

The Siemens logo, consisting of the word "SIEMENS" in a bold, teal, sans-serif font.

**Siemens Water Technologies Corp.**

# **Sewage Treatment and Resource Recovery in the Capital Regional District**

An Expression of Interest by Siemens Water Technologies

*January 2007*

# Siemens Acquired USFilter in 2004 Creating a \$2 Billion Business Focused on Water Treatment

**SIEMENS**

**USFilter**

Systems Group

**USFilter**

Services and Products Group

**SIEMENS**

Water Activities

## Broad Technological Competence

Trendsetting technologies



Conventional technologies



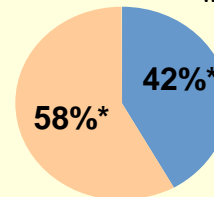
## Extensive Service Network



## Diversified customer base

Municipal customers

- Wastewater
- Drinking water



Industrial customers

- Ultra pure water
- Process water
- Wastewater

\* Position No. 1 or 2 in each market segment

## Systems for Automation & Drives



- Pumping Stations
- Water Pipelines
- Drive Systems

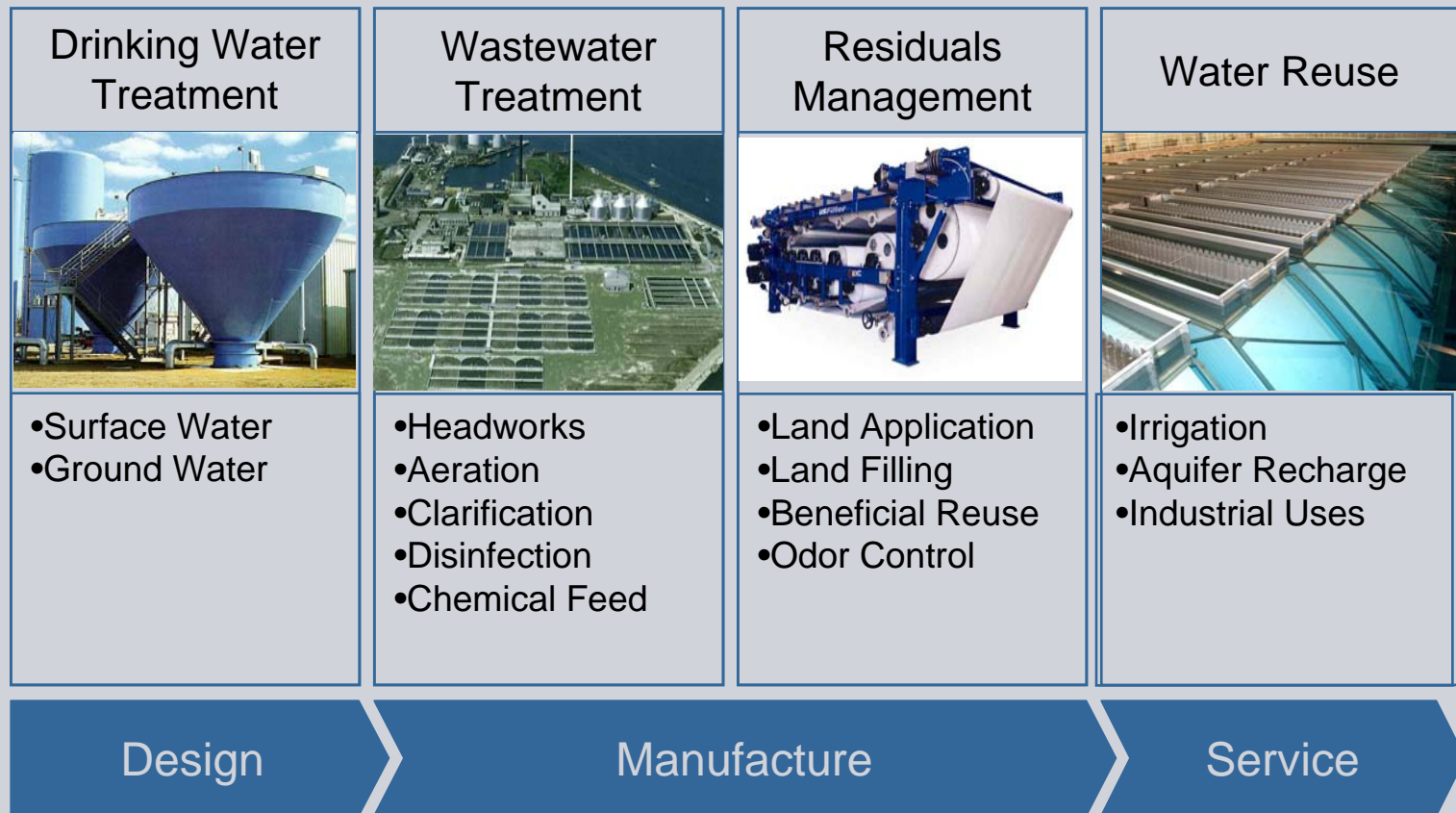


- Control Systems

