



Company Name: QEP ENERGY (WY, CO - VERMILLION)



Azimuths to True North  
Magnetic North: 10.19°  
Magnetic Field  
Strength: 52437.6nT  
Dip Angle: 66.76°  
Date: 12/14/2015  
Model: IGRF2015

Project: Powder Wash - CO  
Site: S19-T12N-R97W  
Well: Powder Wash 19-1  
Wellbore: Original Wellbore  
Design: Plan ver. 0

WELL DETAILS: Powder Wash 19-1

Ground Level:

6778.40

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1612883.950	2218698.630	40.981498	-108.330040	

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Powder Wash 19-1, True North  
Vertical (TVD) Reference: RKB @ 6800.00usft (EST RKB)  
Section (VS) Reference: Slot - (0.00N, 0.00E)  
Measured Depth Reference: RKB @ 6800.00usft (EST RKB)  
Calculation Method: Minimum Curvature

PROJECT DETAILS: Powder Wash - CO

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

System Datum: Mean Sea Level

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PW 19-1 BHL	8500.00	158.86	430.50	1613029.000	2219134.000	Circle (Radius: 50.00)

FORMATION TOP DETAILS

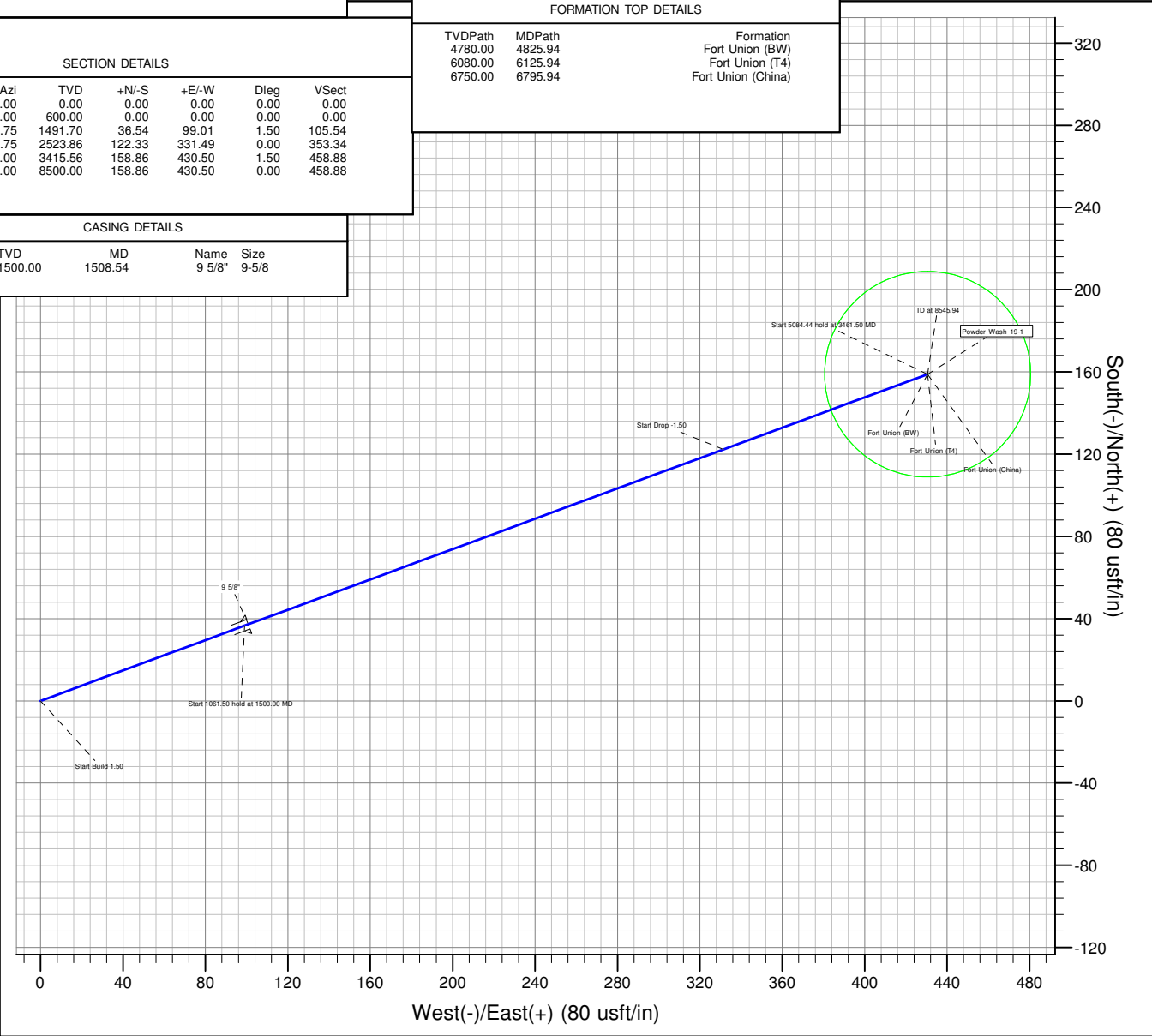
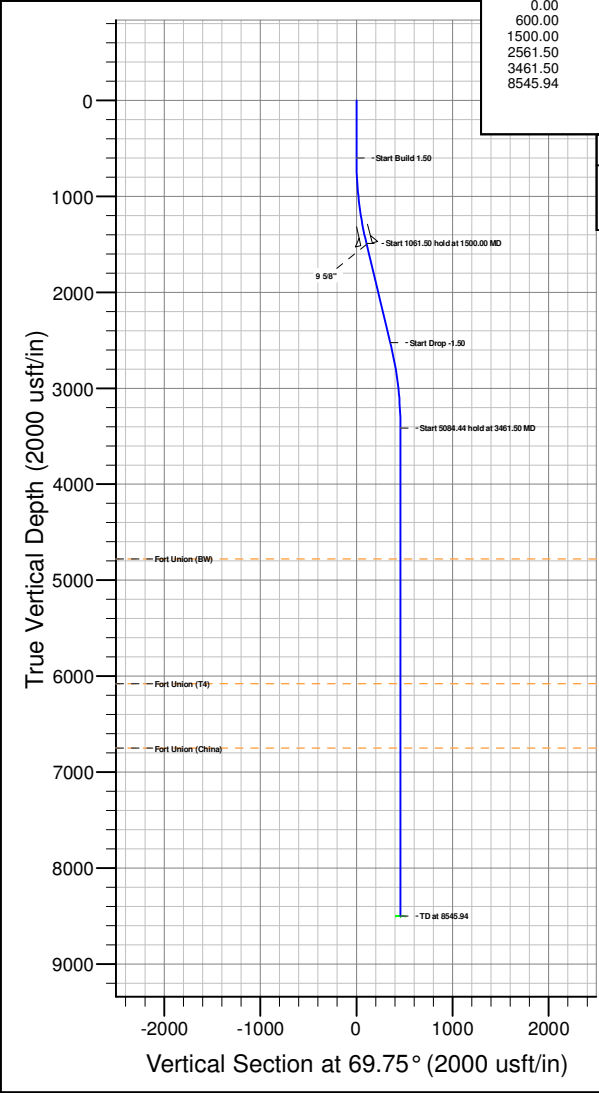
TVDPath	MDPath	Formation
4780.00	4825.94	Fort Union (BW)
6080.00	6125.94	Fort Union (T4)
6750.00	6795.94	Fort Union (China)

