

### LISBON WASTE WATER SYSTEM





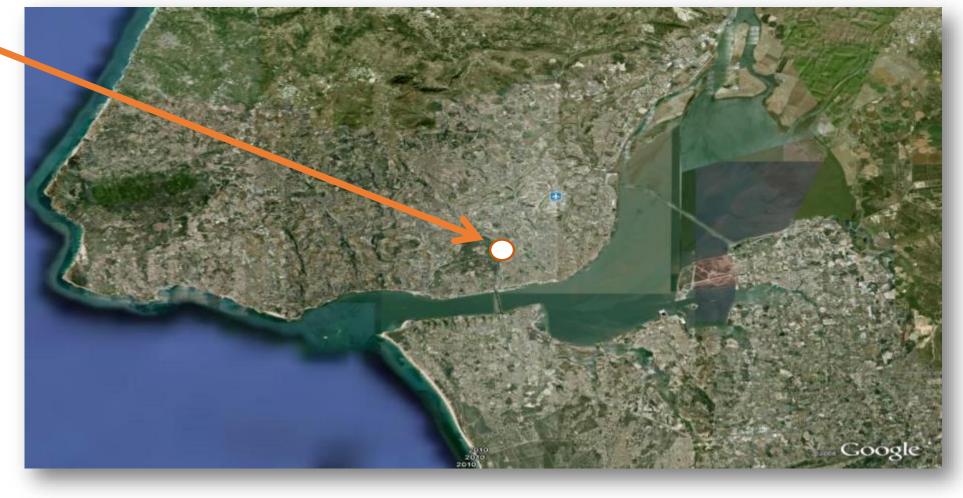
### LISBON WASTE WATER TREATMENT SOLUTION: ALCÂNTARA SUBSYSTEM





# ALCÂNTARA WASTE WATER TREATMENT PLANT







### ALCÂNTARA WASTEWATER TREATMENT PLANT

• **Population served** 750,000 inhabitants-equivalent

• **Flow** Max: 3.3 + 3.3 m3 /s

#### Infrastructures

Wastewater treatment plant
Pumping stations
km of main sewers





### ALCÂNTARA : SYSTEM CONFIGURATION



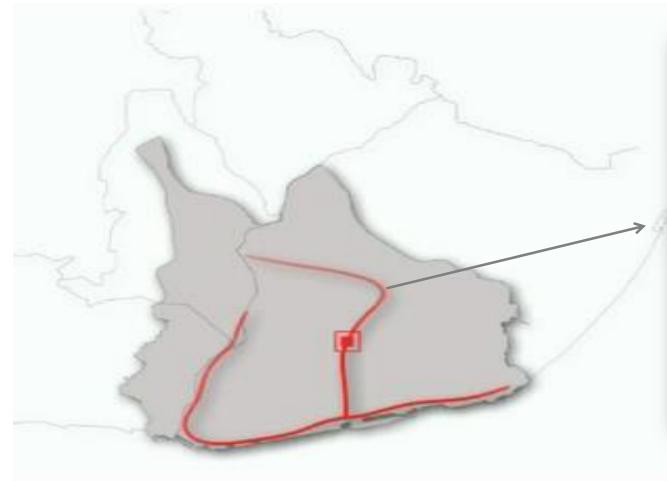


### ALCÂNTARA : SYSTEM CONFIGURATION





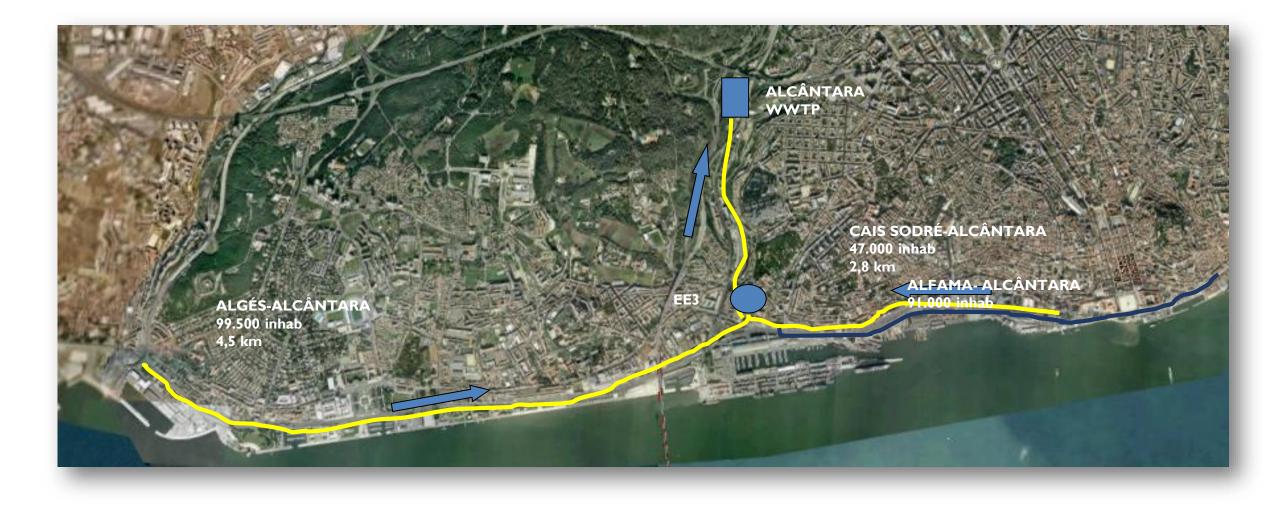
### ALCÂNTARA : SYSTEM CONFIGURATION







### ALCÂNTARA : LOW AREA SYSTEM CONFIGURATION





#### System Configuration – Alfama / Cais do Sodré

100% Dry Weather (DW)

**First-flush** 

Tide Valves Rua Augusta/Rua Prata 4 x DW Peak Flow : 1615 I/s

Tide Valves Rua Ouro 4 x DW Peak Flow : 455 l/s PS Terreiro do Trigo 2 x DW Peak Flow: 110 l/s

