160.00	7.60	195.40	1,155.21	-72.50	-12.28	-72.43	1.16	-0.80	6.09
1,248.00	8.10	193.80	1,242.39	-84.13	-15.31	-84.05	0.62	0.57	-1.82
1,335.00	8.10	188.30	1,328.52	-96.15	-17.65	-96.05	0.89	0.00	-6.32
1,422.00	8.40	187.70	1,414.62	-108.51	-19.39	-108.41	0.36	0.34	-0.69
1,509.00	7.10	182.90	1,500.82	-120.18	-20.51	-120.07	1.67	-1.49	-5.52
1,597.00	4.60	186.90	1,588.36	-129.11	-21.21	-129.00	2.88	-2.84	4.55
1,684.00	3.10	205.00	1,675.16	-134.71	-22.63	-134.59	2.20	-1.72	20.80
1,771.00	3.70	210.50	1,762.01	-139.26	-25.05	-139.13	0.78	0.69	6.32
1,858.00	5.40	205.90	1,848.73	-145.36	-28.26	-145.21	2.00	1.95	-5.29
1,925.00	5.80	211.50	1,915.41	-151.08	-31.40	-150.92	1.01	0.60	8.36
2,055.00	6.47	212.54	2,044.67	-162.86	-38.78	-162.65	0.52	0.52	0.80
2,150.00	6.50	208.13	2,139.06	-172.11	-44.19	-171.88	0.53	0.03	-4.64
2,245.00	6.09	202.73	2,233.49	-181.50	-48.67	-181.25	0.76	-0.43	-5.68
2,340.00	7.00	216.57	2,327.87	-190.80	-54.07	-190.52	1.91	0.96	14.57
2,529.00	6.28	214.52	2,515.61	-208.57	-66.79	-208.22	0.40	-0.38	-1.08
2,624.00	7.67	206.57	2,609.90	-218.52	-72.57	-218.14	1.78	1.46	-8.37
2,719.00	7.05	208.33	2,704.12	-229.32	-78.17	-228.91	0.69	-0.65	1.85
2,814.00	9.22	192.28	2,798.17	-241.89	-82.56	-241.46	3.29	2.28	-16.89
2,910.00	8.31	188.41	2,893.05	-256.27	-85.21	-255.82	1.13	-0.95	-4.03
3,030.00	7.57	182.77	3,011.90	-272.75	-86.86	-272.29	0.89	-0.62	-4.70
3,124.00	8.37	180.92	3,104.99	-285.77	-87.27	-285.31	0.89	0.85	-1.97
3,220.00	7.86	180.28	3,200.03	-299.32	-87.41	-298.86	0.54	-0.53	-0.67
3,314.00	8.21	178.72	3,293.11	-312.46	-87.29	-312.00	0.44	0.37	-1.66
3,409.00	8.54	179.55	3,387.09	-326.29	-87.09	-325.84	0.37	0.35	0.87
3,504.00	8.80	176.71	3,481.01	-340.60	-86.62	-340.15	0.53	0.27	-2.99
3,600.00	9.03	175.57	3,575.85	-355.44	-85.61	-354.99	0.30	0.24	-1.19
3,695.00	7.07	180.83	3,669.91	-368.72	-85.12	-368.28	2.20	-2.06	5.54
3,790.00	6.39	179.45	3,764.25	-379.86	-85.15	-379.41	0.74	-0.72	-1.45
3,884.00	6.35	174.08	3,857.67	-390.26	-84.57	-389.81	0.64	-0.04	-5.71
3,979.00	6.14	165.85	3,952.11	-400.41	-82.78	-399.97	0.97	-0.22	-8.66
4,074.00	7.07	184.71	4,046.49	-411.16	-82.02	-410.73	2.47	0.98	19.85
4,169.00	5.83	185.09	4,140.89	-421.80	-82.93	-421.36	1.31	-1.31	0.40
4,264.00	7.88	182.98	4,235.20	-433.11	-83.70	-432.67	2.17	2.16	-2.22
4,359.00	7.76	176.45	4,329.32	-446.01	-83.64	-445.57	0.94	-0.13	-6.87
4,453.00	6.95	170.90	4,422.55	-457.96	-82.35	-457.53	1.15	-0.86	-5.90
4,548.00	6.47	170.99	4,516.90	-468.92	-80.60	-468.50	0.51	-0.51	0.09
4,643.00	5.74	171.04	4,611.36	-478.90	-79.02	-478.49	0.77	-0.77	0.05
4,738.00	7.13	195.01	4,705.78	-489.29	-79.81	-488.87	3.15	1.46	25.23
4,833.00	6.36	191.16	4,800.12	-500.15	-82.35	-499.71	0.94	-0.81	-4.05
4,928.00	7.53	195.12	4,894.42	-511.32	-85.00	-510.87	1.33	1.23	4.17
5,024.00	6.44	191.01	4,989.71	-522.68	-87.66	-522.22	1.25	-1.14	-4.28
5,119.00	7.72	195.55	5,083.98	-534.06	-90.39	-533.58	1.47	1.35	4.78

# Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-2-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KBE 24' @ 4715.60usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KBE 24' @ 4715.60usft
<b>Well:</b>	GROTHEER 5-61 11B-2-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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)
5,214.00	5.96	184.76	5,178.30	-545.12	-92.51	-544.63	2.29	-1.85	-11.36
5,309.00	4.88	182.32	5,272.88	-554.07	-93.09	-553.58	1.16	-1.14	-2.57
5,404.00	4.40	181.61	5,367.57	-561.75	-93.35	-561.26	0.51	-0.51	-0.75
5,498.00	3.89	178.72	5,461.32	-568.55	-93.38	-568.05	0.59	-0.54	-3.07
5,520.00	0.65	167.63	5,483.30	-569.41	-93.34	-568.92	14.80	-14.74	-50.43
KOP - 5520' MD, 5483' TVD									
5,592.00	10.03	1.75	5,554.95	-563.53	-93.06	-563.04	14.80	13.03	-230.38
5,688.00	18.53	3.43	5,647.90	-539.90	-91.89	-539.42	8.86	8.85	1.75
5,782.00	23.03	1.80	5,735.77	-506.60	-90.42	-506.12	4.83	4.79	-1.73
5,878.00	30.15	2.53	5,821.56	-463.69	-88.76	-463.22	7.42	7.42	0.76
5,972.00	42.59	4.21	5,897.10	-408.16	-85.37	-407.71	13.28	13.23	1.79
6,067.00	52.69	1.71	5,961.03	-338.15	-81.87	-337.72	10.81	10.63	-2.63
6,161.00	58.39	359.44	6,014.20	-260.69	-81.15	-260.27	6.38	6.06	-2.41
6,256.00	66.94	354.94	6,057.80	-176.52	-85.41	-176.07	9.93	9.00	-4.74
6,351.00	78.55	352.49	6,085.94	-86.51	-95.38	-86.01	12.47	12.22	-2.58
6,436.83	87.67	356.49	6,096.23	-1.79	-103.53	-1.25	11.59	10.63	4.66
~460' X-OVER PNT - 6436.83' MD, 460' FSL, 1341' FEL SEC 11									
6,446.00	88.65	356.91	6,096.52	7.36	-104.05	7.90	11.59	10.65	4.59
HZ LANDING PNT - 6446' MD, 6097' TVD									
6,541.00	88.81	356.54	6,098.63	102.18	-109.48	102.75	0.42	0.17	-0.39
6,636.00	88.95	359.65	6,100.48	197.10	-112.64	197.68	3.28	0.15	3.27
6,730.00	89.49	359.20	6,101.76	291.08	-113.58	291.67	0.75	0.57	-0.48
6,826.00	89.56	358.64	6,102.56	387.06	-115.39	387.66	0.59	0.07	-0.58
6,921.00	89.00	358.12	6,103.75	482.01	-118.08	482.62	0.80	-0.59	-0.55
7,015.00	89.84	1.10	6,104.70	576.00	-118.71	576.61	3.29	0.89	3.17
7,111.00	90.25	0.43	6,104.63	671.99	-117.43	672.59	0.82	0.43	-0.70
7,205.00	90.25	0.51	6,104.22	765.98	-116.66	766.58	0.09	0.00	0.09
7,300.00	90.83	0.68	6,103.32	860.97	-115.68	861.56	0.64	0.61	0.18
7,395.00	90.94	0.44	6,101.86	955.96	-114.75	956.54	0.28	0.12	-0.25
7,490.00	90.38	358.01	6,100.76	1,050.93	-116.03	1,051.52	2.62	-0.59	-2.56
7,585.00	88.85	356.27	6,101.40	1,145.81	-120.77	1,146.42	2.44	-1.61	-1.83
7,679.00	88.32	358.96	6,103.72	1,239.69	-124.68	1,240.32	2.92	-0.56	2.86
7,775.00	89.11	359.68	6,105.88	1,335.66	-125.82	1,336.29	1.11	0.82	0.75
7,869.00	88.59	357.33	6,107.76	1,429.60	-128.27	1,430.25	2.56	-0.55	-2.50
7,964.00	88.89	359.84	6,109.85	1,524.54	-130.62	1,525.20	2.66	0.32	2.64
8,059.00	89.73	359.80	6,111.00	1,619.53	-130.92	1,620.19	0.89	0.88	-0.04
8,155.00	90.28	359.19	6,110.99	1,715.53	-131.76	1,716.19	0.86	0.57	-0.64
