

# GREAT WESTERN OIL & GAS

Location: COLORADO Slot: SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18)  
Field: ADAMS COUNTY Well: WILLOW BEND LD 18-22HC  
Facility: SEC.18-T01S-R67W Wellbore: WILLOW BEND LD 18-22HC PWB

Plot reference wellpath is WILLOW BEND LD 18-22HC REV-A.0 PWP

True vertical depths are referenced to Rig on SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18) (RT)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to Rig on SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18) (RT)	North Reference: True north
Rig on SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18) (RT) to Mean Sea Level: 5247 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: wagnjam on 6/5/2013

## Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.18-T01S-R67W	3161318.875	1232792.596	39°58'15.460"N	104°55'27.900"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)
SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18)	-0.71	149.95	3161468.823	1232792.861
Rig on SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18) (RT) to Mud line (At Slot: SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18))				5247ft
Mean Sea Level to Mud line (At Slot: SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18))				0ft
Rig on SLOT#06 WILLOW BEND LD 18-22HC (335°FNL & 527°FEK SEC 18) (RT) to Mean Sea Level				5247ft

## Survey Program

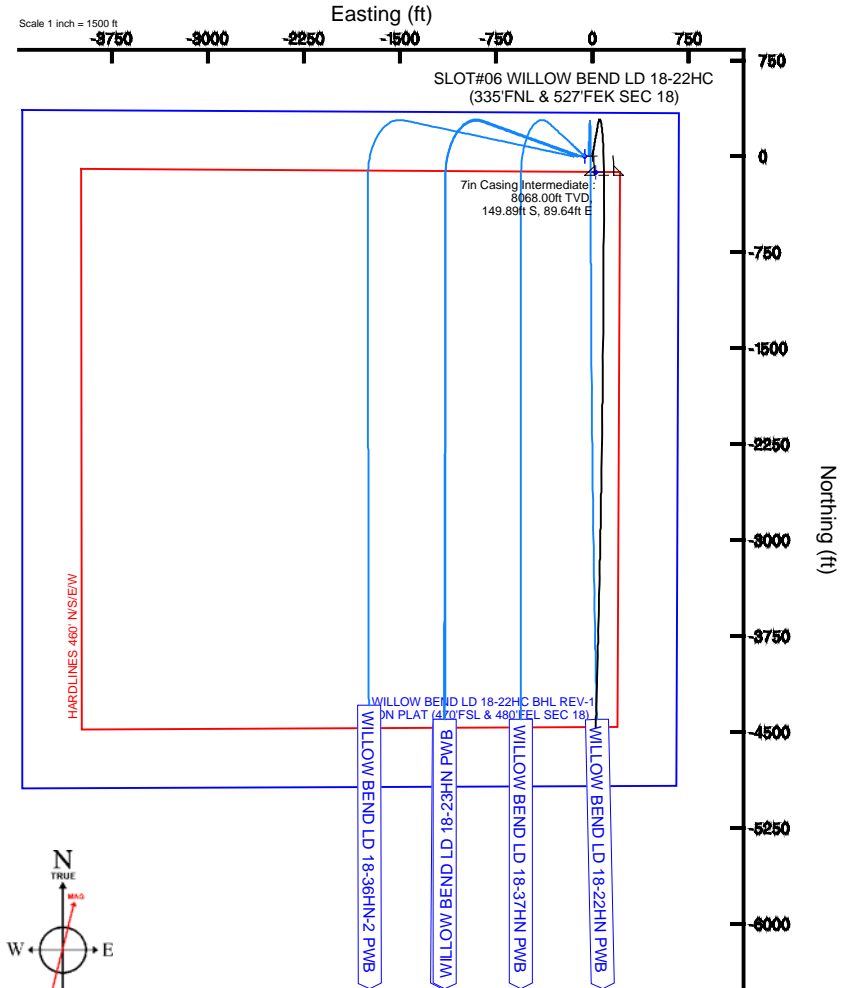
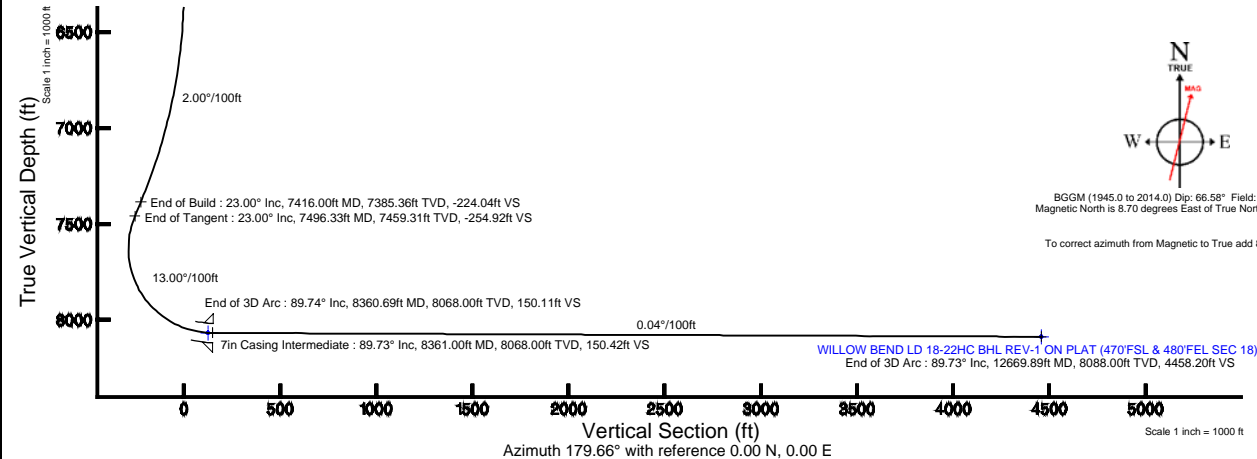
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
16.00	6266.00	Generic gyro - continuous	Generic gyro - continuous (Standard)		WILLOW BEND LD 18-22HC PWB
6266.00	12669.89	NaviTrak	NaviTrak (Standard)		WILLOW BEND LD 18-22HC PWB

## Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
WILLOW BEND SECTION 18		0.00	0.40	-59.95	3161408.87	1232792.88	39°58'15.460"N	104°55'26.749"W
WILLOW BEND LD 18-22HC LANDING POINT (460°FNL & 480°FEL SEC 18)		8068.00	-125.00	26.55	3161496.18	1232668.04	39°58'14.221"N	104°55'25.638"W
WILLOW BEND HARDLINES 460° N/SEW		8078.00	0.40	-59.95	3161408.87	1232792.88	39°58'15.460"N	104°55'26.749"W
WILLOW BEND LD 18-22HC BHL REV-1 ON PLAT (470°FSL & 480°FEL SEC 18)	12669.89	8088.00	-4458.12	26.55	3161524.34	1228335.16	39°57'31.399"N	104°55'25.638"W

## Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	16.00	0.000	10.000	16.00	0.00	0.00	0.00	0.00
End of Tangent	6266.00	0.000	10.000	6266.00	0.00	0.00	0.00	0.00
End of Build	7416.00	23.000	10.000	7385.36	224.28	39.55	2.00	-224.04
End of Tangent	7496.33	23.000	10.000	7459.31	255.19	45.00	0.00	-254.92
End of 3D Arc	8360.69	89.735	180.000	8068.00	-149.58	89.64	13.00	150.11
End of 3D Arc	12669.89	89.733	181.678	8088.00	-4458.12	26.55	0.04	4458.20



BGGM (1945.0 to 2014.0) Dip: 66.58° Field: 52577 nT  
Magnetic North is 8.70 degrees East of True North (at 6/4/2013)

To correct azimuth from Magnetic to True add 8.70 degrees



# Planned Wellpath Report

## WILLOW BEND LD 18-22HC REV-A.0 PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	GREAT WESTERN OIL & GAS	Slot	SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18)
Area	COLORADO	Well	WILLOW BEND LD 18-22HC
Field	ADAMS COUNTY	Wellbore	WILLOW BEND LD 18-22HC PWB
Facility	SEC.18-T01S-R67W		

### REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 4.0.0
North Reference	True	User	Wagnjam
Scale	0.999969	Report Generated	6/5/2013 at 11:23:23 AM
Convergence at slot	n/a	Database/Source file	WA_DENVER/WILLOW_BEND_LD_18-22HC_PWB.xml

### WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-0.71	149.95	3161468.82	1232792.86	39°58'15.456"N	104°55'25.979"W
Facility Reference Pt			3161318.88	1232792.60	39°58'15.463"N	104°55'27.905"W
Field Reference Pt			3161318.89	1232792.62	39°58'15.463"N	104°55'27.905"W

### WELLPATH DATUM

Calculation method	Minimum curvature	Rig on SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18) (RT) to Facility Vertical Datum	5247.00ft
Horizontal Reference Pt	Slot	Rig on SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18) (RT) to Mean Sea Level	5247.00ft
Vertical Reference Pt	Rig on SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18) (RT)	Rig on SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18) (RT) to Mud Line at Slot (SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18))	5247.00ft
MD Reference Pt	Rig on SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18) (RT)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	179.66°



# Planned Wellpath Report

## WILLOW BEND LD 18-22HC REV-A.0 PWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	GREAT WESTERN OIL & GAS	Slot	SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18)
Area	COLORADO	Well	WILLOW BEND LD 18-22HC
Field	ADAMS COUNTY	Wellbore	WILLOW BEND LD 18-22HC PWB
Facility	SEC.18-T01S-R67W		

WELLPATH DATA (132 stations) † = interpolated/extrapolated station								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
0.00†	0.000	10.000	0.00	0.00	0.00	0.00	0.00	
16.00	0.000	10.000	16.00	0.00	0.00	0.00	0.00	Tie On
116.00†	0.000	10.000	116.00	0.00	0.00	0.00	0.00	
216.00†	0.000	10.000	216.00	0.00	0.00	0.00	0.00	
316.00†	0.000	10.000	316.00	0.00	0.00	0.00	0.00	
416.00†	0.000	10.000	416.00	0.00	0.00	0.00	0.00	
516.00†	0.000	10.000	516.00	0.00	0.00	0.00	0.00	
616.00†	0.000	10.000	616.00	0.00	0.00	0.00	0.00	
716.00†	0.000	10.000	716.00	0.00	0.00	0.00	0.00	
816.00†	0.000	10.000	816.00	0.00	0.00	0.00	0.00	
916.00†	0.000	10.000	916.00	0.00	0.00	0.00	0.00	
1016.00†	0.000	10.000	1016.00	0.00	0.00	0.00	0.00	
1116.00†	0.000	10.000	1116.00	0.00	0.00	0.00	0.00	
1216.00†	0.000	10.000	1216.00	0.00	0.00	0.00	0.00	
1316.00†	0.000	10.000	1316.00	0.00	0.00	0.00	0.00	
1416.00†	0.000	10.000	1416.00	0.00	0.00	0.00	0.00	
1516.00†	0.000	10.000	1516.00	0.00	0.00	0.00	0.00	
1616.00†	0.000	10.000	1616.00	0.00	0.00	0.00	0.00	
1716.00†	0.000	10.000	1716.00	0.00	0.00	0.00	0.00	
1816.00†	0.000	10.000	1816.00	0.00	0.00	0.00	0.00	
1916.00†	0.000	10.000	1916.00	0.00	0.00	0.00	0.00	
2016.00†	0.000	10.000	2016.00	0.00	0.00	0.00	0.00	
2116.00†	0.000	10.000	2116.00	0.00	0.00	0.00	0.00	
2216.00†	0.000	10.000	2216.00	0.00	0.00	0.00	0.00	
2316.00†	0.000	10.000	2316.00	0.00	0.00	0.00	0.00	
2416.00†	0.000	10.000	2416.00	0.00	0.00	0.00	0.00	
2516.00†	0.000	10.000	2516.00	0.00	0.00	0.00	0.00	
2616.00†	0.000	10.000	2616.00	0.00	0.00	0.00	0.00	
2716.00†	0.000	10.000	2716.00	0.00	0.00	0.00	0.00	
2816.00†	0.000	10.000	2816.00	0.00	0.00	0.00	0.00	
2916.00†	0.000	10.000	2916.00	0.00	0.00	0.00	0.00	
3016.00†	0.000	10.000	3016.00	0.00	0.00	0.00	0.00	
3116.00†	0.000	10.000	3116.00	0.00	0.00	0.00	0.00	
3216.00†	0.000	10.000	3216.00	0.00	0.00	0.00	0.00	
3316.00†	0.000	10.000	3316.00	0.00	0.00	0.00	0.00	
3416.00†	0.000	10.000	3416.00	0.00	0.00	0.00	0.00	
3516.00†	0.000	10.000	3516.00	0.00	0.00	0.00	0.00	
3616.00†	0.000	10.000	3616.00	0.00	0.00	0.00	0.00	
3716.00†	0.000	10.000	3716.00	0.00	0.00	0.00	0.00	
3816.00†	0.000	10.000	3816.00	0.00	0.00	0.00	0.00	
3916.00†	0.000	10.000	3916.00	0.00	0.00	0.00	0.00	
4016.00†	0.000	10.000	4016.00	0.00	0.00	0.00	0.00	
4116.00†	0.000	10.000	4116.00	0.00	0.00	0.00	0.00	
4216.00†	0.000	10.000	4216.00	0.00	0.00	0.00	0.00	
4316.00†	0.000	10.000	4316.00	0.00	0.00	0.00	0.00	



