



Global Water, Wastewater & Reuse Treatment Solutions

May 2018



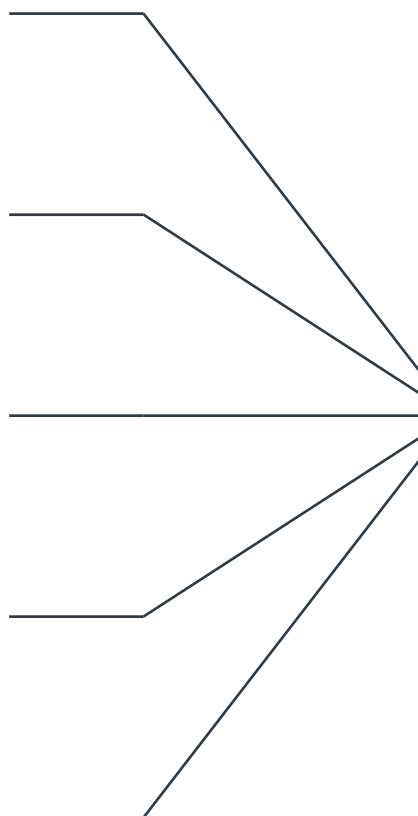
Formed in 2017 following the consolidation of independent water and wastewater treatment solution providers Emefcy and RWL Water

Fluence provides local, sustainable treatment and reuse solutions while empowering businesses and communities worldwide to make the most of their water resources

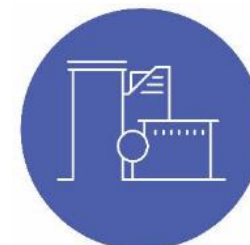