8,250.00	89.89	1.53	6,110.85	1,810.52	-131.17	1,811.18	2.50	-0.41	2.46
8,344.00	90.87	1.27	6,110.22	1,904.49	-128.87	1,905.13	1.08	1.04	-0.28
8,438.00	91.29	1.38	6,108.45	1,998.44	-126.70	1,999.08	0.46	0.45	0.12
8,532.00	88.99	0.76	6,108.22	2,092.42	-124.94	2,093.04	2.53	-2.45	-0.66
8,626.00	89.00	0.27	6,109.87	2,186.40	-124.10	2,187.02	0.52	0.01	-0.52
8,722.00	90.34	1.80	6,110.42	2,282.38	-122.36	2,282.99	2.12	1.40	1.59
8,816.00	88.69	358.03	6,111.22	2,376.36	-122.50	2,376.96	4.38	-1.76	-4.01

## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-2-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KBE 24' @ 4715.60usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KBE 24' @ 4715.60usft
<b>Well:</b>	GROTHEER 5-61 11B-2-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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)
8,910.00	90.12	4.02	6,112.20	2,470.29	-120.82	2,470.89	6.55	1.52	6.37
9,003.00	90.33	7.87	6,111.83	2,562.77	-111.19	2,563.32	4.15	0.23	4.14
9,099.00	90.82	5.08	6,110.87	2,658.15	-100.36	2,658.63	2.95	0.51	-2.91
9,193.00	89.81	2.33	6,110.35	2,751.94	-94.29	2,752.39	3.12	-1.07	-2.93
9,287.00	90.16	2.29	6,110.37	2,845.86	-90.50	2,846.29	0.37	0.37	-0.04
9,382.00	89.92	1.70	6,110.31	2,940.80	-87.20	2,941.22	0.67	-0.25	-0.62
9,478.00	90.30	0.62	6,110.12	3,036.78	-85.25	3,037.18	1.19	0.40	-1.12
9,573.00	89.58	358.65	6,110.22	3,131.77	-85.86	3,132.18	2.21	-0.76	-2.07
9,668.00	90.24	359.96	6,110.37	3,226.76	-87.01	3,227.17	1.54	0.69	1.38
9,763.00	90.08	358.70	6,110.11	3,321.76	-88.12	3,322.17	1.34	-0.17	-1.33
9,858.00	89.80	356.78	6,110.21	3,416.68	-91.87	3,417.11	2.04	-0.29	-2.02
9,952.00	89.43	358.52	6,110.84	3,510.59	-95.72	3,511.04	1.89	-0.39	1.85
10,047.00	89.84	358.46	6,111.44	3,605.56	-98.22	3,606.02	0.44	0.43	-0.06
10,143.00	90.30	357.43	6,111.33	3,701.49	-101.67	3,701.97	1.18	0.48	-1.07
10,237.00	89.22	359.01	6,111.72	3,795.44	-104.59	3,795.94	2.04	-1.15	1.68
10,332.00	90.22	358.86	6,112.18	3,890.42	-106.35	3,890.93	1.06	1.05	-0.16
10,427.00	90.66	358.55	6,111.45	3,985.40	-108.50	3,985.91	0.57	0.46	-0.33
10,521.00	89.57	0.91	6,111.27	4,079.39	-108.94	4,079.90	2.77	-1.16	2.51
10,615.00	89.91	0.26	6,111.69	4,173.38	-107.98	4,173.89	0.78	0.36	-0.69
10,711.00	90.17	359.79	6,111.63	4,269.38	-107.94	4,269.88	0.56	0.27	-0.49
10,806.00	91.15	0.04	6,110.53	4,364.37	-108.08	4,364.88	1.06	1.03	0.26
10,901.00	89.60	359.52	6,109.91	4,459.37	-108.45	4,459.87	1.72	-1.63	-0.55
10,996.00	91.03	359.81	6,109.39	4,554.36	-109.00	4,554.87	1.54	1.51	0.31
11,092.00	87.97	359.80	6,110.22	4,650.35	-109.33	4,650.85	3.19	-3.19	-0.01
11,186.00	87.97	359.52	6,113.55	4,744.29	-109.88	4,744.79	0.30	0.00	-0.30
11,281.00	88.45	359.46	6,116.52	4,839.23	-110.73	4,839.75	0.51	0.51	-0.06
11,470.00	89.64	1.22	6,119.67	5,028.19	-109.61	5,028.70	1.12	0.63	0.93
11,565.00	91.40	2.05	6,118.81	5,123.15	-106.90	5,123.63	2.05	1.85	0.87
