

**SIEMENS**

# Overview of Siemens Water Technologies

**December 6<sup>th</sup>, 2006**

Water Technologies  
2006

- ❑ **Headquarter in Munich, Germany, Siemens is the largest electrical and electronics equipment company in the world.**
- ❑ **2004 sales were in excess of 75 million euros.**
- ❑ **We have production facilities around the globe**
  - ❑ **Over 430,000 employees**
  - ❑ **Activities in more than 190 countries**
- ❑ **Siemens invests more than €5 billion each year in R & D (7% of sales).**
- ❑ **24% of Siemens workforce are scientist and engineers.**
- ❑ **Siemens has over 450 major production facilities worldwide.**
- ❑ **Main business areas include:**
  - ❑ **Information and Communications**
  - ❑ **Automation and Control**
  - ❑ **Power**
  - ❑ **Transportation**
  - ❑ **Medical**
  - ❑ **Lighting**
  - ❑ **Financing and Real Estate**

**PRESS RELEASE**  
**For the business press**  
**Erlangen/New York, 2004-08-03**

**Siemens completes acquisition of US Filter - Strategic \$993 million acquisition in the growing water market**

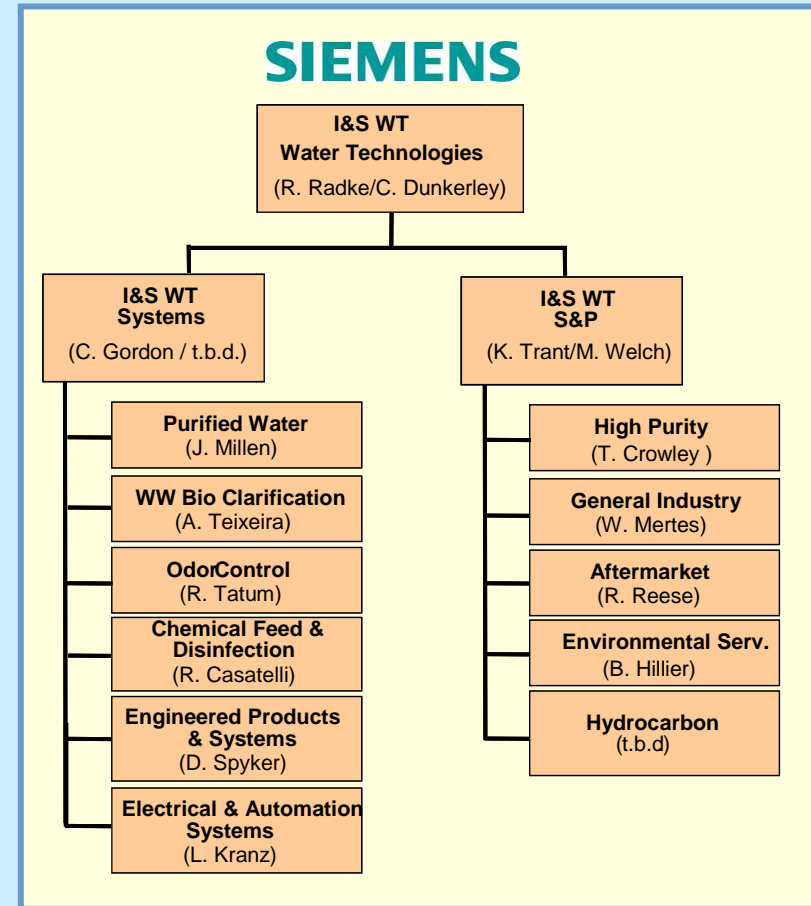
**Effective July 31, Siemens completed its acquisition of the US Filter Corporation from the French parent company, Veolia Environnement, Paris. This \$993 million acquisition positions Siemens as the market leader in the water and wastewater treatment business in North America. The worldwide product, system and service business of US Filter with its 5,800 employees and an annual turnover of \$1.2 billion will now become a part of the Siemens Industrial Solutions and Services Group (I&S) in the form of the newly formed "Water Technologies" division.**

Since July 2004 we have been transforming a set of unrelated business units into a process-driven organization

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Status in July 2004



New organizational setup since October 2005

# Water markets

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### Municipal Drinking Water