Fluence product solutions produce high quality water for potable and process water, as well as treated wastewater for reuse in municipal, industrial and commercial sites around the world

The company employs over 330 highly-trained water professionals with experience operating in 70 countries

Fluence is a publicly company traded on the Australian Stock Exchange (ASX: FLC)



Merging global innovators with a field-proven execution team to deliver breakthrough water technology solutions to the world

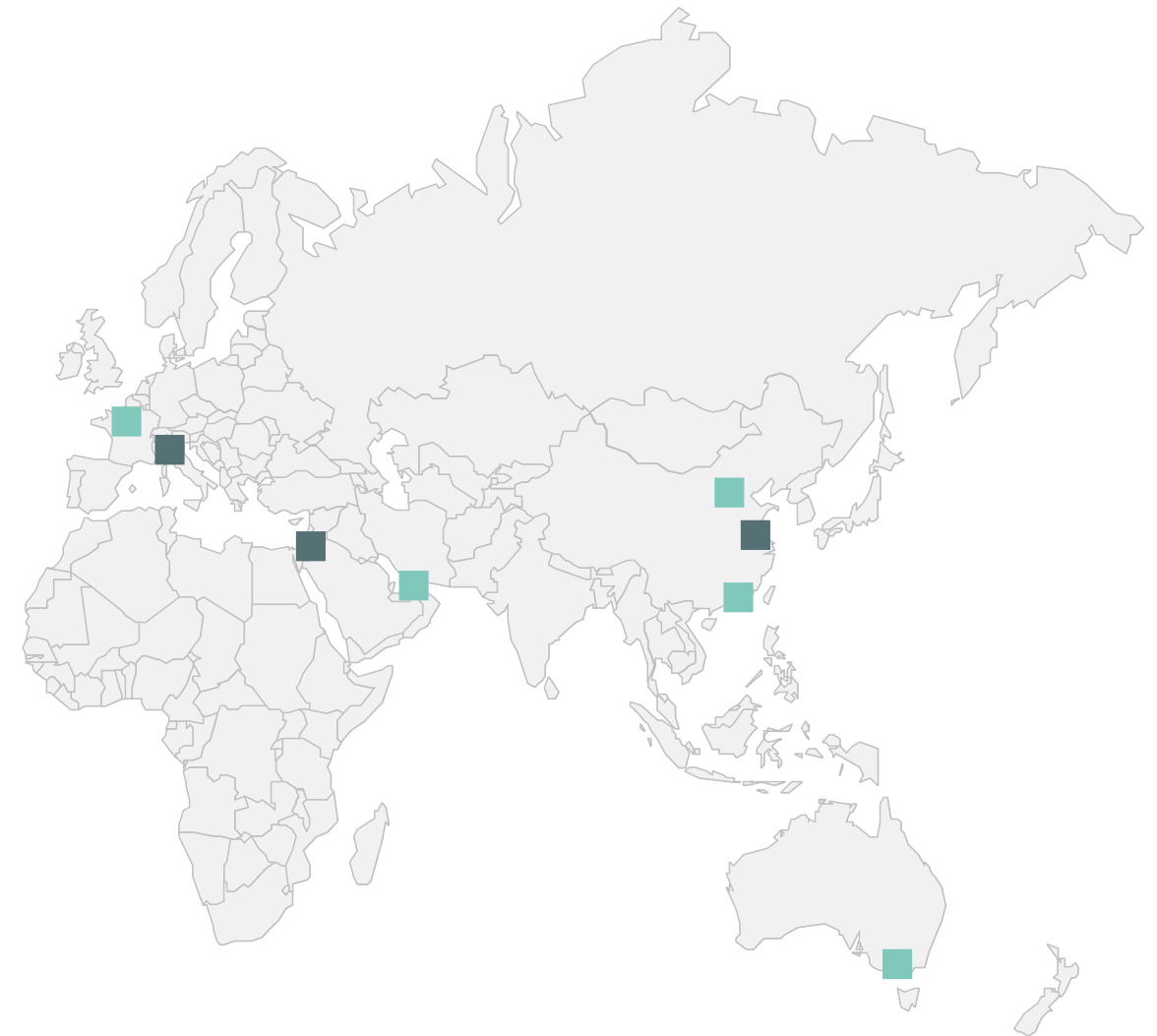
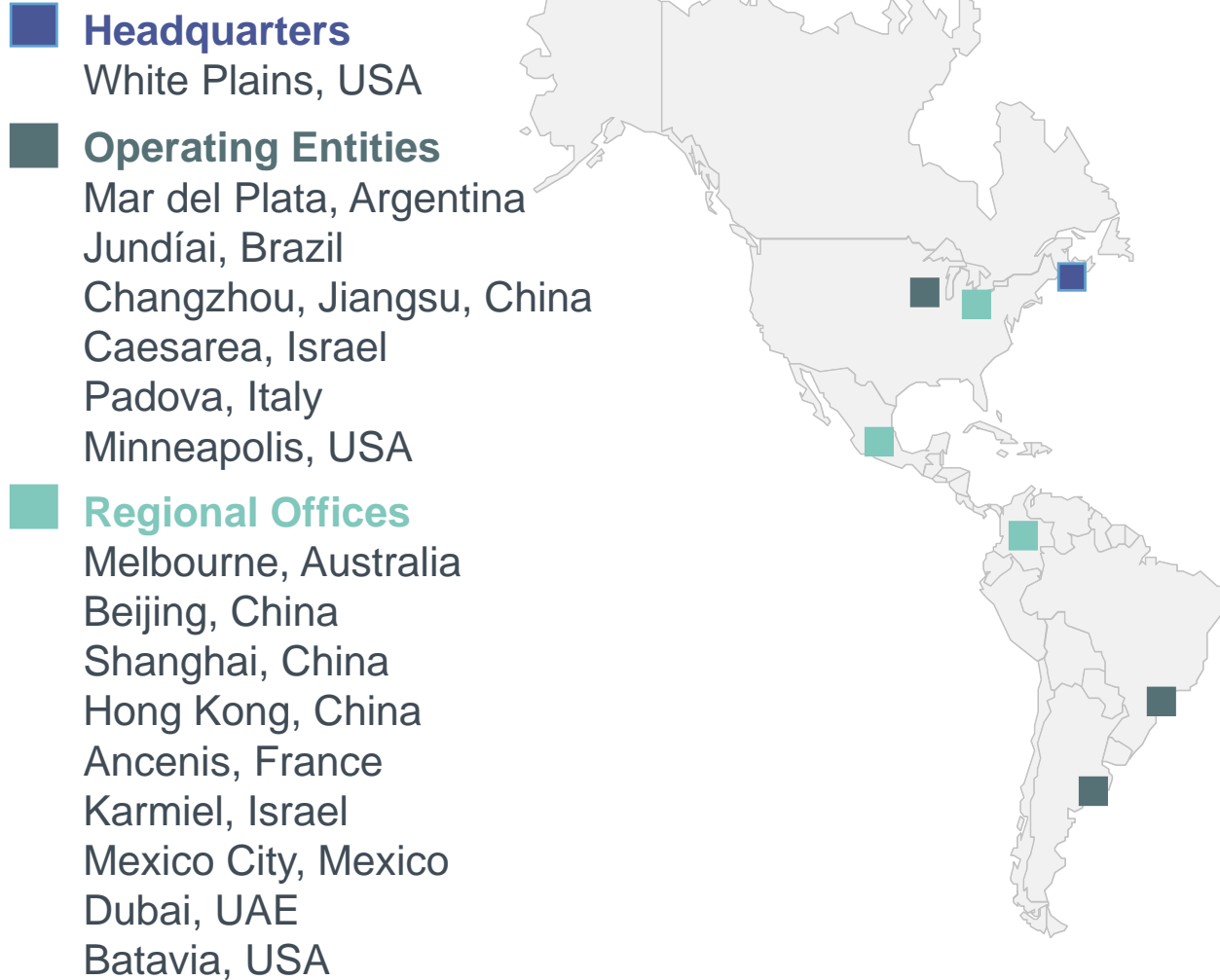