11,661.00	89.28	1.54	6,118.24	5,219.09	-103.89	5,219.56	2.27	-2.21	-0.53
11,756.00	90.04	0.88	6,118.80	5,314.07	-101.89	5,314.53	1.06	0.80	-0.69
11,850.00	89.97	0.23	6,118.80	5,408.06	-100.97	5,408.52	0.70	-0.07	-0.69
11,946.00	90.05	0.15	6,118.78	5,504.06	-100.66	5,504.51	0.12	0.08	-0.08
12,041.00	89.77	359.68	6,118.93	5,599.06	-100.80	5,599.51	0.58	-0.29	-0.49
12,136.00	89.09	359.18	6,119.87	5,694.05	-101.74	5,694.50	0.89	-0.72	-0.53
12,231.00	88.50	358.56	6,121.87	5,789.01	-103.62	5,789.47	0.90	-0.62	-0.65
12,326.00	88.90	358.31	6,124.03	5,883.95	-106.21	5,884.42	0.50	0.42	-0.26
12,420.00	88.75	2.07	6,125.96	5,977.91	-105.90	5,978.38	4.00	-0.16	4.00
12,516.00	88.68	1.88	6,128.11	6,073.83	-102.59	6,074.29	0.21	-0.07	-0.20
12,611.00	90.22	2.57	6,129.02	6,168.75	-98.90	6,169.19	1.78	1.62	0.73
12,705.00	90.22	1.43	6,128.66	6,262.69	-95.62	6,263.11	1.21	0.00	-1.21
12,800.00	89.69	359.24	6,128.73	6,357.69	-95.07	6,358.10	2.37	-0.56	-2.31
12,896.00	91.56	1.41	6,127.69	6,453.67	-94.52	6,454.07	2.98	1.95	2.26
12,991.00	91.53	0.02	6,125.12	6,548.63	-93.34	6,549.02	1.46	-0.03	-1.46

# Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-2-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KBE 24' @ 4715.60usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KBE 24' @ 4715.60usft
<b>Well:</b>	GROTHEER 5-61 11B-2-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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)
13,086.00	92.58	359.72	6,121.72	6,643.56	-93.55	6,643.96	1.15	1.11	-0.32
13,180.00	89.78	359.75	6,119.78	6,737.53	-93.99	6,737.93	2.98	-2.98	0.03
13,274.00	90.88	0.67	6,119.24	6,831.53	-93.64	6,831.92	1.53	1.17	0.98
13,369.00	91.69	1.21	6,117.11	6,926.49	-92.08	6,926.88	1.02	0.85	0.57
13,464.00	88.51	0.40	6,116.95	7,021.47	-90.75	7,021.84	3.45	-3.35	-0.85
13,558.00	88.54	0.15	6,119.36	7,115.43	-90.30	7,115.81	0.27	0.03	-0.27
13,654.00	88.27	0.34	6,122.04	7,211.40	-89.89	7,211.77	0.34	-0.28	0.20
13,749.00	87.99	359.55	6,125.14	7,306.35	-89.98	7,306.71	0.88	-0.29	-0.83
13,843.00	90.19	1.67	6,126.63	7,400.32	-88.98	7,400.68	3.25	2.34	2.26
13,938.00	90.54	0.90	6,126.02	7,495.29	-86.85	7,495.64	0.89	0.37	-0.81
14,033.00	90.60	1.00	6,125.08	7,590.27	-85.27	7,590.61	0.12	0.06	0.11
14,128.00	91.02	0.94	6,123.74	7,685.25	-83.67	7,685.58	0.45	0.44	-0.06
14,223.00	91.49	0.08	6,121.66	7,780.22	-82.82	7,780.55	1.03	0.49	-0.91
14,318.00	89.64	0.55	6,120.72	7,875.21	-82.30	7,875.53	2.01	-1.95	0.49
14,413.00	89.78	0.26	6,121.20	7,970.21	-81.63	7,970.52	0.34	0.15	-0.31
14,508.00	90.32	1.19	6,121.12	8,065.20	-80.42	8,065.51	1.13	0.57	0.98
14,603.00	88.03	1.35	6,122.48	8,160.16	-78.32	8,160.46	2.42	-2.41	0.17
14,699.00	87.98	0.44	6,125.83	8,256.09	-76.82	8,256.38	0.95	-0.05	-0.95
14,794.00	88.11	0.18	6,129.07	8,351.03	-76.31	8,351.31	0.31	0.14	-0.27
14,890.00	88.44	359.62	6,131.96	8,446.99	-76.47	8,447.27	0.68	0.34	-0.58
