



PFAS Risk Ranking and Prioritisation for Local Fire and Rescue Services

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What is PFAS?

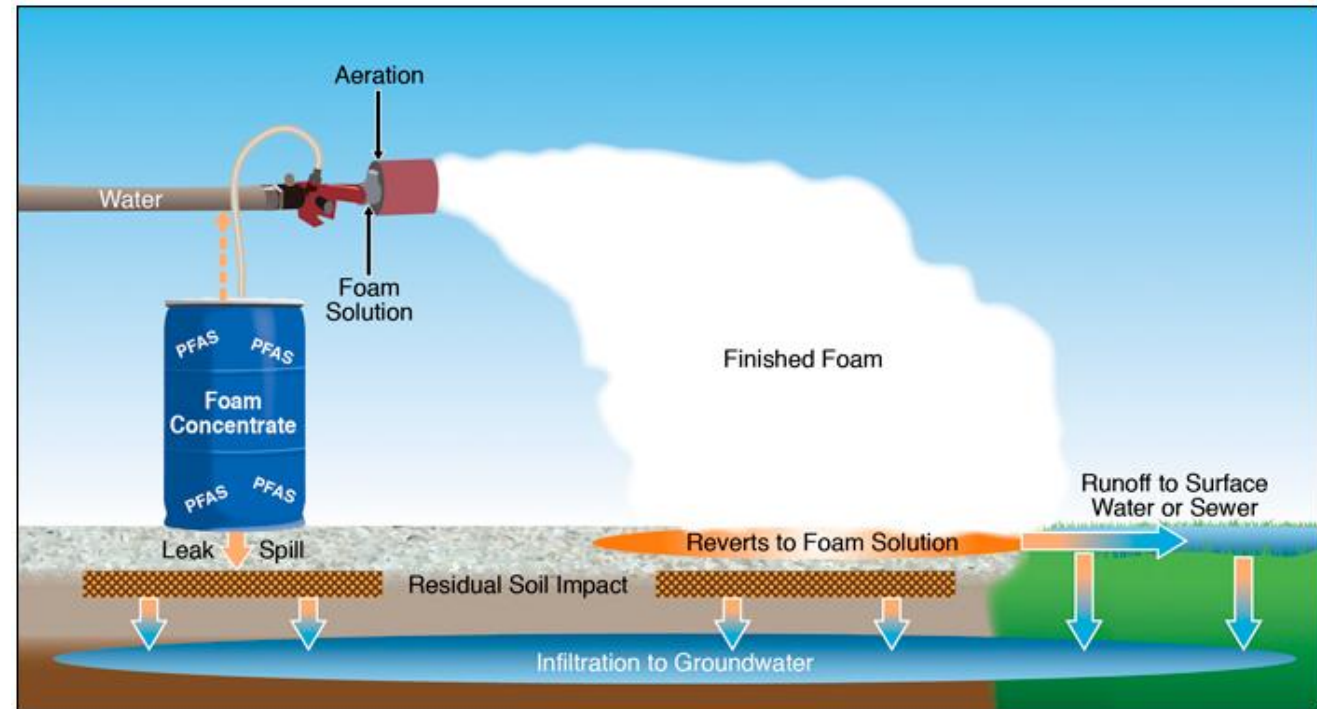
Poly- and Per- Fluorinated AlkyL Substances

- Over 6,000 compounds including PFOS, PFOA, PFBS and GenX
- Persistent, bio-accumulative and toxic
- Highly mobile in the environment
- Pose potential risks to human and ecological health and the environment
- Used since the 1940s across a wide range of industries

PFAS in Fire-Fighting Foam

Industrial applications

- Aqueous film forming foams (AFFF) and as fire suppressants
 - Foam concentrate diluted using water when used
- Fire-fighting training sites and fire stations
 - Repeat releases of foam
 - Extinguishing fires within drill yards
 - Equipment testing
 - Incident response
 - Losses of foam concentrate during storage/transfer
- Military sites
- Airports



