

# McIlvaine Hot Topic Hour

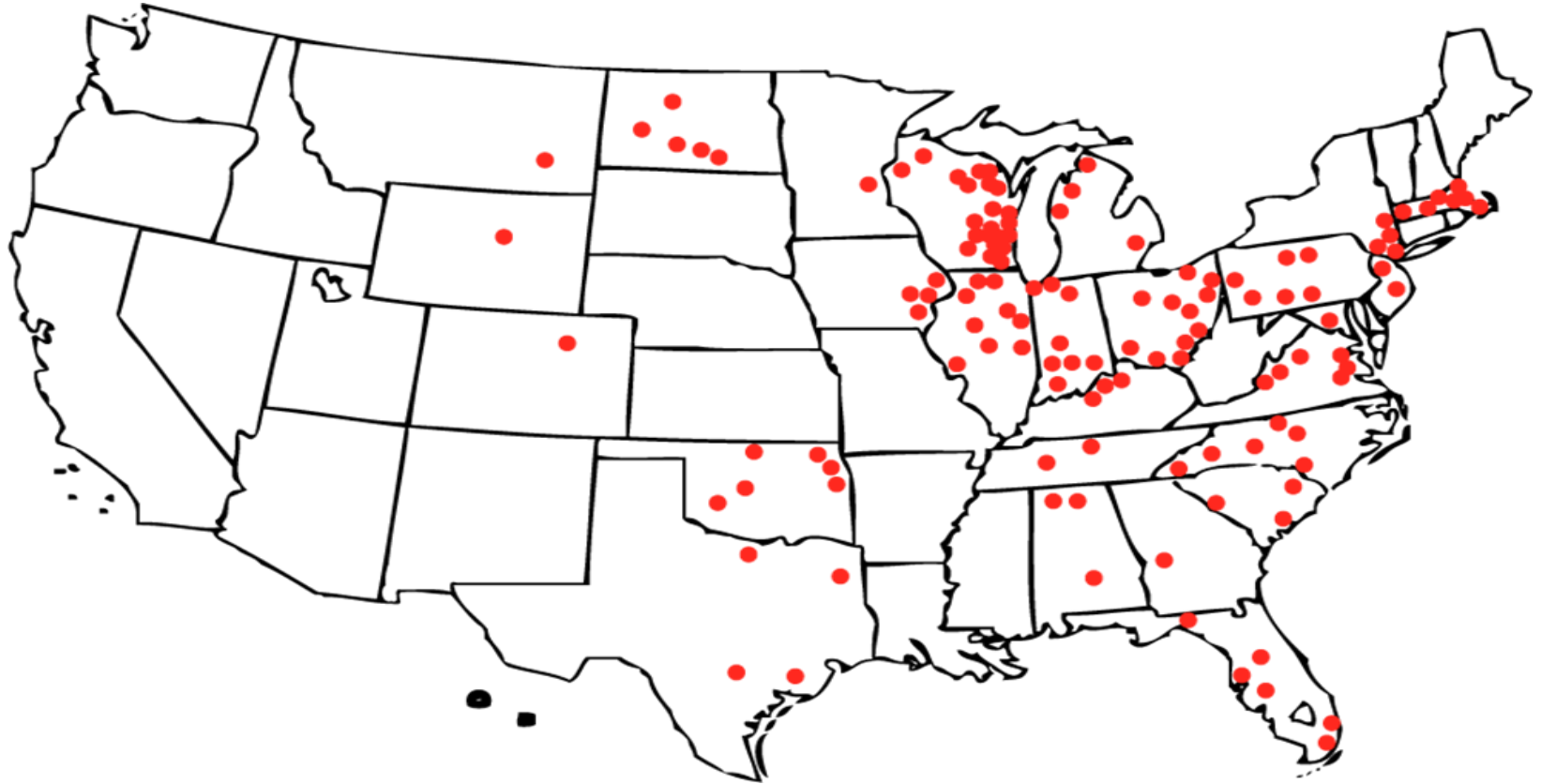
Coal Ash/CCR Issues, Standards and Solutions

[→] October 3, 2013



**[ DURABILITY RUNS DEEP ]**

# Why? Impact to Waters



Coal Ash Disposal and USEPA Documented Groundwater Contamination

# Current Political/Regulatory Situation

## 1. House of Representatives passes HR 2218

**US HR clear message – Non-hazardous; Subtitle D RCRA**

## 2. Legal Action vs. US EPA - Force CCW rule-making

- Environmental Coalition; Beneficial Use Industry; Utility Group
- Judge ruling set for October/November
- Deadline for Rule

## 3. US EPA - Attempting to respond to rulemaking/reuse concerns.

- No statutory requirement to do its work by a certain date.
- Needs a 1-year minimum to respond/change/etc. and certainly not 6-months.
- A year might not be enough time to develop a set of regulations that are scientifically sound and legally defensible.

