SED-313
Email from Bret Lane to Jim LaGrone et al re
FW: Potential communication between P39A and SS25 through WSO (Feb. 6, 2016)
I.19-06-016
ALJs: Hecht/Poirier
Date Served: May 17, 2021

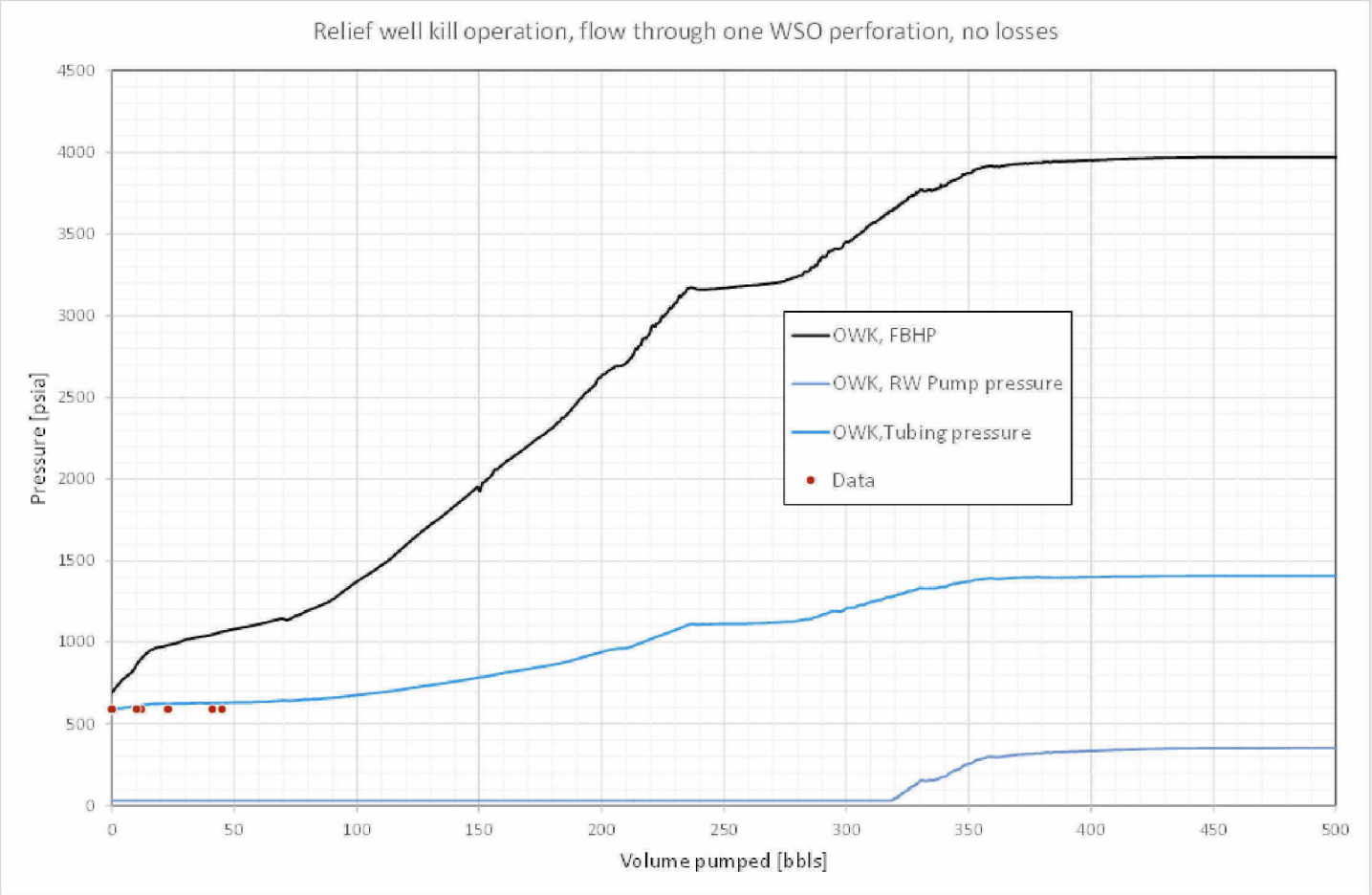
Message

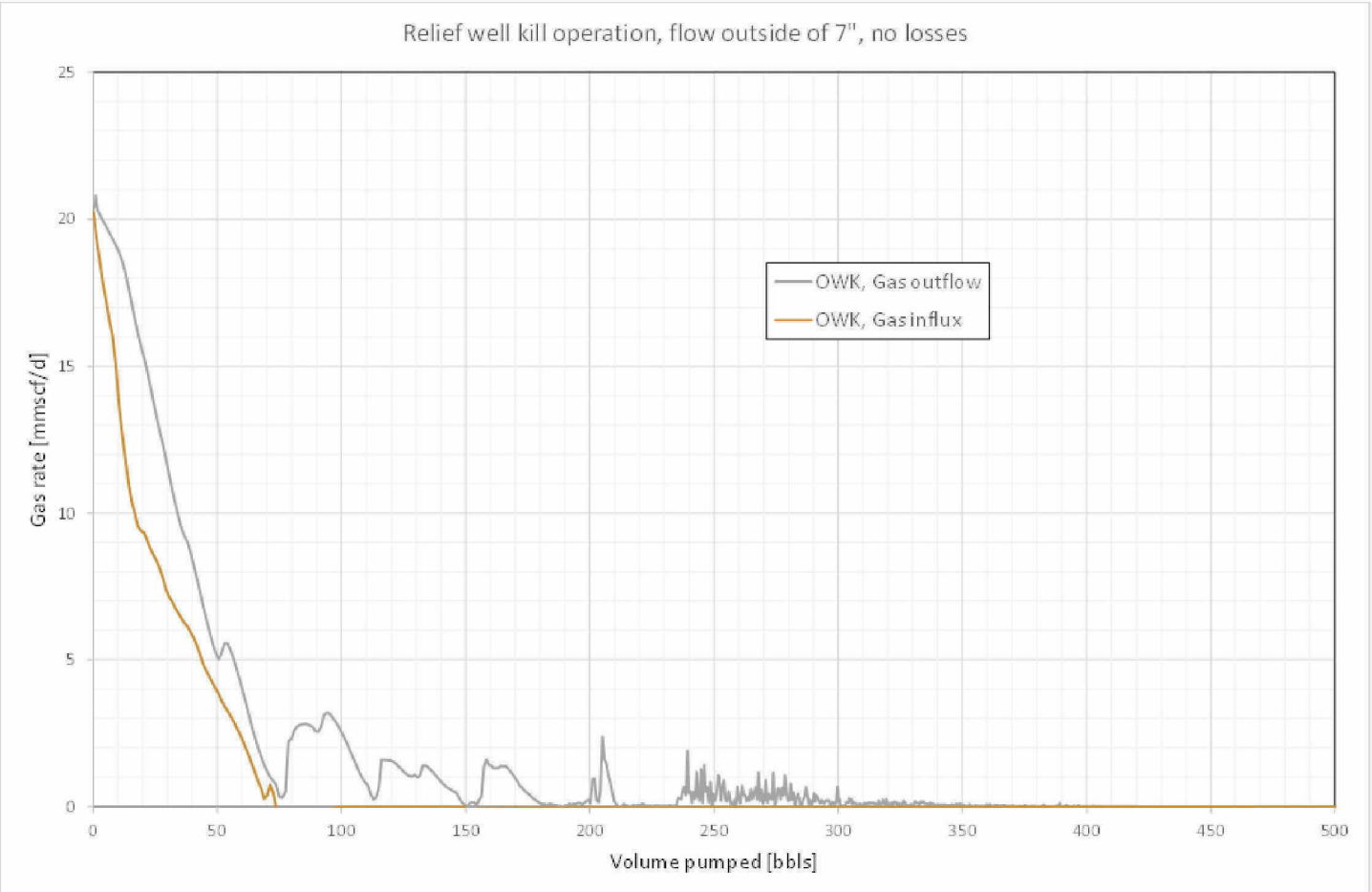
From: Lane, Bret [/O=ENOVA/OU=SOCAL/CN=RECIPIENTS/CN=TPJBL]
Sent: 2/6/2016 1:38:56 PM
To: Jim LaGrone [Jim.LaGrone@boots-coots.com]; Rolando Gomez [Rolando.Gomez@boots-coots.com]; Arash Haghshenas [arash@boots-coots.com]; John Hatteberg [jhatteberg@boots-coots.com]; Schwecke, Rodger [/o=ENOVA/ou=SOCAL/cn=Recipients/cn=RSchwecke]; Van de Putte, Todd [/O=ENOVA/OU=SDGE/cn=Recipients/cn=TVandePu]
Subject: FW: Potential communication between P39A and SS25 through WSO