Source: ITRC <https://pfas-1.itrcweb.org/3-firefighting-foams/>

PFAS in Fire-Fighting Foam

Historical Use

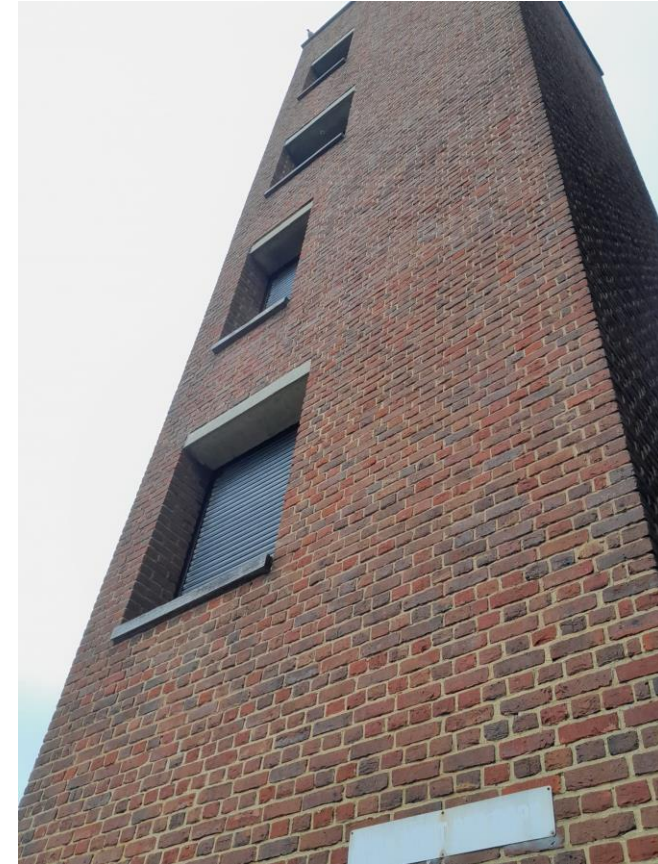
- Foams containing PFAS used to extinguish Class B fires (e.g., flammable liquid) since 1962.
- PFOS (perfluorooctane sulfonic acid) introduced for commercial use in firefighting foams in 1964.
- General sale of foams containing PFOS ended in 2003 –BUT long shelf lives.
- Use of firefighting foam products containing >0.001 wt% PFOS banned in the EU since 27th June 2011.



Source: Royal Society of Chemistry

Local Fire and Rescue Prioritisation

- High level environmental sensitivity review of a portfolio of 57 No. fire station sites across the county.
- Adopted a score-based approach to prioritise the fire station sites.
- Assessing the potential risks for both current and continued future use in a commercial land use setting, and for potential contaminants associated with the current and historic site uses.
- Potential for PFAS substances associated with fire-fighting foam to be present on sites in use between the 1960s and circa 2011.



Local Fire and Rescue Prioritisation

- Environmental setting of the site (70%)
- Additional information on the site history/planning records/anecdotal information/previous reports (30%)

Influencing Factors

- Groundwater Source Protection Zone
- Principal aquifer
- Close proximity of a surface water feature



Source: Google Earth

Local Fire and Rescue Prioritisation: Environmental Setting (70%)

Environmental/Site Setting	Factor	Score	Factor	Score	Factor	Score
Drill Tower	Yes	5	No	0		
Distance to Surface Water	0-50m	10	50-150m	5	150m-1km	2.5
Aquifer Type (Bedrock)	Principal	10	Secondary (A/B/U)	5	Unproductive	0
Aquifer Type (Superficial)	Principal	10	Secondary (A/B/U)	5	Unproductive/Not present	0
Source Protection Zone	1	15	2	10	3	5
Depth to Groundwater	0-5m	10	5-15m	5	15m+	2.5
Build Year	Pre-2000	10	Post-2000	2.5		

- Assumed drill towers were historically used for fire and rescue training on site, which may have included use of firefighting foam and fuels (to start fires)
- Build year of the fire station - key indicator of potential contamination risk, with greater risk (typically) being associated with older fire stations

Local Fire and Rescue Prioritisation: Additional information (30%)

Risk	Example	Score
Very High	Used as a training centre, on site >70 years, former development on site, drill tower present	30
High	On site >50 years, drill tower, former development	25
Moderate	On site >40 years, drill tower, former development, or on site >50 years but no former development	20
Low-Moderate	<40 years, drill tower, former development low risk	15
Low	<30 years, no former development, drill tower	10
Very Low	Post 2000, no previous development, no drill tower	5

Local Fire and Rescue Prioritisation: Outcomes

- 12 sites identified as the 'highest priority' sites (all scoring >65/100)
 - Pose a potential Moderate to Very High risk to the environment
 - All built prior to 2000 and all had drill towers
 - 6 are within 50m of a controlled surface water feature
 - 9 located on a Principal Aquifer
 - 1 in SPZ 1 and 3 within a SPZ 2
 - 8 with groundwater level 0-5mbgl
 - 1 identified as a training centre



Local Fire and Rescue Prioritisation: Outcomes

Build Year	Drill Tower	Closest Surface Water Features	Aquifer (Bedrock)	Superficial Aquifer	Source Protection Zone	Groundwater level	Environmental Score/70	Very Low to Very High Risk Score/30	Total Score/100
10	5	2.5	10	5	10	2.5	45	25	70
10	5	10	10	5	0	10	50	20	70
10	5	0	10	5	10	2.5	42.5	25	67.5
10	5	2.5	10	0	0	10	37.5	30	67.5
10	5	2.5	10	0	15	5	47.5	20	67.5
10	5	2.5	10	5	0	10	42.5	25	67.5
10	5	10	10	5	0	10	50	15	65
10	5	2.5	10	0	10	2.5	40	25	65
10	5	10	5	0	0	10	40	25	65
10	5	10	10	0	0	10	45	20	65
10	5	10	5	0	0	10	40	25	65
10	5	10	5	5	5	10	50	15	65

Local Fire and Rescue Prioritisation: Ongoing Works

- Currently carrying out detailed desk studies on top priority sites
- Interviewing current employees at fire stations on historic use of firefighting foam on site, storage areas, training activities, frequency of use etc.
- Obtaining further information from the Local Fire and Rescue Service including foam distribution, training facilities, and drainage plans
- Aim to further refine the prioritisation and identify any sites which require intrusive investigation



Questions and answers

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