Nexom®

INTENSIFIED

technologies for cleaner water

FEATURING

BioPORTS™ MBBR

BioPORTS™ IFAS


MEET THE

BioPorts removes BOD from industrial-strength wastewater in Kentucky.

The wastewater industry has seen how nutrients and energy costs expose the limits of existing solutions. Nexom provides design support and supplies the next wave of proven technologies so consulting engineers can confidently exceed all municipal or industrial demands.

NEXOM WAVE

OF PROVEN INTENSIFIED TECHNOLOGIES

Nexom has been redefining the state-of-the-art MBBR and IFAS system. With in-house attached-growth treatment Ph.Ds, partnerships with leading academics, and extensive R&D that has tested our technologies to the extreme at our own full-scale facilities, we ensure the facility you upgrade exceeds expectations, not nutrient limits.

Nexom®

By creating the optimal conditions for attached-growth biomass to flourish, a BioPorts moving bed biofilm reactor (MBBR) enables treatment plants of all sizes to **intensify their biological treatment.**

REMOVES BOD, AMMONIA, NITRATES, & OPERATORS' WORRIES

An MBBR installation between Billings and Bozeman, Montana.

Bioports is MBBR, evolved.

A BioPorts MBBR is the culmination of premium products and process engineering. It combines high-quality media, retention screens, and fixed grid products with Nexom's unmatched process expertise to create an industry leading technology. Reliability, simplicity, and intensified treatment have never been more available than now.

BioPORTS™ MBBR

BioPorts enables WWTPs to consistently hit required $cBOD_5$, Total Ammonia-Nitrogen, and Total Nitrogen/Nitrate removal levels. It increases the surface area available to attached-growth microorganisms. By growing nitrifying and/or heterotrophic biomass on a surface, BioPorts:

- minimizes the washout associated with suspended-growth systems
- can respond dynamically in situations where loading is high strength or highly variable.

TECHNOLOGY:

Moving bed biofilm reactor

ADVANTAGES:

- Wastewater treatment intensification offers more treatment capacity in a small footprint
- Handles variable loading
- Media size optimized for large surface area while allowing for more coarse screening
- Operational simplicity

APPLICATIONS:

- BOD reduction
- Nitrification
- Pre- or post-denitrification
- Activated sludge plant upgrades
- New installations
- Small-footprint lagoon pre-treatment or polishing

BioPORTS® MBBR MOVING BED BIOFILM REACTOR

Reliable. Simple. Intense. Pick all three.

BioPorts MBBRs work based on a series of basic principles, offering three key advantages:

1. Reliable

When flows increase quickly, it can overwhelm other treatment systems' capacity and cause biological washout.

With BioPorts, biology is fixed where it is needed most: in your treatment basin, fixed to the surface of BioPorts media which themselves are retained using coarse screens. No more washout.

2. Simple

Balancing return and waste activated sludge (RAS/WAS) is a challenging part of managing an activated sludge plant. Likewise managing membrane-based fine-bubble aeration adds to an operator's workload.

A BioPorts MBBR does not need RAS because microorganisms are fixed directly to the media retained in the basin using coarse screens. And because moving media both shears bubbles finer while increasing their detention time, lower-maintenance membrane-free diffusers can be used while achieving similar oxygen transfer.

3. Intense

Wastewater facilities are often upgraded because they were neither intended nor designed to handle the high strength or variability they later see.

Create and retain the density of treatment to better handle today's (and tomorrow's) loading levels and their fluctuations, all thanks to the BioPorts MBBR.

BioPORTS™ MBBR

HOW IT WORKS

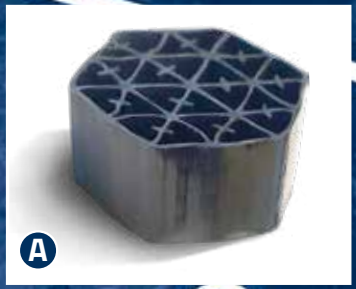
Frequently asked questions.

How easily can a BioPorts system be upgraded?
Based on its small footprint design and modular scalability, BioPorts is among the simplest wastewater treatment solutions to upgrade, whether your focus is further BOD removal, nitrification, denitrification to meet Total Nitrogen limits, or beyond.

How often does media need to be replaced?
The BioPorts media you start with should last the life of your installation. It is built from durable HDPE and sized so that it can be retained by coarse effluent screens for no downstream media loss.