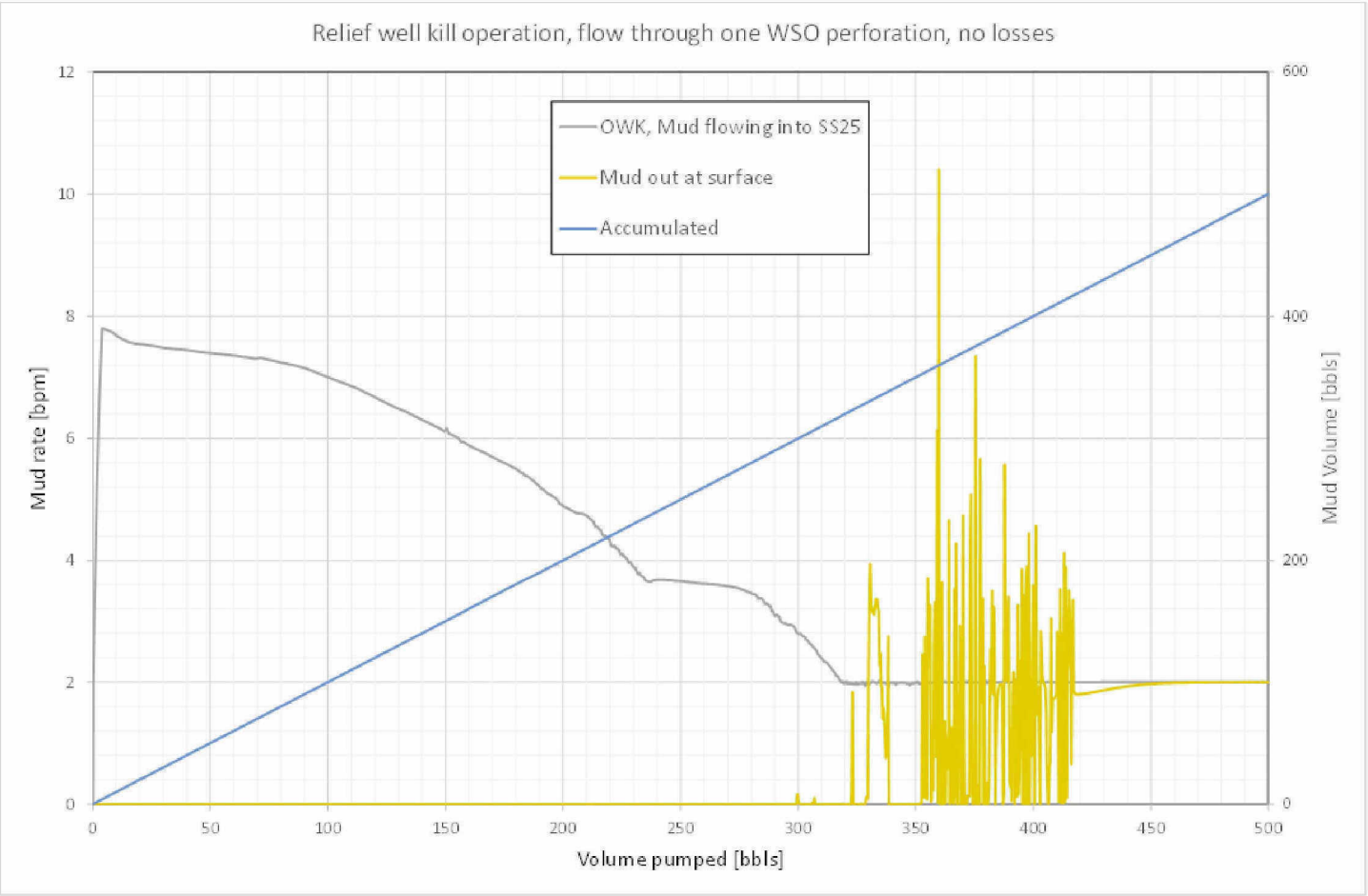
From: Morten Haug Emilsen [mailto:morten.haug.emilsen@addenergy.no]
Sent: Saturday, February 06, 2016 1:35 PM
To: Lane, Bret; Don Shackelford; jwright@jwco.com; pete@slagel.net
Subject: RE: Potential communication between P39A and SS25 through WSO

