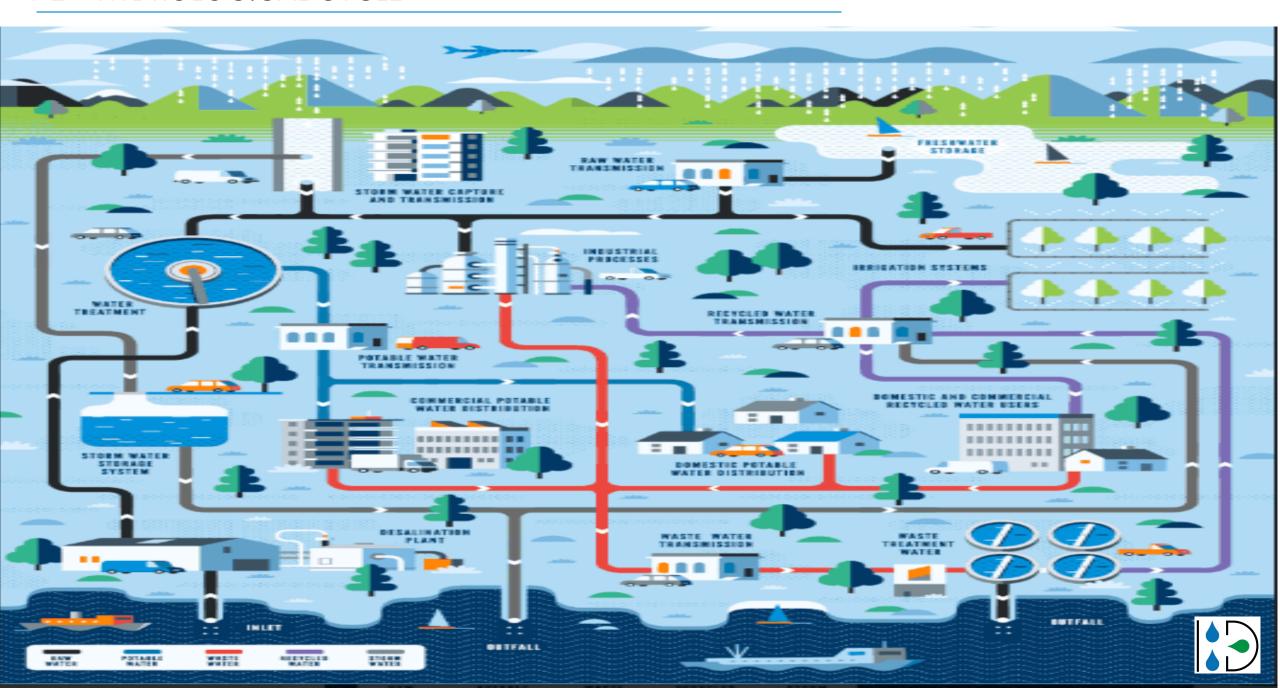


SOLUTION FOR WATER MANAGEMENT

802 Hallmark Dr. Laredo, Texas – USA 78045 Office Phone USA: 956 568 4188



Our business partners

Commercial representations

More than 20 years of experience in the market, allows us to formally represent leading manufacturing companies worldwide in water management solutions, some of them are:

SAWYER, WATER FILTRATION, American manufacturing of 0.1-micron absolute hollow fiber membrane provide even further protection where water sources can include viruses, heavy metals, chemicals, and other contaminants.

ZOELLER PUMP COMPANY, an American manufacturer whit more of 80th years now in its fourth generation of family ownership. Submersible pumps for wastewater, subsidiaries: Zoeller Engineering Products, Clarus Environmental Inc, Flint & Walling, WOLF Pumps.

AMERICAN WATER SOLUTIONS, LLC., American Company founded in 2015 dedicated to searching, innovation and development of water Technologies including: Reverse Osmosis, Desalination Plants for Sea Water, Ultrafiltration Plants, Microfiltration Plants, Nanofiltration Plants. Pre-treatments with Multimedia filters, Activated Carbon and Softeners, Demineralization by Ion Exchange.

DELTA WATER TREATMENT, LLC, American Designer of advanced wastewater treatment systems manufactured since the 1960s. Delta Systems was acquired in 2015 by Infiltrator Water Technologies. Today Infiltrator manufactures and sells multiple product lines for the onsite wastewater and water industry.

SMITH & LOVELESS, INC. American manufacturing of Solutions for Wastewater treatment plants and station pumps, The Company currently owns more than 75 active U.S. patents, holds foreign patents in 15 different countries, and more than 50 domestic and foreign trademarks.

BIOMICROBICS, INC., American leading manufacturer of advanced decentralized wastewater treatment systems. It was founded in 1996 with a vision to manufacture simple, low-cost, and robust products to the onsite water industry. Advanced treatment units are preengineered for residential, commercial, and high strength applications. Systems are scalable to treat various flow and are extremely efficient, providing a cost-effective solution to managing waste and improving onsite sanitation.

Our business partners

Commercial representations

More than 20 years of experience in the market, allows us to formally represent leading manufacturing companies worldwide in water management solutions, some of them are:

HARRINGTON, North American wholesale distributor of process items and equipment, founded in 1959. Offers a broad line of quality, corrosion-resistant, and ultra high purity piping systems including components required to meet the diverse specifications of the industrial, aquatic life support, metal plating & finishing, biotechnology, pharmaceutical, water & wastewater, and semiconductor industries.

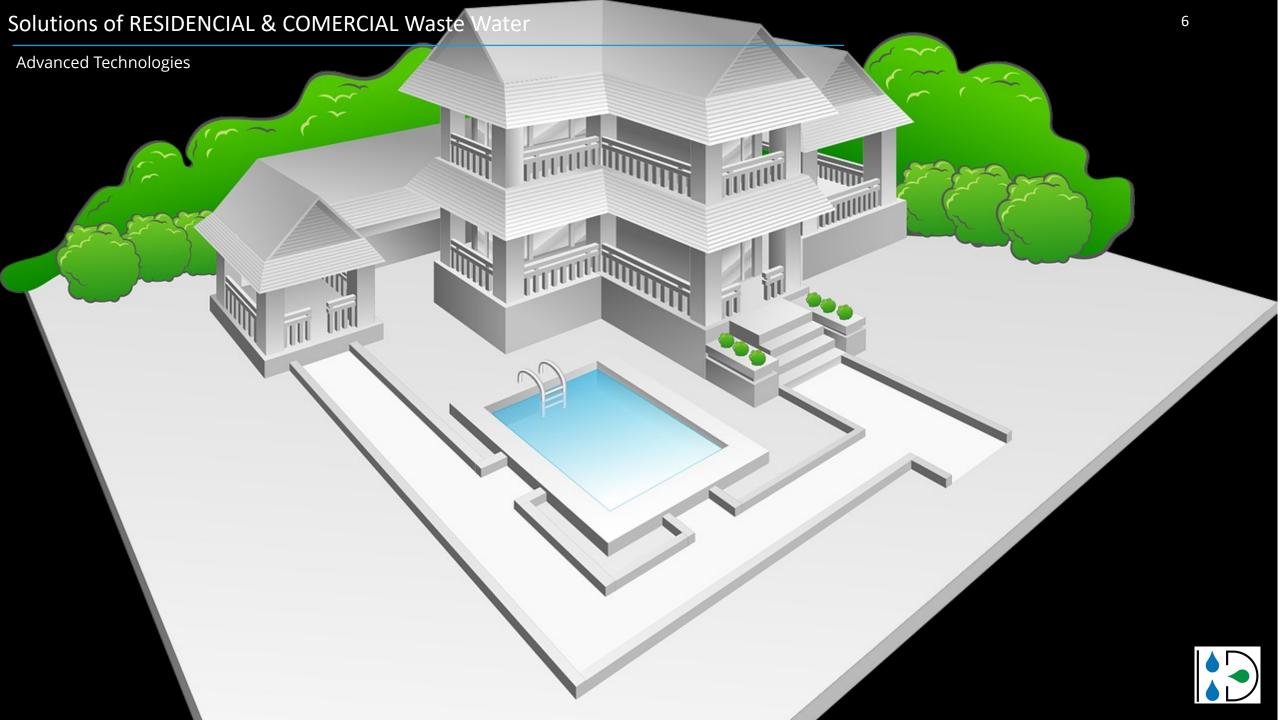
THETIS ENVIRONMENTAL INC., Canadian manufacturer of Ultrafiltration PermaFlow™ membrane successfully integrated to meet small and large water industrial separation. The membrane Solution offer products globally to large multinational corporations, government institutions and small manufacturers. Permaflux™ is the latest patented membrane technology with several successful case studies, including MBR and directly oil **water separation**.

AQUA AZUL CORPORATION., American manufacturer of disinfection systems by technology of UV lamps. The arrangement include PVC (low press), SS (high press) and large flow in SS and concrete channels.

APGNEUROS., Canadian manufacturer of Advanced aerospace technology, energy efficiency reliable and low maintenance, APG-Neuros Turbo Blowers and Aeration Systems, with environmentally sustainable solutions in a variety of different wastewater treatment applications.

VOLTEA VB. Dutch company manufacturer of the CapDI - Capacitive Deionization technology for reduction from 25 to a maximum of 90% of Dissolved Ions in the water without the use of chemicals, only electricity consumption at a rate of 0.5 kwh/m3. Maximum feed water quality 4000 micro Siemens/cm.

