

NAWTEC17-2301

WASTE COMBUSTOR ASH UTILIZATION

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ABSTRACT

The incorporation of municipal solid waste combustor (MWC) ash into bituminous pavements has been investigated in the United States since the middle 1970s. Thus far, most, if not all of these projects, have attempted to answer the questions: Is it safe? Is it feasible? Or does it provide an acceptable product? Polk County Solid Waste located in Northwest Minnesota has now completed three Demonstration Research Projects (DRP) utilizing ash from its municipal solid waste combustor as a partial replacement of aggregate in asphalt road paving projects. The results of these projects show no negative environmental or worker safety issues, and demonstrate improved structural performance and greater flexibility from the ash-amended asphalt as compared to conventional asphalt. Polk County has submitted an application to the Minnesota Pollution Control Agency (MPCA) to obtain a Case-Specific Beneficial Use Determination (CSBUD), which would allow for continued use of ash in road paving projects without prior MPCA approval. However, concerns from the MPCA Air Quality Division regarding a slight increase in mercury emissions during ash amended asphalt production has resulted in a delay in receiving the CSBUD.

Polk County decided to take a different approach. In January 2008, Polk submitted and received approval for their fourth ash utilization DRP. This DRP differs from the first three in that the ash will be used as a component in the Class 5 gravel materials to be used for a Polk County Highway Department road rebuilding project. The project involves a 7.5 mile section of County State Aid Highway (CSAH) 41, which conveniently is located about 10 miles south of the Polk County Landfill, where the ash is stored. The CSAH 41 project includes the complete rebuilding and widening of an existing 7.5 mile paved road section. Ash amended Class 5 gravel would be used in the base course under the asphalt paving, and also in the widening and

shouldering sections of the road. The top 2 inches of the widening and shouldering areas would be covered with virgin Class 5 and top soil, so that all ash amended materials would be encapsulated. This has been the procedure followed in previous projects. No ash will be used in the asphalt mix for this project.

This paper discusses production, cost, performance and environmental issues associated with this 2008 demonstration research project.

1.0 INTRODUCTION

The Polk County Solid Waste Department, located in Polk County, Minnesota, participates in an integrated solid waste management system that includes four other counties in Northwest Minnesota. One component of this system includes the operation of a Waste-To-Energy (WTE) plant that receives and processes approximately 33,500 tons per year of residential and commercial municipal solid waste. The plant consists of two 40 ton per day starved air, mass burn waste combustors with dry sorbent duct injection and electrostatic precipitators (ESP) as the air pollution control technology. The facility began full operation in 1988. The ash generated by the waste combustors is deposited in lined ash monofill cells at the Polk County Landfill.

In 1996, Polk designed and installed an up-front separation facility, or materials recovery facility (MRF), to remove recyclable, non-processible, and objectionable materials prior to incineration. Most of the extracted materials are recycled or reused.

In 2000, Polk began construction of an air pollution control retrofit project designed to meet EPA revised air emission guidelines. This project upgraded the ESP's and added dry sorbent reagent duct injection, and in 2003 Polk achieved compliance with the revised regulations. In 2008, Polk