# Siemens Provides the Broadest Range of Equipment & Services to Municipalities ...

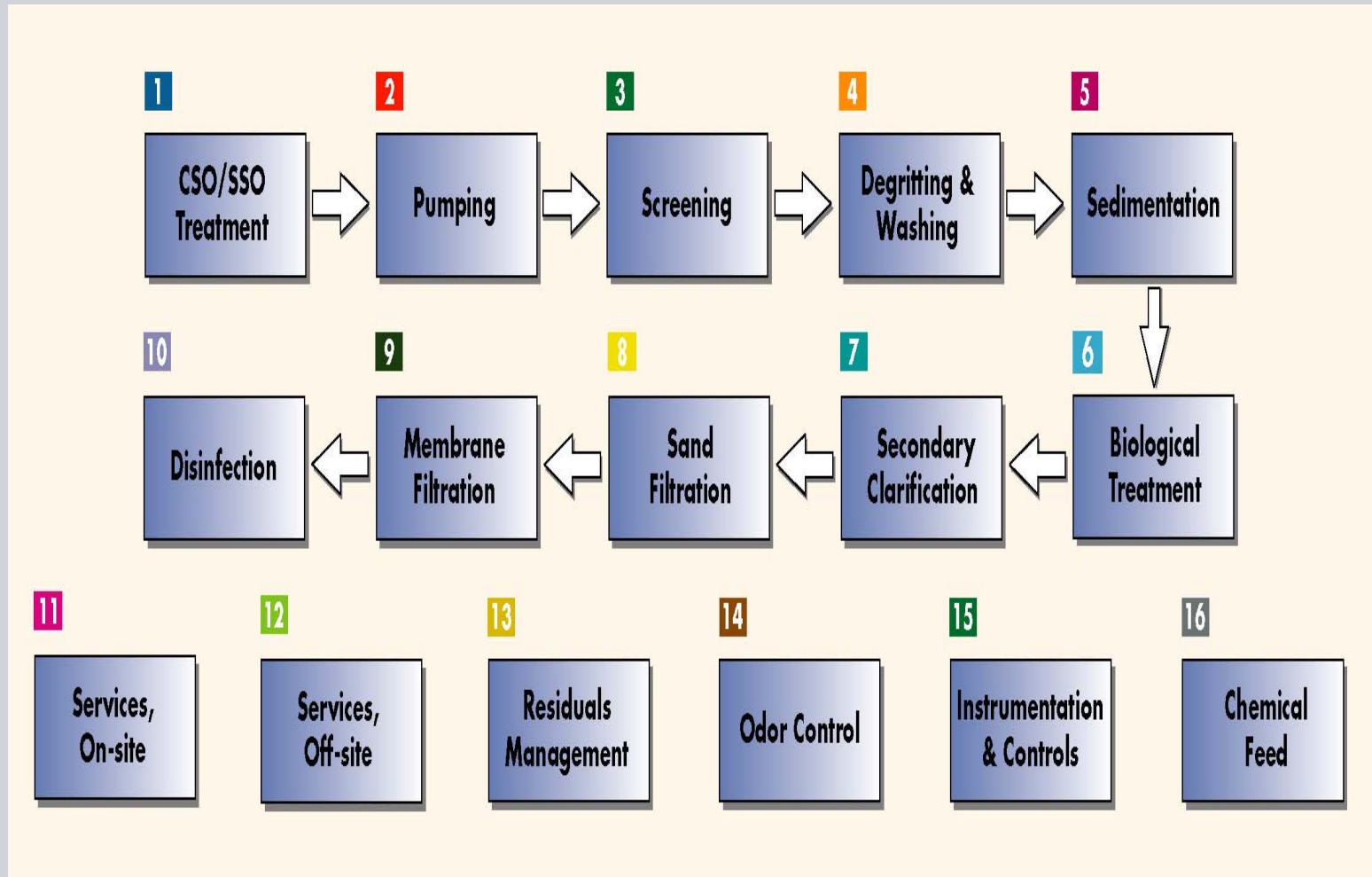


## Municipal Treatment



# ... with Process Technology Across the Entire Municipal Wastewater Treatment Technology Map

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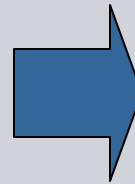


# Capital Regional District: Wastewater Treatment & Resource Recovery



## Challenge

Treating wastewater from an estimated 300,000 to 500,000 people (roughly 170 to 265 million liters per day), with an environmentally sound, unobtrusive facility, while recovering the maximum amount of resources.



## Solution

- Readily meet wastewater treatment discharge standards.
- Produce a compact footprint.
- Optimize for energy recovery, solids minimization and biosolids resource recovery.
- Do all of these things economically.

## Siemens will work with CRD's Engineering Team to:

- Evaluate potentially conflicting solutions (eg; solids minimization or energy recovery or lower cost of conventional treatment vs higher cost of membranes etc.)
- Provide data for full economic analyses of different options
- Help integration of multiple offerings from one technology provider

## Providing the Best Treatment Process

- Siemens has a broad range of activated sludge processes, including:
  - Orbal<sup>®</sup> Oxidation Ditches
  - VertiCel<sup>®</sup> Reactor and Vertical Loop Reactor (VLR<sup>®</sup>)
  - OmniFlo<sup>®</sup> Sequencing Batch Reactors
  - Membrane Bio Reactors (MBR's)
  - Moving Bed Bio Reactors (MBBRs) and Integrated Fixed Film Activated Sludge (IFAS) processes
- ...all of these technologies can be integrated with 'secondary' solids separation – conventional sedimentation or microfiltration using MBR technology depending upon treatment objectives.
- Following clarification, 'tertiary' filtration can be achieved using a variety of granular media filters, disk filters, or even microfiltration.

## Disinfection & Public Health

- Following tertiary filtration, the facility will require high level disinfection to guarantee public health and maintain the potential for reuse.

