Common mineland hazards

- High wall/pits
- Water filled pits
- Abandoned workings
- Subsidence
- Acid mine drainage
- Mine fires

Close association of mining activities [past and present] with villages

6/23/1999

Highwalls

Haul road
High wall

City of Shenandoah
site of two drownings
39 acres
240 feet deep
View from High Wall

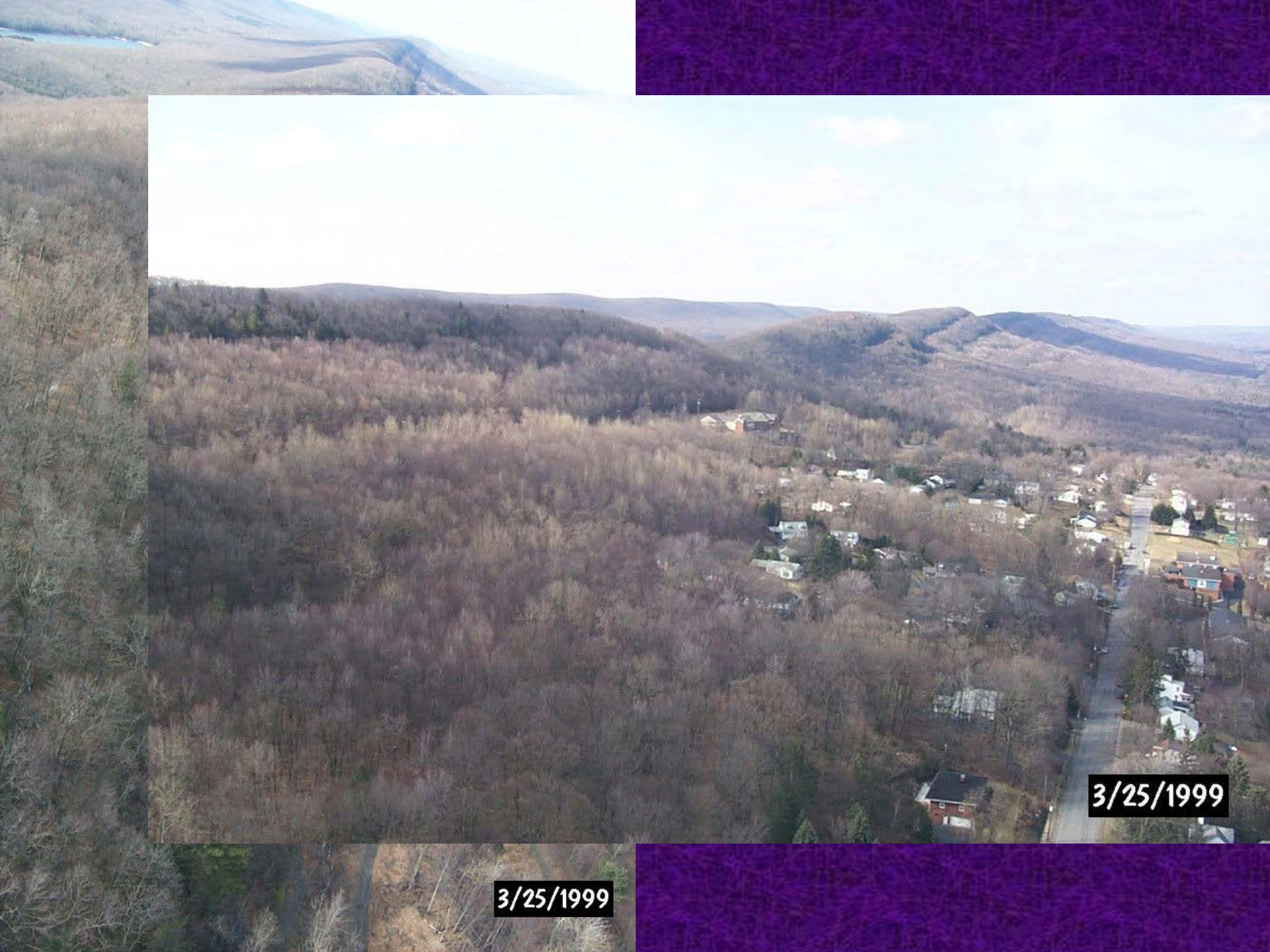
Water filled pits

Coal silt
3/25/1999

Abandoned workings

Abandoned Colliery

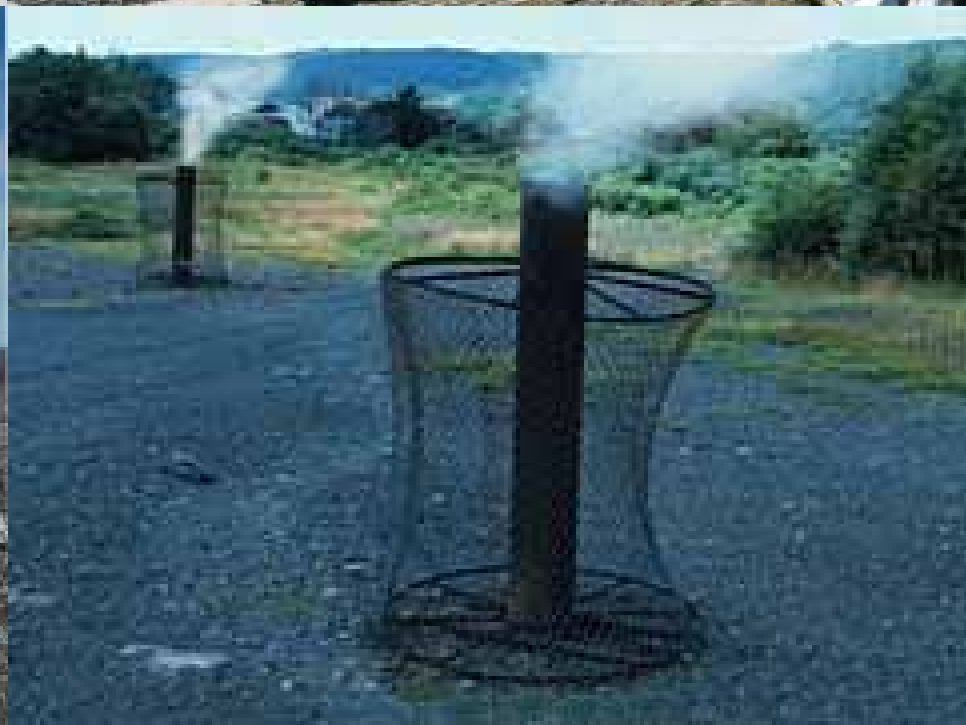
Subsidance


3/25/1999
3/25/1999

11/11/1999
11/11/1

Acid mine drainage

Mine Fire



