Randolph County, North Carolina

Randolph County – Board of Commissioner's Presentation May 6, 2013

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Presentation Outline

- Modern Solid Waste (MSW) Disposal Facilities
  - Cost effective option
  - Regulatory requirements
  - Operations
  - Unauthorized Waste
  - Human Health
  - HDPE Liners
  - Landfill Gas to Energy
- *New* Conceptual Site Plans
- Activities Completed
- Activities In-progress
- Next Steps

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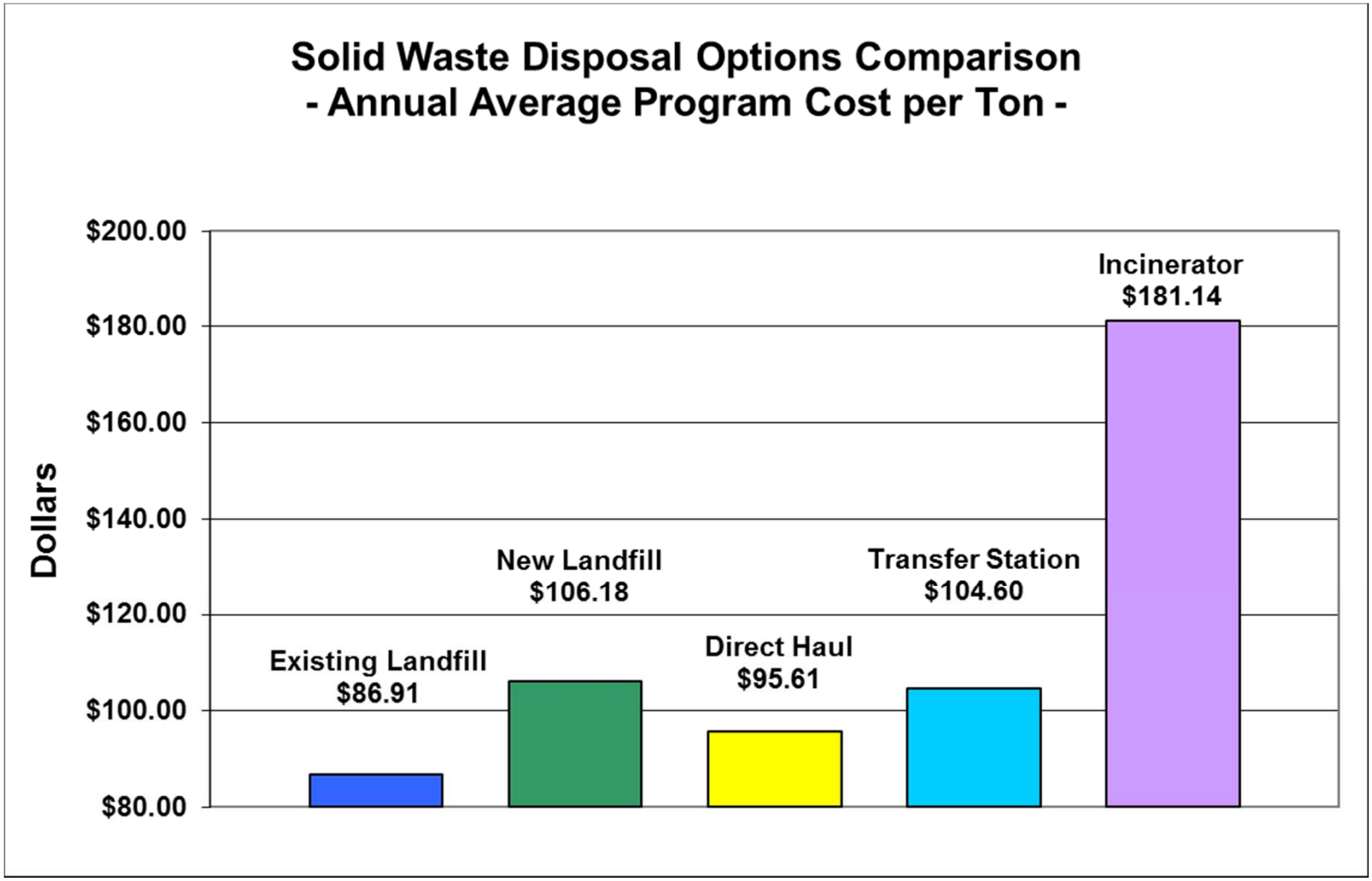
Solid Waste Disposal Options



