

Energy Recovery from Kansas "Organic-Rich" Waste Streams

by:

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presented to:

Joint Committee on Energy and
Environmental Policy

November 20, 2012

Our vision is "healthy Kansans living in safe and sustainable environments."



Joint Energy and Environmental
Policy Committee
November 19 and 20, 2012

Attachment: 29

What are these “organic-rich” wastes?

- Mixed municipal solid waste (60-80%)
- Dairy and feedlot manure, poultry litter
- Waste tires
- Packing plant paunch, etc.
- Food waste (grocery stores, institutions, mfg, etc.)
- Saw dust/wood scraps
- Agricultural crop residues
- Construction/demolition waste
- Septic tank liquids, porta-potty waste, etc.

WORKS! Conference Sessions on Energy Recovery from Waste

- Expanded from recycling, composting, and HHW management to include energy from waste in 2009
- Participants in Energy Sessions
 - Cargill Beef
 - Frito-Lay
 - Universities (KSU, NE, MO)
 - USDA
 - Western Plains Energy
 - Forget-Me-Not Dairy
 - KLA Dairy Council
 - Seaboard Foods
 - National Beef
- Many consultants and others

Factors that Affect Project Feasibility

- #1 – Low current price of energy (natural gas and electricity)
- High capital costs of waste processing systems
- Limited interest of electric utilities
- High system maintenance cost
- Uncertain business future
- Tax incentives and grants

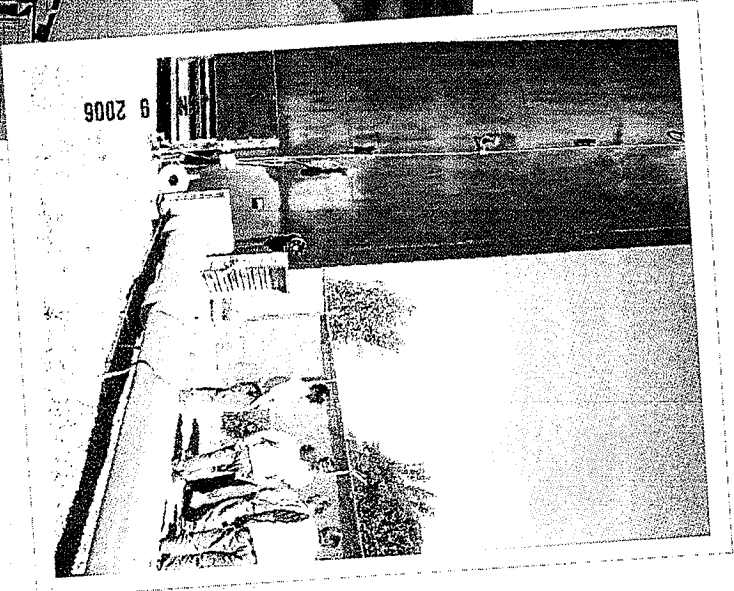
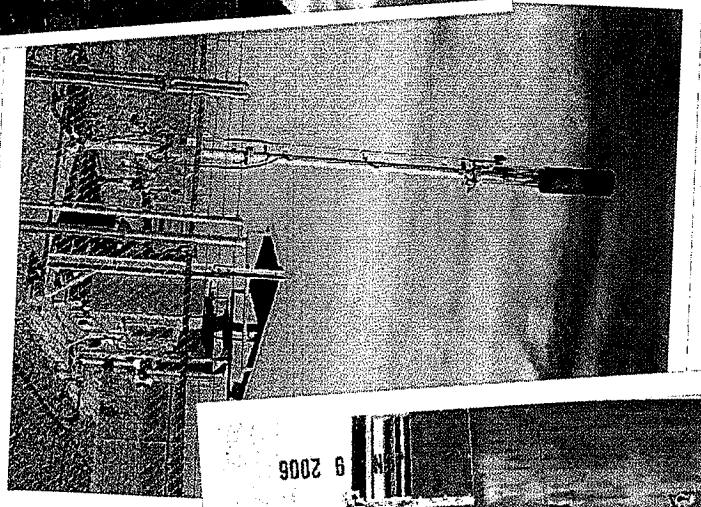
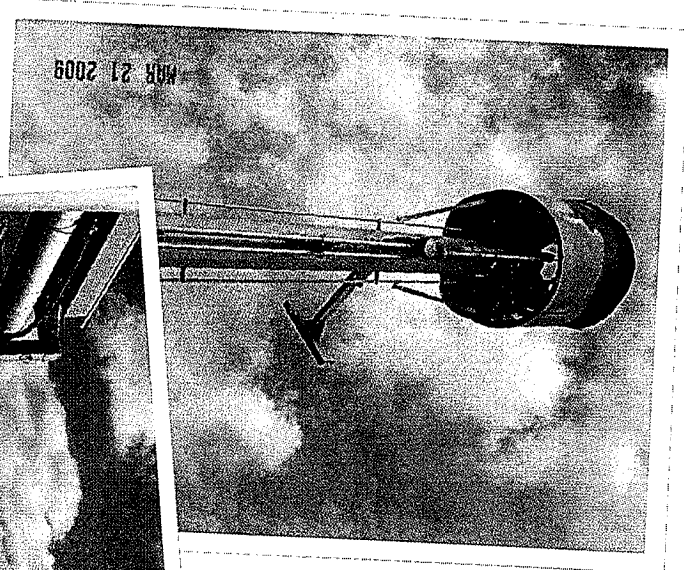
Most are waiting and watching