### Municipal Wastewater



### High Purity Water



### Industrial Process Water



### Industrial Wastewater



### Water Reuse

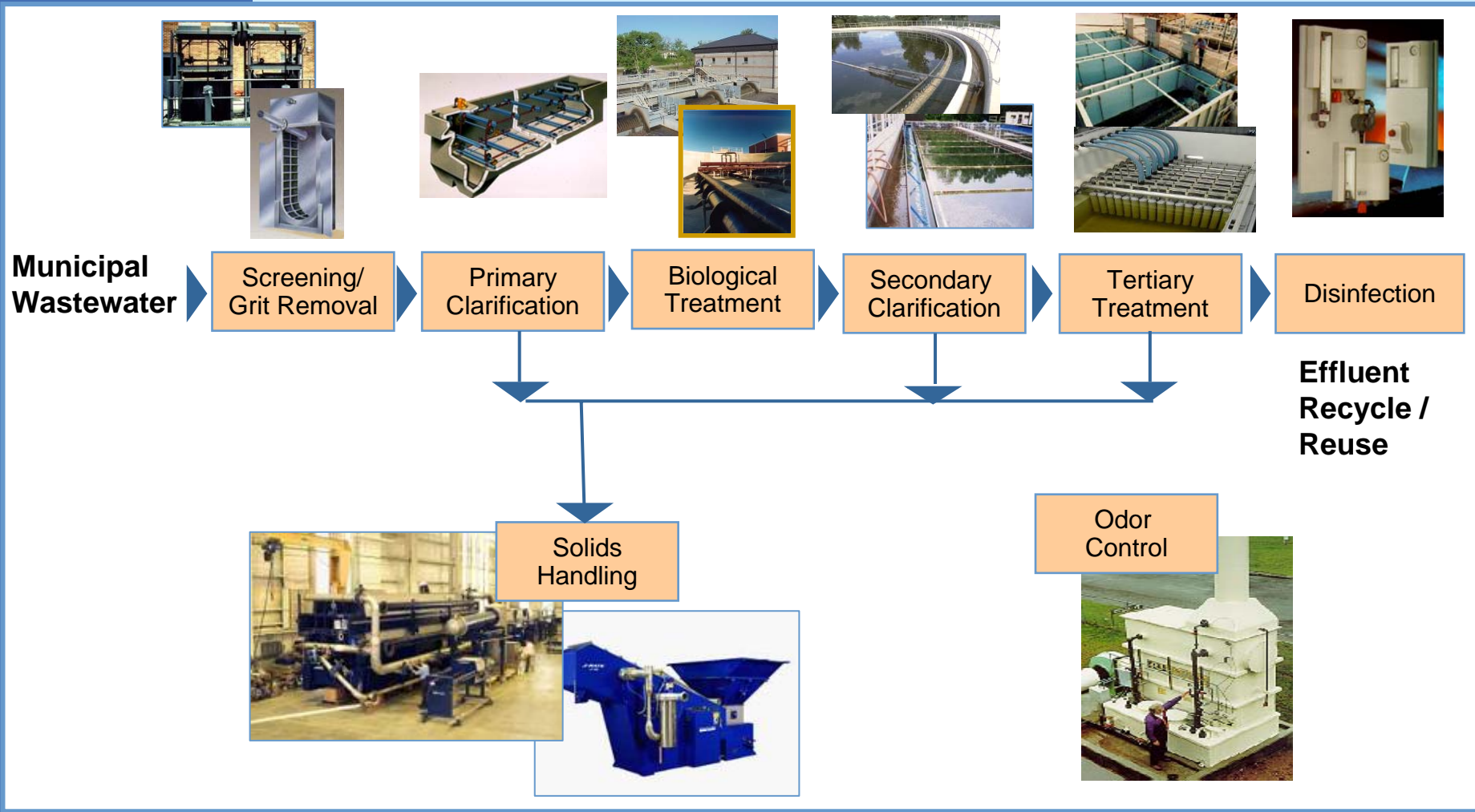


- ❑ We are a market focused organization. Our goal is to first understand our customers needs and operations, and then provide custom designed solutions to economically need their water needs.
  
- ❑ Market Teams
  - ❑ Oil and Gas Production
  - ❑ Downstream Petroleum
  - ❑ Chemicals
  - ❑ Food and Beverage
  - ❑ Pharmaceutical
  - ❑ Metals and Mining
  - ❑ Microelectronics
  - ❑ Power
  - ❑ Municipal



# Wastewater Treatment in the Public Sector (Municipal)

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# Municipal Wastewater Treatment Case Study

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**End User:** Water Factory 21

**Location:** Orange County, CA

**Scope:** Microfiltration and Reverse Osmosis system for reuse of biologically treated municipal effluent.

**Capacity:**

MF – 83 MGD

RO – 75 MGD





# Municipal Wastewater Treatment Case Study

**SIEMENS**

**End User:** Beni Suef WWTP

**Location:** Beni Suef, Egypt

**Scope:** Biological Treatment by Oxidation  
Ditch using disc aerators with 4 x 60  
HP disc aerators, Secondary  
Clarification with 4 x 25.0 m dia.

**Capacity:** 50,000 m<sup>3</sup>/day



# Municipal Wastewater Treatment Case Study

**SIEMENS**

**End User:** Honouliuli WWTP

**Location:** Hawaii, USA

**Goal:** Produces approx. 12 MGD of beneficial reuse water from effluent previously discharged into the Pacific Ocean. Process generates two grades of water, one grade is high purity for power and petro-refining companies and second grade is for irrigation purposes. Dramatically increase amount of available potable water for residential needs – an important aspect for an island surrounded by salt water

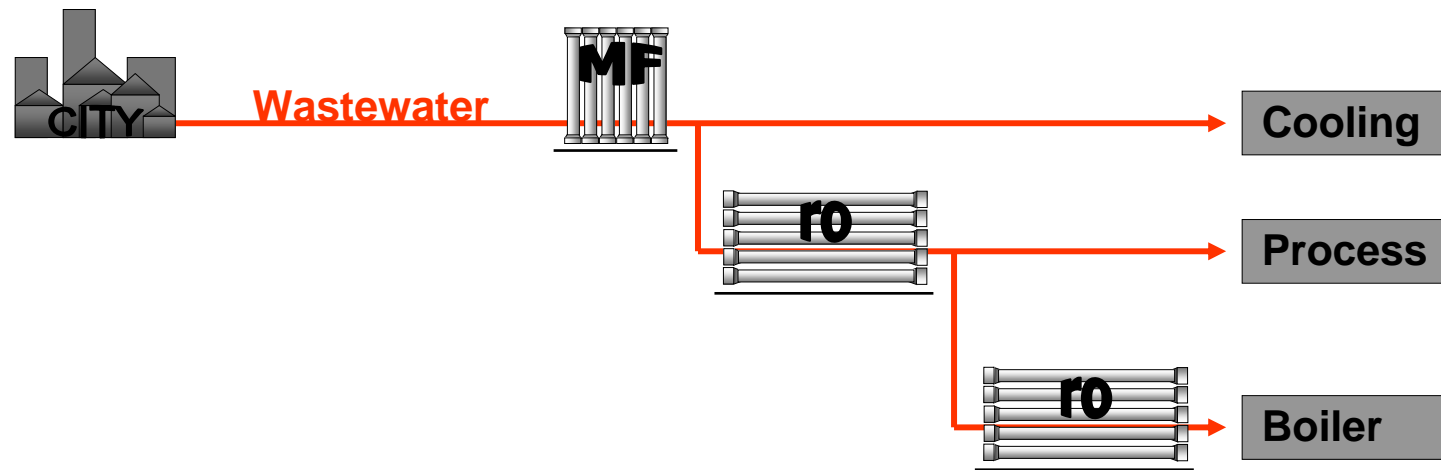
**Scope:** Addition of effluent filters, microfiltration and reverse osmosis to a secondary WWTP.

