

ThermAer™ Applications Report **Maryville, Tennessee**

2nd Generation ATAD Provides a Green and Sustainable Process

Maryville, Tennessee – The ThermAer™ produces Class A biosolids that are in demand. This community wanted to reuse and recycle, and they got it with ThermAer.

The ThermAer process installed at Maryville accomplishes the following:

- *Solids reduction from approximately 5 dry tons per day to less than 2 dry tons per day*
- *Approximately 65% solids destruction*
- *Up to 27% cake solids off the belt press*
- *Class A EQ odor-free biosolids*
- *Eliminated the demand for lime stabilization*
- *Eliminated disposal costs of biosolids*



2010 plant upgrades included the reuse of inactive activated sludge aeration basins. They now house the ThermAer process.

As a result of an effective and thorough evaluation, the Maryville Regional Wastewater Treatment Plant located in Maryville, Tennessee, installed Tennessee's first ThermAer™ – a 2nd generation Autothermal Thermophilic Aerobic Digester (ATAD). Maryville joins multiple plants throughout the US who have proven that ThermAer is green, cost effective and sustainable.

Maryville, the gateway of the beautiful Great Smoky Mountains, first established a wastewater treatment facility in 1975. This basic plant consisted of a small headworks, primary clarifiers, activated sludge tanks,



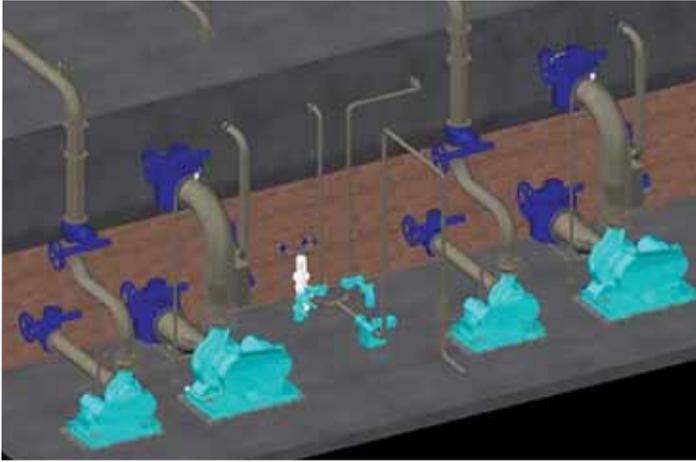
clarifiers and a pump station. The solids were treated using an on-site incinerator. Ash and excess biosolids were disposed of on-site and in a sanitary landfill. Further upgrades such as expanded headwork capabilities, new pumps and clarifiers were made to the facility in the 1990's, increasing the biological capacity to 10 MGD and the hydraulic capacity to 42 MGD. In addition, the facility abandoned the incinerator for lime stabilization in order to meet Class A/EQ standards.

By 2009, Maryville needed another upgrade and they were determined to find a green and sustainable system that would last. Evaluation criteria were developed to address a number of issues such as:

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| • Odors | • Landfill space conservation |
| • Solids reduction | • Class A/EQ biosolids status |
| • Energy conservation | • Compatibility of the final biosolids product with the user market |
| • Operational longevity and costs | |
| • Maintenance | |

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Custom screens allow operators a real-time view of the reactor operations.

By including operator, maintenance, management and engineering personnel, the city of Maryville visited numerous installations to review and observe equipment in operation.

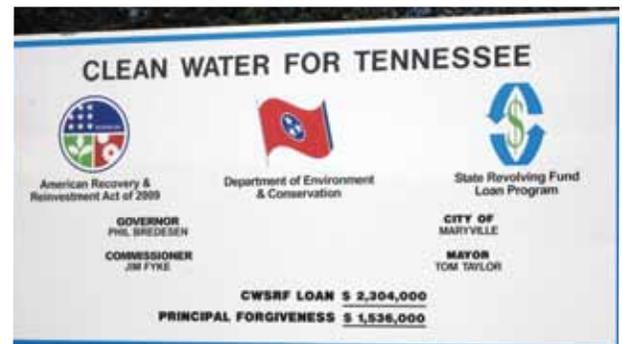
Thermal Process Systems' ThermAer was considered along with anaerobic digestion, mechanical heated dryers, incineration, composting and solar dryers. These processes were evaluated to make certain that they met their primary goals of low odor production, solids volume reduction and final product demand and use. High capital and O&M costs ruled out incineration as well as solar and thermal dryers. The potential energy savings made biogas, derived from anaerobic digestion an attractive option, until the gas production volume revealed that it was impractical. Escalating transportation and tipping fees, and limited landfill space made landfill options unattractive. And finally, finish odors, texture and public acceptance steered Maryville away from the current lime stabilization process to Class A/EQ biosolids directly from the ThermAer process. Maryville has also taken a look to the future and can utilize tree trimmings from the Electric Department in combination with the ThermAer treated material to provide a well-accepted compost product, while further reducing the volume of tree trimmings that have traditionally gone to the landfill.

ThermAer is a system with great versatility to meet a variety of municipal goals and citizen needs.



After careful evaluation, ThermAer provided Maryville the ability to utilize existing tankage, reduced capital cost and provided an odor-free Class A/EQ product.

Plant upgrades included the ThermAer process, 2 new aeration basins with biological nutrient removal, 2 new final clarifiers and modifications to the disinfection system. With these modifications, the facility can treat wastewater to levels cleaner than required by treatment standards and produce a biosolids end product that is acceptable to and desired by the community for beneficial reuse.



The American Recovery and Reinvestment Act assisted Maryville with process improvements designed to support beneficial green projects for biosolids.

The Water Quality Control Department of the City of Maryville selected the Thermal Process Systems approach to treating biosolids, recognizing the TPS commitment to producing an exceptional product, after an extensive review process.

Operational results show that the product from the ATAD is reliably meeting EPA Class A/EQ standards.



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