CASE STUDY

A Sustainable Wastewater Treatment and Reuse Solution for Commercial Properties

MIRAGGIO THERMAL SPA RESORT, GREECE

Problem A new luxury resort was planned for a scenic location just outside the small Greek village of Paliouri. With no municipal sewer available, the investors needed a decentralized wastewater treatment system. The system would have to consistently meet discharge limits, allow for future expansion, and offer low life-cycle costs. Also, it would need to operate with minimal odor or sound, so as to go unnoticed by guests.

Solution Investors chose an AdvanTex Wastewater Treatment System, along with a six-year service contract from Orenco distributor Dialynas S.A. The AdvanTex system met each of the key project requirements: reliability, expandability, and low operation and maintenance costs. Plus, according to the resort's maintenance manager, "the system operates 24/7, with no sound or odor."

Luxury Resort Chooses AdvanTex® for Reliability and Low Life-Cycle Costs

The Miraggio Thermal Spa Resort on the Greek peninsula of Chalkidiki is billed as "a dream destination, an oasis of luxury." With a grand opening in 2016, the resort features a 300-room hotel, four restaurants, and six bars. Additional attractions include a variety of water sports, archery, horseback riding, and beach volleyball, plus a full range of fitness classes and spa therapies.

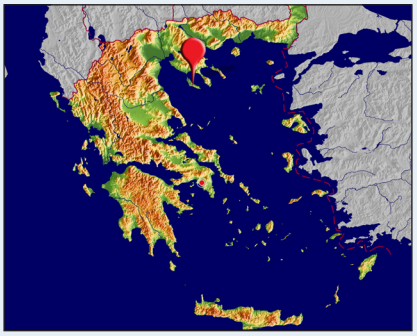
During the planning stages for the resort, investors had a problem to solve: how to provide wastewater treatment services to the site when no gravity sewer was available.

An AdvanTex Treatment System handles up to 240 m^3/day (63,400 gpd) of wastewater at the Miraggio Thermal Spa Resort in Greece. The effluent meets strict quality standards, and the system can be expanded to allow for future growth at the resort.

Commercial — Reuse Market

Project Overview

CHALKIDIKI PENINSULA, GREECE



Design Parameters
- 300-room luxury hotel with marina
- Four restaurants and six bars
- 200 m^3/day (52,800 gpd) average design flow
- 240 m^3/day (63,400 gpd) peak design flow

Treatment Requirements
- 10 mg/L BOD_5
- 2 mg/L TSS
- 5 CFU/100 mL E. coli

Mean Effluent Quality*
- 8.7 mg/L BOD_5
- < 1.0 mg/L TSS
- < 1.0 CFU/100 mL E. coli
- 14.1 mg/L TN

Start-Up Date
- May 2016

Project Cost
- Approximately €710,000 ($780,000), including design, shipping, installation, and six-year service contract

Primary Treatment
- 350-m^3 (92,500-gallon) septic tank
- 78-m^3 (20,500-gallon) grease tank
- 400-m^3 (105,600-gallon) recirculation tank

Secondary Treatment
- 22 AdvanTex AX100 units

Tertiary Treatment
- Sand filter for polishing

** Samples collected between 27 June 2016 and 29 August 2016 and analyzed by a third party.*

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MIRAGGIO THERMAL SPA RESORT, GREECE

Not only that, but whatever treatment system they chose had to satisfy each of these conditions:

- Strict discharge limits of 10 mg/L BOD_5, 2 mg/L TSS, and 5 CFU/100 mL E. coli
- Possible future expansion as dictated by the growth of the resort
- Low life-cycle costs for operation and maintenance
- Installation just two meters (6½ feet) from hotel suites without guests being bothered by noise or odors
- Treatment units that could be pleasingly landscaped so as to go unnoticed

These twenty-two AX100s work around the clock, turning wastewater into high-quality effluent, which is then disinfected and reused for landscape irrigation.

After consulting with Orenco distributor Dialynas S.A., the resort's investors agreed that an AdvanTex Wastewater Treatment System would meet every condition. AdvanTex systems use a fixed-film, attached-growth treatment process that is an excellent and reliable solution for highly-variable flow applications like tourist facilities.

Following primary treatment, an AdvanTex system uniformly distributes the wastewater onto an unsaturated textile media. The system uses low wattage fans to draw air through the media and provide sufficient oxygen for aerobic digestion. Low-horsepower turbine pumps operate intermittently with sophisticated controls that automatically adjust pump run-times based on daily flows to meet pre-set recirculation ratios. The controls allow for remote monitoring, so if part of the treatment system needs adjustment, an operator is alerted via text message with no disturbance to the hotel guests.

Unlike most advanced wastewater treatment systems, AdvanTex is extremely energy efficient – using fewer than 2 kWh/3.8 m^3 (1,000 US gallons).[1] And maintenance requirements are minimal, which keeps operational costs low.

There are twenty-two AdvanTex AX100 units quietly doing their job at the Miraggio Resort. Nikos Leontiadis is the Maintenance Manager there. He says, "Just a few feet from the suite's balcony, the [wastewater treatment] system operates 24/7, with no sound or odor. It is hard to believe that below the balcony is the treatment system for all the wastewater of this huge club hotel."

1. Internal tests.

All product and performance assertions are based on proper design, installation, operation, and maintenance according to Orenco's current published documentation. Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of April 2018.

Commercial — Reuse Market

Disinfection
- Chlorination

Reuse Application
- Landscape irrigation

Equipment Supplier
- Dialynas S.A.

"Just a few feet from the suite's balcony, the [wastewater treatment] system operates 24/7, with no sound or odor. It is hard to believe that below the balcony is the treatment system for all the wastewater of this huge club hotel."

– Nikos Leontiadis, Maintenance Manager, Miraggio Thermal Spa Resort

For information about Prelos® Sewer, AdvanTex® Wastewater Treatment, or Orenco Controls™, contact Orenco Systems®, Inc.

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