Waste-to-Energy Technologies

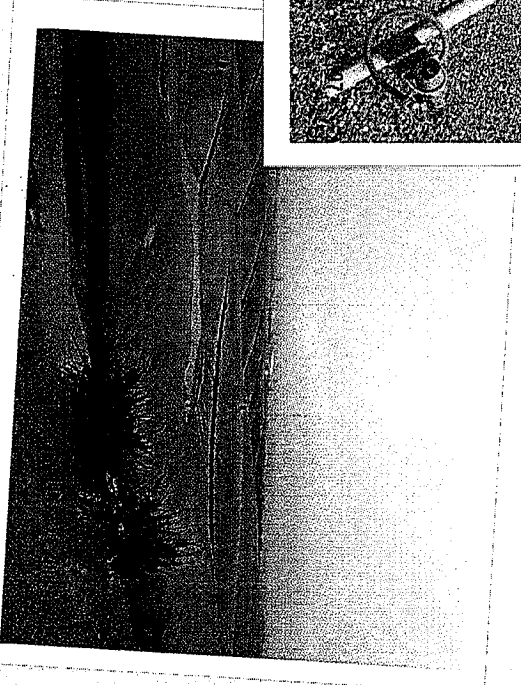
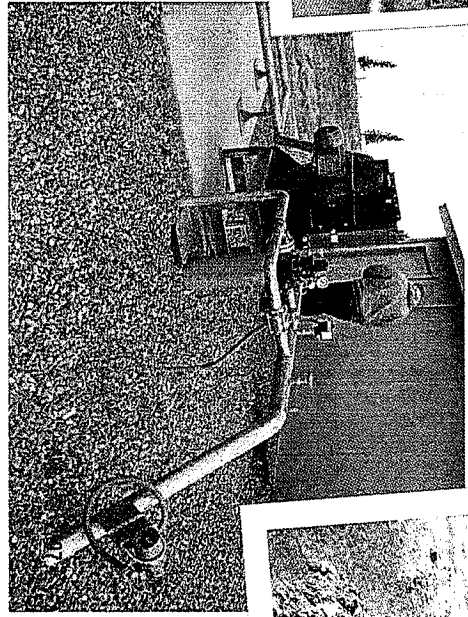
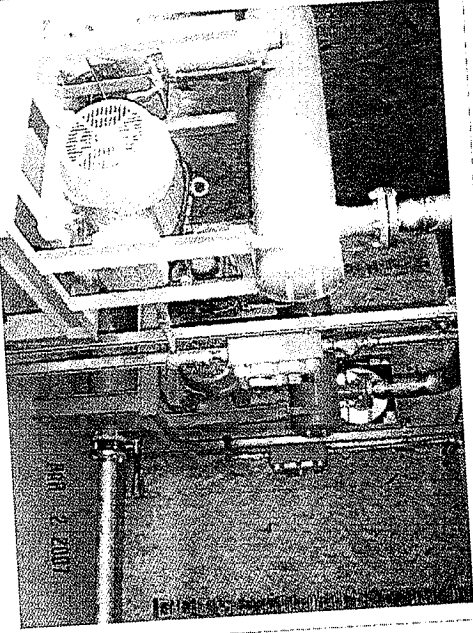
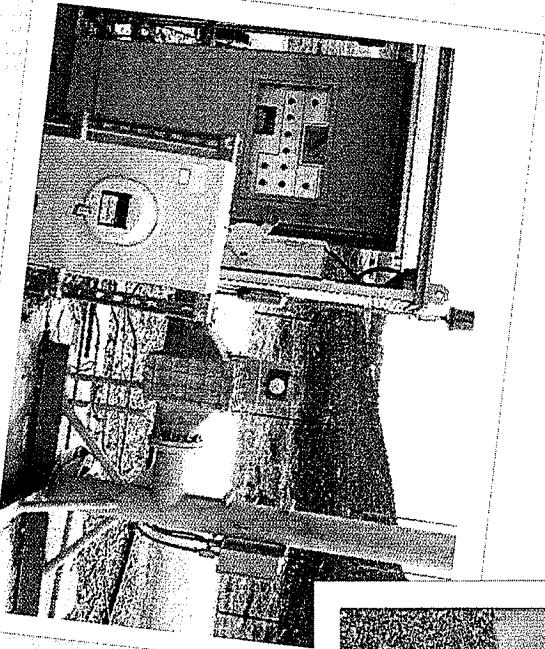
- Landfill gas generation and recovery
- Anaerobic digesters to produce methane
- Biomass gasifiers
- Wood waste boilers
- Cement kilns

