

Solid Waste Management Alternatives for Delaware

**A Report to
The Honorable Ruth Ann Minner
Governor of Delaware**

**Prepared by
The Solid Waste Management Technical Working Group**

Working Group Members:

Edwin H. Clark II, Project Director
Pasquale S. Canzano
Andrew Goudy
Gary R. Hater
H. Lanier Hickman, Jr.
Michael Keefe
Wallace Kremer
Matthew F. Lintner
William Montgomery
Paul E. Sample
James D. Werner
Paul R. Wilkinson
Tad B. Yancheski
Marian R. Young

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Abbreviations

BTU	British Thermal Units
DNREC	Delaware Department of Natural Resources and Environmental Control
DSWA	Delaware Solid Waste Authority
Kwh	Kilowatt hours
MRF	Materials Recovery Facility (there are two types of MRFs, a mixed waste MRF which attempts to recover recyclable materials from the full MSW stream, and the “clean” MRF which separates commingled recycled materials into the different component materials (paper, plastics, iron, non-ferrous metals, etc.)
MSW	Municipal solid waste
RSW	Residential solid waste
RDF	Refuse derived fuel
TPD	Tons per day
VOC	Volatile organic compounds

Executive Summary

In response to a directive from Governor Minner, DNREC Secretary John Hughes convened a Working Group of technical experts in October 2005 to evaluate the suitability of alternative technological systems for processing Delaware's municipal solid wastes. This is the final report of that Working Group.

In the Working Group's judgment, the primary solid waste issue facing Delaware is how the state can most effectively and economically preserve the valuable landfill capacity that it has. Although the Working Group considered statewide solid waste management needs, this is a particularly serious issue in New Castle County where the available landfill capacity is very limited and disposal rates are increasing rapidly.

In carrying out its review, the Working Group particularly focused on three waste streams that appeared to be creating the biggest problems:

1. Municipal solid waste (MSW):

The amount of MSW disposed of in each of Delaware's counties has increased at least 25 percent over the past five years as a result of both rapid population growth and increases in the per capita rate of waste generation.

2. Sludge from the Northern Delaware (Wilmington) Waste Water Treatment plant:

Wilmington is very close (a few years at most) to running out of space at the facility where it is currently disposing of its sewage sludge, and,

3. Tires throughout the state:

The improper disposal of tires is creating environmental and public health risks throughout the state.

The Working Group recommends a two-prong attack on these problems.

The first, and most important, prong is to divert as much valuable material from being disposed of in the state's landfills as possible. This requires that Delaware adopt aggressive and effective source reduction and recycling (or materials recovery programs to divert materials such as paper, metals, plastics, and glass that can be processed into new materials from the landfills.

The Working Group is unanimous in its recommendation that the state proceed with an effective source reduction and recycling program. This effort has the potential for maximum energy savings. The Cherry Island permit extension has a goal of 40% recycling by the end of 2007. Delaware's Recycling Public Advisory Committee study indicated at least 50% could be achieved. Planning needs to be initiated to set even higher goals that have been achieved by others. A zero waste approach can be helpful in this effort. One state's survey indicated 94% participate in the program and 93% believe in the effort. We should strive for such enthusiastic

citizen participation. This will require providing appropriate incentives for households, commercial establishments, and government.

In addition, the Working Group recommends that yard wastes (or yard trimmings) be banned from all three of the state's landfills with incentives and assistance for private and local government initiatives to handle yard wastes as well as having the DSWA providing opportunities for citizens to drop off these wastes at all of the state's landfills and transfer stations. It also recommends that the state aggressively explore options for diverting other reusable or hazardous materials such as electronic wastes from the waste stream.

Implementing this first prong could divert as much as 250,000 tons of waste a year – equivalent to 25 percent of the current total – from the state's landfills. This would significantly extend the life of the landfills, and should result in significant long-term cost savings as well.