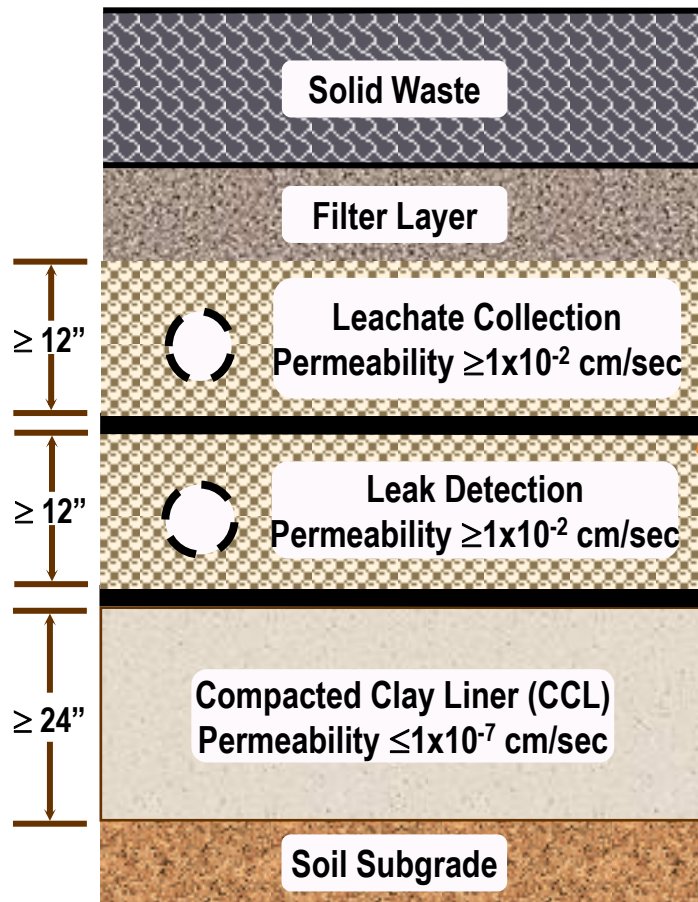
## 4. All options currently call for liner systems - Geosynthetic Opportunities

