

11900  
Exhibit No. \_\_\_\_\_  
Worldwide Court  
Reporters, Inc.

**IN THE UNITED STATES DISTRICT COURT FOR  
THE EASTERN DISTRICT OF LOUISIANA**

*In re: Oil Spill by the Oil Rig Deepwater Horizon  
in the Gulf of Mexico on April 20, 2010 (MDL No. 2179)*

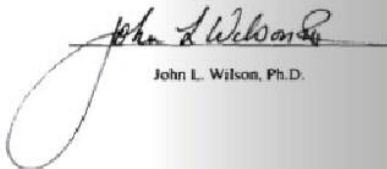
Before the Honorable Judge Carl J. Barbier

**EXPERT REPORT OF DR. JOHN L. WILSON**

*BP Internal Well Flow Rate Estimates in April and May 2010*

May 1, 2013

Submitted by Transocean Offshore Deepwater Drilling, Inc.



John L. Wilson, Ph.D.

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TREX 0

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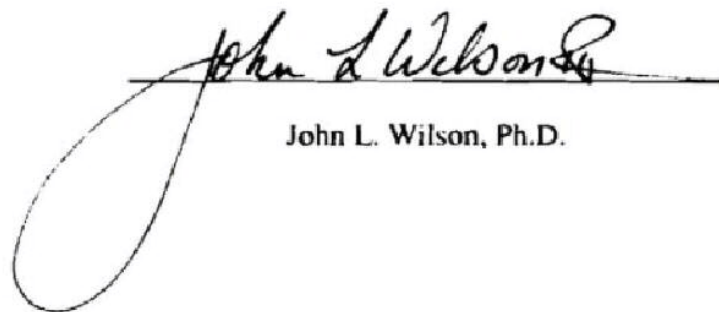
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# Summary of Dr. Wilson's Expert Opinions

- A.** Immediately after the blowout of the Macondo MC 252-1 well, BP began conducting well flow rate modeling to inform its source control efforts, including the top kill operation.
- B.** In the weeks following the blowout BP's computer models suggested higher well flow rates than those BP reported to the government, the press and the public.
- C.** BP knew or should have known from its modeling efforts that the top kill was very likely to fail because the well flow rate exceeded a 15,000 BOPD threshold rate.
- D.** After the top kill failed, BP was informed that the failure was most likely due to the flow rate.

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From: Hill, Trevor  
Sent: Wed Apr 28 12:49:52 2010  
To: Birrell, Gordon Y  
Cc: Austin, Julian; Tooms, Paul J; Nichols, Mark  
Subject: RE: Action Items from 3:00 PM Sunday telecon - flow modeling  
Importance: Normal  
Attachments: Modeling of system flow behaviour rev 1.doc

Gordon

As requested via Julian please see the attached short note on modeling of flow through the system. Please let me know if this does not cover the full intent of your question. We have modeled the whole system from reservoir to sea in order to bound the answers on flowrate.

Regards  
Trevor

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#### Modeling of system flow behaviour (reservoir to sea)

There are four data points in which we have good confidence... reservoir pressure of ~12000 psi, seabed water pressure of ~2250 psi, fluid properties (bubble point ~6600 psi, gas-oil ratio ~2800 scf/bbl, and fluid composition), and flow path to sea being out of the full bore of the riser.

We are currently less certain of the following aspects, and need to keep abreast of the up-to-date view on each in order to maintain the best available model of the system:

## Modeling of system flow behaviour (reservoir to sea)

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size are given below (for the two positions - cases of flow through orifice pipe and flow through full bore riser). The model solves for flowrate and wellhead flowing pressure, given the orifice size and the inlet and outlet boundary conditions of reservoir and seawater pressure respectively.

The further variable of reservoir in-flow performance is also modelled with three illustrative values, 1 bbl/d/psi, 10 bbl/d/psi and fixed bottomhole pressure. The last of these three shows the maximum hydraulic capacity of the system from bottomhole to sea and is a theoretical-only worst case. In reality the reservoir will always impose some resistance to flow, given by the illustrative values of 1 and 10 bbl/d/psi. We need the view of Macondo subsurface modeller and well designer to give us their view of the most appropriate value.

The data generated takes the form of the following illustrative table:

Orifice size inches diam	Flowrate stock tank bbl/day	Wellhead flowing pressure, psi	Flow path
0.25	2523	8567	All Drill string
0.5	9840	8514	
0.75	20898	8170	
1	33184	7472	
2	58284	4964	
5	65171	4176	

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BP-HZN-2179MDL03675263

TREX 005063.0004

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Modeling of system flow behaviour (reservoir to sea)

There are four data points in which we have good confidence... reservoir pressure of ~12000 psi, seabed water pressure of ~2250 psi, fluid properties (bubble point ~6600 psi, gas-oil ratio ~2800 scf/bbl, and fluid composition), and flow path to sea being out of the full bore of the riser.

We are currently less certain of the following aspects, and need to keep abreast of the up-to-date view on each in order to maintain the best available model of the system:

- in-flow performance both prior to incident and after any formation damage that could have occurred during the incident
- flow path from sand face to mud line, whether this is through the drill pipe or up the casing string
- flow path through the BOP stack and into the riser, particularly on the effect of the kink and whether flow is in the drill pipe or in the riser... we are closely connected to the work under way by Julian Austin on modelling both of these flow paths
- flow path through the riser, whether flow remains in the drill pipe for most of the riser until a break in the drill pipe (particularly whether flow is in the drill pipe through the floating riser highpoint), or is discharged into the riser anywhere upstream of the highpoint

The current system model is set up with 5.625" ID pipe in the whole well (slight)

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The data generated takes the form of the following illustrative table:

Orifice size inches diam	Flowrate stock tank bbl/day	Wellhead flowing pressure, psi	Flow path
0.25	2523	8557	All Drill string
0.5	9840	8514	
0.75	20888	8170	
1	33184	7472	
2	58284	4984	
5	65171	4179	

The data generated takes the form of the following illustrative table:

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BP-HZN-2179MDL03675263

TREX 005063.0004

From: Ole B. Rygg  
Sent: Sun May 09 21:18:29 2010  
To: Mix, Kurt  
Subject: blowout Rates  
Importance: Normal  
Attachments: image001.jpg; Blowout Rates.docx

see enclosed

From: Ole B. Rygg  
Sent: Sun May 09 21:18:29 2010  
To: Mix, Kurt  
Subject: blowout Rates  
Importance: Normal  
Attachments: image001.jpg; Blowout Rates.docx

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individual and purpose, and is protected by law.  
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BP-HZN-2179MDL04894453

