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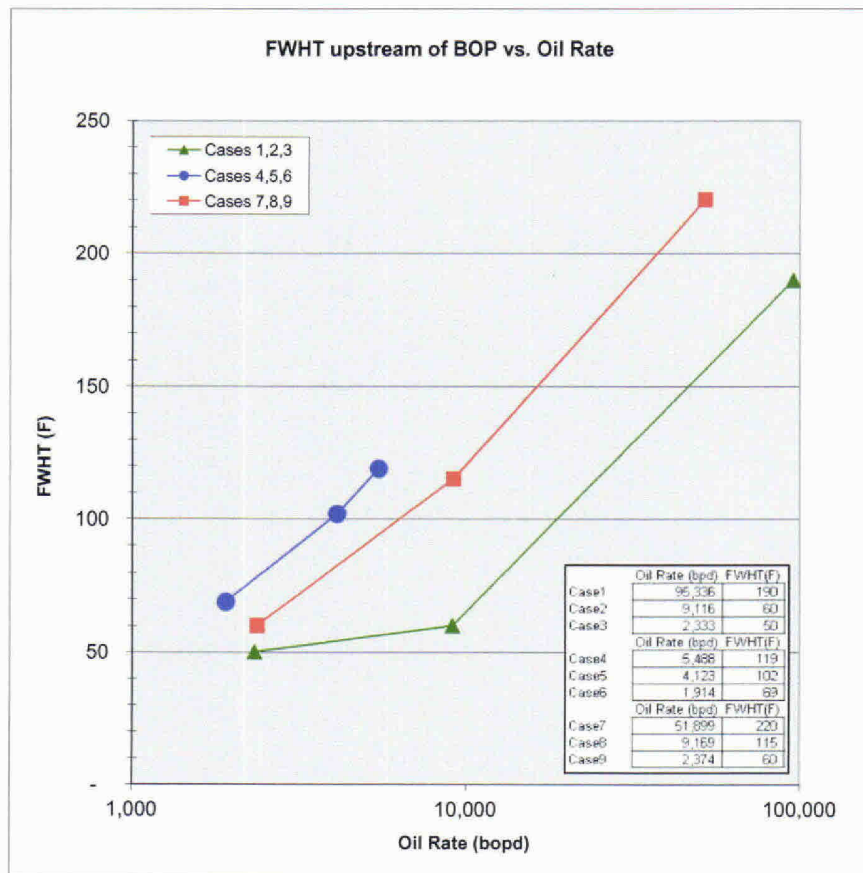
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BP-HZN-2179MDL05029025
BPD361-032462





	Oil Rate (bpd)	FWHT(F)
Case1	95,336	190
Case2	9,116	60
Case3	2,333	50
Oil Rate (bpd) FWHT(F)		
Case4	5,488	119
Case5	4,123	102
Case6	1,914	69
Oil Rate (bpd) FWHT(F)		
Case7	51,899	220
Case8	9,169	115
Case9	2,374	60



	Eqv Choke	FWHT	Qo	Qg	FWHPUp	FWHPDn	FBHP	dP Friction	dp Gravity	dp Total
Case 1	No Choke	190	95,336	276	2337		9927	4956	2634	7590
Case 2	1/2"	60	9,116	26.4	8494	2486	11,666	46	3167	3213
Case 3	1/4"	50	2,333	6.8	8650	2509	11802	4	3235	3239
Skin = 50, 10' Pay Open										
Case 4	No Choke	119	5,488	15.9	2270		4885	74	2508	2582
Case 5	1/2"	102	4,123	12	3865	2270	6760	42	2873	2915
Case 6	1/4"	69	1,914	5.5	6524	2270	9505	10	2913	2923
Skin = 0, 88' Pay open										
Case 7	No Choke	220	51,899	150.5	2270		10804	6043	2421	8464
Case 8	1/2"	115	9,169	26.6	8485	2270	11665	190	2925	3115
Case 9	1/4"	60	2,374	6.9	8662	2270	11802	40	2978	3018

Situation 1 **Drill Pipe Top at BOP**

Tubulars Summary	Approx. Footage (MD) below Mud Line	OD	Top	Bottom
		2,542	5.500	4,989
	831	3.500	7,531	8,362
	3,998	9.875	5,067	12,360
	5,812	7.000	12,488	18,300
	13,183	Total Length		

