



13 th Forum for Applied  
Biotechnology - Gent  
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## Session 1 : Environmental Biotechnology

# Waste water minimization and water reuse in the automotive industry

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# Water users in the automotive

## ■ Industrial processes

- ✓ cooling water welding shop;
- ✓ pretreatment installations (degreasing, phosphatation and passivation);
- ✓ electrocoat;
- ✓ wet sanding lines and carwash machine;
- ✓ spraybooths (humidification, recirculation tanks, ...);
- ✓ miscellaneous (energy center, water test, filling line, ...).

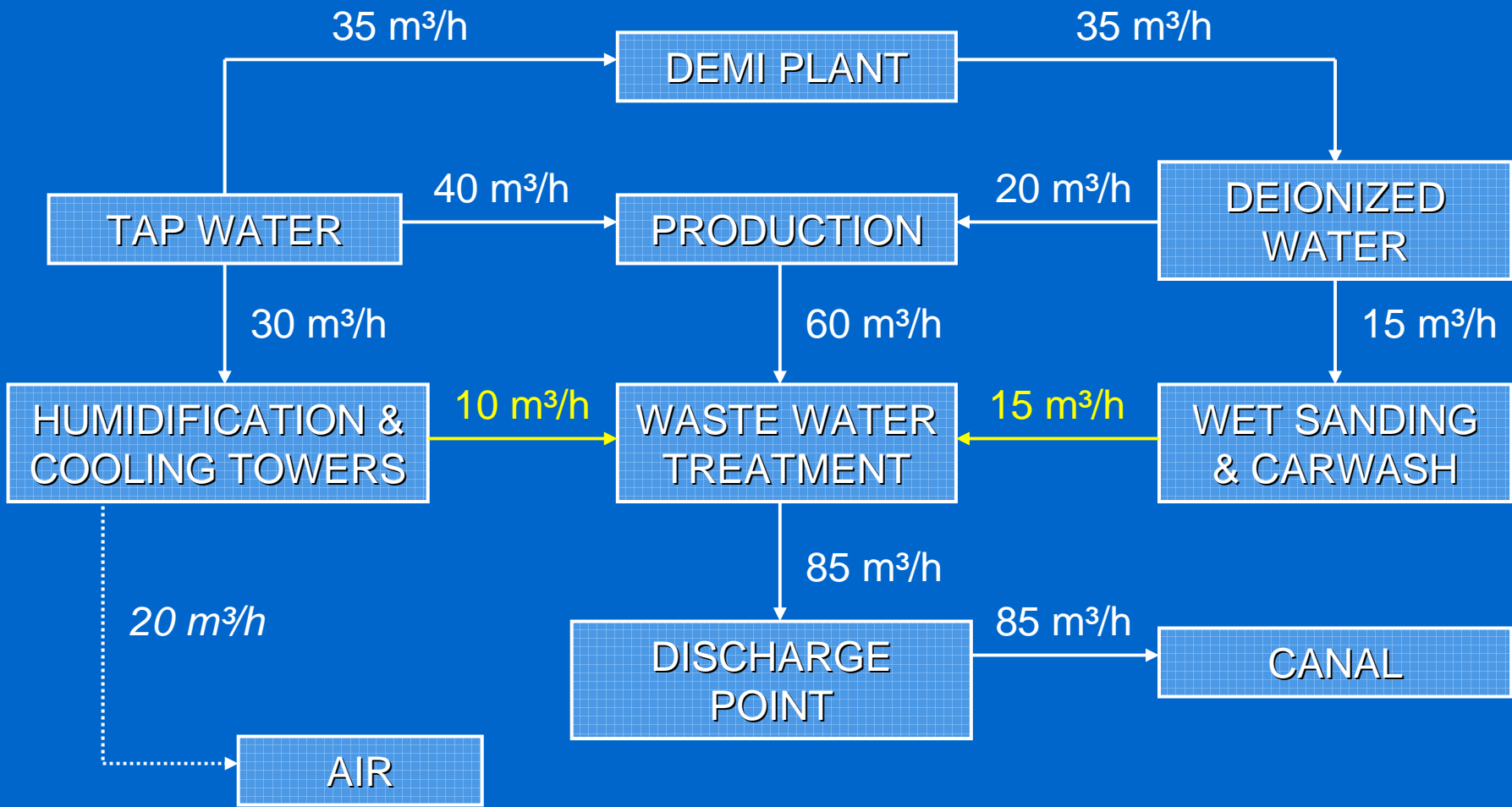
## ■ Sanitary purposes

- ✓ kitchen, toilets and showers.