TREX 009266.0001

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BP-HZN-2179MDL04894453

TREX.9266.1.1.TO



Flow Path	Seabed	Back Pressure psi	Oil rate bopd	Gas rate mmscfd
Annulus	Unrestricted to seabed	2244	43000	120
Annulus	Current restrictions/measured	3800	37000	110
Casing	Unrestricted to seabed	2244	63000	180
Casing	Current restrictions/measured	3800	55000	160
Both	Unrestricted to seabed	2244	87000	250
Both	Current restrictions/measured	3800	74000	210

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Both	Unrestricted to seabed	2244	87000	250
Both	Current restrictions/measured	3800	74000	210

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BP-HZN-2179MDL04894455

TREX 009266.0002

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TREX 009266.0002

# Summary of Dr. Wilson's Expert Opinions

- A. Immediately after the blowout of the Macondo MC 252-1 well, BP began conducting well flow rate modeling to inform its source control efforts, including the top kill operation.
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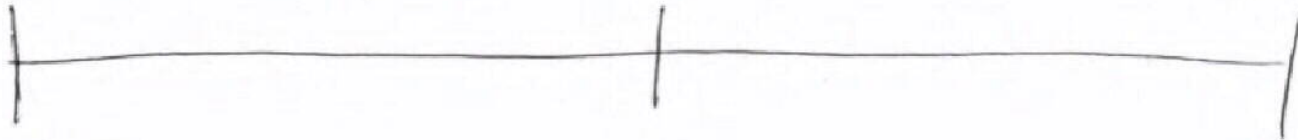
9628

Exhibit No. \_\_\_\_\_  
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Reporters, Inc.

1000 bbls

2500 bbls

bbls  
5000



1000 bbls

2500 bbls

bbls  
5000



TREX 009628.0001

**From:** Doug.Suttles@bp.com [Doug.Suttles@bp.com] on behalf of Suttles, Doug J [Doug.Suttles@bp.com]  
**Sent:** Monday, May 10, 2010 11:39 AM  
**To:** Landry, Mary RADM  
**CC:** Neffenger, Peter RDML; Allen, Thad ADM; lars.herbst@mms.gov  
**Subject:** FW: 01090800.PDF - Adobe Reader  
**Attachments:** 01090800.PDF

Admiral Landry,

Attached is a short note covering our view of the "worst case scenario". Please let me know if you have any questions.

Doug

**From:** Doug.Suttles@bp.com [Doug.Suttles@bp.com] on behalf of Suttles, Doug J [Doug.Suttles@bp.com]  
**Sent:** Monday, May 10, 2010 11:39 AM  
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Doug

Doug Suttles  
Chief Operating Officer  
Exploration & Production  
BP

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HCG266-012219

TREX 009155.0001

TREX.9155.1.1.TO

bp

bp



Doug Suttles

Chief Operating Officer

Exploration & Production

BP America Inc.  
501 WestLake Park Boulevard  
Houston, TX 77079

**CONTAINS PROPRIETARY INFORMATION**

CONFIDENTIAL TREATMENT REQUESTED UNDER THE FREEDOM OF  
INFORMATION ACT

May 10, 2010

Mary E. Landry  
Rear Admiral, U.S. Coast Guard  
Commander, Eighth Coast Guard District  
Hale Boggs Building  
500 Poydras Street  
New Orleans LA 70130

31 366 3969  
366 7239  
es@bp.com

Re: MC 252 Response -- United States Coast Guard Request for Proprietary  
Information Regarding Potential Productive Capacity of the Maconda  
Well.

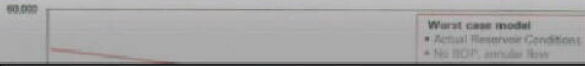
TREX.9155.2.1.TO

If the Well continues to flow at its **currently estimated rate of 5,000 barrels per day**, the estimated well flow period is a total of 145 days, starting on April 20, resulting in a total volume of 0.7 million stock tank barrels. Note that this is the volume as released at the seabed. Natural dispersion and evaporation are estimated to reduce the amount reaching the surface by c.40%.

**The estimated unrestricted full-stream capacity of the Well is approximately 55,000 barrels per day.** This rate uses actual measured information from this well including the reservoir permeability, gas-oil ratio, oil viscosity and the measured flowing pressure at the base of the blow-out-preventer. This estimate also assumes there is no "skin" or restrictions to flow from the reservoir. **This would be extremely rare and represents a theoretical downside.** It also assumes the flow is through the annular space and that there is a complete failure of the blow-out-preventer. Using the same 145 days per the previous case results in a total volume of 7.2 million stock tank barrels released at the seabed.