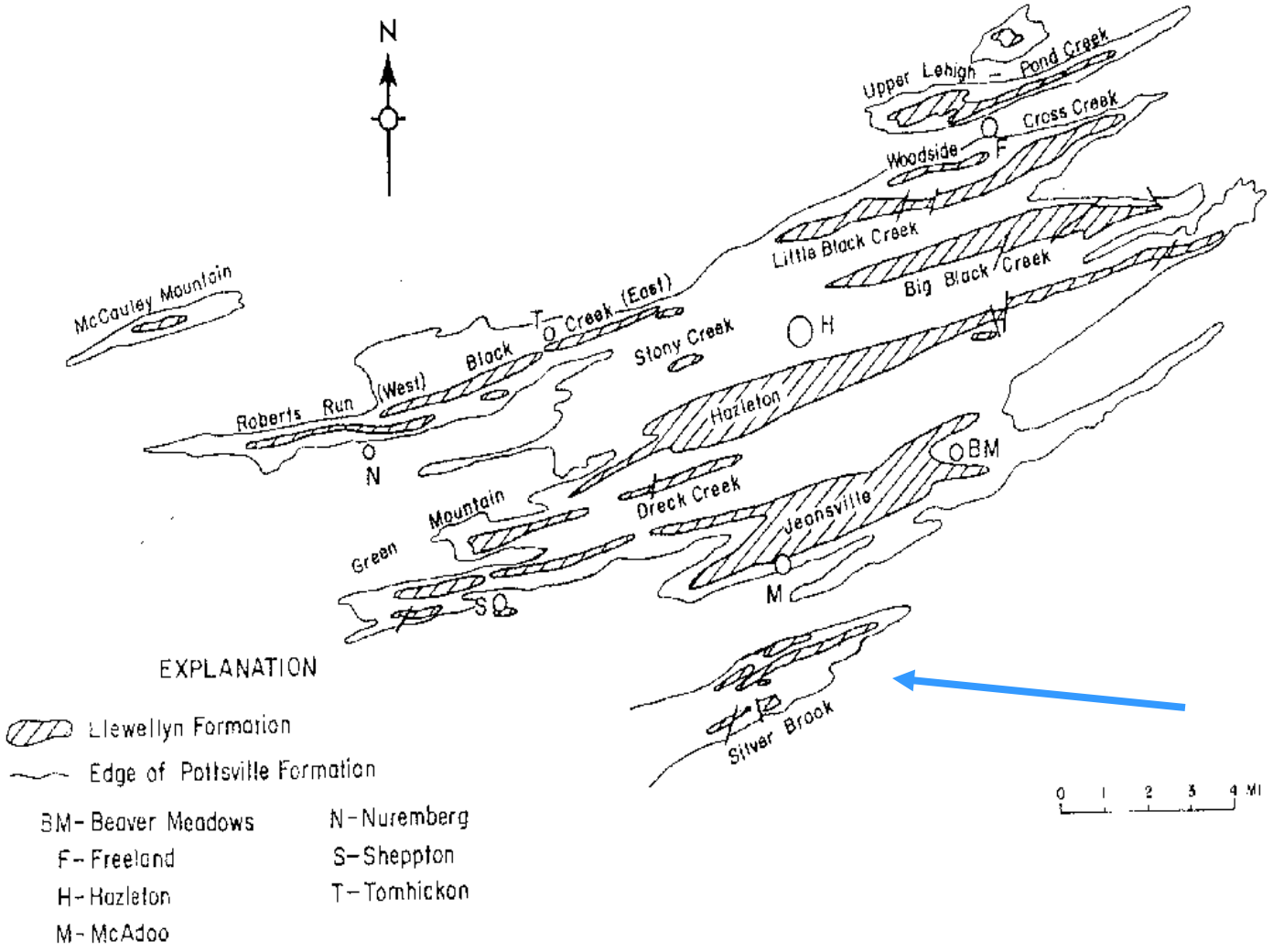
Remediation Strategies

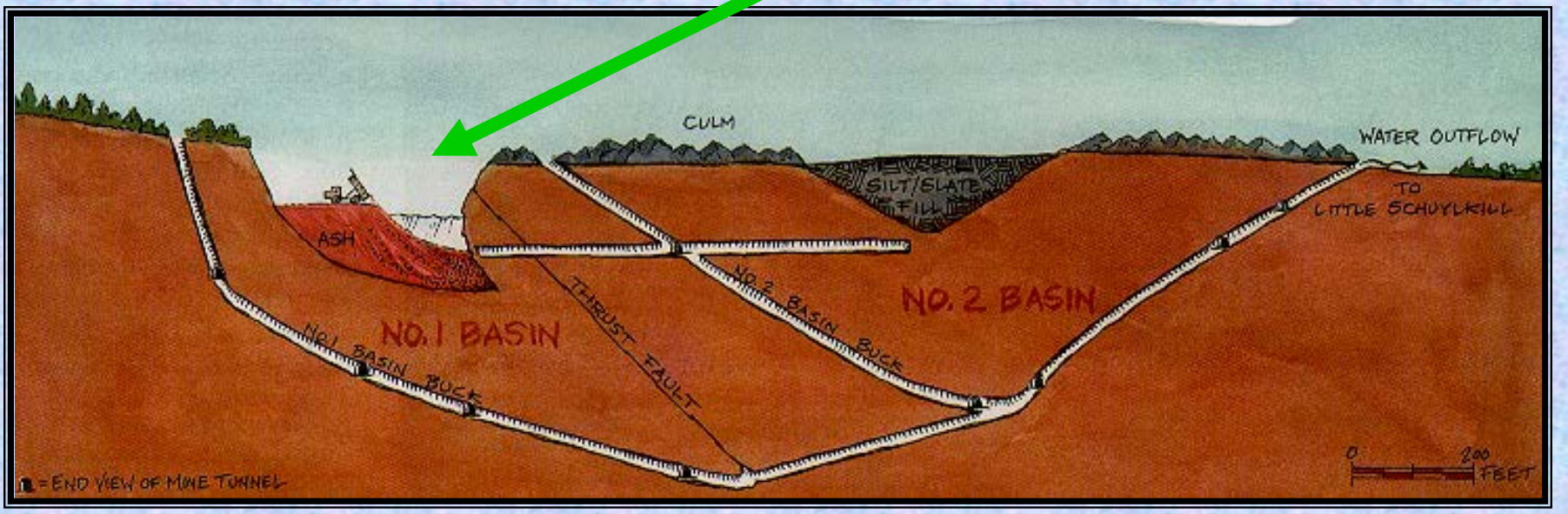
High wall/pits Water filled pits Abandoned workings Subsidence	Structural fill
Acid mine drainage	infiltration barriers in situ grout injection structural fill
Mine fire	remine

Case Study

Closure of a Water Filled Pit

Location of the Silver Brook Basin in the East Central Anthracite Coal Field




CULM
WATER OUTFLOW
TO
LITTLE SCHUYLKILL
SILT/SLATE
FILL
ASH
NO. 1 BASIN
NO. 2 BASIN
NO. 2 BASIN BUCK
NO. 1 BASIN BUCK
THRUST FAULT
0
200
FEET
= END VIEW OF MINE TUNNEL

