



Wastewater Management Inspiring an Environmental Revolution

World Plumbing Conference Melbourne 2019

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Sponsored by: CleanBlu Innovations Inc.*



Global Water Crisis

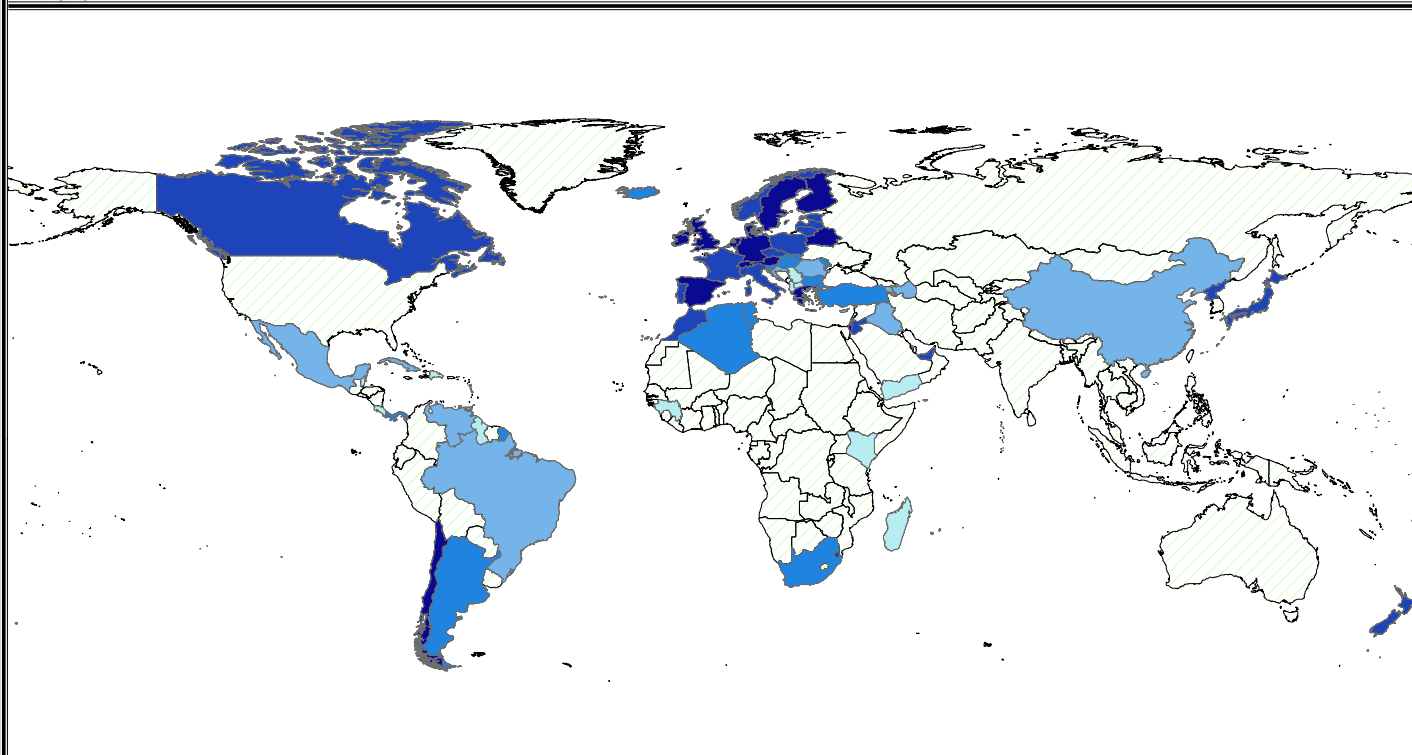


DEWATS and Water Reuse





Population Connected to Wastewater Treatment



Units: %

*Note that data correspond to the latest year available.



Data Source: UNSD
Map Source: UNGIWG

Last Update: March 2011

Map available at: <http://unstats.un.org/unsd/environment/qindicators>

Wastewater Treatment - a Consumer Product?

- Current technologies and systems are far too expensive
- Most need operator and strict process control and maintenance
- Sometimes require onsite operator or personnel
- Most technology exists but needs meaningful implementation
- Systems are proprietary and inadequate - open source
- Standards are emerging but require expansion



Wastewater Treatment - a Consumer Product?

