

# Investigation and Remediation of Multiple PFAS Source Zones at an Airport to Safeguard an at-Risk Water Supply

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**Background/Objectives.** Guernsey, a British Crown Dependency, is located in the English Channel between England and France and represents one of the Channel Islands. Concentrations of PFAS were detected in the surface waters which are used to source drinking water supply for the Island's population. The affected catchment area, which includes one of the Island's principle water supply reservoirs, collects surface water and groundwater from within the vicinity of the islands airport. The airport was identified as a potential source for the PFAS contamination detected. The objectives of the project were to investigate: the extent of PFAS impacts within the airport and the surrounding environment; whether the existing conditions were likely to deteriorate further; and, ultimately to identify an appropriate solution protected to safeguard the Island's water supply into the future

**Approach/Activities.** As an immediate step a detailed desk based review and preliminary risk assessment was completed, looking at historic uses of AFFF foam at the airport through records of aircraft accidents, training procedures, and material storage. The outcome of this study identified eleven potential source locations which required further assessment. Site investigations followed, including extensive soil, groundwater and surface water sampling, which identified PFAS impacts at seven of these locations. Following detailed fate and transport modelling 4 of these location were considered to require remedial action. All investigation works were undertaken on an active airport without disruption to operations.

On completion of the investigation activities a bespoke water treatment system was designed, which incorporated the installation of two below ground capture trenches across the airfield to intercept PFAS impacted groundwater. The water treatment system also collects and treats impacted surface water. With a capacity to treat up to 20 liters of water per second, the system is ensuring that concentrations of the PFAS are below drinking water criteria, prior to discharge into the wider catchment area.

Following the installation of the water treatment system, soils identified to be contaminated with PFAS in the four source zones across the airport were excavated and contained within a purpose built soil bund. The soils are encapsulated so as to isolate them entirely from the local environment, whilst also acting an acoustic barrier to mitigate noise pollution from the airfield operations.

**Results/Lessons Learned.** The project highlighted the requirement to understand the history of AFFF use at airports and airfields as multiple sources zones are typical. The treatment solution reduced PFAS concentrations in the drinking water supply whilst also removing the risk of further leaching from the main source areas by isolating the contaminated material as part of wider redevelopment scheme.