# PFOS Remediation in Contaminated Water Using Ozone Nanobubble Technology

PFOS (perfluorooctane sulfonic acid), a highly persistent and toxic "forever chemical," poses major challenges for water remediation due to its resistance to traditional treatment methods. Nanobubble Technologies Pty Ltd (NBT) commissioned the UNSW Water Research Laboratory to test its innovative ozone nanobubble system, which harnesses ultra-fine bubbles to generate powerful reactive oxygen species. This low-energy technology rapidly degrades PFOS while promoting foam fractionation for enhanced removal, delivering a sustainable, chemical-free solution for contaminated water. Nanobubble Technologies Pty Ltd (NBT) partnered with the UNSW Water Research Laboratory to evaluate the effectiveness of its innovative Ozone Nanobubble ($O_3$-NB) system for PFOS remediation.

**Client:** Nanobubble Technologies Pty Ltd (NBT)

**Unit Type:** 1-Cell Ozone Nanobubble System made by NBT

**Trial Date:** March 2026

**Trial Size:** 20 L laboratory Tank

## Trial Overview

Rigorous laboratory trials were conducted using spiked PFOS water (0.01 mM) under alkaline conditions. The tests utilised a 1-Cell Ozone Nanobubble system in a 20 L laboratory tank.

## Key results

- Initial PFOS concentration: 2.16 mg/L
- After 5 hours of treatment: 0.26 mg/L, achieving **88% PFOS removal**
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- Fluoride levels increased to 3.1 µg/L, providing clear evidence of successful C–F bond cleavage (defluorination)
- Enhanced foam formation was observed, demonstrating effective enrichment and separation of PFOS at the air-water interface


Photo 1: Ozone nanobubble system setup at UNSW

## Benefits

- Dramatic PFOS reduction of 88% in just 5 hours
- Clear evidence of molecular breakdown through defluorination
- Enhanced foam fractionation for superior PFOS removal
- Reactive oxygen species generation for efficient oxidation
- Low-energy, eco-friendly alternative to conventional technologies
- Promising scalability for real-world PFAS/PFOS remediation projects

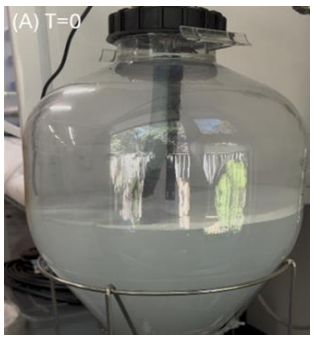


**Photo 2: Foam formation at T = 0 h, Immediately after mixing with oxygen for 10 min**


**Photo 3: Foam formation at T = 5 h, after 5 hours of ozonation, a clear visual sign of active PFOS removal and foam development**

## Conclusion

The UNSW Water Research Laboratory trials confirm that ozone nanobubble technology is highly effective for PFOS remediation. These outstanding results demonstrate the combined power of ozonation and enhanced foam fractionation, proving nanobubble technology as a reliable, low-energy, chemical-free solution that delivers real and rapid environmental benefits for PFAS-contaminated water.