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# Waste water flow till 1993





## Influent recuperation unit

### ■ Waste water from wet sanding lines and carwash

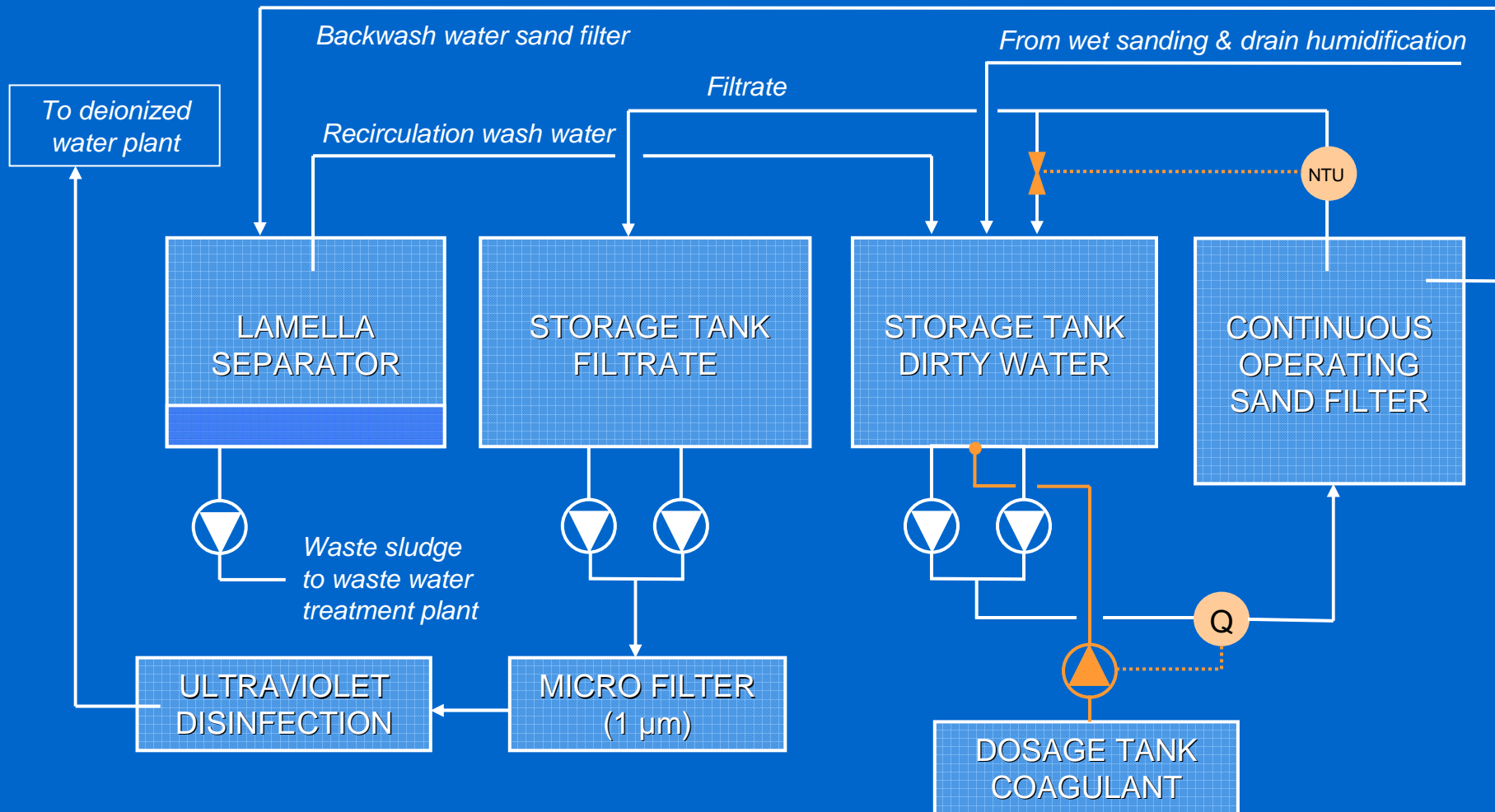
✓ pH	6.5
✓ conductivity	15 $\mu\text{S}/\text{cm}$
✓ total hardness	< 1 $\text{DH}$
✓ suspended solids	10 mg/l
✓ particle size	
✓ average	25 $\mu\text{m}$
✓ maximum	125 $\mu\text{m}$
✓ manganese	< 0.2 mg/l
✓ iron	< 0.1 mg/l

