



# Biosolids Solutions

**WATER TECHNOLOGIES**

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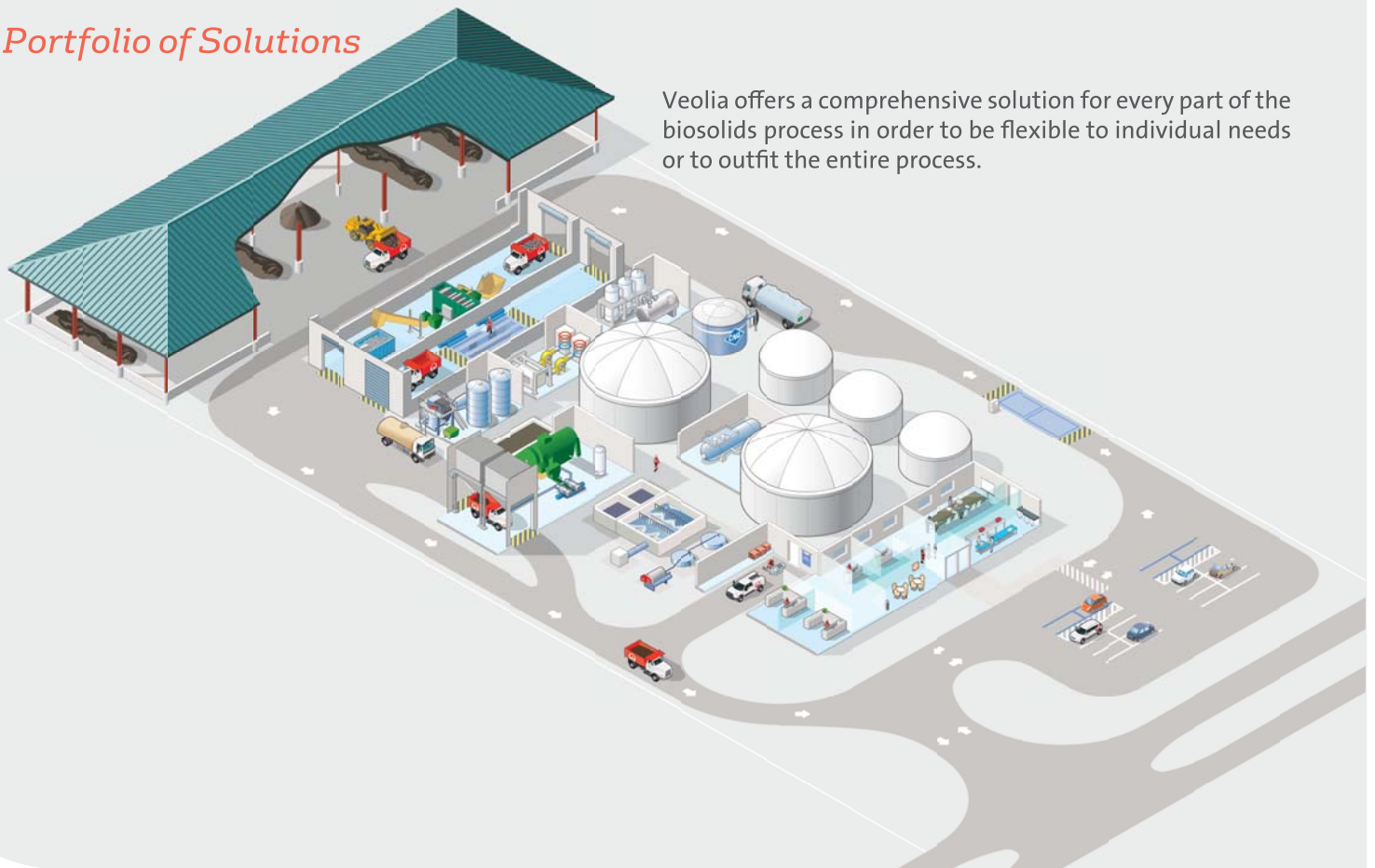
## Resource and Energy Recovery



We offer safe and environmentally friendly biosolids solutions that focus on performance enhancement, renewable energy, beneficial reuse, and optimization. Veolia Water Technologies is committed to providing innovative solutions with proven value-added performance. Our technologies transform vital resources into clean water, clean energy, and valuable end products, thereby empowering utility owners to develop their own regional circular economies.

