

From: Mason, Mike C
Sent: Tue May 11 16:33:44 2010
To: Yeilding, Cindy; Kercho, Debbie A; McAughan, Kelly; Liao, Tony T; Bishop, Simon R; Cecil, Chris
Subject: FW: Meeting Presentation May 11 2010 (3).ppt
Importance: Normal
Attachments: Meeting Presentation May 11 2010 (3).ppt
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All,

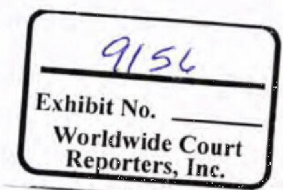
Jasper's feedback after reviewing with Andy Inglis is very positive.

He will let us know if anything else is required.

Mike Mason PE

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From: Mason, Mike C
Sent: Tuesday, May 11, 2010 10:34 AM
To: Peijs, Jasper
Subject: Meeting Presentation May 11 2010 (3).ppt



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BP-HZN-2179MDL04808637

TREX 009156.0001

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Key Messages

Expected Case:

In the current state a wellhead pressure decrease from 3800 psi to 2270 psi (pressure seafloor) results in a flow rate increase ranging from 15% to 30%

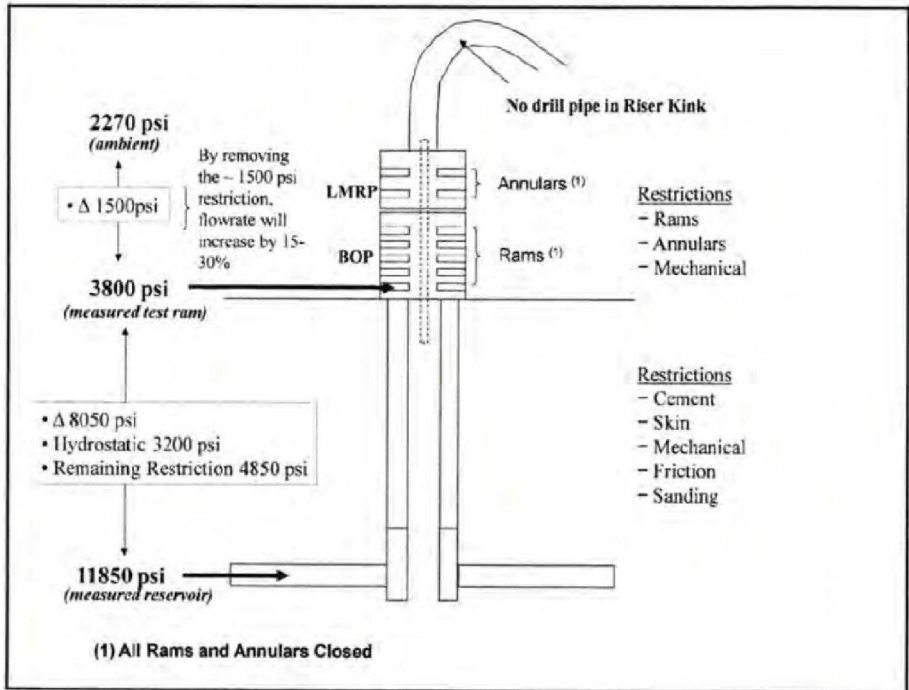
Alternate Case:

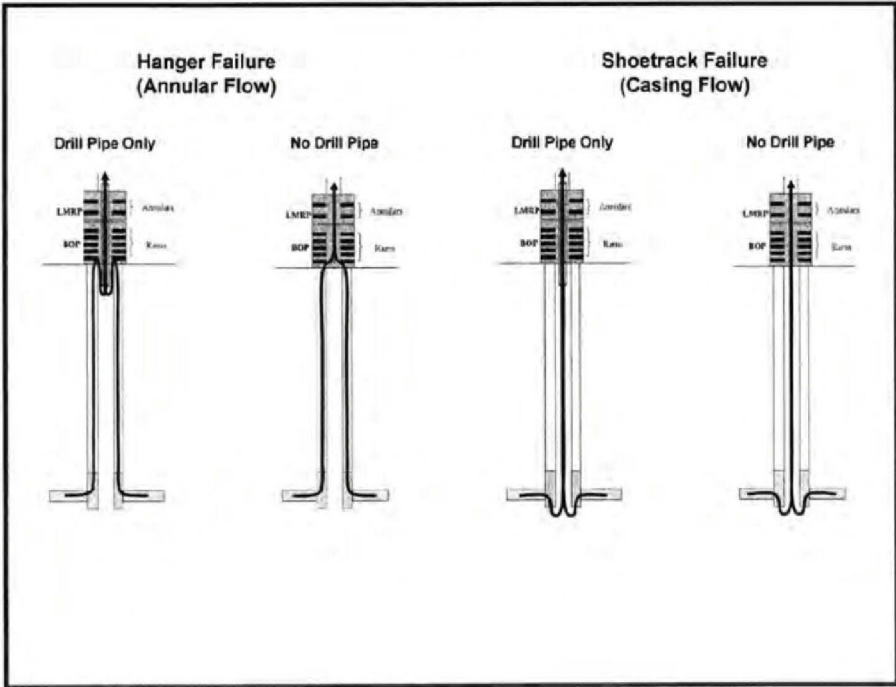
If fluid flow is only through the drill pipe – and then the drill pipe is unintentionally removed and flows into the sea (2270 psi):

- For flow up the annulus the rate doubles
- For flow inside production casing the rate triples

Note:

If BOP and wellhead are removed and if we have incorrectly modeled the restrictions – the rate could be as high as ~ 100,000 barrels per day up the casing or 55,000 barrels per day up the annulus (low probability worst cases)





Maximum Reservoir Exposed, High K

	Scenario:		Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)	
	<ul style="list-style-type: none"> 88' reservoir exposed 300 mD 3800 psi at wellhead 		Drill Pipe Only	No Drill Pipe	Drill Pipe Only	No Drill Pipe
Skin 0			24	45	31	82
Skin 10			23	40	28	67
Skin 25			21	34	26	50

	Scenario:		Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)	
	<ul style="list-style-type: none"> 88' reservoir exposed 300 mD 2270 psi at wellhead 		Drill Pipe only	No Drill Pipe	Drill Pipe Only	No Drill Pipe
Skin 0			27	52	35	96
Skin 10			26	47	32	79
Skin 25			24	41	29	61

Flow increases by an average of 15% when wellhead pressure drops from 3800 psi to 2270 psi

Partial Reservoir Exposed, Low K

	Scenario:		Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)	
	<ul style="list-style-type: none"> ▪ 44' reservoir exposed ▪ 170 mD ▪ 3800 psi at wellhead 		Drill Pipe Only	No Drill Pipe	Drill Pipe Only	No Drill Pipe
	Skin 0	21	35	26	53	
Skin 10	18	25	20	31		
Skin 25	14	17	15	18		

	Scenario:		Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)	
	<ul style="list-style-type: none"> ▪ 44' reservoir exposed ▪ 170 mD ▪ 2270 psi at wellhead 		Drill Pipe only	No Drill Pipe	Drill Pipe Only	No Drill Pipe
	Skin 0	25	42	30	65	
Skin 10	21	31	24	39		
Skin 25	17	21	18	23		

Flow increases by an average of 22% when wellhead pressure drops from 3800 psi to 2270 psi

Ratios	Scenario: ■ 88' reservoir ■ 300 mD ■ 3800 to 2270 psi	Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)		
		Drill Pipe Only	No Drill Pipe	Drill Pipe Only	No Drill Pipe	
		Skin 0	1.13	1.16	1.13	1.16
		Skin 10	1.14	1.19	1.14	1.18
	Skin 25	1.15	1.20	1.15	1.23	
	Scenario: ■ 44' reservoir ■ 170 mD ■ 3800 to 2270 psi	Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)		
		Drill Pipe only	No Drill Pipe	Drill Pipe Only	No Drill Pipe	
		Skin 0	1.15	1.19	1.15	1.22
		Skin 10	1.18	1.25	1.18	1.26
	Skin 25	1.22	1.28	1.21	1.31	
<i>Flow increases by 13-31% when wellhead pressure drops from 3800 psi to 2270 psi</i>						

