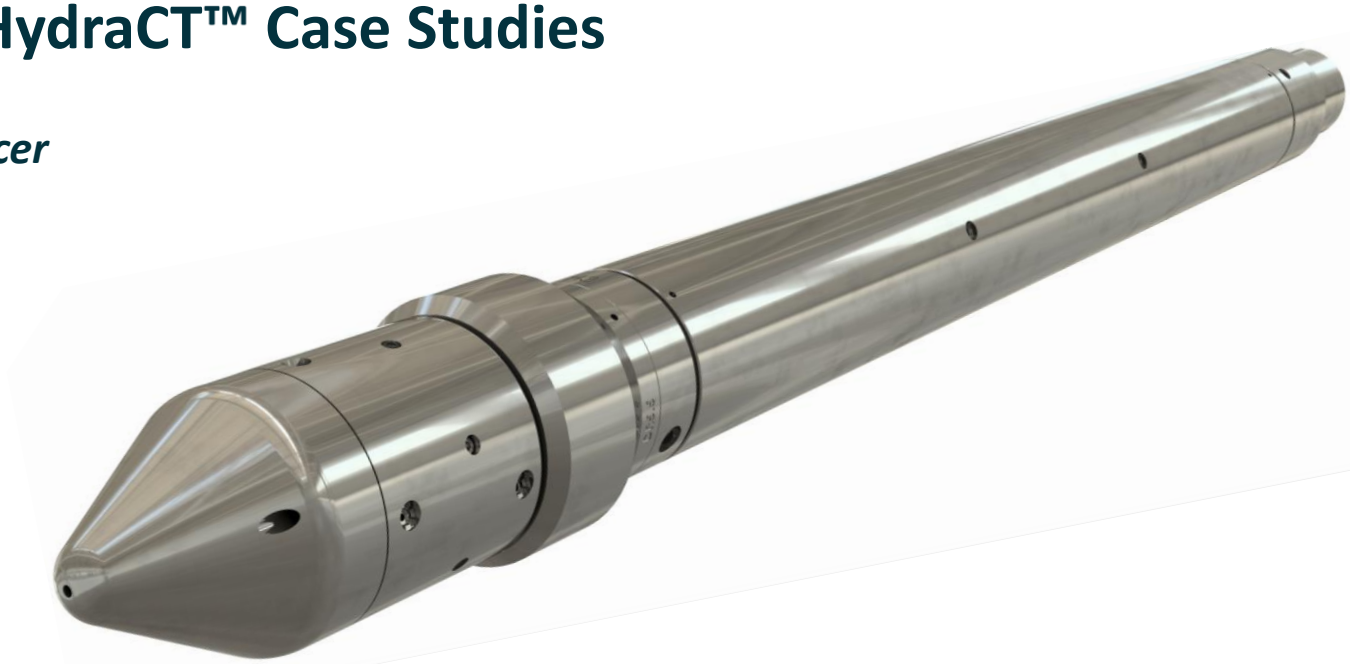
HydraWell

PWC on Coiled Tubing: HydraCT™ Case Studies

Erlend Engelsgjerd, Chief Commercial Officer



POWERED BY INVENTION

How did we get here?

As responsible P&A innovators, our PWC® method for annular remediation has evolved over the years.

HydraCT™ ExpandaJet
Coiled Tubing Based

HydraCT™ SviwelJet
Coiled Tubing Based

HydraTyphon™
Hybrid Cup + Jet

HydraHemera™
Jet Based System

Hydrawash™
Cup Based System

Value Creation

2025
Through restriction

2023
Eliminate rig

2021
Expand operational envelope

2013
Reduce to <24hrs per plug

2010
Eliminate section milling
± 3 days per plug

HydraCT™ - Development timeline

HydraCT SwivelJet™

2020-2021
Early development

2021
Case study #1
Ullrigg SIT

2022-2023
Case study #2
Alaska campaign
(12 plugs)

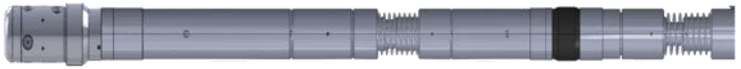
2024
Case study #3
Australia campaign
(4 plugs)

2023-2025
Expandable
nozzles

HydraCT™ - Development timeline

HydraWell

HydraCT SwivelJet™



2020-2021
Early development

2021
Case study #1
Ullrigg SIT

2022-2023
Case study #2
Alaska campaign
(12 plugs)