Silt Deposited from Coal Washing

Silverbrook Outfall
"Big Gorilla"
reclaimed
Little Gorilla
16 5:01PM

17 10:30AM

17 10:30AM

Spring 2001
Ash front

Status of Closure as of February 2003

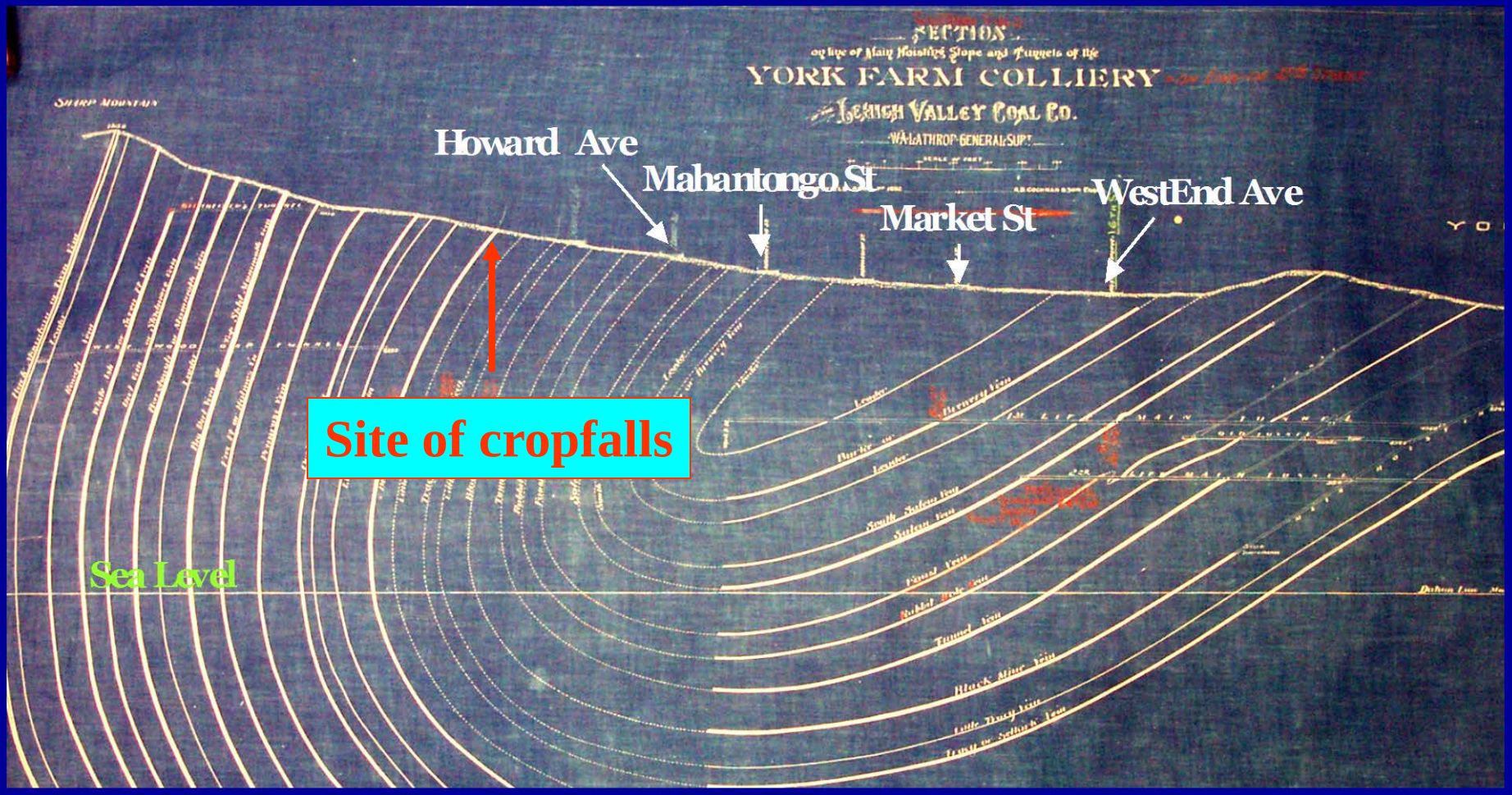
Important characteristic properties of by-product materials for use as a structural fill are:

- **Density/porosity**
- **Bearing capacity**
- **Consolidation**
- **Permeability**