Landfill Gas Management

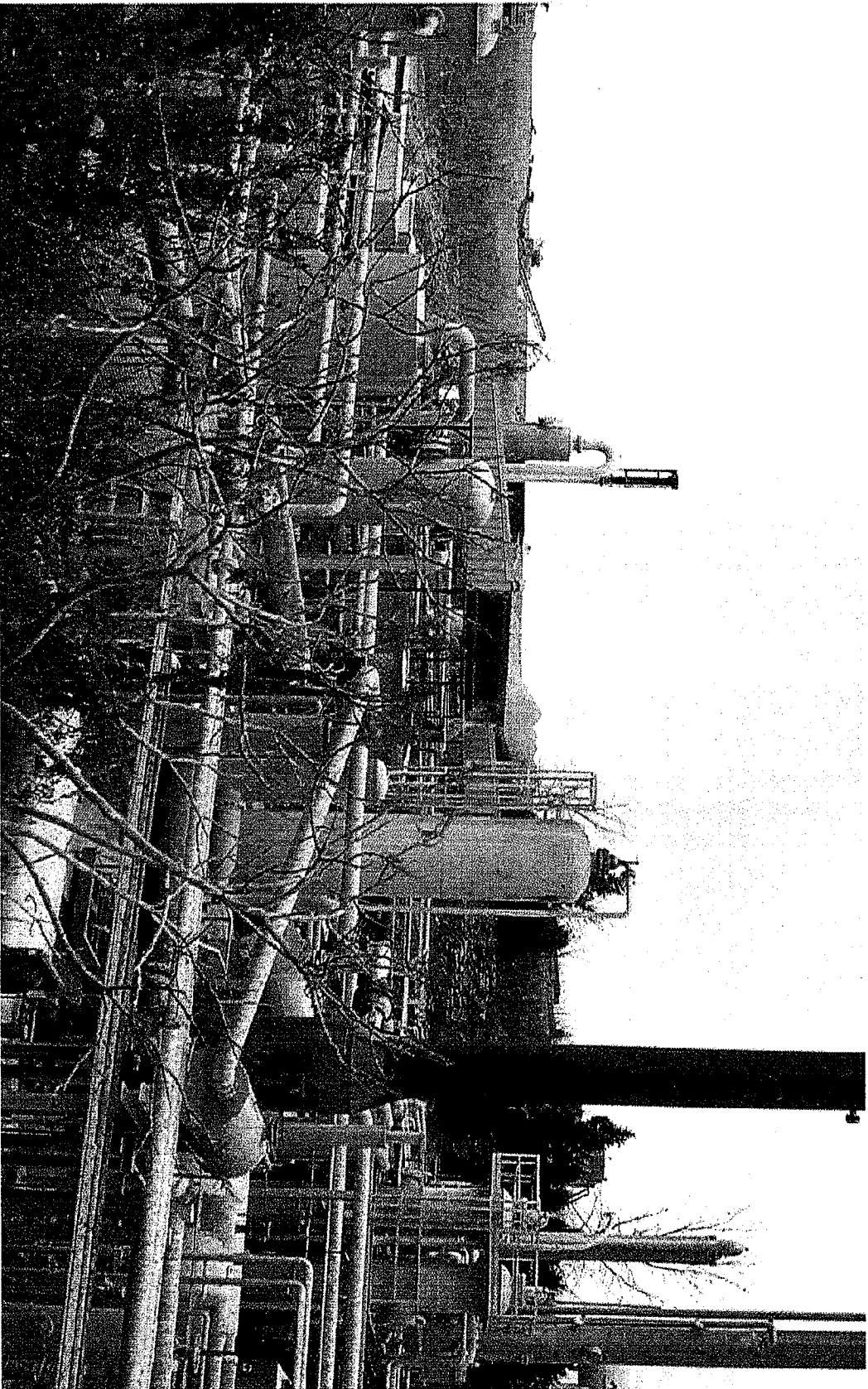
Flares & Vents



Gas Recovery Systems

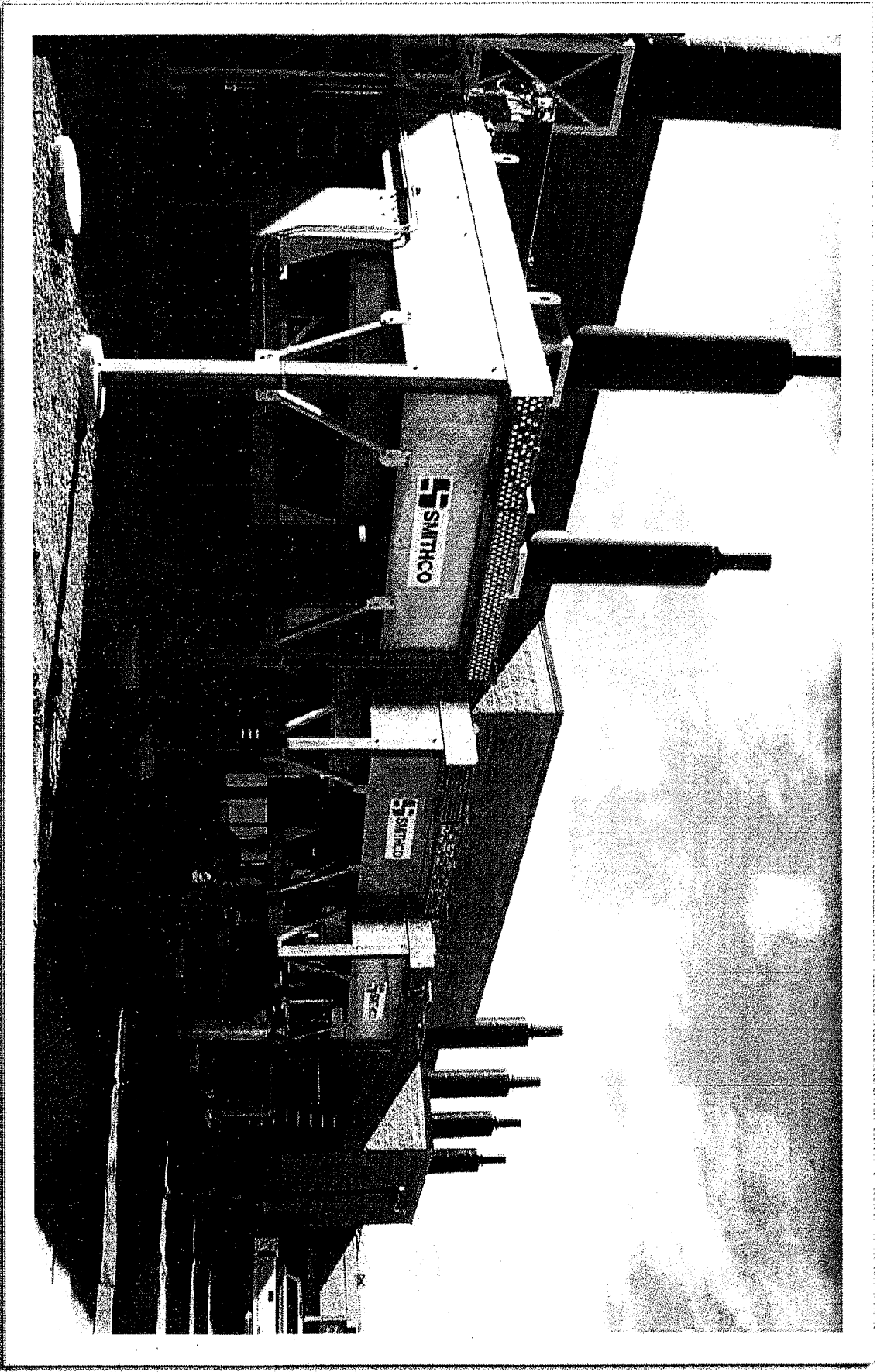


Deffenbaugh Gas Plant
Johnson County

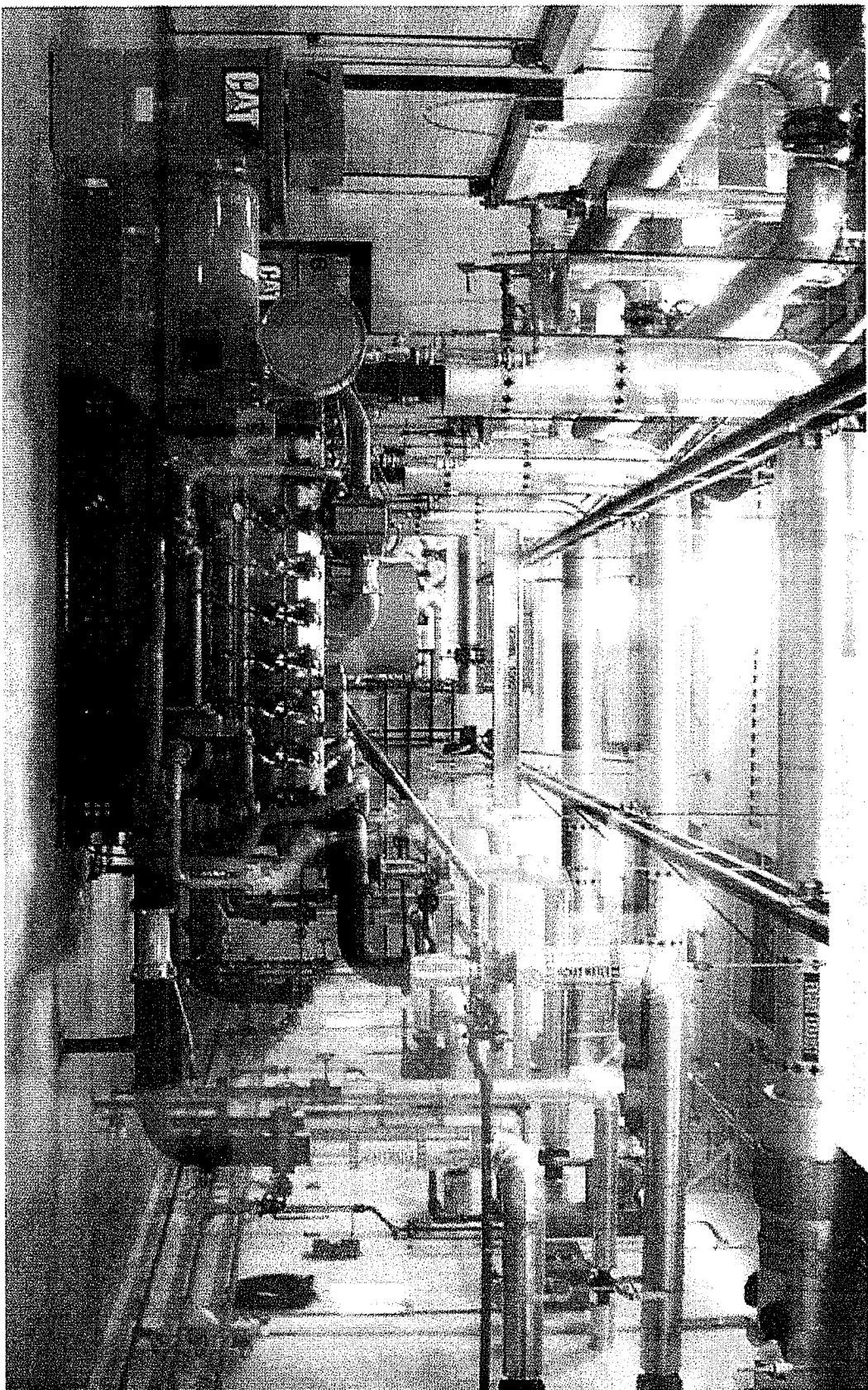


Waste Management Electricity

Rolling Meadows



Caterpillar, Electric Engine Rolling Meadows - Topeka



An Example of Landfill Gas Recovery and Utilization

Waste Management/Rolling Meadows/Topeka
Gas to Electricity Plant