For having “moving” in the name, this MBBR doesn’t have many traditional moving parts.

Apart from the aeration blowers and/or mechanical mixers, there’s almost nothing to maintain.



Ⓐ **BioPorts 900-09 media** is proprietarily designed to optimize biologically- active surface area to up to 942 m^2/m^3 (287 ft^2/ft^3). It is made of high-quality HDPE with standard carbon black added for UV protection.

Ⓑ **CoarsAir MaxAir coarse bubble aeration** provides the mixing energy required to keep the media and water in contact, while ensuring aerobic conditions when so desired, all with minimal O&M. (Mechanical mixing is available where anoxic conditions are required.)

Ⓒ **Retention screens** are uniquely designed to keep media in the basin, prevent solids blinding, and provide easy operator access for sampling or maintenance.

Flexible to suit your needs.

Whether you need to remove BOD, ammonia, nitrates, or any combination of those, a BioPorts MBBR can help.

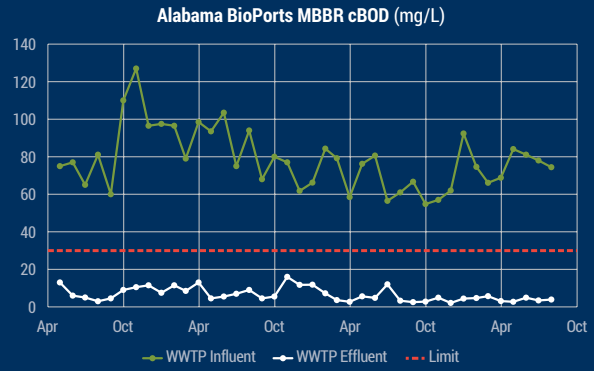
A post-lagoon BioPorts MBBR west of Milwaukee, Wisconsin.

Ready to handle whatever you have to throw at it.

Because a BioPorts MBBR delivers optimal conditions for biological treatment, it can be used for a variety of uses and optimized for a variety of criteria, even within the same treatment stream.

For example, at a municipal Alabama treatment facility where existing infrastructure prevented any chance of expanding the plant's footprint, the MBBR was engineered to fit in a sliver of land directly next to the blower building, and still delivers BOD and ammonia compliance.

FIND THE WHOLE STORY AT NEXOM.COM/ROLLTIDE.

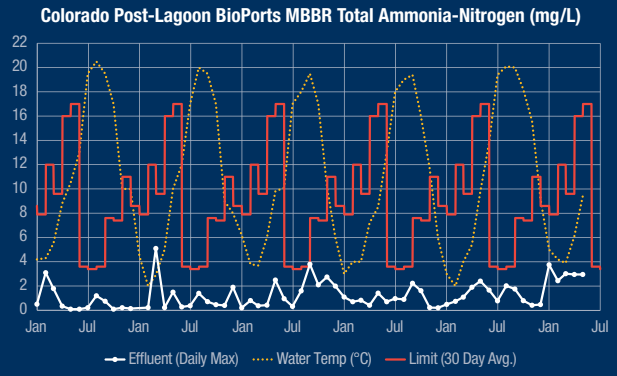


BioPORTS™ MBBR

HOW IT PERFORMS

Meanwhile, it's an entirely separate challenge to engineer a system to follow a lagoon at an elevation of 2,200m (1.4mi) above sea level. The BioPorts MBBR at one Colorado town northwest of Denver experiences warm summers and water temperatures that plunge in fall. In spite of this, the BioPorts MBBR has operated for more than a decade, within two sets of permitted limits, and has demonstrated long-term compliance.

FIND THE WHOLE STORY AT NEXOM.COM/ELEVATION.



A BioPorts IFAS system in Puerto Rico.

UPGRADE YOUR ACTIVATED SLUDGE TO INTENSIFY TREATMENT

...and create a customized system capable of biological nutrient removal (BNR) that allows you to meet any or all of your BOD, ammonia, nitrogen, or phosphorus requirements..

Meet BOD, ammonia, nitrate or even phosphorus limits.

BioPorts Integrated Fixed-Film Activated Sludge (IFAS) enables your existing activated sludge basin to do more with less footprint by increasing the surface area available to attached-growth biomass.

