Use of Alternative Daily Cover (ADC) at Tennessee Landfills – a Refresher

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Prepared by:

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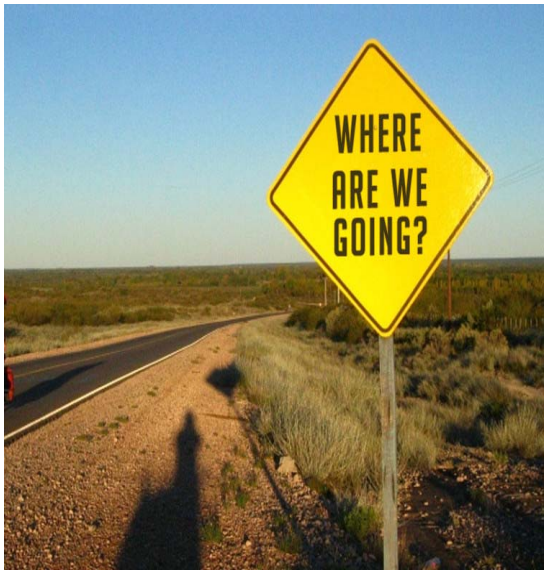
Outline



- Introduction
- Purpose (Regulatory Review)
- History of ADC
- Typical Material Categories
- Benefits - Why Use ADC
- When Not to Use ADC
- Example Applications
- Comparison Points
- Summary and Closing

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Part I
Background Information

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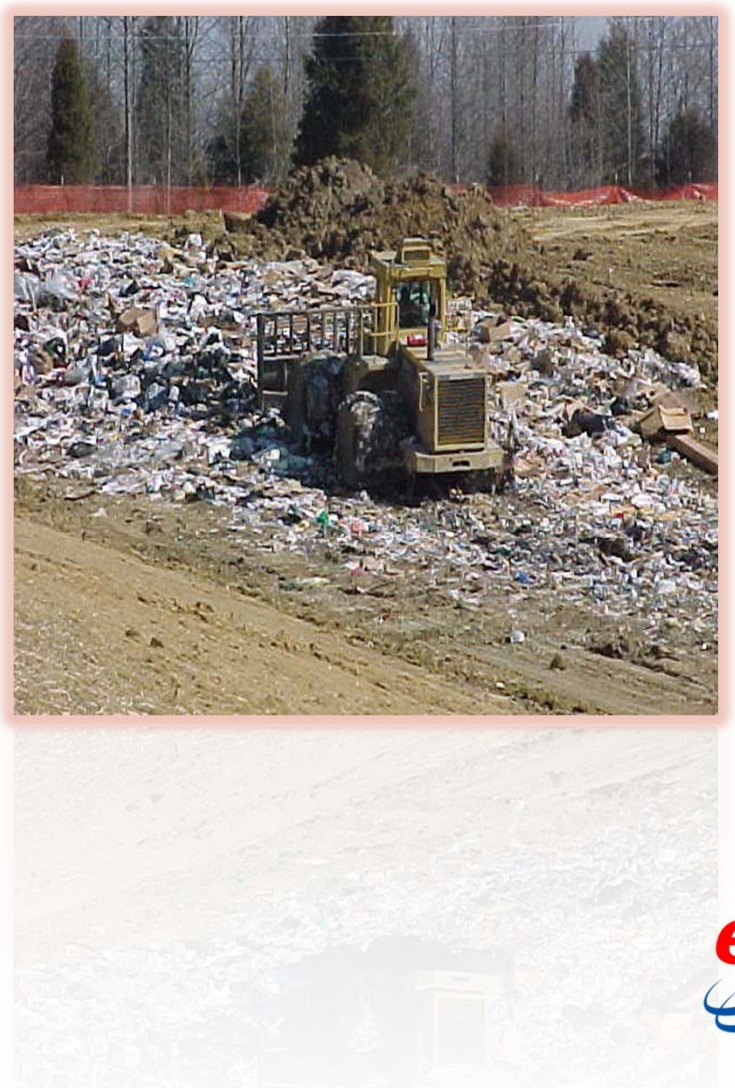
Introduction



Alternative Daily Cover (ADC)

- In Use for Years Now
- Effective and Important Part of Landfill Operations
- Some aren't Aware of Materials Being Used
- Refresher for Some

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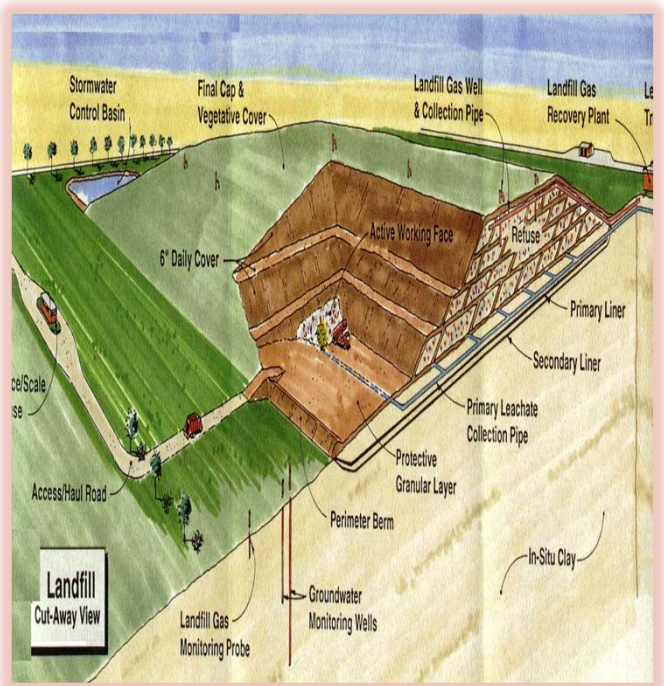
Purpose – Daily Cover Requirements



