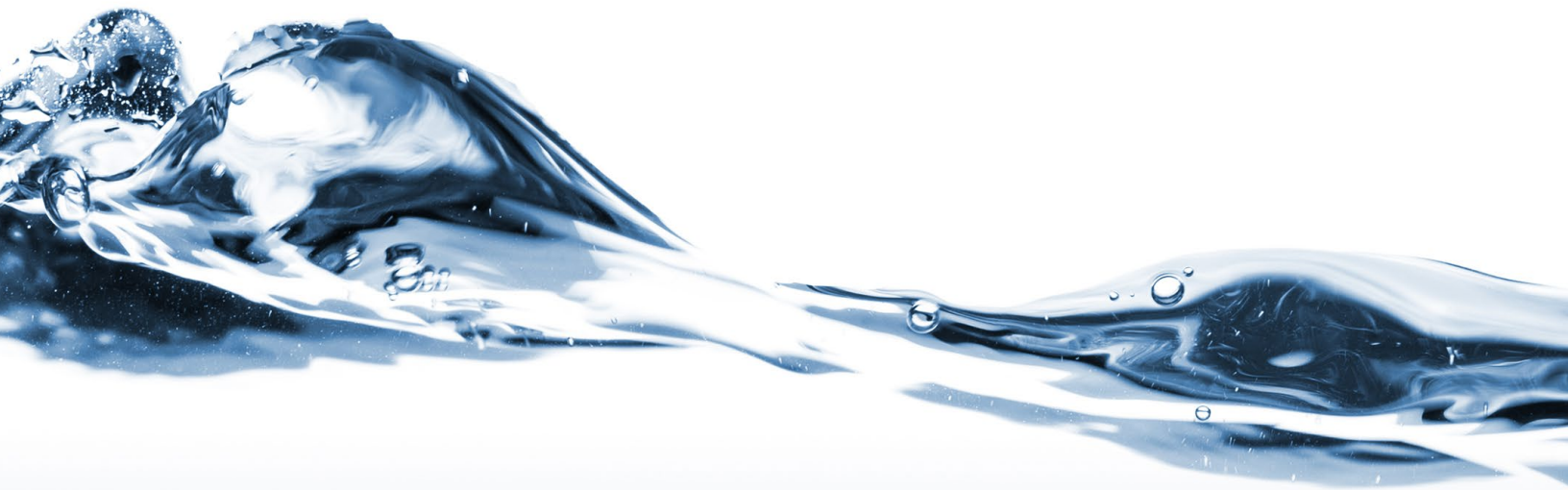


*Does Your Process Water  
Meet Your Company's Needs?*





## *Water Treatment and Reuse for your Business*

### **The Value of Clean Water to Company Growth**

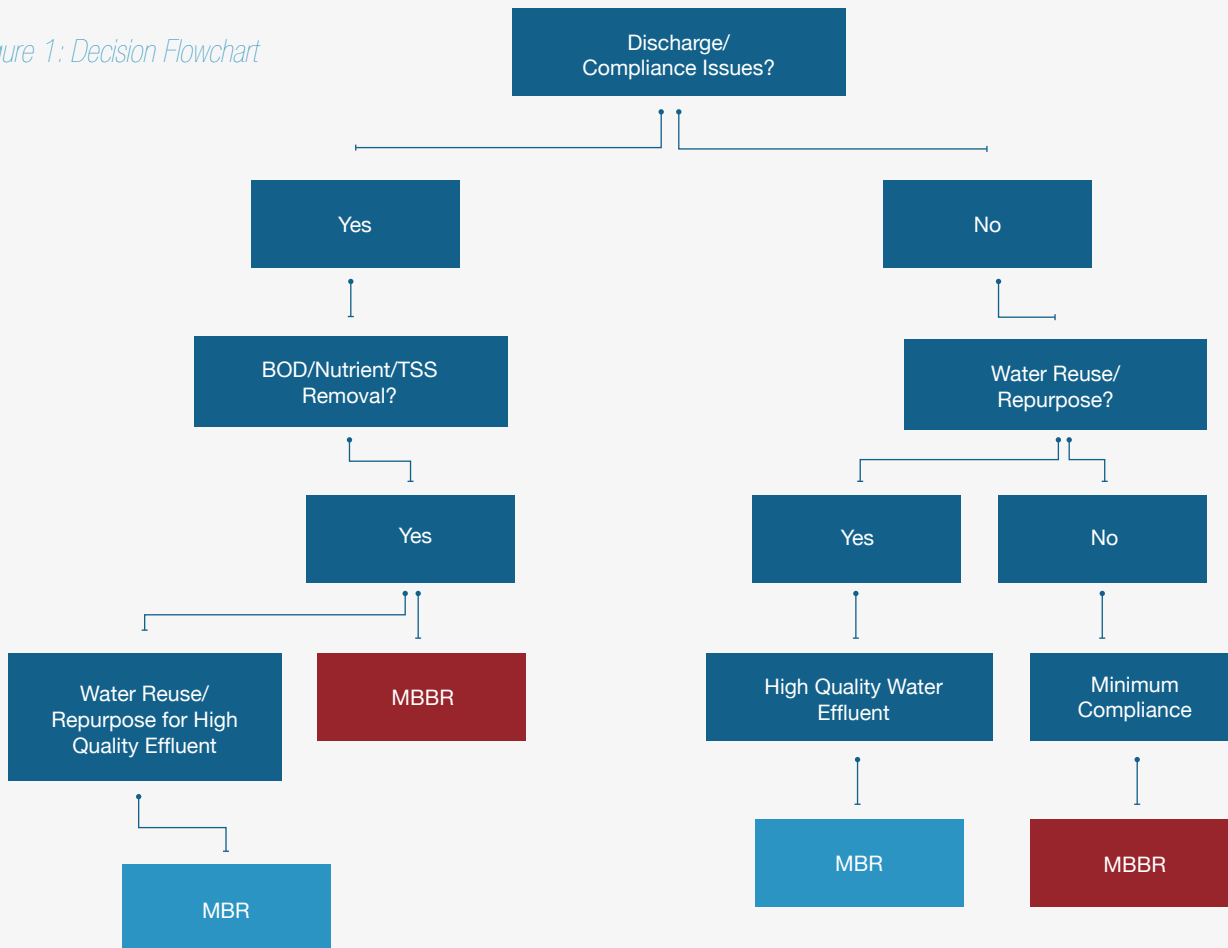
When it comes to business planning, one of our most precious resources is something we often take for granted, clean water. Regardless of the industry or application, it is important that all companies have a strategy for reliable water reuse or discharge system in place.