## 5. EPA Effluent Guideline Rule – RCRA Subtitle D is likely adequate.

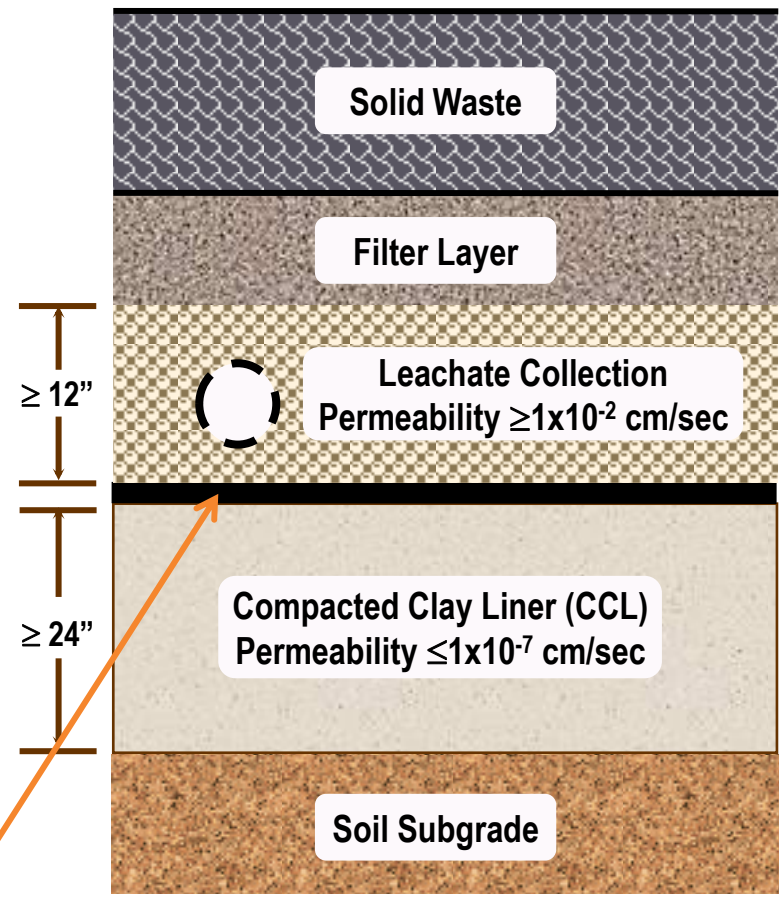
# Base Liner Systems

EPA Minimum  
Technical Guidance

## Subtitle C



## Subtitle D

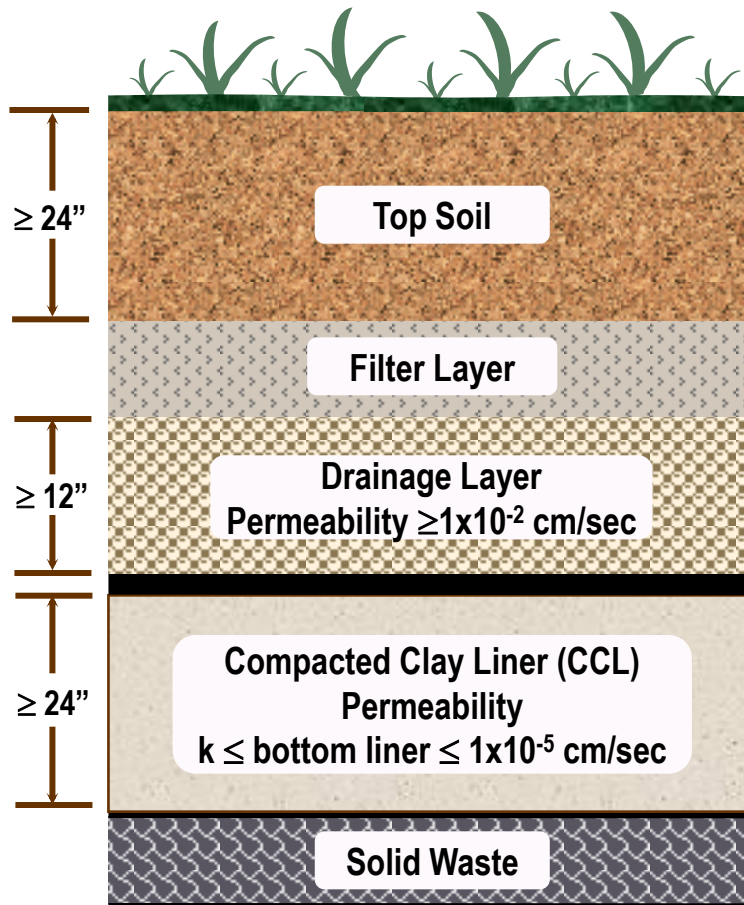


Geomembrane

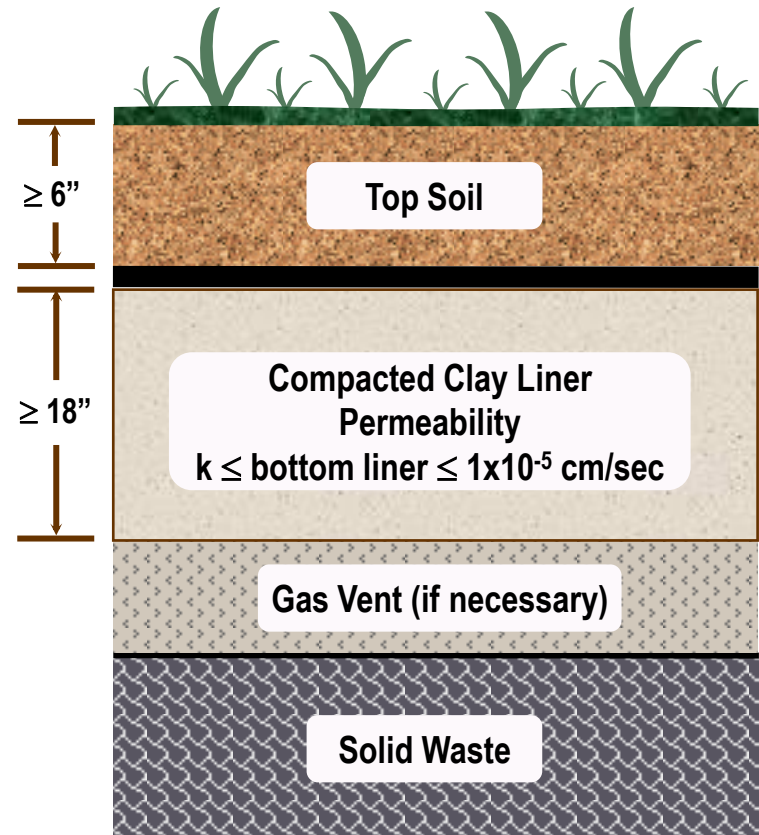
# Cover Systems

EPA Minimum  