Assumptions: Tubing + Annular Flow
 No Riser Effects
 Flow from Float Shoe @ TD
 Choke Located Above BOP
 No Water production
 All Prosper calculations based on depth below mud line
 Assumed 88' of reservoir open to flow with Total Skin = 0

Calculations:

	Case 1	Case 2	Case 3
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	95,336	9,116	2,333
Gas Flow Rate (mmscfd)	276.0	26.4	6.8
Annular Liquid Velocity below BOP (ft/s)	70	4.2	1.1
Annular Gas Velocity below BOP (ft/s)	70	-	-
Annular Liquid Velocity in (mph)	48		
FWHP (psig)	2,337		
FWHP (Upstream of Choke) (psig)		8,494	8,650
FWHP (Downstream of Choke) (psig)		2,486	2,509
Delta P across Choke		6,008	6,141
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	9,927	11,666	11,802
Fluid Phase upstream of Choke	Gas + Liquid	Liquid	Liquid
GOR (scf/bbl)	2,895	2,896	2,915
Friction Pressure Loss	4,956	46	4
Gravitational Pressure Loss (Hydrostatic)	2,634	3,167	3,235
FWHT (F) Rough Approx Model, HTC = 8	190	60	50

Situation 2 **Drill string has fallen into well. Base of 3.5 at top of 9.875" to 7" XOver**

Calculations: No significant difference with respect to Situation 1
 Fluid velocities will be slightly lower at the BOP & fluid rates slightly higher

PVT Data:	
GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ_o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation 3 **Flow is behind Long Casing String**

Tubulars Summary	Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
				Top	Bottom
	6,164	9.875	14.850	4,989	11,153
	1,334	9.875	12.375	11,153	12,487
	316	7.000	12.375	12,487	12,803
	1,956	7.000	10.711	12,803	14,759
	2,409	7.000	8.650	14,759	17,168
	962	7.000	9.875	17,168	18,130
	170	7.000	8.500	18,130	18,300
	13,311	Total Length			

Assumptions: Flow Behind 9-7/8" x 7" Tapered Long String
 No Riser Effects
 No Flow from Float Shoe...full Float Shoe integrity
 Inflow occurs at 9-7/8" Drilling Liner Shoe
 Choke Located Within BOP at Shear Rams
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 10' of reservoir open (top of sand) with Total Skin = 50

Calculations:

	Case 4	Case 5	Case 6
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	5,488	4,123	1,914
Gas Flow Rate (mmscfpd)	15.9	12.0	5.5
Annular Liquid Velocity below BOP (ft/s)	1.79	0.93	0.48
Annular Gas Velocity below BOP (ft/s)	1.79	1.73	-
FWHP (psig)	2,270		
FWHP (Upstream of Choke) (psig)		3,865	6,524
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		1,595	4,254
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	4,885	6,760	9,505
Fluid Phase upstream of Choke	Gas + Liquid	Gas + Liquid	Liquid
GOR (scf/bbl)	2,897	2,911	2,874
Friction Pressure Loss	74	42	10
Gravitational Pressure Loss (Hydrostatic)	2,508	2,873	2,913
FWHT (F) Rough Approx Model, HTC = 8	119	102	69

PVT Data:

GOR (scf/stb)	2,847	
API Gravity	35	
Pbp (psig)	6,601	(@ 243F)
Reservoir Pressure (psig)	11,850	
Reservoir Depth (ft)	18,000	
Reservoir Temperature (F)	243	
Mudline Temperature (F)	40	
Bo (rb/stb)	2.77	
μ _o (cp)	0.168	

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation 3 **Flow is behind Long Casing String**

MD below Sea level

Tubulars Summary	Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
				Top	Bottom
	6,164	9.875	14.850	4,989	11,153
	1,334	9.875	12.375	11,153	12,487
	316	7.000	12.375	12,487	12,803
	1,956	7.000	10.711	12,803	14,759
	2,409	7.000	8.650	14,759	17,168
	962	7.000	9.875	17,168	18,130
	170	7.000	8.500	18,130	18,300
	13,311	Total Length			