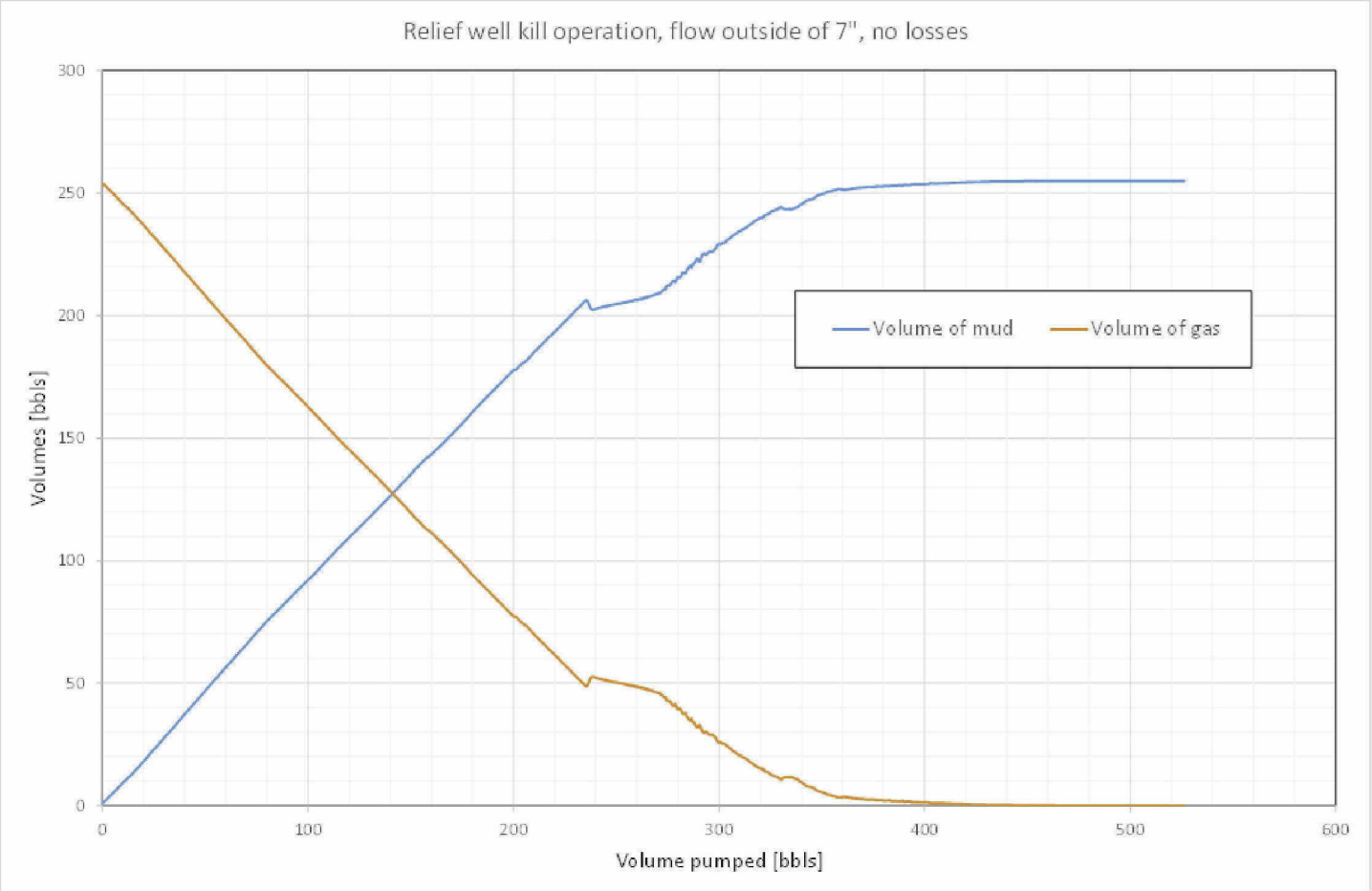
Updated plots with open BOP initially to limit the additional pressure we put on the formation in the RW.