- Design as an affordable consumer product
- Able to compete with existing methodology
- Economical to run
- Remote managed and connected (IoT)
- Simple to install and operate
- Low power consumption - alternative power sourced
- Third world ready



Alternate Water Sources

Rain Water Harvesting

Well established technology - should be implemented everywhere

Greywater

The most underrated Alternate Water Resource

Onsite Treatment

Onsite Wastewater processing for Reuse will be the norm in 10 - 15 years

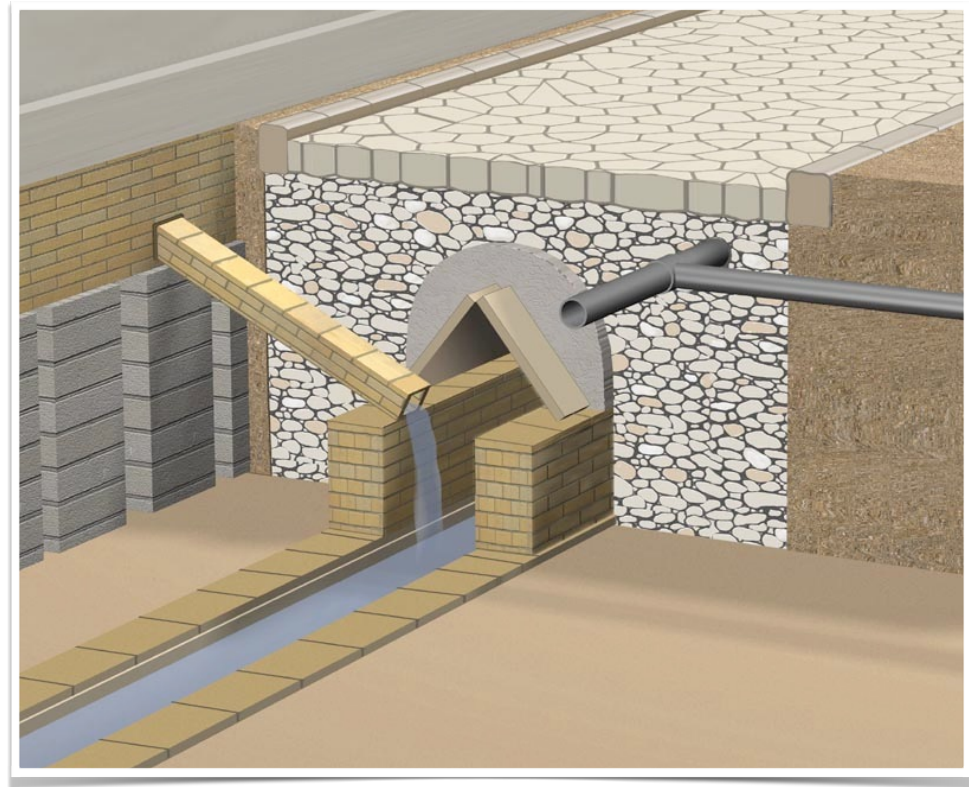
DEWATS (Decentralized Wastewater Processing)

DEWATS is replacing traditional WWTP plants and eliminating costly sewers



Why DEWATS (Decentralized Wastewater Treatment Systems)?

- 2000 year old Roman technology
- Expensive to Build and Maintain
- Expensive to transport Wastewater
- Inefficient use of Energy
- Large Carbon Footprint
- Public Health Hazard



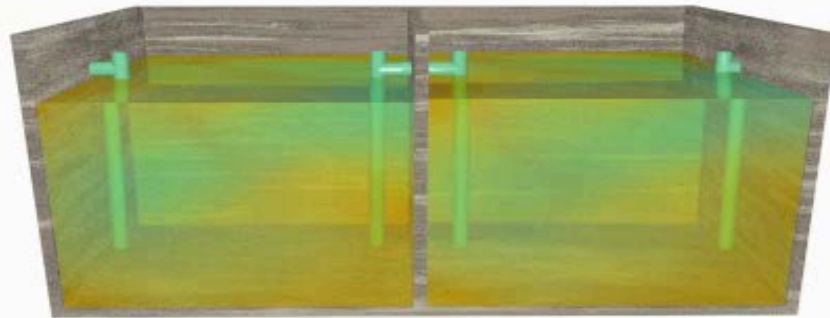
Regulatory Standards - New Standards Needed

- Few standards existing are inadequate
- Specific standards needed depending on type of water reuse
- Multi competency standards needed
- Encourage willingness to beta test publicly providing adequate telemetry and remote supervision (IoT)
- International effort with stakeholders across economic spectrum