> PS Fluvial 2 x DW Peak Flow : 130 l/s

PS Agências 2 x DW Peak Flow : | | 00 |/s

> Emissário da EE Agencias 2 x DW Peak Flow : | | 00 l/s

Gravitic

Pressure

19 2008 - Skyline Sonsvare Systems, Inc.



#### System Configuration – Cais do Sodré / Alcantara





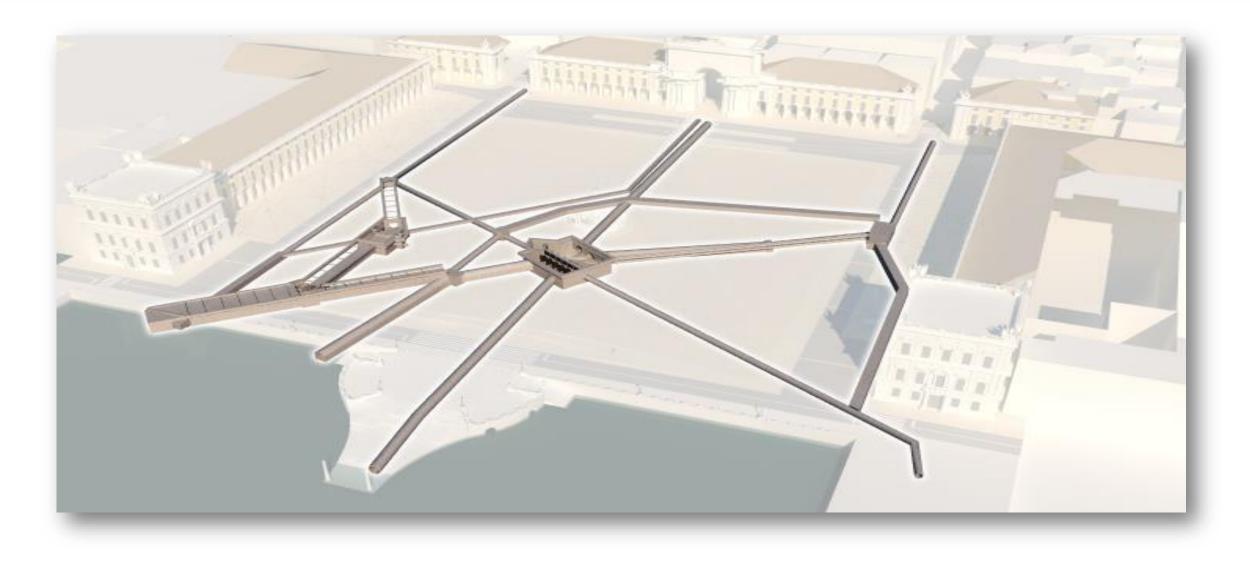
#### TERREIRO DO PAÇO – TIDE & FLOW CONTROL







### TERREIRO DO PAÇO - TIDE & FLOW CONTROL





#### TERREIRO DO PAÇO – TIDE & FLOW CONTROL





#### ALCÂNTARA SUBSYSTEM INVESTMENT

# Global Subsystem investment: I8I M€

### • WWTP: 64.4 M€

• EU Funding (Cohesion Fund): **II.0 M**€







### ALCÂNTARA WWTP

#### Before:





## ALCÂNTARA WWTP

- Primary Treatment since 1989
- Advanced Primary Treatment since 2003
- Secondary Treatment since 2009
- Population Served: 750,000 eq.hab
- Treated flow: 570,240 m3/day
- Load: BOD5: 99,792 kg O2/day
  - COD: 285,120 kg O2/day
  - SS: 114,048 kg/day