Company Neutralox GmbH. Germany manufacturer of equipment for odor control and exhaust gas treatment plants. Neutralox was founded in 1999. Is serious expert in odor control, exhaust gas treatment, dust removal and ventilation systems. Today, with more than 20 years of experience, Neutralox equipment has been installed in more than 700 systems worldwide, with more than 60 installations in the Americas.



Solutions of Storm & Waste Water management

Business partner: Zoeller Pump Company - Kentucky

- Design of concrete pumping stations with Non-Clog and/or Grinder pumps
- Supply and integration of long solid roughing screens (garbage)
- Crankcases pre-assembled in reinforced fiberglass bowl with aluminum cover
- Design and integration of Low Pressure Drainage Low Pressure Sewage (LPS)
- Design of stormwater sumps





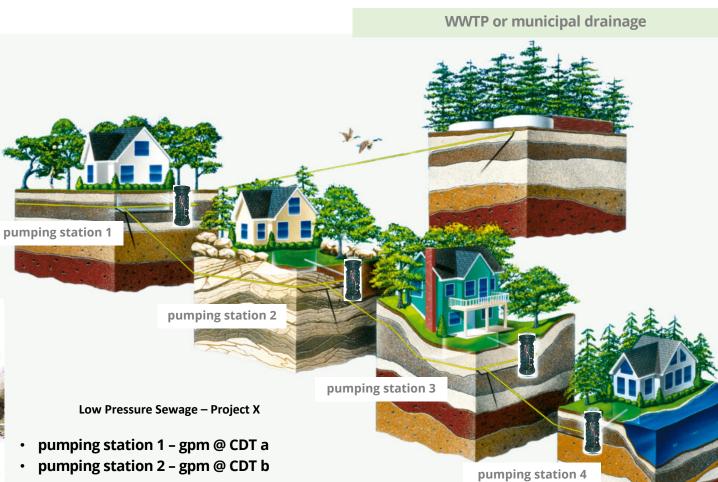




Low Pressure Sewage - LPS







pumping station 3 – gpm @ CDT cpumping station 4 – gpm @ CDT d



LOW PRESSURE SEWAGE

Business partner: Zoeller Pump Company - Kentuky















LOW PRESSURE SEWAGE

Business partner: Zoeller Pump Company - Kentucky







LOW PRESSURE SEWAGE

Business partner: Zoeller Pump Company - Kentucky



1915 London England, first municipal Activated Sludge Extended Aeration plant



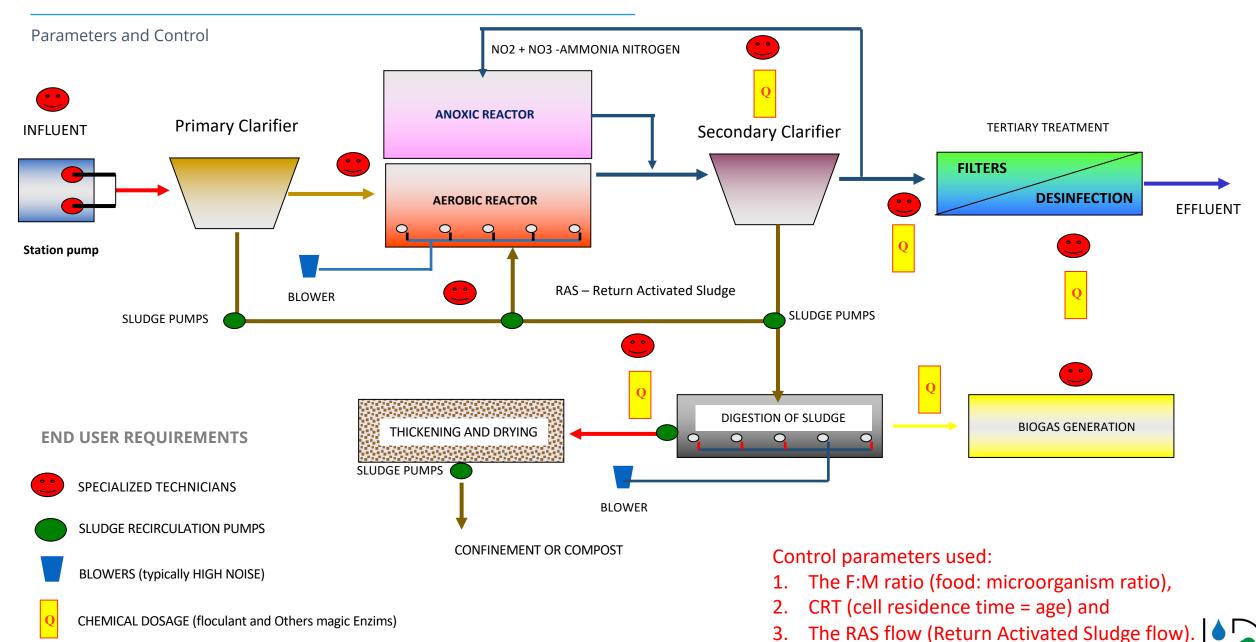
More than 90% of Municipal Plants use the Biological Activated Sludge process in Extended Aeration and SBR configuration

More than 110 years of its discovery

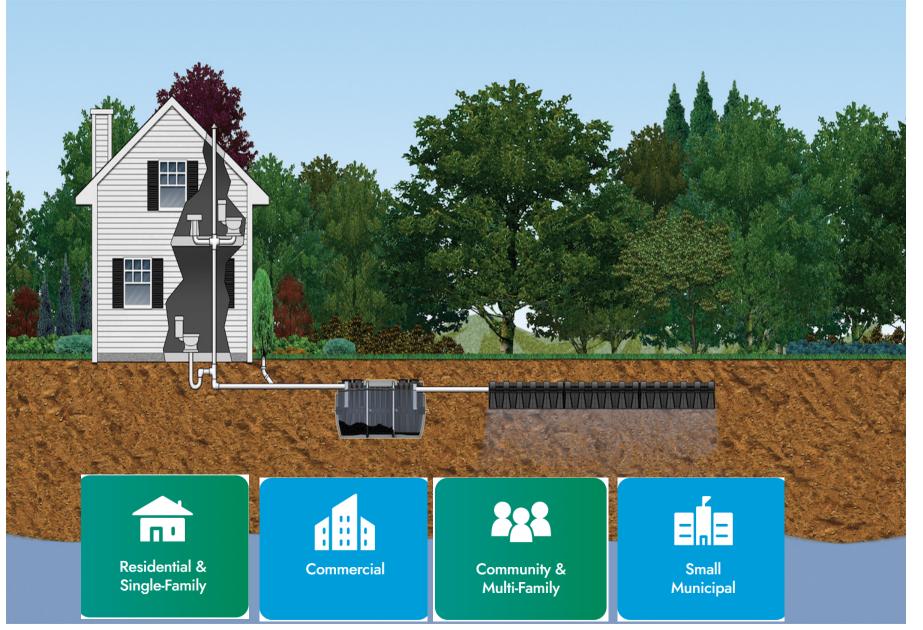


Image of "employees of the month"

SSX - Conventional Activated Sludge treatment process



Different story municipal decentralized drainage



Main factors

- intermittent discharge
- load variation
- holiday season
- low operating experience
- local regulations



FAST ® - 1970







CUSTOM SERIES PUMP STATION (1948)



CAPSULAR® (1960s)



OXIGEST® (1960s)



ORIGINAL WWMPS (1970)



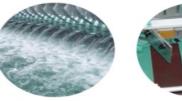
FAST® Treatment System (1970s)



PISTA® 270™ Grit Chamber™ (1973)



PISTA® Grit Screw Conveyor™ (1974)



Mechanical Aerators (1970s)



Recessed WWMPS (1979)



PISTA® TURBO GRIT PUMP™ (1982)



TRIPLEX™WWMPS (1982)



PISTA® 360™ Model A (1988)





PISTA® TURBO GRIT SCREW CONVEYOR™ (1989)



SERIES WWMPS (1990)



CAPSULAR® WWMP (1994)



X-PELLER® (2001)



FORMULA X® (2001)



SONIC START® (2001)



RECTANGULAR WWMPS (2004)



PISTA® 360™ with V-FORCE BAFFLE™ (2004)



TITAN MBR™ (2006)



8D4V & 12D6V (2006)



DURO-LAST® (2009)



PISTA® TURBO GRI1 WASHER™ (2009)



PISTA® Works™ (2010)



PISTA® PRO-PAK™ (2011)



QUICKSMART™ (2014)



OPTIFLOW 270® Baffle System (2014)



RAPIDJACK® (2015)



PISTA® VIO™ (2015)



EVERLAST™ WWMPS (2016)



WAVESTART® (2019)



INVORSOR® (2022)

Food Processing & Commercial Facilities



Commercial Restaurant - USA

- Avg. Flow: 19 cmd
- BOD Loading: 400 mg/l
- TSS Loading: 200 mg/L TSS . FE. Aeration with Membranes, SH
- Plant Dimensions: 4.6 m x 3.7 m



FAST

Major Fast Food Restaurant - Australia

- · Peak Flow: 15 cmd
- Organic Loading: 45 kg/d
- Aeration, Clarification, Sludge Holding
- Plant Dimensions: 37 m x 3.7 m



ADDIGEST®

Pet Food Production Plant - Mexico

- Peak Flow: 34 cmd
- BOD Loading: 2.500 mg/L BOD
- TSS Loading: 2,500 mg/L TSS
- Aeration, Clarification, DAF, SH
- Plant Dimensions: 10.7 m x 7.3 m



