



Project Memo

Operator: Devon Energy **Job Number:** 2013-119
Well Name: Lava Tube #27 State 1H
Date: April 5, 2013
To: Kenny Allen **From:** Dicky Robichaux / Terry A. Strickland / Chris Stover
CC: Larry Nixon / David Moody / Dan Eby / Fred Ng / Kerry Girlinghouse
Subject: Well Control Operations

PROJECT MEMO # 6

Background

While drilling 8³/₄" pilot hole; a kick was taken at 12,200' with 9.2 ppg mud, strong flow was observed at surface. WWCI was dispatched and observed 2,400 psi on the casing upon arrival on location. The surface casing in this well is 9⁵/₈" 40 ppf J-55 set at 4,110'. A Formation Integrity Test (FIT) was performed with 8.6 ppg fluid giving a 9.2 ppg equivalent (129 psi surface pressure). As of March 30, lubricate and Bleed operations have been performed in an attempt to reduce surface casing pressure from 2,550 psi. Current casing pressure is 500 psi and has held steady for over 18+ hours. Noise / Temperature log and stuck pipe log have been run and identified a possible loss zone at 6,600' and 7,040'. Surface casing pressures have been kept below 2,750 psi, 70% burst of casing.

Additional logs have been ran that indicate the flow is from bottom to top based on the temperature logs, also we note an additional location for a thief zone where the temperature spikes at 7,040'. The sonic log has indicated there is a possible bridge located between 5,694' to 5,712'.

April 3, 2013: The drill string was opened to the pump truck to apply pressure on the string before severing the drill string at 11214 feet. Once the low torque valve was opened, a pressure of 715 psi was observed on the pump trucks pressure gauges. Discussions of why and how the pressure was discussed.

April 4, 2013: While waiting on the equipment to arrive, the string parted at a currently unknown depth. A sling shot affect lifted the drillpipe about 4 feet up, the slips kicked out and the drillpipe fell into the well. The pump line that had been installed sheared off. The low torque valve was in the open position for monitoring purpose was pulled into the rotating head and lodged. During this event the low torque valve closed, isolating the drillpipe pressure.



Project Memo

Objective

The objective of this Project Memo is to provide the on-site team a forward plan to safely bring the well under control. Options are described below in no particular order of importance. Both options will require a firefighting spread to be installed prior to any work performed on the well, including, maintaining the surface pressure below ≤ 500 psi by the lube and bleed method. This aspect is deemed important to not change the current well dynamics which could change the current state of the well relative to an uncontrolled flow situation with the drillpipe.

Both options will also require:

Clearing the location of equipment and materials which may impede access under and around the substructure, is required. Items to be removed include the casing, catwalk and V-Door. Additionally, 10 frac tanks will be moved to the safe location to store firefighting water. There are pipe racks and trailers on the North East side of location that will be cleared to provide more working area.

The high pressure pump will be moved to the safe location and be re-installed on to the annulus with one 500 bbl frac tank to hold brine water for the lube and bleed operation. A second tie in for the lube and bleed operation will be installed into the $9\frac{5}{8}$ " casing annulus. This line will have a tee installed with redundant isolation low torque valves on each side, one line will run to the high pressure pump and the second to be installed to the choke manifold. This will allow the well to be monitored and pressure maintenance to continue when the lower pipe rams are closed.

Option 1:

Recovering the drillpipe to surface

The lower pipe rams will be closed and the pressure bled to zero between the lower and upper pipe rams. A set of blind shear bonnets and shear rams along with an accumulator unit have been ordered for the job. The blind rams and bonnets will be removed and replaced with blind/shear rams and bonnets. The accumulator will be positioned in a remote and safe area and connected to the blind shear rams. This accumulator will be used to actuate the blind shear rams in the event of loss of well control. With these blind shear rams installed, the rotary and support beams can be removed. The rotating head will be pulled up and off the BOP stack followed by the annular preventer. This will expose the drillpipe and FOSV. The FOSV will be closed and the low torque opened and then removed. A pup joint with a FOSV installed on top will be installed. Bringing the top FOSV to the rig floor. This option is not without significant risk of unintentionally opening / disturbing the low torque valve currently deemed to be in the closed position. At this point we have to assume this risk is significant unless further investigation and observations indicate otherwise.



Project Memo

Wireline will be run to determine the depth of the parted pipe and a bottom hole pressure calculated. Determine kill weight mud and design and perform a kill to bring the well to a static condition. Pump cement to secure the Lava Tube # 27 State 1H well below the bridge. Lube and bleed the well dead above the bridge.

Option 2:

Shear the drillpipe and allow it to drop below the rams to secure the well

Once the blind shear rams have been installed from Option 1 above, activate the blind shear rams to cut the drillpipe and allow same to fall into the well to secure same.

Another consideration to above portion of Option 2: Rig down the drilling rig before shearing the drillpipe in the event the blind shear rams do not seal.