In addition to Federal and State mandates for regulatory water compliance companies are faced with water scarcity or nutrient rich runoff. Companies are realizing the importance of implementing a strategy for water reuse or to discharge process water therefore creating value and growth for their business.

When selecting a water technology partner to help develop a wastewater treatment strategy, companies need to decide what they want to do with their process water. This will help determine how to move forward.

To help make the decision on how you want to proceed, it is important to first ask:

Figure 1: Decision Flowchart



## Understanding the Difference between MBR and MBBR Systems

The key difference between these two types of water treatment solutions is their method of filtration. MBR systems transfer the effluent through a series of membranes for highly efficient, ultra/micro filtration of solids and liquids, resulting in high quality effluent for reuse or discharge. Alternatively, MBBR systems employ thousands of biofilm carriers operating in a continuous mixed motion throughout the bioreactor, allowing biomass to thrive while breaking down the aerated wastewater. MBBR systems are ideal for pretreatment of organic waste streams or for minimum compliance set forth by the EPA or other regulatory standards.



## What is a Membrane Bioreactor (MBR) System?

Membrane Bioreactor systems are biological wastewater systems to provide high quality effluent discharge suitable for regulation requirements and water reuse applications. During the treatment process, the wastewater passes through series of membranes that can handle high strength wastewater streams and produce a high quality biological treated permeate effluent.

The high quality effluent water can be reused for a variety of applications such as cooling towers, irrigation, and factory boilers or discharged into waterways. The MBR systems are compact and modular fully automated systems making them easy to operate and maintain.