Our Vision

To become the leading global provider of fast-to-deploy decentralized and packaged water and wastewater treatment solutions



Global Presence

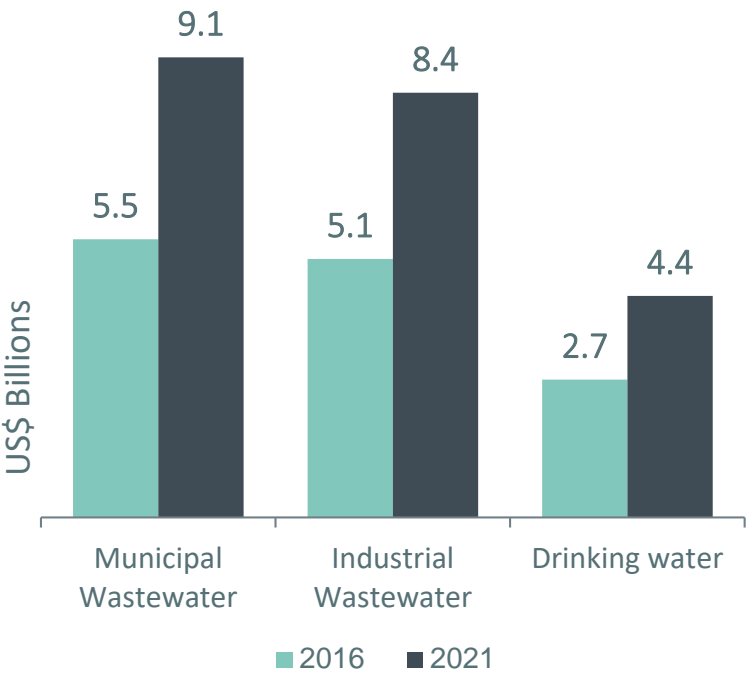


Innovative Solutions

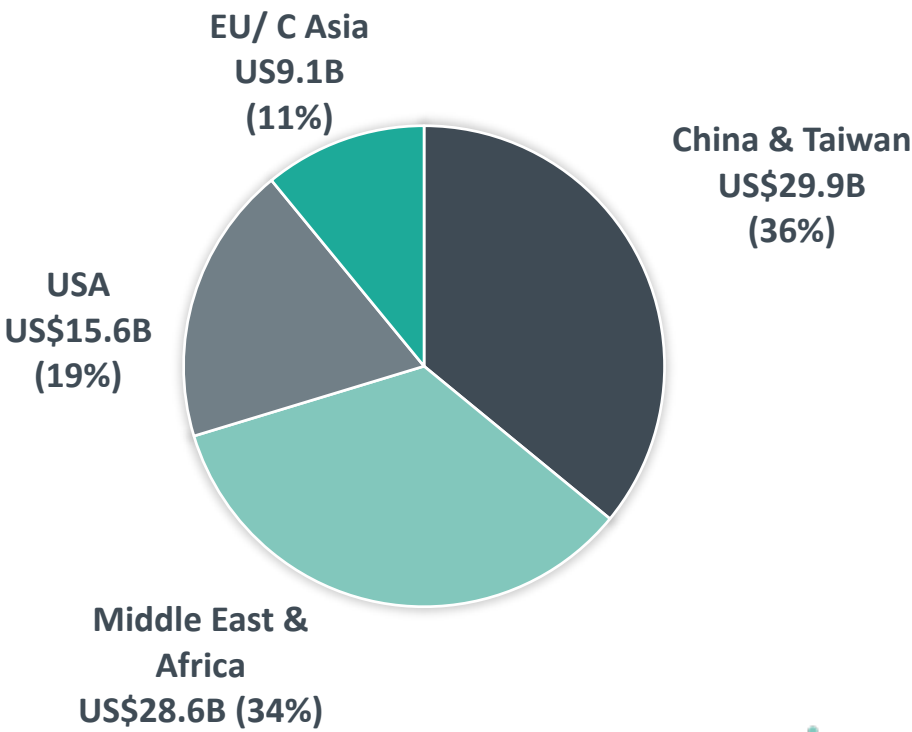


Target Markets Growing Rapidly

Smart Packaged Plants:
Global market growing from
US\$13.3B to US\$21.8B (2016 to 2021)



US\$83B in Planned CapEx
Desalination and Reuse plants
(2017 to 2022)



Sources: MarketsandMarkets Analysis, Global Water Intelligence, company estimates

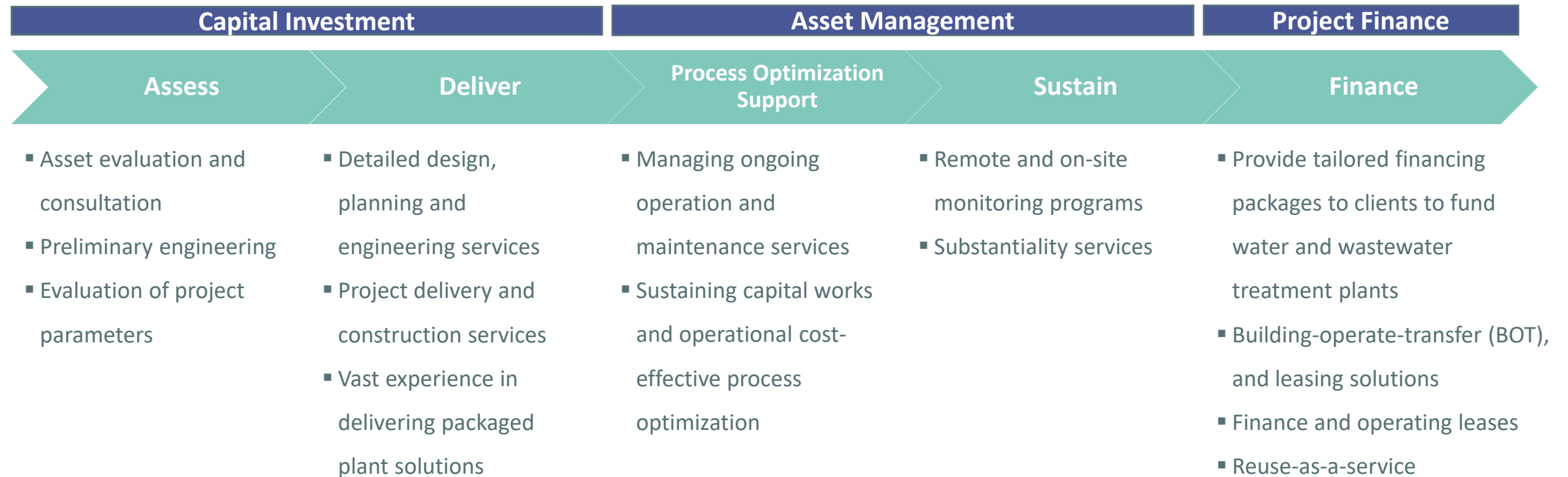
Experienced Multi-Sector Provider

Fluence is a differentiated, global provider of solutions in the areas of desalination, water, wastewater, waste-to-energy and reuse

Client Sector Base					
Industrial	Municipal	Commercial	Oil & Gas	Power	Food & Beverage
Water Markets Served					
Desalination	Water	Wastewater	Waste-to-Energy	Reuse & Recovery	Food & Beverage
<ul style="list-style-type: none"> ▪ Delivery of desalination plants for long or short term applications ▪ Ready-to-use modular systems can be pre-assembled on a skid or containerised 	<ul style="list-style-type: none"> ▪ Provide custom designed and advanced treatment plants specializing in mechanical and chemical treatment processes, disinfection, removal of toxic substances, ultrafiltration, reverse osmosis and biological potabilization 	<ul style="list-style-type: none"> ▪ Provide custom and standard packaged wastewater treatment plants, using up to 90% less energy, halving OPEX, designed to treat influents for either reuse or discharge 	<ul style="list-style-type: none"> ▪ Provide delivery services for anaerobic treatment systems ▪ Customized plants for the production of biogas, starting from analysis of the type and quantity of biomass to be treated 	<ul style="list-style-type: none"> ▪ Worldwide experience in the advanced treatment of wastewater and process water to the required purity levels, for reuse in industrial, agricultural, or municipal processes 	<ul style="list-style-type: none"> ▪ Custom design of food processing water solutions using membrane separation, food grade media filtration, ion exchange resins ▪ Leader in the design and implementation of 4SMB chromatography plants for the purification of fruit juices