# Alcântara WWTP

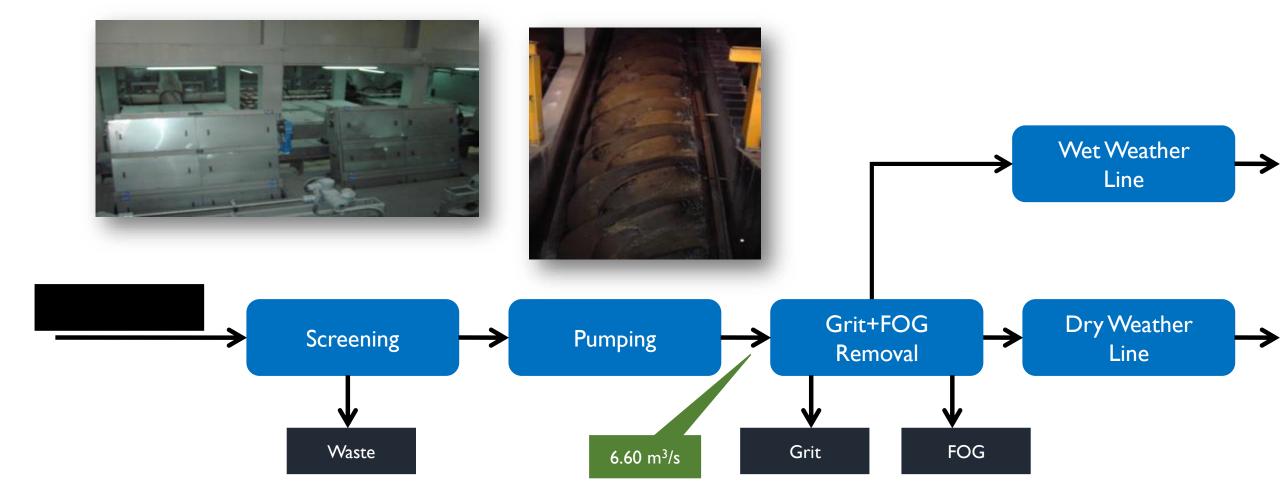
- Peak flow (dry weather): 3.3 m3/s
- Peak flow (wet weather): 6.6 m3/s (13.2 m3/s)
- Plant Objectives:
  - BOD: 25 mg O2/L
  - COD: 125 mg O2/L
  - SS: 35 mg/L
  - E.Coli: 2,000 Un/100 mL (option)



