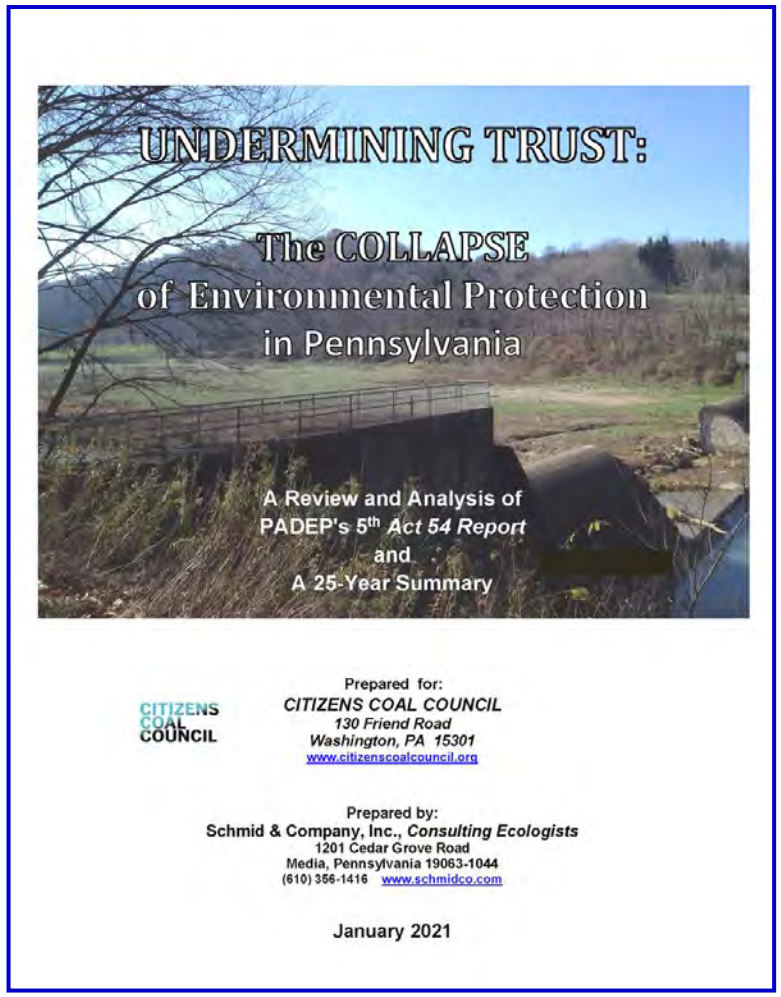
“Undermining Trust: The Collapse of Environmental Protection in Pennsylvania”

January 19, 2021

Citizens Coal Council's Review of the 5th 5-Year Act 54 Report



PA DEP's 5th 5-Year Act 54 Report

Act 54

Enacted June 22, 1994

Amended the 1966 Bituminous Mine Subsidence and Land Conservation Act (BMSLCA)

- Allowed damage to all homes but with repair or replacement expected

- Proposed restoration or replacement of damaged water supplies

- Required analysis/reports by the PA DEP on subsidence effects every 5 years

Did <u>not</u> authorize stream damage, existing environmental laws remained in effect

Act 54: Section 9.1

(d) Nothing in this act shall be construed to amend, modify or otherwise supersede standards related to prevailing hydrologic balance contained in the Surface Mining Control and Reclamation Act of 1977 [SMCRA] …. nor any standard contained in …. "The Clean Streams Law," or any regulation promulgated thereunder by the Environmental Quality Board.

Stream Protection in Pennsylvania in 1994

1. **Clean Streams Law (1937) – prohibits pollution:**
   - Physical changes to stream
   - Temperature changes
   - Changes in flow or use

2. **Environmental Rights Amendment (Article 1, Section 27) – 1971**
   - Trustee obligation to conserve natural resources

PA DEP's Reporting Responsibilities Under Act 54

The agency must document and track impacts and resolutions related to:

- Structures
- Water supplies
- Land
- Streams and wetlands

The Facts

Longwall mining is responsible for most damages (95% in 5th Period)

Less than 10% of all damages to structures and water supplies are being repaired (contrary to Act 54 requirements)

Damages to streams and other water resources are allowed, not avoided (in violation of Act 54, CSL)

25 years since passage of Act 54

- 175,815 **acres** have been undermined
- 1,427 **structures** damaged – 94% longwall mining
- 1,726 **water supplies** damaged – 67% longwall mining
- 362 incidents of **stream** damage/pollution – 99% longwall mining