ADDIGEST®

Meat Processing - USA

- · Peak Flow: 265 cmd
- BOD Loading: 1,400 mg/L BOD
- TSS Loading: 1,200 mg/L TSS
- Aeration, Clarification, DAF, SH
- Plant Dimensions: 35 m x 7.3 m



ADDIGEST®

Mass Production Bakery - USA

- · Peak Flow: 95 cmd
- BOD Loading: 6,000 mg/l
- TSS Loading: 200 mg/L TSS
- · FE, Aeration, Clarification, Sludge Holding
- Plant Dimensions: 22.3 m x 8.5 m



ADDIGEST®

Waffle Production Plant - USA

- Peak Flow: 150 cmd
- BOD Loading: 10,000 mg/l
- TSS Loading: 1.000 mg/L TSS
- FE, Aeration/CMAS, Digestion
- Primary & Secondary Clarification
- Plant Dimensions: 30 m x 7.3 m

Beverage Processing Facilities



Beverage Processing & Bottling - USA

- Ava. Flow: 57 cmd
- BOD Loading: 10,000 mg/l
- TSS Loading: 1,000 mg/L TSS
- · FE, Aeration with Membranes, SS
- Plant Dimensions: 18.3 m x 3.7 m



FAST Winery - USA

- · Avg. Flow: 4 cmd
- · BOD Loading: 10,000 mg/L BOD (max.)
- · Dual Aeration, Clarification, Sludge Holding
- Plant Dimensions: 8.2 m x 2.6 m



OXIGEST

Rum Distilling & Bottling - Puerto Rico

- Peak Flow: 1,700 cmd
- · BOD Loading: 5,500 mg/L BOD
- TSS Loading: 2,100 mg/L TSS
- · Plant Diameter: 64 m
- CLAR-I-VATOR. Solids Contact Clarifer
- TSS loading: 5,500 mg/l / 12 m diameter



OXIGEST

Beer Processing - Domincan Republic

- Peak Flow: 11.356 cmd
- BOD Loading: 4,400 kg/d
- TSS Loading: 4,440 kg/d
- · Clarification, Sludge Holding
- Plant Diameters: (2) 27.4 m Units



Fruit Juice Processing - USA

- Peak Flow: 1,900 cmd
- BOD Loading: 650 mg/L BOD
- . TSS Loading: 500 mg/L TSS
- · Aeration, Clarification, Sludge Holding
- Integral Nitrification, Filtration, Phos Precip.
- Plant Diameter: 38 m





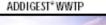
SMITH & LOVELESS INC.

www.smithandloveless.com

Solutions for Mexico, Central America, & the Caribbean's Water Problems

Smith & Loveless Inc. is a global leader in the design and manufacture of pre-engineered water and wastewater treatment systems—backed by 55 years of experience. We've supplied more than 350 systems in Mexico, Central America and the Caribbean, helping to improve infrastructure and quality of life. We offer treatment plants, clarifiers, grit removal systems, pump stations and other equipment to this region. We also maintain local representation in several offices throughout the area. Please contact us by e-mail (answers@smithandloveless.com) to locate one nearby. Se habla espeñol.







Model R OXIGEST WWTP



SCIENCO/FAST® a subsidiary of BioMicrobics, Inc.

Prototype aboard the river towboat Mississippi Vessel Missouri







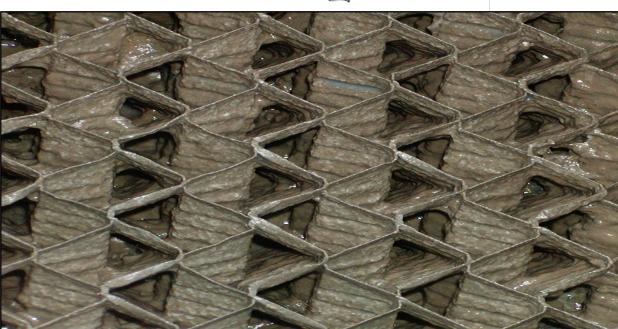
Extended Aeration Fixed Film Mixed Activated Sludge Treatment Fixed Activated Sludge Treatment Influent **Effluent** Influent **Effluent**



FAST - Biological process of activated sludge in fixed growth

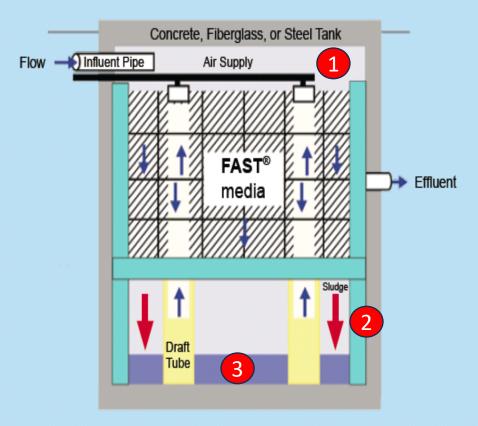
Bioreactor by blocks of fixed media placed in rectangular liner











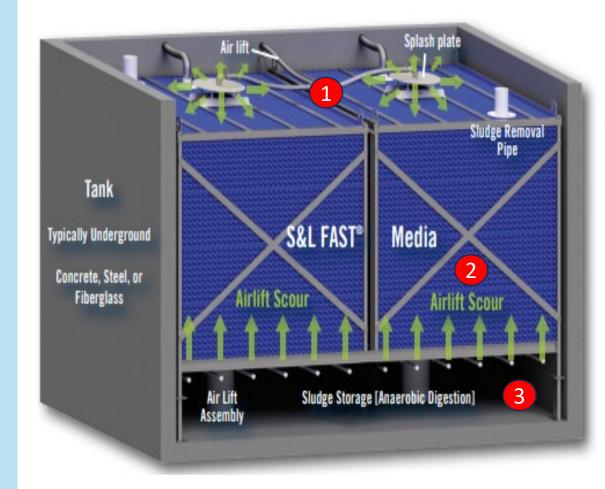
Aeration

The air supply and draft tube creates a high rate, complete mix of the wastewater throughout the FAST* media.

Clarification

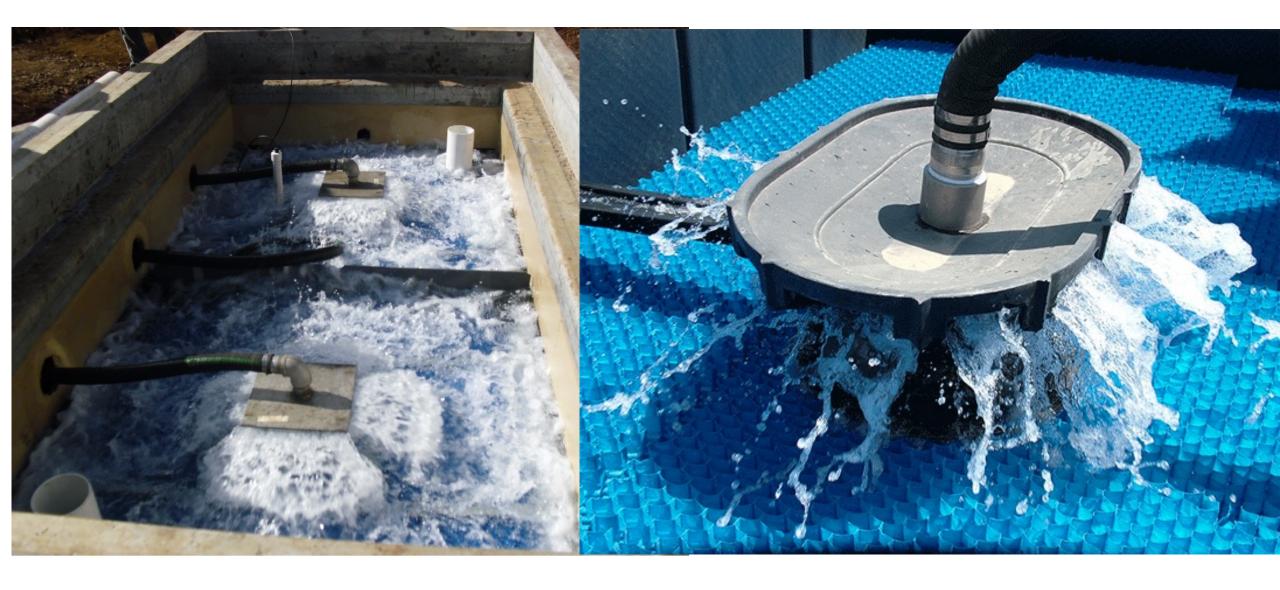
Rapid settling of sloughed solids from the aeration zone, keep sludge away from the media. Anaerobic Digestion

Anaerobic conditions enable higher life forms to further digest settled sludge, reducing the sludge blanket until removal.