Assumptions: Flow Behind 9-7/8" x 7" Tapered Long String
 No Riser Effects
 No Flow from Float Shoe...full Float Shoe integrity
 Inflow occurs at 9-7/8" Drilling Liner Shoe
 Choke Located Within BOP at Shear Rams
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

	Case 7	Case 8	Case 9
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	51,899	9,169	2,374
Gas Flow Rate (mmscfpd)	150.5	26.6	6.9
Annular Liquid Velocity below BOP (ft/s)	66.9	3.84	0.96
Annular Gas Velocity below BOP (ft/s)	66.9	-	-
Annular Liquid Velocity in (mph)	46		
FWHP (psig)	2,270		
FWHP (Upstream of Choke) (psig)		8,485	8,662
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		6,215	6,392
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	10,804	11,665	11,802
Fluid Phase upstream of Choke	Gas + Liquid	Liquid	Liquid
GOR (scf/bbl)	2,900	2,901	2,906
Friction Pressure Loss	6,043	190	40
Gravitational Pressure Loss (Hydrostatic)	2,421	2,925	2,978
FWHT (F) Rough Approx Model, HTC = 8	220	115	60

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation 3 **Flow is within Long Casing String and then Drill Pipe**

Tubulars Summary	Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
				Top	Bottom
	6,164	9.875	14.850	4,989	11,153
	1,334	9.875	12.375	11,153	12,487
	316	7.000	12.375	12,487	12,803
	1,956	7.000	10.711	12,803	14,759
	2,409	7.000	8.650	14,759	17,168
	962	7.000	9.875	17,168	18,130
	170	7.000	8.500	18,130	18,300
	13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0
Case 11 - GAP, simplified Temp model; Tortuos Flow Path just belo BOP Stack

Calculations:

	Case 10	Case 11
Equivalent Choke ID (in)	None	None
Oil Flow Rate (bopd)	4,546	27,808
Gas Flow Rate (mmscf/d)	13.6	83.4
Annular Liquid Velocity below BOP (ft/s)	7.7	
Annular Gas Velocity below BOP (ft/s)	7.7	
Annular Liquid Velocity in (mph)	5	
FWHP (psig)	2,270	2270
FWHP (Upstream of Choke) (psig)		
FWHP (Downstream of Choke) (psig)		
Delta P across Choke		
SIWHP (psig)	8,815	8,815
FBHP (psig)	7,049	11,295
Fluid Phase upstream of Choke	Gas + Liquid	
GOR (scf/bbl)	2,992	2,999
Friction Pressure Loss	96	
Gravitational Pressure Loss (Hydrostatic)	2,817	
FWHT (F) Rough Approx Model, HTC = 8	88	154

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation A. Production from the back side of the long string:

1. into wellbore (no drill pipe) straight into BOP (drill pipe failure) (shear worked) (haven't done yet, Case 12)
2. into long string, VBR closed. Go down and into drill pipe (VBR worked) (Case 11)
3. Up back side of drill pipe and into drill pipe. (Nothing worked) (Haven't done yet)
4. straight up BOP but not into the drill string. (Cases 4 through 9).

Situation B. Production from 7" float shoe:

1. Straight up the long string, only into the drill string (fluid flows in drill string only) (this requires the VBR to work). (Case 10)
2. Fluid comes straight up the long string, flows into the drill string and the back side of the drill string (Cases 1, 2 and 3)
3. Unlikely case that fluid is flowing straight up the long string and only up the back side of drill string. (Haven't done yet)

Situation A1 Production from the back side of the long string:

1. Into wellbore (no drill pipe) straight into BOP (drill pipe failure) (shear worked)

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

	Case 1	Case 2	Case 3
Equivalent Choke ID (in)	1/4	0.50	None
Oil Flow Rate (bopd)	2,375	9,172	51,902
Gas Flow Rate (mmscfd)	6.9	26.6	151.0
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2,270	2270
FWHP (Upstream of Choke) (psig)	8,667	8,374	
FWHP (Downstream of Choke) (psig)	2,270	2,270	2,270
Delta P across Choke	6,397	6,104	
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	11,802	11,685	10,803
Fluid Phase upstream of Choke	Liquid	Liquid	Gas + Liquid
GOR (scf/bbl)	2,905	2,900	2,909
Friction Pressure Loss	14	190	6,043
Gravitational Pressure Loss (Hydrostatic)	2,978	2,925	2,421
FWHT (F) Rough Approx Model, HTC = 8	75	148	218