Current Situation

PA DEP – Aware of these failures

PA DEP – Allows continued violations

PA DEP – Does not punish violators

Underground Mining Methods in Pennsylvania

Room & Pillar

R&P with Pillar Recovery

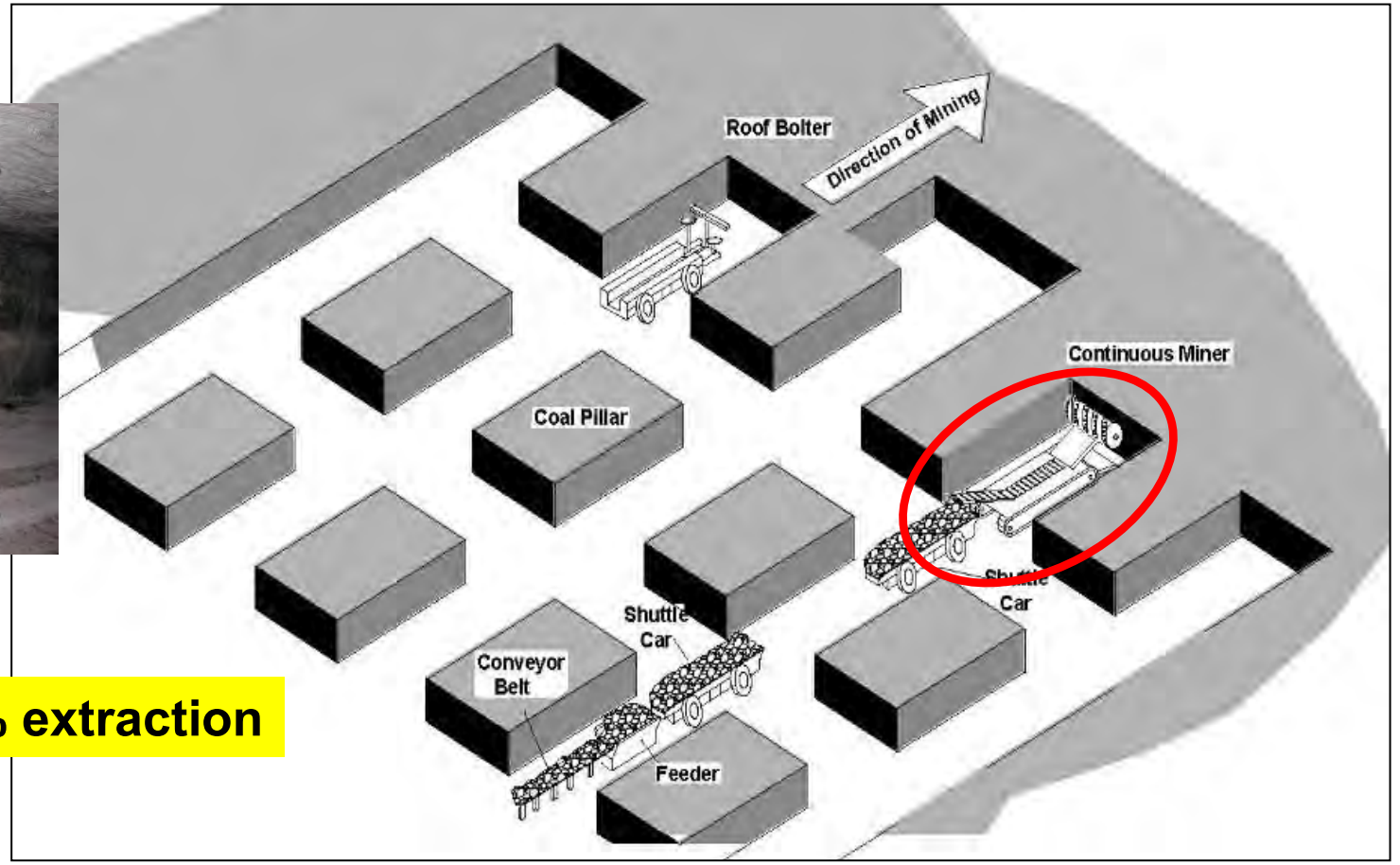
Longwall Mining

Room & Pillar

200+ years

Manual, labor-intensive

Room & Pillar



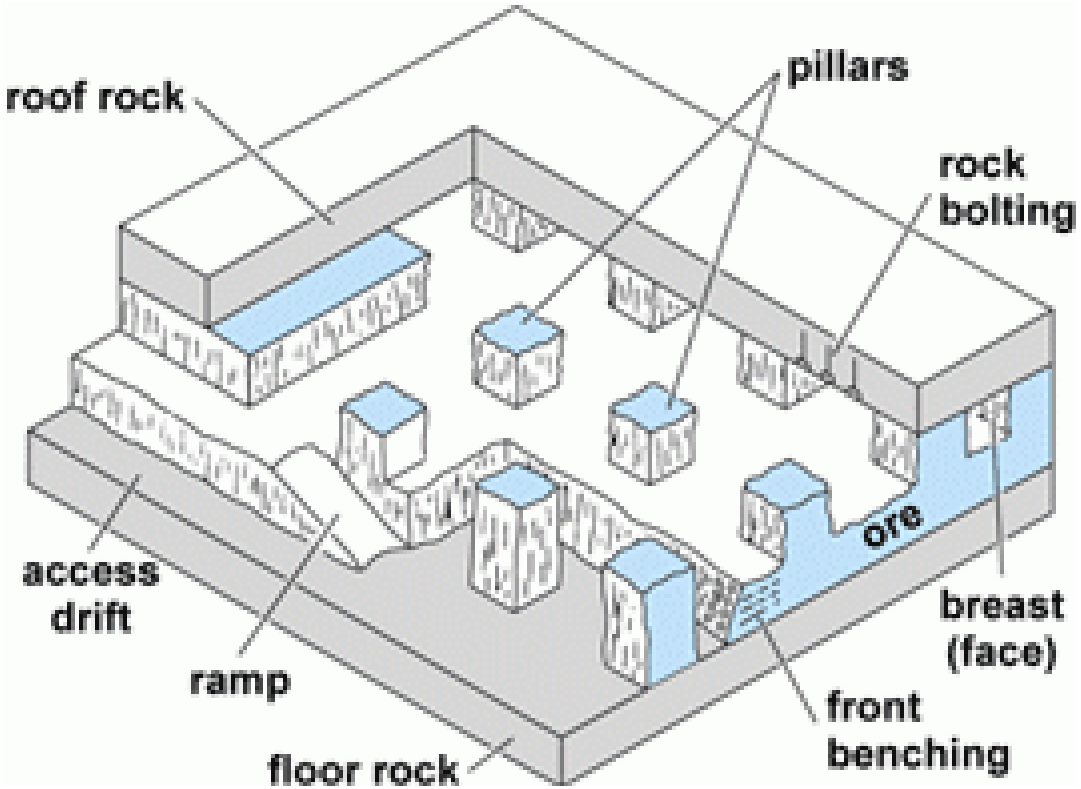
50-60% extraction

76% of mines
5th Act 54 Period

R&P with Pillar Recovery

- a.k.a, "*Pillar Removal Mining*" or "*Retreat Mining*"
- Selective removal of pillars
- Typically little surface damage
- Higher extraction than room-and-pillar