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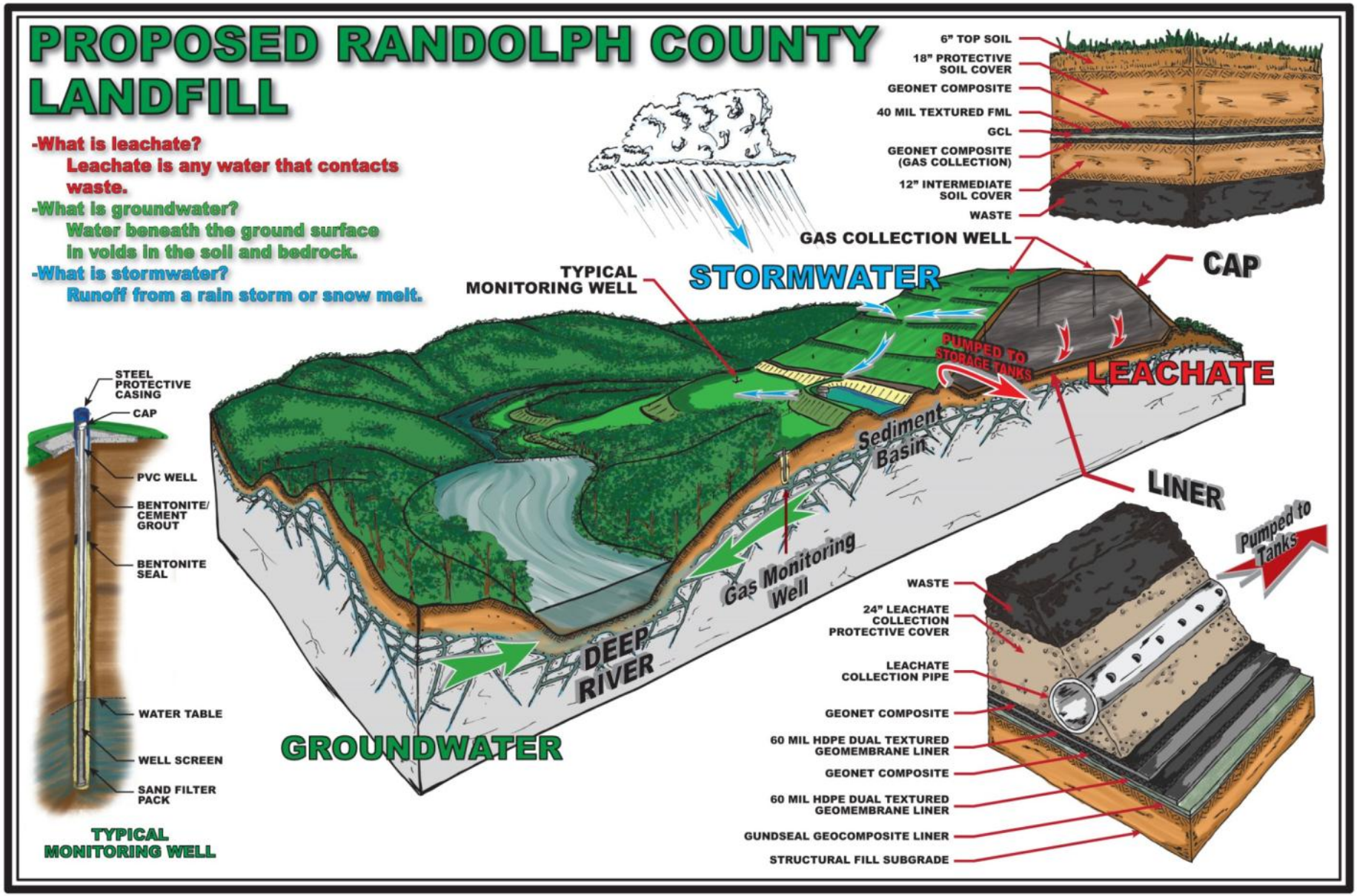
Facility Components - Landfill Schematic