- Reduction in waste to be disposed
  - PFAS Treatment
  - Deammonification
  - Phosphorus Removal
- Recovery of valuable byproducts including:
    - > Biosolids as alternate for fertilizer
    - > Nutrients (sulfur, phosphorus)
    - > Energy (biogas, electricity, heat)
    - > Water (for reuse)
  - New revenue stream for facility from:
    - > Accepting waste from Municipality
    - > Stabilized biosolids as alternate for fertilizer
    - > Nutrients recovered
    - > Renewable bioenergy generated

## Portfolio of Solutions



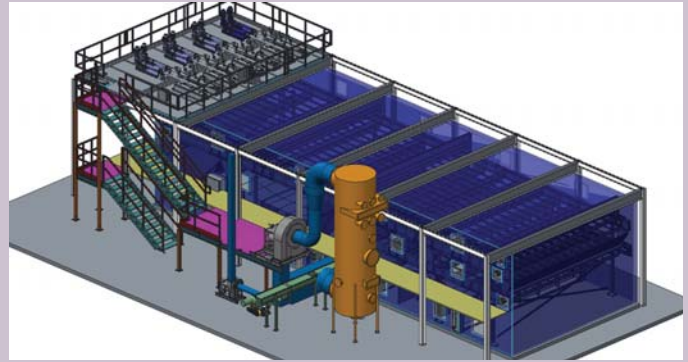
Veolia offers a comprehensive solution for every part of the biosolids process in order to be flexible to individual needs or to outfit the entire process.

## Thermal Drying



The **BioCon™** thermal sludge drying system is designed to be safe, easy to operate, energy efficient and environmentally friendly.

- Low operating temperatures
- Stainless steel belt material allows for better air flow and increased durability
- Minimal exhaust air easily integrates with existing odor control system
- Automated temperature control strategy, ensures a minimum DS content of 90% and meets Class A requirements



The low temperature nature of the thermal sludge dryer enables the BioCon™ dryer to utilize various thermal energy sources including thermal oil, air or steam. Thermal efficiency can be further increased by employing BioCon™ Energy Exchange System. Fuel sources for the Biocon™ system include natural gas, biogas, or fuel oil.

The BioCon™ dryer does not utilize any back-mixing which further reduces dust generation inside the dryer building, creating a cleaner facility with low maintenance.

## PFAS Decomposition



**BioCon™ ERS** (Energy Recovery System) is a safe and sustainable drying and combustion system that combines the efficiencies of a convective air low temperature belt dryer with a biomass furnace to recover sensible heat and combust all organic material.

PFAS (Perfluoroalkyl and Polyfluoroalkyl Substances) are a class of anthropogenic chemicals containing fluorinated carbons that are extremely resistant to degradation.



Additionally, the BioCon™ dryer can be fueled by the biosolids end product by incorporating the ERS which can result in an autogenous system by combusting the end product and utilizing the heat of combustion to fuel the dryer.

- Treat PFAS and organic compounds
- Energy independent solids facility
- Volume reduction of >95%

## Co-digestion



**BIOMET™** is an advanced anaerobic co-digestion process for the conversion of high strength and municipal organic waste to bioenergy and biofertilizer lowering greenhouse gas emissions.

- Receives and processes variable strength waste
- Stabilizes variable loads preventing digester upset
- Guarantees a higher organic loading rate than any other conventional anaerobic digestion systems
- Mechanical equipment is external to the digesters, allowing for maintenance without process interruptions
- Guarantees a higher biogas production of 10 to 20% greater than conventional digestion



**BIOMET™** recovers and recycles biomass and biowaste in order to extract the most added value from it.

- Advanced co-digestion system decouples SRT and HRT to achieve acidification in a batch system
- Proprietary seed management algorithm to maintain an active inventory of acidifiers in each reactors at all time
- Achieves Class A using US EPA prescribed traditional time-temperature method, hence simpler and applicable nationwide
- Can easily be retrofitted to existing infrastructure and does not require specialized components that are single sourced

## Depackaging



The **Ecrusor™** is a food depackaging and organics recovery process ideal for preparing source separated organics, landfill diverted organics and other biodegradable wastes for energy generation.