The second prong of the Working Group's recommendations consists of two components:

- DSWA should complete its projects as quickly as possible to use the methane produced at its Kent and Sussex landfills to generate electricity, and continue to operate those landfills as bioreactor landfills. and
- The state should build a MSW processing facility serving New Castle County to further reduce the amount of material that is disposed of at the Cherry Island landfill. (It should be noted, however, that a minority of the Working Group members opposed any decision to proceed building a waste processing facility, at least until a minimum waste reduction, recycling and diversion goal is met.)

Although all of the currently available technologies for processing MSW demonstrate some weaknesses, based on the information available to it regarding current conditions, the Working Group recommends two particular processes for further consideration.

One is the anaerobic digestion process that biologically converts organic wastes into methane gas that can be used to generate electricity or as a feedstock for chemical manufacturing processes. An anaerobic digestion system would help in addressing both MSW and sewage sludge problems facing New Castle County. It would not, however, address the tire problem.

The second, contingent upon the results of a study currently being completed by the National Academy of Sciences, is the waste-to-energy process that uses a

mass burn approach to directly generate electricity.¹ A waste-to-energy facility would address both the MSW and the tire problem, but would not, without additional processing, address the sewage sludge problem.

Before proceeding with any processing facility, however, the state should address three issues:

1. The first is to determine whether anaerobic digestion will effectively process the MSW stream being produced in Northern Delaware. The application of anaerobic digestion processes to municipal wastes is a relatively recent development, and many of the existing facilities are processing only certain components of MSW. The Working Group recommends that the state quickly assess the suitability of this process for Northern Delaware's wastes by undertaking a pilot study processing Northern Delaware's MSW after removing the materials that would be expected to be diverted by the recycling program or removed as a result of the yard trimmings ban. The pilot study should also include sludge from the Wilmington waste water treatment plant.
2. The second is to assess the compatibility of the technologies with whatever aggressive recycling/source reduction programs Delaware implements. The state should delay building a MSW processing facility until it determines how successful the recycling, reuse, source reduction, and other programs are in diverting different types of materials away from the landfills, and the compatibility of the resulting modified waste stream with the alternative processing technologies being considered.
3. The third is to formulate an MSW management plan that carefully combines the various components of the waste management process together into an integrated solid waste management system that minimizes the amount of material that needs to be disposed of in landfills. This plan should carefully evaluate the potential complementarities and conflicts between the waste processing technologies being considered, and between these technologies and the recycling/source reduction programs being established in the state.

DSWA should also update its statewide solid waste management plan on a periodic basis as required by its enabling legislation. The state should complement this planning effort by an aggressive public information and outreach program that keeps the public well informed about the progress being made in implementing the Working Group's recommendations and the other solid waste planning and management initiatives underway.

¹ The National Academy of Sciences is completing an extensive review of the toxicology and risks associated with the dioxins and furans generated by waste-to-energy facilities. If this review determines that the risks are more serious than EPA currently estimates, many of the members of the Working Group would not favor proceeding with this technology.

Developing an anaerobic digestion facility would not require any changes to existing Delaware law. Proceeding with a waste-to-energy facility will require an amendment to SB 280. However, the Working Group believes that there is no reason to make such an amendment until the state completes its evaluation of the suitability of anaerobic digestion and prepares an integrated waste management plan as outlined above.

The Working Group is unanimous in its recommendation that the state proceed with the first prong – implementing effective source reduction and recycling programs to divert wastes from the landfills – as quickly as possible. Any delay in implementing these programs is likely to have serious ramifications for the state in the future. Further, a majority of the working group also supports proceeding expeditiously with the second prong – building a processing facility to further reduce the amount of waste that has to be disposed of in the New Castle County landfill.

It is important to emphasize that the Working Group focused its attention on the technical factors related to the choice of a solid waste processing facility for Delaware. We recognize that there are many other considerations that have to be taken into account in making this decision. These include the question of where a facility should be sited, community acceptance, financing considerations, and ownership and operating responsibilities. The Working Group was established for the purpose of informing the decision making process, not being that decision making process. This also is the intent of our recommendations.