# Planned Wellpath Report

WILLOW BEND LD 18-22HC REV-A.0 PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	GREAT WESTERN OIL & GAS	Slot	SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18)
Area	COLORADO	Well	WILLOW BEND LD 18-22HC
Field	ADAMS COUNTY	Wellbore	WILLOW BEND LD 18-22HC PWB
Facility	SEC.18-T01S-R67W		

## WELLPATH DATA (132 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
4416.00†	0.000	10.000	4416.00	0.00	0.00	0.00	0.00	
4516.00†	0.000	10.000	4516.00	0.00	0.00	0.00	0.00	
4616.00†	0.000	10.000	4616.00	0.00	0.00	0.00	0.00	
4716.00†	0.000	10.000	4716.00	0.00	0.00	0.00	0.00	
4816.00†	0.000	10.000	4816.00	0.00	0.00	0.00	0.00	
4916.00†	0.000	10.000	4916.00	0.00	0.00	0.00	0.00	
5016.00†	0.000	10.000	5016.00	0.00	0.00	0.00	0.00	
5116.00†	0.000	10.000	5116.00	0.00	0.00	0.00	0.00	
5216.00†	0.000	10.000	5216.00	0.00	0.00	0.00	0.00	
5316.00†	0.000	10.000	5316.00	0.00	0.00	0.00	0.00	
5416.00†	0.000	10.000	5416.00	0.00	0.00	0.00	0.00	
5516.00†	0.000	10.000	5516.00	0.00	0.00	0.00	0.00	
5616.00†	0.000	10.000	5616.00	0.00	0.00	0.00	0.00	
5716.00†	0.000	10.000	5716.00	0.00	0.00	0.00	0.00	
5816.00†	0.000	10.000	5816.00	0.00	0.00	0.00	0.00	
5916.00†	0.000	10.000	5916.00	0.00	0.00	0.00	0.00	
6016.00†	0.000	10.000	6016.00	0.00	0.00	0.00	0.00	
6116.00†	0.000	10.000	6116.00	0.00	0.00	0.00	0.00	
6216.00†	0.000	10.000	6216.00	0.00	0.00	0.00	0.00	
6266.00	0.000	10.000	6266.00	0.00	0.00	0.00	0.00	End of Tangent
6316.00†	1.000	10.000	6316.00	-0.43	0.43	0.08	2.00	
6416.00†	3.000	10.000	6415.93	-3.86	3.87	0.68	2.00	
6516.00†	5.000	10.000	6515.68	-10.72	10.74	1.89	2.00	
6616.00†	7.000	10.000	6615.13	-21.01	21.03	3.71	2.00	
6716.00†	9.000	10.000	6714.15	-34.70	34.73	6.12	2.00	
6816.00†	11.000	10.000	6812.63	-51.78	51.83	9.14	2.00	
6916.00†	13.000	10.000	6910.44	-72.23	72.31	12.75	2.00	
7016.00†	15.000	10.000	7007.46	-96.03	96.13	16.95	2.00	
7116.00†	17.000	10.000	7103.58	-123.14	123.28	21.74	2.00	
7216.00†	19.000	10.000	7198.68	-153.54	153.71	27.10	2.00	
7316.00†	21.000	10.000	7292.65	-187.19	187.39	33.04	2.00	
7416.00	23.000	10.000	7385.36	-224.04	224.28	39.55	2.00	End of Build
7496.33	23.000	10.000	7459.31	-254.92	255.19	45.00	0.00	End of Tangent
7516.00†	20.494	11.371	7477.58	-262.07	262.35	46.34	13.00	
7616.00†	8.227	30.606	7574.31	-285.45	285.77	53.47	13.00	
7716.00†	7.262	144.757	7673.82	-286.40	286.77	60.79	13.00	
7816.00†	19.370	167.941	7771.01	-264.89	265.30	67.93	13.00	
7916.00†	32.171	173.303	7860.89	-222.01	222.46	74.53	13.00	
8016.00†	45.079	175.812	7938.85	-159.96	160.44	80.24	13.00	
8116.00†	58.021	177.387	8000.91	-81.92	82.43	84.78	13.00	
8216.00†	70.978	178.566	8043.87	8.11	-7.58	87.91	13.00	
8316.00†	83.941	179.572	8065.54	105.50	-104.97	89.47	13.00	
8360.69	89.735	180.000	8068.00 <sup>1</sup>	150.11	-149.58	89.64	13.00	End of 3D Arc
8416.00†	89.735	180.022	8068.26	205.42	-204.89	89.63	0.04	
8516.00†	89.735	180.060	8068.72	305.41	-304.88	89.56	0.04	



