REINHOLD ENVIRONMENTAL Ltd.

2018 NOx-Combustion Round Table & Expo Presentation

February 19-20, 2018, in St. Louis, MO / Hosted by Dynegy

Southern Company

Ash Pond Closure 101

2018 Nox-Combustion-CCR/PCUG Conference
February 20, 2018

Presenter:

Anita Perry

CONSTRUCTION

Summary of work in Georgia

- Hybrid closure strategy – since the Fall of 2014
  - Closure by Removal in some areas
  - Close in place

- Divide and conquer by creating ditches to route ground water and storm water around construction areas.

- Utilize Best Management Guidelines published by the University of North Carolina's CALM group (Coal Ash and Liquid Management).
  - Work Plan for Safe work on ash
  - Training for equipment operators, supervisors and engineers
  - Collaborative approach – Contractor ways and means AND Owner engineering/Consultants

It takes a village!

- Our concern has been layers of material that will not allow the water pressure to relieve itself upon loading (with equipment, material stockpiling, etc.)

- Our concern has been material that exhibit “clay like” properties. Plastic. Fine particles. Affinity for water.

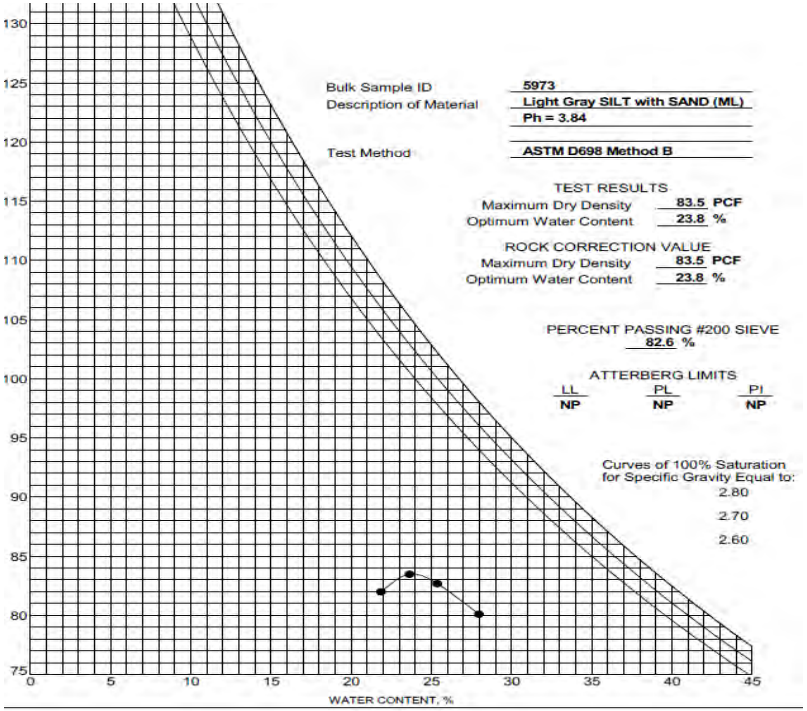
- Other concerns – dust and water quality