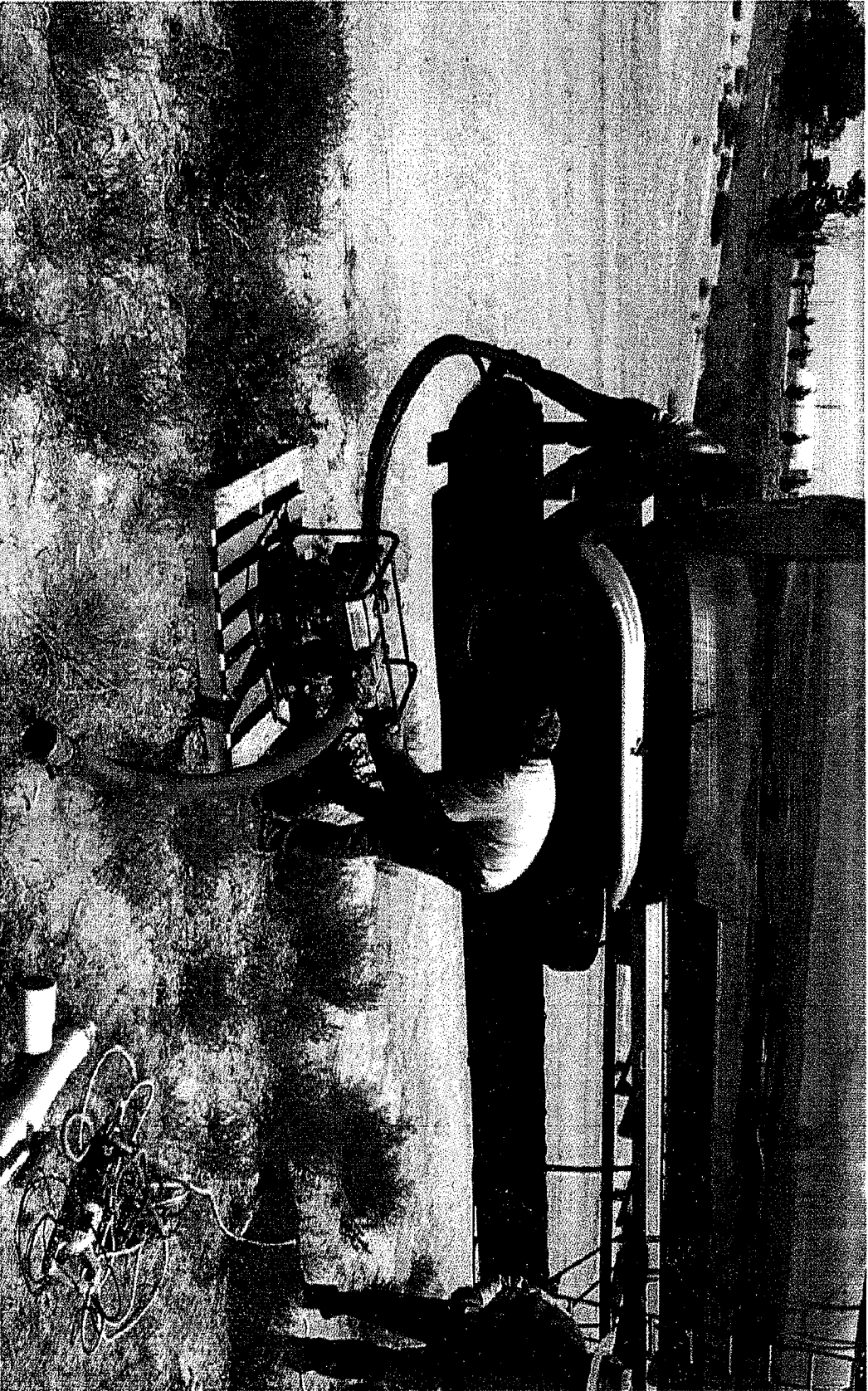
- Startup – January 2010
- Gas consumed through October 31, 2012
 - 2.9 billion cubic feet
 - 1800 cubic feet per minute
- Electricity produced
 - 131 million kWh (expanding)

Liquids Addition to MSW Landfills to Enhance Gas Generation and Landfill Stabilization

- Seward County
- Deffenbaugh, Johnson County
- Waste Connections (Plumb Thicket), Harper County
- Waste Connections, Finney County