Integrated Range of Services

Fluence offers global clients an integrated range of services, from early stage evaluation, through design and delivery, to ongoing support and optimization of water related assets



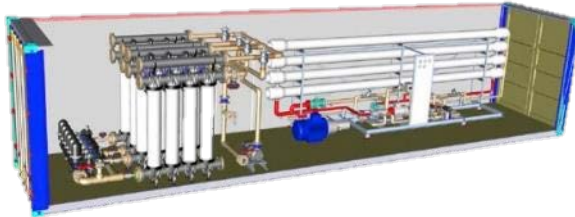
Why Smart Packaged Plants Win: Case Study

Deploys in 1/3 of the time, at 37% lower cost, capturing more value



Typical Custom Desalination Plant

- ✗ Long time to complete (18+ mos)
- ✗ High CapEx
- ✗ Fixed site, hard to upgrade

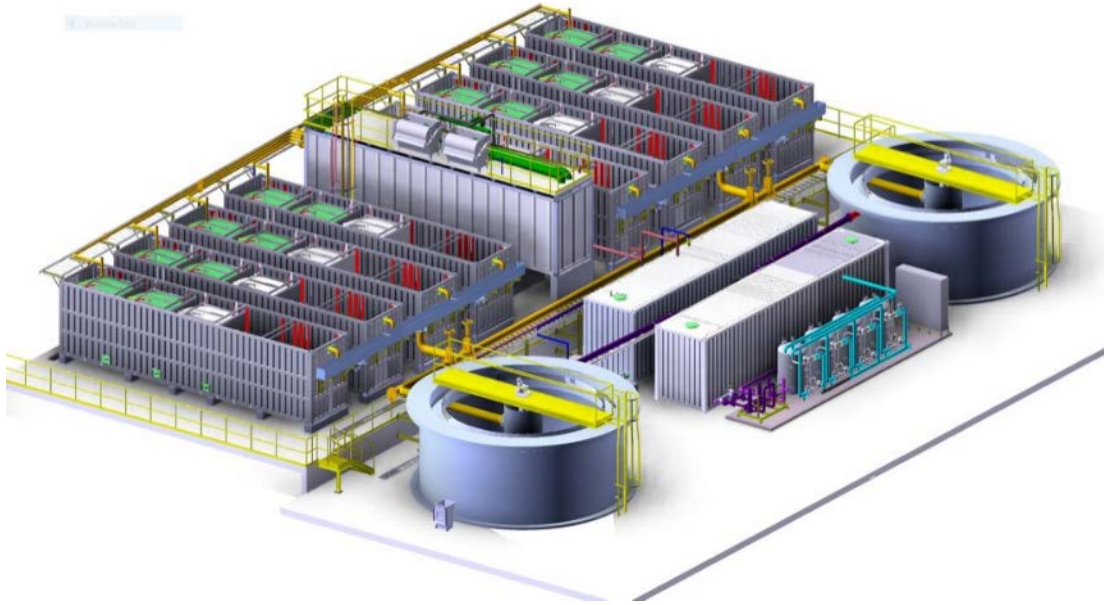


Fluence Desalination Plant

- ✓ One-third of construction time
- ✓ CapEx = 37% less
- ✓ Easy to upgrade as required
- ✓ Easy to relocate – mobile
- ✓ Lower energy use

“South Africa’s first mobile desalination plant”
Global Water Intelligence

Smart Packaged Plants Accelerate Project Timeline



Packaged plant expertise helps speed rollout:

- Packaged solutions minimize engineering per plant, allowing for handling of bulk orders
- Minimal civil works accelerates commissioning
- Smart operation avoids need for onsite staff
- Energy savings minimize customer OpEx, increase IRR



NIROBOX™

Packaged seawater, brackish water or fresh water plant designed and built by Fluence, deploying globally since 2015



Aspinal™

Packaged wastewater treatment plant designed and built by Fluence, deploying since 2017

Smart Packaged NIROBOX™ Plants Deliver Water Fast

The growing demand for potable water due to climate change requires fast deployment of robust, reliable water desalination solutions



Large, tailor-made desalination plants require long development time due to environmental, site, interconnection and financing requirements



NIROBOX™

- **NIROBOX** is a field-proven solution that addresses the mid market
- **Shorter time-to-water** makes it the ideal solution for drought stricken areas
- **Lower Initial CapEx**
- **Modular** and **scalable** approach that can suit any site requirement, enabling fast delivery, integration, commissioning and operation.

Advanced Technology:

- High availability
- Lower OpEx costs
- Online monitoring for improved & enhanced efficiency



NIROBOX™ Family of Packaged Water Treatment Solutions

Pre-engineered water treatment solutions, fully assembled in a standard 40-foot container, ready for rapid deployment and operation



NIROBOX SW

- Seawater RO desalination
- Municipal and industrial applications
- Ready-to-use plant in a single container

3 Standard Models:

- 500 m³/d
- 1,000 m³/d
- 1,500 m³/d
- Modular approach to accommodate any required capacity



NIROBOX BW

- Brackish Water RO desalination
- Municipal and industrial applications
- Ready-to-use plant in a single container

2 Standard Models, each available in two feed capacities::

- Low salinity: 1,000 & 2,000 m³/d
- High salinity: 1,000 & 2,000 m³/d
- Modular approach for any required capacity