BioPORTS™ IFAS

Increasing aeration energy or oxygen is not the only method for increasing treatment in a given basin. By growing microorganisms as a fixed film on a surface, BioPorts increases the amount of biomass in a given volume.

If it sounds like BioPorts IFAS is like a superpower for your activated sludge basins, you're correct. But it's the combination of superior components and process design expertise that ensures your IFAS system is designed for your specific application and will work as intended.

TECHNOLOGY:

Integrated fixed-film activated sludge

ADVANTAGES:

- Easy upgrade for activated sludge-based treatment plants
- Handles high strength and/or highly-variable loading
- Reduces clarifier loading
- Media size optimized for large surface area while allowing for more coarse screening
- Operational simplicity
- Minimizes footprint

APPLICATIONS:

- BOD reduction
- Nitrification for Total Ammonia-Nitrogen compliance
- Denitrification for Total Nitrogen/nitrate compliance
- Enhanced biological phosphorus removal (EBPR)
- Activated sludge plant upgrades
- New IFAS installations

INTEGRATED FIXED-FILM ACTIVATED SLUDGE
BioPORTS® IFAS

Retain and oxygenate more concentrated biomass.

Biomass is easiest to retain when it's fixed to a surface, minimizing the washout that occurs in a suspended-growth environment. BioPorts provides that surface area—and plenty of it—in the form of dynamic media that is submerged and contained in a tank.

While the biofilm is fixed on the media, the media itself circulates in the tank. The integrated aeration in the tank not only ensures high dissolved-oxygen levels throughout, it also moves the media within the tank, enabling a more even distribution of loading and oxygenation to the biomass.

BioPorts IFAS installations address high strength or highly-variable loading more effectively than traditional activated sludge basins because there is ample surface area for biomass expansion and mixing effectively distributes the biofilm-laden media, loading and oxygen throughout the basin.

A BioPorts IFAS system also reduces loading to your clarifiers. Because the BioPorts media retain more of the biomass in the basin, your IFAS system can treat substantially more BOD or nutrients, while contributing less mixed liquor suspended solids (MLSS) loading to clarifiers.