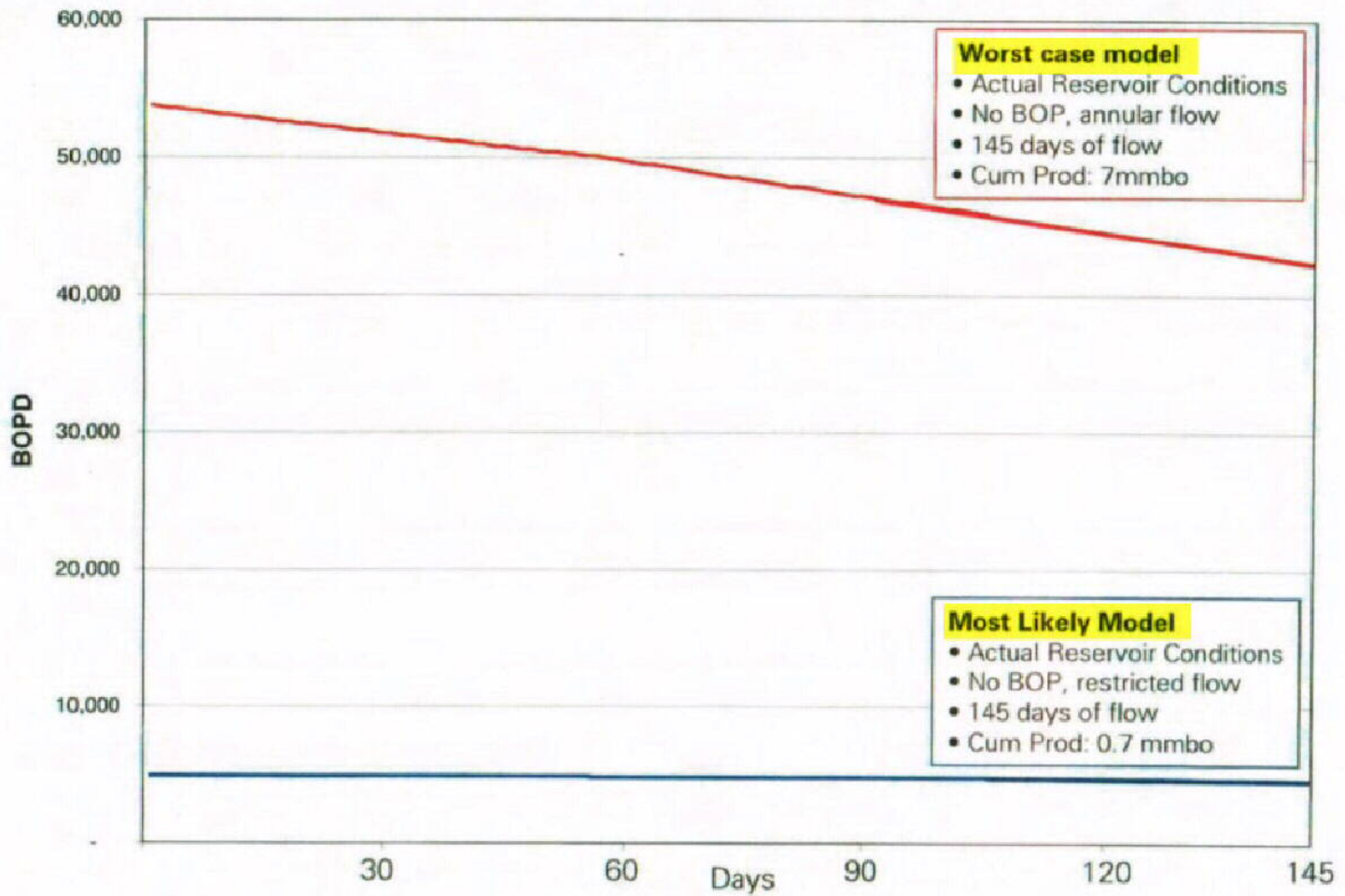
## Macondo Reservoir Model

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CONFIDENTIAL TREATMENT REQUESTED UNDER THE FREEDOM OF INFORMATION ACT



## Macondo Reservoir Model

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From: McAughan, Kelly  
Sent: Thu May 06 02:01:06 2010  
To: Ritchie, Bryan  
Subject: WCD Plots Request  
Importance: Normal

**From: McAughan, Kelly**

**Sent: 05 May 2010 22:04**

**To: Peijs, Jasper; Yeilding, Cindy**

**Cc: Bozeman, Walt; Epps, David S; Kercho, Debbie A**

**Subject: WCD Plots**

**Here are the plots that were discussed.** Please contact me if you need anything further.

Thanks,  
Kelly

From: McAughan, Kelly  
Sent: 05 May 2010 22:04  
To: Peijs, Jasper; Yeilding, Cindy  
Cc: Bozeman, Walt; Epps, David S; Kercho, Debbie A  
Subject: WCD Plots  
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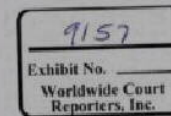
Thanks,  
Kelly

Cell 281-650-5274  
Home 281-392-3424

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BP-HZN-2179MDL04850782

TREX 009157.0001



TREX.9157.1.1.TO



From: McAughan, Kelly  
Sent: Thu May 06 02:01:06 2010  
To: Ritchie, Bryan  
Subject: WCD Plots Request  
Importance: Normal  
Attachments: WCD Plots - Macondo 1 - 050510.ppt

Andy Inglis requested WCD (worse case discharge) plots on various flowrate restrictions. Attached is the file but like Jasper said please don't pass around. I have more data behind these plots on assumptions but Jasper just wanted the plots.

From: Peijs, Jasper  
Sent: Wednesday, May 05, 2010 5:15 PM  
To: McAughan, Kelly; Yeilding, Cindy  
Cc: Bozeman, Walt; Epps, David S; Kercho, Debbie A  
Subject: RE: WCD Plots

**From: Peijs, Jasper**  
**Sent: Wednesday, May 05, 2010 5:15 PM**  
**To: McAughan, Kelly; Yeilding, Cindy**  
**Cc: Bozeman, Walt; Epps, David S; Kercho, Debbie A**  
**Subject: RE: WCD Plots**

Both Tony and Andy have seen it and are impressed with the fast turn-around. This is exactly what they asked for. This information is sensitive, so please do not forward.

Many thanks for you help with this.