**Year:** 2003



# West Basin, El Segundo, CA

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<b>City</b>	West Basin, El Segundo, CA	<b>Flow</b>	24 MGD	<b>Start-Up</b>	1995
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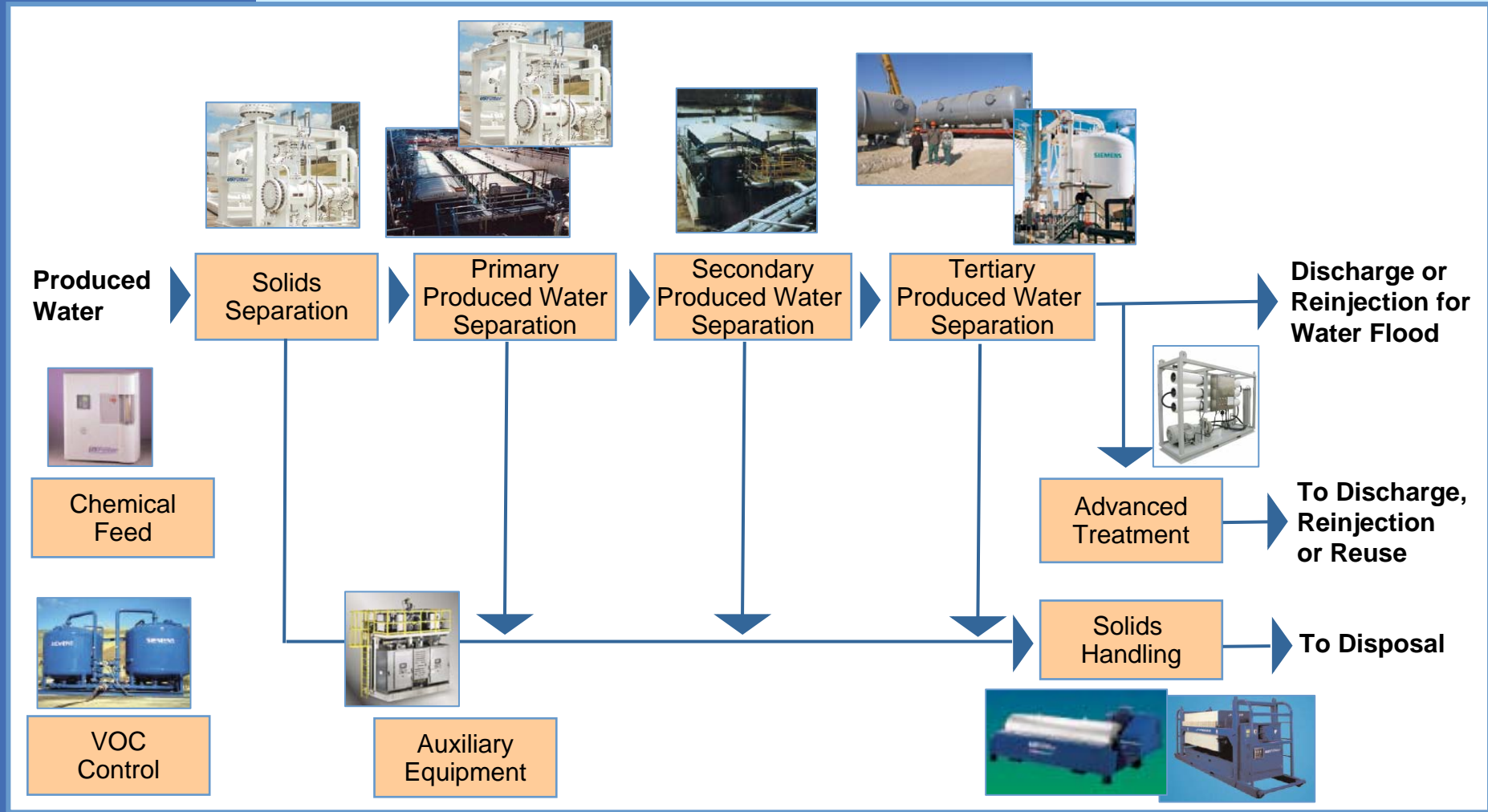
**Water Technologies offers technology and services for process water and wastewater treatment to petroleum and petrochemical customers worldwide.**

- ❑ Product and systems: Separation, clarification, biological treatment, filtration and membranes, chemical feed systems, Electrocatalytic systems and components.
- ❑ Services and aftermarket: Parts, O&M, bulk waste treatment, hydrocarbon services, rebuilds and retrofit, build-own-operate, carbon and resin services, membrane cleaning.