Regulatory Requirements

- State approvals required (NCDENR)
  - Engineering plans
  - Construction reports
  - Environmental controls
- Exceeds regulatory requirements
  - Double bottom liner system (leak detection)
  - Additional buffers
- Other regulatory oversight
  - NC Department of Cultural Resources
  - US Army Corps of Engineers
  - NC DOT
  - FAA

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Landfill Operations

- Operations Plan
  - Protect human health and the environment
  - NCDENR-approved program
- Certified operator training
- Employee health and safety training
- Unauthorized waste screening program
- Placement, compaction, and daily cover requirements
- Litter, noise, odor, dust, and animal control
- Record keeping and reporting
- State and County inspections

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Unauthorized Wastes

- Hazardous waste
- Regulated medical waste
- Industrial waste
- Lead acid batteries
- Liquid paint
- Used oil and filters
- Antifreeze
- Electronics

- Wooden pallets
- Yard waste
- White goods
- Aluminum cans
- Scrap tires
- Beverage containers
- Plastic containers
- Oyster shells

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Unauthorized Waste Program

- Unauthorized Waste Program
  - Protect human health and the environment
  - Pathogenic, hazardous, and other unacceptable wastes
  - NCDENR-approved program
- Inspection procedures
  - Incoming loads
  - Working face
- Removal procedures
  - Segregation and loading
  - Manifesting and proper off-site disposal
  - Regulatory reporting
- Annual training of employees
- Penalties for improper disposal activities

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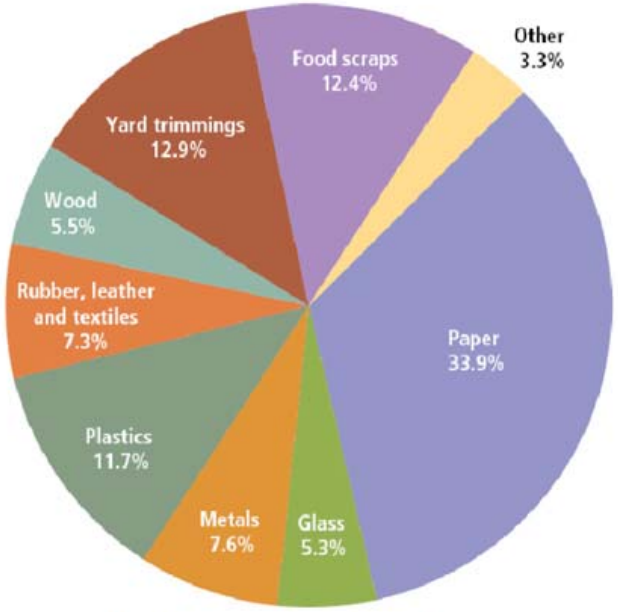
Human Health

- Airborne pathogens (e.g., fungi, bacteria)
  - Higher quantities in agricultural settings than waste disposal areas
  - Dissipate rapidly with vegetated buffers and distance from source
- Diesel exhaust particulates / noise
  - Route chosen based on fewest impacts
- Landfill gas composition
  - Mercury trace amounts in concentrations < worker exposure standards



