



Demo Site No. 10a: Thirasia Island, Greece

Solar photocatalysis and ultrafiltration as pre- and post-treatment for CW at full scale in small insular communities

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General Description of the Demo Site



- **Thirasia is part of the volcanic island group of Santorini (Thira), in the Aegean Cyclades complex**
 - Area: 9.3 km²
 - Permanent population: 319 inh. (2011)
 - Seasonal residents & tourists: 1,350 (2013)
- **Negative impacts on natural & socio-economic environment due to untreated WW**
 - Pollution
 - Slope erosion & landslide risk
 - Severe contamination of groundwater & marine environment
 - Deterioration in quality of life
 - Impacts on tourism

The WWTP of Thirasia

- **Currently under construction**
- **Served settlements**
 - Manolas (capital of the island)
 - Potamos
 - Agrilia
- **30 year time horizon**
 - Projected population in the final phase
 - 400 permanent population
 - 1,292 seasonal residents & tourists
- Maximum daily capacity (year 2045): 213 m³/day



Location of the WWTP & of the served settlements (Google Earth, 2016)

Expected Benefits of the Demo Site

- **Reliable performance & improved quality of treated WW**
- **Environmental protection**
- **Low operational & maintenance costs**
- **Increased system marketability in similar conditions**
- **Improved quality of life**

cNES for Wastewater Treatment

Innovative unconventional treatment methods implemented for the first time in full scale, using soft energy sources

Engineered Systems

Pre-treatment

- Screening & grit removal

Post-treatment

- Pre-chlorination tank
- Tertiary treatment
 - Ultrafiltration membranes
- Disinfection
 - Chlorination –
 - Dechlorination

Natural Systems

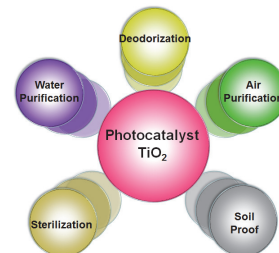
Solar heterogeneous photocatalysis

- Degradation tanks
 - Catalyst: TiO₂
- Sedimentation tanks

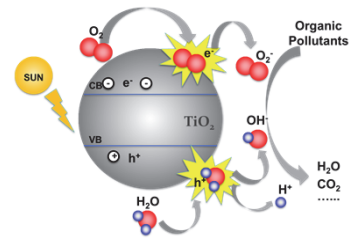
Constructed Wetlands

- 2 parallel horizontal flow reed beds
- Equalization basin

TiO₂ Photocatalysis: A Cutting-edge Technology

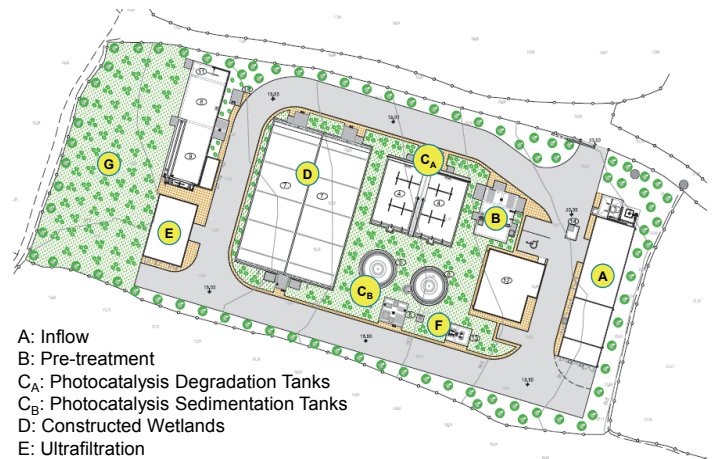


Applications of TiO₂



Photocatalytic action of TiO₂

Overview of the WWTP



- A: Inflow
- B: Pre-treatment
- C_A: Photocatalysis Degradation Tanks
- C_B: Photocatalysis Sedimentation Tanks
- D: Constructed Wetlands
- E: Ultrafiltration
- F: Bag Filters for Sludge Dewatering
- G: WW Reuse

Reuse of Treated Wastewater

- **Irrigation of public spaces**
- **Aquifer recharge through subsurface disposal**
- **Fire protection**

