SynaPure™
wastewater treatment

CASE STUDY
SOLVING COMPLIANCE ISSUES FOR BEVERAGE MANUFACTURER

This case study highlights the effectiveness of the SynaPure™ wastewater treatment system in helping industries with their wastewater compliance challenges. These systems offer numerous advantages over conventional treatment methods including:

- **Exceptional Efficiency –** With 14 different grades of purity available, the system can remove a wide range of contaminants to often nondetect levels.
- **Modular Design –** The system can be rapidly deployed and readily expanded to accommodate future growth.
- **Robust and Automated Operation –** The system requires minimal operator intervention and maintenance costs.
- **Environmentally Friendly –** The system does not require any chemicals for operation thereby significantly reducing reliance on chemicals and minimizing waste generation.

For industries struggling to comply with effluent discharge regulations, the SynaPure system offer a fast, reliable, high-performance solution that promotes environmental responsibility and operational sustainability in a compact footprint and low overall cost.

THE PREMIER SUSTAINABLE SOLUTIONS PROVIDER IN NORTH AMERICA

Synagro delivers environmentally beneficial products, services and circular innovation by reimagining product design, material use and resource efficiency.

INTRODUCTION

A leading beverage manufacturer in Texas was facing increasing difficulty adhering to stringent effluent discharge regulations. Their existing wastewater treatment system was proving inadequate in removing organics and key contaminants to acceptable levels. This resulted in recurring noncompliance fines to the point of jeopardizing operational viability.

CHALLENGE

The beverage manufacturer's wastewater contained significant recalcitrant organic matter, including carbohydrates, sugars and alcohols. These pollutants were difficult to biodegrade and led to high levels of biological oxygen demand (BOD) and chemical oxygen demand (COD) in the effluent, frequently overwhelming their existing treatment system causing the plant to exceed its permit. With all alternatives exhausted, a solution was needed, and fast, to avoid being shut down.

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SOLUTION

The beverage manufacturer chose to implement Synagro's SynaPure™ membrane-based wastewater treatment system. This system utilizes a combination of nanofiltration (NF) and reverse osmosis (RO) membranes for a superior level of contaminant removal. This NF-RO combination effectively removed:

- **Suspended Solids and Colloids –** Effective removal with > 99% reduction significantly reducing turbidity and color.
- **Organics –** High removal of a broad spectrum of dissolved organics including recalcitrant matter, significantly lowering BOD and COD levels.
- **Nutrients and Other Contaminants –** The combined action of NF and RO membranes achieved exceptional removal of nutrients like nitrogen and phosphorus, along with other dissolved contaminants, producing reuse quality effluent.

SUCCESS

The implementation of the SynaPure™ system yielded remarkable results with > 95% BOD and COD removal. The system further achieved Total Suspended Solids (TSS) and colloidal removal exceeding 99%, helping not only meet, but exceed the discharge permit requirements.

The robust nature of the tubular membranes further enabled a much more forgiving and robust operation with high up times and quick response to flow and load variations (as is frequently experienced with beverage manufacturing operations). The fully automated nature of the system further helped significantly reduce the need for operator intervention and helped optimize overall operations and maintenance costs.

The compact and modular nature of the technology enabled rapid deployment with minimal civil construction and real estate requirements helping to achieve compliance in a short period of time.

These outcomes significantly exceeded the capabilities of the previous treatment system and led to the following benefits for the beverage manufacturer:

- **Eradication of Noncompliance Fines –** Consistent compliance with discharge regulations eliminating significant financial penalties and the possibility of having to shut down operations.
- **Reduced Water Consumption –** Treated wastewater could be reused for various purposes, minimizing reliance on fresh water sources.
- **Enhanced Brand Image –** Demonstrating commitment to environmental sustainability and strengthening the company's reputation and public perception.

ABOUT THE SYNAPURE WASTEWATER TREATMENT SYSTEM

The SynaPure wastewater treatment system is a flexible, single-pass process capable of treating a wide variety of influent wastewater types to produce direct discharge or reuse quality effluent. Provided on a skid or built into a shipping container, the system can be rapidly deployed to virtually any site.

The technology behind the SynaPure system removes contaminants including inorganic and organic pollutants, total suspended solids, total dissolved solids, PFAS, heavy metals and pathogens that can create challenges and disposal issues for our current and future customers.[1]

[1]https://www.epa.gov/system/files/documents/2021-09/multi-industry-pfas-study_preliminary-2021-report_508_2021.09.08.pdf

Climate Change

We've baselined our Scope 1, 2 and 3 CHG emissions and calculated our beneficial handprint.

Product Stewardship

In 2022, we processed 6.5 million tons of biosolids, of which 80% was reused for a beneficial purpose.

Technology and Circular Innovation

We are collaborating with CharTech Solutions to pilot an industry-first process to treat biosolids.

To learn more about our sustainability efforts and how we plan to grow our business sustainably, visit www.synagro.com/sustainability.

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CONTACT US

Synagro Technologies Inc.
435 Williams Court, Suite 100
Baltimore, Maryland 21220

800.370.0035
sales@synagro.com
www.synagro.com