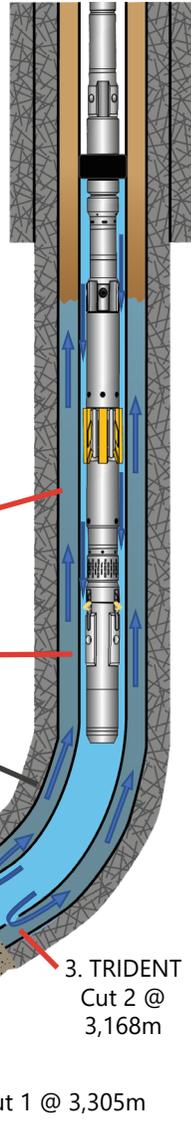


# RECOVERING CASING FROM SQUEEZING FORMATION

Ardyne's Toolbox approach creates 62m window for open hole sidetrack, saving 14 days planned rig time



Long string recovered with TRIDENT Precision Cutting System



- 1. TRIDENT Set BP @ 3,320m
- 2. TRIDENT Cut 1 @ 3,305m
- 3. TRIDENT Cut 2 @ 3,168m
- 4. Packer set, circulation achieved
- 5. 3,168m of casing recovered

## THE OBJECTIVE

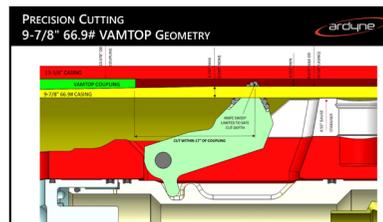
Recover 9 7/8" casing - for open hole sidetrack preventing the requirement to carry out the planned 4x milling trips per clients AFE based on offset wells.

## THE CHALLENGES

The first challenge was performing a precision cut on the 9 7/8" casing inside the 13 3/8" shoe, ensuring the integrity of the outer casing. Another complexity to the operation was the high hole angle of 58 degrees along with heavy casing string due to deep recovery depth and heavy wall P-110 casing (66.9 lbs per foot). Furthermore logs indicate stuck casing due to squeezing Jorsalfare shale formation - more detail on page 2.

## THE TRIDENT® OPERATION

1. Bridge plug set by TRIDENT @ 3,320m
2. First cut completed at 3,305m in open hole squeezing Jorsalfare shale formation
3. Followed by precision cut (*not damaging the host casing*) completed @ 3,168m
4. Set packer - good circulation achieved
5. Pull out of hole, reset anchor at hanger and recover 3,168m of 9 7/8" P-110 casing

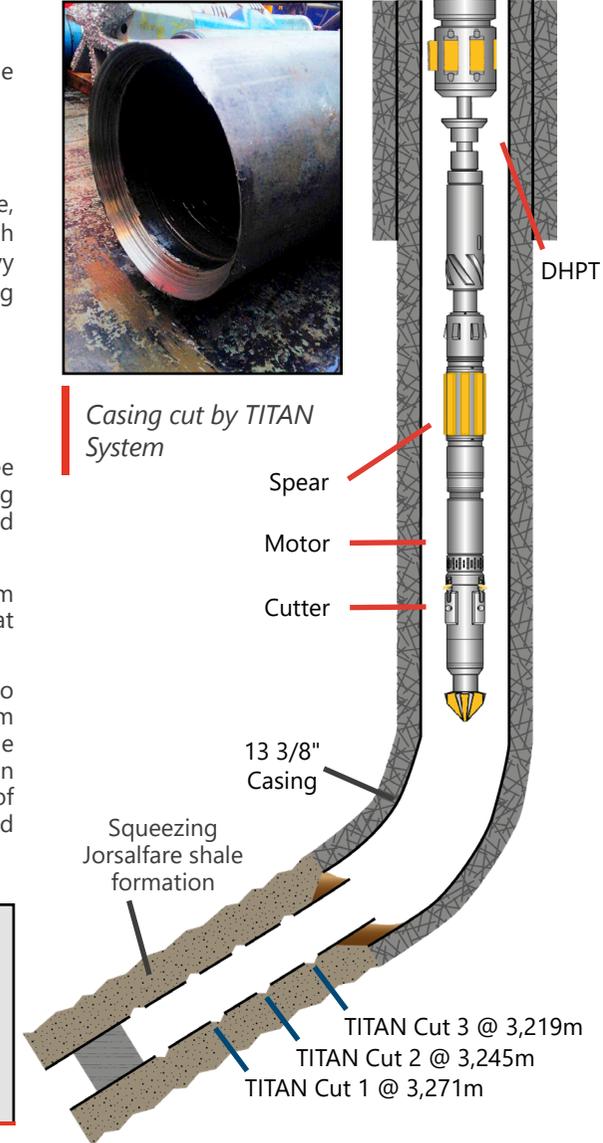


## THE TITAN® OPERATION

6. TITAN was deployed and performed three high-quality cuts in a single trip. The casing was jacked in an attempt to free prior to and after each cut
7. The 9 7/8" was jacked free after cut #3 from 3,186m down to 3,219m - with 6 jacks at 653,000 lbs and POOH to surface
8. The TITAN System was then redeployed to jack casing free from 3,219m to 3,245m - due to the squeezing Jorsalfare shale formation the system required activation 19 times in order to jack the final section of casing free with a max of 800,000 lbs and POOH to surface



Casing cut by TITAN System



- TITAN Cut 3 @ 3,219m
- TITAN Cut 2 @ 3,245m
- TITAN Cut 1 @ 3,271m

Click here to learn more about Ardyne's Precision Cutting Operation

# THE TECHNICAL DETAILS



Logs from 3,150m down to 3,250m showing 9 7/8" casing in open hole encased in squeezing shale formation

