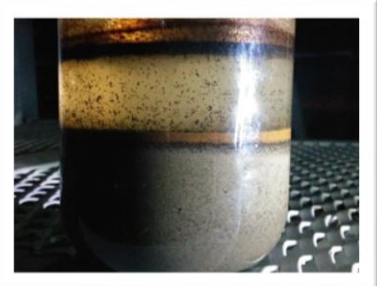




Case Study: Sand Removal

Location:
• Los Angeles, CA, USA
Project Dates:
• August 2014



Project Summary

Our customer's oil production operation continually experienced costly problems related to excess sand in their produced fluids: frequent shutdowns to remove sand build-ups in their separators and tanks, equipment worn down by abrasion, and the loss of revenues during shutdown. ASAP's two-week trial demonstrated a removal rate of over 1 gallon of sand per day. A permanent SandZapper installation could reduce the maintenance shutdown frequency to every 2 years (estimated), instead of twice annually, leading to a potential savings of over \$60,000 per year!



Solids captured by SandZapper

Details

- ASAP completed a two-week trial utilizing a SandZapper 5K2D unit (5,000 BFPD capacity, 2" diameter hydrocyclones)
 - Despite low concentrations and small particle sizes, the SandZapper consistently removed a range of 10% to 20% of solids < 20 microns
- The SandZapper was installed at the wellhead of a well producing 3,200 BFPD with a 98% water cut at 150°F
- The single well has its own tank farm, incl. free water knockout & separator
- The customer currently cleans their vessels every 6 months, costing an estimated \$40,000 (also accounting for downtime production losses)
- System testing revealed that the typical size & concentration of sand flowing in the produced fluid was both small and low:
 - Inlet Particle Size Distribution (PSD) tests had a median size in the range of 3.0 to 7.4 microns
 - Total Suspended Solids (TSS) ranged from 68ppm to 187ppm at the Inlet, 56ppm to 122ppm at the Outlet
- Sludge Bin PSD testing revealed the most interesting data:
 - Median size particle = 159 microns
 - Only 1% of particles from the Sludge Bin were smaller than 7 microns

Conclusion

- Although the SandZapper 5K2D typically removes 80% to 90% of particles > 20 microns, this trial demonstrated significant capture rates for particles of 20 to 8 microns
- The bulk of large-grain sand produced from this well flows thru in short-lived "slugs" rather than consistent concentrations across time
- A surprise discovery was the average size of captured particles, 14% of which were > 300 microns (which can damage downstream equipment)



SandZapper 5K2D installed at the wellhead