Technical Guidance

## Subtitle C

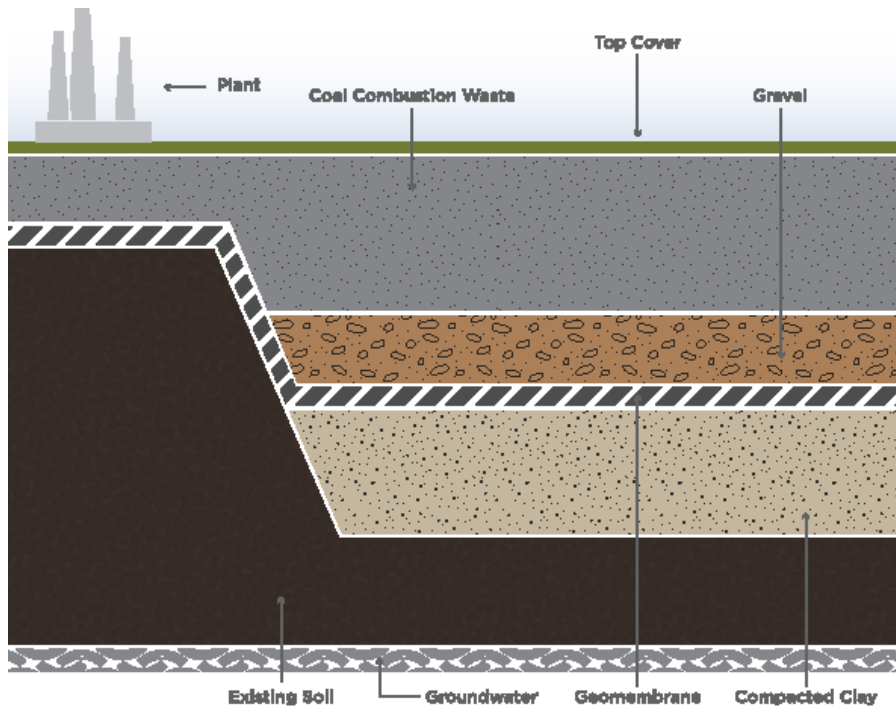


## Subtitle D

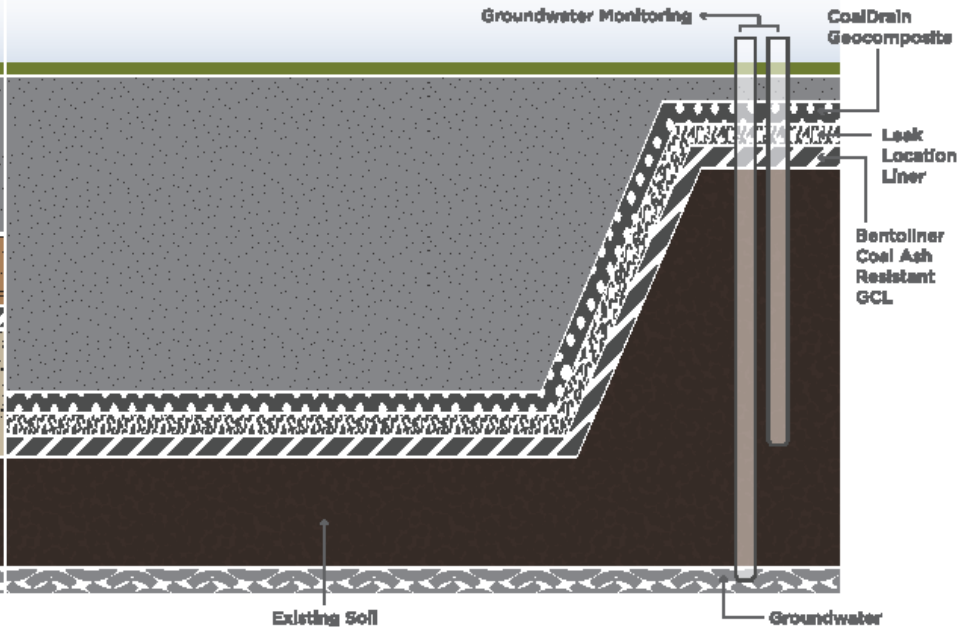


# RCRA Subtitle "D" vs. Coal Ash Barrier System

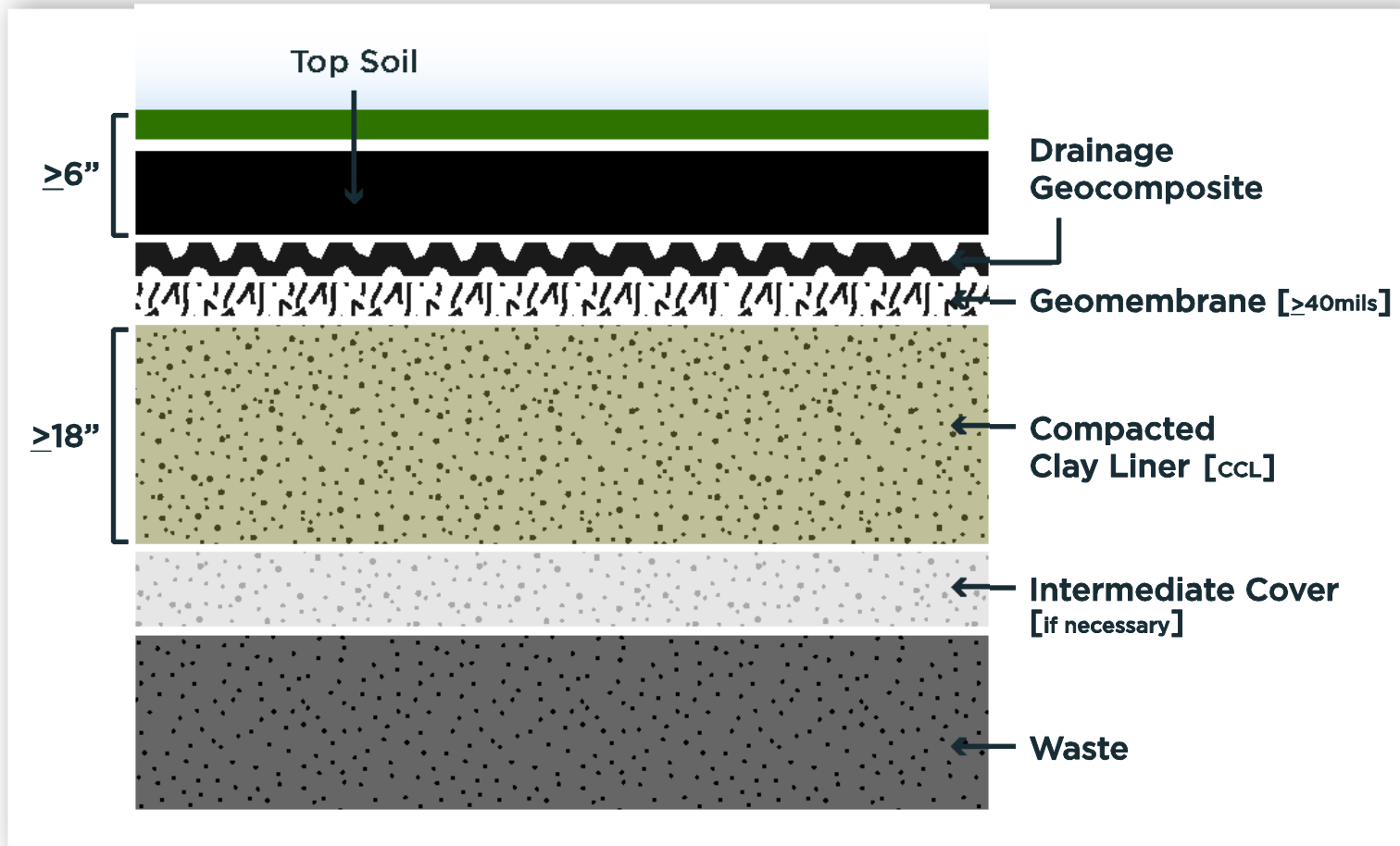
## Minimum Subtitle D



## Coal Ash Barrier System



# Coal Ash Barrier System - Cap



# Geosynthetic vs