

# ProDecon® Case Study UK Petrochemical Plant



## PFAS Decontamination Using PFAScrub™



### PROJECT HIGHLIGHTS

- ▶ BEST PRACTICE MINIMISING CLIENT RISK
- ▶ 12,000L FIRE SUPPRESSION SYSTEM
- ▶ PFAS MASS (MG) REDUCED BY 99.82%
- ▶ REBOUND CONCENTRATIONS BELOW REGULATORY LIMITS
- ▶ MINIMAL WASTE PRODUCED
- ▶ UNIQUE PFAS TESTING AND SWABBING METHODOLOGY

### THE CHALLENGE

A petrochemical plant required a specialist PFAS decontamination partner to remove PFAS which can self-assemble in multiple layers on fire suppression tank walls, to form a waterproof coating. Water rinsing of fire suppression equipment and storage tanks using water alone can lead to 'PFAS rebound', resulting in re-contamination of new foam stocks. ProDecon have partnered with Tetra Tech to provide market leading PFAS and decontamination expertise.

### THE SOLUTION

ProDecon provided an end-to-end transition service including pre-engineering, foam removal, a three stage decontamination cycle, loading of new foam and importantly PFAS testing and analysis for verification of the decontamination KPI's. ProDecon set up an enclosed system and controlled area before de-inventory of the old foam stock to IBC's ready for disposal. The system was then water flushed to remove residual concentrate and any loosely adhered residues. At this point an initial swab sample from a know area using our 3 stage swabbing process was taken.

The system was then connected to our decontamination skid and decontaminated using **PFAScrub™** solution at 50-60°C. The decontamination process was designed to ensure sufficient contact time and attrition on all surfaces in contact with the foam concentrate including tank surfaces and distribution pipework. On completion the **PFAScrub™** solution was drained to IBC's followed by a final water flush to remove residual chemical. A final swab sample was then collected for use in process verification.

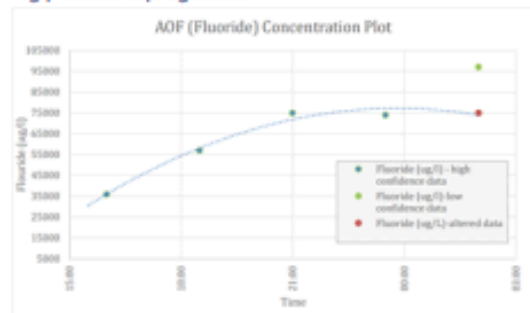
PFAS containing wastes require expensive high temperature incineration. ProDecon's process is designed to minimise waste with this 12,000Ltr system successfully completed generating less than 4000Ltr total effluent volume.

### PROCESS MONITORING

During decontamination, samples were periodically collected from the decontamination solution for AOF analysis. This provides an indication of the organic fluorine recovered by the decontamination solution. Swab samples collected following water flush and again after decontamination for TOP Assay are used to demonstrate PFAS removed and potential residual on the internal surfaces.

### THE RESULTS

The AOF results reported an increasing trend over the course of the decontamination works. This indicates that PFAS mass is being successfully removed from interior surface of the tanks as the cleaning procedure progresses.



TOP Assay analysis of the pre and post decontamination swabs demonstrate the effectiveness of the **PFAScrub™** decontamination process in removing assembled PFAS layers left behind after water flushing, with 99.82% removed.

Initial Pre-Decon	Verification Post - Decon	% Reduction Of Derivatives Post = Decon	Estimated Rebound Conc. Post = Ox (ppb)	EU Regulation Post = Ox (ppb)	Pass
Post-Ox	Post-Ox				
<b>Total PFAS</b>					
<b>49,014,843</b>	<b>85,889</b>	<b>99.82%</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>PFOA</b>					
<b>18,135,000</b>	<b>16,933</b>	<b>99.91%</b>	<b>1.411</b>	<b>1,000</b>	<b>✓</b>
<b>PFOS</b>					
<b>13,585</b>	<b>Non detect</b>	<b>100.00%</b>	<b>Non detect</b>	<b>10</b>	<b>✓</b>
<b>PFCA</b>					
<b>75,108</b>	<b>496</b>	<b>99.34%</b>	<b>0.041</b>	<b>260</b>	<b>✓</b>

The Post decontamination results are used to calculate the potential rebound concentration should all the detected residual PFOA, PFOS and C9-C14 PFCA's rebound into new foam stocks. Comparison against regulatory thresholds demonstrates another successful decontamination!



# PFAS Decontamination of Fire Suppression Systems



IS YOUR BUSINESS COMPLIANT?



## Keeping Ahead Of Regulations

Many class B firefighting foams used in industrial fire suppression systems contain PFAS (Per- and polyfluoroalkyl substances), sometimes referred to as 'forever chemicals' due to their longevity in the environment which poses an ongoing potential risk to human health and the environment.

PFAS regulator concern is accelerating, with multiple PFAS compounds already restricted. From January 1<sup>st</sup> 2023, C8 foams cannot be used if the released foam cannot be 100% contained, with a complete ban from July 4<sup>th</sup> 2025. The same applies for C9-C14 Perfluoroalkyl Carboxylic Acids (PFCA's) which came into force 1<sup>st</sup> February 2023. Further regulations addressing C6 foams and wider PFAS are currently under review.

## PFAS Foam Transition

With use of these foams being subject to regulation, many businesses are required to change their foam stocks to alternative fluorine free firefighting foam (F3). There are many F3 foams available that have passed multiple fire tests, showing comparable performance to fluorinated foams and are described as being 100% biodegradable, suggesting a safer and more sustainable option.

Effective decontamination of the existing fire suppression infrastructure is essential as fluorosurfactants are known to self-assemble on interior surfaces of fire suppression systems in large supramolecular assemblies.

Evidence has shown that water rinsing is not an effective method for removing these layers and can lead to significant recontamination of PFAS into new foam stocks. This results in the new F3 foam stock being classed as renewed stockpile of POPs under REACH regulations.

## A Trusted Partnership

The ProDecon\* and Tetra Tech partnership provides market leading expertise and comprehensive management of the foam transition programme including fire engineering, decontamination and environmental compliance. Our team can assist with chemical analysis of firefighting foams and help manage the environmental risks and prioritising where to start foam change outs.

Utilising proprietary decontamination agents PFAScrub\*, our partnership will provide regulatory assurance with the removal of self-assembled forms of PFAS that adhere to interior of fire suppression systems, ensuring you remain compliant in the transition to fluorine-free foam stock.

## Assets supported include:

- ▶ FOAM SUPPRESSION SYSTEMS
- ▶ FOAM STORAGE TANKS
- ▶ FIRE ENGINE TANKS
- ▶ PUMPS & PROPORTIONERS
- ▶ MARINE & MILITARY SYSTEMS
- ▶ PIPEWORK



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