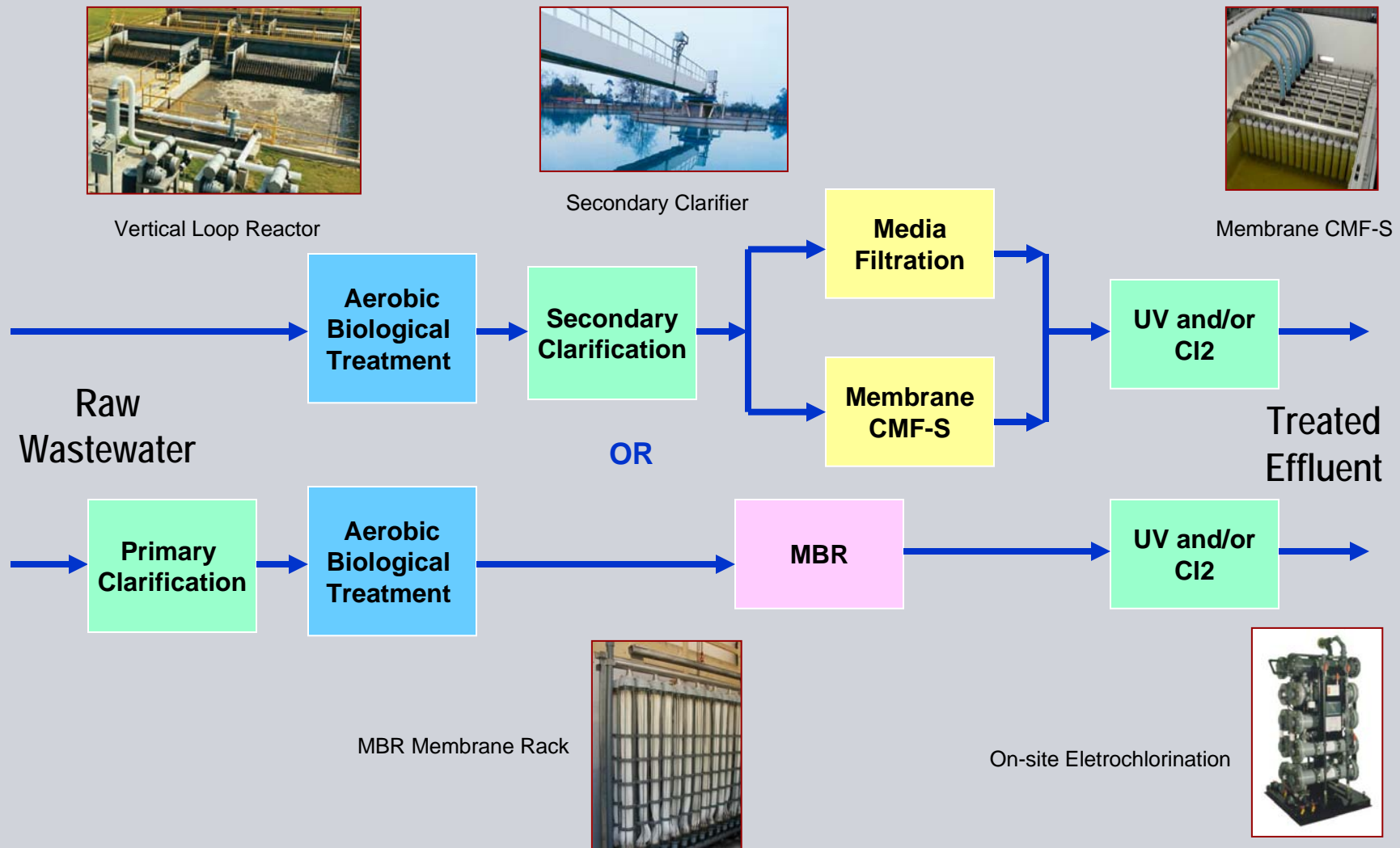


- Siemens has expertise with a variety of disinfection technologies:
  - Gas chlorination
  - Liquid feed of sodium hypochlorite
  - On-site electro-chlorination
  - Ultraviolet disinfection



