

AN ABSTRACT OF A THESIS

**THE WILLIAMSON COUNTY, TENNESSEE, AERATED BIOREACTOR
LANDFILL: CELLULOSE, LIGNIN, AND BMP TESTS
CONDUCTED ON MUNICIPAL SOLID WASTE**

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An aerated bioreactor landfill equipped with leachate recirculation and influx of pressurized, atmospheric air is located in Williamson County, TN. Samples of waste were collected from the landfill on July 2000, November 2000, and July 2001 as part of the initial segment of this study. Samples were collected on December 2001, April 2002, and October 2002 for the second segment. Several tests were performed on the samples of solid waste from these dates to investigate the degradation under aerobic conditions with the introduction of leachate and air into the waste mass. The properties tested were percent total solids, percent volatile solids, percent cellulose, percent lignin, and biochemical methane potential.

It was determined that through the course of the study the concentration of lignin, cellulose, and volatile solids decreased significantly. The percent total solids and biochemical methane potential, which was only completed through the December 2001 sample date, did not change during the time of testing. It was assumed that the changes during the study period were caused by the successful creation of aerobic conditions, increasing the biodegradation in the landfill.