

Special Considerations For Extreme PFAS Sites

Adopting a cost-effective strategy for mitigating PFAS in highly contaminated environments, which can be as much as a million times more polluted than other water sources, tends to be overwhelming.

While these sites are often classified as a group — known for being military bases, airports, landfills, and large industrial sites — each should be analyzed for individual traits that can impact the optimal treatment design. Flow rates; water characteristics like pH, hardness, and salinity; the presence of metals or other contaminants suspended in the water; and other factors can vary widely, making each site a unique challenge.

The best way to combat the extreme PFAS at these locations as economically as possible is to develop a custom approach that takes every factor into account and isn't beholden to any single technology.

Where To Begin

ALTRA is a technology integrator that offers a suite of solutions, including proprietary media, and will attempt to optimize existing solutions. The process starts with several treatment trials, which are laboratory validated, to determine which approach is most viable based on a list of possible factors, including what contaminants are in the water besides PFAS.

Once the design phase kicks off, ALTRA considers how current treatment technology can fit into the process — for instance, landfill sites may have a biological treatment in place, like a membrane bioreactor (MBR) — and determines the most efficient method for disposal of the contaminated media or concentrated waste stream. All these factors determine the total lifecycle costs.



Because it can be so expensive, eliminating PFAS over a long period of time means that it is also critical to understand the different options for structuring costs. For managers of some sites, ALTRA's alternative pricing approach — where ALTRA operates the entire system and charges a flat rate per gallon — may be more appealing than making a significant investment into the capital expenditure necessary to build a treatment facility. ALTRA can also design and build the site as well as supply the equipment.

Regardless of the structure, operators are encouraged to seek out any grants that may be available to help offset as much of the cost as possible.

An Independent View

ALTRA's approach is to design a custom solution for PFAS treatment that is the most effective within the

smallest footprint and at the smallest operating costs possible. The company doesn't represent granular activated carbon (GAC) or ion exchange (IX) resin manufacturers, so it will only use one or both of those solutions at a PFAS site if it makes sense.

The GAC approach, which is currently the most common in the industry, can be cost-prohibitive as a primary approach for highly contaminated environments. A case study based on the mitigation of more than 1 ppm of PFAS in the water of a Canadian military base, for instance, recently reported nearly \$1 per gallon for treatment in carbon media costs alone. GAC still figures into PFAS treatment at highly contaminated sites, but it is typically a finishing step in those scenarios.

An additional factor is that landfill and military sites are likely to have

hydrocarbon and other solvents in the water. That would be a significant problem for carbon and resins, which will be fouled by those contaminants and therefore not able to eliminate the PFAS. ALTRA's approach is to deal with the contamination from hydrocarbons and other solvents at the same time, or just prior, to protect the PFAS removal solutions.

A recent new client, for example, wanted to continue using its GAC solution to address solvents in its source water while addressing its PFAS issue. By performing a thorough investigation, which included asking a lot of questions, ALTRA was able to design an efficient way to minimize the use of carbon media on-site, thereby

lowering long-term costs, and then installed a PFAS solution downstream.

Experience Is Key

Because there is significant risk involved in mitigating PFAS at highly contaminated sites — when it comes to financial, safety, and reputation — it is critical to select an accomplished and field-proven solutions provider that is willing to take on the biggest challenges.

ALTRA has been fighting PCBs (polychlorinated biphenyls, toxic industrial compounds) for many decades and began working on PFAS projects 20 years ago. Since then, the company has completed a wide variety of projects, including several major disasters. It

also offers a comprehensive one-stop shop, which is different than a typical scenario in the U.S., where a consulting firm designs a solution, then bids the work out to a contractor. Additionally, ALTRA operates an environmental risk assessment department with experts in eco-toxicology and other related fields and can help tackle soils impacted with PFAS.

Treating PFAS in relatively minor conditions is a difficult proposition, but highly contaminated sites can be exponentially complex to address. Hiring an experienced partner that takes a holistic approach is likely to yield the most efficient and economical approach over the long term. ■