### ■ Drain humidification & cooling towers

✓ pH	8.5
✓ conductivity	1500 $\mu\text{S}/\text{cm}$
✓ total hardness	30 $\text{DH}$
✓ suspended solids	2 mg/l

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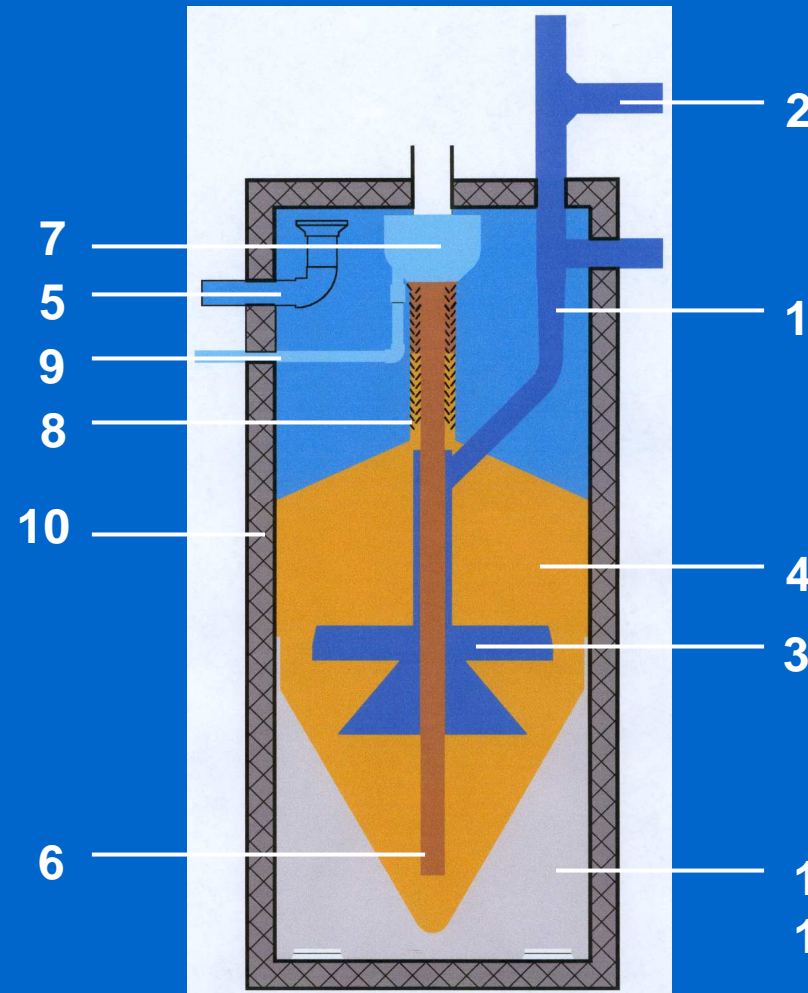
# Principle flow diagram