Simulations show that the "base case" flow path scenario between the 7" casing and the 2 ¨þ" tubing is easy to kill. We only need to raise mud 2500 ft above the top producing sand to overcome the reservoir pressure. Even if we lose mud through only one of the WSO perforations, the resulting rate is sufficient to kill the well. See below for rates, volumes and pressures.


Relief well kill operation, flow through one WSO perforation, no losses
Pressure [psia]
Volume pumped [bbls]
OWK, FBHP
OWK, RW Pump pressure
OWK,Tubing pressure
Data
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
50
100
150
200
250
300
350
400
450
500


Relief well kill operation, flow outside of 7", no losses
Gas rate [mmscf/d]
Volume pumped [bbls]
OWK, Gas outflow
OWK, Gas influx
0
5
10
15
20
25
0
50
100
150
200
250
300
350
400
450
500


Relief well kill operation, flow through one WSO perforation, no losses
OWK, Mud flowing into SS25
Mud out at surface
Accumulated
Mud rate [bpm]
Mud Volume [bbls]
Volume pumped [bbls]
0
2
4
6
8
10
12
0
200
400
600
0
50
100
150
200
250
300
350
400
450
500



From: Morten Haug Emilsen
Sent: 6. februar 2016 19:44
To: 'Lane, Bret' <JLane@semprautilities.com>; 'Don Shackelford' <donwshackelford@yahoo.com>; jwright@jwco.com; 'pete@slagel.net' <pete@slagel.net>
Subject: Potential communication between P39A and SS25 through WSO

Tomorrow, if we get communication with SS25 through the WSO (Water Shut-off perforations), there is a possibility that we will observe losses but at a rate limited by the restriction through those perforations.

I have looked at different scenarios to evaluate the maximum rate through the WSO perforations. Two scenarios, both assuming flow in the annulus between the 7" and the 2 ¨þ" tubing in SS25 and with no losses, no fracturing and no washout.

The conclusion is that even if we get communication through only one of the perforations, we are still ok.

1. Assume we get communication with SS25 through all four 0.5 in holes:

This yields a total flow are of 0.7853 in2 and will not introduce any challenges with our planned pump rate.

A pump rate of 10 bpm through the perforations yields a pressure drop of only 300 psi and this will hence not limit our operation.

2. Assume we get communication with SS25 through only one of the 0.5 in holes:

This yields a total flow area of 0.19635 in2 and will cause increased pressure drop down hole.

Initially, when making intersection, the pressure differential is 3100 psi, (3800 in the RW and 700 psi in SS25) the flow rate through the open perf will be limited to 8 bpm. As we build back pressure, the rate will drop slightly due to increased pump pressure (I have limited this to 3300 psi), but it will not limit our ability to kill the well, see charts below.