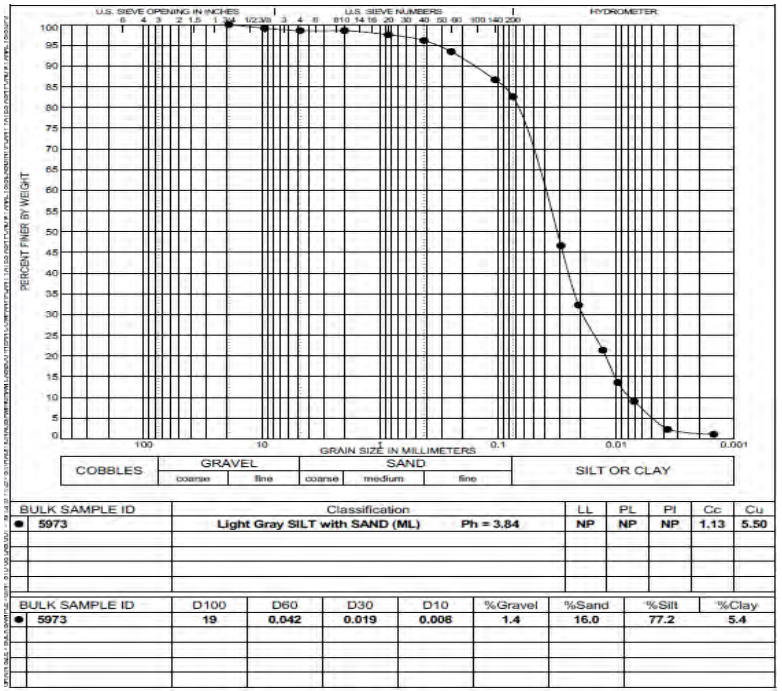
How will the material respond to Construction Loads?