About 10 million gallons since began in 2011
50,000 tons

Seward County

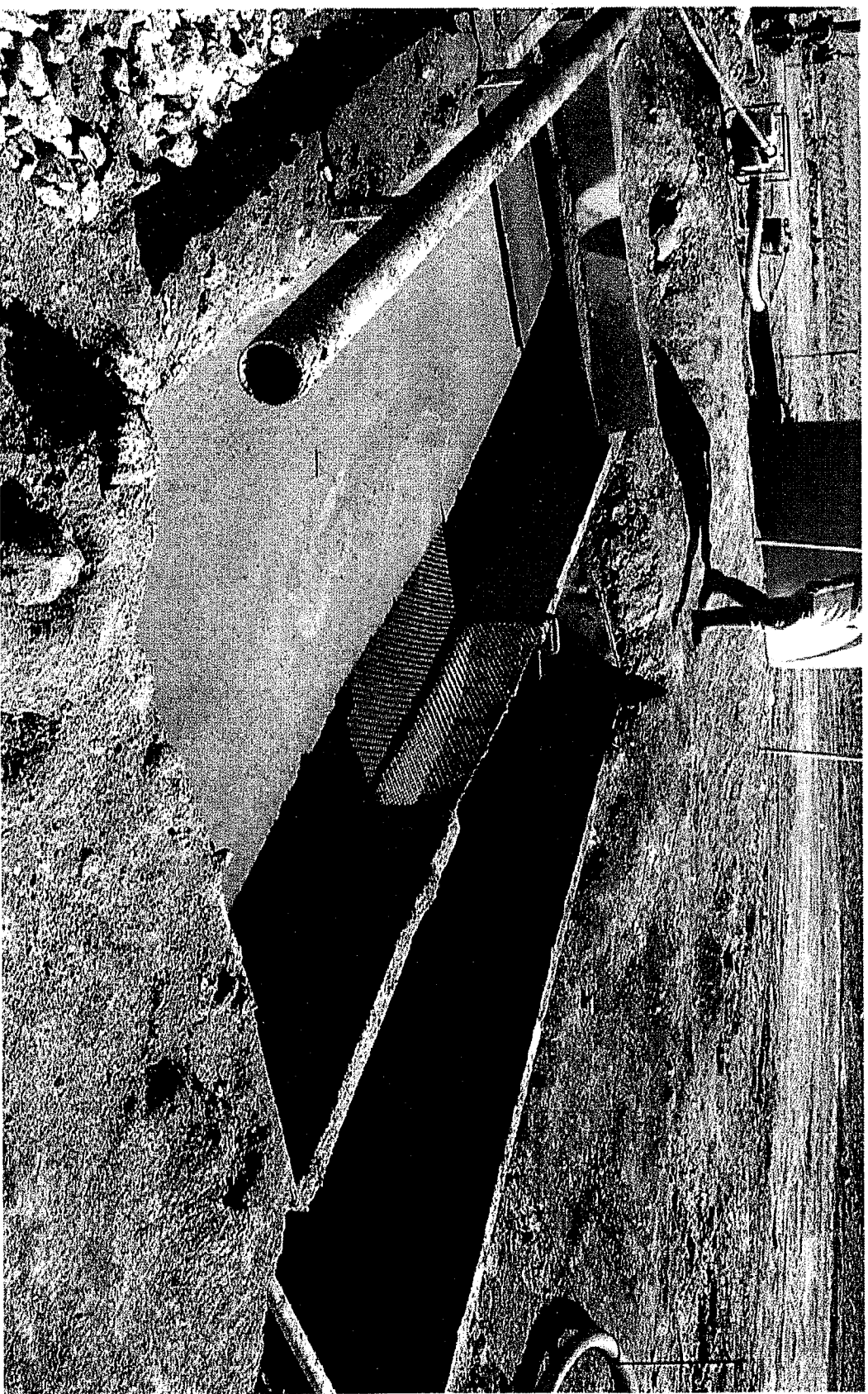


Deffenbaugh

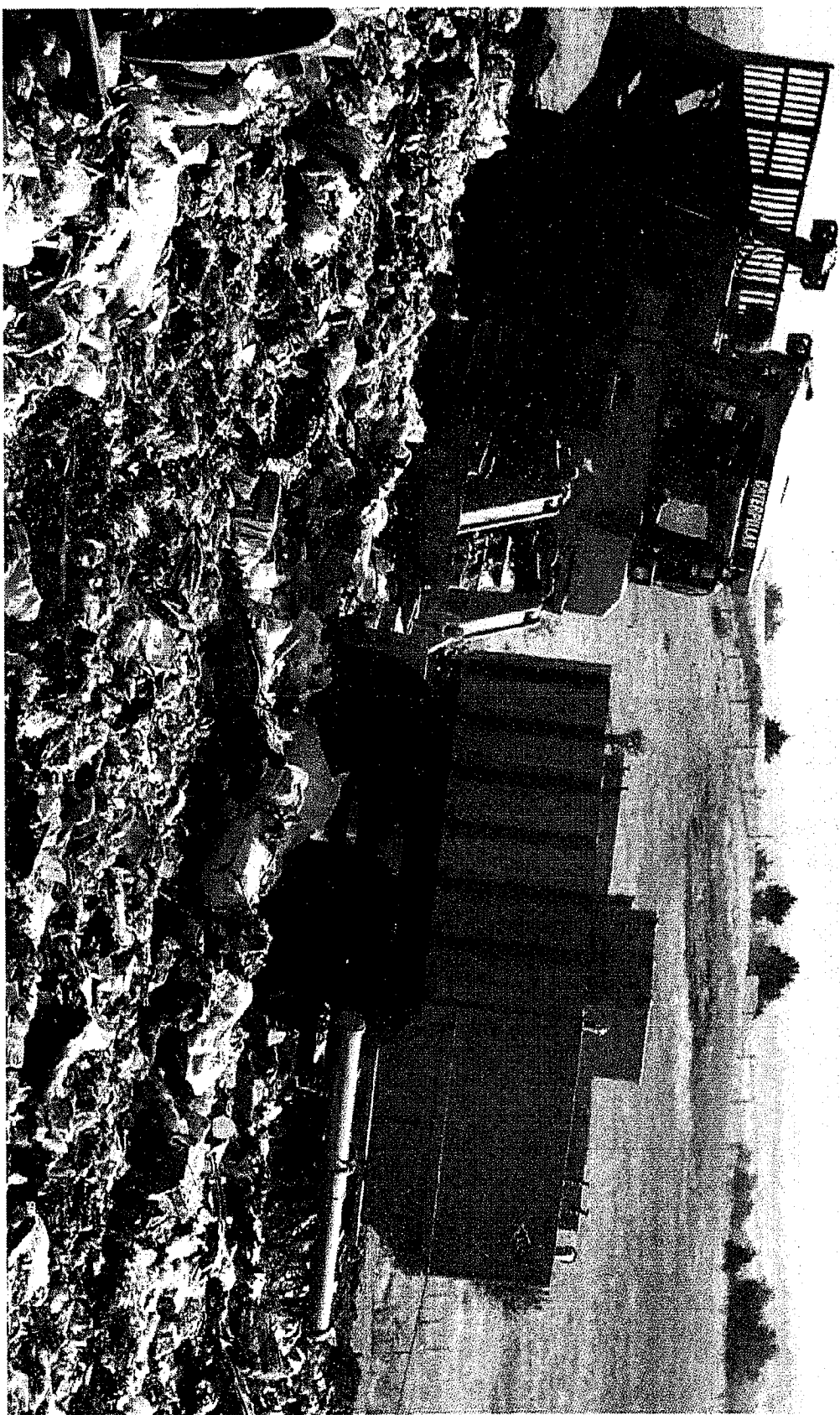


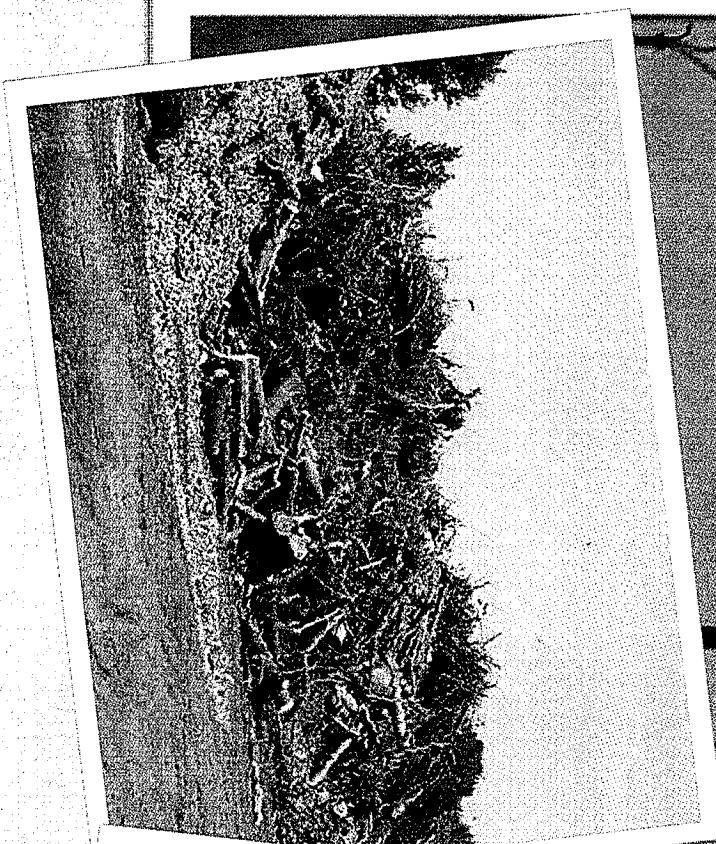
Oil & Gas Drilling Waste

Waste Connections - Harper County

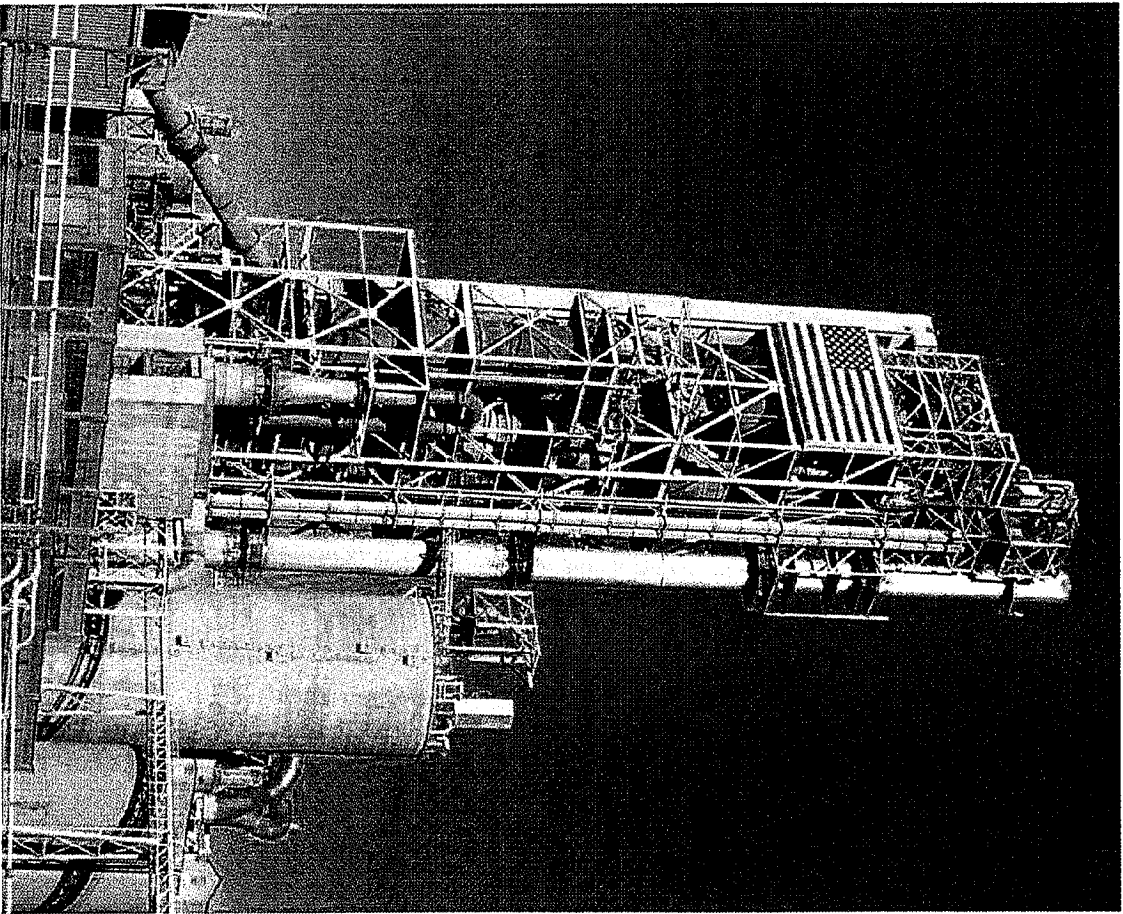