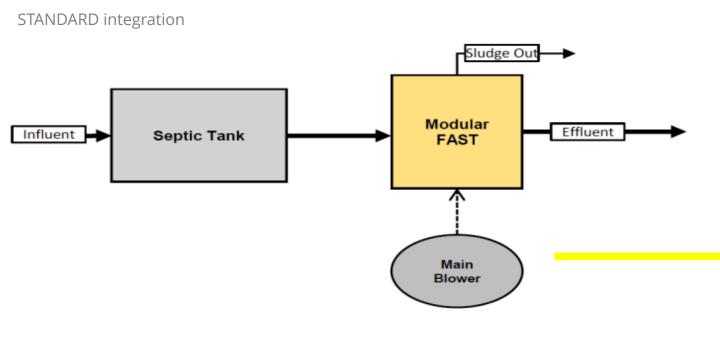


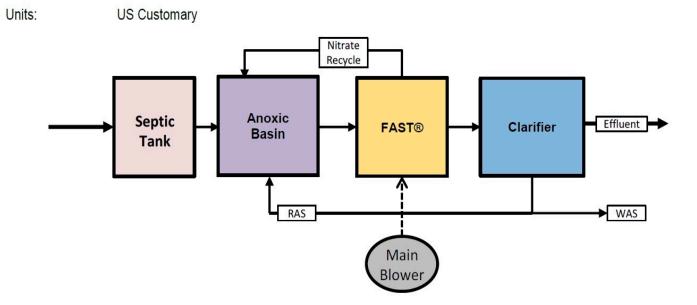
Star-UP ModularFAST®





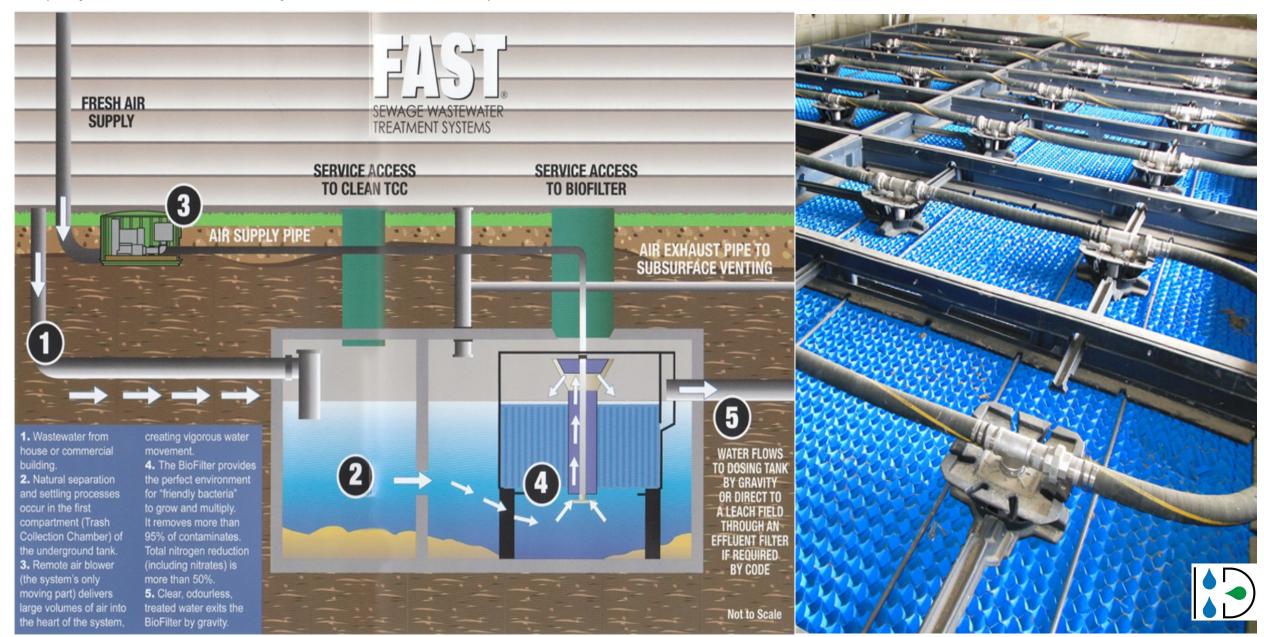
ModularFAST by Smith & Loveless, INC.



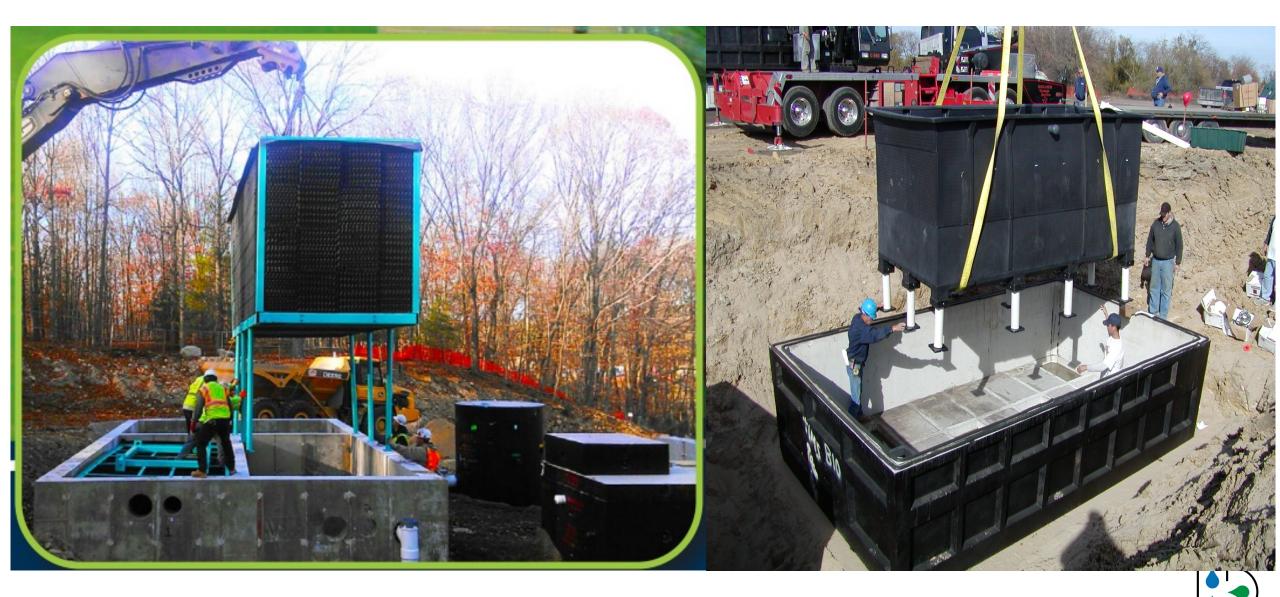




Capacity from 150 GPD (500 liters/day) to 2.6 million GPD (86 liters per second)



STANDARD integration



Applications & Data

S&L Modular FAST® is uniquely designed to handle the variable flows of these applications











- Decentralized / on-site private developments
- Hotels and resorts
- Schools and university facilities
- Campgrounds, retreat centers, and recreation
- Restaurants, shopping and commercial centers
- Wineries and breweries with leach field discharge
- Lagoon effluent polishing for tighter regulations
- Retrofit in aeration basins to boost capacity

Application Flow	BOD [In	mg/l] Out	TSS [mg/l] Out	Remo BOD	val % TSS	Effluent N (% Removal)
High School 12,000 gpd [46 m³/d]	186	3	74	12	98%	84%	0.5 (85%) NH ₃ - N
Gas Station 2,000 gpd [8 m³/d]	716	3	900	18	97%	98%	18 (84%) Total N
Hotel 15,000 gpd [57 m³/d]	622	17	101	19	97%	81%	7 (83%) Total N



Biological process of activated sludge in fixed growth

Series: EcoPOD-N® Polyethilene housing Minimum capacity 250 GPD – maximum capacity 1,500 GPD



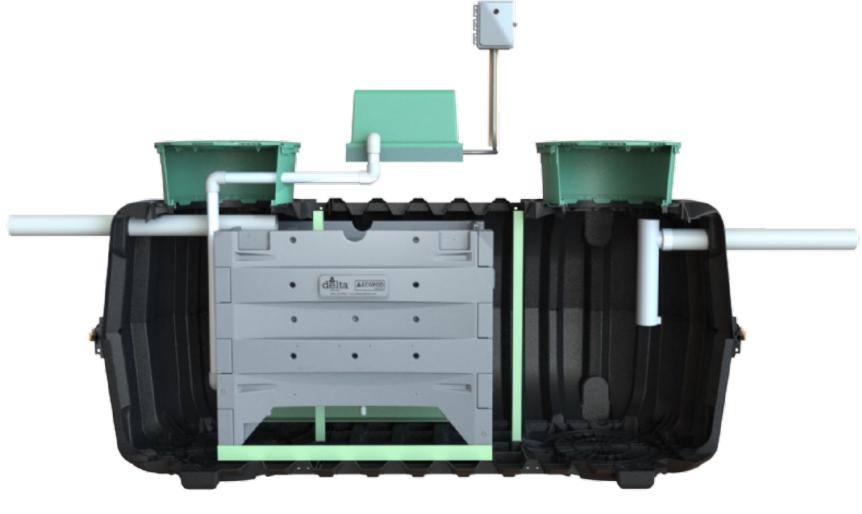




Integration Septick Tank IM1060 Infiltrator Water Technologies ILL









Integration Septick Tank Infiltrator Water Technologies ILL – Maximum Capcity 1,000 GPD (3.75 m3/día)