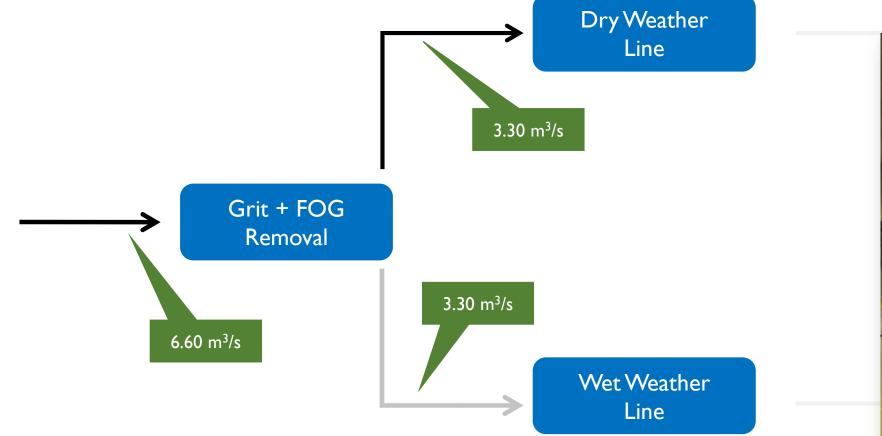








### ALCÂNTARA WWTP WASTE WATER TREATMENT LINE



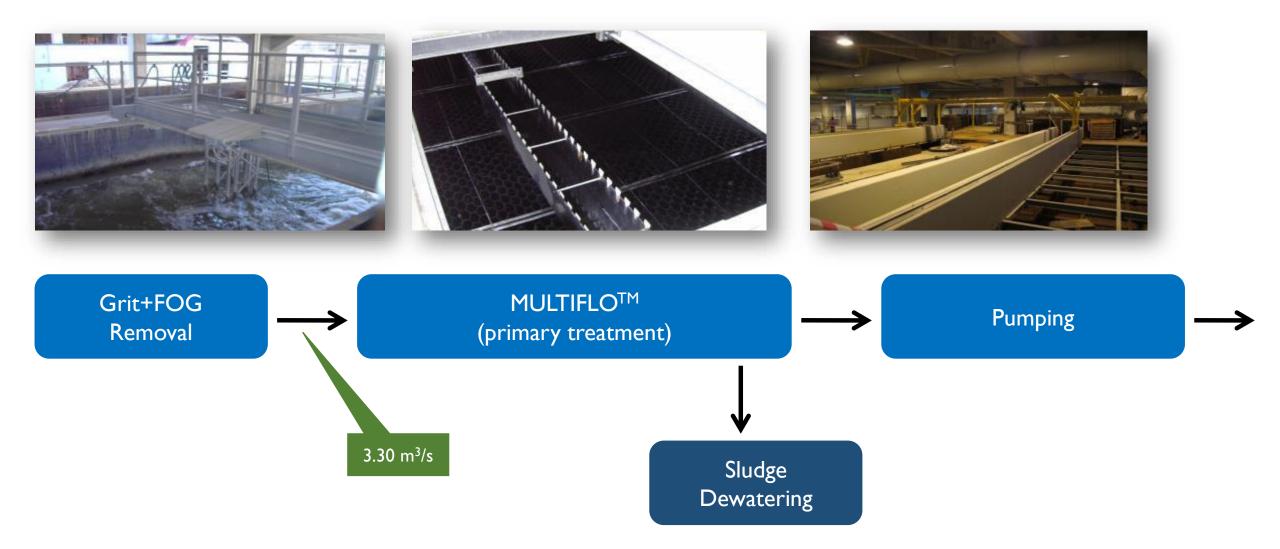
**EPAL** 

Grupo Águas de Portugal



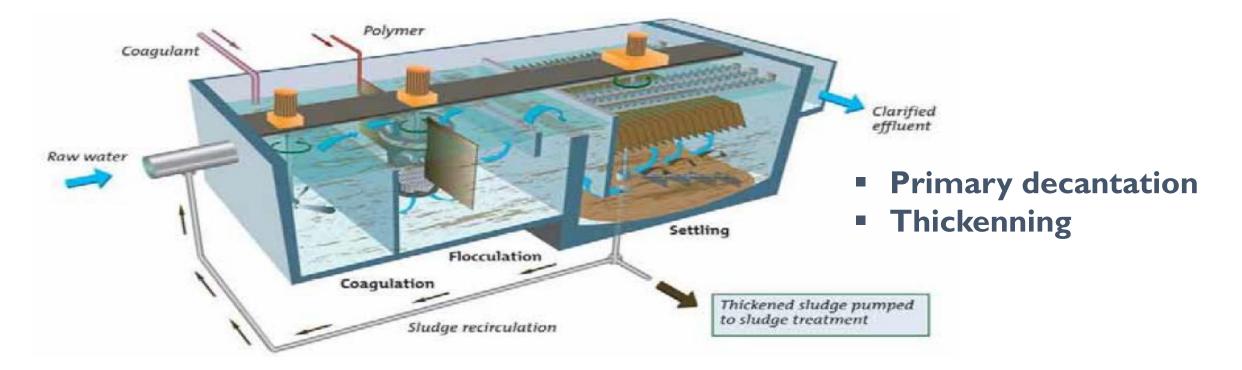


### ALCÂNTARA WWTP Dry Weather Treatment Line





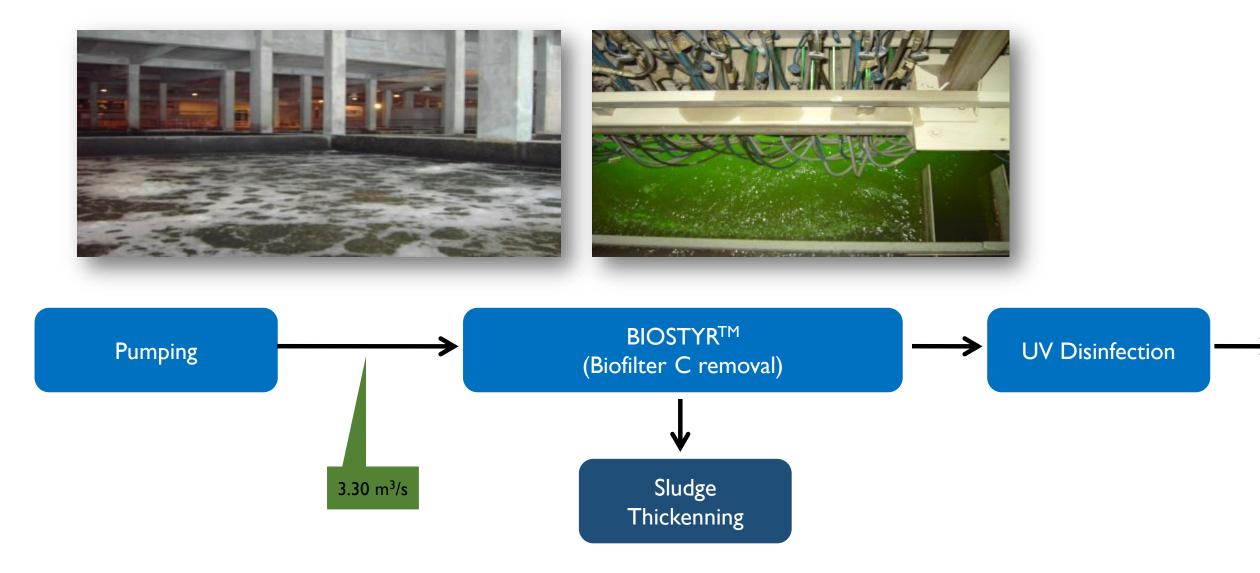
### Alcântara WWTP – Treatment Line MULTIFLO<sup>TM</sup>