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00
1500.00	13.50	69.75	1491.70	36.54	99.01	1.50	105.54
2561.50	13.50	69.75	2523.86	122.33	331.49	0.00	353.34
3461.50	0.00	0.00	3415.56	158.86	430.50	1.50	458.88
8545.94	0.00	0.00	8500.00	158.86	430.50	0.00	458.88

CASING DETAILS

TVD	MD	Name	Size
1500.00	1508.54	9 5/8"	9-5/8



# **QEP ENERGY (WY, CO - VERMILLION)**

**Powder Wash - CO**

**S19-T12N-R97W**

**Powder Wash 19-1**

**Original Wellbore**

**Plan: Plan ver. 0**

## **Standard Planning Report**

**14 December, 2015**

# QEP Resources

## Planning Report

<b>Database:</b>	EDMDB_QEP	<b>Local Co-ordinate Reference:</b>	Well Powder Wash 19-1
<b>Company:</b>	QEP ENERGY (WY, CO - VERMILLION)	<b>TVD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Project:</b>	Powder Wash - CO	<b>MD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Site:</b>	S19-T12N-R97W	<b>North Reference:</b>	True
<b>Well:</b>	Powder Wash 19-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Wellbore		
<b>Design:</b>	Plan ver. 0		

<b>Project</b>	Powder Wash - CO		
<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		S19-T12N-R97W			
Site Position:		Northing:	1,612,883.950 usft	Latitude:	40.981498
From:	Map	Easting:	2,218,698.630 usft	Longitude:	-108.330040
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.83 °

