

From: Baker, Kate H (UNKNOWN BUSINESS PARTNER)
Sent: Tue Jun 15 18:56:49 2010
To: Hill, Trevor; Bruce, Zander
Cc: Tooms, Paul J
Subject: FW: Depletion Rates
Importance: Normal
Attachments: Macondo Technical Note -Depletion Rates vA.ZIP

Here is an exploration of the decline rate space by Bob Merrill for various aquifer sizes, skin and production rates. He assumed that the flow regime (chokes) did not change with time as the reservoir depletes. Even for the larger aquifer size and zero skin, rates of more than 50 kbd give declines greater than the max that are constant with observations.

One has to invoke a fortuitous erosion of chokes downstream of PT_B that just offsets the reservoir decline.

Please advise if you would like additional sensitivities.

FYI, I have also queried the permeability basis. I believe the k_{air} were klinkenberg corrected core plug perms which would have been measured at sleeve (gas bottle) pressure, not at overburden pressure. If this is true, then the perms would need rather a larger downward correction than the 0.85 used to convert k_{air} to $k_{oil/swconnate}$ based on

Thunderhorse correlations for SCAL measurements made under net overburden conditions. Stay tuned.

From: Merrill, Robert C
Sent: Tuesday, June 15, 2010 1:17 PM
To: Baker, Kate H (UNKNOWN BUSINESS PARTNER)
Subject: RE: Depletion Rates

Yes, the magenta line is the 8 psi/day line and the blue is 13 psi/d.

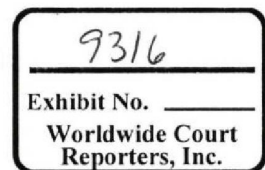
Bob

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From: Baker, Kate H (UNKNOWN BUSINESS PARTNER)
Sent: Tuesday, June 15, 2010 12:37 PM
To: Merrill, Robert C
Subject: RE: Depletion Rates

Thanks, Bob. In your first figure, both dashed lines are labeled "Observed low" I think you intended one to be the least decline rate and the other to be the highest decline rate consistent with observations. Can you confirm? Kate

From: Merrill, Robert C
Sent: Tuesday, June 15, 2010 12:00 PM
To: Baker, Kate H (UNKNOWN BUSINESS PARTNER)
Cc: Cecil, Chris; Mason, Mike C; MC252_Email_Retention; McLaughan, Kelly; Kercho, Debbie A
Subject: Depletion Rates
Kate:



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I enclose a rough draft which describes the simulations used to compare the pressures observed at the BOP with reservoir depletion rates. I increased the rate to 60 mbd and 80 mbd (which required a larger "equivalent diameter" in the tubing). At these rates the depletion at the well head exceeds the observed values.

Bob

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