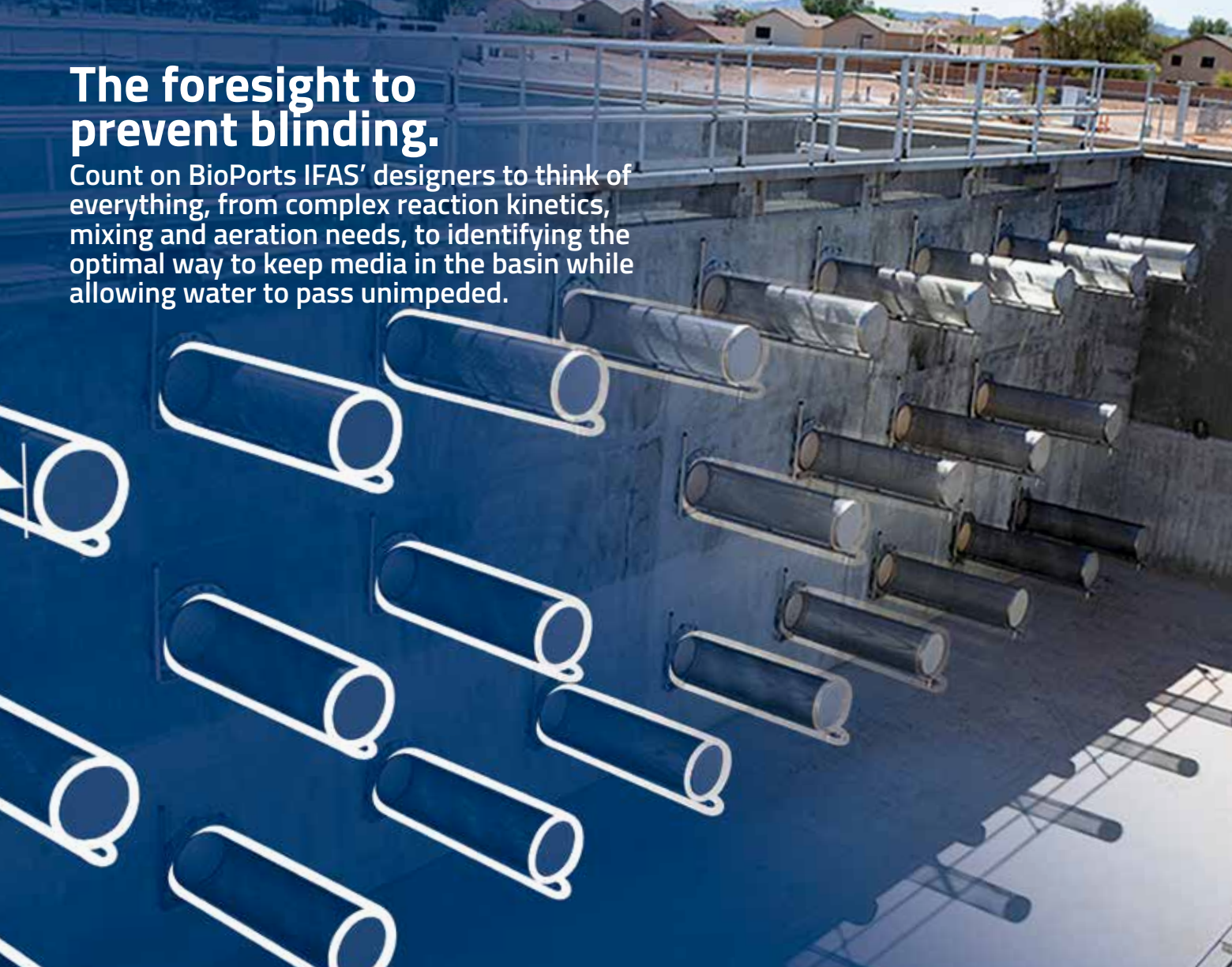
BioPORTS™ IFAS

HOW IT WORKS

Frequently asked questions.

What activated sludge facilities can be upgraded to BioPorts IFAS? Whether your focus is BOD removal or full biological nutrient removal, most activated sludge systems can be upgraded to a BioPorts IFAS system. Nexom engineers will examine the existing reactors and solids separation capacity to determine the simplest way to integrate an IFAS system for additional capacity and more stringent nutrient limits.

How low can you go with effluent limits? Both IFAS and MBBR systems can be designed to the limits of secondary treatment technologies (3 mg/L of Total Nitrogen and 0.1 mg/L Total Phosphorus).



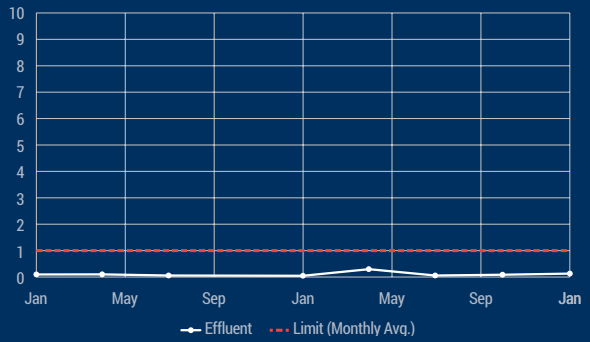
The foresight to prevent blinding.

Count on BioPorts IFAS' designers to think of everything, from complex reaction kinetics, mixing and aeration needs, to identifying the optimal way to keep media in the basin while allowing water to pass unimpeded.

IFAS system offers years-long track record of compliance.

When an Arizona wastewater treatment plant's activated sludge plant needed upgrading, they turned to BioPorts IFAS. With monthly averages for BOD and ammonia needing to remain below 30 mg/L and 1 mg/L, respectively, the system needs biological treatment that is reliable enough to comply consistently. After six years, BioPorts has shown to provide that, with universal BOD and ammonia compliance.

Arizona BioPorts IFAS Total Ammonia-Nitrogen (Daily Max mg/L)



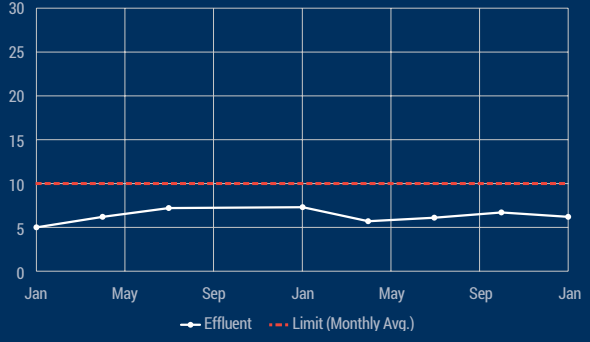
BioPORTS™ IFAS

HOW IT PERFORMS

Even when comparing daily maximum effluent levels to its monthly average limits, the BioPorts system has shown it can deliver results and provide valuable operations advantages. Should daily maximum BOD, ammonia, or even nitrate/nitrite levels rise above monthly average compliance levels, the BioPorts system will respond quickly to a simple adjustment to IMLR to enable a swift return to safely-compliant effluent.