NIROBOX FW

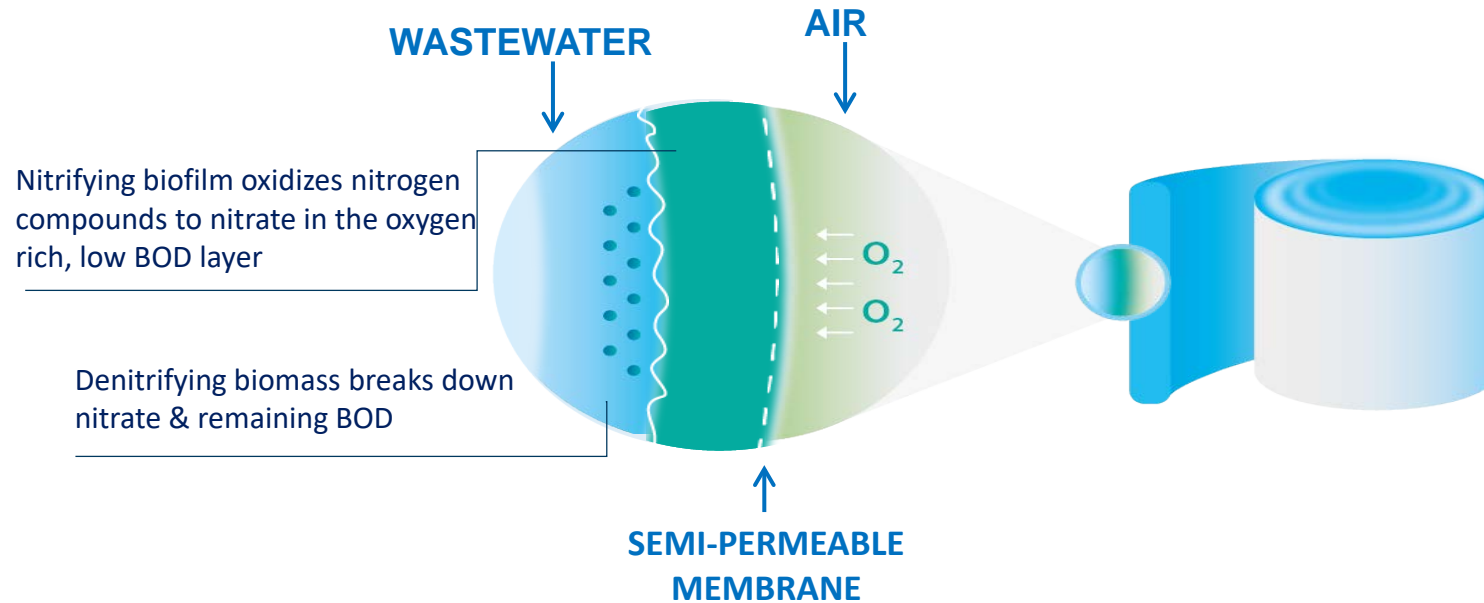
- Fresh water treatment for municipal & industrial applications
- Ready-to-use plant

Standard model:

- 5,000 m³/d
- Modular approach to accommodate any required capacity

The MABR Technology

Fluence's proprietary treatment technology
Membrane Aerated Biofilm Reactors ("MABR")



Simultaneous Nitrification and De-Nitrification

Energy-efficient Wastewater Treatment Product Solutions for
Agriculture, Discharge to the Environment and Reuse

Unique Benefits

- High effluent quality, enabling water reuse
- Up to 90% less energy consumption
- Decentralized solution
- Ideal for small-medium sized plants treating domestic sewage
- Simple to operate
- Water scalping capability
- Modular structure enabling gradual expansion
- Low CapEx and OpEx

Aspiral™ Family of Smart Packaged Wastewater Treatment Solutions

Pre-engineered wastewater treatment solutions, fully assembled in a standard 20-, 30- or 40-foot containers, ready for rapid deployment and operation



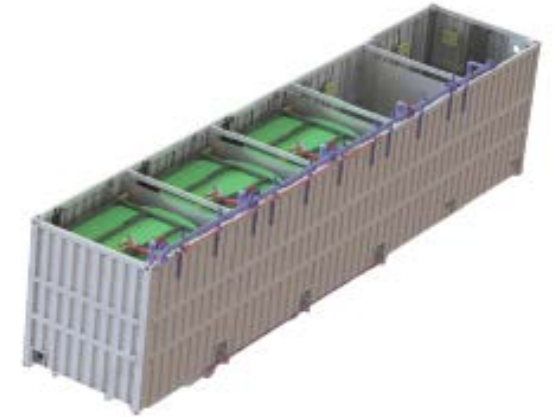
Aspiral S1

- Treats up to 50 m³/d of raw municipal wastewater
- Includes integral pre-treatment screen and clarifier



Aspiral M2

- Treats up to 115 m³/d of raw municipal wastewater
- Includes integral pre-treatment screen and clarifier



Aspiral L3

- Treats up to 300 m³/d of raw municipal wastewater
- External clarifier for cost-effective multiple reactor installations

- A standard Aspiral system will achieve the following removal rates at the clarifier effluent:

Contaminant	Removal %	Typical entry value	Typical effluent value
BOD ₅	>96%	300 ppm	<10 ppm
COD	>88%	600 ppm	<70 ppm
NH ₄ N	>89%	45 ppm	<5 ppm
TN	>82%	55 ppm	<10 ppm
TP	>80%	8 ppm	<1 ppm
TSS	>94%	350 ppm	<20 ppm