2024
Case study #3
Australia campaign
(4 plugs)

2023-2025
Expandable nozzles

HydraCT™ - Case study #1: Ullrigg SIT

HydraWell

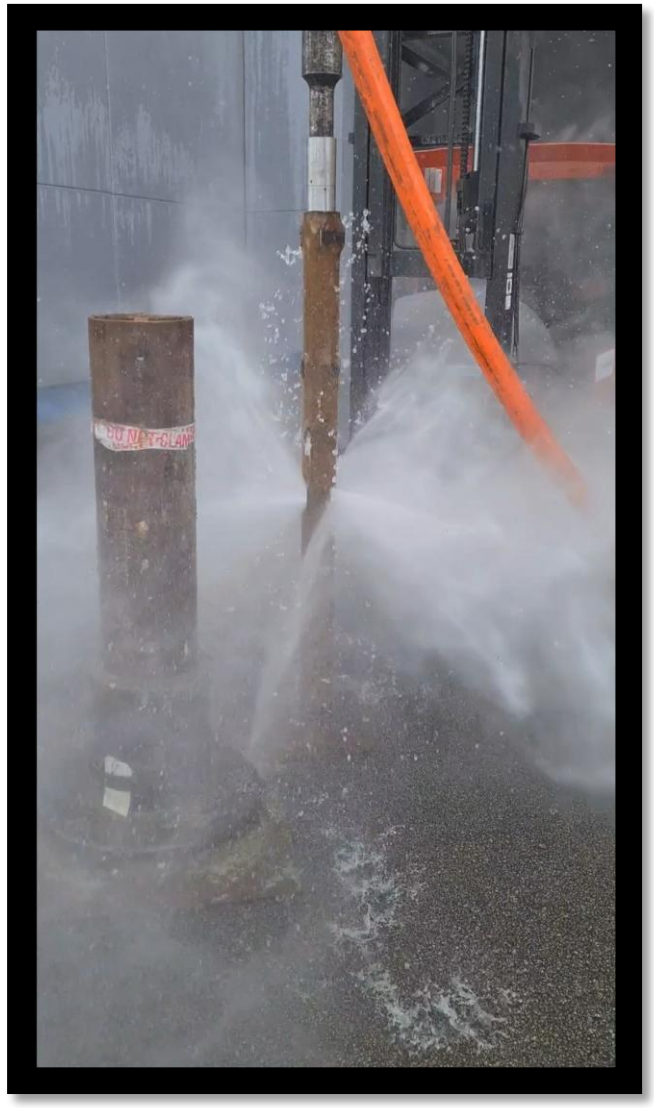
FEATURES

- ✓ Jet propulsion driven wash/spacer/cement tool
- ✓ Integrated long lasting rotational face seal
- ✓ Adjustable RPMs
- ✓ Interchangeable wash head size
- ✓ Change from wash to cement mode downhole
- ✓ Incorporated RPM gauge

BENEFITS

- ✓ Ability to perform PWC® on CT
- ✓ Assurance of Cement placement
- ✓ Risk reduction of over pressuring formation
- ✓ Increased Operational Reliability
- ✓ Flexibility to modify to well conditions
- ✓ Highly efficient Single wash/cement system
- ✓ Field-redress

Jet Propulsion Rotating Washing and Cement Head



HydraCT™ - Case study #1: Ullrigg SIT

***When**: 2021*

- Access to 6-5/8" x 10-3/4" annulus achieved by a mechanical perforator, creating slots over 30 meters.
- During the wash job, HydraCT™ was self-rotating by pumping wash fluid through the coil, cleaning out the barite-filled annulus.
- The cement job was successfully performed by pumping class G slurry, leaving a uniform cement plug in the entire cross-section.
- Hard cement was drilled out and logged with USIT/CBL.
- The fixture was pulled out and cut into sections to visualize the cement quality across multiple positions.

HydraCT™ - Case study #2: Alaska

***When**: 2022-2023*

- 7" casing, 2" CT, between 4500 and 6500 ftMD
- 3.5 bpm washing, 1.5 bpm cementing
- First campaign with the coiled tubing PWC tool, eliminating rig and cutting P&A costs
- CFD simulations to support the operation by confirming operational parameters
- Wells were pre-perforated, and bridge plugs installed using wireline
- Wash and cement done in a single run by dropping a ball to change the tool to cement mode, thus successfully placing the barrier in less than 24 hours
- Barrier quality confirmed by drilling out and logging, indicating successful cement placement and annular isolation
- 12ea PWC jobs in total

HydraCT™ - Case study #3: Australia

***When**: 2024*

- 5-1/2" casing, 2" CT, 2800 ftMD
- 3.3 bpm washing, 1.75 bpm cementing
- P&A on two wells, installing 4ea PWC plugs, fixing surface casing vent flow (SCVF) issues
- Average operational time of 14 hours, with three of the plugs done under 10 hours (wash and cement)
- Plugs confirmed by tagging, pressure testing, and subsequent monitoring for 6 months
- Upcoming SPE paper (SPE-228568-MS) in November

Coiled Tubing PWC – HydraCT ExpandaJet

Challenge:
P&A inside 9-5/8” casing through 5.62” restriction.

Building on the success of the HydraCT™ SwivelJet™
Evolving the technology to PWC through restrictions

Testing at workshop – BHA functionality

Expandable wash nozzles

Expandable stabilizers

HydraWell

POWERED BY INVENTION

Thanks!

Erlend Engelsgjerd
ee@hydrawell.no