

ODOR CONTROL ABATEMENT STUDY No.1

A Midwest Landfill Recycling & Disposal Facility
September and October 1994

Waste Management, Inc. conducted a qualitative study of two new products for use as an odor control adsorbent at a midwest landfill, recycling & disposal facility in Wayne, MI (suburban Detroit). The products tested were KZN 100 and KZI 600. Both of the products evaluated were in a granular form.

The principal reason for evaluating KZN 100 and KZI 600 for odor control has to do with their physical properties. KZN and KZI grade materials are regularly used in various air and gas separation processes because of their molecular sieve properties, and their ability to effect cation exchanges. Further, they are used for soil buffering and various agricultural applications. It is these two features, i.e., molecular sieve and cation exchange, that allow the materials to trap the certain foul smelling gas molecules, such as hydrogen sulfide, -mercaptans, and di-methyl disulfide, etc.—these are the molecules commonly found in composting, sludges, and landfills--into the pore structure of the materials.

KZN and KZI materials do this by making use of principles of physical chemistry. The surfaces of these materials have a naturally occurring negative (-) electrical charge that allows them to attract certain sulfur-hydrogen banded molecules and to trap the molecule because of weak van der Waals forces or weak hydrogen bonds. In this way zeolites prevent the hydrogen-sulfur containing molecules from becoming airborne where they affect the sense of smell. with their characteristic malodors.

In this study KZN 100 and KZI 600 were applied to the surface of the landfill for the suppression of odors. It was determined that these materials were very effective in reducing odors coming from the decaying materials in the landfill because they did, in fact, trap the sulfur-containing molecules. The KZI 600 material is a KZN 100 base substrate that has been impregnated with 6% KMnO4 (potassium permanganate) that has superior oxidizing impact on odors and generates nascent oxygen.

These materials are packaged as follows:

KZN-100	KZI-600
50 lb. Kraft, poly-lined bags	50 gallon plastic drums
2000 lb. Supersacks	5 & 6 gallon plastic pails