# Waste Treatment in the Upstream Petroleum Industry (Produced Water Treatment)

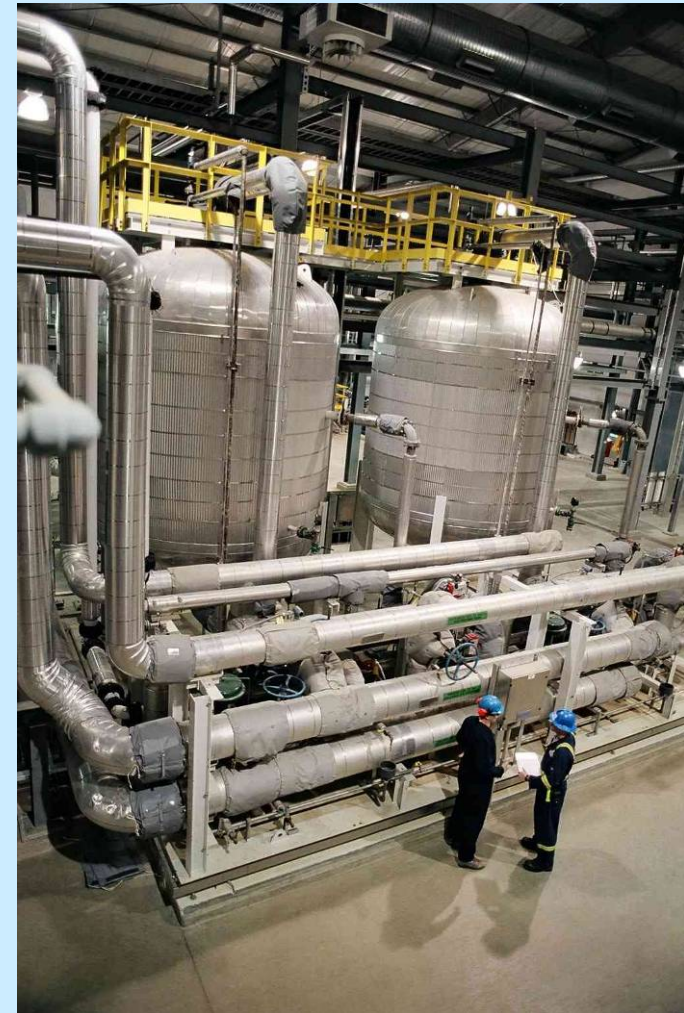
**SIEMENS**



# Upstream Petroleum Industry Produced Water Treatment Case Study

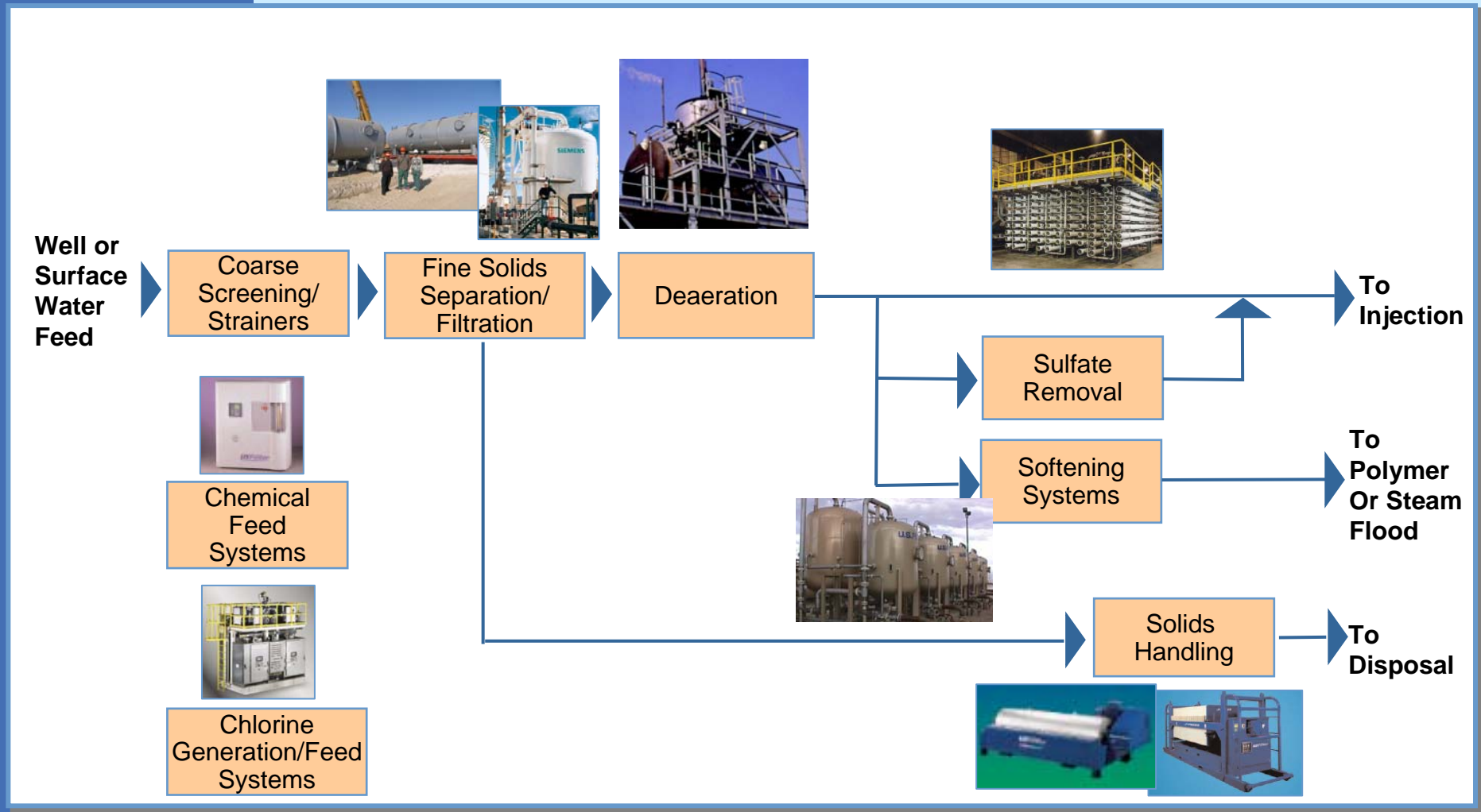
**SIEMENS**

- ❑ End User: Suncor
- ❑ Location: Fort McMurray, Alberta, Canada
- ❑ Application: Steam Assisted Gravity Drainage
- ❑ Scope: Design, supply and installation of a water reuse system consisting of IGF separators, walnut shell filters, warm lime softener, media filters and softeners.
- ❑ Flowrate: 35,000 bbl/day bitumen extraction facility.
- ❑ Year: 2003



# Water Treatment in the Upstream Petroleum Industry (Water and Steam Flood)

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# Upstream Petroleum Industry Injection Water Treatment Case Study