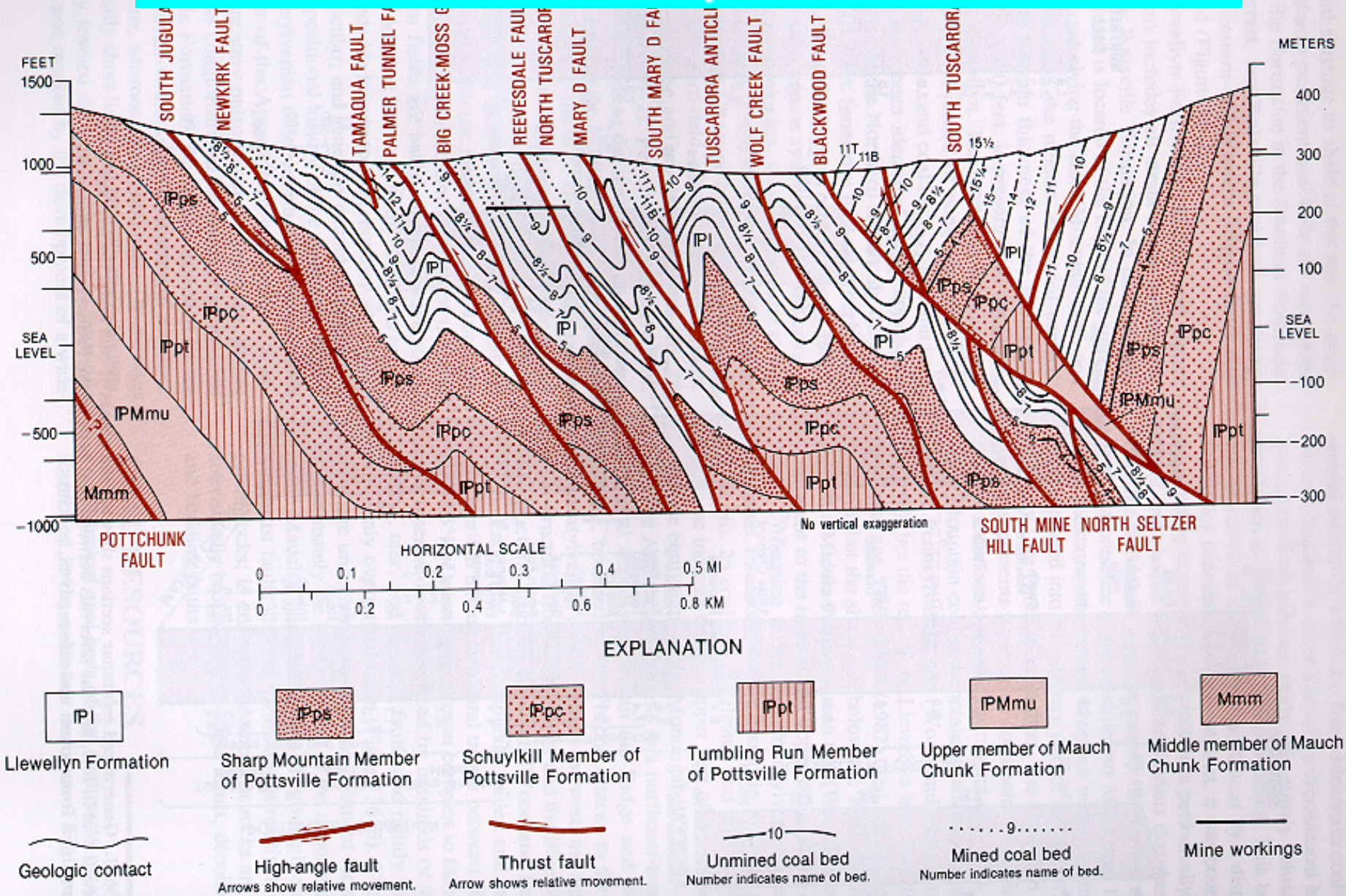
Case Study subsidence

Anatomy of a Crop Fall

Cross sectional map of Pottsville York Farm Colliery – April 1, 1892



Characteristic Structure in the Anthracite Coal Fields of Pennsylvania