Waste Connections Harper County





Ash Grove Cement - Chanute



Ash Grove Cement - Chanute





29-21

ICM Biomass Gasifier

Harvey County Landfill



Pilot Project

1000-2000 tons/yr

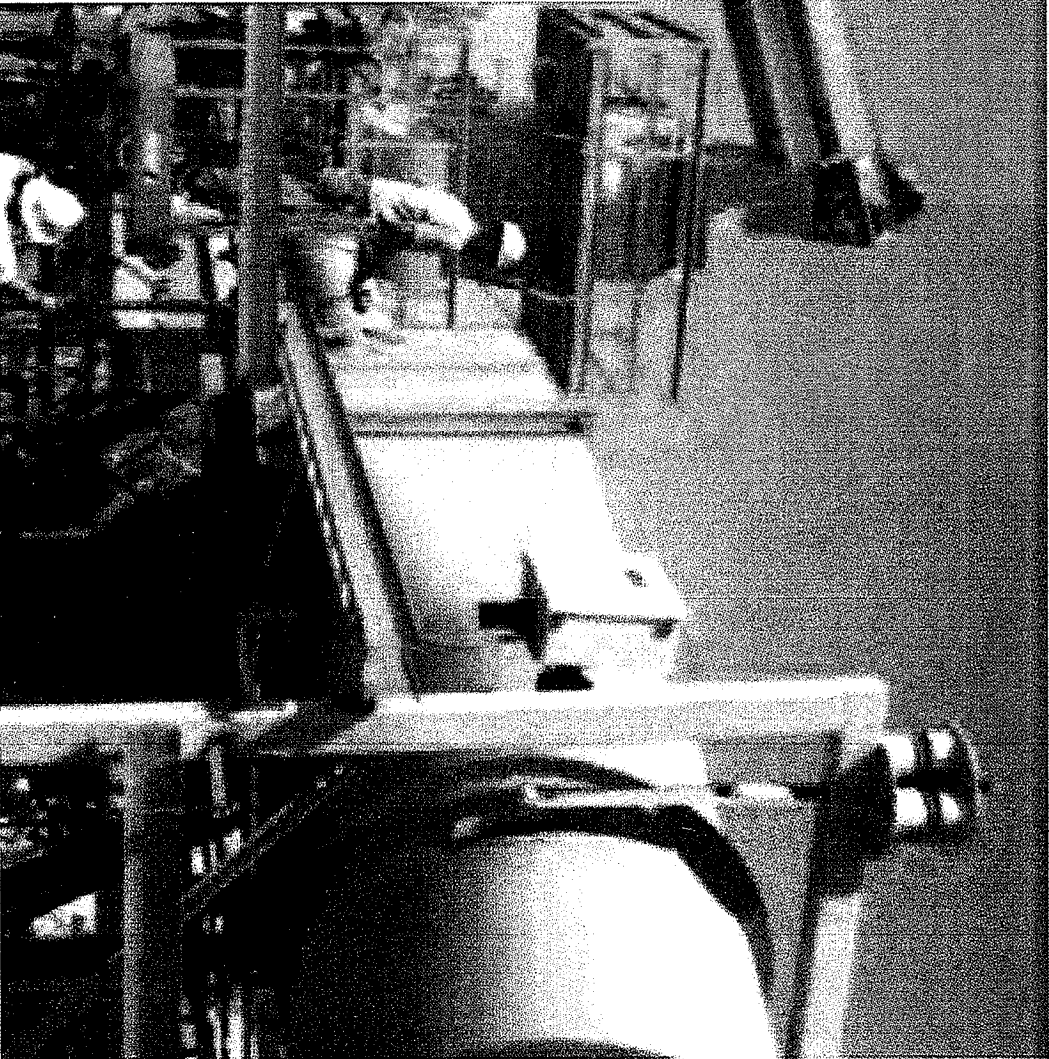
Wood chips

Wheat straw

MSW

Tires

Manure



Western Plains Energy (Ethanol Plant)