PVT Data:

GOR (scf/stb)	2,847	
API Gravity	35	
Pbp (psig)	6,601	(@ 243F)
Reservoir Pressure (psig)	11,850	
Reservoir Depth (ft)	18,000	
Reservoir Temperature (F)	243	
Mudline Temperature (F)	40	
Bo (rb/stb)	2.77	
μ _o (cp)	0.168	

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation A1 Production from the back side of the long string:

1. Into wellbore (no drill pipe) straight into BOP (drill pipe failure) (shear worked)

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

skin 50, 10' open skin 50, 10' open skin 50, 10' open

	Case 4	Case 5	Case 6
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	5,489	4,126	1,194
Gas Flow Rate (mmscfpd)	15.9	12.0	5.5
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2,270	2270
FWHP (Upstream of Choke) (psig)		3,862	6,523
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		1,592	4,253
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	4,885	6,757	9,505
Fluid Phase upstream of Choke	Gas + Liquid	Gas + Liquid	Gas + Liquid
GOR (scf/bbl)	2,897	2,908	4,606
Friction Pressure Loss	74	42	10
Gravitational Pressure Loss (Hydrostatic)	2,508	2,873	2,913
FWHT (F) Rough Approx Model, HTC = 8	118	101	68

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation A2 Production from the back side of the long string:
 2. Into long string, VBR closed. Go down and into drill pipe (VBR worked) (Case 11)

Tubulars Summary	Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
				Top	Bottom
	6,164	9.875	14.850	4,989	11,153
	1,334	9.875	12.375	11,153	12,487
	316	7.000	12.375	12,487	12,803
	1,956	7.000	10.711	12,803	14,759
	2,409	7.000	8.650	14,759	17,168
	962	7.000	9.875	17,168	18,130
	170	7.000	8.500	18,130	18,300
	13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

	Case 11		
Equivalent Choke ID (in)	None		
Oil Flow Rate (bopd)	27,808		
Gas Flow Rate (mmscfpd)	83.4		
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2,270	2270
FWHP (Upstream of Choke) (psig)			
FWHP (Downstream of Choke) (psig)			
Delta P across Choke			
SIWHP (psig)	8,815		
FBHP (psig)	11,295		
Fluid Phase upstream of Choke			
GOR (scf/bbl)	2,999	2,999	#DIV/0!
Friction Pressure Loss			
Gravitational Pressure Loss (Hydrostatic)			
FWHT (F) Rough Approx Model, HTC = 8	154		

PVT Data:

GOR (scf/stb)	2,847	
API Gravity	35	
Pbp (psig)	6,601	(@ 243F)
Reservoir Pressure (psig)	11,850	
Reservoir Depth (ft)	18,000	
Reservoir Temperature (F)	243	
Mudline Temperature (F)	40	
Bo (rb/stb)	2.77	
μ _o (cp)	0.168	

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation A3 Production from the back side of the long string;
 3. Up back side of drill pipe and into drill pipe. (Nothing worked)

Tubulars Summary	Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
				Top	Bottom
	6,164	9.875	14.850	4,989	11,153
	1,334	9.875	12.375	11,153	12,487
	316	7.000	12.375	12,487	12,803
	1,956	7.000	10.711	12,803	14,759
	2,409	7.000	8.650	14,759	17,168
	962	7.000	9.875	17,168	18,130
	170	7.000	8.500	18,130	18,300
	13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations: Skin 0, 88' open Case 1 Skin 0, 88' open Case 2 Skin 0, 88' open Case 3