Technologies and Applications



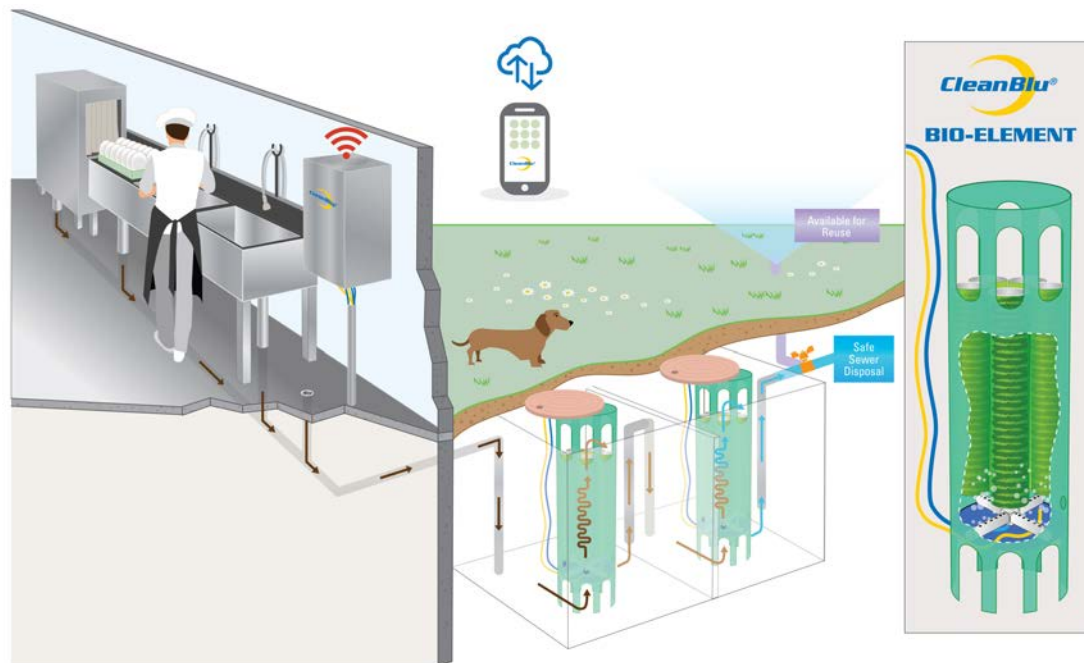
BioElements



Kitchen Water Reuse

Technology Designed to Reuse Commercial Kitchen Water

- Potentially reclaiming 75,000 to 150,000 liters a day



Kitchen Water Reuse FOG-DS Technology



Fuel Harvesting



Water



Biofuel



- Converts Hydrocarbons including both brown and yellow grease
- Prevents Hydrolysis, reduces phosphates and heavy metals
- Treats 80% water content of brown-grease inside the waste enclosure
- Pathogen elimination due to aerobic environment
- No need to pump and haul 80% wastewater, only biofuel
- Auto fuel recovery dispatch function via email or web