Drains Well

Holds Water

Drains Well

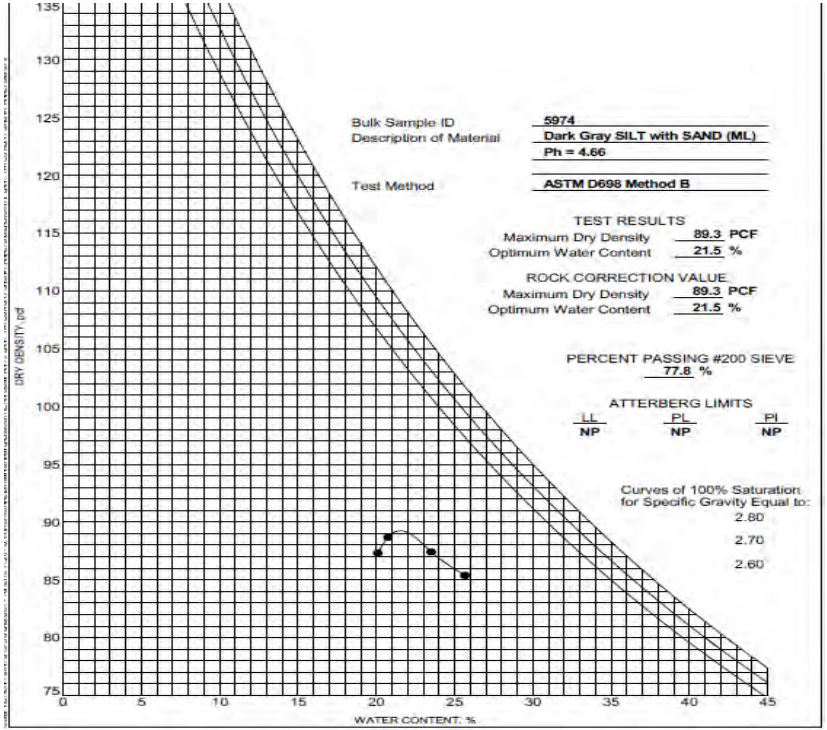


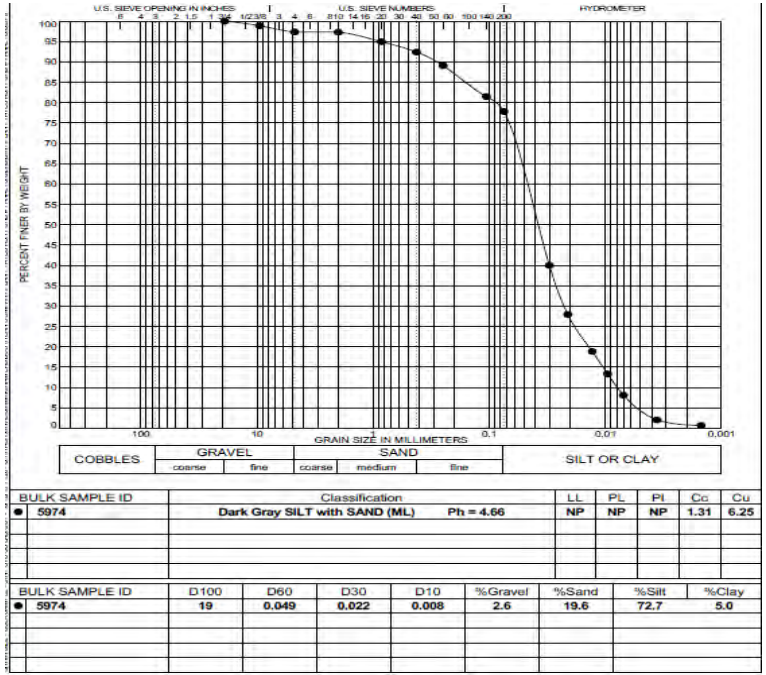


BULK SAMPLE ID	Classification	LL	PL	PI	Cc	Cu
● 5973	Light Gray SILT with SAND (ML) Ph = 3.84	NP	NP	NP	1.13	5.50

BULK SAMPLE ID	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 5973	19	0.042	0.019	0.008	1.4	16.0	77.2	5.4

Holds Water





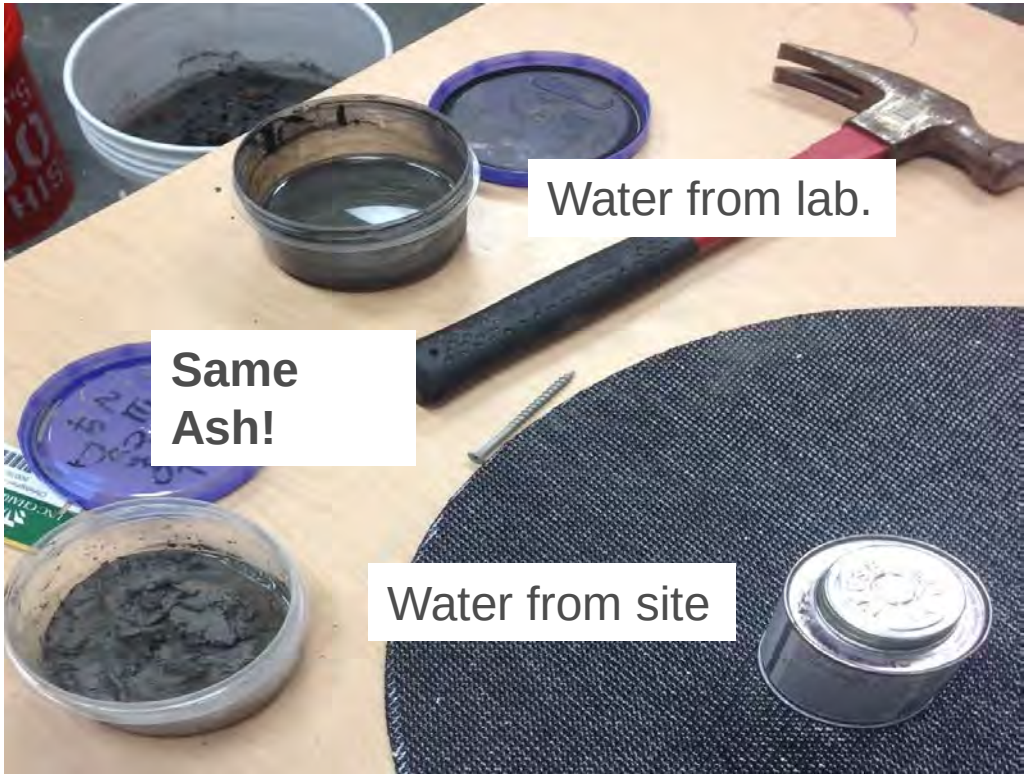
BULK SAMPLE ID	Classification	LL	PL	PI	Cc	Cu
● 5974	Dark Gray SILT with SAND (ML) Ph = 4.66	NP	NP	NP	1.31	6.25

BULK SAMPLE ID	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 5974	19	0.049	0.022	0.008	2.6	19.6	72.7	5.0

Ash from same pond. Grain size distribution and proctor curves are similar. Color different. Properties are **vastly** different.