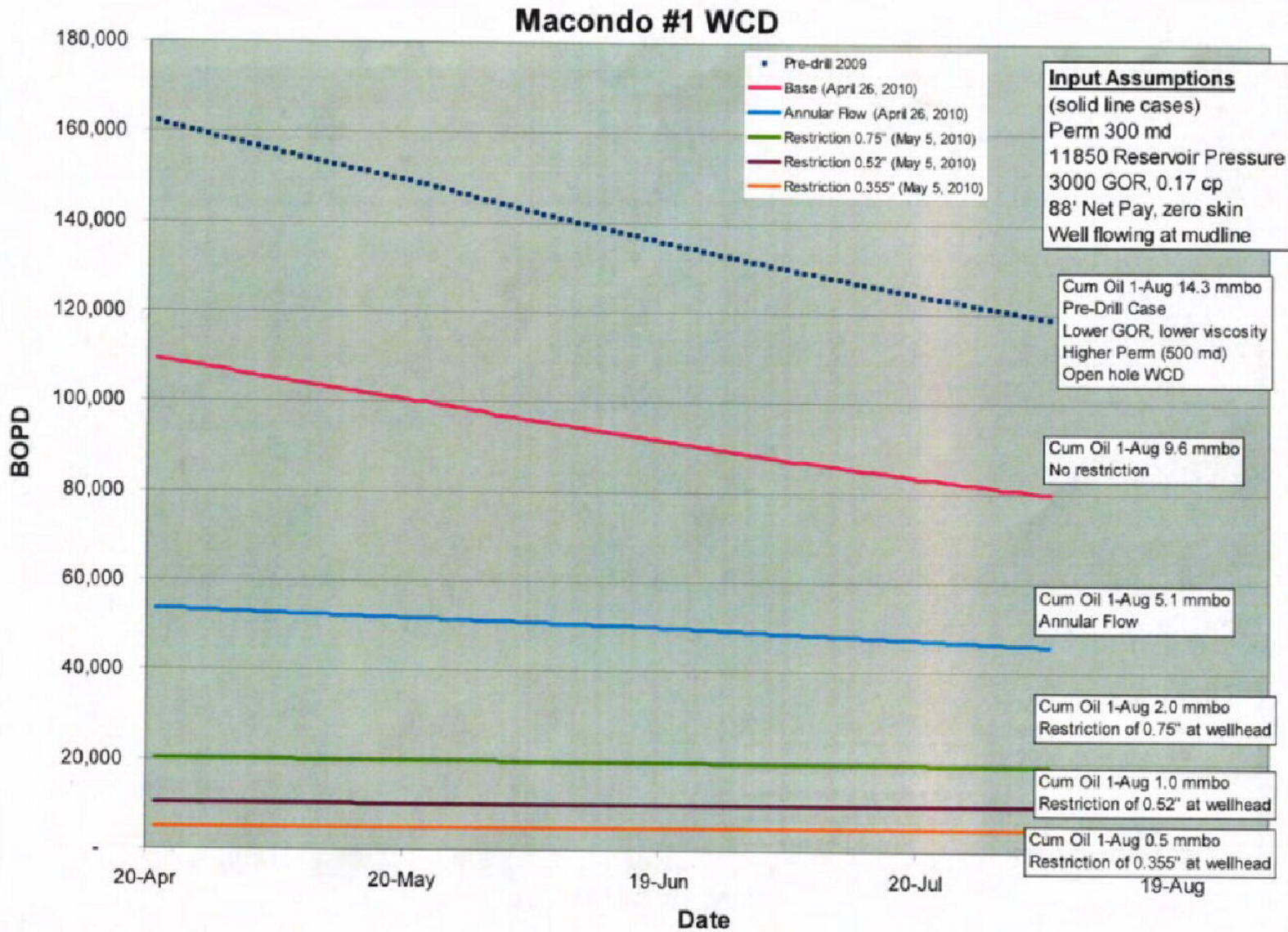
Regards,

Jasper

TREX 009157.0001

TREX.9157.1.2.TO

Macondo #1 WCD



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BP-HZN-2179MDL04850783

From: McAughan, Kelly  
Sent: Thu May 06 13:06:24 2010  
To: Peijs, Jasper; Yeilding, Cindy  
Cc: Bozeman, Walt; Ritchie, Bryan; MC252\_Email\_Retention; Epps, David S; Kercho, Debbie A  
Subject: RE: WCD Plots  
Importance: Normal  
Attachments: WCD Plots - Macondo1 - 050610.ppt; Forecast from MBAL 5-6.xls

Jasper,  
Ran the new cases and put them in a graph with the other 6 (total of 8 cases now). I attached the excel file as well so you can edit freely. Let me know if there is anything else!

From: McAughan, Kelly  
Sent: Thu May 06 13:06:24 2010  
To: Peijs, Jasper; Yeilding, Cindy  
Cc: Bozeman, Walt; Ritchie, Bryan; MC252\_Email\_Retention; Epps, David S; Kercho, Debbie A  
Subject: RE: WCD Plots  
Importance: Normal  
Attachments: WCD Plots - Macondo1 - 050610.ppt; Forecast from MBAL 5-6.xls

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Kelly

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9330  
Exhibit No. \_\_\_\_\_  
Worldwide Court  
Reporters, Inc.

BP-HZN-2179MDL04800330  
BPD344-000762

TREX 009330.0001

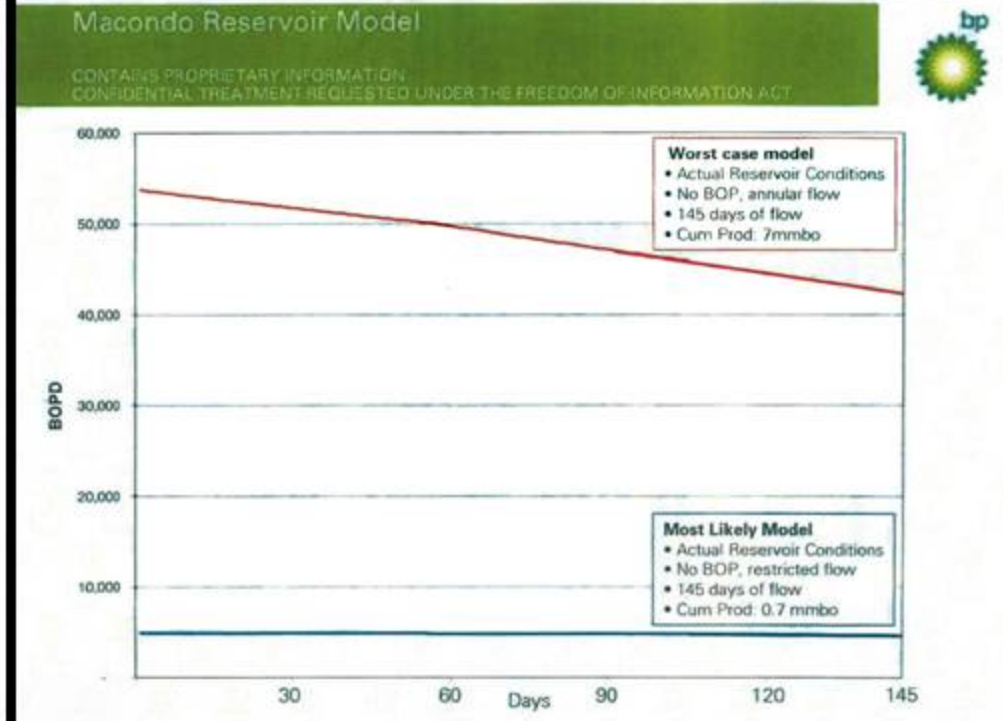
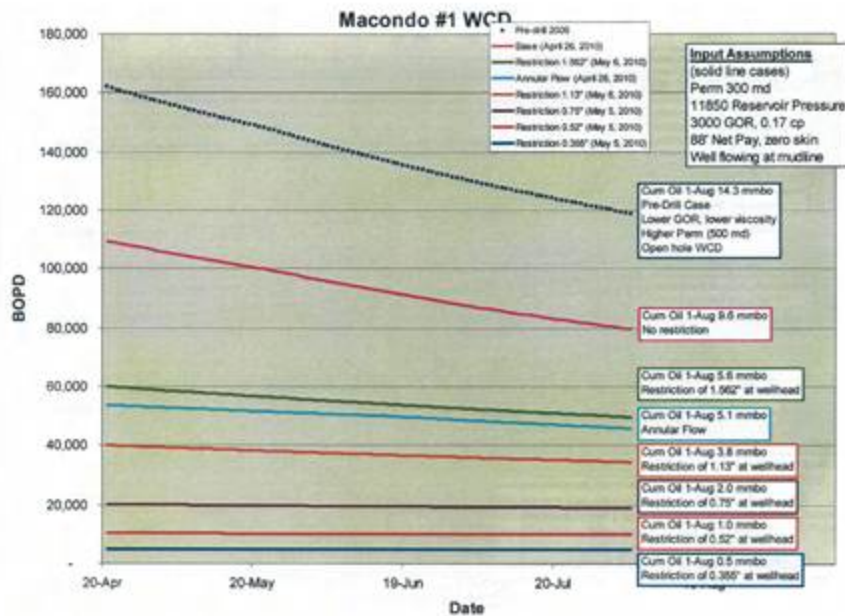
TREX.9330.1.1.TO

# Internal vs. External Flow Rate Estimates

## BP Internal Flow Rate Estimates

## Reported to Coast Guard

“edit freely.”