# Planned Wellpath Report

WILLOW BEND LD 18-22HC REV-A.0 PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	GREAT WESTERN OIL & GAS	Slot	SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18)
Area	COLORADO	Well	WILLOW BEND LD 18-22HC
Field	ADAMS COUNTY	Wellbore	WILLOW BEND LD 18-22HC PWB
Facility	SEC.18-T01S-R67W		

## WELLPATH DATA (132 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
8616.00†	89.735	180.099	8069.18	405.41	-404.88	89.42	0.04	
8716.00†	89.735	180.138	8069.64	505.40	-504.88	89.21	0.04	
8816.00†	89.735	180.177	8070.11	605.40	-604.88	88.93	0.04	
8916.00†	89.735	180.216	8070.57	705.39	-704.88	88.59	0.04	
9016.00†	89.735	180.255	8071.03	805.39	-804.88	88.18	0.04	
9116.00†	89.735	180.294	8071.50	905.38	-904.87	87.70	0.04	
9216.00†	89.735	180.333	8071.96	1005.37	-1004.87	87.15	0.04	
9316.00†	89.735	180.372	8072.42	1105.37	-1104.87	86.54	0.04	
9416.00†	89.735	180.411	8072.89	1205.36	-1204.87	85.85	0.04	
9516.00†	89.734	180.450	8073.35	1305.35	-1304.86	85.10	0.04	
9616.00†	89.734	180.489	8073.81	1405.33	-1404.86	84.28	0.04	
9716.00†	89.734	180.528	8074.28	1505.32	-1504.85	83.40	0.04	
9816.00†	89.734	180.567	8074.74	1605.31	-1604.85	82.44	0.04	
9916.00†	89.734	180.606	8075.20	1705.30	-1704.84	81.42	0.04	
10016.00†	89.734	180.644	8075.67	1805.28	-1804.83	80.33	0.04	
10116.00†	89.734	180.683	8076.13	1905.26	-1904.83	79.17	0.04	
10216.00†	89.734	180.722	8076.59	2005.25	-2004.82	77.94	0.04	
10316.00†	89.734	180.761	8077.06	2105.23	-2104.81	76.65	0.04	
10416.00†	89.734	180.800	8077.52	2205.21	-2204.80	75.29	0.04	
10516.00†	89.734	180.839	8077.99	2305.19	-2304.79	73.86	0.04	
10616.00†	89.734	180.878	8078.45	2405.16	-2404.77	72.36	0.04	
10716.00†	89.734	180.917	8078.91	2505.14	-2504.76	70.79	0.04	
10816.00†	89.734	180.956	8079.38	2605.11	-2604.75	69.16	0.04	
10916.00†	89.734	180.995	8079.84	2705.08	-2704.73	67.45	0.04	
11016.00†	89.734	181.034	8080.31	2805.06	-2804.71	65.68	0.04	
11116.00†	89.734	181.073	8080.77	2905.02	-2904.70	63.85	0.04	
11216.00†	89.734	181.112	8081.24	3004.99	-3004.68	61.94	0.04	
11316.00†	89.734	181.151	8081.70	3104.96	-3104.66	59.97	0.04	
11416.00†	89.734	181.190	8082.17	3204.92	-3204.63	57.92	0.04	
11516.00†	89.734	181.228	8082.63	3304.88	-3304.61	55.81	0.04	
11616.00†	89.734	181.267	8083.10	3404.84	-3404.59	53.64	0.04	
11716.00†	89.734	181.306	8083.56	3504.80	-3504.56	51.39	0.04	
11816.00†	89.734	181.345	8084.03	3604.76	-3604.53	49.08	0.04	
11916.00†	89.733	181.384	8084.49	3704.71	-3704.50	46.70	0.04	
12016.00†	89.733	181.423	8084.96	3804.67	-3804.47	44.25	0.04	
12116.00†	89.733	181.462	8085.42	3904.62	-3904.44	41.73	0.04	
12216.00†	89.733	181.501	8085.89	4004.57	-4004.40	39.14	0.04	
12316.00†	89.733	181.540	8086.35	4104.51	-4104.37	36.49	0.04	
12416.00†	89.733	181.579	8086.82	4204.46	-4204.33	33.77	0.04	
12516.00†	89.733	181.618	8087.28	4304.40	-4304.29	30.98	0.04	
12616.00†	89.733	181.657	8087.75	4404.34	-4404.25	28.12	0.04	
12669.89	89.733	181.678	8088.00 <sup>2</sup>	4458.20	-4458.12	26.55	0.04	End of 3D Arc