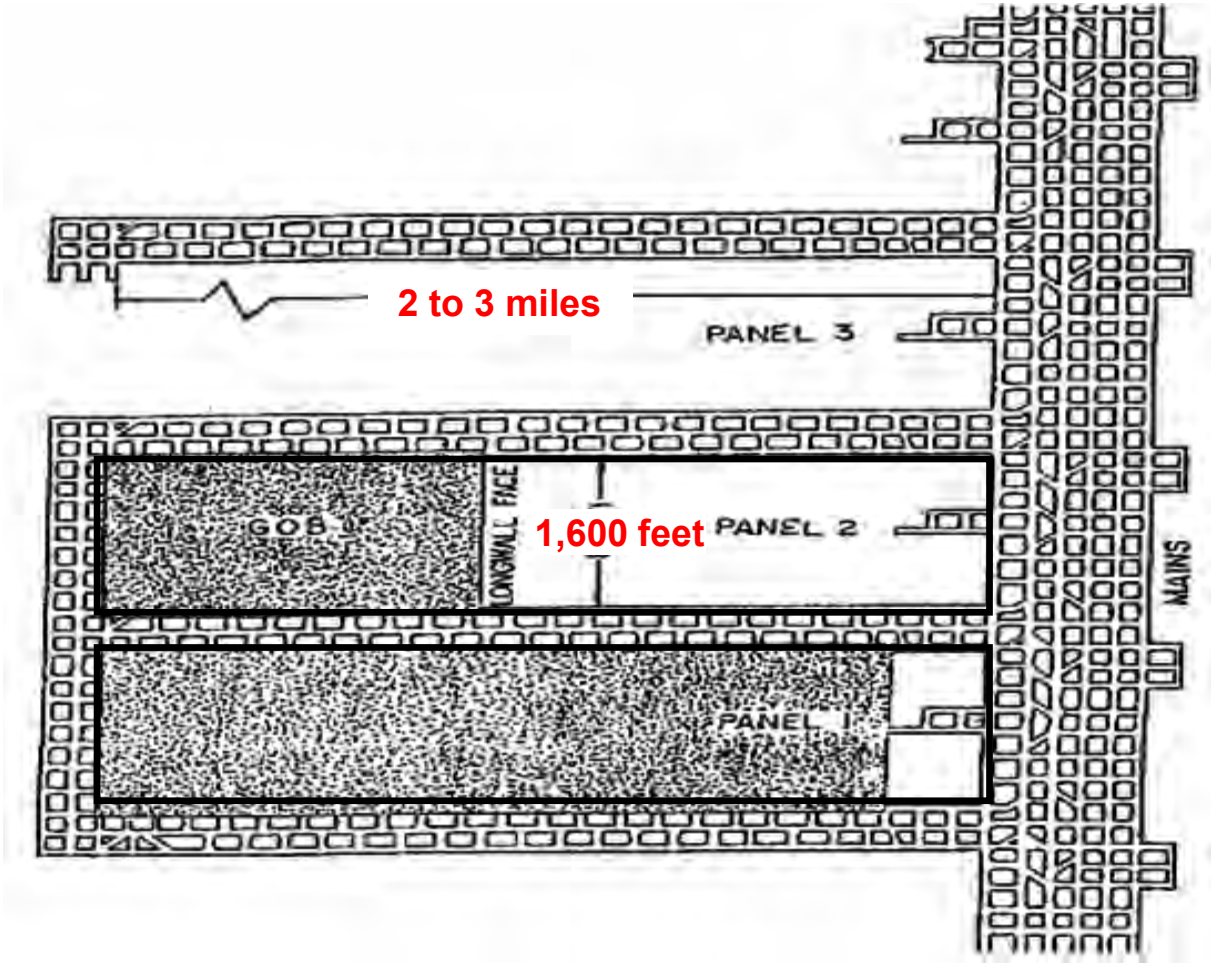
60-65% extraction



10% of mines
5th Act 54 Period

LONGWALL

Since 1970s

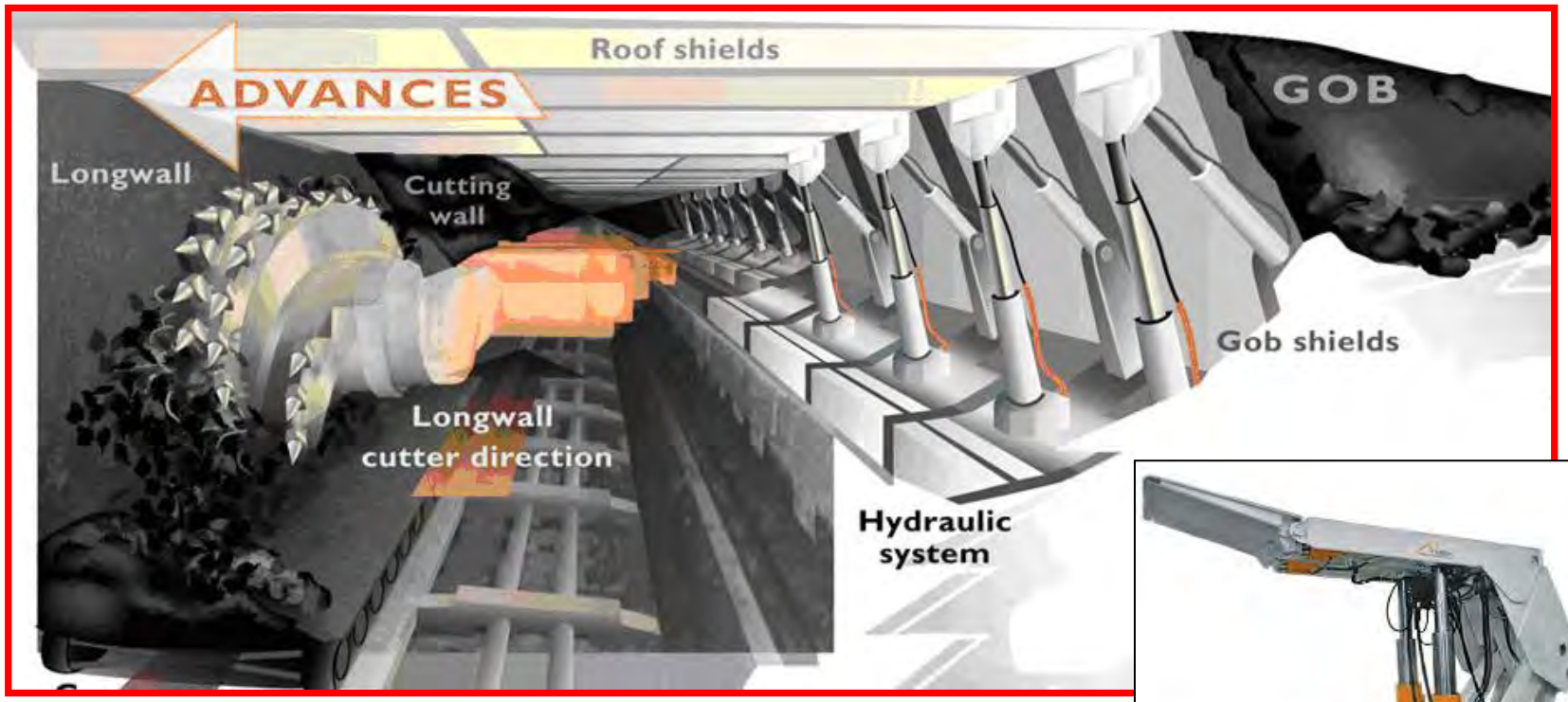


60-75% extraction

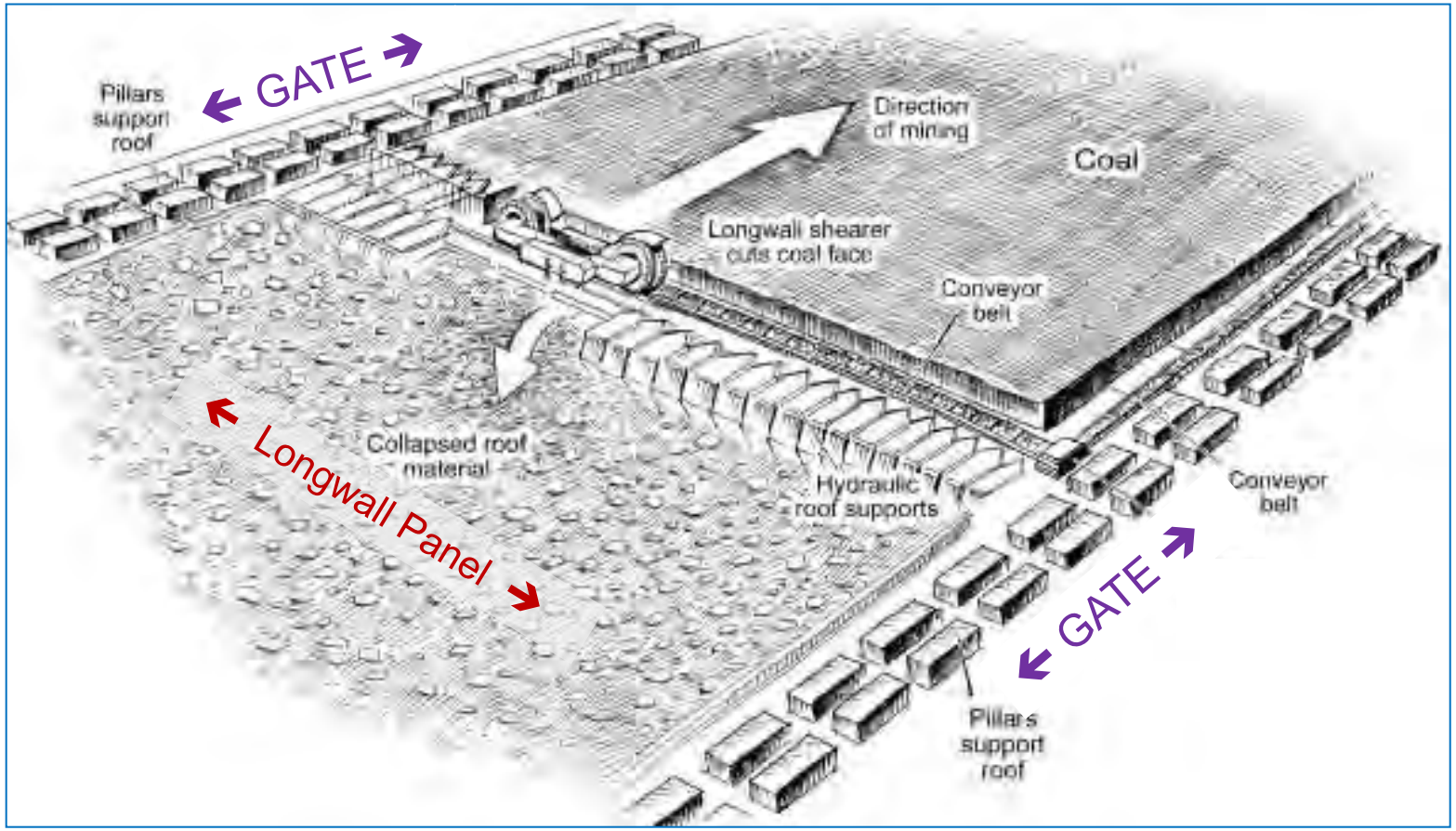
14% of mines
5th Act 54 Period

LONGWALL

Shearer



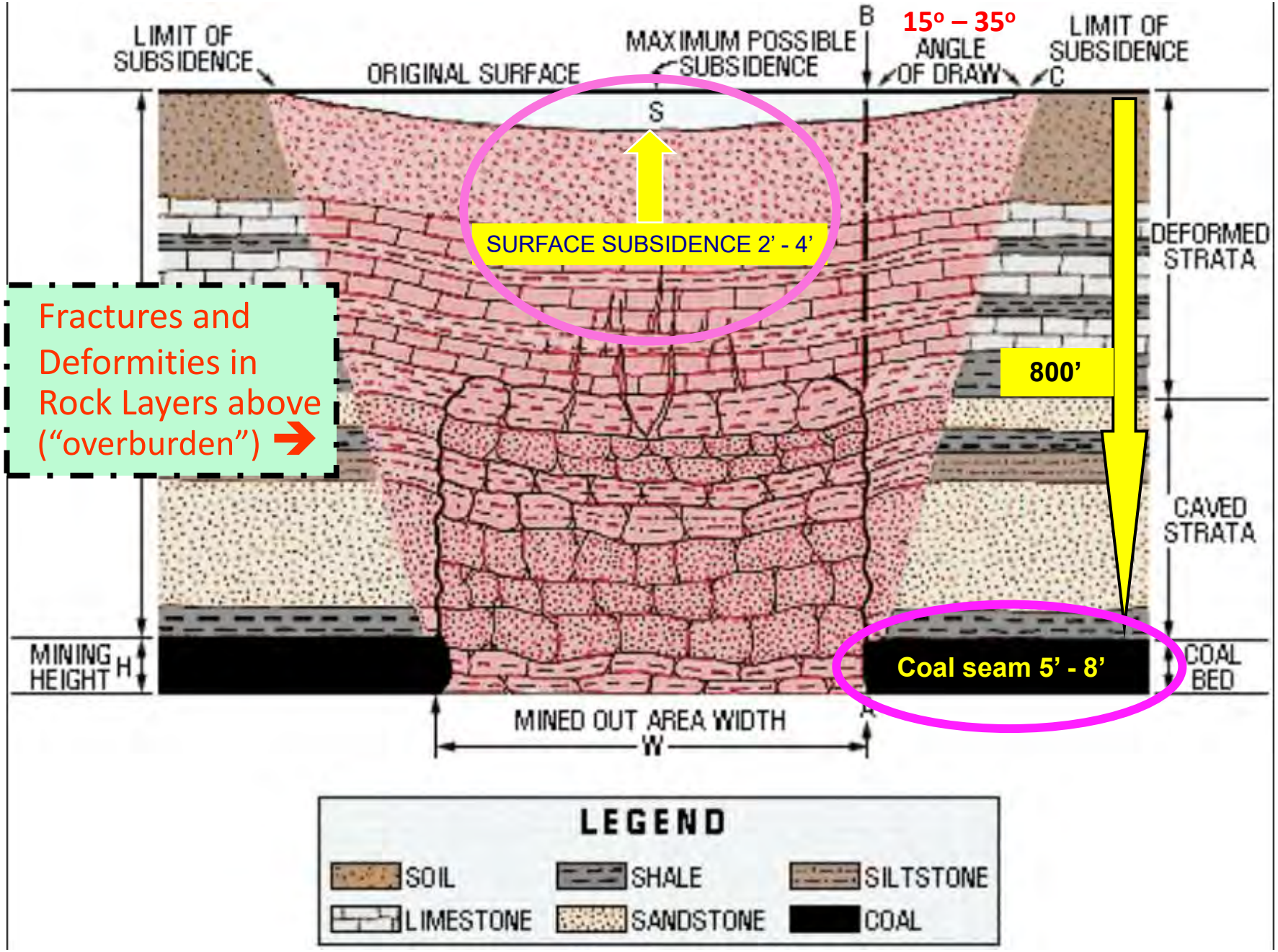