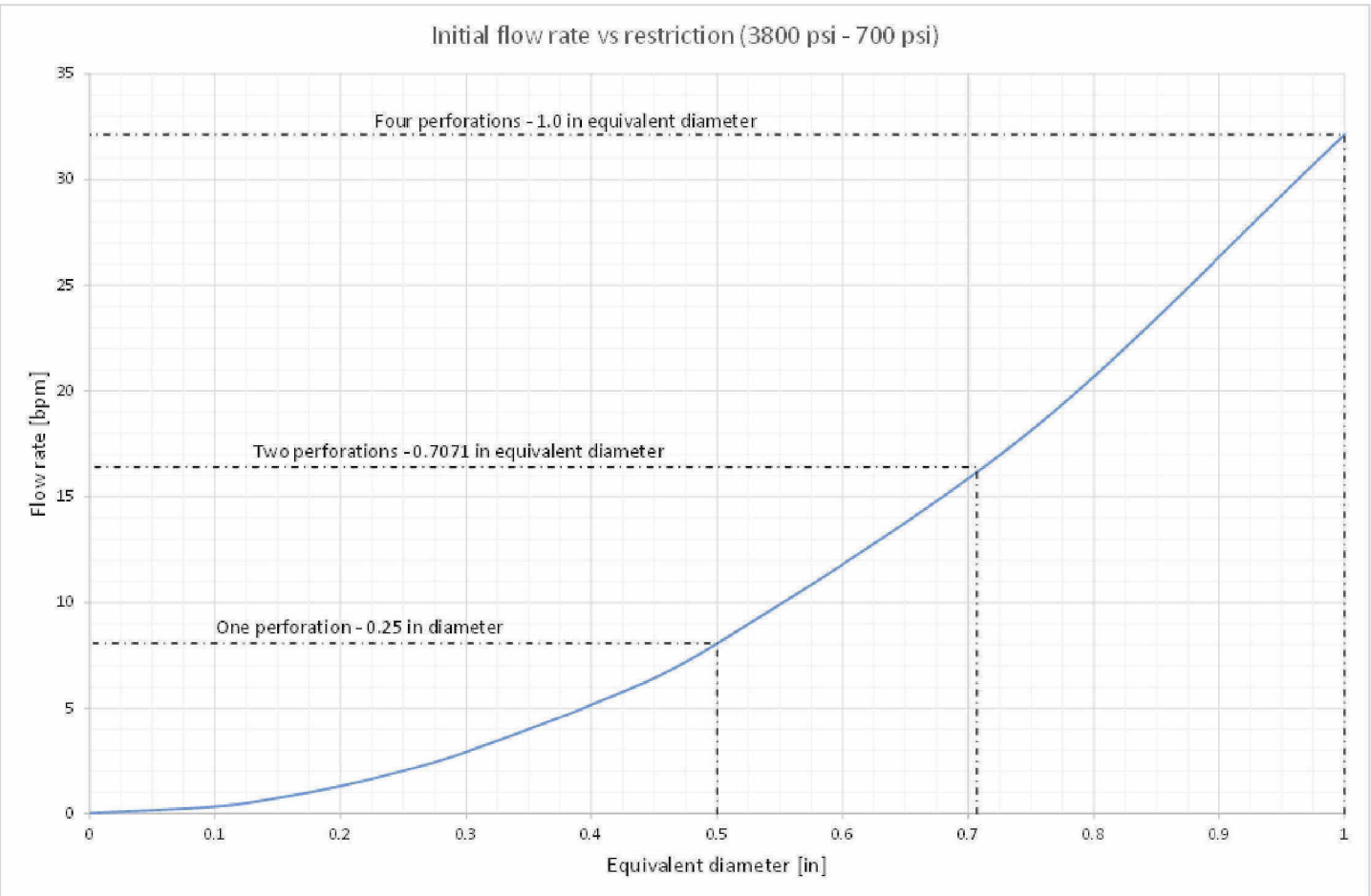


Figure 1: Flow rate through restriction with 3800 psi upstream and 700 psi downstream of the restriction