Total MSW generation (by Material). 2006 EPA

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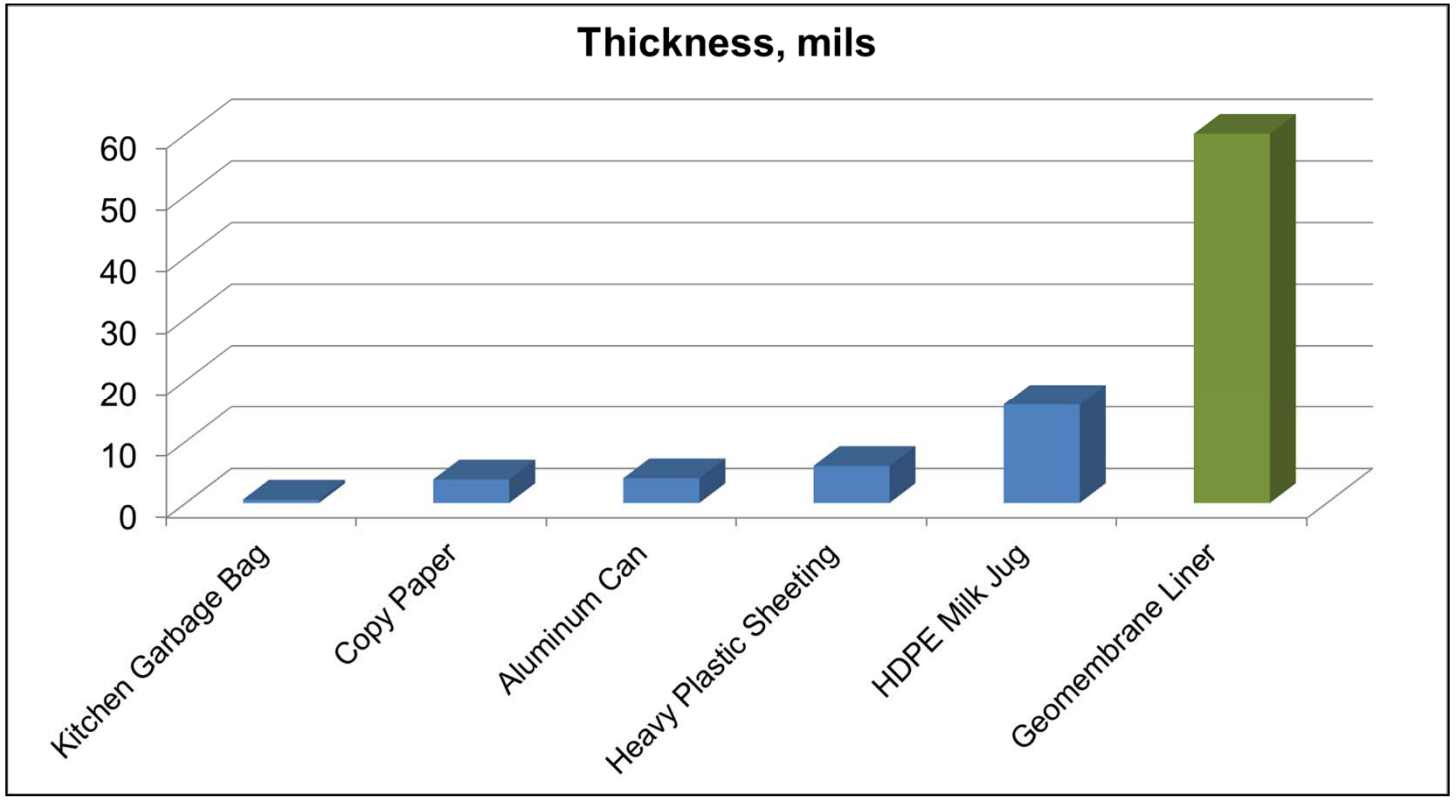
HDPE Geomembrane Liners - Thickness

High-Density Polyethylene (HDPE) - Polyethylene thermoplastic made from petroleum. HDPE is commonly used in the production of plastic bottles, corrosion-resistant piping, geomembranes, and plastic lumber.