Highest Grade Biofuel available - far exceeding B-100 Biofuel Standard

THE NEW SLC
AIRPORT REDEVELOPMENT PROGRAM



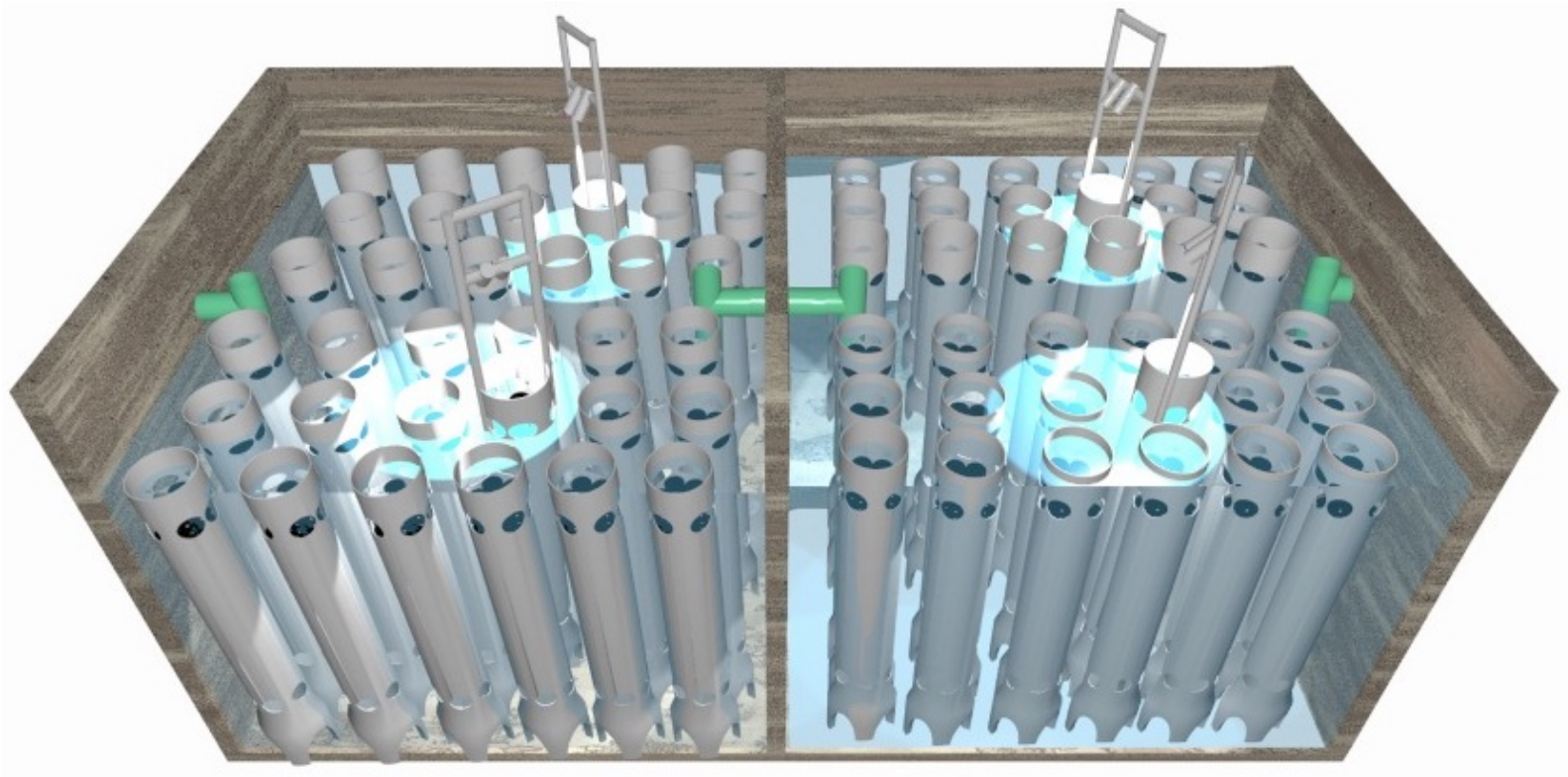
Alternative Water A New Resource



ReNEWW House
Perdue University



DEWATS



Integrated Treatment Features



Vertical Farming

Permaculture Garden Produces 7000 Pounds of Organic Food Per Year on a Tenth of an Acre

DECEMBER 23, 2017 AT 10:11 PM

Family grows 7000 pounds of organic food per year on a tenth of an acre, supplying 90 percent of their vegetarian diet... They spend less than \$2 per day per person on other kitchen staples and make over \$20,000 a year selling excess produce



Fifteen minutes from downtown Los Angeles, just 100 feet away from a major freeway, a small city lot was transformed into a mini paradise.

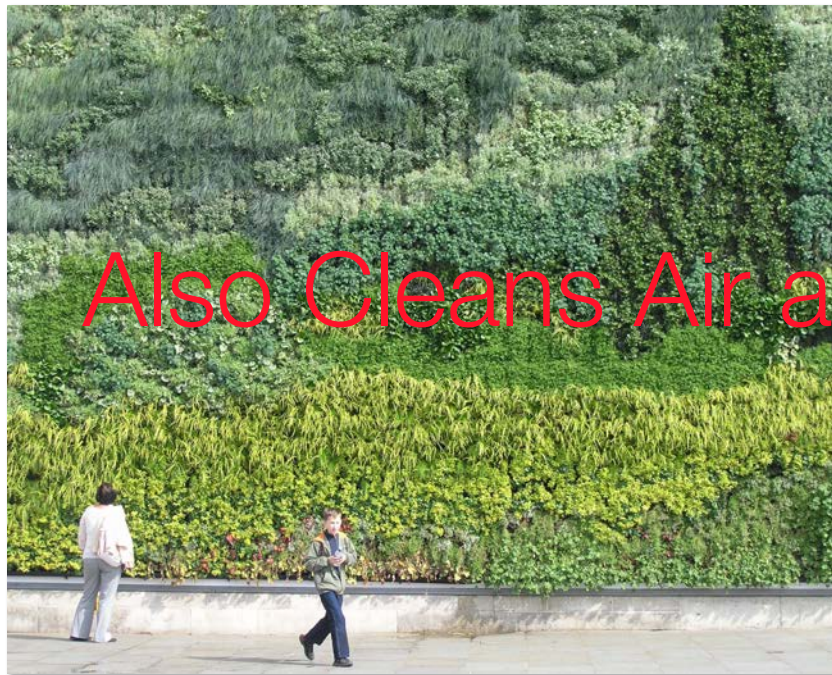
A fifth acre lot, minus the house, garage and driveway, the family has converted the remaining tenth of an acre into a tiny food forest that produces 7000 pounds of food per year with no synthetic fertilizers.



Aerated Water Feature as Storage and Biological Pre-Treatment



Biological Water Treatment / Bio-filtration



Also Cleans Air and Oxidizes Pollutants

CleanBlu Water Reuse Controller

Designed and Built in San Clemente, CA



Conclusions

- When designing a water system, always start with efficiency first!
- Water can be treated to any desired quality for reuse.
- Remote monitoring and control coupled with AI to ensure safe operation and compliance
- A new set of multidisciplinary standards are needed
- Standards depending on type of water reuse

Questions?