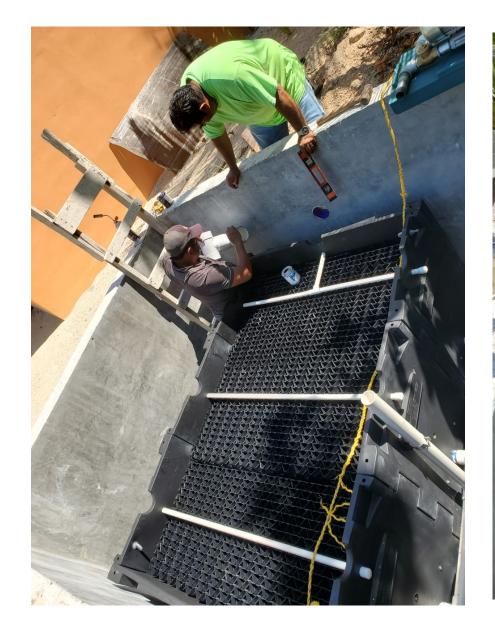






Exit Case – EcoPOD-N

Beach, Club Xpu-HA, Riviera Maya, MX





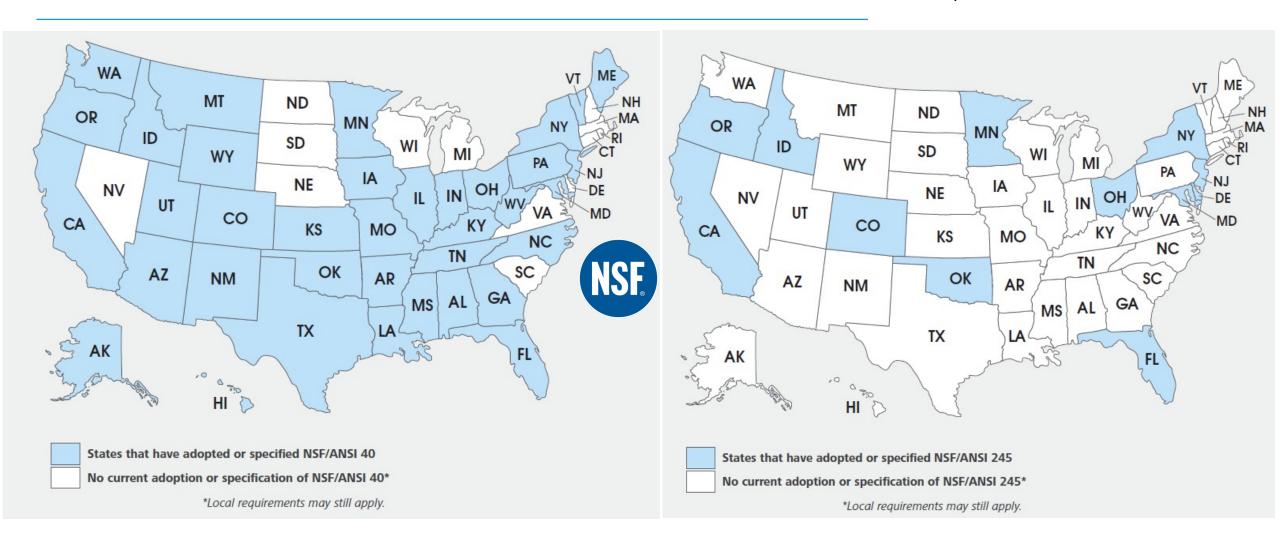
Exit Case – EcoPOD-N

Beach, Club Xpu-HA, Riviera Maya, MX









NSF/ANSI 40 – Certification for RESIDENTIAL sanitary wastewater treatment systems

NSF/ANSI 245 Standard requires a minimum 50% reduction of total nitrogen. This rigorous standard helps the growing demand for nutrient reduction in coastal areas and sensitive environments.

Compliance Guarantee Environmental Regulation Mexico

The FAST® series Fixed Growth Activated Sludge process is a technology certified by **NSF** - National Federation Sanity, in Standards American national Estándar Institute Normativity named NSF/ANSI 40 and NSF/ANSI 245.

Certification in these Standards allows us to guarantee compliance in Mexico with the following Standards:

NOM SEMARNAT 001 - 2021

ESTABLISHES THE MAXIMUM PERMISSIBLE LIMITS OF POLLUTANTS IN WASTEWATER DISCHARGE INTO NATIONAL WATERS AND ASSETS.

NOM SEMARNAT 002 - 1996

ESTABLISHES THE MAXIMUM PERMISSIBLE LIMITS OF POLLUTANTS IN WASTEWATER DISCHARGE TO URBAN OR MUNICIPAL SEWER SYSTEMS.

NOM SEMARNAT 003 - 1997

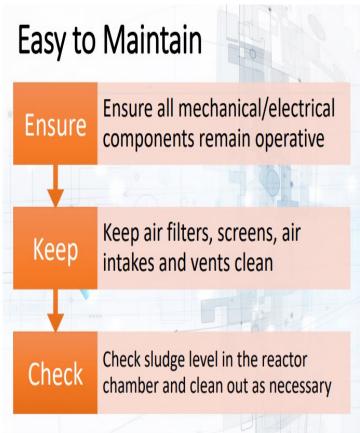
ESTABLISHES THE MAXIMUM PERMISSIBLE LIMITS OF CONTAMINANTS FOR TREATED WASTEWATER THAT IS REUSED IN PUBLIC SERVICES.

NOM SEMARNAT 004 - 2002

ENVIRONMENTAL PROTECTION SLUDGE AND BIOSOLIDS SPECIFICATIONS AND MAXIMUM PERMISSIBLE LIMITS OF CONTAMINANTS FOR THEIR USE AND FINAL DISPOSAL.

Advantage and Disadvantage

















Advantage and Disadvantage

Sludge Management

- Distance/elevation to tanks
- The hoses are not that flexible.
- Large systems may require multiple access points to remove sludge
- Sludge removal "grid" if the system warrants it





Desinfection

Chlorine dilution by pills NORWECO®





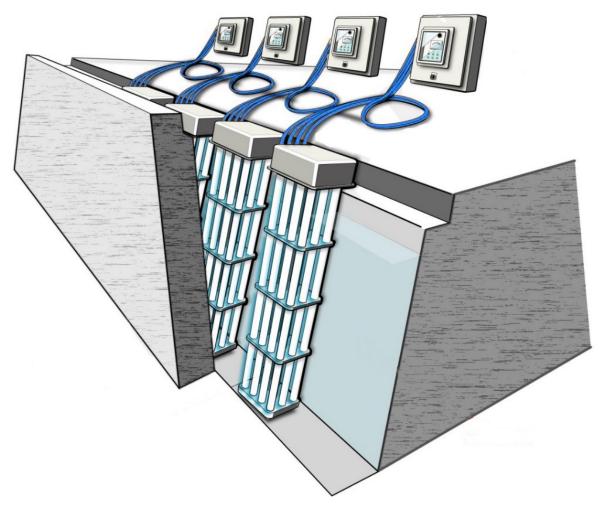


Capacity dilution: 5 gr. / 10 m3 Effluent

Desinfection

Chlorine dilution Norweco & UV lamps





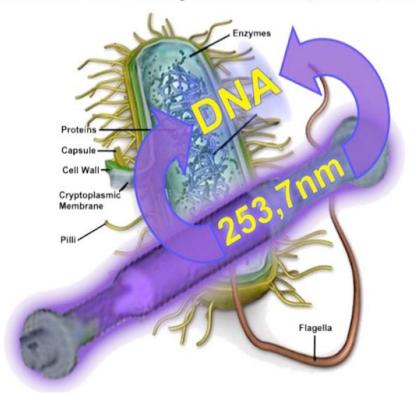




Desinfection UV Technology

UV Light Intensity

Intensity x Residence Time = Dosage Different microorganisms require different doses.



- •UV energy alters the DNA of a microorganism.
- •DNA on microorganism allows its reproduction.

Other agents of Disinfection:

- Chlorine (Cancer or fatal damage)
- Ozone: High investment cost and danger due to escape O3.





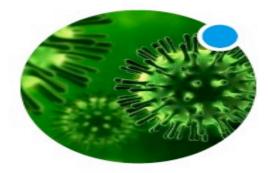
Aqua Azul – UV Technology

Microorganisms



Bacteria

E coli
Fecal coliform
Salmonella
Vibrio cholerae
Legionella



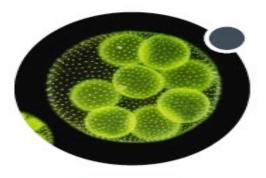
Virus

Hepatitis
Poliovirus
Adenovirus
Coxsackie
Rotavirus



Protozoa

Giardia Cryptosporidium Microsporidiosis



Algae

Chlorella vulgaris Didymosphenia geminata (rock snot) Blue green algae



History - Horizontal UV Disinfection

- 1986 USEPA published a design manual for Municipal Wastewater Disinfection.
- 1992 USEPA reports on UV growth.
 Shows open channel being majority.
- Our founders installed some of the earliest open channels.