Equivalent Choke ID (in)	No choke	1/2	1/4
Oil Flow Rate (bopd)	51,519	9,168	2,374
Gas Flow Rate (mmscf/d)	149.4	26.6	6.9
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2,270	2270
FWHP (Upstream of Choke) (psig)		8,373	8,666
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		6,103	6,396
SIWHP (psig)			
FBHP (psig)	10,811	11,665	11,802
Fluid Phase upstream of Choke	Gas + Liquid	Liquid	Gas + Liquid
GOR (scf/bbl)	2,900	2,901	2,898
Friction Pressure Loss	6,021	192	15
Gravitational Pressure Loss (Hydrostatic)	2,465	2,925	2,978
FWHT (F) Rough Approx Model, HTC = 8	218	149	76

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation A3 **Production from the back side of the long string:**
 3. Up back side of drill pipe and into drill pipe. (Nothing worked)

Tubulars Summary	Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
				Top	Bottom
	6,164	9.875	14.850	4,989	11,153
	1,334	9.875	12.375	11,153	12,487
	316	7.000	12.375	12,487	12,803
	1,956	7.000	10.711	12,803	14,759
	2,409	7.000	8.650	14,759	17,168
	962	7.000	9.875	17,168	18,130
	170	7.000	8.500	18,130	18,300
	13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations: Skin 50, 10' open Skin 50, 10' open Skin 50, 10' open

Equivalent Choke ID (in)	Case		
	Case 1	Case 2	Case 3
	No choke	1/2	1/4
Oil Flow Rate (bopd)	5,488	4,124	1,914
Gas Flow Rate (mmscf/d)	16.0	12.0	6.0
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2,270	2270
FWHP (Upstream of Choke) (psig)		3,866	6,524
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		1,596	4,254
SIWHP (psig)			
FBHP (psig)	4,886	6,760	9,505
Fluid Phase upstream of Choke	Gas + Liquid	Gas + Liquid	Gas + Liquid
GOR (scf/bbl)	2,915	2,910	3,135
Friction Pressure Loss	75	42	10
Gravitational Pressure Loss (Hydrostatic)	2,508	8,272	2,913
FWHT (F) Rough Approx Model, HTC = 8	119	102	69

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation A4 Production from the back side of the long string:

4. Straight up BOP but not into the drill string. (Cases 4 through 9).

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

	Case 4	Case 5	Case 6
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	5,488	4,123	1,914
Gas Flow Rate (mmscfpd)	15.9	12.0	5.5
Annular Liquid Velocity below BOP (ft/s)	1.79	0.93	0.48
Annular Gas Velocity below BOP (ft/s)	1.79	1.73	-
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2,270	2270
FWHP (Upstream of Choke) (psig)		3,865	6,524
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		1,595	4,254
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	10,804	11,665	11,802
Fluid Phase upstream of Choke	Gas + Liquid	Liquid	Liquid
GOR (scf/bbl)	2,897	2,911	2,874
Friction Pressure Loss	6,043	190	40
Gravitational Pressure Loss (Hydrostatic)	2,421	2,925	2,978
FWHT (F) Rough Approx Model, HTC = 8	220	115	60

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation A4 **Production from the back side of the long string:**
 4. Straight up BOP but not into the drill string. (Cases 4 through 9).

Tubulars Summary	Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
				Top	Bottom
	6,164	9.875	14.850	4,989	11,153
	1,334	9.875	12.375	11,153	12,487
	316	7.000	12.375	12,487	12,803
	1,956	7.000	10.711	12,803	14,759
	2,409	7.000	8.650	14,759	17,168
	962	7.000	9.875	17,168	18,130
	170	7.000	8.500	18,130	18,300
	13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

	Case 7	Case 8	Case 9
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	51,899	9,169	2,374
Gas Flow Rate (mmscfpd)	150.5	26.6	6.9
Annular Liquid Velocity below BOP (ft/s)	66.9	3.84	0.96
Annular Gas Velocity below BOP (ft/s)	66.9	-	-
Annular Liquid Velocity in (mph)	46		
FWHP (psig)	2,270		
FWHP (Upstream of Choke) (psig)		8,485	8,662
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		6,215	6,392
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	4,885	6,760	9,505
Fluid Phase upstream of Choke	Gas + Liquid	Gas + Liquid	Liquid
GOR (scf/bbl)	2,900	2,901	2,906
Friction Pressure Loss	74	42	10
Gravitational Pressure Loss (Hydrostatic)	2,508	2,873	2,913
FWHT (F) Rough Approx Model, HTC = 8	119	102	69

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation B1

Production from 7" float shoe:

1. Straight up the long string, only into the drill string (fluid flows in drill string only) (this requires the VBR to work).