- Removes contaminants such as plastic, metal and mixed material packaging
- Produces a high quality organic slurry generating biogas
- Installed below grade, outdoors or within truck off-loading stations to receive material directly from vehicles
- Processes up to 52 cubic yards of mixed waste every hour with very low operating energy

## Sidestream



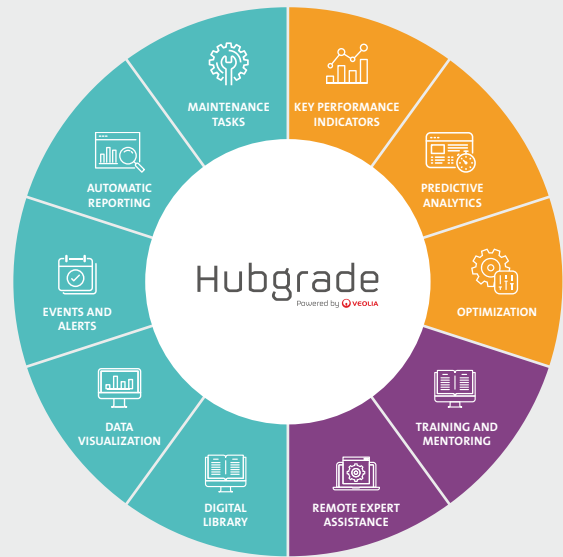
The **ANITA™ Mox** process is the simplest, most robust, compact anammox process solution for high strength ammonia streams. It combines aerobic nitritation with anaerobic ammonia oxidation (anammox) in a continuous single-stage reactor.

- Media based system eliminates anammox washout during exposure to high TSS and polymer influent
- Requires 60% less oxygen than conventional nitrification
- Patented control strategy achieves ammonia removal higher than 90% and total nitrogen removal in the range of 75 to 85% without external carbon addition

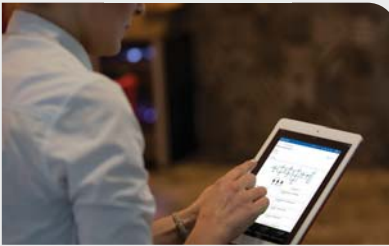
## Digital Services

Hubgrade™ is Veolia's digital services to optimize water treatment systems and can be implemented for a single technology, a range of equipment or the complete treatment plant. By using a highly secure cloud portal to facilitate better use of data, Hubgrade™ can be monitored through an intuitive portal anywhere, anytime, at any device.

Hubgrade™ can achieve lower capital and operational costs, reduced maintenance, chemical use and energy consumption with Veolia support.



### Hubgrade ESSENTIAL



#### Performance Optimization Tool

- Digital library to access all relevant documents
- Data visualization to collect and display process data
- Events and alarms to prevent unexpected shutdowns or regulatory breaches
- Automatic reporting to facilitate data analysis and reporting regularly
- Maintenance module overview

### Hubgrade ASSIST



#### Access to Veolia Process Experts

- Remote expert assistance enabled by real-time monitoring, alarm management, and augmented reality
- Training and mentoring features provide access to training materials showing on-site issue resolution or e-learning programs

### Hubgrade PERFORMANCE



#### Online Smart Control Tool

- Key performance indicators assess the quality of the operation and guide operational decision making
- Predictive analytics predicts the evolution of strategic operation parameters or anticipates the failures, reduces downtime risks and optimizes maintenance
- Optimization features provide simulated operational scenarios and setpoints



## Aftermarket Services

Customer support is a continuous process, from the design to start-up to operation. Our team of informed and experienced professionals are available for anything from process reoptimization, preventative maintenance or spare parts.

We maintain an extensive parts inventory so that most items can ship the same day the order is placed. In addition to parts, we can also provide a repair service that includes a trained technician to assist with the part replacement.

# Resourcing the world

**Veolia Water Technologies**

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