Well	Powder Wash 19-1					
Well Position	+N/-S	0.00 usft	Northing:	1,612,883.950 usft	Latitude:	40.981498
	+E/-W	0.00 usft	Easting:	2,218,698.630 usft	Longitude:	-108.330040
Position Uncertainty		0.00 usft	Wellhead Elevation:	6,778.40 usft	Ground Level:	6,778.40 usft

<b>Wellbore</b>	Original Wellbore				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	12/14/2015	10.19	66.76	52,438

<b>Design</b>	Plan ver. 0			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<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	69.75

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	13.50	69.75	1,491.70	36.54	99.01	1.50	1.50	0.00	69.75	
2,561.50	13.50	69.75	2,523.86	122.33	331.49	0.00	0.00	0.00	0.00	
3,461.50	0.00	0.00	3,415.56	158.86	430.50	1.50	-1.50	0.00	180.00	
8,545.94	0.00	0.00	8,500.00	158.86	430.50	0.00	0.00	0.00	0.00	PW 19-1 BHL

# QEP Resources

## Planning Report

<b>Database:</b>	EDMDB_QEP	<b>Local Co-ordinate Reference:</b>	Well Powder Wash 19-1
<b>Company:</b>	QEP ENERGY (WY, CO - VERMILLION)	<b>TVD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Project:</b>	Powder Wash - CO	<b>MD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Site:</b>	S19-T12N-R97W	<b>North Reference:</b>	True
<b>Well:</b>	Powder Wash 19-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Wellbore		
<b>Design:</b>	Plan ver. 0		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	1.50	69.75	699.99	0.45	1.23	1.31	1.50	1.50	0.00
800.00	3.00	69.75	799.91	1.81	4.91	5.23	1.50	1.50	0.00
900.00	4.50	69.75	899.69	4.08	11.05	11.77	1.50	1.50	0.00
1,000.00	6.00	69.75	999.27	7.24	19.63	20.92	1.50	1.50	0.00
1,100.00	7.50	69.75	1,098.57	11.31	30.66	32.68	1.50	1.50	0.00
1,200.00	9.00	69.75	1,197.54	16.28	44.12	47.03	1.50	1.50	0.00
1,300.00	10.50	69.75	1,296.09	22.14	60.01	63.96	1.50	1.50	0.00
1,400.00	12.00	69.75	1,394.16	28.90	78.31	83.47	1.50	1.50	0.00
1,500.00	13.50	69.75	1,491.70	36.54	99.01	105.54	1.50	1.50	0.00
1,508.54	13.50	69.75	1,500.00	37.23	100.88	107.53	0.00	0.00	0.00
9 5/8"									
1,600.00	13.50	69.75	1,588.93	44.62	120.91	128.88	0.00	0.00	0.00
1,700.00	13.50	69.75	1,686.17	52.70	142.81	152.23	0.00	0.00	0.00
1,800.00	13.50	69.75	1,783.41	60.78	164.72	175.57	0.00	0.00	0.00
1,900.00	13.50	69.75	1,880.64	68.86	186.62	198.92	0.00	0.00	0.00
2,000.00	13.50	69.75	1,977.88	76.95	208.52	222.26	0.00	0.00	0.00
2,100.00	13.50	69.75	2,075.12	85.03	230.42	245.61	0.00	0.00	0.00
2,200.00	13.50	69.75	2,172.35	93.11	252.32	268.95	0.00	0.00	0.00
2,300.00	13.50	69.75	2,269.59	101.19	274.22	292.30	0.00	0.00	0.00
2,400.00	13.50	69.75	2,366.83	109.27	296.12	315.64	0.00	0.00	0.00
2,500.00	13.50	69.75	2,464.07	117.36	318.02	338.98	0.00	0.00	0.00
2,561.50	13.50	69.75	2,523.86	122.33	331.49	353.34	0.00	0.00	0.00
2,600.00	12.92	69.75	2,561.35	125.37	339.75	362.14	1.50	-1.50	0.00
2,700.00	11.42	69.75	2,659.10	132.67	359.53	383.23	1.50	-1.50	0.00
2,800.00	9.92	69.75	2,757.36	139.08	376.90	401.74	1.50	-1.50	0.00
2,900.00	8.42	69.75	2,856.08	144.60	391.86	417.68	1.50	-1.50	0.00
3,000.00	6.92	69.75	2,955.18	149.22	404.38	431.03	1.50	-1.50	0.00
3,100.00	5.42	69.75	3,054.60	152.94	414.47	441.79	1.50	-1.50	0.00
3,200.00	3.92	69.75	3,154.27	155.76	422.11	449.93	1.50	-1.50	0.00
3,300.00	2.42	69.75	3,254.11	157.68	427.30	455.47	1.50	-1.50	0.00
3,400.00	0.92	69.75	3,354.06	158.69	430.04	458.38	1.50	-1.50	0.00
3,461.50	0.00	0.00	3,415.56	158.86	430.50	458.88	1.50	-1.50	0.00
3,500.00	0.00	0.00	3,454.06	158.86	430.50	458.88	0.00	0.00	0.00
3,600.00	0.00	0.00	3,554.06	158.86	430.50	458.88	0.00	0.00	0.00
3,700.00	0.00	0.00	3,654.06	158.86	430.50	458.88	0.00	0.00	0.00
3,800.00	0.00	0.00	3,754.06	158.86	430.50	458.88	0.00	0.00	0.00
3,900.00	0.00	0.00	3,854.06	158.86	430.50	458.88	0.00	0.00	0.00
4,000.00	0.00	0.00	3,954.06	158.86	430.50	458.88	0.00	0.00	0.00
4,100.00	0.00	0.00	4,054.06	158.86	430.50	458.88	0.00	0.00	0.00
4,200.00	0.00	0.00	4,154.06	158.86	430.50	458.88	0.00	0.00	0.00
4,300.00	0.00	0.00	4,254.06	158.86	430.50	458.88	0.00	0.00	0.00
4,400.00	0.00	0.00	4,354.06	158.86	430.50	458.88	0.00	0.00	0.00
4,500.00	0.00	0.00	4,454.06	158.86	430.50	458.88	0.00	0.00	0.00
4,600.00	0.00	0.00	4,554.06	158.86	430.50	458.88	0.00	0.00	0.00
4,700.00	0.00	0.00	4,654.06	158.86	430.50	458.88	0.00	0.00	0.00
4,800.00	0.00	0.00	4,754.06	158.86	430.50	458.88	0.00	0.00	0.00
4,825.94	0.00	0.00	4,780.00	158.86	430.50	458.88	0.00	0.00	0.00