- I 2.8 m3/m2.h
- No chemicals (Dry Weather)
- Sludge recirculation
- Option (iron chloride + flocculant)

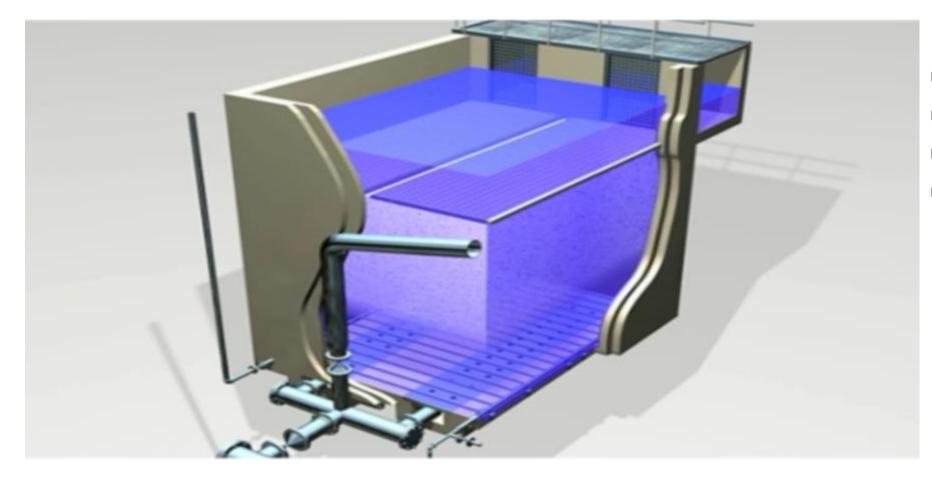


### Alcântara WWTP Dry Weather Treatment Line





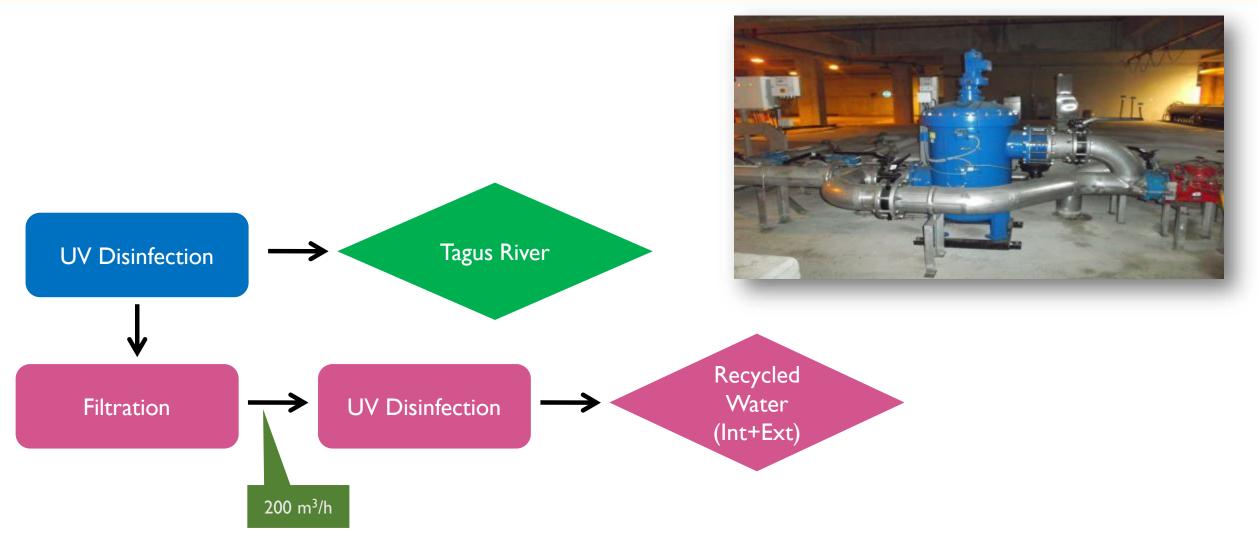
### Alcântara WWTP – Treatment Line BIOSTYR<sup>TM</sup>