FIND THE WHOLE STORY AT NEXOM.COM/DESERT.

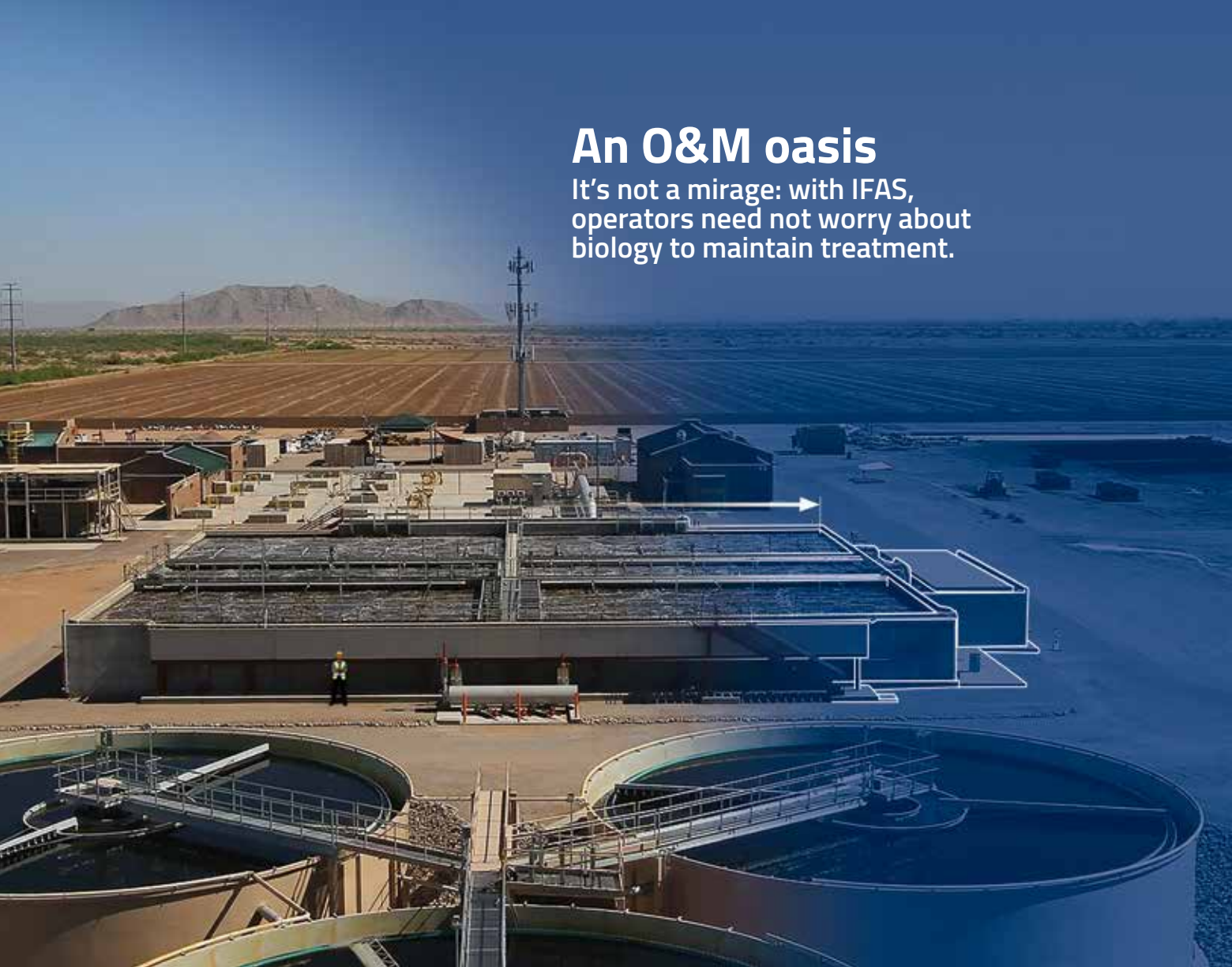
Arizona BioPorts IFAS NO_2^- & NO_3^- (Daily Max mg/L)



A BioPorts IFAS-upgraded treatment system in Arizona.