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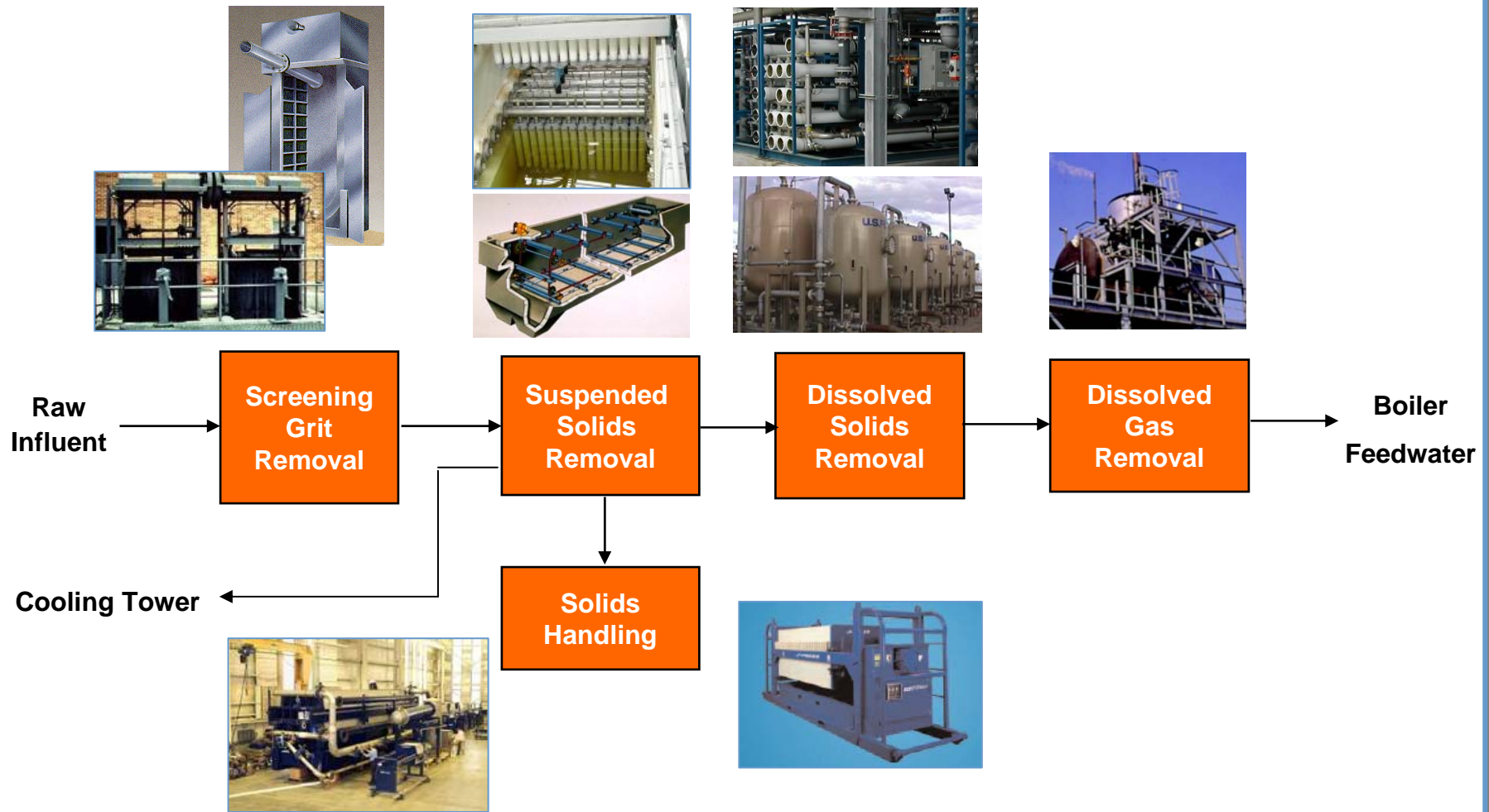
- ❑ End User: Saudi Aramco
- ❑ Application: Shedgum and Kurais Oil Field Water Floods.
- ❑ Location: Qurrayah Sea Water Filtration Plant, Saudi Arabia
- ❑ Scope: Sea Water Media Filters (20 + 36) and Electrochlorination System
- ❑ Flowrate: 2.5 million bbl/day and 4.0 million bbl/day
- ❑ Year: 2004 and 2006





# Water Treatment in the Downstream Petroleum Industry (Refining and Petrochemicals)

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# Downstream Petroleum Industry Water Treatment Case Study