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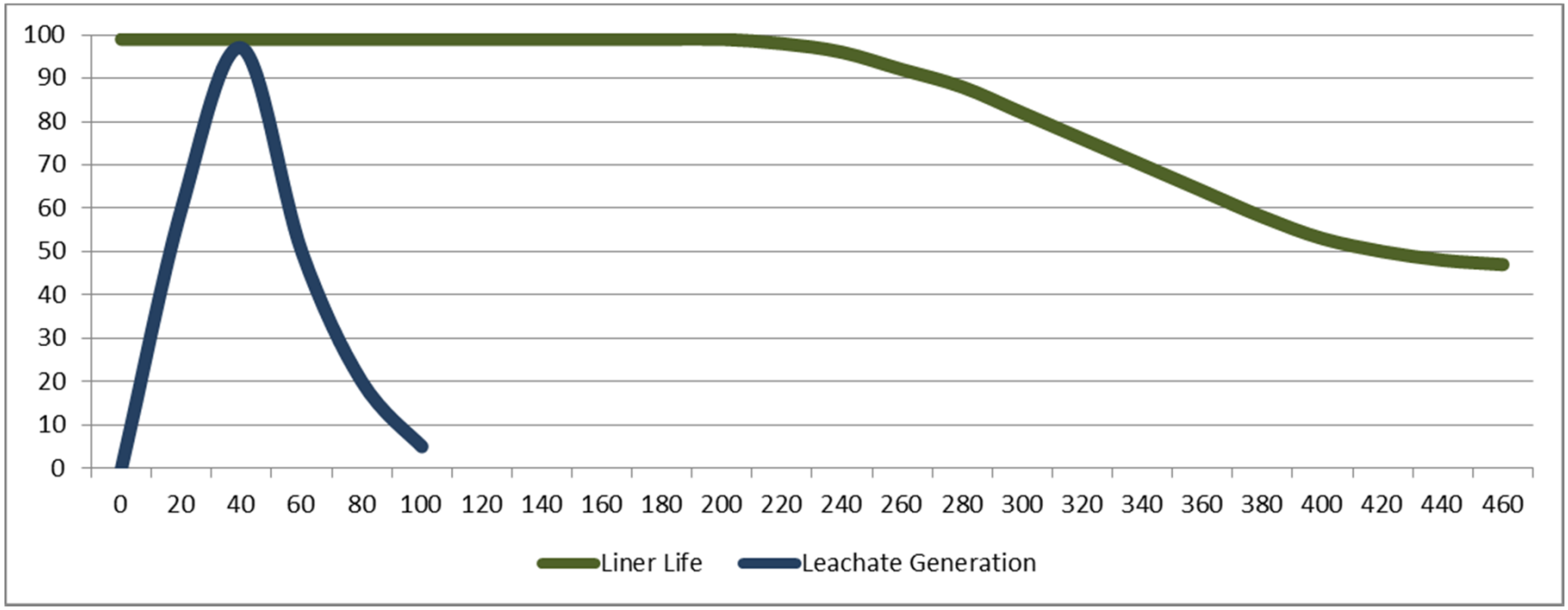
HDPE Geomembrane Liners - Leachate

Landfill leachate generation is primarily dependent on the volume of waste in place and the length of time the waste mass is exposed to precipitation prior to placement of the final cover system.



HDPE Geomembrane Liners - Seepage

Leachate generation and seepage rates are predicted using the EPA's Hydrologic Evaluation of Landfill Performance (HELP) computer program model.