Earthen Materials

- ✓ Greater durability, consistency and reliability
- ✓ Reduced risk of groundwater contamination
- ✓ Ensured compliance with regulations
- ✓ Increased landfill capacity; optimized land use
- ✓ Easier and quicker to install
- ✓ Lower installed cost
- ✓ Reduced impact to borrow areas and plant operations



# GCL Good for Environment & Neighbors

150 Truckloads of Clay = 1 Truckload of GCLs



# Performance Issue – Filtration/Drainage

## CoalDrain:

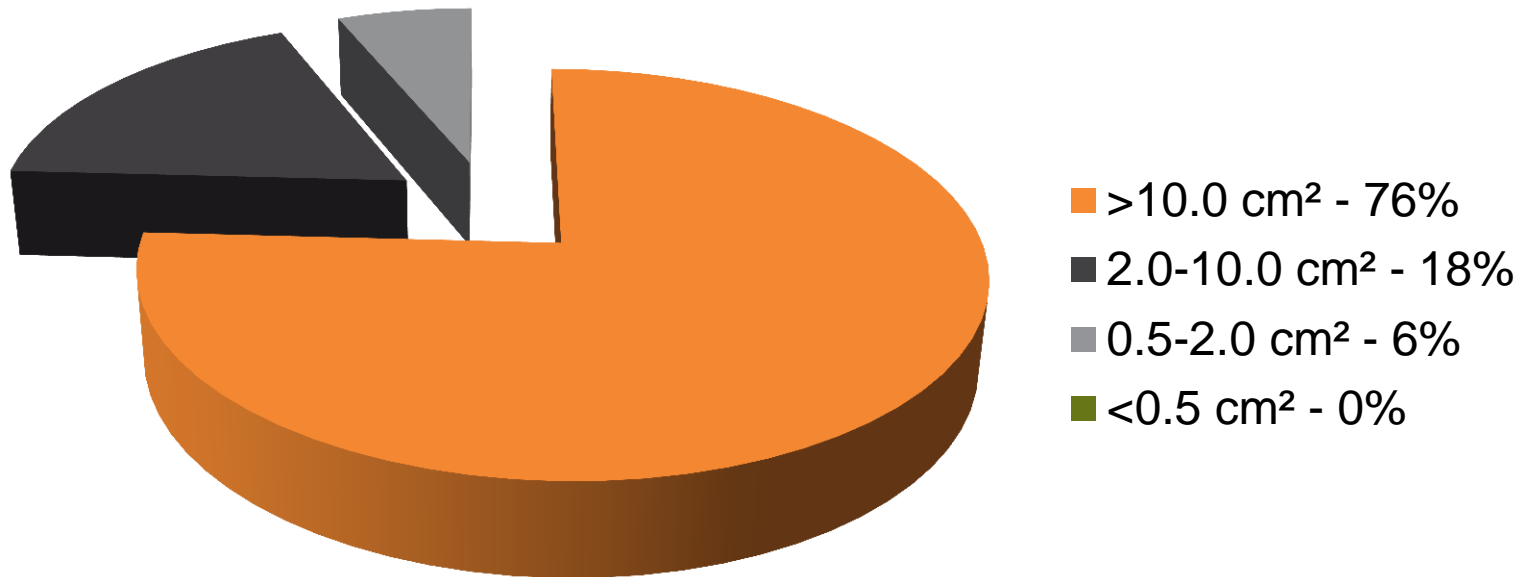
### Engineered to be Effective Geocomposite

- ✓ More consistent than earthen
- ✓ More cost-effective than earthen
- ✓ No piping
- ✓ No clogging