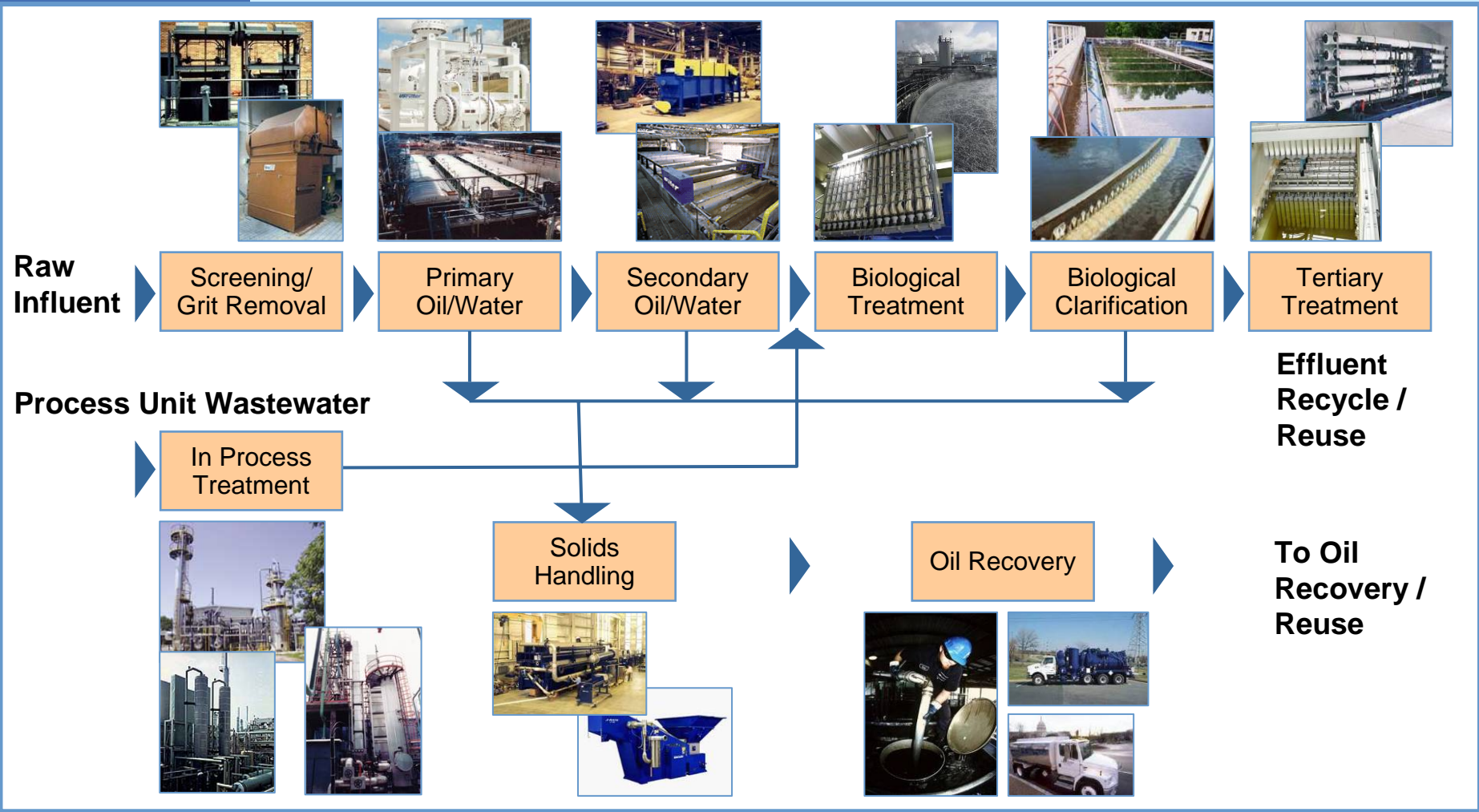
**SIEMENS**

- ❑ Invista (DuPont)
- ❑ Application: Boiler feed water treatment. Source is river water.
- ❑ Location: Victoria, TX (facility produces 20% of the worlds nylon intermediates).
- ❑ Scope: Design, build, own and operate. Microfiltration, reverse osmosis and polishing softeners.
- ❑ Flowrate: 14,170 m<sup>3</sup>/day
- ❑ Year: 2002, 15 year contract.



# Wastewater Treatment in the Downstream Petroleum Industry (Refining and Petrochemicals)

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# Downstream Petroleum Industry Wastewater Treatment Case Study

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- ❑ End User: Oryx GTL Ltd.
- ❑ Application: 34,000 bbl/day GTL Plant.
- ❑ Location: Ras Laffan Industrial City, Qatar
- ❑ Scope: Complete wastewater treatment system for reuse as irrigation water. Includes oil/water separation, biological treatment, effluent filtration and sludge thickening/dewatering.
- ❑ Flowrate: 4,900 m<sup>3</sup>/day
- ❑ Year: 2004

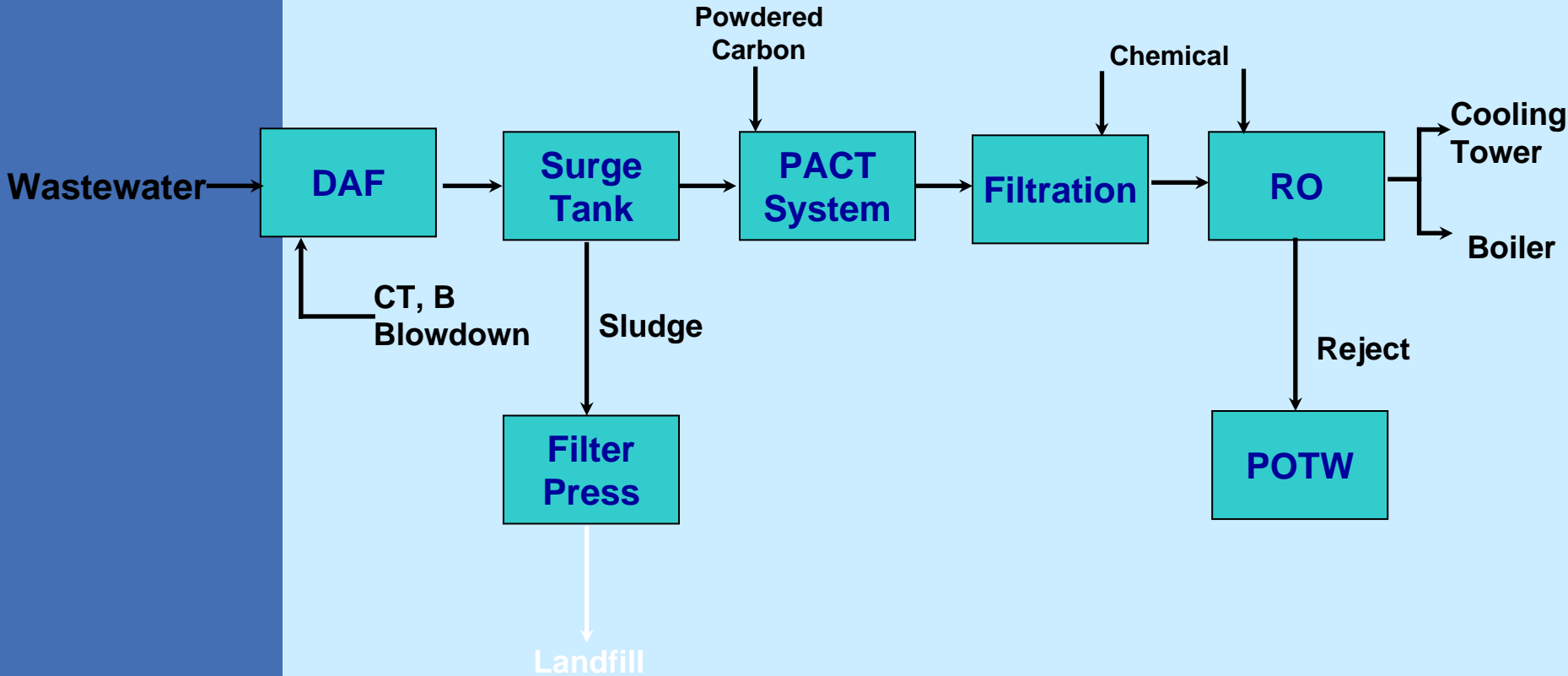


Petroleum Refinery WW Reuse System

	Wastewater	CT Makeup Water Quality	RO Water to Boilers
pH, SU	6-9	6-9	6-9
Chloride, mg/l	480	480	24
Sulfate, mg/l	160	200	10
Phenols, mg/l	20	0.1	0.005
TDS, mg/l	2000	2000	100
TSS, mg/l	100	5	ND
Oil & Grease, mg/l	40	2.5	ND
BOD, m/l	300	10	1
COD, mg/l	600	60	2
Alkalinity as CaCO <sub>3</sub> , mg/l	300	150	2
Silica as SiO <sub>2</sub> , mg/l	40	10	2
TOC, mg/l	150	20	2
Hardness, as CaCO <sub>3</sub> , mg	80	30	1.5
Fluoride, mg/l	0.04	0.1	0.001
Calcium, mg/l	40	0.02	1.0
Iron, mg/l	0.5	0.1	0.01
Magnesium, mg/l	4	0.002	0.2
Sodium, mg/l	360	400	20
Strontium, mg/l	1	0.5	0.05
NH <sub>3</sub> , ppm	7	<10	<10