Max. generation rate = 75,000 gal/acre/day (~10 feet of waste)

Max. seepage rate = 0.015 gal/acre/day @ peak generation rate

$$= \quad 0.00002\% \quad = \quad \frac{2}{100{,}000\text{th}} \quad = \quad \frac{2 \text{ cups}}{660{,}000 \text{ gallons}}$$

(Olympic swimming pool)

…and is expected to be captured by the secondary liner "leak detection" system

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HDPE Geomembrane Liners - Testing

- Rigorous Testing Requirements for Liners
  - Manufacturer's Testing (over 20 physical properties including thickness, density, strength, UV resistance, etc.)
  - Construction Quality Assurance (CQA) *conformance* testing is completed on the HDPE geomembrane upon delivery to verify the manufacturer's *certified* material properties
  - Construction Quality Assurance (CQA) field testing is completed on the HDPE geomembrane after installation to *certify* its seam strength and *water tightness*

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Landfill Gas to Energy

Various uses of Landfill Gas (LFG)

- Medium BTU fuel (direct on-site use)
- Electricity generation
- High BTU fuel (pipeline quality)
- Renewal energy source

Collection methods (vacuum system)

- Vertical piping (extraction wells)
- Horizontal collectors (within waste mass)
- Extracted from leachate collection system

LFG to Energy Partnerships

- DTE Biomass Energy
- Ingenco
- Ameresco
- Methane Power
- Toro Energy
- Plus many others

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New Conceptual Site Plans

- Refined waste disposal area ~ 198 acres
- Proposed final grades ~ 110 feet above highest natural grade on site (< 300 foot above existing grade)
- Gross design capacity ~ 46 million cubic yards
  - Bottom liner system (675,000 cy)
  - Final cover system (1,025,000 cy)
  - Net design capacity (~ 44,300,000 cy for MSW and daily cover)
- Reserved < 8 acres for stormwater management ponds
- Well over 30 years of life at an average of 1,500 tons/day

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New Conceptual Site Plans

- Traffic Study by CDM-Smith
  - Upper projected limit of 100 trucks per day
  - Only a 1% increase to the road design capacity
  - Roadway geometries suitable
  - Recommended left turn lane into the facility
  - Voluntary relocation of mail boxes and reduction of speed limit
- Eastern buffer ≥ 300 feet to property line/Deep River
  - Actual waste disposal setback is ~390 feet to property line
- Southern buffer ≥ 400 feet to property line
  - Actual waste disposal setback is ~450 feet to property line

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New Conceptual Site Plans

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Activities Completed

- Alternate Site Evaluation
- Fatal Flaw Study
- Financial Analysis
- Market Study
- Environmental Impact Study
- Site Suitability Study
  - Geophysical Survey
  - Phase I Cultural Resources Survey
  - Phase II Cultural Resources Survey
  - Rare Plant Survey
  - Wetlands and Perennial Stream Delineation
- Hydrogeologic/Geotechnical Investigation
  - Drilling/Survey/Field Work

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Activities in Progress

- Hydrogeologic/Geotechnical Investigation
  - Report in progress
- Finalize Conceptual Site Plans
  - Refined waste disposal footprint
  - Facility entrance road layout
  - Supporting facility structures
  - Stormwater Management
  - Preliminary grading
  - Earthwork volumes

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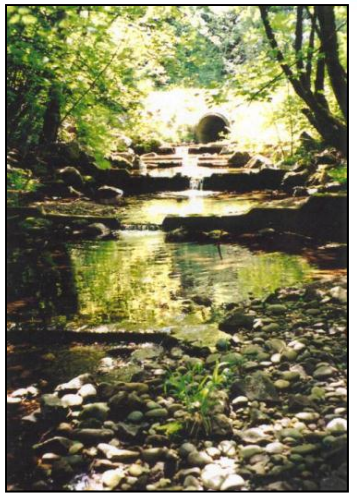
Next Steps

- Site Suitability Report
  - Submitted after resolution approval
- Facility Plan & Design Hydrogeologic Report
  - Submitted with Site Suitability Report
- RFQ/RFP for Teaming Partner based on refined Conceptual Site Plans
- Application for Permit to Construct
  - Prepared after Site Suitability approval and partner selection
- Regulatory Meetings and Public Hearings
  - 2 Hearings for EIS
  - 2 Hearings for NCDENR
  - Hearing for Franchise Agreement



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