- I 5 units
- 215 m2/unit
- Media depth: 3,8 m
- Media size: 3,5 mm

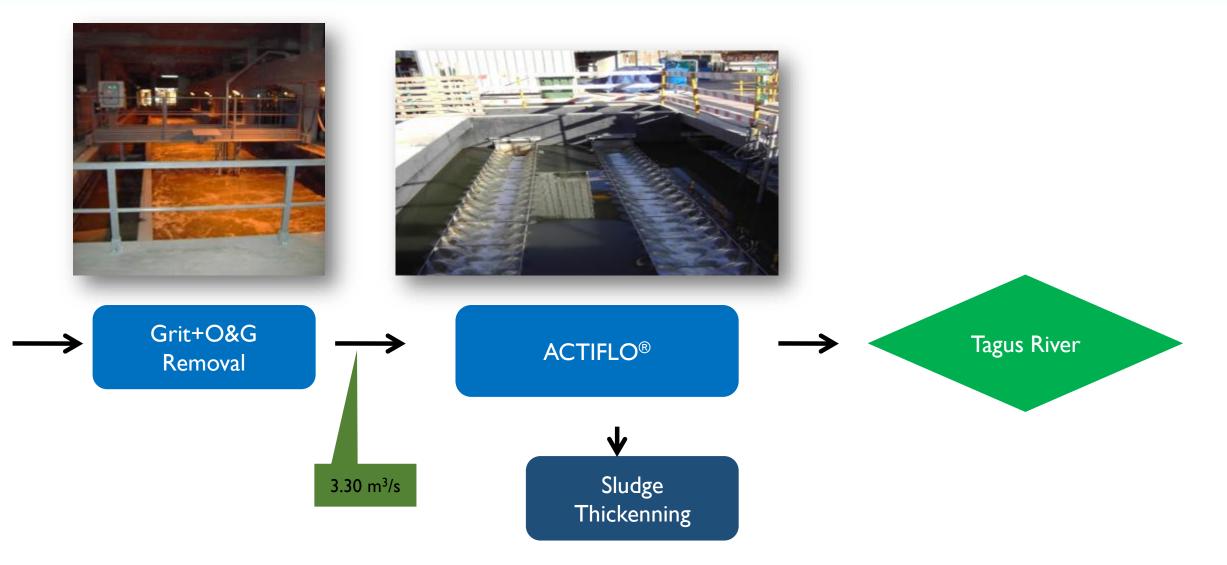
### ALCÂNTARA WWTP Dry Weather Treatment Line





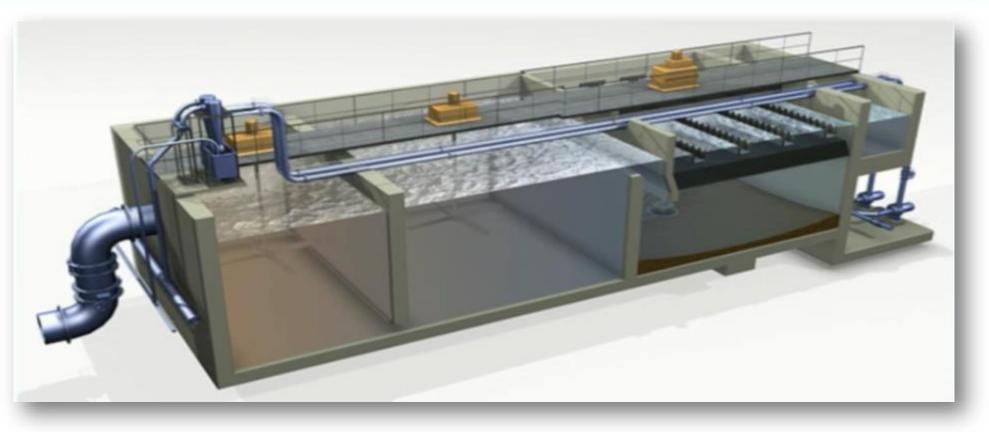
### Alcântara WWTP Wet Weather Treatment Line