# Possible Wastewater Management Concept: Alternative Biological Treatment Schemes

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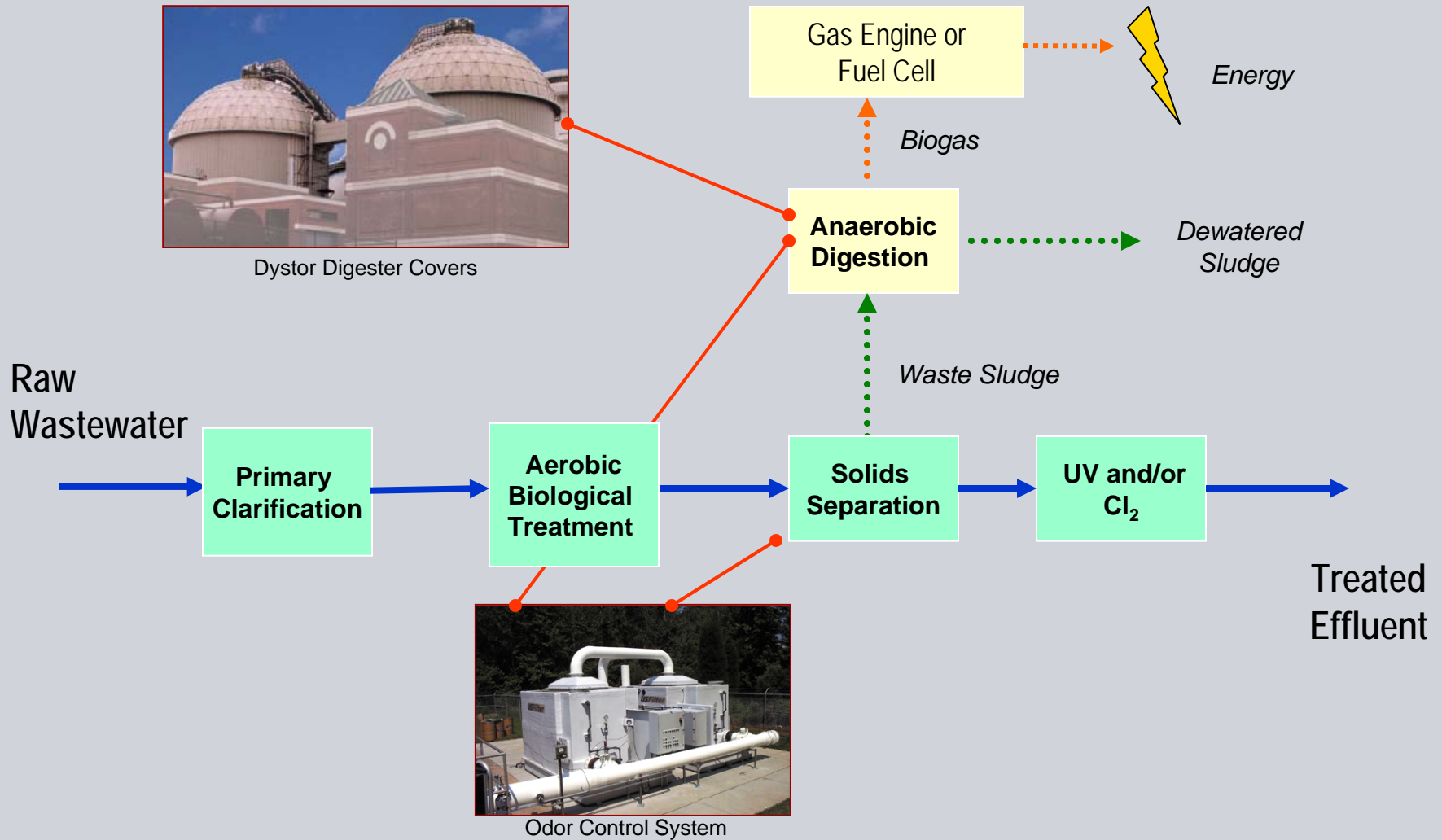


## Energy Recovery Potential

- Anaerobically digest waste sludge, recovering biogas for conversion to power. Siemens has many plants producing green energy with:
  - Full line of anaerobic digestion equipment including covers and mixing
  - Dystor<sup>®</sup> Gas Storage System
  - Sludge heaters
  - All necessary gas handling equipment
- Power generation using digester gas with:
  - Engine/generator sets
  - Siemens is the foremost innovator in fuel cells for this application
- Siemens also provides highly efficient motors to reduce the overall power draw
- Siemens controls & automation maximize efficiency of plant operation