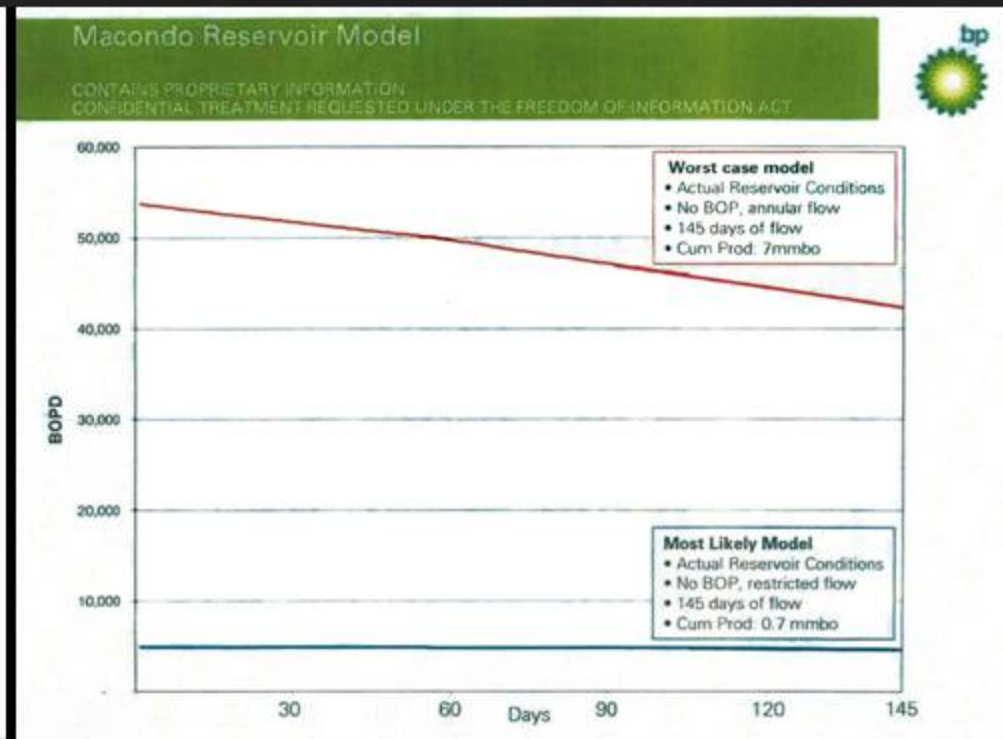
# Internal vs. External Flow Rate Estimates

## BP Internal Flow Rate Estimates

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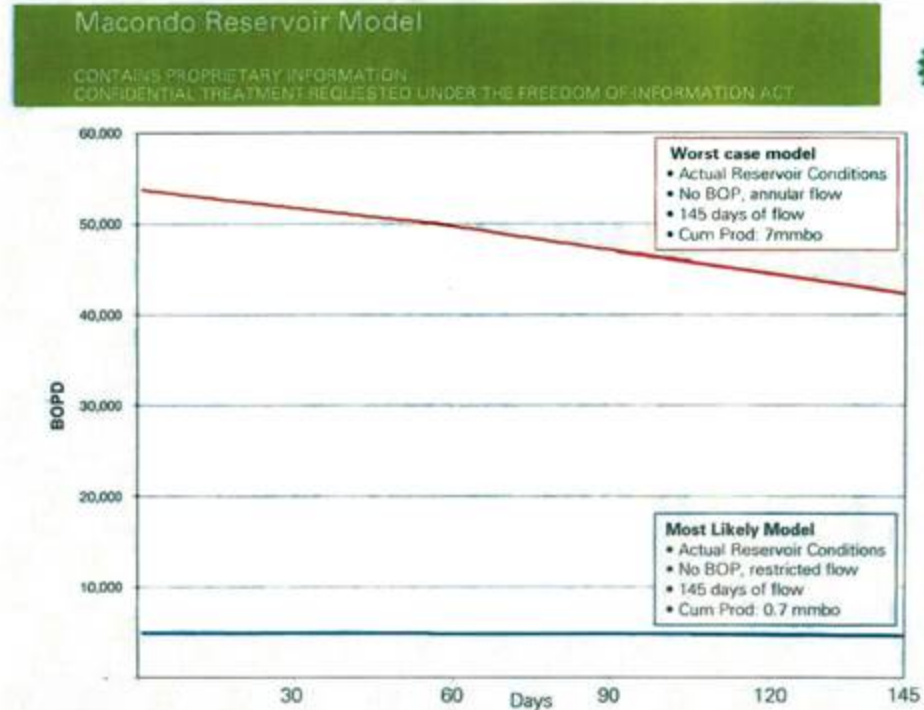
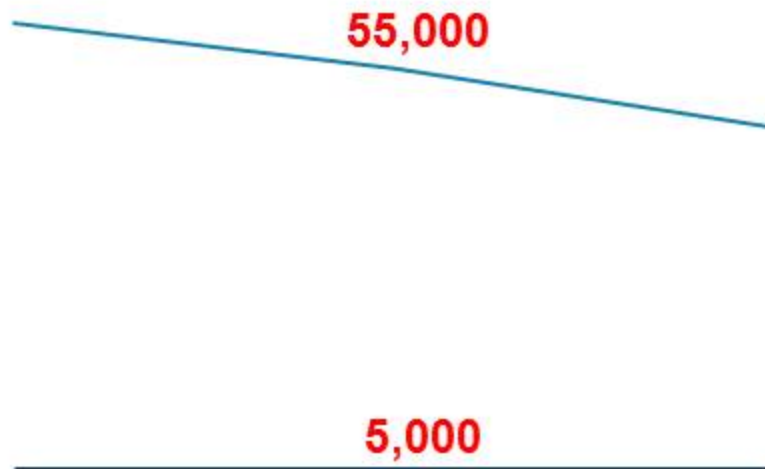
## Reported to Coast Guard