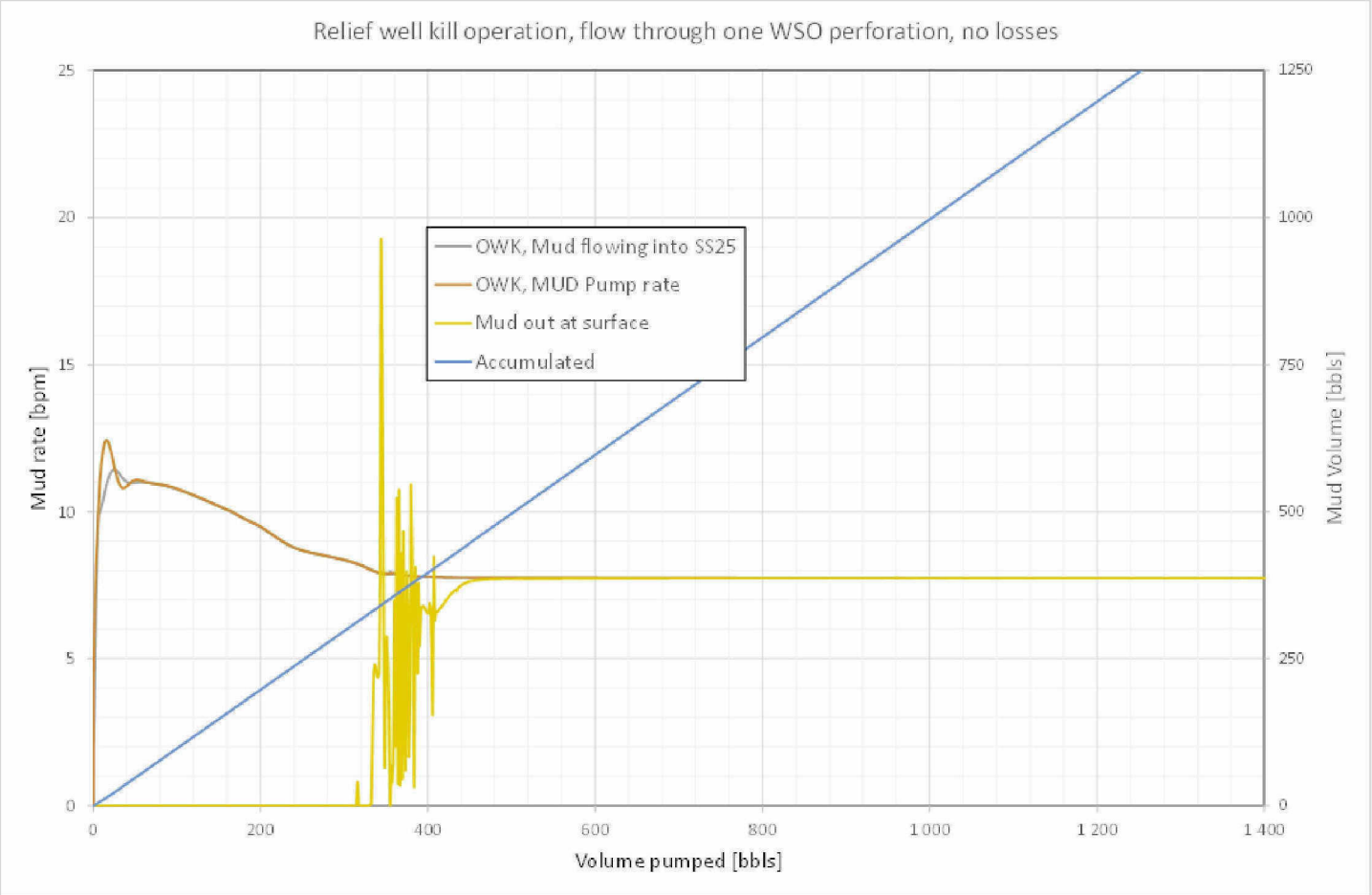


Figure 2: Flow rate during kill. Pump path down hole through one 0.5 in WSO perforation

