



BIOMIN, INC.

State of the art water filtration media

We will lower operations costs by 50%, and bring them into compliance with discharge regulations.

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Technical Advisory #17

BIOMIN'S "TIP OF THE MONTH"

PRE-POLISHING TO ECONOMIZE "ADVANCED OXIDATION TECHNOLOGIES"?

The answer is a resounding yes, with OILSORB; even if P&T is used.

Background: The various "Advanced Oxidation Technologies" (AOT) are Ozone, or Ozone-UV; H₂O₂, or Ozone-H₂O₂ or H₂O₂-UV (this may *also* include Fenton chemistry). The idea is to generate hydroxyl radicals which quickly react with organic contaminants in the water, breaking them down into carbon dioxide and water. These technologies are very effective for BOD and COD destruction. However, in most cases for BOD removal, biological methods are employed which are more cost effective. UV/Oxidation requires energy to produce sufficient hydroxyl radicals to destroy the contaminants and a great deal of expense is required to size these systems to meet flow rate and BOD/COD destruction requirements. H₂O₂ can also be added, which is activated by the UV light to form oxidizing hydroxyl radicals to increase system efficiency. However, due to the cost of the peroxide, this can be a very expensive proposition.

A UV/H₂O₂ type system can be more economical than activated carbon above a concentration of 10 ppm. An AOT system has high capitalization and operational costs, and pre-testing in a laboratory to determine the appropriate design, is necessary for efficient application.

Causes for problems which often result in significant operational cost increase are: Suspended solids, oil and grease, iron and high chloride. Soluble oil and grease content slows down treatment because it competes with the hydroxyl radicals, requiring more energy and more H₂O₂ or ozone for effective destruction, thus increasing the costs. In addition, hydrophobic organic compounds such as benzene dissolve (partition) into insoluble oil droplets and will not be treated by AOT Technologies unless all of the solubilized oils are also destroyed. Mechanically emulsified oil and grease must be removed by an oil/water separator and OILSORB organoclay to keep operational costs in line and maintain system efficiencies. Since the OILSORB removes oil preferentially over any other compounds, it has a tendency to allow the lighter molecular weight compounds to pass through when at higher concentrations, allowing the AOT to destroy them efficiently.

These Technical Bulletins which have been produced by Biomin over the last 3 years have shown that no one technology is a cure all, no matter what the vendor claims. The key for maximum efficiency at lowest cost is to “BUNDLE” appropriate technologies.