# Performance Issue – Membrane Damage

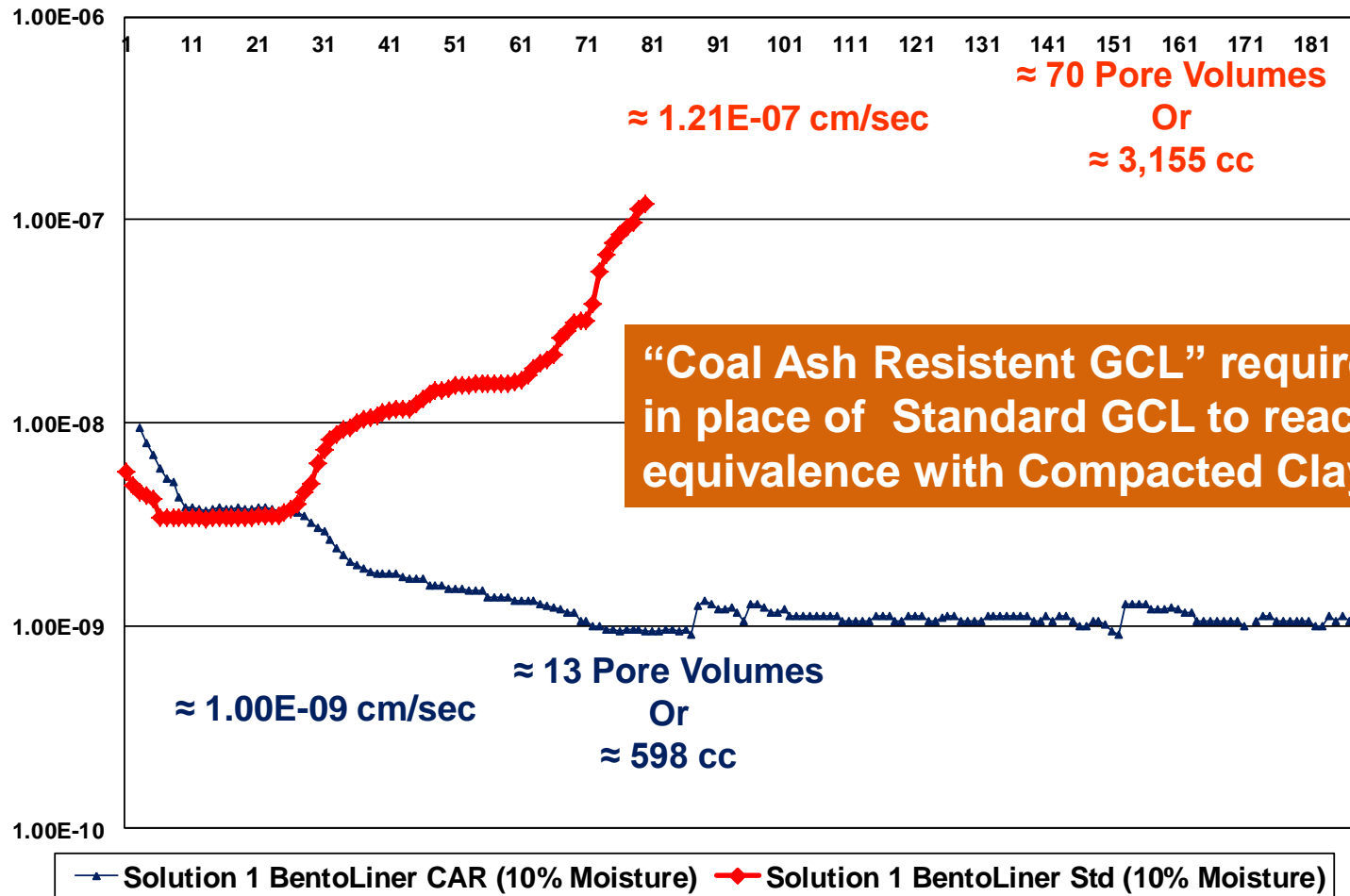
## Survey Data - Defect Perforation Sizes, Nosko & Touze Foltz (2000)