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

no skin, 80' open no skin, 80' open no skin, 80' open

	Case 1	Case 2	Case 3
Equivalent Choke ID (in)	1/2	1/4	none
Oil Flow Rate (bopd)	8,989	2,369	34,717
Gas Flow Rate (mmscf/d)	26.0	6.9	100.7
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2,270	2,270	2,270
FWHP (Upstream of Choke) (psig)	8,178	8,636	
FWHP (Downstream of Choke) (psig)	2,270	2,270	2,270
Delta P across Choke	5,908	6,366	
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	1,169	11,802	11,150
Fluid Phase upstream of Choke	Liquid	Liquid	Gas + Liquid
GOR (scf/bbl)	2,892	2,913	2,901
Friction Pressure Loss	379	29	2,770
Gravitational Pressure Loss (Hydrostatic)	2,945	2,992	5,984
FWHT (F) Rough Approx Model, HTC = 8	132	74	199

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation B1

Production from 7" float shoe:

1. Straight up the long string, only into the drill string (fluid flows in drill string only) (this requires the VBR to work).

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

skin 50, 10' open skin 50, 10' open skin 50, 10' open

	Case 4	Case 5	Case 6
Equivalent Choke ID (in)	none	1/2	1/4
Oil Flow Rate (bopd)	5,359	4,119	1,909
Gas Flow Rate (mmscfd)	15.5	12.0	5.5
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2270	2270
FWHP (Upstream of Choke) (psig)		3,843	6,507
FWHP (Downstream of Choke) (psig)	2,270	2,270	2,270
Delta P across Choke		1,573	4,237
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	5,108	6,767	9,511
Fluid Phase upstream of Choke	Gas + Liquid	Gas + Liquid	Gas + Liquid
GOR (scf/bbl)	2,892	2,913	2,881
Friction Pressure Loss	178	93	20
Gravitational Pressure Loss (Hydrostatic)	2,641	2,584	2,928
FWHT (F) Rough Approx Model, HTC = 8	105	93	68

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation B2 Production from 7" float shoe:

2. Fluid comes straight up the long string, flows into the drill string and the back side of the drill string (Cases 1, 2 and

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

skin 50, 10' open skin 50, 10' open skin 50, 10' open

	Case 1	Case 2	Case 3
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	5,408	4,180	1,956
Gas Flow Rate (mmscf/d)	14.0	11.0	5.0
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)		-	-
Annular Liquid Velocity in (mph)	-		
FWHP (psig)	2,270		
FWHP (Upstream of Choke) (psig)		3,703	6,330
FWHP (Downstream of Choke) (psig)		2,270	2,270
Delta P across Choke		1,433	4,060
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	5,061	6,689	9,453
Fluid Phase upstream of Choke	Gas + Liquid	Gas + Liquid	Gas + Liquid
GOR (scf/bbl)	2,589	2,632	2,556
Friction Pressure Loss	21	10	2
Gravitational Pressure Loss (Hydrostatic)	2,753	2,983	3,044
FWHT (F) Rough Approx Model, HTC = 8	90	79	58

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation B2

Production from 7" float shoe:

2. Fluid comes straight up the long string, flows into the drill string and the back side of the drill string (Cases 1, 2 and 3)
 MD below Sea level

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

	Case 1	Case 2	Case 3
Equivalent Choke ID (in)	None	1/2	1/4
Oil Flow Rate (bopd)	95,336	9,116	2,333
Gas Flow Rate (mmscf/d)	276.0	26.4	6.8
Annular Liquid Velocity below BOP (ft/s)	70	4.2	1.1
Annular Gas Velocity below BOP (ft/s)	70	-	-
Annular Liquid Velocity in (mph)	48		
FWHP (psig)	2,337		
FWHP (Upstream of Choke) (psig)		8,494	8,650
FWHP (Downstream of Choke) (psig)		2,486	2,509
Delta P across Choke		6,008	6,141
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	9,927	11,666	11,802
Fluid Phase upstream of Choke	Gas + Liquid	Liquid	Liquid
GOR (scf/bbl)	2,895	2,896	2,915
Friction Pressure Loss	4,956	46	4
Gravitational Pressure Loss (Hydrostatic)	2,634	3,167	3,235
FWHT (F) Rough Approx Model, HTC = 8	190	60	50