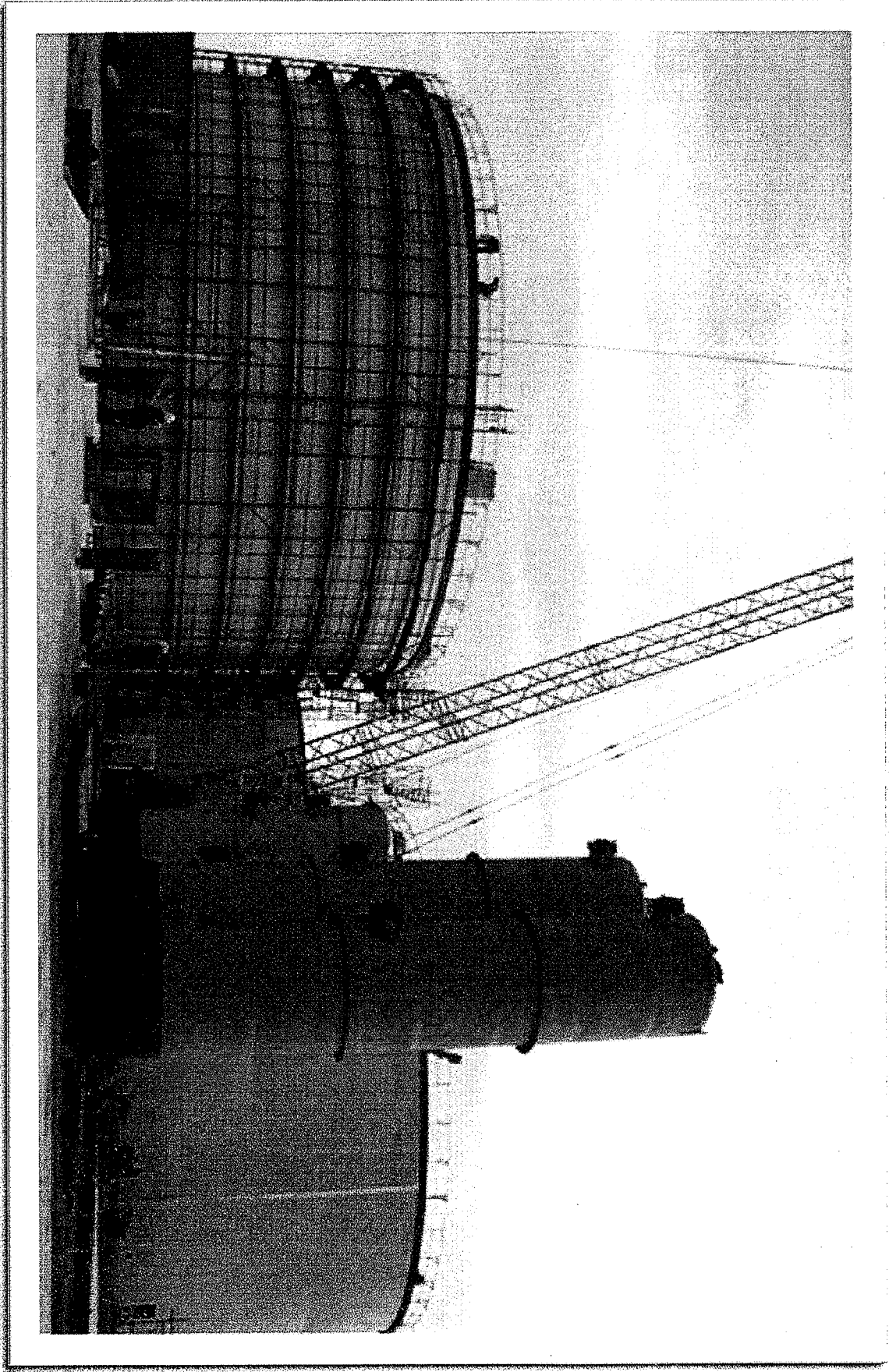
\$40 Million Biogas Digester, Oakley

- \$5 million USDA grant
 - \$15 million Kansas ARRA funds
 - Primary waste-feed lot manure
- Also grain dust, food waste