Hydraulic Roof Support

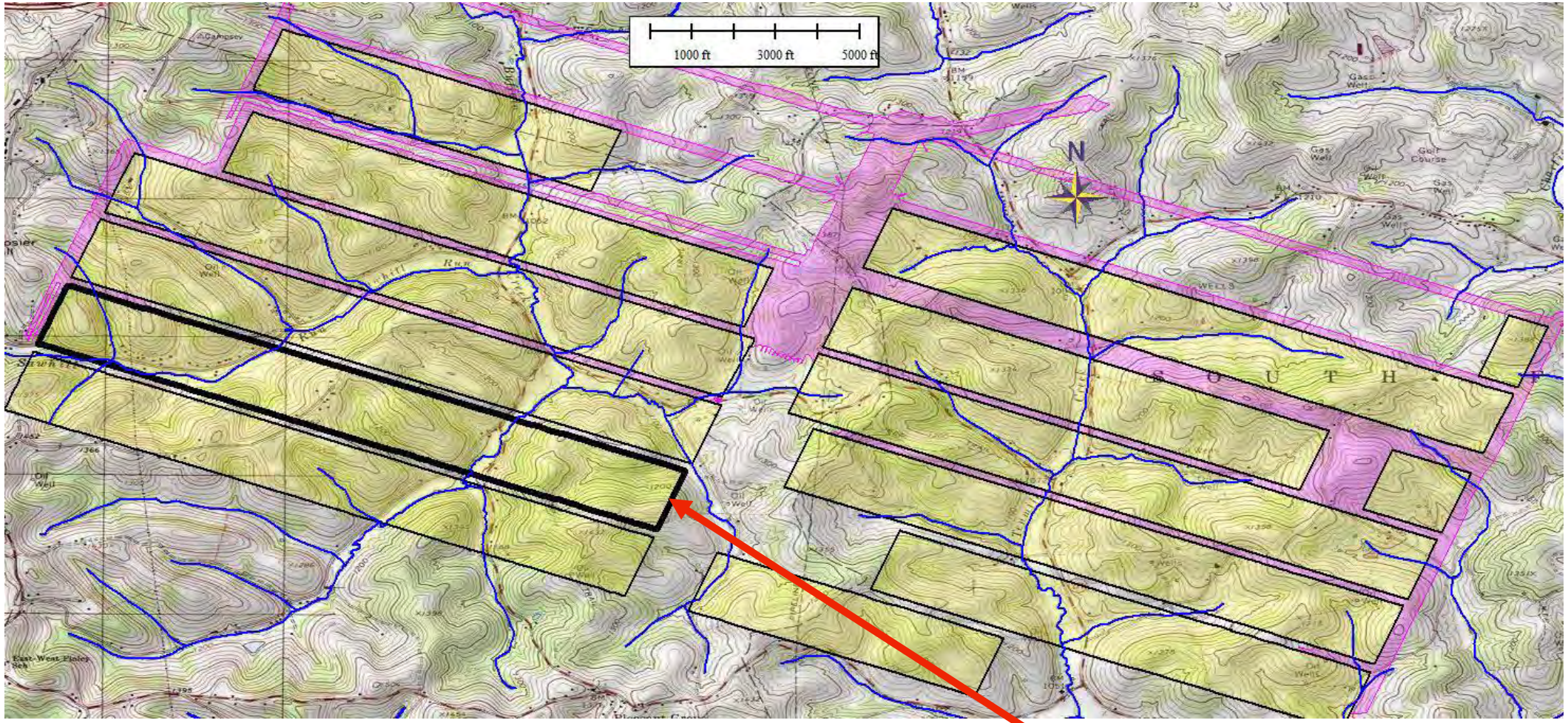


Longwall Mining

As mining advances, the supports move forward allowing rocks to collapse into the void

PACE of MINING **LW = 1 acre/day**
vs
R&P = 6 acres/month


LIMIT OF SUBSIDENCE
ORIGINAL SURFACE
MAXIMUM POSSIBLE SUBSIDENCE
B
15° – 35°
ANGLE OF DRAW
LIMIT OF SUBSIDENCE
C
S
SURFACE SUBSIDENCE 2' - 4'
Fractures and Deformities in Rock Layers above ("overburden")
800'
DEFORMED STRATA
CAVED STRATA
COAL BED
Coal seam 5' - 8'
MINING HEIGHT H
MINED OUT AREA WIDTH
W
LEGEND
SOIL
SHALE
SILTSTONE
LIMESTONE
SANDSTONE
COAL

