

ABMet* for selenium removal

simple one-step solution with guaranteed performance



superior reliability

low operating cost

manage risk

refocus on core business

trusted solution

SUEZ in your corner

simple is best

ABMet meets stringent effluent selenium requirements as well as most effluent BOD and suspended solids requirements in one simple step. No post-treatment required.

Low labor cost – Automatic operation, remote monitoring and diagnostics with SUEZ's Insight* and a one-step process means that optimal performance is achieved with minimum operator resources (less than 1 FTE).

Low consumables cost – SUEZ's single nutrient is an all-in-one source of carbon, nitrogen, phosphorus and micro-nutrients. One injection point + one chemical system + one consumable = low operating costs

Superior Reliability – Simple gravity flow biofilter design and no integration of multiple unit operations means no downtime. In the power industry, availability is critical. ABMet can meet the industry's 99.9% availability requirement.

experience matters

From being a breakthrough technology in the late 1990s to being the technology of choice for the mining and power industries today, selenium removal is in the ABMet DNA.

Trust – With 17 years of biological selenium removal development, more than 10 operating plants and several projects under development, ABMet is a trusted technology for selenium removal.

guaranteed performance is a must

ABMet systems are backed by a performance guarantee

that manages the risk of non-compliance and allows clients to focus on their core business.

Manage risk – Guaranteed effluent total selenium concentration down to below 5 ppb-total selenium. Guaranteed effluent BOD and TSS concentrations down to 30 and 35 ppm respectively without the need for post-treatment. Guaranteed performance down to a water temperature of 5°C without the need for pre-heating.

Focus on the core business – ABMet has a proven track record getting the job done, enabling our clients to employ their resources more efficiently in their core business activities.

innovative technology means...

Fast and guaranteed startup – SUEZ's seed culture product consists of specialized bacteria strains optimally selected for treatment of selenium laden waters. One-time seeding only.

Optimal performance – SUEZ's innovative biofilter design along with a carefully selected seed culture and specifically formulated nutrient, optimize the environment needed for biological removal of selenium.

Selenium REMOVAL solution – ABMet biofilters are designed to capture and remove selenium directly, NOT transform it and transfer it to downstream processes for removal.

SUEZ is in your corner – SUEZ innovation and commitment to performance is working for you.

single nutrient addition

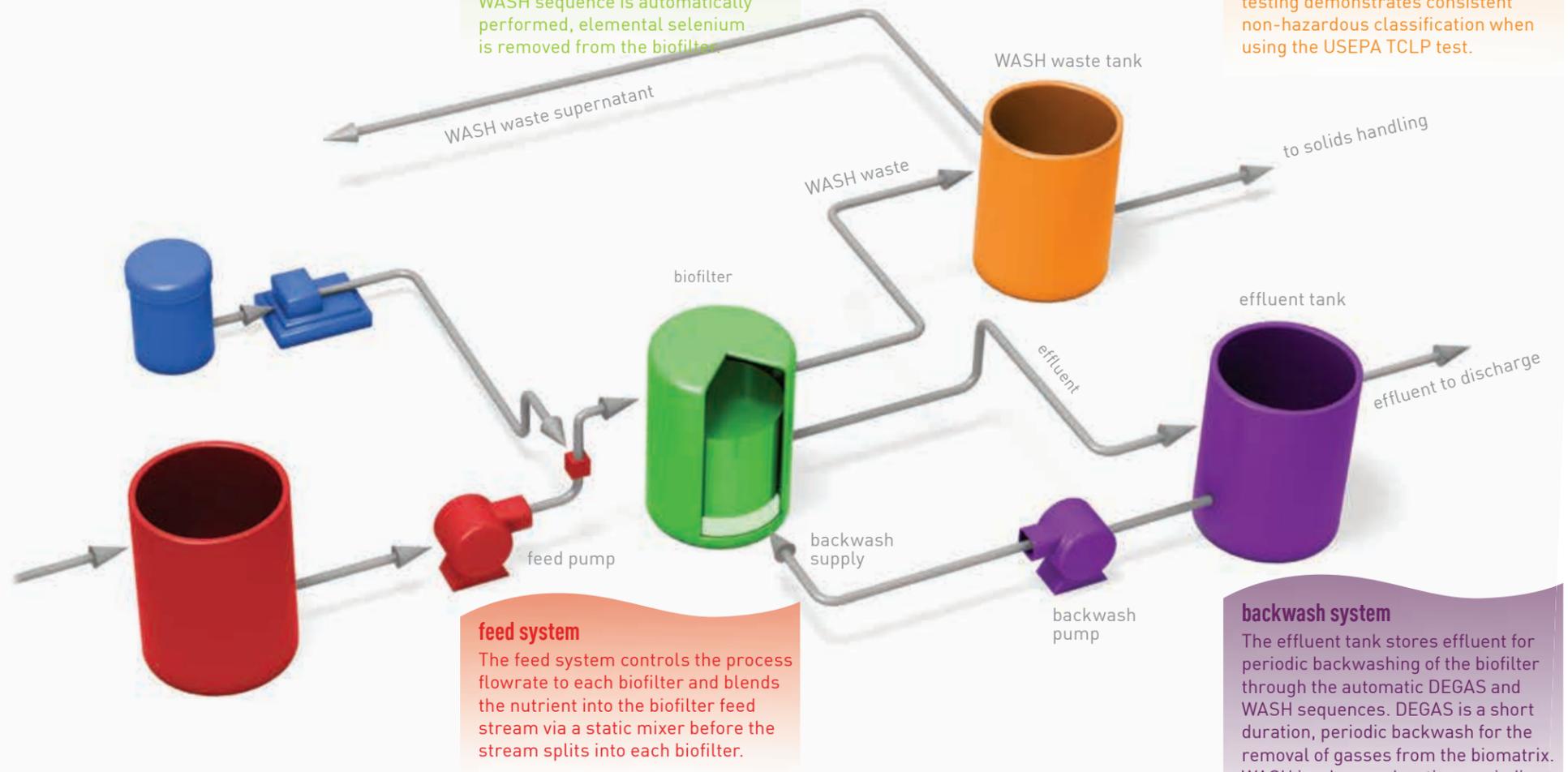
SUEZ's single nutrient is automatically dosed into the common biofilter feed line to maintain the ORP in the biofilter within the optimal range for maximum selenium removal.