TABLE 2-2. STATUS OF UV APPLICATIONS TO WASTEWATER

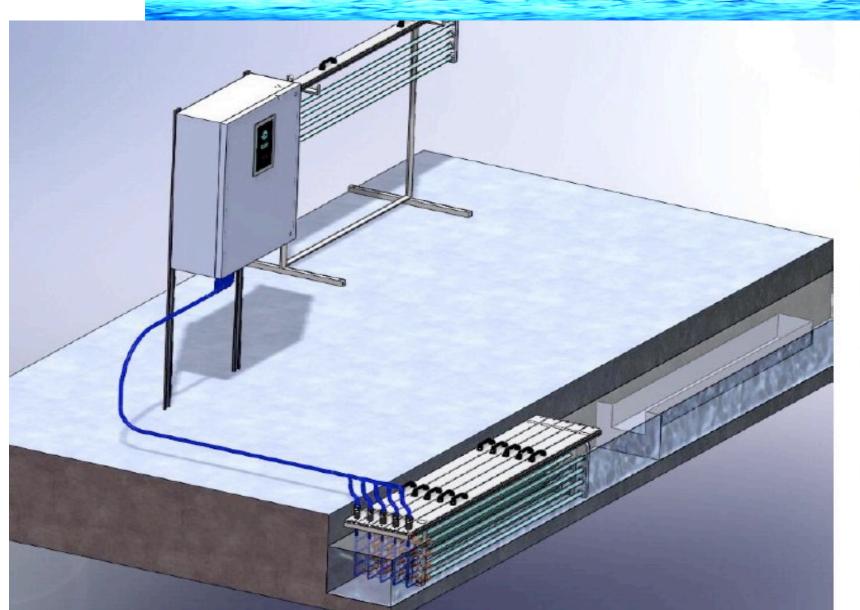
Year	1984	1990	
Number of Plants	50 to 60	500 to 600	
Flows < 1.0 mgd	80%	50x	
1-20 mgd	20%	47%	
> 20	-	3%	
Closed Shell	491	-√ 25¥	
 Teflon		7X	
Open Channel	8X	66X	
Horizontal	(100x)	(85%)	
Vertical	•	(15%)	
Other	- 8x	21	

In 1990, with a ten-fold increase in plants, there were more larger plants. Approximately half have design flows greater than 1 mgd, with several greater than 20 mgd. No new Teflon systems are being installed; these represent only approximately seven percent of the operating plants. Closed-shells systems are being installed at a low rate, with very few being considered for new applications. Approximately, 25 percent of operating systems are closed shell configurations. A small number of plants (two percent) comprise other designs, including the older fixed open-channel units and the new medium pressure (four systems) or alternate lamp systems.

1992 US EPA Survey







Horizontal UV Systems

UV lamps are enclosed in quartz sleeves and are submerged into the effluent. The sleeves protect lamps.

The modules are watertight and connect to a corresponding control center.

A sensor probe reads UV output and is displayed to operators.

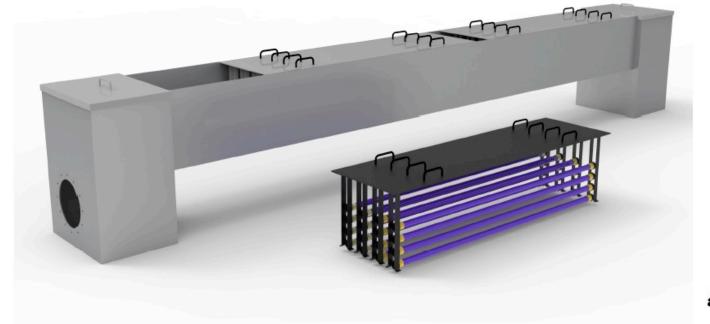
The modules need to be cleaned on a periodic basis to remove debris and mineral build up. A product like CLR or LimeAway is used.

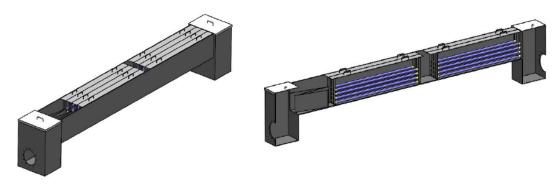




Aqua Azul – Open Channel

Packaged 2 Bank – In Series













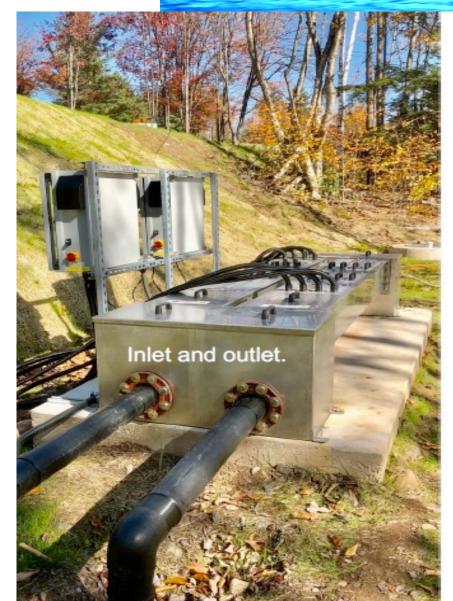
Packaged 2 Bank – U Turn

















Packaged Plants

This shows a traditional packaged plant used to treat 25,000 GPD.





30 Year Old System installed by Founder







The following results can be used by engineers when designing systems requiring a 30 mJ dosage at end of lamp life with quartz sleeve fouling. These systems are most typically associated with permit levels of 126/100 ml – 200/100 ml.

UV Transmission %	Gallons per Minute per Lamp	Gallons per Day per Lamp	Dosage (mJ) end of lamp life and quartz fouled
50%	21.5	30,960	30 mJ
55%	30	43,200	30 mJ
60%	40	57,600	30 mJ
65%	54	77,750	30 mJ

Validation used MS-2, T1 and QB coliphage.

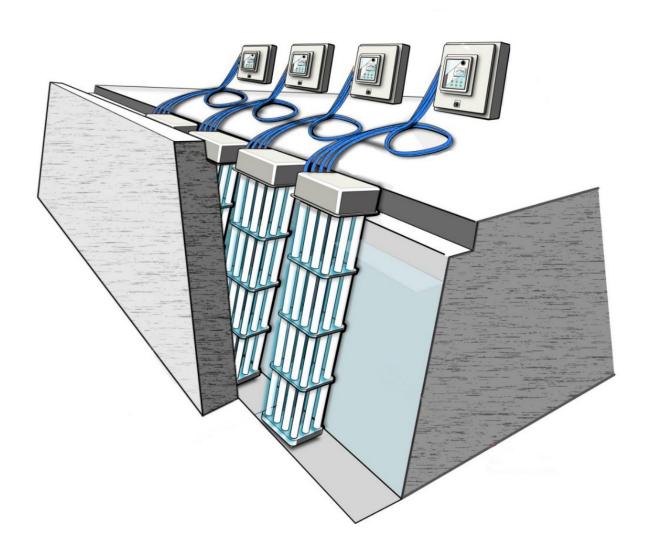
EXAMPLE:

1.0 MGD	65% UVT	=	13 lamps	30 mJ
1.0 MGD	60% UVT	=	18 lamps	30 mJ
1.0 MGD	55% UVT	=	24 lamps	30 mJ
1.0 MGD	50% UVT	=	33 lamps	30 mJ





VM SERIES



Vertical UV Systems

Our first verticals date to the early 1990s.

UV lamps are lowered into quartz sleeves, which are put into the effluent. The sleeves protect lamps and all seals are above the water line.

The modules are watertight and connect to a corresponding control center.

A sensor probe reads UV output and is displayed to operators.

Systems have automatic quartz wiping.







Vertical UV Systems

The photo is from a late 1980s Vertical installed by our founder.







VM SERIES





Vertical UV Systems - The photo is from a late 2000s Vertical installed by Aqua Azul.

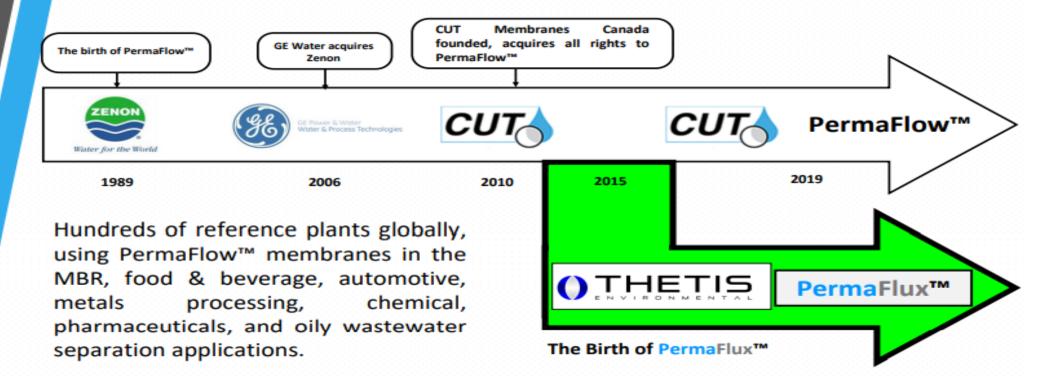


Ultrafiltration PERMAFLUX® Conventional processes MM & GAC EL ESPECTRO DE LA FILTRACIÓN Microscopio de electrones ← M croscopio Ó tico ← ST Microscopio ← Visible al ojo Moléculas Macromoléculas Micropatículas Macropartículas Iones 0.001 0.01 0.1 100 1000 Micras Unidades 1000 10⁵ 10⁶ 10⁷ 10 100 de Angstrom 5 8 5 8 I I IIII 5 8 1 1111 8 1000 10,000 20,000 Peso molecular aprox. 100 200 100,000 500,000 Tamaño relativo Quistes de Sustancias Giardia Comunes Sales acuosas Polvo de Carbón Polen Arena de playa Indotoxinas/Pirogenos **Bacterias** Virus Levaduras Lecho de resina Radio atómico Azúcar Proteína de Albúmina Polvo fino Iónica Iones metalicos Humo del Tabaco Harina molida Herbicidas Latex/Emuls ones Silicona coloidal Pigmentos de pintura Cabello Humano Polvo de carbón Pesticidas Asbestos Gelatina A :ul indigo Niebla Carbón activo granular Hematies Proceso de FILTRACIÓN DE PARTÍCULAS ÓSMOSIS INVERSA ULTRA FILTRACIÓN Separación NANO FIL TRACIÓN MICRO FILTRACIÓN 1 micra = 1 x 10-6 metros 1 Angstrom = 1 x 10⁻¹⁰ metros = 1 x 10⁻⁴ micras