# US West Coast Refinery Wastewater Reuse Application

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**Polifin, Ltd. – South Africa  
VCM Plant  
Wastewater Reuse**

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<b>Parameter</b>	<b>mg/L</b>
<b>Chemical Oxygen Demand (COD)</b>	<b>2,180</b>
<b>Total Organic Carbon (TOC)</b>	<b>950</b>
<b>Total Kjeldahl Nitrogen (TKN)</b>	<b>&lt;0.73</b>
<b>Total Suspended Solids</b>	<b>7</b>
<b>Total Solids</b>	<b>51,100</b>
<b>Total Ash</b>	<b>20,700</b>
<b>Alkalinity</b>	<b>3,400</b>
<b>pH</b>	<b>10</b>
<b>Total Phosphorus</b>	<b>&lt;0.09</b>
<b>Copper</b>	<b>*</b>
<b>Aluminum</b>	<b>*</b>
<b>Specific Organic Compounds</b>	<b>*</b>

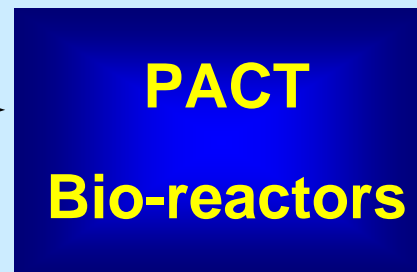
**Polifin, Ltd. – South Africa  
Wastewater Reuse**

**SIEMENS**

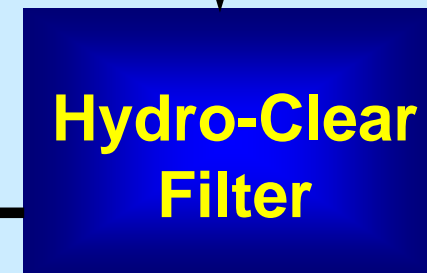
	<b>Raw Wastewater</b>	<b>PACT Effluent</b>	<b>Effluent (after UV Oxidation)</b>
<b>TOC, mg/l</b>	<b>400 - 500</b>	<b>5 - 10</b>	<b>&lt;5</b>
<b>COD, mg/l</b>	<b>800 - 1000</b>	<b>20 - 30</b>	<b>&lt;10</b>



Waste Stream



Incinerator Waste Stream



To Chlorine Plant

To Cyanide Plant

# Solutions for Food & Beverage, Biopharm and Steel Markets

**SIEMENS**

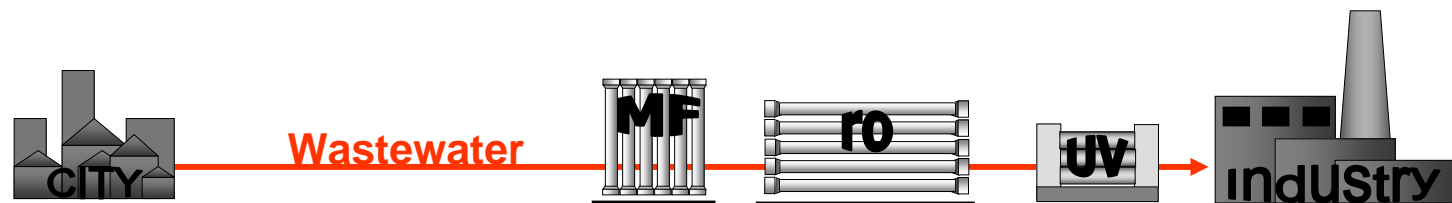
**Water Technologies provides high purity water and wastewater treatment technologies and services to major customers in food & beverage, steel and biopharm markets.**

- ❑ Products and technologies: RO, continuous deionization, chemical feed systems, controls, filtration, biological treatment.
- ❑ Services and aftermarket: Service DI, parts, O&M, carbon and resin services, retrofits and rebuilds, build-own-operate, membrane cleaning



# Kranji, Singapore

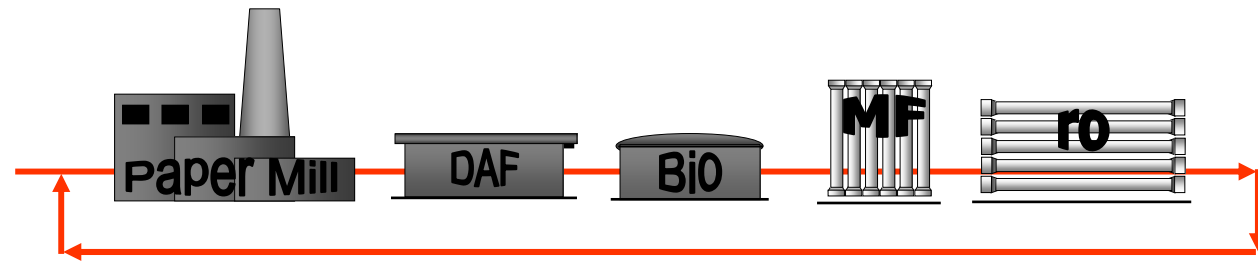
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<b>City</b>	Kranji, Singapore	<b>Flow</b>	1,840 gpm 7,290 gpm	<b>Start-Up Phase 2</b>	2000 2002
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# McKinley Paper