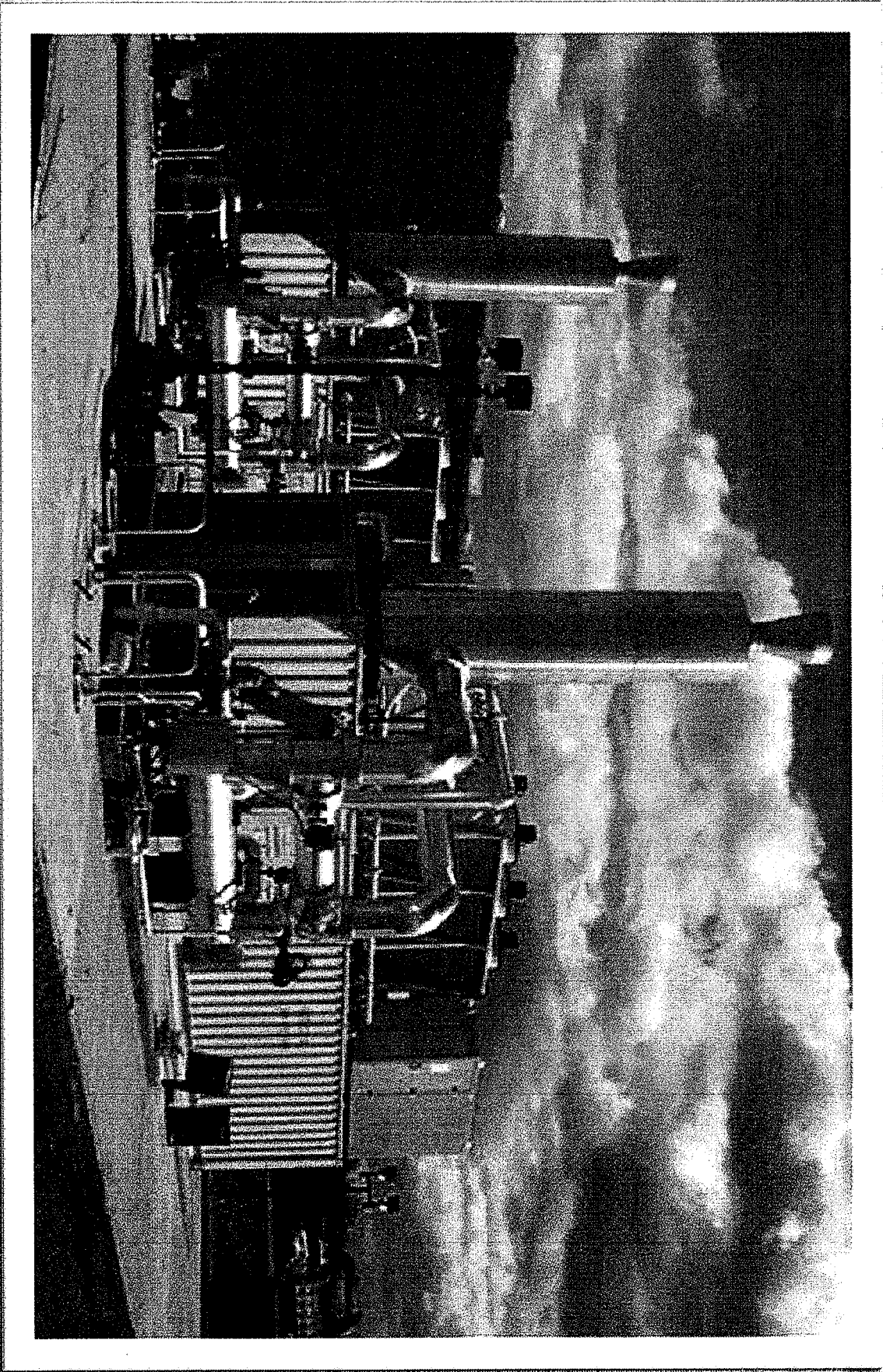
Operational in 2013

Western Plains Ethanol Plant (Oakley)

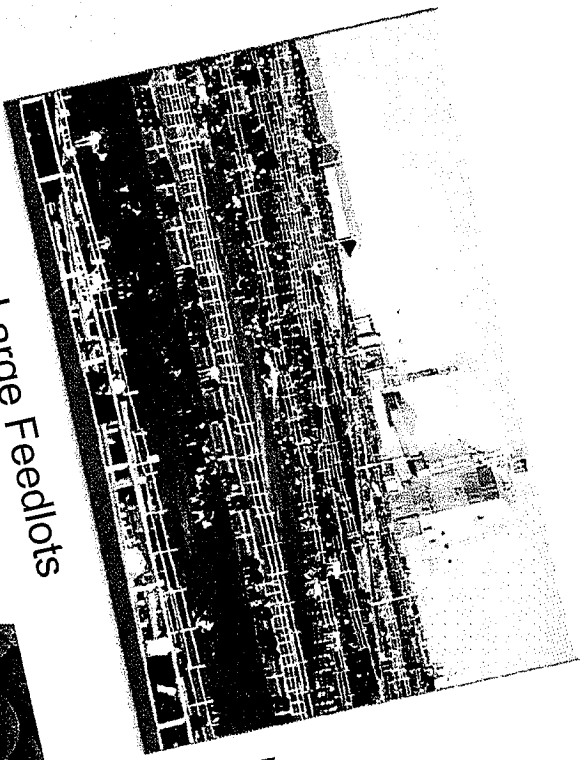
29-24



Johnson Co. Wastewater Treatment Plant
Anaerobic Digester – ARRA Funding



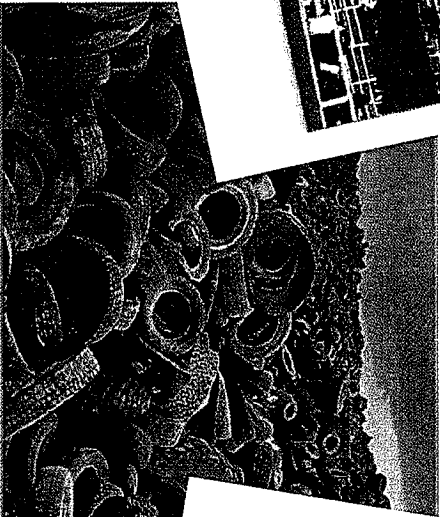
Untapped Waste Resources



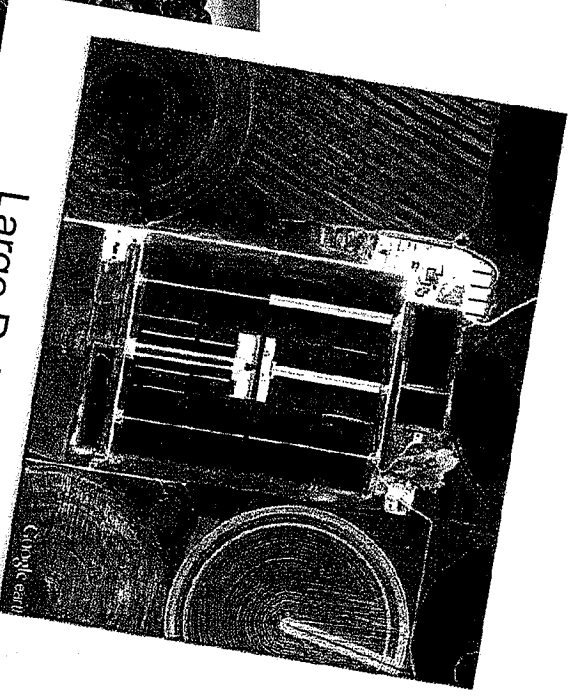
Large Feedlots



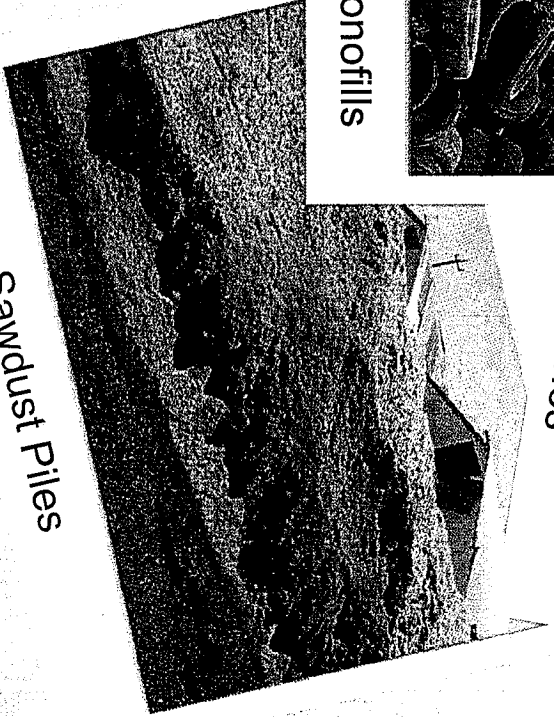
Beef Packing Plants



Waste Tire Piles and Monofills



Large Dairies



Sawdust Piles