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation B3 Production from 7" float shoe:

3. Unlikely case that fluid is flowing straight up the long string and only up the back side of drill string.

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

skin 0, 88' open skin 0, 88' open skin 0, 88' open

	Case 1	Case 2	Case 3
Equivalent Choke ID (in)	none	1/2	1/4
Oil Flow Rate (bopd)	82,088	9,520	2,460
Gas Flow Rate (mmscf/d)	214.0	24.8	6.4
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2270	2270
FWHP (Upstream of Choke) (psig)		8,356	8,580
FWHP (Downstream of Choke) (psig)	2,270	2,270	2,270
Delta P across Choke		6,086	6,310
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	10,195	11,658	11,800
Fluid Phase upstream of Choke	Gas + Liquid	Liquid	Liquid
GOR (scf/bbl)	2,607	2,605	2,602
Friction Pressure Loss	4,952	67	6
Gravitational Pressure Loss (Hydrostatic)	2,844	3,061	3,112
FWHT (F) Rough Approx Model, HTC = 8	222	143	83

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.

Situation B3 Production from 7" float shoe:

3. Unlikely case that fluid is flowing straight up the long string and only up the back side of drill string.

Tubulars Summary

Approx. Footage (MD) below Mud Line	Long String Dia	Annular Dia	MD below Sea level	
			Top	Bottom
6,164	9.875	14.850	4,989	11,153
1,334	9.875	12.375	11,153	12,487
316	7.000	12.375	12,487	12,803
1,956	7.000	10.711	12,803	14,759
2,409	7.000	8.650	14,759	17,168
962	7.000	9.875	17,168	18,130
170	7.000	8.500	18,130	18,300
13,311	Total Length			

Assumptions: Flow into 9-7/8" x 7" Tapered Long String then through Drill Pipe
 No Riser Effects
 No Float Shoe integrity
 Inflow occurs at base of Long Casing String
 No Choke
 No Water production
 All Prosper calculations based on depth below mud line
 Assume 88' of reservoir open (entire sand) with Total Skin = 0

Calculations:

skin 50, 10' open skin 50, 10' open skin 50, 10' open

	Case 4	Case 5	Case 6
Equivalent Choke ID (in)	1/4	1/2	none
Oil Flow Rate (bopd)	1,950	4,146	5,421
Gas Flow Rate (mmscfpd)	5.0	11.0	14.0
Annular Liquid Velocity below BOP (ft/s)			
Annular Gas Velocity below BOP (ft/s)			
Annular Liquid Velocity in (mph)			
FWHP (psig)	2270	2270	2270
FWHP (Upstream of Choke) (psig)	6,341	3,753	
FWHP (Downstream of Choke) (psig)	2,270	2,270	2,270
Delta P across Choke	4,071	1,483	
SIWHP (psig)	8,815	8,815	8,815
FBHP (psig)	9,460	6,734	5,044
Fluid Phase upstream of Choke	Gas + Liquid	Gas + Liquid	Gas + Liquid
GOR (scf/bbl)	2,900	2,900	2,900
Friction Pressure Loss	4	14	29
Gravitational Pressure Loss (Hydrostatic)	3,041	2,976	2,729
FWHT (F) Rough Approx Model, HTC = 8	76	101	114

PVT Data:

GOR (scf/stb)	2,847
API Gravity	35
Pbp (psig)	6,601 (@ 243F)
Reservoir Pressure (psig)	11,850
Reservoir Depth (ft)	18,000
Reservoir Temperature (F)	243
Mudline Temperature (F)	40
Bo (rb/stb)	2.77
μ _o (cp)	0.168

Uncertainties: Uncertainties in Case 1 (No Choke) calculated fluid velocities.
 PVT data based on single Lab Test. Repeat test planned.
 Unknown whether the well is producing any Water.