The Case for 5000 bopd at 3800 psi

Hanger Failure – Annular Flow – No Drill Pipe

Permeability 170 mD
Reservoir Thickness 10'
Skin 25

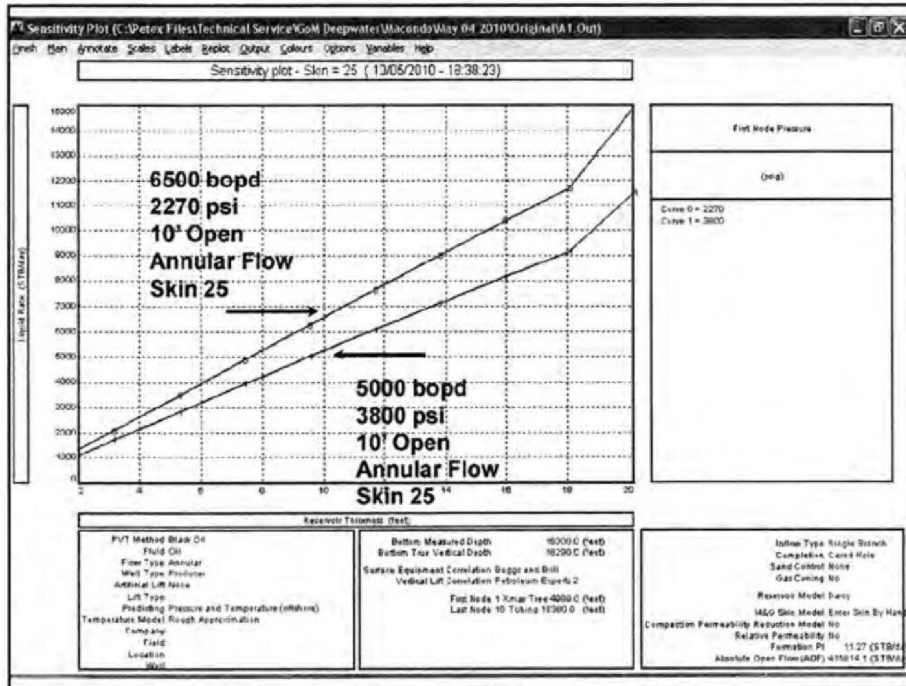
If we drop Pressure to 2270 psi, the flow rate will increase to 6500 bopd (30%)

Hanger Failure– Annular Flow – Drill Pipe Only

Permeability 170 mD
Reservoir Thickness 12'
Skin 25

If we drop Pressure to 2270 psi, the flow rate will increase to 6300 bopd (26%)