Figure 2: MBR Process Water Flow Example

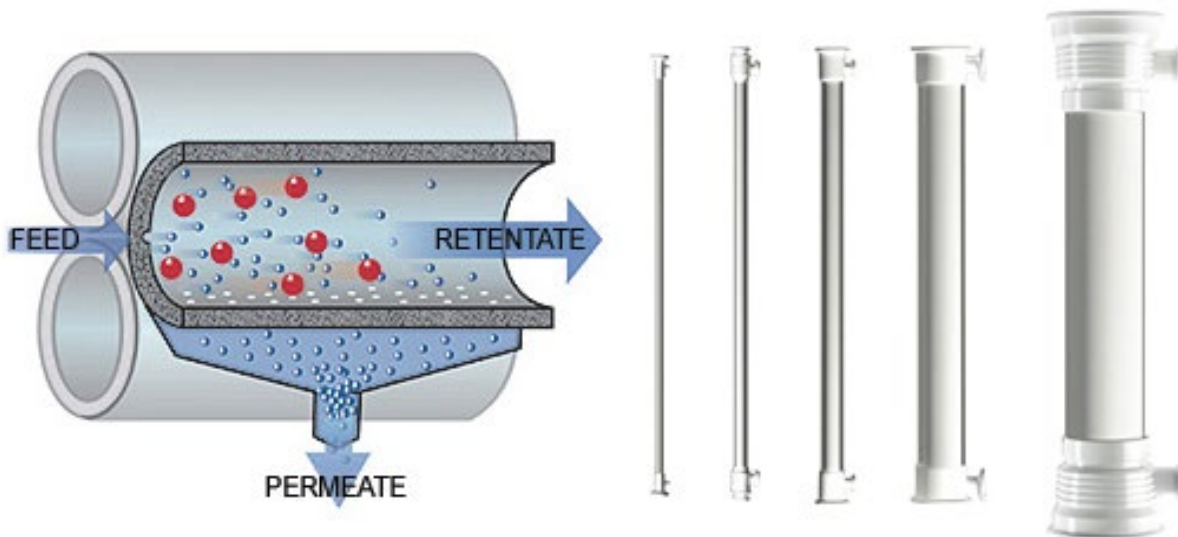


Figure 3: Inside Membrane

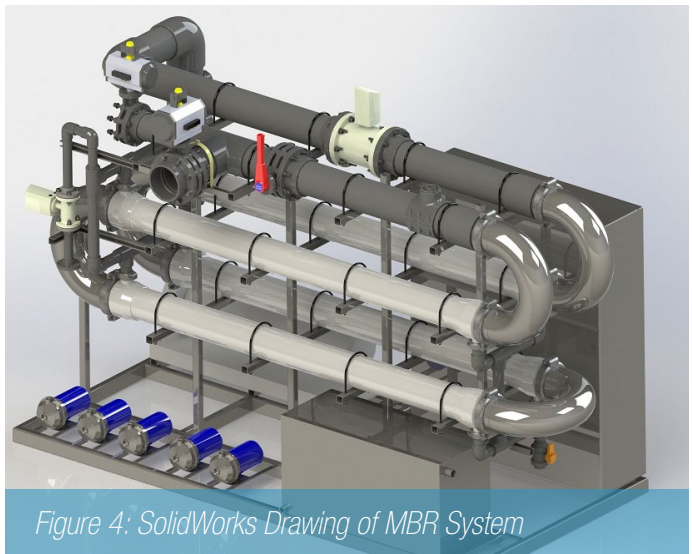


Figure 4: SolidWorks Drawing of MBR System

## MBR Case Studies

For companies implementing clean water reuse systems, these fully automated, PLC controlled systems use membrane separation to maximize productivity while reducing operating costs. The applications below are examples of treatment installations:

- **Ridge Vineyards** – At this California vineyard, bioprocessH2O™ installed a bioPULSE™ Airlift Containerized MBR to recycle wastewater from wine processing and reuse it for vine irrigation. The system was designed to fit within a customized 20 foot long container to accommodate site constraints. The bioPULSE™ MBR system removed biochemical oxygen demand (BOD), chemical oxygen demand (COD), and total suspended solids (TSS) from the process water to irrigate the vines. The installation at Ridge Vineyards created a solution for them to not only meet required discharge regulations but also reclaim their water for vine irrigation. By increasing their water supply, they were able to produce a much larger harvest than prior years reducing the effects of the drought.



Figure 5: Ridge Vineyards



Figure 6: bioPULSE™ MBR Ridge Vineyards Installation

- **Coca-Cola** – A Massachusetts-based branch of Coca-Cola Bottling Company needed to replace an existing system that was not maintaining the proper flowrate for effluent discharge. bioprocessH2O™ replaced the old system with a customized bioFLOW Membrane System that increased the flow rate to remove up to ~98% BOD with minimal input from an operator. The bioprocessH2O™'s bioFLOW MBR system treated water to meet the effluent discharge requirements set forth by state regulations and can now be discharged to a local sewer, saving them the additional cost of hauling the sludge away



