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Sent: Sun May 23 18:33:45 2010

To: Hill, Trevor

Subject: RE: Plume pics_with measurements

Importance: Normal

Unless we move to CFD for this, we have to approximate these holes by circles with diameter D when the first and second leaks are more like slots of width W and length L. I have used equivalent area to do this:

Equivalent Area, $D = ((W * L) * 4 / \text{PI})^{0.5}$

We also have a degree of uncertainty in whether the fluid exiting these holes is preferentially gas compared with the equilibrium fluid for these conditions, and some uncertainty over the conditions. For the purposes of the following flowrates, I have used an equilibrium fluid (gas and liquid exiting in the correct proportions for the conditions) at base case pressure of 2750 psia and 200F, with sensitivity cases at 2700 psia and then also at a sensitivity of 175F.

Details are in the attached xls but essentially, we should expect these leaks to have flowrates as follows

leak#1 ~3600 sbbl/d

leak#2 ~7100 sbbl/d

leak#3 ~900 sbbl/d

Total: 11600 sbbl/d