**Innovative Leak Location Liner allows location construction damage even after placement of protective cover soil.**

# Performance Issue – Chemical Compatibility

## Hydraulic Conductivity (cm/s) vs. Time (Days)

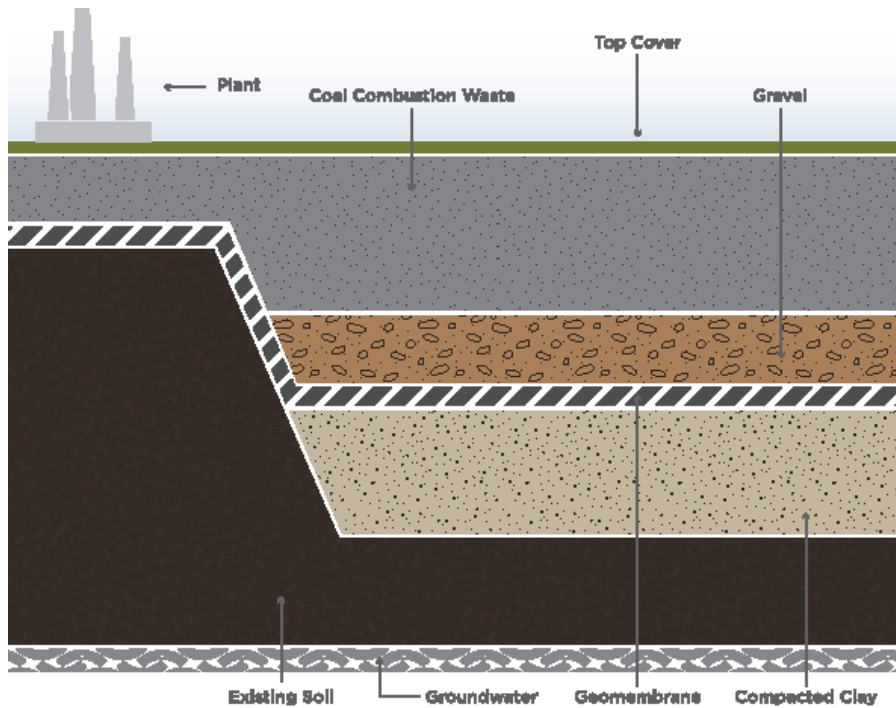


“Coal Ash Resistent GCL” required in place of Standard GCL to reach equivalence with Compacted Clay Liner

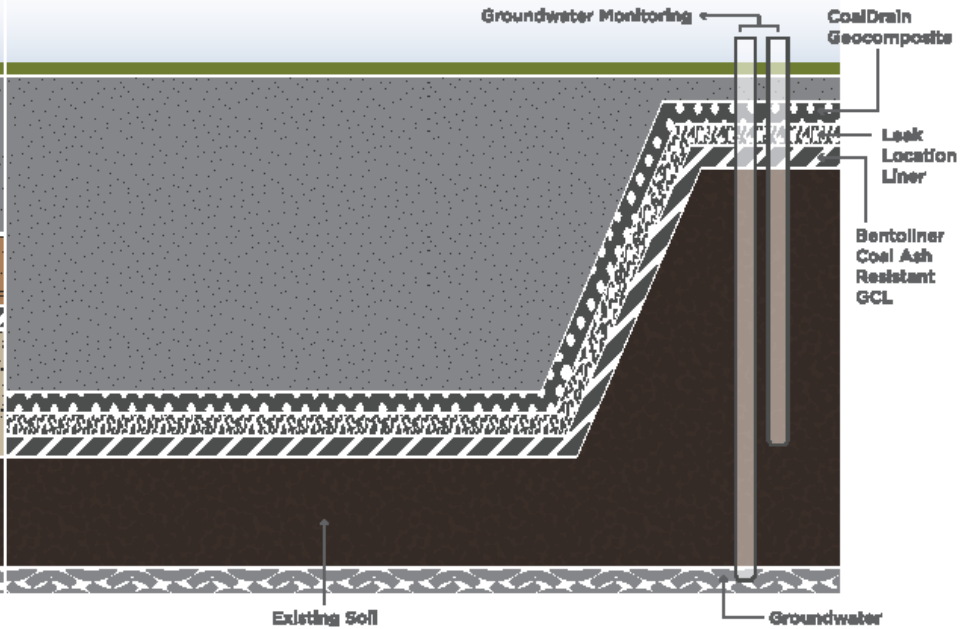


# RCRA Subtitle "D" vs. Coal Ash Barrier System

## Minimum Subtitle D



## Coal Ash Barrier System





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