Figure 7: bioFLOW MBR Coca-Cola Installation

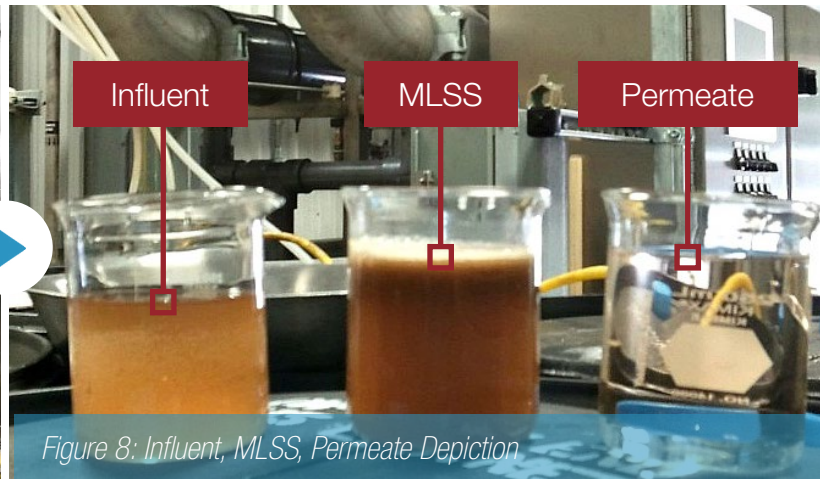


Figure 8: Influent, MLSS, Permeate Depiction



## What is a Moving Bed Biofilm Reactor (MBBR) System?

Moving Bed Biofilm Reactor systems are commonly used for industrial wastewater treatment applications. They provide pretreatment of organics in wastewater streams. MBBR systems can effectively be integrated with industrial and municipal treatment systems for BOD removal, nitrification and denitrification.

MBBR systems consist of biofilm carriers that provide protected surface area for the acclimation process of bacteria. They are constructed of high density polyethylene and have an effective life of over fifteen years. These organisms are continuously sloughed and discharged along with the treated water, which makes MBBR systems ideal for the pretreatment of organic bearing water streams. This technology provides cost-effective, easy to operate solution that is durable against toxic shock loads, compact, requiring minimal maintenance.

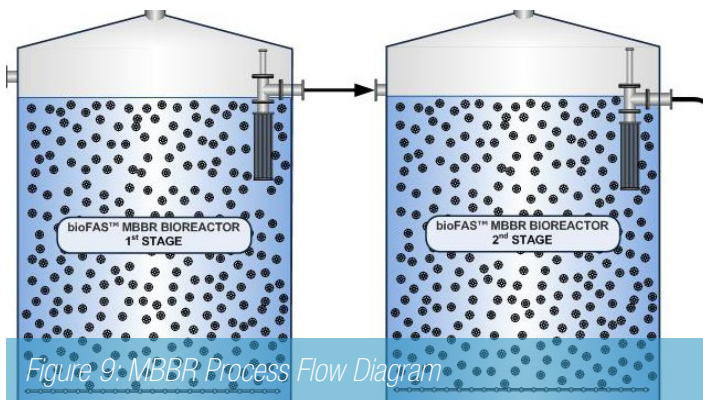


Figure 9: MBBR Process Flow Diagram

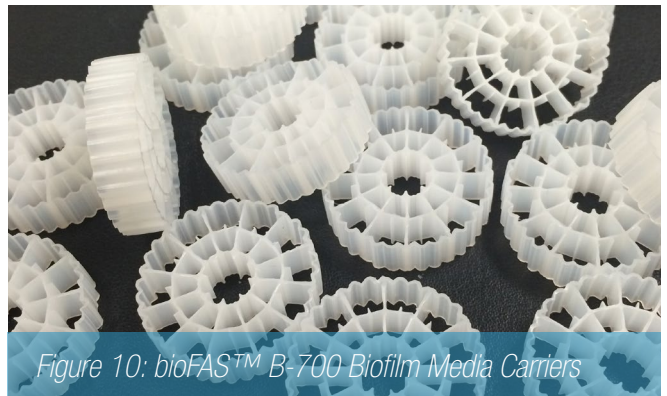


Figure 10: bioFAS™ B-700 Biofilm Media Carriers

## MBBR Case Study

Below is a compact, low power consumption MBBR system applicable for industrial and municipal applications. These systems are fully customizable to match the needs of each application as well as the specific chemical processes required (denitrification, nitrification, BOD, and O2 depletion, for example).

- ▶ **Republic Golden Triangle Landfill** – To comply with increasingly stringent compliance standards, this Beaumont, Texas landfill needed to reduce the amount of ammonia and BOD in the leachate. bioprocessH<sub>2</sub>O™ installed a two-stage bioFAS™ MBBR biological treatment process to slough off the dead bacteria, reduce BOD and the nitrification of ammonia, and expand the landfill's capacity. The MBBR system treated water to meet the effluent discharge requirements set forth by state regulations and can now be discharged to a local sewer.



Figure 11: Golden Triangle Landfill Installation

# About bioprocessH2O™

These three case studies are just a few examples of bioprocessH2O™'s capabilities and our extensive line of next generation MBR and MBBR system solutions. Whether you need an individual component, a replacement system, or a brand new water treatment strategy, bioprocessH2O™ can customize an MBR or MBBR solution to fit your facility's specific needs.

With over 140 years of experience protecting clean water, bioprocessH2O™ is the only company in the nation that offers cost effective solutions for both water discharge and reuse. We integrate and develop innovative filtration and treatment technologies to provide single pass discharge systems as well as multi-component systems for secondary use.

Our team of experts can help you find the perfect strategy to fit your water reuse or discharge needs. For more information about any of our clean water systems, contact bioprocessH2O™ today.

[Contact Us](#)