# Planned Wellpath Report

## WILLOW BEND LD 18-22HC REV-A.0 PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	GREAT WESTERN OIL & GAS	Slot	SLOT#06 WILLOW BEND LD 18-22HC (335'FNL & 527'FEK SEC 18)
Area	COLORADO	Well	WILLOW BEND LD 18-22HC
Field	ADAMS COUNTY	Wellbore	WILLOW BEND LD 18-22HC PWB
Facility	SEC.18-T01S-R67W		

### HOLE & CASING SECTIONS -

Ref Wellbore: WILLOW BEND LD 18-22HC PWB

Ref Wellpath: WILLOW BEND LD 18-22HC REV-A.0 PWP

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
7in Casing Intermediate	16.00	8361.00	8345.00	16.00	8068.00	0.00	0.00	-149.89	89.64
9.625in Casing Surface	16.00	1000.00	984.00	16.00	1000.00	0.00	0.00	0.00	0.00
12.25in Open Hole	16.00	1000.00	984.00	16.00	1000.00	0.00	0.00	0.00	0.00
8.75in Open Hole	1000.00	8361.00	7361.00	1000.00	8068.00	0.00	0.00	-149.89	89.64
6.125in Open Hole	8361.00	12669.89	4308.89	8068.00	8088.00	-149.89	89.64	-4458.12	26.55

### TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
WILLOW BEND SECTION 18		0.00	0.40	-59.95	3161408.87	1232792.88	39°58'15.460"N	104°55'26.749"W	polygon
1) WILLOW BEND LD 18-22HC LANDING POINT (460'FNL & 480'FEL SEC 18)		8068.00	-125.00	26.55	3161496.18	1232668.04	39°58'14.221"N	104°55'25.638"W	point
WILLOW BEND HARDLINES 460' N/S/E/W		8078.00	0.40	-59.95	3161408.87	1232792.88	39°58'15.460"N	104°55'26.749"W	polygon
2) WILLOW BEND LD 18-22HC BHL REV-1 ON PLAT (470'FSL & 480'FEL SEC 18)	12669.89	8088.00	-4458.12	26.55	3161524.34	1228335.16	39°57'31.399"N	104°55'25.638"W	point

### SURVEY PROGRAM - Ref Wellbore: WILLOW BEND LD 18-22HC PWB Ref Wellpath: WILLOW BEND LD 18-22HC REV-A.0 PWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
16.00	6266.00	Generic gyro - continuous (Standard)		WILLOW BEND LD 18-22HC PWB
6266.00	12669.89	NaviTrak (Standard)		WILLOW BEND LD 18-22HC PWB