APPLICATION FOR PROJECT XL:
LEACHATE RECIRCULATION AND
BIOREACTOR SYSTEMS

WASTE MANAGEMENT
King George County Landfill and Recycling Center
Maplewood Recycling and Waste Disposal Facility

1 August 2000

GeoSyntec Consultants
Components of Final Project Agreement

- Legal Requirements of USEPA
- Monitoring Program
- Permitting: Outline of Proposed
- Technical Scope of Work Performed

Description of Leachate Recirculation

Permitting

Purpose of Project and Overview

Overview

Tim S
What are Leachate Recirculation and Bioreactor Technologies About?

♦ Well-established technologies; (California 1970's)
  (1960's extensive laboratory studies)
♦ First used in 1974; hundreds of successful applications since then;
♦ Currently being used at nearly one hundred landfills;
♦ WM is recirculating leachate at three landfills in Virginia: Charles City County, Middle Peninsula, and Atlantic Waste.

DE Solid Waste Authorities since mid 1980's.
Germany, Switzerland, and Austria.
• Decreased potential for post-closure impacts to environment.
• Decreased post-closure care maintenance requirements.
• Reduced settlement and strain in final cover system.
• Earlier re-use of site.
• Improved economics of energy recovery project feasibility.
• Increased waste disposal capacity.
• Decreased leachate management costs.
• Improved leachate quality.
Restriction of 40 CFR 258.28.

Requires regulatory flexibility regarding the liquids and bioreactor technologies on an operational scale and the many benefits of leachate recirculation.

Quantity the relative effectiveness of different liquids.

Overall Goals are:

Landfill bioreactor at King George County Landfill. Recirculation system at Maplewood Landfill and leachate development of leachate.

Introduction
Liner System Details: Maplewood and King George County Landfills
Commonwealth of Virginia Benefits


- **Pollution Prevention**
  - Air - no long-term gas potential
  - Groundwater/surface water - no long-term leachate potential
  - Avoid other leachate disposal issues

- **No Future “Open Dump” Status**

- **Waste Stabilization**
  - Prior to closure
  - Active permit control
  - Financial assurance
  - Reduced cost to Commonwealth
- duration: 4 years maximum, 1 year renewable
  public participation
  operation, closure, variance, financial assurance,
  permit review: local certification, design,
  protect human health and the environment,
  treatment technology or process
  an innovative and experimental solid waste
  for solid waste facility which proposes to utilize
  (9 VAC 20-80-480.G)
  Solid Waste Experimental Facility Permit
  Permit Amendment

Permitting
Need a variance to recirculating bulk liquids in an alternate linear facility.

Need a variance to leachate collection for alternate linear.

Both facilities currently have variances to:

- Upper component: 60-mil HDPE
- Lower component: 2' soil (1X10-7 cm/sec)

VSWMR requires a composite linear variances.

Permit Amendment

Permitting
NSPS (40 CFR §60.750)

- Air Permit
- Water Discharge Permit
- Permit Amendment

Permitting
Design Criteria

- Maplewood Landfill: recirculate all of the leachate generated;
- King George County Landfill: recirculate twice the amount recirculated at the Maplewood Landfill;
- Uniformly distribute leachate throughout the waste mass;
- Place distribution structures at least 100 feet from the crests of slopes;
- Provide monitoring features within the liquid application structures; and
- Manage landfill gas throughout the recirculation process.
Maplewood Landfill

Leachate Recirculation System Layout:
Track the settlement of the waste.

- Track the rate of methane;
- Monitor for landfill gas components (i.e., NMOCs);
- Monitor for the occurrence of odors;
- Trenches;
- Monitor for trench gas that leachate can be applied to the sources;
- Track the total cost for leachate treatment at off-site treated;
- Track the total quantity of leachate collected and cells;

Measure leachate quality in test cells and control.

Monitoring Program