# QEP Resources

## Planning Report

<b>Database:</b>	EDMDB_QEP	<b>Local Co-ordinate Reference:</b>	Well Powder Wash 19-1
<b>Company:</b>	QEP ENERGY (WY, CO - VERMILLION)	<b>TVD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Project:</b>	Powder Wash - CO	<b>MD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Site:</b>	S19-T12N-R97W	<b>North Reference:</b>	True
<b>Well:</b>	Powder Wash 19-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Wellbore		
<b>Design:</b>	Plan ver. 0		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>Fort Union (BW)</b>									
4,900.00	0.00	0.00	4,854.06	158.86	430.50	458.88	0.00	0.00	0.00
5,000.00	0.00	0.00	4,954.06	158.86	430.50	458.88	0.00	0.00	0.00
5,100.00	0.00	0.00	5,054.06	158.86	430.50	458.88	0.00	0.00	0.00
5,200.00	0.00	0.00	5,154.06	158.86	430.50	458.88	0.00	0.00	0.00
5,300.00	0.00	0.00	5,254.06	158.86	430.50	458.88	0.00	0.00	0.00
5,400.00	0.00	0.00	5,354.06	158.86	430.50	458.88	0.00	0.00	0.00
5,500.00	0.00	0.00	5,454.06	158.86	430.50	458.88	0.00	0.00	0.00
5,600.00	0.00	0.00	5,554.06	158.86	430.50	458.88	0.00	0.00	0.00
5,700.00	0.00	0.00	5,654.06	158.86	430.50	458.88	0.00	0.00	0.00
5,800.00	0.00	0.00	5,754.06	158.86	430.50	458.88	0.00	0.00	0.00
5,900.00	0.00	0.00	5,854.06	158.86	430.50	458.88	0.00	0.00	0.00
6,000.00	0.00	0.00	5,954.06	158.86	430.50	458.88	0.00	0.00	0.00
6,100.00	0.00	0.00	6,054.06	158.86	430.50	458.88	0.00	0.00	0.00
6,125.94	0.00	0.00	6,080.00	158.86	430.50	458.88	0.00	0.00	0.00
<b>Fort Union (T4)</b>									
6,200.00	0.00	0.00	6,154.06	158.86	430.50	458.88	0.00	0.00	0.00
6,300.00	0.00	0.00	6,254.06	158.86	430.50	458.88	0.00	0.00	0.00
6,400.00	0.00	0.00	6,354.06	158.86	430.50	458.88	0.00	0.00	0.00
6,500.00	0.00	0.00	6,454.06	158.86	430.50	458.88	0.00	0.00	0.00
6,600.00	0.00	0.00	6,554.06	158.86	430.50	458.88	0.00	0.00	0.00
6,700.00	0.00	0.00	6,654.06	158.86	430.50	458.88	0.00	0.00	0.00
6,795.94	0.00	0.00	6,750.00	158.86	430.50	458.88	0.00	0.00	0.00
<b>Fort Union (China)</b>									
6,800.00	0.00	0.00	6,754.06	158.86	430.50	458.88	0.00	0.00	0.00
6,900.00	0.00	0.00	6,854.06	158.86	430.50	458.88	0.00	0.00	0.00
7,000.00	0.00	0.00	6,954.06	158.86	430.50	458.88	0.00	0.00	0.00
7,100.00	0.00	0.00	7,054.06	158.86	430.50	458.88	0.00	0.00	0.00
7,200.00	0.00	0.00	7,154.06	158.86	430.50	458.88	0.00	0.00	0.00
7,300.00	0.00	0.00	7,254.06	158.86	430.50	458.88	0.00	0.00	0.00
7,400.00	0.00	0.00	7,354.06	158.86	430.50	458.88	0.00	0.00	0.00
7,500.00	0.00	0.00	7,454.06	158.86	430.50	458.88	0.00	0.00	0.00
7,600.00	0.00	0.00	7,554.06	158.86	430.50	458.88	0.00	0.00	0.00
7,700.00	0.00	0.00	7,654.06	158.86	430.50	458.88	0.00	0.00	0.00
7,800.00	0.00	0.00	7,754.06	158.86	430.50	458.88	0.00	0.00	0.00
7,900.00	0.00	0.00	7,854.06	158.86	430.50	458.88	0.00	0.00	0.00
8,000.00	0.00	0.00	7,954.06	158.86	430.50	458.88	0.00	0.00	0.00
8,100.00	0.00	0.00	8,054.06	158.86	430.50	458.88	0.00	0.00	0.00
8,200.00	0.00	0.00	8,154.06	158.86	430.50	458.88	0.00	0.00	0.00
8,300.00	0.00	0.00	8,254.06	158.86	430.50	458.88	0.00	0.00	0.00
8,400.00	0.00	0.00	8,354.06	158.86	430.50	458.88	0.00	0.00	0.00
8,500.00	0.00	0.00	8,454.06	158.86	430.50	458.88	0.00	0.00	0.00
8,545.94	0.00	0.00	8,500.00	158.86	430.50	458.88	0.00	0.00	0.00

# QEP Resources

## Planning Report

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<b>Company:</b>	QEP ENERGY (WY, CO - VERMILLION)	<b>TVD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Project:</b>	Powder Wash - CO	<b>MD Reference:</b>	RKB @ 6800.00usft (EST RKB)
<b>Site:</b>	S19-T12N-R97W	<b>North Reference:</b>	True
<b>Well:</b>	Powder Wash 19-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Wellbore		
<b>Design:</b>	Plan ver. 0		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PW 19-1 BHL	0.00	0.00	8,500.00	158.86	430.50	1,613,029.000	2,219,134.000	40.981934	-108.328481
- plan hits target center									
- Circle (radius 50.00)									

Casing Points				
Measured Depth	Vertical Depth	Name		
(usft)	(usft)			
		Casing Diameter	Hole Diameter	
		(")	(")	
1,508.54	1,500.00	9 5/8"	12-1/4	

Formations					
Measured Depth	Vertical Depth	Name		Dip	Dip Direction
(usft)	(usft)		Lithology	(°)	(°)
4,825.94	4,780.00	Fort Union (BW)		0.00	
6,125.94	6,080.00	Fort Union (T4)		0.00	
6,795.94	6,750.00	Fort Union (China)		0.00	

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		
(usft)	(usft)	+N/-S	+E/-W	Comment
		(usft)	(usft)	
600.00	600.00	0.00	0.00	Start Build 1.50
1,500.00	1,491.70	36.54	99.01	Start 1061.50 hold at 1500.00 MD
2,561.50	2,523.86	122.33	331.49	Start Drop -1.50
3,461.50	3,415.56	158.86	430.50	Start 5084.44 hold at 3461.50 MD
8,545.94	8,500.00	158.86	430.50	TD at 8545.94