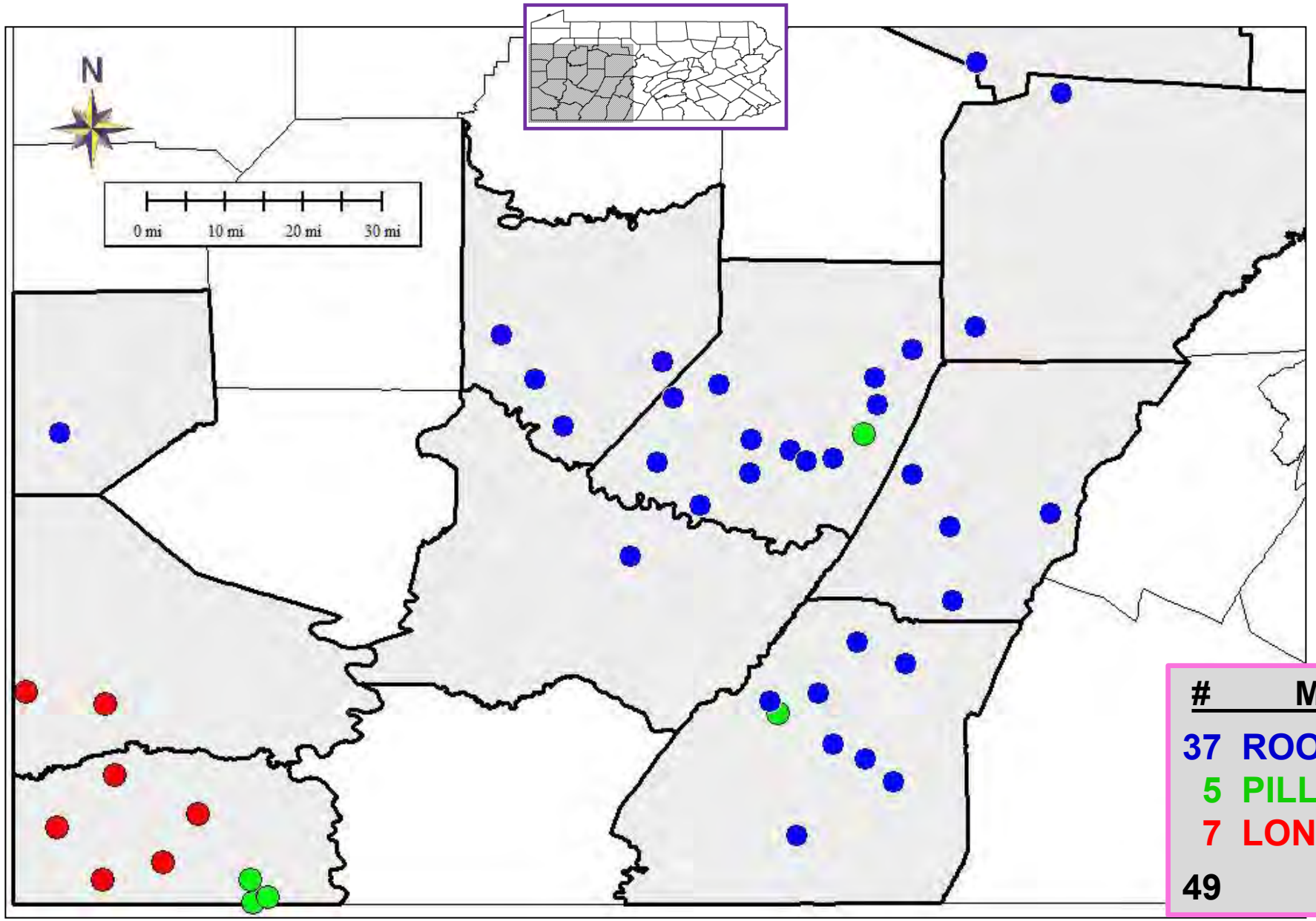


Typical layout of **longwall panels** (yellow)

Room-and-Pillar in gates/entries (purple)