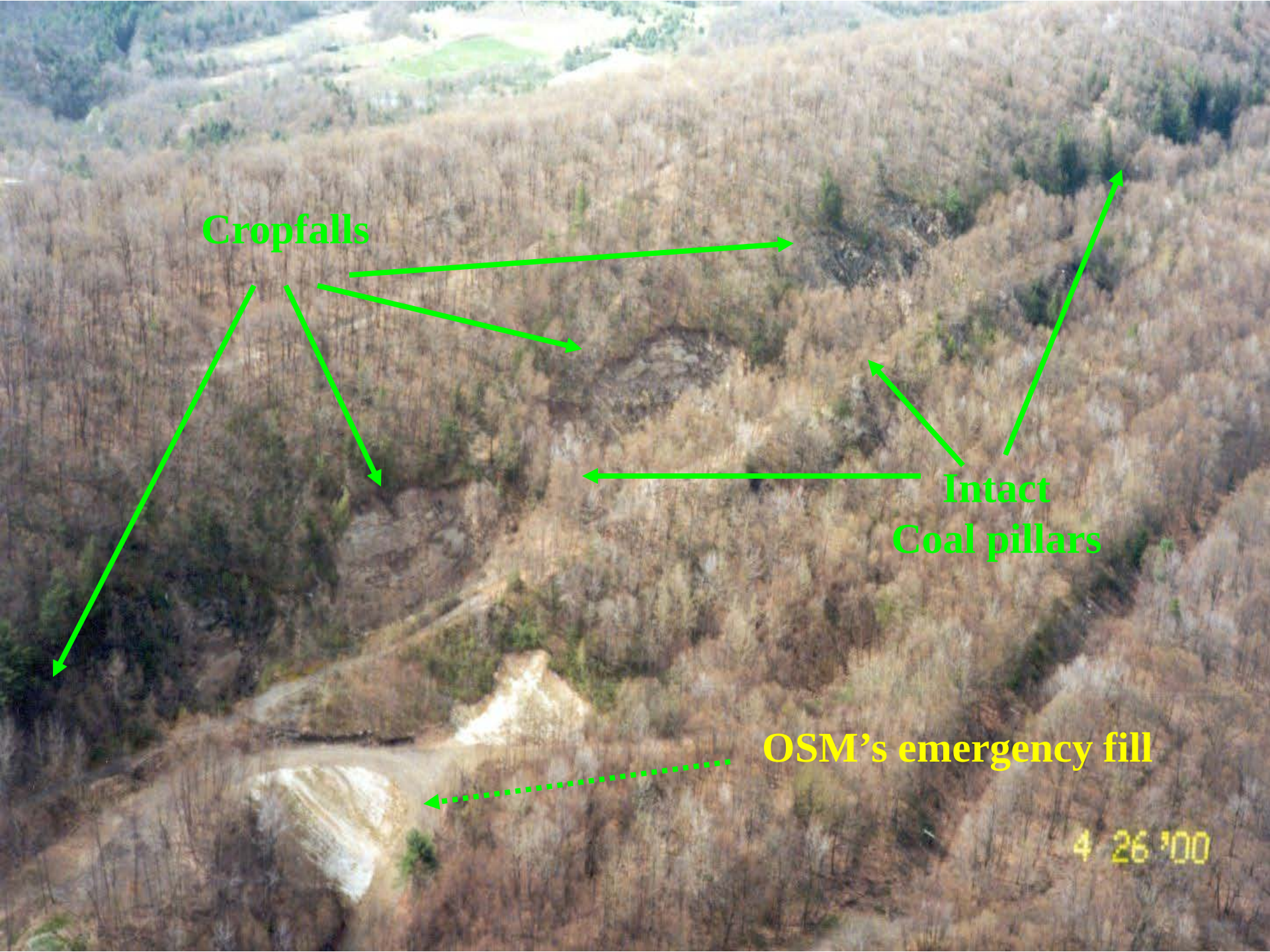


3/25/1

Active Cropfalls can reach 400’ deep and 80’ in width

23 10:20AM

Typical Appearance of Subsidences with Cropfalls


Cropfalls
Intact
Coal pillars
OSM's emergency fill
4 26 '00

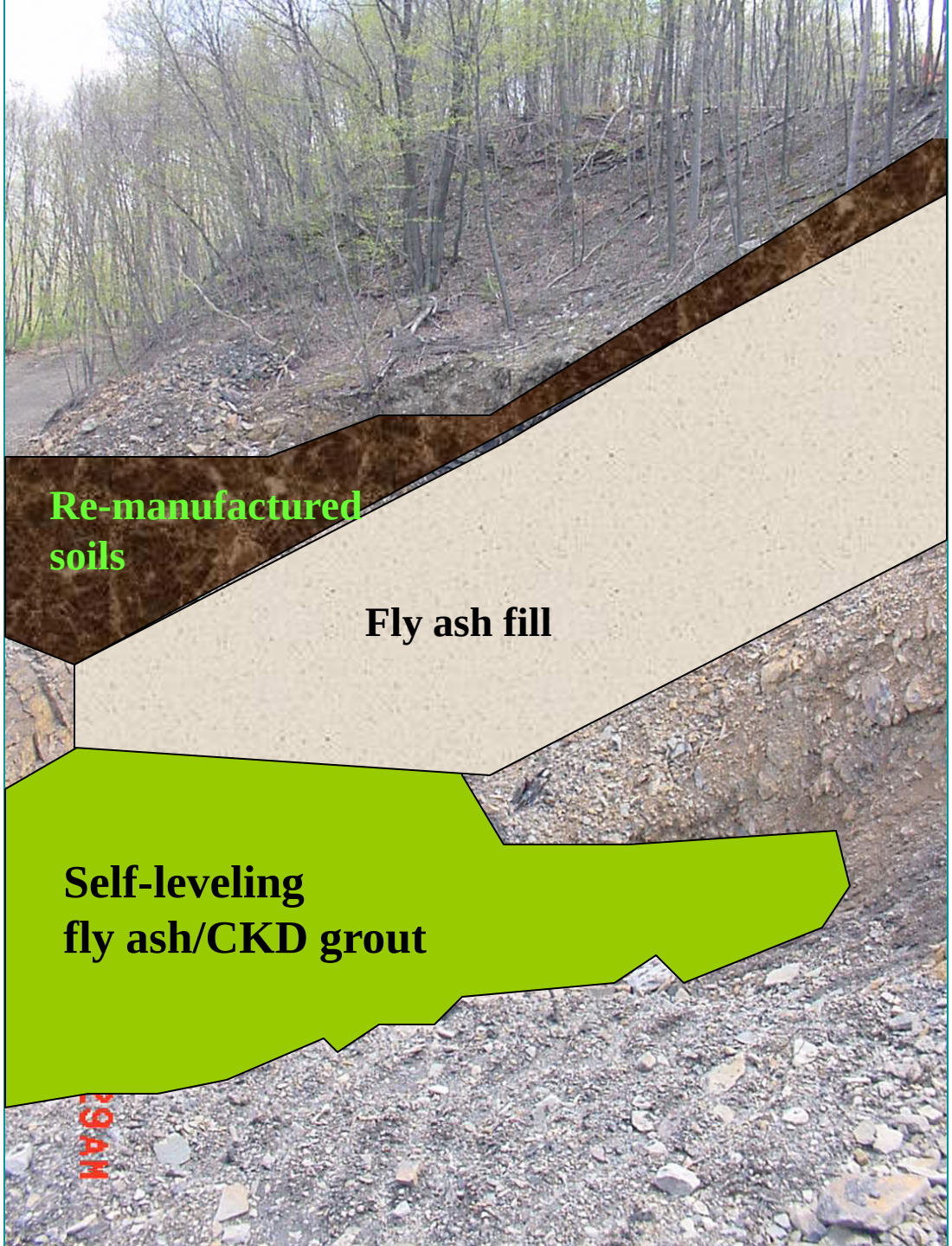
What remains of OSM's
emergency back fill
23 10:12AM

Coal pillar
23 10:12AM

Inverted Truss Closure

23 10:39AM

Self-leveling
Fly ash/CKD grout
23 1:48PM


Re-manufactured soils
Fly ash fill
Self-leveling fly ash/CKD grout