



Based on this analysis and sensitivity studies which are described later in Section 8.3, the calculated flow rate at the Riser End is 25,100 stbpd.

For a detailed discussion of how the range of qualifying flow rates was determined, see Appendix G.

8.2 Kink Leak Flow Rate

To calculate the flow rate through the Kink leak, I extended the model used to estimate flow from the Riser End to include the kinked section of the riser (refer to Section 7 for a description of the Kink Model). In these simulations, I varied the unknown resistance through the Kink to produce different flow rates through the riser. As described in Section 8.1, qualifying simulations exhibited double peak behavior on May 13 and single peak behavior on May 16. From those qualifying simulations, I chose the simulation with the maximum Kink leak flow rate.

I consider this the maximum Kink leak flow rate for the following reasons. First, I selected an upstream pressure from PT-M that was higher than other reported values for that gauge. A higher pressure results in a higher calculated kink leak flow rate. Second, I relied upon measurements of the holes that were made when they were in their final state (that is, after the kinked section of the riser had been retrieved). I note that the actual sizes of the holes on any day between May 13 and May 20 could have

conservative measurement of the pressure, I calculated the maximum possible flow rate for the three holes composing the Kink leak during the May 13 to May 20 period. This maximum Kink leak flow rate is 4900 stbpd.

8.3 Sensitivities

Some of the model inputs are not known to the same degree of certainty as others. To address uncertainties in the inputs, I ran several sensitivity studies. The same general procedure was performed for each of the sensitivity studies I performed:

- Vary one model input to address its uncertainty
- Run simulations using the May 13 and May 16 riser motion characteristics described in Appendix F-5.
- Determine the range of acceptable flow rates as described in Section 8.1

As an example, the roughness of the riser pipe was not known. To address this uncertainty, I varied the roughness from that of a smooth pipe to 100 times the roughness of a smooth pipe. Detailed discussion of all such sensitivity studies are included in Appendix G.