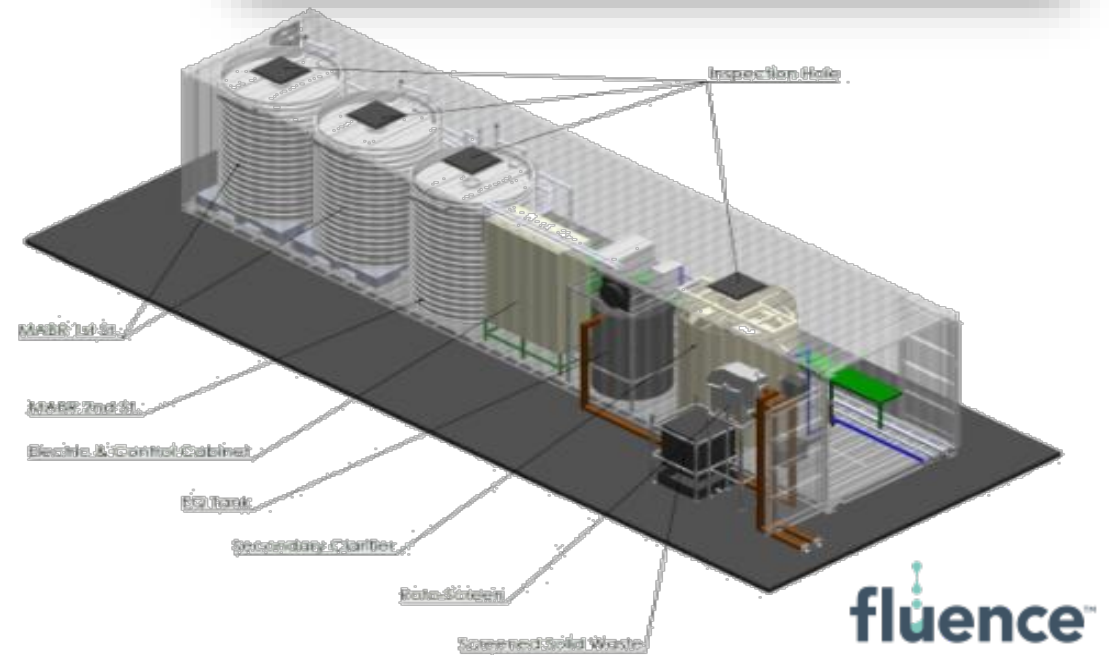
- Typical energy consumption is 0.25 kWh/m³ (0.001 kWh/gal) for flow rates of >500m³/day (132,000 GPD)

- System can be designed for higher removal rates as required

aspiralTM Demo Plants

25 m³/d
(6600 GPD)
treatment
capacity

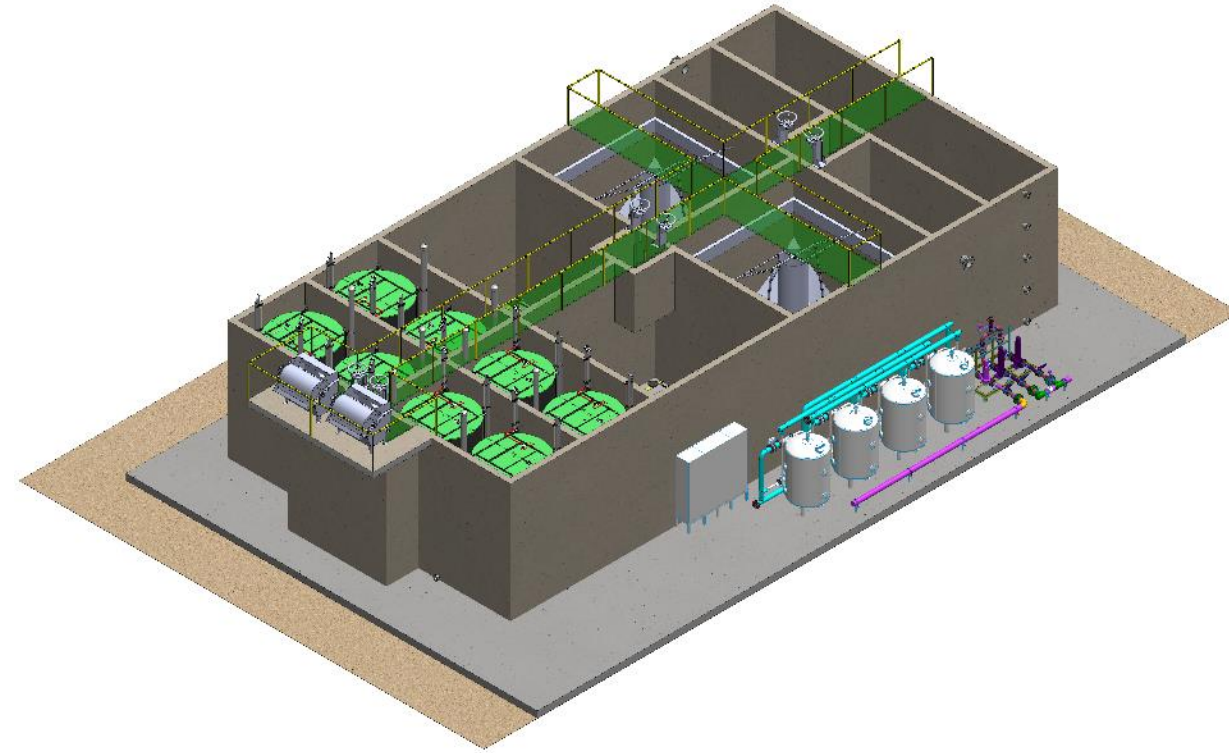
Secondary
quality:
TSS/BOD/TN
30/20/15 mg/l



SUBRE: A Solution for Existing Centralized Installations

SUBRE

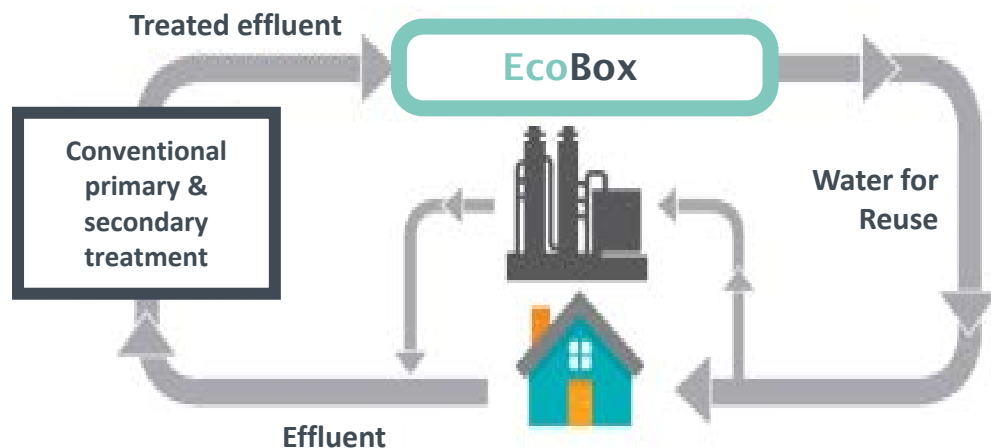
- Submerged MABR upgrades **centralized WWT plant** capacity
- Increases efficiency by
 - increasing basin treatment capacity
 - lowering energy consumption
 - reducing carbon source requirements
- Increases removal of TN, Bio P and BOD **without chemicals**
- Reduces OpEx