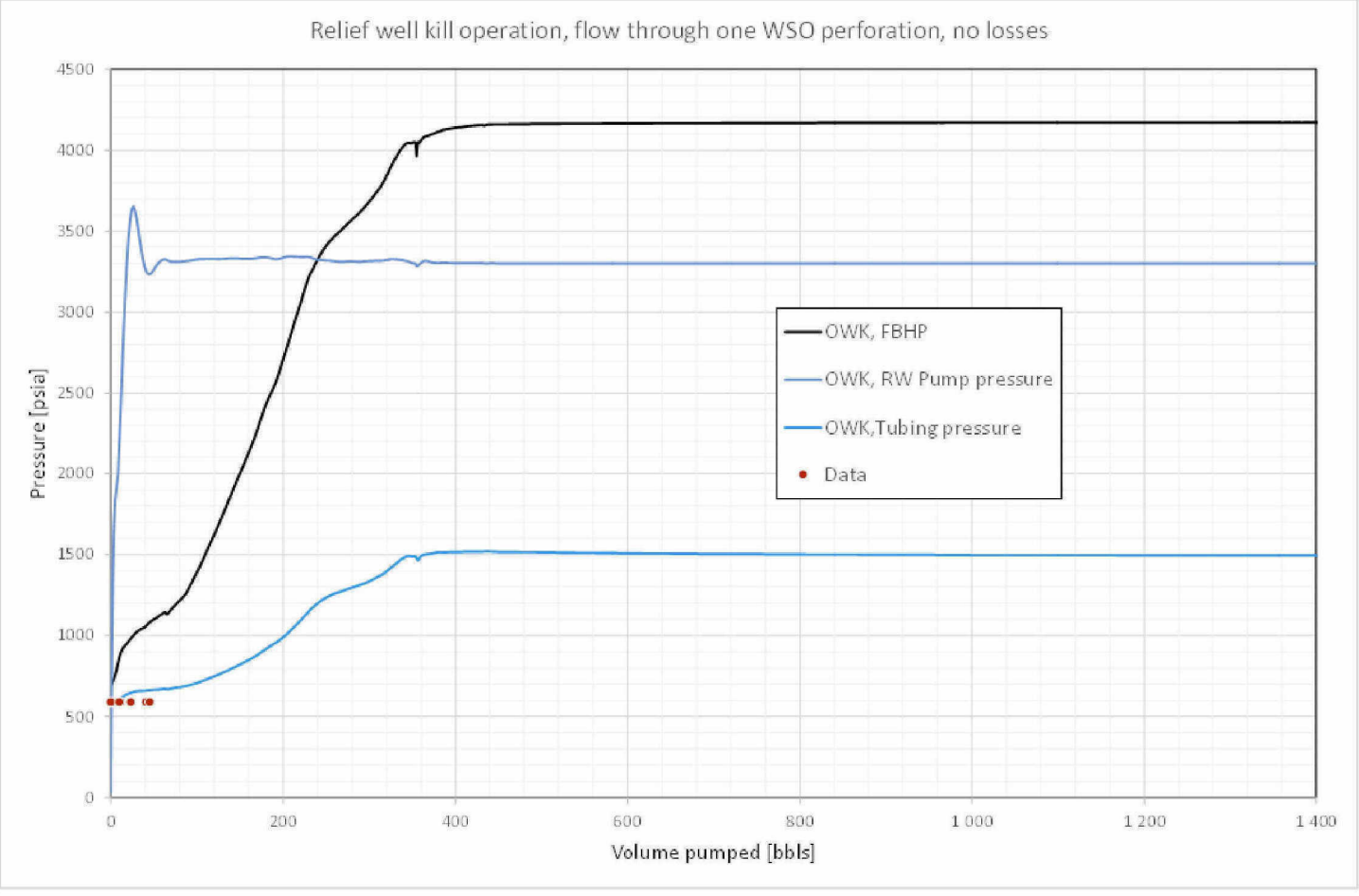


Figure 3: Pressures during kill. Pump path down hole through one 0.5 in WSO perforation

Best regards

add energy

Morten Haug Emilsen
Managing Director, add wellflow as

Senior Vice President, add energy group

[redacted]

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