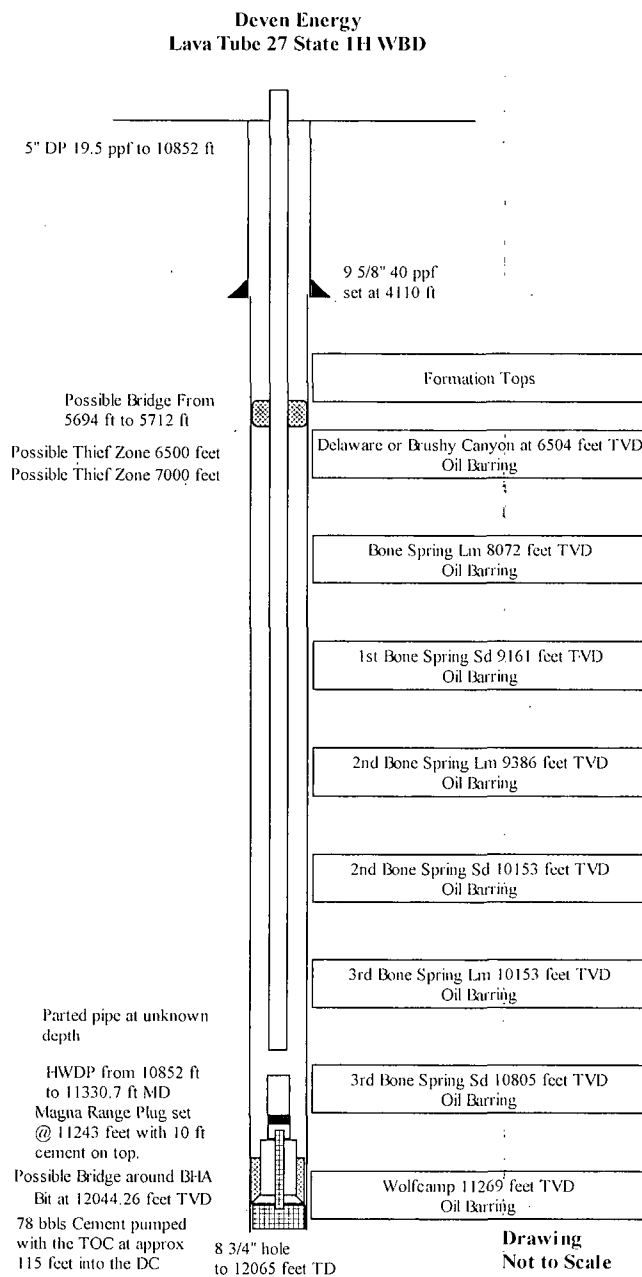
Rig up snubbing unit inside the derrick or rig down the rig and move off location and then rig up a snubbing unit.

Our recommendation would be to proceed with Option 2, as it lends lesser risk of any escalation to loss of control.



Project Memo

Current Wellbore Diagram



All material contained in this report are believed to be true and accurate but is presented on an "as is" basis. Wild Well Control, Inc. cannot and does not guarantee, warrant or represent the accuracy of or accept any responsibility for the use of any information contained herein. All services have been provided on a "best efforts" basis and are believed to have successfully met the desired goals and objectives of the client.



Daily Operations Report

WWCI Job Number- 2013-119			
Customer Information			
Customer	Devon Energy Corporation	Well Name	Lava Tube #27
Representatives	Kenny Allen		
Start Date	3/22/2013	Report Date	04/07/2013
WWCI Personnel	Chris Stover, Dicky Robichaux, Terry Strickland, Kirk Johnson, Ben Chorney, Jason McNew, and 3 BTI hands		

Summary
Changed out the blind rams and bonnets to blind shear rams and bonnets. Continued to monitor pressures; pressure had built to 257 psi, lube 11 bbls into casing and bled casing from 340 to 175 psi.

Time	Details
0000-0730	Continued to monitor the casing pressure. Casing pressure at 200 psi through the night. No build up between lower pipe rams and upper pipe rams.
0730-0800	Rig up on blind shears with 20 bottle koomey unit. Spot equipment in preparation for bonnet change out. Check bridging material recipe.
0800-0830	Held JSA meeting with all personnel on location. Confirmed head count of 31 personnel on location. Restrict access to location with safety gate guard.
0830-0945	Prepare to open blind rams. Open up upper and lower pipe rams to atmosphere and monitor for 30min.
0945-1045	Open Blind rams and pull left side standard bonnet.
1045-1530	Install left side booster bonnet
1530-1630	Pull right side standard bonnet
1630-1730	Install right side booster bonnets and close blind rams.
1730-1800	Clean up tools from sub-structure
1800-1900	Conference call with Devon office. Agreed to shear pipe tomorrow. Note: Casing pressure 250psi.
1900-2100	Monitor well Casing pressure = 257 psi. Lined up truck to lube into well, opened up HCR valve on the 9-5/8" casing kill line side. Checked pump truck lines to be sure open.
2100-2130	Lube 11 bbls 9.3 brine into the well, casing pressure increased to 345 psi.
2130-2300	Allowed fluid to swap with gas.
2300-2330	Lined up to bleed gas, casing pressure was bled from 340 psi to 220 psi on the choke panel, a 20 foot flare was observed. Shut in below the pressure gauge valve and bled gas from the upper choke line.

[illegible]

WWCI Personnel			
This document does not reflect billing days on location. An itemized invoice will be issued.			
Name	Start	Days	End
D. Robichaux	3/22/13	17	
T. Strickland	3/22/13	17	
A. Scheet	3/28/13	1	3/28/13
A. Scheet	3/30/13	5	4/3/13
Chris Stover	4/4/13	4	
Kirk Johnson	4/4/13	4	
Ben Chorney	4/4/13	4	
Jason McNew	4/4/13	4	
Mark Young (BTI)	4/5/13	3	
Ean Mizell (BTI)	4/5/13	3	
Sammy Meche (BTI)	4/5/14	3	
By D. Robichaux/T, Strickland/C, Stover	Customer	Devon Energy Corporation	