Empresa Canadiense

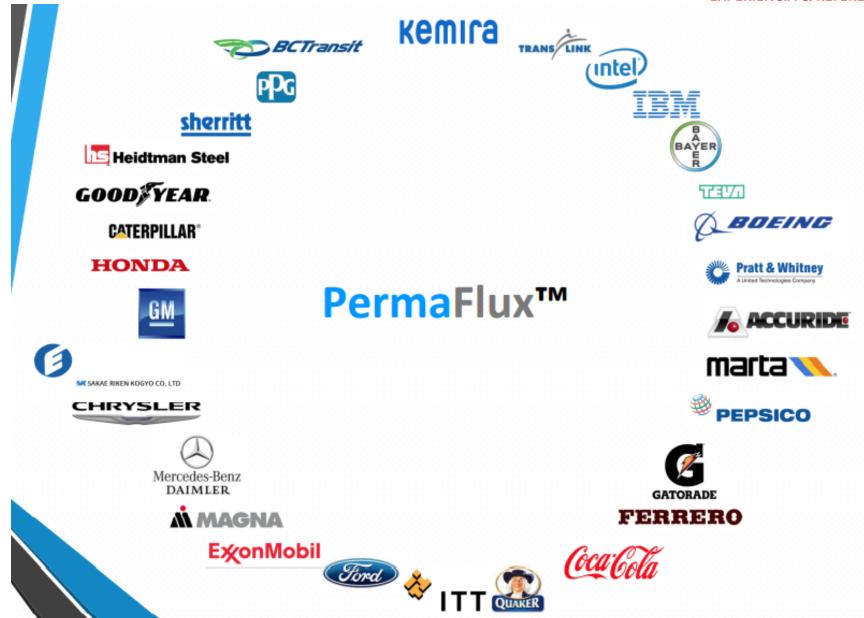
Background & Development of PermaFlow™ & PermaFlux™



Thetis was incorporated in 2015 as pure player, 100% dedicated to the development and scale up of the new technology (PermaFlux™) and has been operating in various applications since 2016.

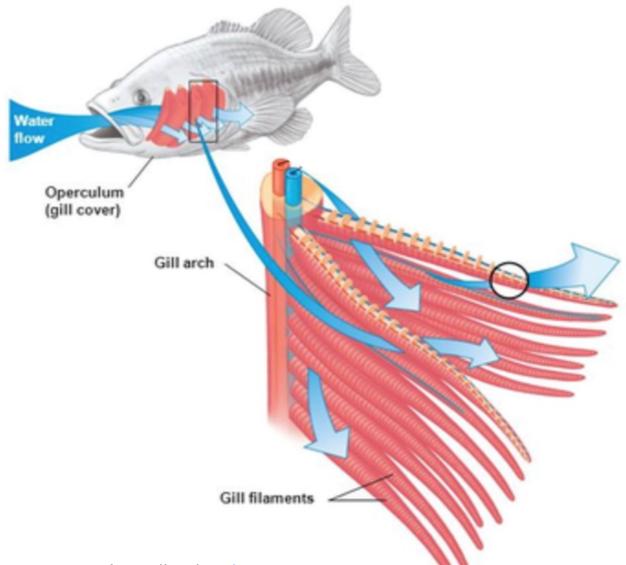






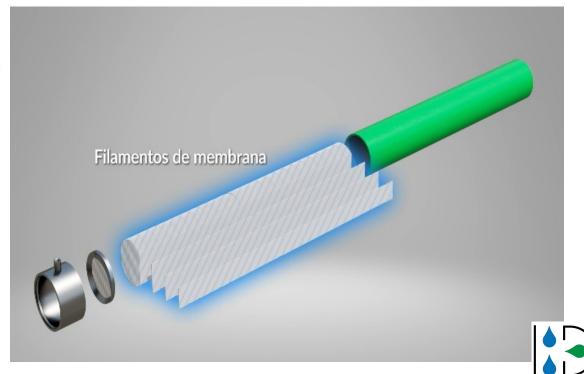
Thetis Environmental INC.

Tecnología Ultrafiltración Permaflux® capacidad 150,000 mg/L SST



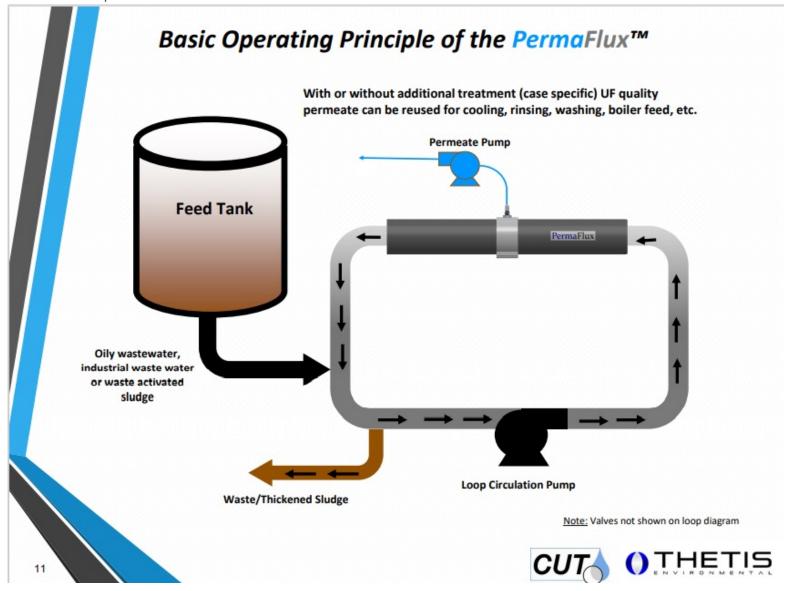


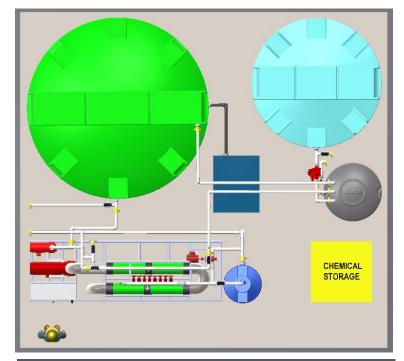


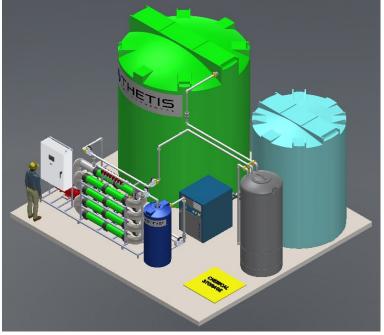


Thetis Environmental INC.