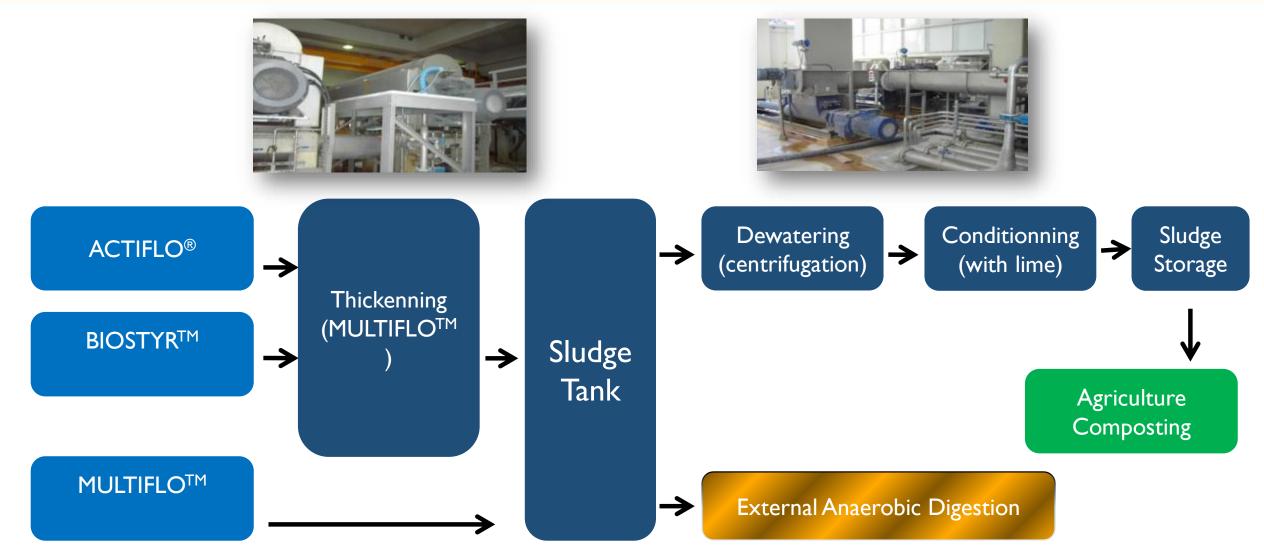
### ALCÂNTARA WWTP – TREATMENT LINE ACTIFLO<sup>TM</sup>



- Iron chloride + micro-sand + flocculant
- I 20 m3/m2.h
- 80% SS removal; 60% BOD/COD removal

