

C A S E S T U D Y

A Sustainable Wastewater Solution for Residential Properties

ESTHER'S ISLAND RETREAT, MASSACHUSETTS

Problem

Resort developer Scout Capital acquired a 10-acre (4-hectare) parcel on an island off the coast of Nantucket that included a dilapidated structure served by a cesspool. Owner Alan Worden wanted to renovate the site and build a single-family retreat ... a summer home that would sit lightly on the land and be a testing site for sustainable building practices the company could integrate into its other, larger resort properties.

Solution

Working with a variety of "green" consultants, Worden built a 2400-ft² (223-m²) home powered by sun and wind and furnished with eco-friendly materials. He also replaced the cesspool with an energy efficient AdvanTex® Wastewater Treatment System that treats household wastewater to reuse quality. Esther's Island Retreat has qualified for a LEED Silver rating.

Historic Houses May Be Charming, But Historic Cesspools Are Not



The Esther's Island Retreat is a model of sustainable redevelopment and serenity. The project qualified for a LEED Silver rating. Photo courtesy of Thomas G. Olcott.

When resort developer Alan Worden decided to renovate an ocean-front cottage on Esther's Island off the tip of Nantucket, he wanted to create an island retreat with all the ambiance of the historic town across the bay. He also wanted to showcase environmentally sound design, materials, construction practices, appliances, and interior decor – not just to educate the public but also to educate his own development company. Above all, he wanted to protect the island's fragile ecosystem.

So Worden and his designer (Doug Wright), engineers (Tetra Tech Rizzo), and project manager (Jack Whelan, Cross Sound Builders) moved the building site back from the water, surrounded it with protective fencing during construction, and purchased an innovative wastewater system to treat the cottage's waste stream to advanced treatment standards.

Patented by Orenco®, the AdvanTex® Wastewater Treatment System is a 21st-century improvement on a one-hundred-year-old technology – the use of settling basins followed by sand or soil to filter out contaminants. Instead of sand, however, AdvanTex systems use a 21st-century engineered textile fabric housed inside a compact, watertight, fiberglass pod. Energy-efficient effluent pumps percolate the wastewater over the textile in small, even doses, for maximum treatment.

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Project Overview

NANTUCKET, MASSACHUSETTS



Residential Island Property

- 2400-ft² (223-m²), 3-bedroom, 3-bath home
- 10 acres (4 hectares), accessible only by boat
- Completely off-the-grid
- Nantucket Conservation Committee oversight

Effluent Quality*

- 6 mg/L cBOD₅
- 5 mg/L TSS
- 7.8 mg/L TN

Start-up Date

- July 2008

Primary Treatment

- 1,500-gal (5678-L) Orenco fiberglass tank (transported by helicopter)
- Orenco Biotube® Pumping System
- Lift station to splitter valve (for high groundwater)
- Two Orenco VeriComm® Remote Telemetry Control Panels

Secondary Treatment

- One Orenco AdvanTex® AX20 Wastewater Treatment System
- Presby leach field

Operation

- Semi-annual service visit/sampling

* Sample collected on 15 October 2009.

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According to Wastewater Technologies, Inc. (the Orenco dealer who supplied and installed the equipment), the AdvanTex system was shallowly buried with a mini-excavator for minimum disruption to the sandy site, with its high groundwater. Concrete “collars” were poured around the tank, treatment pod, and pump basin to keep them firmly in place. Field Service Manager Dave Mead installed the system and tests it regularly. “It’s running great,” said Mead. His last sample showed excellent treatment, with cBOD₅ of 6 mg/L, TSS of 5 mg/L, and TN of 7.8 mg/L. By comparison, conventional sewers are allowed to discharge municipal wastewater with contaminant levels that are six times higher, or worse.

In “The Perfect House,” an article describing the Esther’s Island Retreat for the March/April 2009 issue of *Ridgefield Magazine*, writer Amanda Bergen described Worden’s new wastewater system this way:

“The old cesspool was replaced by an environmentally sensitive, high-tech septic system and leaching field that is designed to prevent nitrogen runoff into the harbor. Worden says after the wastewater has been through the state-of-the-art system, the water is supposedly clean enough to drink** – though he’s in no hurry to test it.”

The rest of the property’s infrastructure is equally benign. Completely “off-the-grid,” the seven-acre, 2,400-ft² (223-m²) retreat gets its power from the wind and the sun, its drinking water from a well, and its landscape irrigation from collected rainwater. In fact, Esther’s Island Retreat has qualified for a LEED Silver rating.

Why did a developer go to these lengths to create such an environmentally sustainable property? “Consumers want it,” Worden told Bergen, “permitters demand it, and it can save us money.”

** Not advised by Orenco.



An Orenco AdvanTex® Treatment System nestles discreetly in the beach grass. This low-energy, highly reliable media filter replaced the former cesspool and treats this Esther’s Island household’s wastewater to reuse quality. Photo courtesy of Scout Capital.

Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of March 2010.

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This aerial view of the Esther’s Island construction site shows the protective fencing around the project perimeter and the green Orenco fiberglass tank, lying on its side in the foreground.

Photo courtesy of Tetra Tech Rizzo.

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



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