Empresa Canadiense

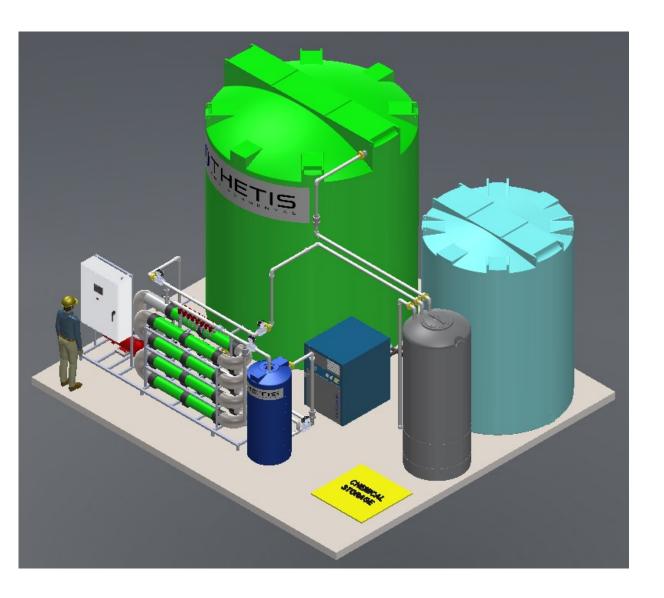


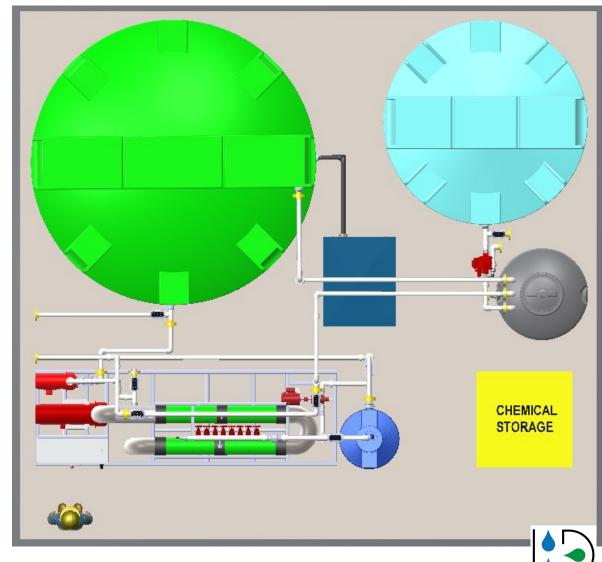




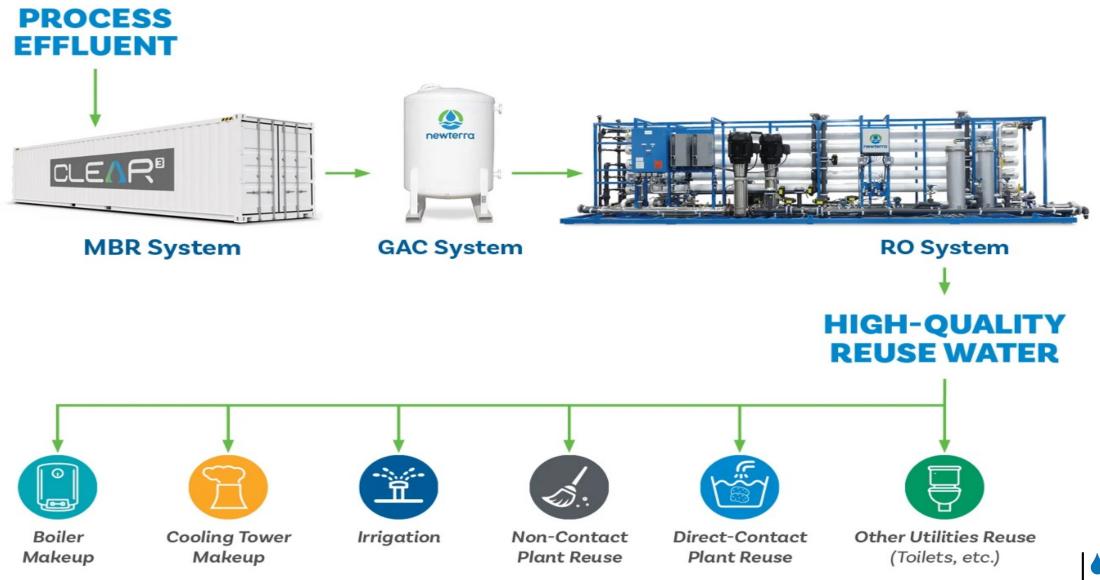


Permaflux® – Thetis Environmental INC





NEWTERRA® - CLEAR3





Business partner: APGNeuros – Blainville QC









2005

APG, Inc. established in Montreal, QC 2006

installed in Saint Pie, QC outdoors 2009

First turbo blower APG-Neuros Inc. established

2010

APG-Neuros, Inc. opens the Plattsburgh, NY

2015

Today, APGN, Inc. has 70 employees in its two offices production facility in Blainville, QC & Plattsburgh, NY







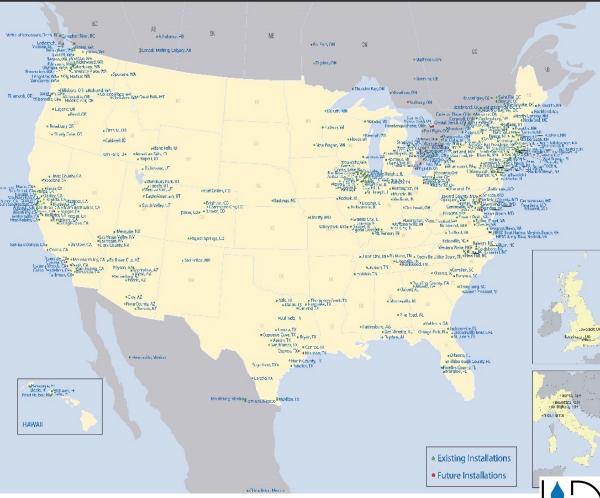
eures

Business partner: APGNeuros – Blainville QC

APG-NEUROS TURBO BLOWER INSTALLATIONS - 2006 🔅 🍂

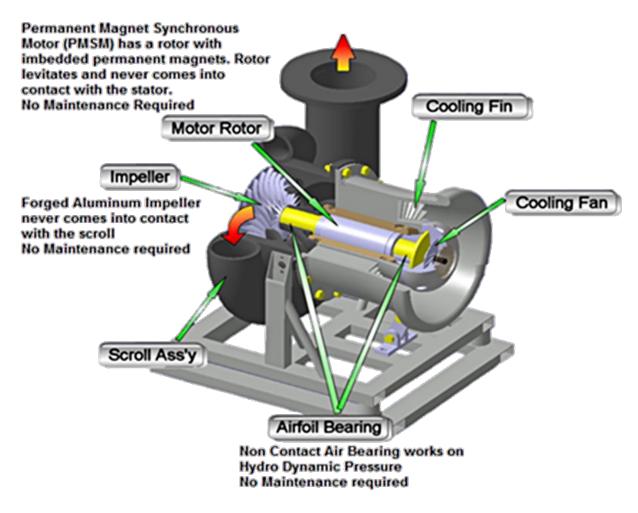


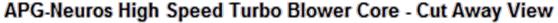
APG-NEUROS TURBO BLOWER INSTALLATIONS - 2015 💥 🎤 🖦 s

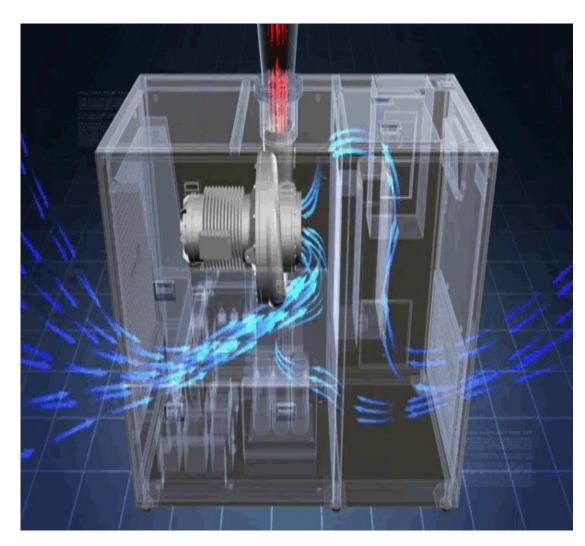


Business partner: APGNeuros - Blainville QC



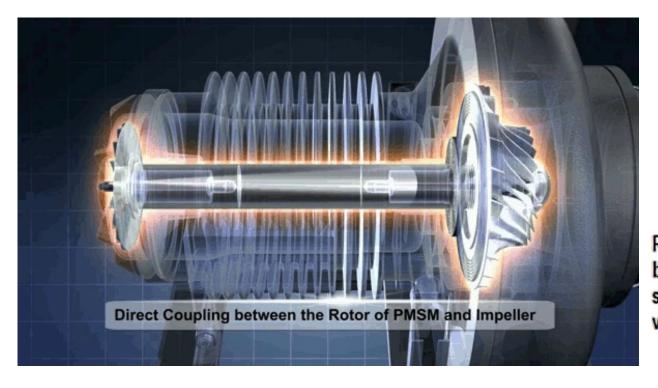




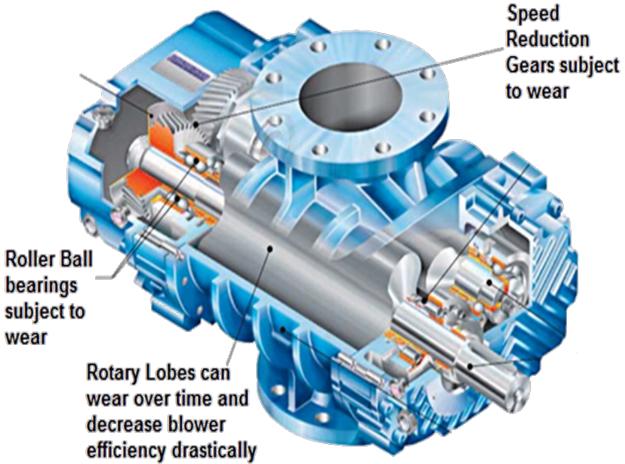




Business partner: APGNeuros – Blainville QC



Positive Displacement Rotary Lobe Blower - Cut Away View





Business partner: APGNeuros – Blainville QC

NX300 - Single Core - Granby, QC



NX300 - Single Core - Las Vegas Valley



Business partner: APGNeuros – Blainville QC





Design and Installation Flexibility Integrated or separated unit





Evitar crecimiento de Lirio acuático y Algas





Una solución especializada para su Aplicación





Reservorios Para Riego

Control de algas para la prevención de taponamiento de bombas, filtros y aspersores







Lagos

Control de algas y mejora en la calidad de agua en grandes cuerpos de agua



Depuración Agua de Lagos & Presas

Evitar crecimiento de Lirio acuático y Algas









Control y Monitoreo de Algas con MPC-Buoy

Monitorear, predecir y controlar las algas

- Paquete de sensores completo para medir continuamente la calidad del agua
- Tratamiento con tecnología de última generación contra las algas para lagos, lagunas y embalses de agua potable
- ⊗ Rango de tratamiento 500m/1600ft de diámetro



Other equipments for WWTP

Grit, Plastic, Fiber, Hair, Separation oil – water, others.





















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