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Suspension Firing - The Heart of An Integrated Waste-to-Energy System

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ABSTRACT

Initially, Waste-to-Energy Systems were built for the sole purpose of reducing the volume of waste to be landfilled. The energy released by burning waste was converted to steam and electricity which was used to operate the facility and surplus energy was sold. With increased public interest in recycling and conservation of resources, a heirarchy established by EPA integrating waste disposal into four acceptable approaches, Reuse (of products), Recycling (of the materials in the waste for new uses), Waste-to-Energy (burning of the wastes to produce energy) and, as a last and least desirable solution, landfill. This paper examines the Integration of waste disposal activities after delivery of the waste to a Waste-to-Energy Facility.

In 1989, Energy Answers Corporation (EAC) opened the SEMASS suspension-fired 2700 tons per day facility in Rochester, Massachusetts. The technology minimizes landfill needs by accomplishing extremely good burnout of the waste and by recovering for recycling virtually all the valuable materials in the bottom ash. Efficient energy recovery as accomplished at SEMASS can encourage development of industries nearby by providing low cost energy and recovered metals are a source of raw materials. The Boiler Aggregate™ produced at SEMASS, can replace natural aggregates in concrete and asphalt applications. The system also has been shown to be capable of burning selected industrial wastes, high moisture wastes and sewage sludge which can be a useful service for the industries.

This paper discusses EAC's experience at providing significant integration and presents a roadmap for development of further integration in the future. The paper also presents the case for private development in which communities could be shareholders but where technical and managerial decisions remain in the hands of private management.

INTEGRATION OF WASTE DISPOSAL, ENERGY AND RECYCLING

There has been a great deal of talk about "Integration" of Waste Disposal Services and yet little indication as to what is meant by the term. With increased public interest in recycling and conservation of resources, the United States Environmental Protection Agency some ten years ago developed a concept of an Integrated Waste System. Under the protocol established by EPA, waste handling was prioritized into four distinct steps, Reuse (of products), Recycling (of the materials for different uses), Waste-to-Energy (burning of the wastes to produce energy) and, as a last and least desirable solution, landfill. This paper examines the Integration of Waste Management after the first two steps have taken place and stresses the need for technology which will enable additional recycling of material and minimization of landfill.