- Minimize:
  - access to waste by vectors
  - scavenging
  - odors
  - blowing of debris or litter
  - dust
  - threat of fires
  - infiltration of precipitation
- Be aesthetically acceptable
- Typically consist of 6-inch thick soil

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Regulatory Review

TDEC – Chapter 0400-11-01-04(6):

- Use 6” of soil
- End of each operating day
- Achieve performance criteria
- Alternatives used if meet criteria w/o a threat to H&E
- Approval of Agency
- Consistent w/ permit approvals

(Rule 0400-11-01-.04, continued)

(b) Class II and Class III Disposal Facilities must meet the standards for Class I disposal facilities in subparagraph (a) of this paragraph unless the operator demonstrates to the satisfaction of the Commissioner that, due to the nature of his solid wastes or operation, no significant amounts of gas will be generated within his facility.

(c) Class IV Disposal Facilities shall not be required to have gas migration control features.

(6) Waste Handling and Cover Standards

(a) Class I Disposal Facilities

1. The unloading of solid wastes at the disposal area must be confined to the smallest practicable area, and must be supervised by trained facility personnel to ensure safety and compliance with waste restriction requirements.

2. Promptly upon unloading, solid wastes (except in the case of solid waste balefills or other instances specifically approved in writing by the Commissioner) shall be spread in shallow (less than three-foot) layers and compacted with appropriate equipment to the maximum practicable density. Special wastes must be handled as specified either in the permit or in the special waste approval granted by the Commissioner.

3. The compacted solid waste must be covered at the end of each operating day with an initial cover consisting of at least a six inch layer of compacted soil or an adequate standard of other material as approved by the Commissioner.

4. Except for those completed portions to be finally closed (e.g., the final lift), all surfaces which will be left exposed for a period of over thirty days (e.g., initial and intermediate lifts) must be covered by an intermediate cover consisting of at least a one-foot layer of compacted soil or other material approved by the Commissioner.

5. All initial and intermediate cover depths must be maintained until either additional wastes are placed over the area or final cover is applied.

6. Upon achieving final grade or as otherwise required by the Commissioner, final cover shall be placed as set forth in the closure standards of paragraph (8) of this rule.

(b) Class II, Class III, and Class IV Disposal Facilities

1. Solid waste disposal activities shall be confined to the smallest practicable area. Compaction will be performed as necessary to ensure a stable fill.

2. Emplaced solid wastes shall be covered with soil or other material approved by the Commissioner of such depths and at such intervals as the Commissioner deems necessary to prevent fire hazards, promote a stable fill, minimize potential harmful releases of solid wastes or solid waste constituents, and control disease vectors.

(i) Class II disposal facilities shall have a frequency and depth of initial and intermediate cover specified in its permit conditions.

(ii) Unless otherwise specified by the Commissioner, Class III disposal facilities must be covered at least once every 14 days with at least a six

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History of ADC

- 1980's – Experimenting and Investigations
- 1990's – More Widespread
- Post 1990's:
  - Continued to Grow
  - Well Documented
  - SOP in Industry

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History of ADC

- Proven to:
  - Achieve Performance Criteria
  - Easily Worked into Operations
- Many Sites Do Not Use Them:
  - Plenty of Airspace
  - Plenty of Soil
  - Considered Potential to Create Soil Lenses
  - Continue with What Familiar With

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Typical Materials Categories

Non-Waste Derived or Manufactured / Commercially Available Materials

- Geosynthetic Materials
- Spray-on Materials

Waste Derived Materials

- Wide Variety

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Benefits – Why Use ADC

Daily Cover = Significant Impact on Landfill Operations and Life:

- Soil Eats-up Capacity
- Compounded when > Min Required Thickness Applied
- Avoid NOV
- Need to Apply >> Min 6" for "Interpreted Acceptable" Cover

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Benefits – Why Use ADC

Why Eliminate Soil:

- Siting Difficulties
- Airspace at a Premium
- Minimize Impacts of Soil Lenses
- Facilitate Operational Practices (e.g., Leachate Recirc, Bioreactors)

Eliminating Daily Soil Cover to Extent Possible = No Brainer

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Benefits – Why Use ADC

- Conserve Airspace
- Extend Landfill Life
- Facilitate Movement of Leachate and Gas to Collection Systems
- Provide an Alternative to Soil When Unavailable or Difficult Placement Conditions
- Save Time and Money
- Add Value