# Internal vs. External Flow Rate Estimates

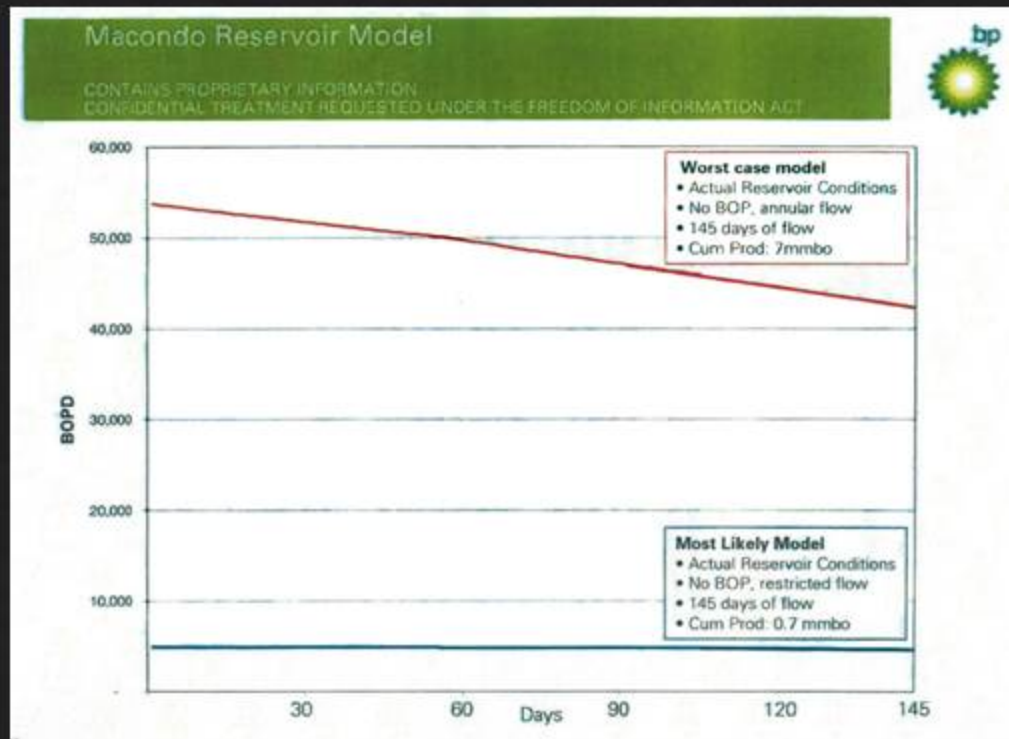
## BP Internal Flow Rate Estimates

## Reported to Coast Guard



# Internal vs. External Flow Rate Estimates

## Reported to Coast Guard



55,000

5,000

From: Suttles, Doug J  
Sent: Wed May 19 10:43:10 2010  
To: Lynch, John E Jr. (Jack); Inglis, Andy G (UPSTREAM)  
Subject: FW: Flow rate note?  
Importance: Normal  
Attachments: rate summary.doc; rate summary attachments.pdf

FYI



From: Suttles, Doug J

Sent: Wednesday, May 19, 2010 11:42 AM

To: Admiral Mary Landry (mary.e.landry@useg.mil); Admiral Thad Allen (Thad.W.Allen@useg.mil)

Cc: James A. Watson IV (james.a.watson@useg.mil); Admiral Neffenger (peter.v.neffenger@useg.mil)

Subject: FW: Flow rate note?

Admiral Allen and Admiral Landry,

Attached below is our most recent work on flow rate estimation. Don't hesitate to contact me if you would like to discuss.

Doug

Doug Suttles

Chief Operating Officer

Exploration & Production

BP

TREX-03218

BP-HZN-2179MDL01446217  
BPD183-012885

TREX 003218.0001

TREX.3218.1.1.TO



## Oil on Water Estimate - Best Guess

	sq mi:	Cover Factor	gals/sq mi	gals	lbs
Sheen	5256	0.65	333	1155164	27504
Dull oil	597	0.35	1332	278321.4	5627
Dark oil	120	0.25	6600	109800	4757

**Total oil on water:** 1633285 38888

x 2 to compensate for wash and drip 77775

recovered 31676

chemically dispersed 33000

burned 11642

**Total emitted** 151023

**Barrels emitted per day** 5707

5/17/2010

**From:** Mason, Mike C  
**Sent:** Tue May 11 16:33:44 2010  
**To:** Yeilding, Cindy; Kercho, Debbie  
**Subject:** FW: Meeting Presentation  
**Importance:** Normal  
**Attachments:** Meeting Presentation

All,  
Jasper's feedback after reviewing  
He will let us know if anything else

**Mike Mason PE**  
Vice President, Base Management  
BP Exploration & Production Technology  
Contact Details  
Office - 281 504 2227  
Cell - 713 301 3745

**From:** Mason, Mike C  
**Sent:** Tuesday, May 11, 2010  
**To:** Pepp, Jasper  
**Subject:** Meeting Presentation

**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  
**Attachments:** Meeting Presentation May 11 2010 (3).ppt

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**  
Vice President, Base Management  
BP Exploration & Production Technology  
Contact Details  
Office - 281 504 2227  
Cell - 713 301 3745

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BP-H2N-2179MDLU4808637

TREX 009156.0001

J MASON 0004 504 2227

0001-8783-04-200905101000000000

TREX 009156.0001

TREX.9156.1.1.TO

**Maximum Reservoir Exposed, High K**

**Scenario:**  
 • 88' reservoir exposed  
 • 300 mD  
 • 3800 psi at wellhead

Skin 0  
 Skin 10  
 Skin 25

**Scenario:**  
 • 88' reservoir exposed  
 • 300 mD  
 • 2270 psi at wellhead

Skin 0  
 Skin 10  
 Skin 25

*Flow increases by a  
 pressure drop*

**Maximum Reservoir Exposed, High K**

**Scenario:**  
 • 88' reservoir exposed  
 • 300 mD  
 • 3800 psi at wellhead

	Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)	
	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:**  
 • 88' reservoir exposed  
 • 300 mD  
 • 2270 psi at wellhead

	Hanger Failure (Annular Flow)		Shoetrack Failure (Casing Flow)	
	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*

## 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

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

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TREX 009156.0012

TREX.9156.12.1.TO

## **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%)

The

Hanger  
Per  
Res  
Skin

If we d  
to 6500

Hanger  
Per  
Res  
Skin

If we d  
to 6300

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TREX 009156.0008

TREX 009156.0008

CONFIDENTIAL

TREX.9156.8.1.TO

**From:** Mason, Mike C  
**Sent:** 5 May 2010 07:38  
**To:** Inglis, Andy G (UPSTREAM)  
**Cc:** Feijs, Jasper  
**Subject:** Macondo Oil Rate

I just read an article in CNN (May 14, 2010 1:00pm) stating that a researcher at Purdue believes that the Macondo well is leaking up to 70,000bopd and that BP stands by a 5,000bopd figure. With the data and knowledge we currently have available we can not definitively state the oil rate from this well. We should be very cautious standing behind a 5,000 bopd figure as our modelling shows that this well could be making anything up to ~100,000 bopd depending on a number of unknown variables, such as: flow path either through the annulus behind the production casing or through the production casing float shoe, the height of reservoir exposed, if drill pipe is suspended in the BOP and sealed by VBR rams, reservoir skin damage, choking effects and etcetera. We can make the case for 5,000bopd only based on certain assumptions and in the absence of other information, such as a well test.

Mike Mason PE  
Vice President, Base Management

I just read an article in CNN (May 14, 2010 1:00pm) stating that a researcher at Purdue believes that the Macondo well is leaking up to 70,000bopd and that BP stands by a 5,000bopd figure. With the data and knowledge we currently have available we can not definitively state the oil rate from this well. We should be very cautious standing behind a 5,000 bopd figure as our modelling shows that this well could be making anything up to ~100,000 bopd depending on a number of unknown variables, such as: flow path either through the annulus behind the production casing or through the production casing float shoe, the height of reservoir exposed, if drill pipe is suspended in the BOP and sealed by VBR rams, reservoir skin damage, choking effects and etcetera. We can make the case for 5,000bopd only based on certain assumptions and in the absence of other information, such as a well test.

