

# Case History

## SAS Wellbore Cleanup / Casing Cleaning North Sea.



Products:- SAS102C, SAS116B, SAS117SC, SAS135SC

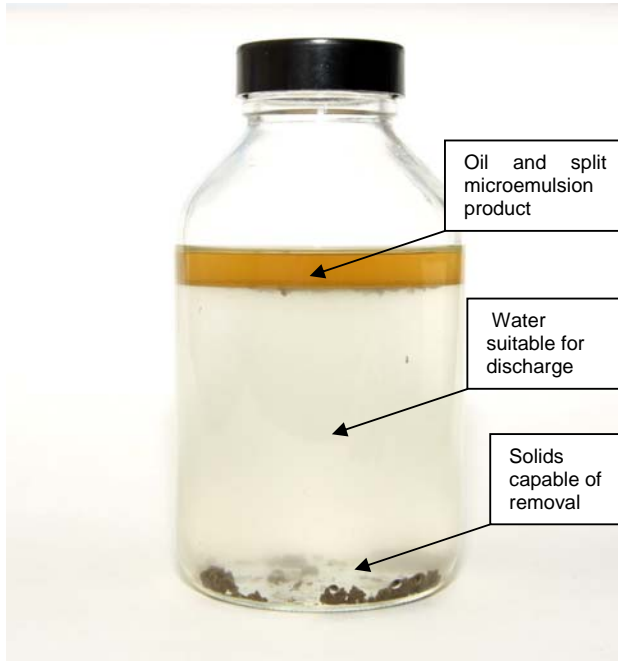
### SAS WBCU / Casing Cleaning North Sea.

Surface Active Solutions was requested to supply their CEFAS Certified Terminator mud pit cleaning and WBCU / Casing Cleaning microemulsion (ME) product to carry out a completion operation in the North Sea via a global service company on behalf of a major North Sea Operator.

The well was displaced to seawater, the annulus having been topped up with base-oil and seawater to cure losses after setting the liner hanger. The displacement to filtered and inhibited seawater was with 50 bbl base oil, a 200 bbl seawater pill, and a 100bbl SAS Terminator ME wash pill followed by filtered inhibited seawater. A further 200bbl of filtered inhibited seawater was pumped before the returns were called clean. The completion string was then run and the well completed and handed over to production. **The total volume of waste produced from the WBCU operation was less than 500bbbls.**

#### Typical SAS WBCU Train.

- 50 – 100bbbls base oil
- 25 – 100bbbls spacer (optional high visc)
- 100 – 300bbbls SAS102C wash pill @ 10 – 20%wt in sea water
- 25 – 100bbbls spacer (optional)
- 200bbbls completion brine



Photograph to show a sample of the resulting SAS ME wash fluid pill following the successful completion operation. Note that the majority of the solids were settled out under gravity and have been removed prior to the sample being split.

### Statistics

The minimal volume of waste produced from the completion operation is itself treatable. The solids are typically removed by settling out under gravity or by centrifugation. The aqueous microemulsion wash fluid is then induced to rapidly phase separate to yield a clean brine phase (for optional filtration and / or disposal) and the organic components are recovered from the waste stream.

#### Results

- **Well successfully cleaned ready for completion**
- **Rapid cleaning** with comparatively low levels of waste produced
- **Use of high visc pills eliminated**
- **Waste capable of simple treatment and disposal** either offshore or onshore
- **Waste production is reduced by over 70 - 90%**
- There is **no emulsion or slop waste formation**
- There are **no rag layers produced**
- Brine oil in water content was **reduced to below 40ppm**
- Total oil discharged to sea was **reduced by 2 orders of magnitude**
- **Significant cost savings** result from time saved, waste reduced, and ease of treatment allowing segregation and low cost disposal.

The first 917bbbls of returns (including the Terminator I wash pill) was segregated and was backloaded to shore for treatment and disposal. The remaining 1502bbbls brine was totally free of suspended solids and had an oil-in-water content of below 15ppm indicating that the well had been efficiently cleaned and was totally devoid of oil. This volume of brine was discharged to sea under current EU legislation. **This represents an immediate reduction in the volume of waste produced by 62%.**

| SAS Terminator I WBCU Wash pill + Brine bbl No. | Oil-in-water content (ppm) |
|---|----------------------------|
| <b>1</b>  | <b>&gt;1000</b>            |
| <b>918</b>                                      | <b>15</b>                  |
| <b>1418</b>                                     | <b>0.1</b>                 |
| <b>1918</b>                                     | <b>0.1</b>                 |
| <b>2419</b>                                     | <b>0.1</b>                 |

The 917bbbls of returns (shown overleaf) was further treated onshore using a chemical treatment and physical separation process. As a result 733bbbls were rendered suitable for discharge to sewer reducing the oil-in-water content to below 40ppm on average leaving only 184bbbls requiring disposal. **This represented a total reduction in waste produced from the job of over 92%.**

The implementation of this SAS ME technology therefore provides for **reduced waste production at source** which should result in **significant waste minimisation** and corresponding **reductions in time, logistics and overall costs** for operators if adopted as a standard procedure for WBCU and pit cleaning operations.

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