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ADDING METALS RECOVERY SYSTEMS (MRS) TO EXISTING WASTE-TO-ENERGY FACILITIES

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INTRODUCTION

The prices for ferrous (Fe) and non-ferrous metals (NFM) reclaimed from the ash at waste-to-energy (WTE) facilities continue to increase. As a result, existing WTE plants are installing metals recovery systems (MRS) to capture most of these metals. These systems provide increased revenues to the facility, increased facility recycling rates, and a decrease in the quantity of ash disposed of at a sanitary landfill. This paper will review MRS economics and the permitting, design, equipment purchase, construction, and startup (where applicable) of these systems at three WTE facilities.

EXISTING FACILITIES ADDING METALS RECOVERY SYSTEMS

The three existing WTE facilities reviewed in this paper not only vary in nameplate municipal solid waste (MSW) daily throughput, but, in the ability to process bottom ash (BA) and/or combined ash (CA). The preferred option is to remove fly ash (FA) from the MRS in order to reduce screen plugging and overall maintenance costs associated with the new system. Table 1 lists the three facility sizes, type of ash being processed, and the recovered metals.

Facility A had no metals recovery equipment as part of the original WTE design. CA (including metals) was hauled to an adjacent landfill and some Fe metals were extracted from the ash piles via a crane-operated electromagnet. The solid waste permit for the WTE facility required that, if metals were extracted in the future, only BA would be processed. Thus, the

FA bypasses the MRS and is added to the BA on the belt conveyor prior to truck loadout.

Facility	MSW Throughput (tpd)	Ash Types Processed	Recovered Metals
A	2250	BA	Fe, NF
B	1500	BA or CA	Fe, NF
C	1000	CA	NF

TABLE 1. WTE FACILITIES ADDING MRS

Facility B was designed with a drum electromagnet for Fe removal. However, this magnet was no longer functional and a complete new system (similar to that used in Facility A) was required including a FA bypass system. Two key differences in Facility B compared to Facility A were: 1) no redundancy in the ash loadout conveyor system, and 2) no limitations on ash to be processed (i.e., BA or CA).

Facility C has a completely intact Fe recovery system. Thus, the only need at this facility was the addition of an eddy current separator (ECS) for NF removal, and ancillary feed and discharge conveyors.

SAMPLE FINANCIAL ANALYSIS

The recent demand to provide additional metals recycling systems equipment was driven by higher Fe and NFM pricing. However, as shown in Figure 1, NFM pricing has shown a dramatic increase over the past few years and has been the financial motivator for the addition or expansion of MRS. For