Mike Mason PE  
Vice President, Base Management

TREX-03220

BP-HZN-2179MDL01458008  
BPD183-024676

TREX 003220.0001

TREX.3220.1.1.TO

Your design basis will need to account for a lot of gas!

Regards

Mike

**From:** Ballard, Adam  
**Sent:** 17 May 2010 18:54  
**To:** Brown, Mike T  
**Subject:** RE: ACTION: Please respond to request for -----> Re: REQUEST: Daily Status Report?

Thanks Mike. I appreciate the feedback.

**Subject:** RE: ACTION: Please respond to request for -----> Re: REQUEST: Daily Status Report?  
Mike,

Could you have one of your engineering team provide the basic information to Adam Ballard, as requested below. We remain in a position where no flow related information can be released internally or externally.

Best Regards,

Richard Lynch  
Vice President - Drilling and Completions - CDO  
501 Westlake Blvd - WL1 12.140  
Houston, Texas USA 77079

**From:** Lynch, Richard  
**Sent:** 17 May 2010 18:06  
**To:** Ballard, Adam; 'Norm.McMullen@comcast.net'; Brown, Mike T  
**Cc:** O'Donnell, William R; Bond, Stan L; MC252\_Email\_Retention; Saidi, Farah; Clarkson, David

**Subject:** RE: ACTION: Please respond to request for -----> Re: REQUEST: Daily Status Report?  
Mike,

Could you have one of your engineering team provide the basic information to Adam Ballard, as requested below. We remain in a position where no flow related information can be released internally or externally.

Best Regards,

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BPD568-004990

TREX 009475.0002

024986

BPD568-004991

TREX 009475.0003

CONFIDENTIAL

BPD568-004990

TREX 009475.0002

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BPD568-004991

TREX 009475.0003

TREX.9475.3.1.TO

9474  
Exhibit No. \_\_\_\_\_  
Worldwide Court  
Reporters, Inc.

From: Hill, Trevor  
Sent: Sun May 16 20:44:48 2010  
To: Saidi, Farah  
Subject: RE: Update  
Importance: Normal

Thanks... understood...

From: Saidi, Farah  
Sent: 16 May 2010 21:14  
To: Hill, Trevor  
Subject: RE: Update  
We are still depressurizing the system. Since the rates are confidential and I was told by Mike Brown not to write anything about it, he advises to call Paul Tooms. It seems the system is working which is encouraging and the team

**From:** Saidi, Farah

**Sent:** 16 May 2010 21:14

**To:** Hill, Trevor

**Subject:** RE: Update

We are still depressurizing the system. Since the rates are confidential and I was told by Mike Brown not to write anything about it, he advises to call Paul Tooms. It seems the system is working which is encouraging and the team is already working on the second version of the tool based on learning from this tool.

*Regards,*

*Farah Saidi*

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BP-HZN-2179MDL07037064

BPD568-017069

TREX 009474.0001

CONFIDENTIAL

BP-HZN-2179MDL07037064

TREX.9474.1.2.TO



From: Mazzella, Mark  
Sent: Fri May 28 02:10:38 2010  
To: Tooms, Paul J; Doshi, Rupen S; Larrison, Jace  
Subject: RE: BJ and Halli Data  
Importance: Normal

Thanks you Paul. No worries here.

Mark M.

From: Tooms, Paul J

**From:** Tooms, Paul J  
**Sent:** Thursday, May 27, 2010 7:47 PM  
**To:** Doshi, Rupen S; Larrison, Jace  
**Cc:** Mazzella, Mark  
**Subject:** RE: BJ and Halli Data

Of course you guys doing the job can get the data, so list is approved. The purpose of the note was meant to put a limit on the people outside the circle of trust getting the data.

Sorry if it caused you any issues.

Paul Tooms  
VP Engineering

Worldwide Court  
Reporters, Inc.

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BP-HZN-2179MDL01628995

TREX 009164.0001

HIGHLY CONFIDENTIAL

BP-HZN-2179MDL01628995

Worldwide Court  
Reporters, Inc.

TREX.9164.1.1.TO

bp

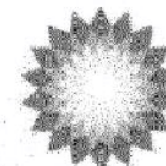


May 24, 2010

BY ELECTRONIC DELIVERY

The Honorable Edward J. Markey  
Chairman  
Subcommittee on Energy and Environment  
Committee on Energy and Commerce  
U.S. House of Representatives  
2125 Rayburn House Office Building  
Washington, DC 20515-6115

bp



May 24, 2010

BY ELECTRONIC DELIVERY

The Honorable Edward J. Markey  
Chairman  
Subcommittee on Energy and Environment  
Committee on Energy and Commerce  
U.S. House of Representatives  
2125 Rayburn House Office Building  
Washington, DC 20515-6115

Re: Response to Chairman Markey's Correspondence, Dated May 14, 2010, to Mr. Lamar McKay, President and CEO of BP America, Inc.

TREX-01651

BP-HZN-2179MDL00000415

TREX 001651.0001

TREX-01651

BP-HZN-2179MDL00000415

TREX.1651.1.1.TO

5. BP falsely suggested, in its May 24, 2010 letter, that the Unified Command's flow rate estimate of 5,000 barrels of oil per day ("BOPD") was the "most scientifically informed judgment" and that subsequent flow rate estimates had "yielded consistent results." In fact, as set forth above, BP had multiple internal documents with flow rate estimates that were significantly greater than 5,000 BOPD that it did not share with the Unified Command.

results." In fact, as set forth above, BP had multiple internal documents with flow rate estimates that were significantly greater than 5,000 BOPD that it did not share with the Unified Command.

6. On or about June 25, 2010, in a BP letter to Congressman Markey, BP's former vice president inserted language that falsely stated that BP's worst case discharge estimate was raised from 60,000 BOPD to 100,000 BOPD after subsequent "pressure data was obtained from the BOP stack." At the time this false representation was made, BP's former vice president knew that the 100,000 BOPD figure was not first derived after

TREX 052673.0017

# Summary of Dr. Wilson's Expert Opinions

- A. Immediately after the blowout of the Macondo MC 252-1 well, BP began conducting well flow rate modeling to inform its source control efforts, including the top kill operation.
- B. In the weeks following the blowout BP's computer models suggested higher well flow rates than those BP reported to the government, the press and the public.
- C. BP knew or should have known from its modeling efforts that the top kill was very likely to fail because the well flow rate exceeded a 15,000 BOPD threshold rate.**
- D. After the top kill failed, BP was informed that the failure was most likely due to the flow rate.