# Possible Wastewater Management Concept: *Optimized for Energy Recovery*

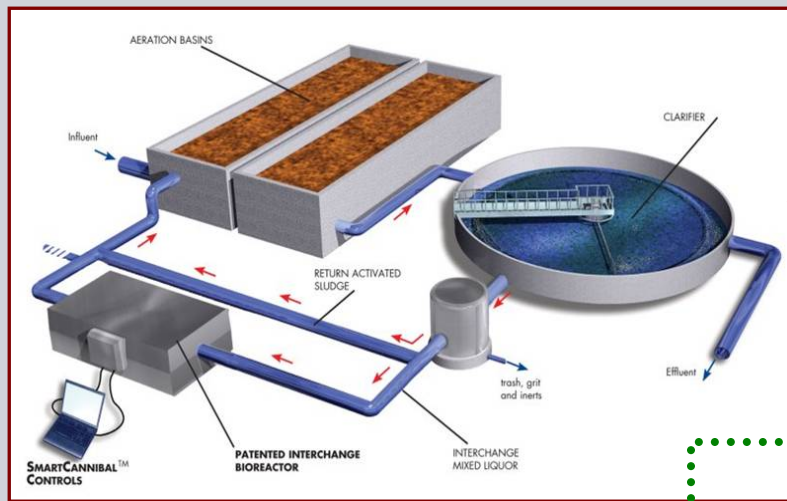
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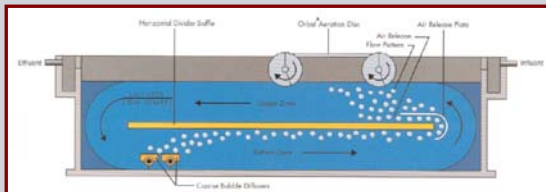
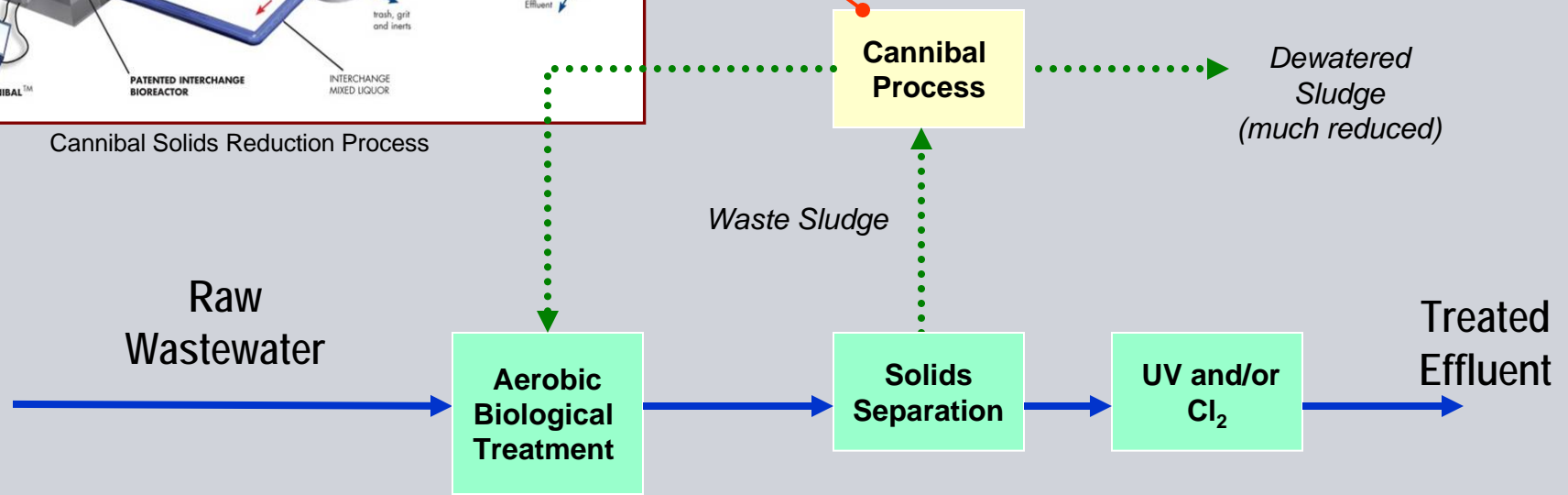
## Minimizing Waste Solid Production

- Siemens offers the patented Cannibal Solids Reduction System:
  - The amount of waste biosolids produced is dramatically reduced
  - The size of biosolids handling facilities is reduced
  - The cost of biosolids disposal is reduced
- Siemens' has extensive experience in the application of many activated sludge technologies and is the only source for the Cannibal Solids Reduction System
  - Siemens can readily integrate the two processes
  - Extensive biological process expertise allow integrated to produce the maximum benefit for the user