Appendix

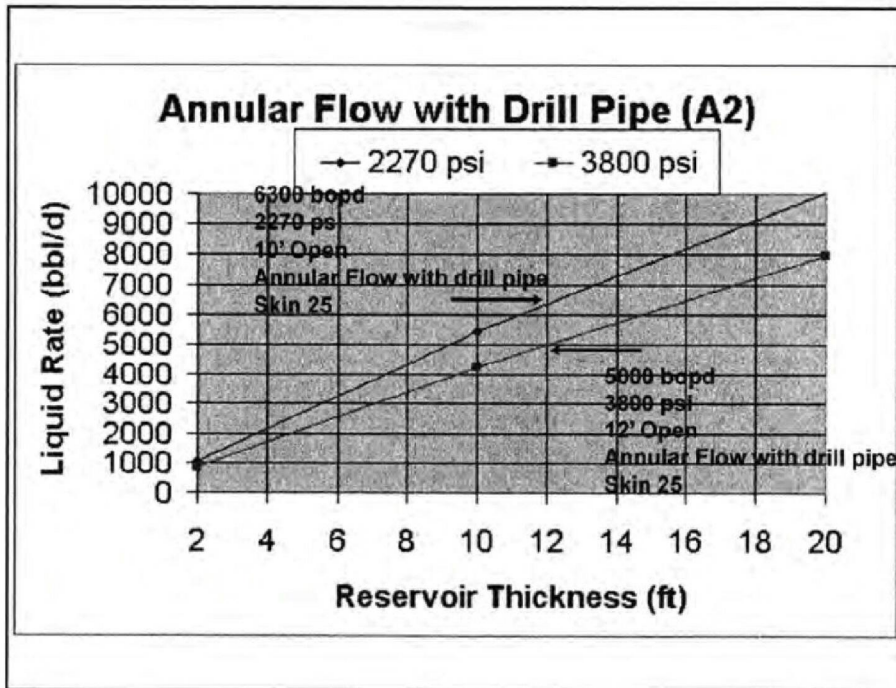


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FAQ

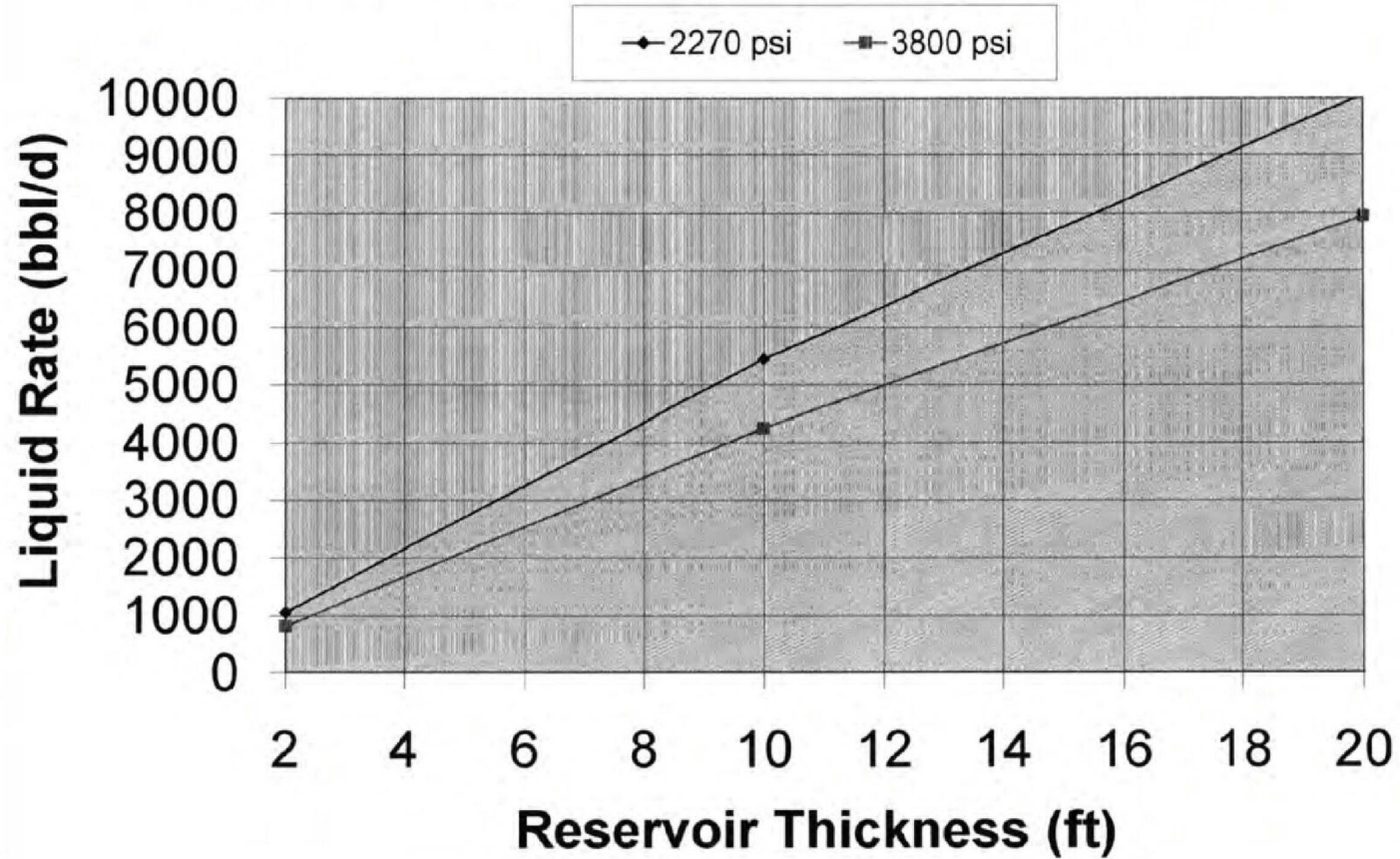
What gives you confidence in your understanding of the data?

- We know:
 - the pressure beneath the BOP
 - Reservoir: properties, fluid characteristics, pressure, depths
 - current state of the BOP
 - geometries in the well
- with this data we can anticipate the expected range of rates

Will Hydrates form?

- Hydrates are not expected to be a problem either in the well or in the BOPs

Annular Flow with Drill Pipe (A2)



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