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When Not to Use ADC

- Winter conditions (e.g., snow for geosynthetics, freezing for spray-on)
- High winds
- Filling logistics
- Working face or slope areas as dictated by permit
- Permit approval limitations (e.g., size, days, etc.)
- Site or operator-specific limitations

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Part II
Examples

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Variety of Alternatives - Example Applications

- Some Good for Some
- Some Not So Good for Others
- Sites Develop Preferences and What Works Best
- Investigate and Evaluate

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Geosynthetic Materials: Plastics and Geotextiles

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Private Illinois Site

Geosynthetic Materials: Plastic Films

Credit: Enviro-Cover (WA)

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Geosynthetic Materials: Plastic Films

Credit: Enviro-Cover (WA)

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Geosynthetic Materials: Plastic Films

Various Private Sites

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Geosynthetic Materials: Tarps

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Credit: Tarp Armor (AR)

Geosynthetic Materials: Tarps

Credit: PacTec LandPac (LA)

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Geosynthetic Materials: Tarps

Various Private Sites

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Geosynthetic Materials: Geotextiles

Public Tennessee Site

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Geosynthetic Materials: Geotextiles and Tarps

Private Illinois Site

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Geosynthetic Materials: Geotextiles and Tarps

Private Illinois Site

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Geosynthetic Materials: Geotextiles and Tarps

Private Illinois Site

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Geosynthetic Materials: Geotextiles

Various Private Sites

Geosynthetic Materials: Geotextiles, Tarps, and Thin Geomembranes

Various Private Sites

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Geosynthetic Materials: Steel Panels

Credit: Iron Grizzly (BC)

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Geosynthetic Materials: Steel Panels

Credit: Iron Grizzly (BC)

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Spray-on Materials: Hydro Mulch

Credit: Emerald ADC Landfill Mulch (OR)

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Spray-on Materials: Hydro Mulch

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Credit: Landfill Solutions – Waste Cover (LA)

Spray-on Materials: Spray-on Slurry

Credit: Posi-Shell (NY)

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Spray-on Materials: Spray-on Slurry

Credit: ConCover (OH)

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Spray-on Materials: Foam

Credit: Rusmar Foam Technologies (PA)

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Waste Derived Materials: Altered Tires

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Private Indiana Site

Waste Derived Materials: Auto Shredder Residue

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Private Tennessee Site

Waste Derived Materials: Auto Shredder Residue

Private Tennessee Site

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Waste Derived Materials: Recycled Paper Pulp

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Waste Derived Materials: Contaminated Soil

Private Illinois Site

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Waste Derived Materials: Wood Chips

Private Illinois Site

Part III
Comparison Points

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Pro's and Con's

Geotextiles and Tarps

Pro's:

- Easily covers large area
- Long life
- Uses no airspace

Con's:

- Can rip from pointed materials
- Cold weather difficulties
- Difficult in winds
- Need adequate anchoring

Spray-on

Pro's:

- Do not need to be removed

Con's:

- May not provide complete "blanketed" cover and/or multiple applications from different directions
- Requires prep and application equipment

Plastic Films

Pro's:

- Easy to deploy in all climates
- No work next day
- Inexpensive
- Uses no airspace

Con's:

- Thin and can tear
- Difficult in winds
- Need adequate anchoring

Waste Derived Materials

Pro's:

- Make use of waste received
- Can be source of revenue
- Brought to working face

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Typical Capital Costs and Re-use Life

	Geosynthetics			Spray-on Examples	
	Plastic Films	Geotextiles	Tarps	Foam	Posi-Shell, Mulch
Material	$0.02 - $0.03/sf	$0.20 - $0.30/sf	$0.50 - $0.70/sf	$0.05 - $0.15/sf	$0.03 - $0.07/sf
Equipment	$0 - $7K to $75K+	minimal	$0 to $30K+ (^)	$50K to $300K (*)	$15K to $100K (#)
Re-use Life (&)	1 day	1 month to 1 year	months to years	1 day	1 day

(^) - High end related to TarpArmor Automated TDS

(*) - Various systems: Handline to Self-Propelled

(#) - Various Hydroseeder set-ups

(&) - Does not represent actual days material can remain in place which is dictated by permit and by material

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Analysis / Evaluation Considerations

Capital Costs:

- Cost of ADC material chosen
- Multiple re-use potential
- Cost of equipment

Operational Costs:

- Equipment and personnel costs for application and removal

Considerations when Comparing to Use of Soil:

- Hourly cost of equipment and operators
- Costs of placing soil (procuring, excavating, hauling, placing)
- Airspace gain and value

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Summary

ADC Has Proven to:

- **Meet Performance Criteria**
- **Save Airspace**
- **Extend Life**
- **Save Soil**
- **Improve Operations**
- **Save Time and Money**
- **Add Value**

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Closing

- **Using ADC – Review and New Ideas**
- **Using Soil:**
  - **Consider Alternatives**
  - **Take Another Look at ADC**
- **See if ADC Can Work for You !**

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Thank You!

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