# Possible Wastewater Management Concept: Optimized for Minimum Waste Solids Production



Cannibal Solids Reduction Process



## Biosolids Management and Utilization

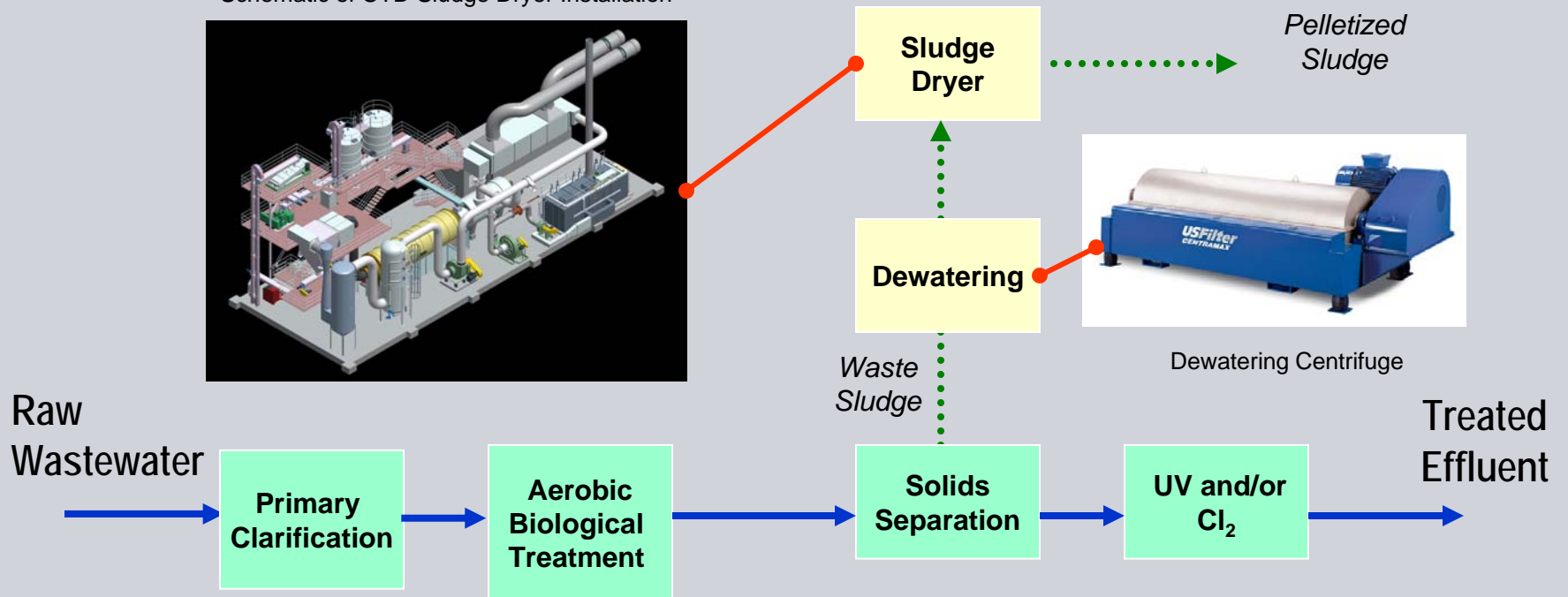
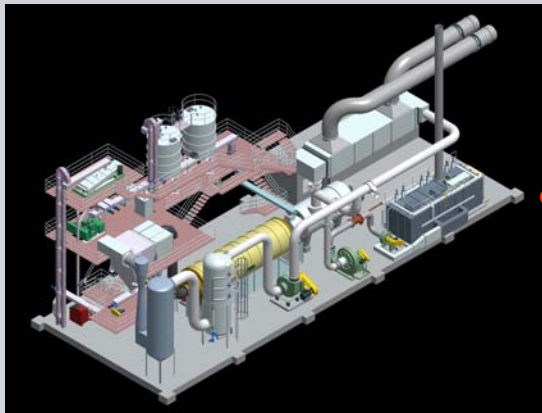
- Siemens offers the dewatering technologies needed for efficient biosolids dewatering:
  - Sernagiotto Beltpresses
  - CentriMax<sup>®</sup> Centrifuges
- Dewatering equipment is available for specialized applications:
  - J-Press<sup>®</sup> Filter Presses
  - J-Vap<sup>®</sup> Pathogen Inactivation Sludge Presses
- Dewatering and pelletizing of waste biosolids for use as fertilizer or as a soil amendment
  - Sernagiotto Direct Dryers
  - Dragon<sup>®</sup> Indirect Dryers



# Possible Wastewater Management Concept: *Optimized for Biosolids Recovery*

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Schematic of CTD Sludge Dryer Installation



## Siemens' Value Proposition

- Siemens provides answers for:
  - Efficient biological treatment
  - Energy recovery
  - Waste solids minimization
  - Biosolids management and recovery
- In addition, the Capital Regional District treatment facility must be designed to treat wastewater to the highest standards including economically treating to the latest enhanced nutrient removal (ENR) standards as mandated
- All these requirements have to be balanced to provide the most cost-effective solution: highest quality wastewater at the lowest lifecycle cost

## Siemens - Technology Provider

- Siemens Water Technologies is the only organization that can offer:
  - All technologies necessary for a complete wastewater treatment facility
  - To work with your Engineer to integrate these technologies into a cohesive treatment solution
  - Front-to-back system guarantees from a world class company - Siemens



## Contacts

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