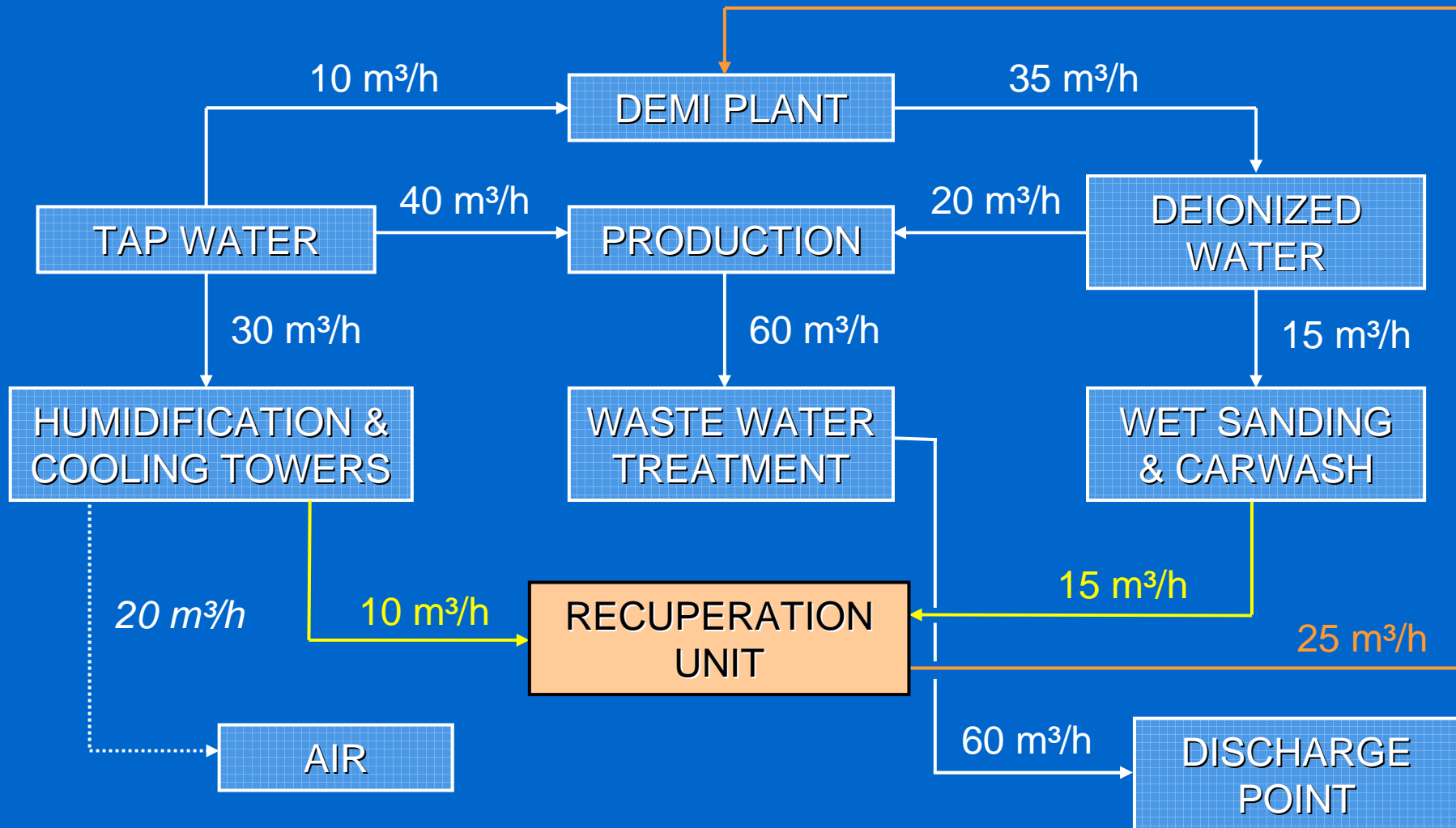
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# Principle of action sand filter

- 1 influent pipe
- 2 overflow pipe
- 3 inlet distributor
- 4 sand bed
- 5 filtrate outlet
- 6 air lift pump
- 7 wash water collector
- 8 washer labyrinth
- 9 wash water outlet
- 10 concrete wall
- 11 tapered bottem



# Waste water flow since 1993



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## Economical balance

### ■ Flow

✓  $25 \text{ m}^3/\text{h} \times 24 \text{ h/d} = 600 \text{ m}^3/\text{d}$

### ■ Investment cost

✓ approximately 15 000 000,- BEF

### ■ Savings

✓ cost price tap water	36,- BEF/m <sup>3</sup>
✓ cost price tap water → deionized water	19,- BEF/m <sup>3</sup>
✓ cost price recuperated water → deionized water	12,- BEF/m <sup>3</sup>
✓ saving per m <sup>3</sup> recuperated water	43,- BEF/m <sup>3</sup> (5 805 000,- BEF/y)
✓ saving in waste water treatment plant	20,- BEF/m <sup>3</sup> (2 700 000,- BEF/y)
<b>→ TOTAL SAVING PER YEAR</b>	<b>8 505 000,- BEF/y</b>

**(Pay-back period : 21 months)**





# Waste water flow Volvo Gent