Ash properties change with water properties

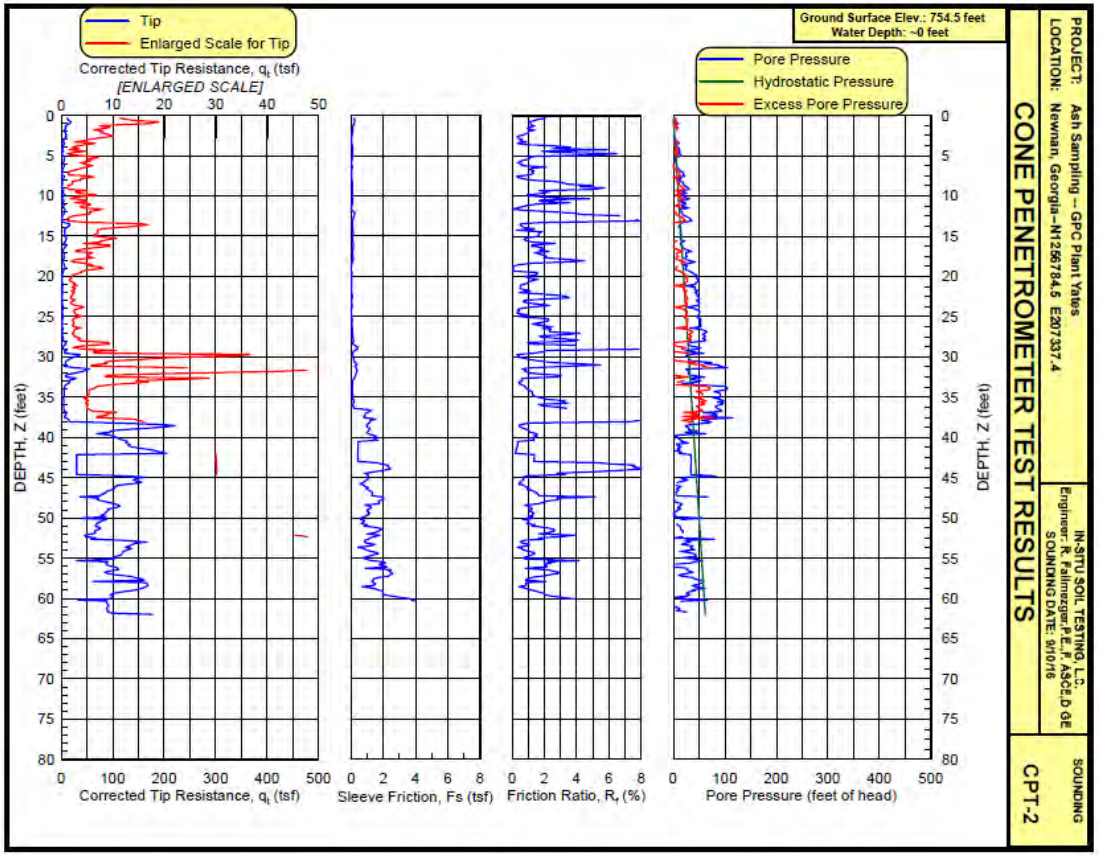
Same ash..**different water**. Lab water separates easily from ash (*top sample*) Pond water stays within ash matrix (*bottom sample*)



What would you do to analyze this?

Pass out cards!

The consultants provide data such as this… CPT rig on a marsh master



Look for drainable layers

- Drainable layers have pore pressures reading along the hydrostatic pressure line.
- Drainable layers at 14’, 30’, 32’, and 39’
- Another clue is looking at the tip resistance. Drainable layers typically have coarser materials with higher tip resistance.