5TH ACT 54 PERIOD

August 2013 – August 2018



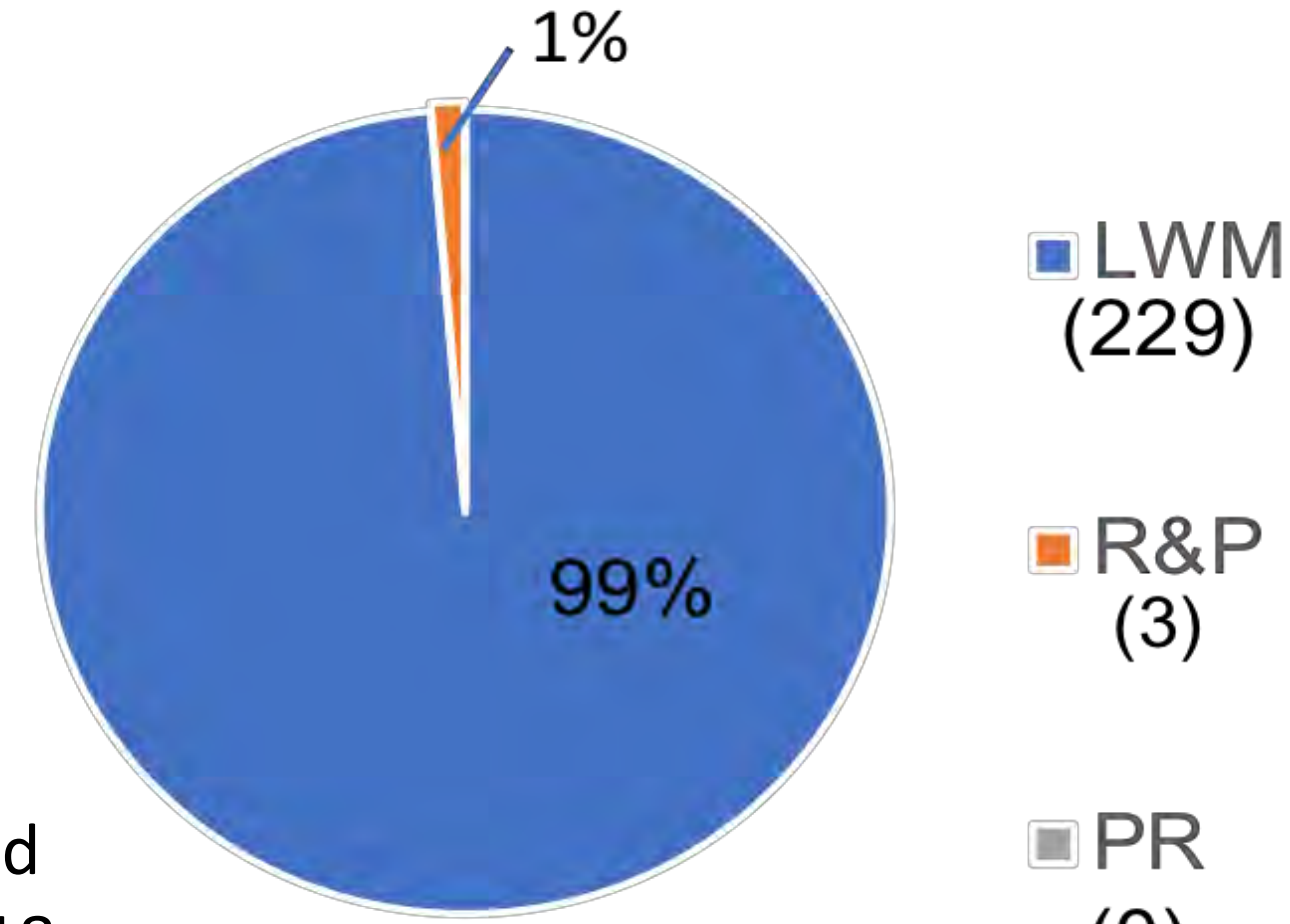
5TH ACT 54 PERIOD

Aug. 2013 – Aug. 2018

Total properties undermined: 3,296

#	Mine Type	Acres
37	ROOM & PILLAR	8,487
5	PILLAR RECOVERY	2,494
7	LONGWALL	17,873