An O&M oasis

It's not a mirage: with IFAS, operators need not worry about biology to maintain treatment.



BioPorts can slash your fees or fines from the municipal plant by giving you the power to **easily and reliably achieve required treatment levels in-house.**

AN OUNCE OF PRE-TREATMENT MAY BE WORTH A POUND OF CASH.

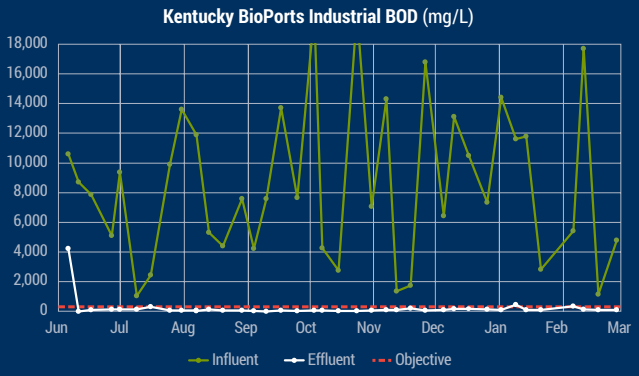
A BioPorts MBBR system treats high-strength leachate at a Pennsylvania landfill.

BioPorts maximizes industry's capacity to keep more money.

Where industrial loading can be degrees of magnitude stronger than typical municipal influent, a municipality's treatment system may charge an industrial user substantial fees for treating their wastewater.

INDUSTRIAL PRE-TREATMENT

Whatever the business' existing infrastructure (even no infrastructure whatsoever), a BioPorts upgrade is a capital- and OpEx-friendly way to ensure long-term compliance with the local requirements. Like at one Kentucky salad dressing manufacturer, where BioPorts reduces BOD peaks in excess of 18,000 mg/L to a consistent fraction of that amount.



TECHNOLOGY:

Industrial pre-treatment

ADVANTAGES:

- Small footprint reduces impact on site
- Customizable for site-specific limits; only treat what you need to treat
- Worry-free operation during and after peak-plus flow events

A BioPorts-equipped facility in Alabama.

BEST OF ALL, WE'LL DO THE DIRTY WORK

In many cases, MBBR or IFAS upgrades and service can be done with minimal disruption to operations. **Trust your installation and maintenance to the pros who know them best.**

Trust your treatment intensification upgrade or service to the people who have done hundreds of them.

Experienced SiteWorks™ field service professionals are experts at installing and maintaining wastewater systems. Work with SiteWorks to get the most out of your equipment, from day one, and through its entire life.

SITEWORKS

Duckett Creek, Missouri

Our relationship with the Duckett Creek Sanitary District began in 1994. The initial upgrade helped the 5 MGD (19,000 m³/day) plant near St. Charles, Missouri save over $60,000 USD in energy and operating costs annually.

Since partnering with SiteWorks, Duckett Creek has doubled the plant's capacity and seen superior DO results, and today, SiteWorks continues to deliver them services in the form of replacement parts and system upgrades.

LEARN MORE ABOUT SERVICES AT NEXOM.COM/SITEWORKS.

SERVICE:

SiteWorks on-site wastewater equipment installation & maintenance

ADVANTAGES:

- Experienced professionals deliver fast, reliable install and maintenance
- Services all brands, enabling single-source maintenance programs
- Single point of responsibility for Nexom equipment

SITEWORKS ONSITE INSTALLATION & MAINTENANCE

The wastewater industry has seen how nutrients and energy costs expose the limits of existing solutions. Nexom designs and supplies

THE NEXT WAVE OF PROVEN TECHNOLOGIES

helping consulting engineers confidently exceed all municipal or industrial demands.

Nexom®

Get the answers you need to move your project forward.
Call: **1-888-426-8180**
Type: **info@nexom.com**
Click: **www.nexom.com**

atac EDI EOSi Napier-Reid Nexom

Axius Water companies

CB3-BI-23-08