Retrofit installation is:

- achieved quickly
- with minimal disturbance to existing installation
- without increasing existing footprint
- has immediate results, within 1 week

Containerized Solutions for Wastewater Reuse



Treatment includes:	<ul style="list-style-type: none">• DAF• UF• UV• RO• AOP
Tertiary treatment for:	<ul style="list-style-type: none">• Domestic wastewater• Industrial wastewater• Grey water
Reuse for:	<ul style="list-style-type: none">• Industrial usage• Indirect potable reuse• Irrigation• Watering• Purple network
Operational factors:	<ul style="list-style-type: none">• Capacity from 120m³/d to 360m³/d• 20' or 40' containers (can be combined)• Plug & Play• Requires primary or secondary treatment

Proven Industrial Waste-to-Energy Solutions



Onsite production of energy reduces electricity and gas consumption

High-quality, treated effluents meet the most stringent requirements

Reduction of sludge volume by up to 90%, significantly reduces landfill waste

Output can be used as a fertilizer

Reduces greenhouse-gas emissions

Dominant in local market sectors, 100% reliable, low operation and maintenance requirements



Tipton Wastewater Treatment Products and Aerators

Packaged Wastewater Treatment Product Solution for Decentralized Applications



Unique Benefits

- Decentralized solution
- Modular, portable and reusable
- Minimal installation, simple to operate
- Pre-fabricated with a flow range up to 500,000 GPD (1,892 m³/day)
- Designed to meet or exceed effluent discharge limits

Best-in-Class Aerators, Mixers and Diffusers



Unique Benefits

- Reduce the costs associated with conventional chemical treatments and eliminate the need to install and operate electrical equipment
- Ruggedly built, designed to provide customers with extended, trouble-free operation

Large Global Projects References

Desalination



Episkopi (Cyprus)
SWRO: 50,000 m³/d

Pulp and Paper



Cartiere di Tivoli (Italy)
WWTP: 100 m³/h

Power



UTE Dead Sea
UPW: 240 m³/h, CPP: 340 m³/h

Food and Beverage



Coca Cola FEMSA (Argentina)
MBR: 300 m³/h

Oil & Gas and Desalination



Pacific Rubiales (Colombia)
BWRO: 80,000 m³/d

Steel



Acciaieria di Rubiera (Italy)
WWTP: 700 m³/h

Appendix of Case Studies

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Decentralized Wastewater Treatment

Bourdeaux, USVI

Customer	Virgin Island Waste Management Authority
Project	Replacement of an outdated and inoperable conventional wastewater treatment plant
Design Parameters	<ul style="list-style-type: none">Flow: 95 m³/D (25,000 GPD)Wastewater characteristics: municipal wastewaterWastewater minimum temperature: 240 ° C
Raw waste water Influent	<ul style="list-style-type: none">BOD_{5,t}: 220 mg/lTSS: 180 mg/lTN: 45 mg/lPhosphorous: 14 mg/l
Effluent Requirements	<ul style="list-style-type: none">BOD_{5,t}: 10 mg/lTSS: 10 mg/lTN: 10 mg/lPhosphorous: 1 mg/l
Solution	MABR
Results	<ul style="list-style-type: none">Up to 90% less energy consumptionHigh effluent quality



Decentralized Wastewater Treatment

Ha'Yogev, Israel

Customer	Palgei Maim, Municipal Water Authority
Project	Replacement of a pond system which faced difficulties in wastewater treatment
Design Parameters	<ul style="list-style-type: none">Flow: 125 m³/day (33,000 GPD)Wastewater characteristics: Dairy farmingWastewater minimum temperature: 200 °C
Wastewater Influent Characteristics	<ul style="list-style-type: none">BOD_{5,t}: 600 mg/lTSS: 670 mg/lAmmonia: 112 mg/l
Effluent Requirements	<ul style="list-style-type: none">BOD_{5,t}: 35 mg/lTSS: 30 mg/lAmmonia: 50 mg/l
Solution	MABR
Results	<ul style="list-style-type: none">Up to 90% less energy consumptionHigh effluent quality



Desalination (SWRO) for Potable Water Conchal, Costa Rica

Customer	Reserva Conchal Hotel & Resort
Technology	NIROBOX™ : 3 units of 500 m³/day; Ultrafiltration, Seawater Reverse Osmosis, Energy Recovery, Remineralization post treatment
Capacity	1,500 m³/day (400,000 GPD)
Overview	<p>Reserva Conchal is located in Guanacaste, a province that has suffered droughts since 2014. When water shortage posed a serious threat, the resort needed an immediate potable water solution that would not hurt the environment or burden the water grid.</p> <ul style="list-style-type: none">○ Environmental solution: high recovery, lowest chemical usage, less energy consumption (40%)○ 8 months from order to commission○ Scalable: allows staged expansion to support capacity upgrades○ Fully automated system for easy , cost efficient operation & maintenance
Commissioned	2016



NIROBOX™

fluence™

Desalination (SWRO) for Potable Water Limassol, Cyprus

Customer	Water Development Department
Challenge	The city experienced an increasingly severe water shortage
Solution	Seawater Desalination
Technology	Ultra filtration and reverse osmosis
Capacity	22,000 m ³ /day (5.8 MGD)
Service	The customer received a complete end-to-end desalination solution within 8 months of receipt of purchase order