Contractor builds roads per his/her work plan for safe work on ash

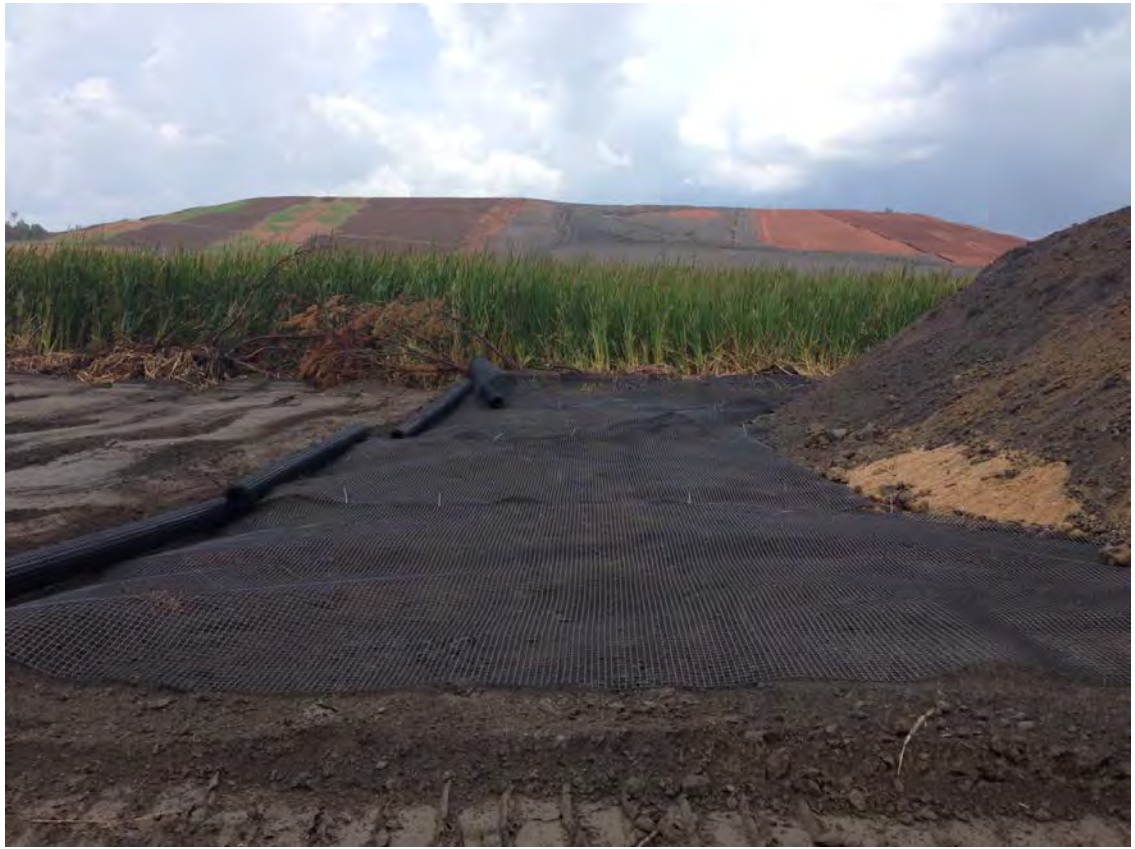
Floating Roads installed in a waffle pattern every 200’.

Contractor pushes material out in several areas to allow water to dissipate. Pore water pressure monitors continuously monitor. Several “time outs” were called!

Pore water pressure monitors are installed directly in ash

Manual analyses using vane shear probe

Geotextiles and course materials for capillary break



Other helps…

Tap in to Engineer's files

August 9, 1976

Yates Emergency Ash Pond

View of Dike

Dike at elevation 746-749
(Higher at far end)

Placement of Material
on dike.

Final clearing of reservoir

Zones within ash ponds can vary

Ash with different properties can be found in the same pond.

Old aerial photos may help.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