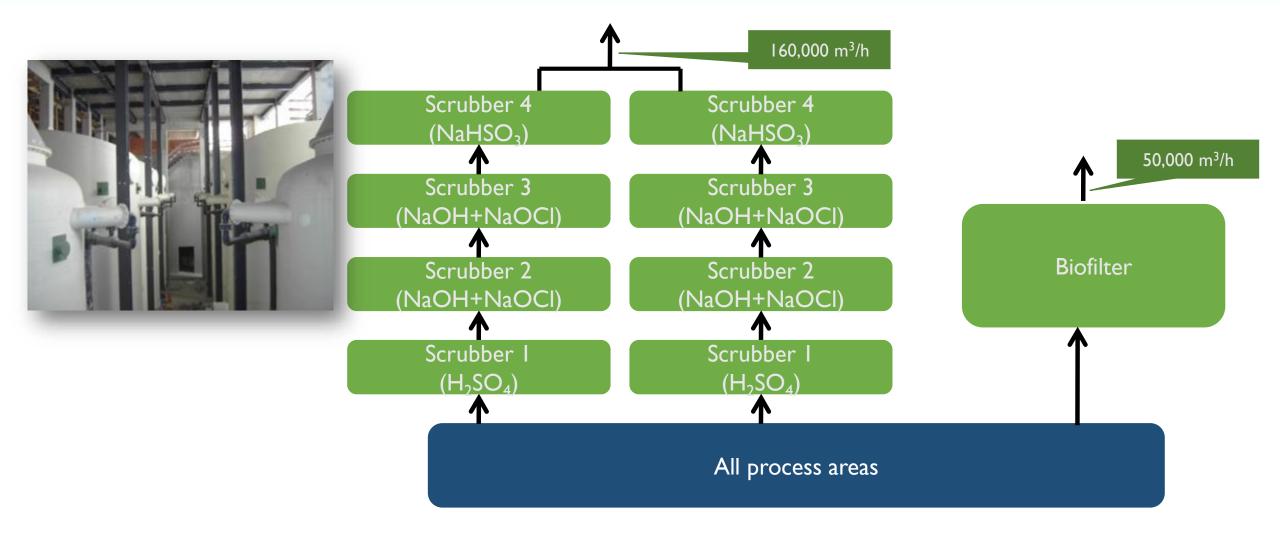






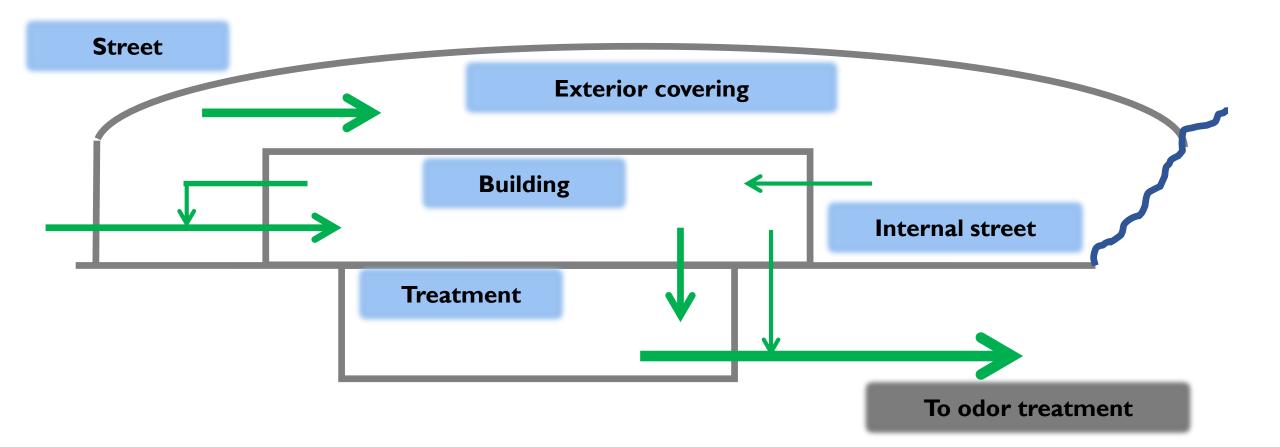


### ALCÂNTARA WWTP – TREATMENT LINE ODOR CONTROL





### ALCÂNTARA WWTP – TREATMENT LINE ODOR CONTROL - PRINCIPLES





### ALCÂNTARA WWTP - GREEN ROOF





- Thermal insulation of buildings (less electrical consumption)
- CO2 fixation
- Noise reduction (internal and external)
- Rain retention
- Landscape integration

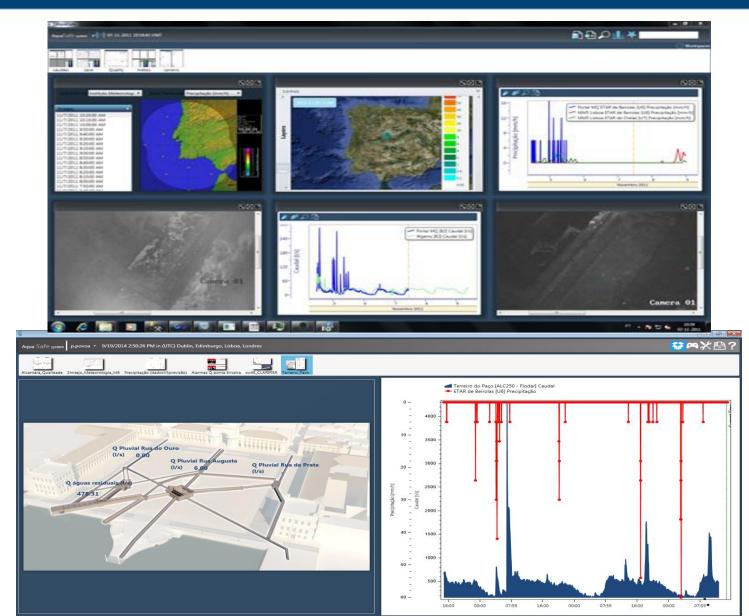


### Alcântara WWTP - Green Roof



# AQUASAFE





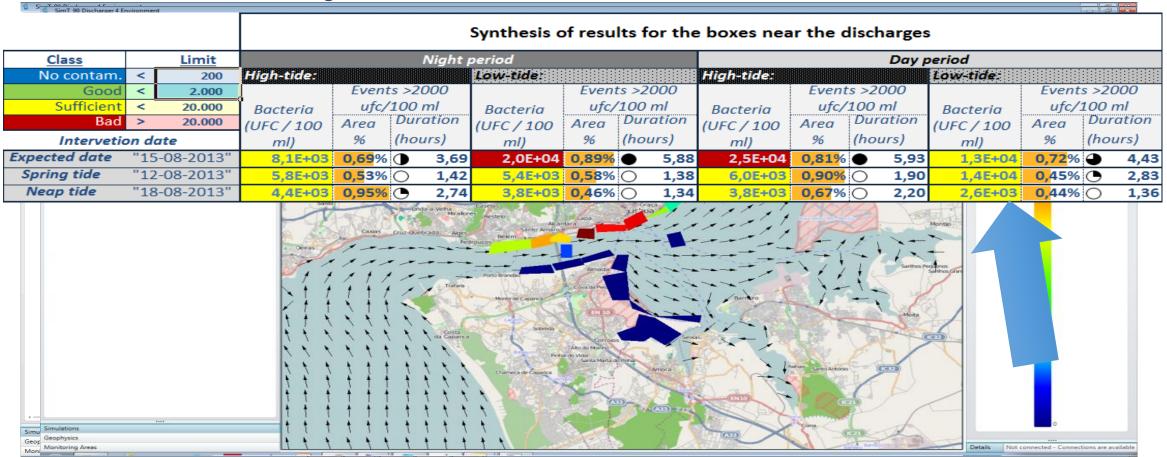


### SIMT\_90 INNOVATION – SMART EFFICIENCY

#### SIMT\_90 SMART OPERATION

#### **Real case example:**

- Emergency stoppage intervention in the Agências Pumping Station.
- What is the most suitable timing for the intervention?





### LISBON FACING TAGUS ESTUARY

### THANK YOU