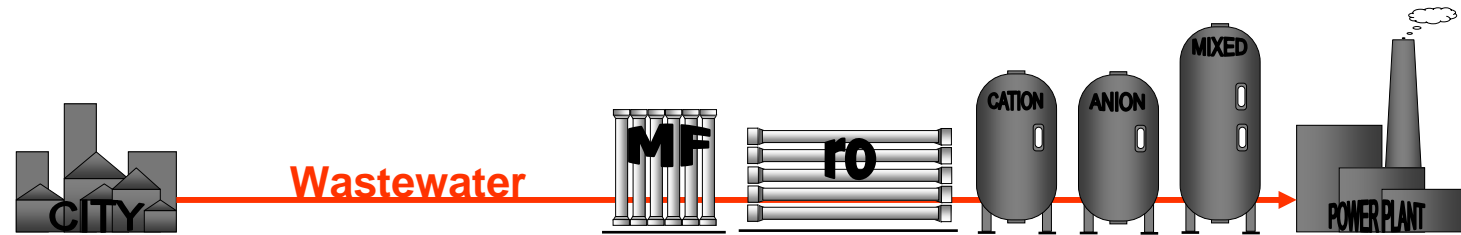
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<b>Plant</b>	McKinley Paper, USA	<b>Flow</b>	350 gpm	<b>Start-Up</b>	1994
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# Eraring Power, NSW

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<b>Plant</b>	<b>Eraring Power, NSW</b>	<b>Flow</b>	<b>380 gpm 570 gpm</b>	<b>Start-Up Phase 2</b>	<b>1995 2000</b>
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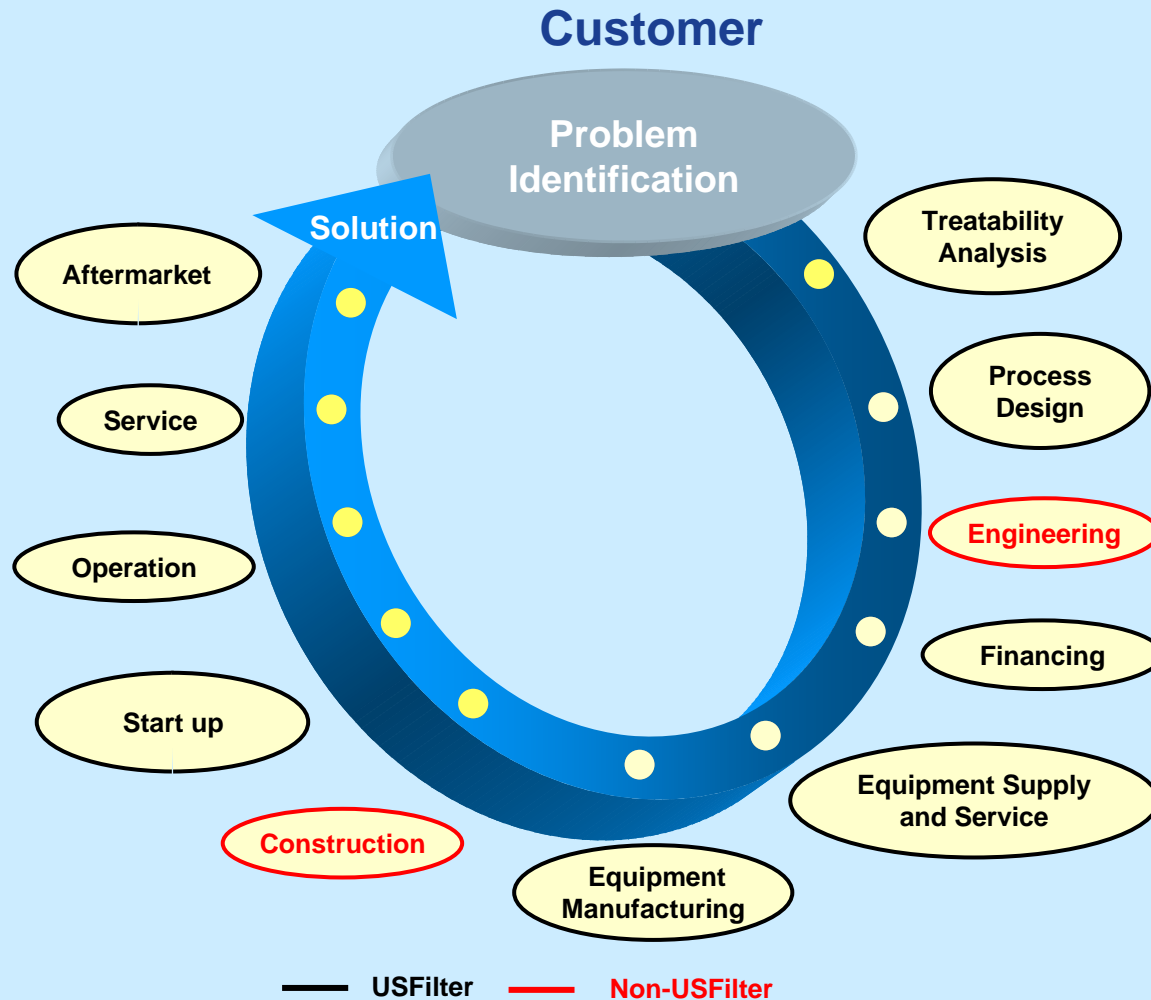
## New smaller economical systems for small communities, satellite treatment

- ❑ New pre-engineered systems for drinking water applications
  - MEMCOR® AXIA™ submerged membrane system
  - MEMCOR® AXIM™ pressurized membrane system
- ❑ New pre-engineered systems for wastewater/ water reuse applications
  - MEMCOR MemJet® Xpress Membrane Bioreactor



# Water & Wastewater Systems & Service Strategy: *Value creation through value chain management*

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- ❑ Integrated Systems & Service project approach
- ❑ Comprehensive offering
  - Widest range of technologies
  - “Bundled” product offering where appropriate
  - Lower life-cycle cost with services
- ❑ Control versus ownership in value chain
  - Ownership of all elements lowers ROI and increases risk
  - Control is exerted through purchasing power and industry know-how

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Thank you!

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