biofilter

As influent gravity flows downward through the submerged biomatrix (support media + biofilm), nitrate and nitrite are reduced to nitrogen gas first, then selenate and selenite are reduced to particulate elemental selenium. When a WASH sequence is automatically performed, elemental selenium is removed from the biofilter.

WASH waste removal

WASH waste solids are collected near the top of the biofilter and flow by gravity to a WASH waste storage tank, pond, or solids handling system. Waste is typically decanted and supernatant recycled to the head of the system for processing. Waste testing demonstrates consistent non-hazardous classification when using the USEPA TCLP test.



feed system

The feed system controls the process flowrate to each biofilter and blends the nutrient into the biofilter feed stream via a static mixer before the stream splits into each biofilter.

backwash system

The effluent tank stores effluent for periodic backwashing of the biofilter through the automatic DEGAS and WASH sequences. DEGAS is a short duration, periodic backwash for the removal of gasses from the biomatrix. WASH is a longer duration, periodic backwash for the removal of gases and solids, including elemental selenium.

what can ABMet remove?

ABMet removes nitrate and nitrite to non-detect levels through a biological denitrification process within the biofilter resulting in the formation and off-gassing of nitrogen gas. ABMet also removes selenium by biologically reducing selenate and selenite to particulate elemental selenium which is then removed via the WASH sequence.

in what types of applications can ABMet be used?

The ABMet system has been demonstrated in applications treating Flue-Gas Desulfurization (FGD) wastewaters, coal power plant ash landfill leachate, coal mine waters, phosphate mine waters, metal refinery wastewater, and agricultural runoff waters.

what are the process constraints?

Nitrate-N < 250 mg/l
Chloride < 25,000 mg/l
TSS < 250 mg/l
Temperature . 40 to 105°F (5 to 40°C)
pH 6–9

what flow rates can be treated with ABMet?

ABMet's innovative modular design is scalable and can be adapted to treat any flow rate. Full scale systems have been designed to treat flows from 25 to 1400 gpm (6 to 318 m3/h).

what is included in the ABMet equipment package?

SUEZ's equipment package includes: process, mechanical, electrical, and control engineering; process valves, instruments and pumps; MCC and programed PLC/HMI; air compressor system, nutrient dosing skid, biofilter, storage tank, equipment warranty, biological support media, seed culture, first-fill of nutrient and onsite commissioning.

is SUEZ's seed culture harmful?

No. The seed culture contains non-pathogenic, naturally occurring Class 1 bacteria. These species are commonly found in natural environments such as pond water and garden soil.

do I need to reseed the plant or maintain a backup supply of the seed culture?

Microbes form a fixed-film on the support media and as a result do not wash out of the system as they do in suspended-growth systems. As a result, reseeding and maintaining a backup supply of the seed culture is not required. If customers want to have a backup supply of seed culture, SUEZ can offer storage programs when requested.

what are the typical power and overall operating costs of an ABMet system?

Typical power consumption is less than 0.5 kW per 1,000 gallons treated (0.13 kW per m³ treated). Overall operating costs typically

range between \$0.1 to \$0.5 per 1,000 gallons of water treated.

what is the lifespan of the support media?

Since the support media's sole purpose is to support the fixed-film created by the microbes and is not for treatment purposes, it doesn't need to be replaced or regenerated. Less than 1% attrition is expected in most applications due to backwashing and one small top-up may be required within the first 5-years of operation.

how quickly can ABMet be implemented?

The timeline is highly dependent upon the nature of the site as well as overall treatment goals, but ABMet's modular approach provides the fastest possible implementation with pre-fabricated tanks, pump skids and pre-engineered layouts to suit your needs.

How do I know if ABMet is the right solution for my application?

ABMet is an option in all applications requiring selenium removal. A SUEZ representative can assist you in further qualifying the technology for your specific requirements.

how do ABMet capital costs compare with other biological systems?

ABMet provides selenium removal with one simple step. Other biological systems require numerous

unit operations to remove selenium and keep organics below discharge limits. This is because these systems only transform selenium from one form to another (selenate to elemental Se) and then rely on other unit operations to remove the elemental selenium along with TSS and organics. With ABMet, selenium is transformed, captured and removed all within the biofilter while keeping TSS and organics below most discharge limits.

does backwashing of the biofilter upset performance?

Periodically backwashing the biofilter keeps the fixed-film healthy by removing excess biomass. Removal through the waste stream is independent of the effluent stream. This separation makes sure that effluent quality is not compromised due to backwashing. Other systems such as fluidized bed reactors constantly backwash. The biomass and other particulates, such as elemental selenium, are dislodged and removed from the reactor through the effluent stream placing pressure on downstream systems to clean it up before discharging to the environment.

what are the waste handling requirements?

ABMet produces one waste stream typically with less than 0.5% solids that can be sent to existing waste handling systems and the supernatant recycled through the plant. Other biological systems that require multiple unit operations to remove selenium will have several different waste streams that require handling and processing.

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