Desalination (SWRO) for Potable Water South Africa



Customer	Connority
Technology	NIROBOX™ : 10 units of 1,000 m³/day; Ultrafiltration, Seawater Reverse Osmosis, Energy Recovery, Remineralization post treatment
Capacity	10,000 m³/day (2.6 MGD)
Overview	<p>A high-output desalination plant was urgently needed to solve an acute potable water shortage on the parched southeast coast of Africa</p> <ul style="list-style-type: none">○ The most compact plant-in-a-box with an extremely small footprint○ Patent-pending process design - reduced energy and chemical usage, recovery rate up to 50%○ Lower O&M costs – pre-designed with centralized intake, post-treatment and remote monitoring○ Plant was ordered and commissioned in just 6 months
Commissioned	2016



NIROBOX™

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Desalination (SWRO) for Industrial Process

Salina Cruz, Mexico

Customer	Quimica Apollo for PEMEX Salina Cruz Refinery
Technology	NIROBOX™ SW-XL : 2 units of 1,000 m ³ /day; Ultrafiltration, Seawater Reverse Osmosis, Energy Recovery
Capacity	2,000 m ³ per day (0.5 MGD)
Overview	<p>Drought conditions prevented the refinery from pumping water for process from a nearby river, inhibiting their proper operation. Requirements included:</p> <ul style="list-style-type: none">○ Fast commission and deployment time○ Ability to relocate as needed○ Water source: Seawater will be supplied from an existing beach well, later mixed with river water resulting in an TDS of 20,000 ppm○ PEMEX rents the units from Quimica Apollo
Commissioned	2017



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Desalination of Produced Brackish Water for Reuse Puerto Gaitan, Colombia

Customer	Pacific Rubiales Energy Corp.
Project	Design, build, operate and maintain a fully automated wastewater treatment plant, with pretreatment including filtration, automatic Micronic filters, BWRO
Capacity	80,000 m ³ /day (21.1 Million GPD)
Overview	<p>Treating produced water, a by-product of the petroleum extraction – replacing an existing process of disposal by deep well injection with fully automated brackish water reverse osmosis (BWRO) treatment, effectively treating the brackish water remaining from the drilling process in order to maximize water reuse while eliminating brine disposal.</p> <ul style="list-style-type: none">○ Treatment plant for 500,000 barrels/day, executed in 18 months○ Lower cost solution for wastewater treatment○ Treating wastewater from onshore oil - the brackish feed water contains residual oils, hydrocarbons, solids, and other tough to treat contaminants



Wastewater Treatment for Reuse

Alcorta, Argentina

Customer	Coca-Cola FEMSA
Challenge	To increase wastewater treatment plant capacity in a very small footprint
Solution	MBR, with the possibility of reuse for service water in the future to reduce the consumption ratio
Technology	External MBR from Pentair (Airlift) (Biofilm protection) and RO for the reuse stage
Capacity	960 m ³ /d (254,000 GPD)
Service	The plant was operational within 6 months from receipt of order



On-Site Water Treatment for Reuse Northern Chile

Customer	Collahuasi Copper Mine
Challenge	The customer was looking for a treatment system that would enable wastewater reuse
Solution	Water Treatment
Technology	Multi-stage on-site water treatment with zero liquid discharge
Capacity	5184 m ³ /d (1.4 MGD)
Service	The customer received a complete end-to-end water treatment solution within 11 months of receipt of purchase order



Waste-to-Energy, Food & Beverage Industry

Bari, Italy

Customer	SABMiller Group (Birra Peroni Group)
Challenge	The customer required enhancement of the existing WWTP to increase production capacity
Solution	Waste-to-Energy : EFC reactor, biogas desulphurisation unit and sludge anaerobic digester
Technology	EFC (External Forced Circulation) reactor with granular sludge
Capacity	2200 m ³ /d (0.5 MGD)
Service	The project was commissioned in June 2011, 10 months from receipt of purchase order.



Waste-to-Energy, Food & Beverage Industry

San Vittore (FC), Italy

Customer	Amadori S.p.A, Chicken Slaughterhouse	
Challenge	To renovate a wastewater treatment plant during the normal operation of the existing plant and slaughterhouse, to increase production while reducing disposal costs	
Project Data	Flow rate: COD: Total nitrogen (TKN)	4,500 m ³ /day(1.2 MGD) 5,000 mg/L 300 mg/L
Solution	Renovate the existing WWTP, adding anaerobic digestion and a new nitrification denitrification system	
Treated Waste Quality	COD Total nitrogen (TKN)	< 80 mg/L < 10 mg/L
Results	Methane production Energy production Thermal energy (hot water) Sludge disposal reduction	6,300 Nm ³ /day 24,000 KWh/day 25,000 KWh/day 80%
ROI	3 years	



Waste-to-Energy, Dairy Products

Treviso, Italy

Customer	Caseificio Moro Dairy Farm	
Challenge	When challenges with hot-whey disposal limited the dairy farm's production quantity, a more efficient waste disposal solution was needed	
Project Data	Hot Whey	180 m ³ /day (47,556 GPD)
	COD	56,900 mg/L
	Nitrogen (total)	728 mg/L
	Phosphorous (total)	297 mg/L
Solution	Refurbished the existing WWTP to treat dairy wastewater and hot whey after anaerobic fermentation, without interrupting the existing plant's operation	
Treated Waste water Quality	COD	< 120 mg/L
	Total nitrogen	< 20 mg/L
	Phosphorous (total)	< 10 mg/L
Results	Methane production	3,000 m ³ /day
	Energy production	11,700 kWh/day
	Thermal energy (hot water)	12,000 kWh/day
ROI	4 years	



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A graphic element consisting of four teal-colored circles of varying sizes arranged vertically, with a central vertical line connecting them, positioned above the letter 'u' in the word 'fluence'.

fluenceTM