

FORGE 58-32 Injection and Packer Performance - April 2019

Packer and bridge plug performance during the injection program in Well 58-32, April and May, 2019, was challenging. This was a stimulation campaign in the openhole toe of the well (single packer with injection below it (Zone 1), an uphole perforated zone straddled by a packer and a bridge plug (Zone 2), and a perforated zone further uphole, also straddled by a packer and a bridge plug (Zone 3). Surface injection pressure was restricted to 6500 psi (wellhead limitations) if the casing was open and approximately 8000 psi for injection down a frac string. Static bottomhole temperature is approximately 200°C. The packers and bridge plugs performed as follows (note the bridge plugs also had 2 sacks of sand on top of them). The reported failures were significantly below the vendor's specifications; pressures and temperatures in the well were always below those same specifications.

- Zone 1: Packer isolating the openhole section failed.
- Zone 2: Packer and bridge plug combination. The packer failed. The bridge plug held.
- Zone 3: Packer and bridge plug combination. Both the packer and the bridge plug failed.

Typical failures are shown in the following photographs.



Figure 1. This image shows a new packer element (bottom) and the retrieved packer element from Zone 1 (run above the perforations at 6964 to 6974 ft measured depth).



Figure 2. This photograph was taken on May 3, 2019 after recovery of the packer from above Zone 3. It shows a failed sealing element. An observer reported: "When packer pulled above the slips the broken ring fell into our hands." There was a significant amount of drag while recovering this tool (refer to Figure 4).

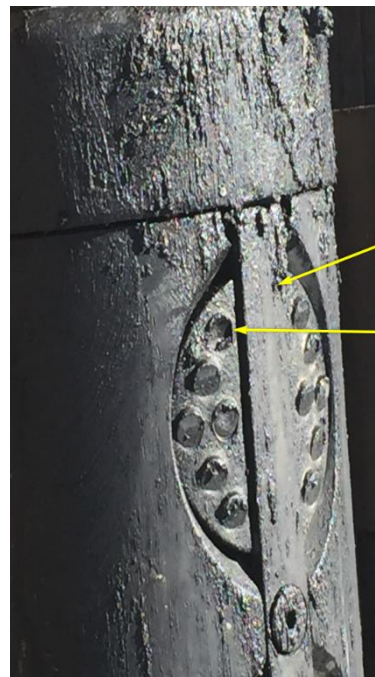


Figure 3. For the packer shown in Figure 2, not only the rubbers were damaged, but the slips had failed. The photograph at left shows new slips. The photograph at right shows the upper slips on the packer recovered from Zone 3 on May 3, 2019. The arrows highlight the damage.



Figure 4: Two views of the Zone 3 packer after recovery. The broken rings caused significant drag.