## Summary points from the Kill the Well on Paper Discussion 18 May, 2010

### Summary Points

- The need for accurate, low latency gauges and a system that permits rapid reaction of pumping operations to measured pressures was a point raised several times in discussion.
- Modeling indicates that a dynamic kill can be achieved for a well flowing oil at a rate of 5000 STBpd if the pressure in most of the flowing wellbore is above the bubble point
- Modeling indicates that a dynamic kill cannot be successfully executed if the oil flow rate is 15000 STBpd
- Knowledge of the flow rate is needed to form a view of the probability of success, as is knowledge of the position of flow restrictions.

### Summary Points

- The need for accurate, low latency gauges and a system that permits rapid reaction of pumping operations to measured pressures was a point raised several times in discussion.
- Modeling indicates that a dynamic kill can be achieved for a well flowing oil at a rate of 5000 STBpd if the pressure in most of the flowing wellbore is above the bubble point
- Modeling indicates that a dynamic kill cannot be successfully executed if the oil flow rate is 15000 STBpd
- Knowledge of the flow rate is needed to form a view of the probability of success, as is knowledge of the position of flow restrictions.
- The dynamic kill operation is likely to put solids-laden fluid at a substantial rate through the BOP stack and riser, which may erode restrictions

TREX 009132.0002

**From:** Ole B. Rygg [mailto:Ole.Rygg@addenergy.no]  
**Sent:** 16 May 2010 17:26  
**To:** Hill, Trevor  
**Cc:** Mix, Kurt; Thomas Selbekk  
**Subject:** RE: Pressure build-up

Be aware that we are working on the 5000 bopd case. That could be too optimistic.

I am currently working on bullheading modelling for the top kill option

Please give me a call if you want to discuss. I have a local cell phone number: . 409 392 3095

Regards, Ole

cid:3310015153\_18375562

**Dr. Ole B. Rygg**  
Managing Director, add wellflow as  
Vice President, Drilling & Production, add energy group

As you can see (shut-in presentation), the last reduction in pressure drop at the wellhead (Yesterday), will give more gas in the well and an increased gas cushion during shut-in. UNLESS, the reduction in wellhead pressure is due to an increased flow rate and the restrictions at the wellhead is giving away. This means a large hole in the BOP stack and less chance of ever being able to do a dynamic top kill, since the required rate through the stack to achieve the required pressure drop is too high.

Be aware that we are working on the 5000 bopd case. That could be too optimistic.

I am currently working on bullheading modelling for the top kill option.

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BP-HZN-2179MDL04883028  
BPD344-083460

TREX 009250.0002

CONFIDENTIAL

BP-HZN-2179MDL04883029  
BPD344-083461

TREX 009250.0003

CONFIDENTIAL

BP-HZN-2179MDL04883028

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BP-HZN-2179MDL04883029

TREX.9250.2.2.TO

9250  
Exhibit No. \_\_\_\_\_  
Worldwide Court  
Reporters, Inc.

From: Wood, Douglas G  
Sent: Tue May 18 00:35:08 2010  
To: Hill, Trevor

**From: Lockett, Tim**  
**Sent: 17 May 2010 23:00**  
**To: Hill, Trevor**  
**Subject: RE: Pressure build-up**

My thoughts (based on the covering email):

1) The apparent reliance in Ole's email on the 5 mbd number, which has little if no origin, is concerning. From all the different ways we have looked at flowrate, 5 mbd would appear to err on the low side. I will therefore be looking to see that the dynamic well kill modelling has been tested at higher well rates. If this hasn't been done, yet, then could you initiate this with Ole.

2) Maybe I am being pessimistic but my first thought when I heard of the fall in pressure upstream of the BOP is that this is bad news rather than good, my thought would go to reduced restriction within the BOP. The insertion of the insertion pipe has increased back-pressure at the kink - we should have seen an increase in pressure transmitted back to the upstream side of the BOP.

Tim

From: Hill, Trevor  
Sent: 17 May 2010 15:31

My thoughts (based on the covering email):

1) The apparent reliance in Ole's email on the 5 mbd number, which has little if no origin, is concerning. From all the different ways we have looked at flowrate, 5 mbd would appear to err on the low side. I will therefore be looking to see that the dynamic well kill modelling has been tested at higher well rates. If this hasn't been done, yet, then could you initiate this with Ole.

2) Maybe I am being pessimistic but my first thought when I heard of the fall in pressure upstream of the BOP is that this is bad news rather than good, my thought would go to reduced restriction within the BOP. The insertion of the insertion pipe has increased back-pressure at the kink - we should have seen an increase in pressure transmitted back to the upstream side of the BOP.

Tim

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BPD344-283459

TREX 009250.0001

4883028

BPD344-283459

TREX 009250.0002

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CONFIDENTIAL

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TREX.9250.1.2.TO

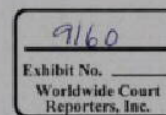
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<number>+12813877509</number>
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<internal_name>l</internal_name>
<timestamp>2010-05-27T03:25:32Z</timestamp>
<status>Sent</status>
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<storage>Phone</storage>
<type>Outgoing</type>
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over 12800 bbl of mud today plus 5 seperate bridging pills. Tired ... Going home and
getting ready for round three tommorrow.</text>
<deleted>l</deleted>
<smsc>
</smsc>
```



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BP-HZN-2179MDL05710203

TREX 009160.0001

HIGHLY CONFIDENTIAL

BP-HZN-2179MDL05710203



TREX.9160.1.1.TO

# BP: 5,000 BOPD “Best Estimate”

- April 28 - 2,500 BP’s “best estimate” (to Landry)
- April 29 - 1,000 to 5,000 “best estimate” (on CBS Early Show)
- April 29 - 1,000 to 5,000 “reasonable estimate” (Good Morning America)
- April 30 - 5,000 “currently estimated rate” (BP 6-K)
- May 4 - 5,000 “current estimate[.]” (BP 6-K)
- May 10 - 5,000 “most likely model” and “currently estimated rate” (BP Letter)
- May 14 - 5,000 “best estimate” and a “reasonable number” (Good Morning America)
- May 17 - 5,000 “best estimate” (UAC Press Briefing)
- May 19 - 5,000 to 6,000 “best guess”; “updated” range same. (BP Memo)
- May 21 - 5,000 “best estimate” (Good Morning America)
- May 21 - 5,000 “our best estimate” (UAC Press Briefing)
- May 22 - 5,000 “best estimate” (NPR)
- May 23 - 5,000 “best estimate” (to McNutt)
- May 24 - 5,000 “best guess” and “most scientifically informed judgment”; “subsequent estimates yield consistent results.” (Markey Letter)

D25018A; [Source: TRENX-9628, 150311, 150075, 150310, 150074, 150149, 150150, 9155, 150312, 150282, 150315, 150283, 150316, 10358, 3220, 3218; Landry Dep. 192:8-24, McNutt Dep. 434:3-13.]