14,984.00	88.02	359.64	6,134.86	8,540.94	-77.08	8,541.23	0.45	-0.45	0.02
15,079.00	87.89	359.34	6,138.25	8,635.88	-77.93	8,636.16	0.34	-0.14	-0.32
15,174.00	88.20	359.69	6,141.49	8,730.82	-78.73	8,731.11	0.49	0.33	0.37
15,269.00	89.52	2.25	6,143.38	8,825.77	-77.12	8,826.06	3.03	1.39	2.69
15,365.00	90.28	2.53	6,143.55	8,921.69	-73.12	8,921.95	0.84	0.79	0.29
15,460.00	91.13	2.55	6,142.38	9,016.59	-68.91	9,016.82	0.89	0.89	0.02
15,554.00	91.85	2.08	6,139.94	9,110.48	-65.11	9,110.69	0.91	0.77	-0.50
15,649.00	89.37	2.31	6,138.93	9,205.40	-61.47	9,205.59	2.62	-2.61	0.24
15,743.00	90.24	1.89	6,139.25	9,299.33	-58.03	9,299.51	1.03	0.93	-0.45
15,839.00	91.05	1.33	6,138.16	9,395.29	-55.33	9,395.45	1.03	0.84	-0.58
15,934.00	89.88	0.91	6,137.39	9,490.26	-53.48	9,490.41	1.31	-1.23	-0.44
16,029.00	90.39	0.66	6,137.17	9,585.25	-52.17	9,585.40	0.60	0.54	-0.26
16,124.00	91.39	0.18	6,135.69	9,680.24	-51.48	9,680.37	1.17	1.05	-0.51
LAST SURVEY - 16124' MD, 6136' TVD									
16,153.84	91.39	0.18	6,134.97	9,710.07	-51.38	9,710.20	0.00	0.00	0.00
~460' X-OVER PNT - 16153.84' MD, 460' FNL, 1369' FEL SEC 2									
16,253.00	91.39	0.18	6,132.56	9,809.20	-51.07	9,809.33	0.00	0.00	0.00
EXTRAPOLATION TO TD - 16253' MD, 360' FNL, 1369' FEL SEC 2									

## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-2-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KBE 24' @ 4715.60usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KBE 24' @ 4715.60usft
<b>Well:</b>	GROTHEER 5-61 11B-2-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

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
LP- GROTHEER 5-61 1' - actual wellpath misses target center by 18.78usft at 6438.06usft MD (6096.28 TVD, -0.57 N, -103.60 E) - Point	0.00	0.00	6,103.00	-1.79	-121.09	1,394,918.18	3,370,111.16	40.409838°N	104.170862°W
PBHL- GROTHEER 5-6' - actual wellpath misses target center by 5.74usft at 16253.00usft MD (6132.56 TVD, 9809.20 N, -51.07 E) - Point	0.00	0.00	6,137.00	9,809.89	-47.50	1,404,729.47	3,370,037.64	40.436770°N	104.170598°W
EPI- GROTHEER 5-61 1 - actual wellpath misses target center by 4.14usft at 16153.80usft MD (6134.97 TVD, 9710.03 N, -51.38 E) - Point	0.00	0.00	6,137.00	9,710.07	-47.78	1,404,629.67	3,370,038.86	40.436496°N	104.170599°W

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
5,520.00	5,483.30	-569.41	-93.34	KOP - 5520' MD, 5483' TVD	
6,436.83	6,096.23	-1.79	-103.53	~460' X-OVER PNT - 6436.83' MD, 460' FSL, 1341' FEL SEC 11	
6,446.00	6,096.52	7.36	-104.05	HZ LANDING PNT - 6446' MD, 6097' TVD	
16,124.00	6,135.69	9,680.24	-51.48	LAST SURVEY - 16124' MD, 6136' TVD	
16,153.84	6,134.97	9,710.07	-51.38	~460' X-OVER PNT - 16153.84' MD, 460' FNL, 1369' FEL SEC 2	
16,253.00	6,132.56	9,809.20	-51.07	EXTRAPOLATION TO TD - 16253' MD, 360' FNL, 1369' FEL SEC 2	

Checked By: _____	Approved By: _____	Date: _____
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