

**2008 Production:**

- Ⓞ 379,000 tons of waste processed with 89,600 tons of ash produced and used as daily cover at the Landfill
- Ⓞ 219 million kilowatts of electricity generated
- Ⓞ \$11.9 million of electric revenue
- Ⓞ 5,876 tons of metal recovered and recycled
- Ⓞ \$1,379,618 of recycled metal revenue

**Total Production to Date:**

- Ⓞ 6.4 million tons of waste processed with 1.6 million tons of ash produced and used as daily cover at the Frey Farm Landfill
- Ⓞ 3.75 billion kilowatts of electricity generated, enough energy to power all of Lancaster County's homes for 3 years
- Ⓞ \$223 million in electric revenue
- Ⓞ 108,000 tons of metal recovered and recycled

The Resource Recovery Facility (RRF) has a very important role in Lancaster County's integrated solid waste management system. In operation since 1991, the RRF has the capacity to process up to 1,200 tons of waste per day.

It creates clean renewable energy (electricity) from the combustion of non-hazardous solid waste, and the sale of electricity creates revenue for the Authority. The RRF also extracts metals for recycling.

But perhaps the most important aspect of the facility is that it reduces the volume of waste processed by 90%, thus extending the life of the Frey Farm Landfill by 19 years. Instead of 10 truckloads of waste going directly to the Landfill, the waste goes to the RRF where it is combusted and converted to one truckload of ash. The ash is then trucked to the Landfill where it is used at the end of every day as protective cover instead of valuable soil. If the \$126 million investment in this state-of-the-art facility had not been made, the Frey Farm Landfill would have been filled in 2001. Instead it is projected to last until about 2020.

*Waste Processing System*

**Combustion**

An overhead crane mixes the waste in the storage pit to ensure even combustion before feeding it into one of the 3 independent furnaces.

- Ⓞ Each furnace, burning at over 1,800° F, has a daily processing capacity of 400 tons and operates 24 hours a day, 7 days a week.

**Production of Electricity**

Boiler water in tubes surrounding each furnace is converted into steam.

- Ⓞ Steam in excess of 800° F spins the turbine, which is connected to a generator that produces about 36 megawatts of electricity.
- Ⓞ The plant uses 4 –5 megawatts and the remainder is sold to First Energy for distribution to its customers.

**Water Source**

Effluent from the Elizabethtown Borough Waste Water Treatment Plant, that was previously discharged into the Susquehanna River, provides the 550,000 gallons of water needed every day for cooling, emissions control, ash quenching and other uses.

# Resource Recovery Facility



**Resource Recovery Facility located in Bainbridge, PA  
Conoy Township, Lancaster County**

Owned by Lancaster County Solid Waste Management Authority and operated by the designer, Covanta Lancaster, Inc.

- Ⓞ Extensive treatment of the effluent on-site is required to generate boiler quality water. A reverse osmosis water treatment system was installed in 2007, eliminating the need for hydrochloric acid and reducing the volume of caustic soda used.
- Ⓞ Since 1991, the RRF has removed over 3,600 tons of solids from the effluent. Over the lifetime of the RRF, an estimated 7,500 tons of solids will be prevented from reaching the Chesapeake Bay.
- Ⓞ The RRF is a member of "Businesses for the Bay", a voluntary pollution prevention program.
- Ⓞ No wastewater leaves the zero-discharge facility; all wastewater is treated on site and recycled within the system.

**Emissions Control**

Emissions at the RRF are well below levels set by the PA DEP with an average of 99.7% emissions compliance over the past 10 years. Several emission control systems are continuously monitored.

- Ⓞ Aqueous ammonia and hydrated lime are injected directly into the combustion chamber of each furnace to control nitrogen oxide and acid gas emissions, respectively.
- Ⓞ Semi-dry scrubbers are used to further lower acid gas emissions.
- Ⓞ Activated carbon is injected directly into the gases leaving the boilers for mercury emissions control.
- Ⓞ The treated gases enter a fabric filter baghouse for removal of suspended particulate matter.
- Ⓞ The cleansed air finally exits the stack, 305 feet above ground.

**Ash Handling**

Reacted salts and fly ash (particulate matter) from the scrubber and baghouse are conditioned with water and then combined with the bottom ash from the furnaces. Conveyors transport the ash to a building for metals recovery.

- Ⓞ The ferrous recovery system removes metals containing iron, using a magnet.
- Ⓞ A non-ferrous recovery system was installed in 2007 to remove aluminum, copper, brass and other precious metals.
- Ⓞ The metals are sold to recycling markets.
- Ⓞ The remaining ash is taken to the landfill to be used as daily waste cover.