

NAWTEC13-3160

Ash Management and Metals Recovery in Broward County, FL

Ram Tewari, PhD, PE, DEE

Sandy Gutner, PE

Introduction

Broward County (the County), which is located on the southeast coast of Florida, is currently faced with an ash management and metals recovery decision. The County has two mass burn resource recovery plants and they process a combined total of approximately 1.65 million tons of MSW. The ash residue from these two facilities is currently landfilled. At one facility, the South Broward Waste-to-Energy Facility (the South County Facility), ferrous was being recovered at the ash monofill using mobile equipment, as the plant was not equipped with metals recovery equipment. But as market prices dropped, so did the ferrous metals recovery. This has adversely affected the useful life of the ash monofill, owned by the County. The County is looking for a cost - effective alternative for an on - line metals (ferrous and non - ferrous) recovery system.

In processing municipal solid waste at waste-to-energy facilities, the primary by product (by weight) is ash residue, which typically represents about 30 percent by weight and 10 percent by volume of the incoming materials. The ash residue contains unburned material, of which a significant percent is metal. The most common type of metal is ferrous metal which is magnetic and easily recovered using magnetic material handling equipment. In addition, some facilities have been recovering non-ferrous metals which although limited in quantity, are of significantly greater value on a unit basis in the secondary materials markets.

Recent projections indicate that the ash monofill will reach capacity around December 2010. The Solid Waste Disposal Services Agreement (SWDSA) between the County and operator is projected to terminate in August 2011. The increasing market value of recovered materials combined with the declining landfill capacity prompted the County to consider implementing a metals recovery system.

Approximately 35 to 40 percent by weight of the metal recovered is ash that is stripped away from the metal during processing, and returned to the ash monofill for disposal (this is called "return ash"). This manual approach to recovering metals at the point of disposal is highly inefficient, as it requires double handling of the material and results in a high return ash component. A third party firm, NAMCO currently operates for about 10 to 12 hours per day, 5 days per week.

The most common approach to recovering metal at a waste-to-energy facility is the use of screening equipment for removal of large material, and magnetic recovery of ferrous metals, as the ash is discharged from the combustion unit into the waiting transfer trailer. The recovered metal is discharged into a concrete bunker for loading when sufficient amounts are collected.

Ash Handling Alternatives

A number of alternatives were considered for handling ash residue from the South County Facility, including:

- Maintaining the Status Quo