49	TOTALS	28,854

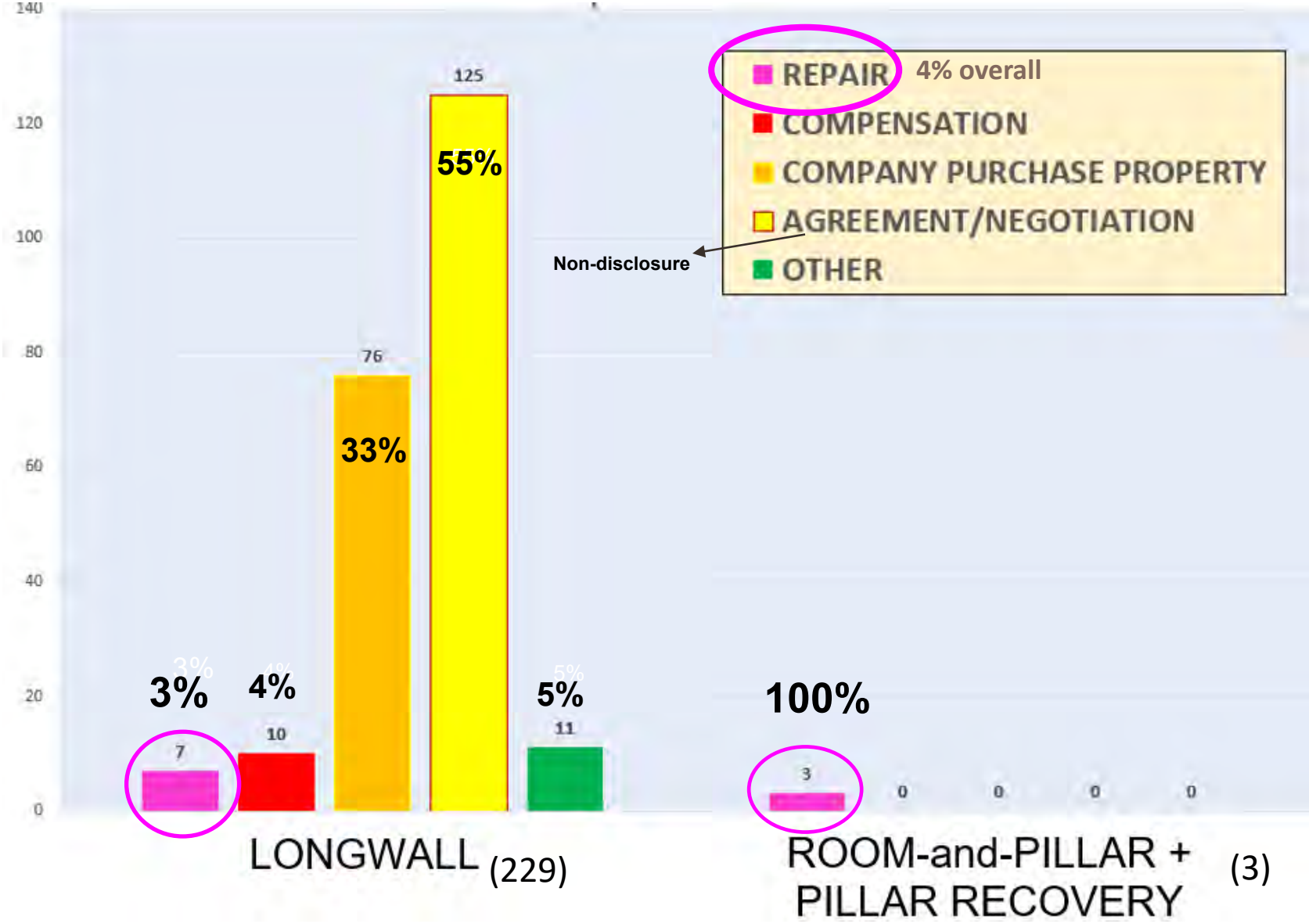
Structure Damage (232) Impacts

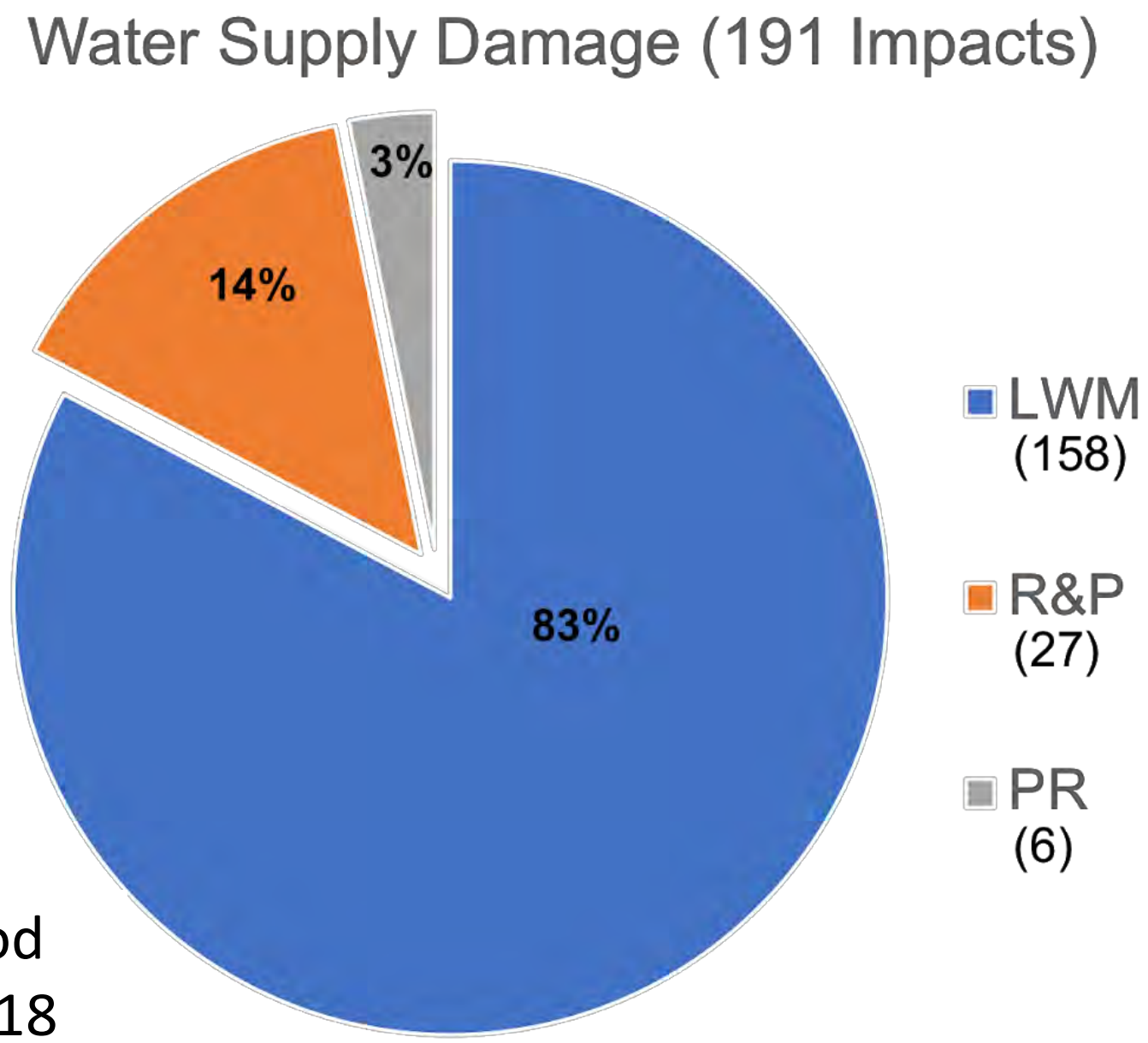


5th Period
2013-2018

MINE-LIABLE **STRUCTURE** RESOLUTIONS

5th Period

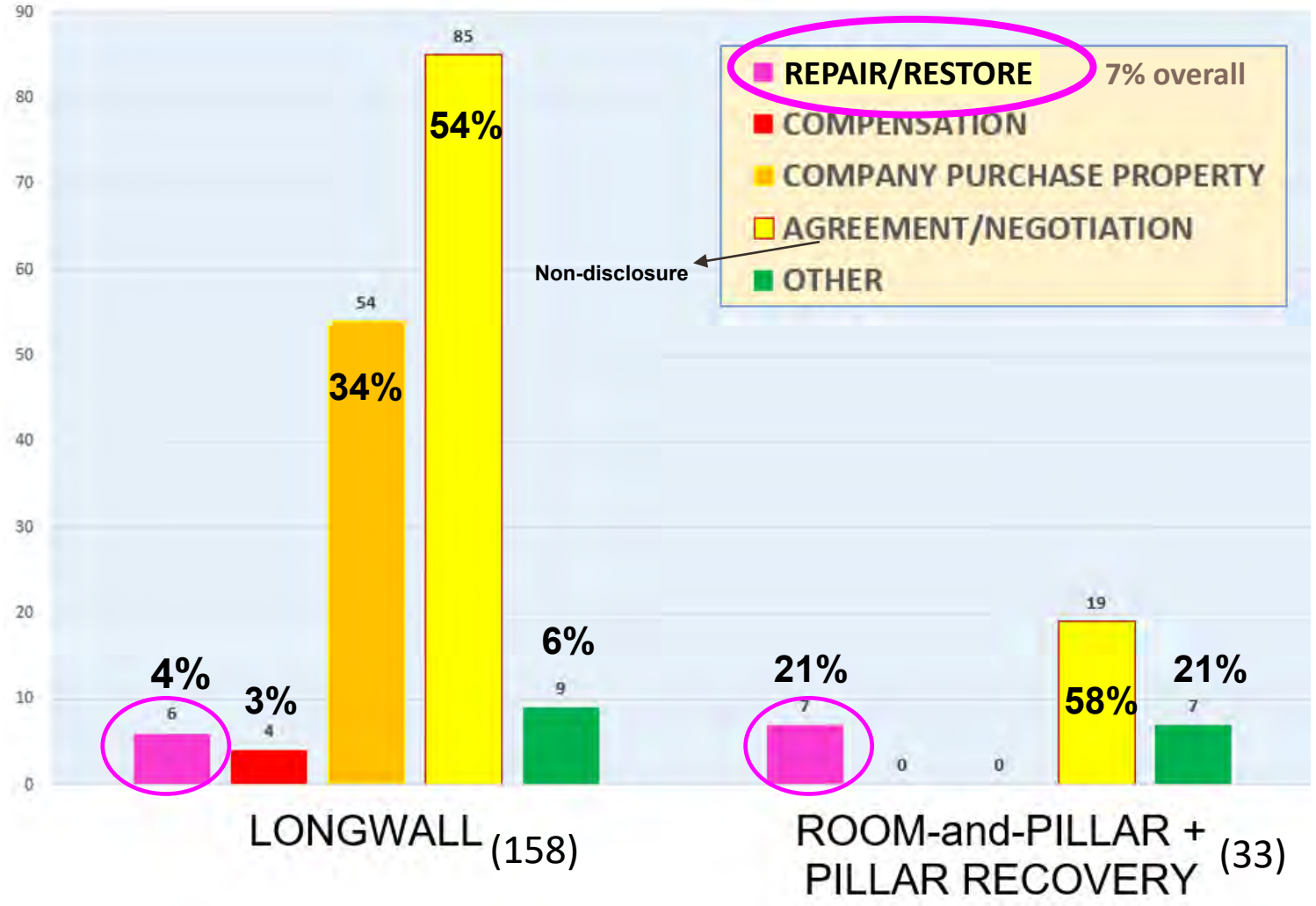




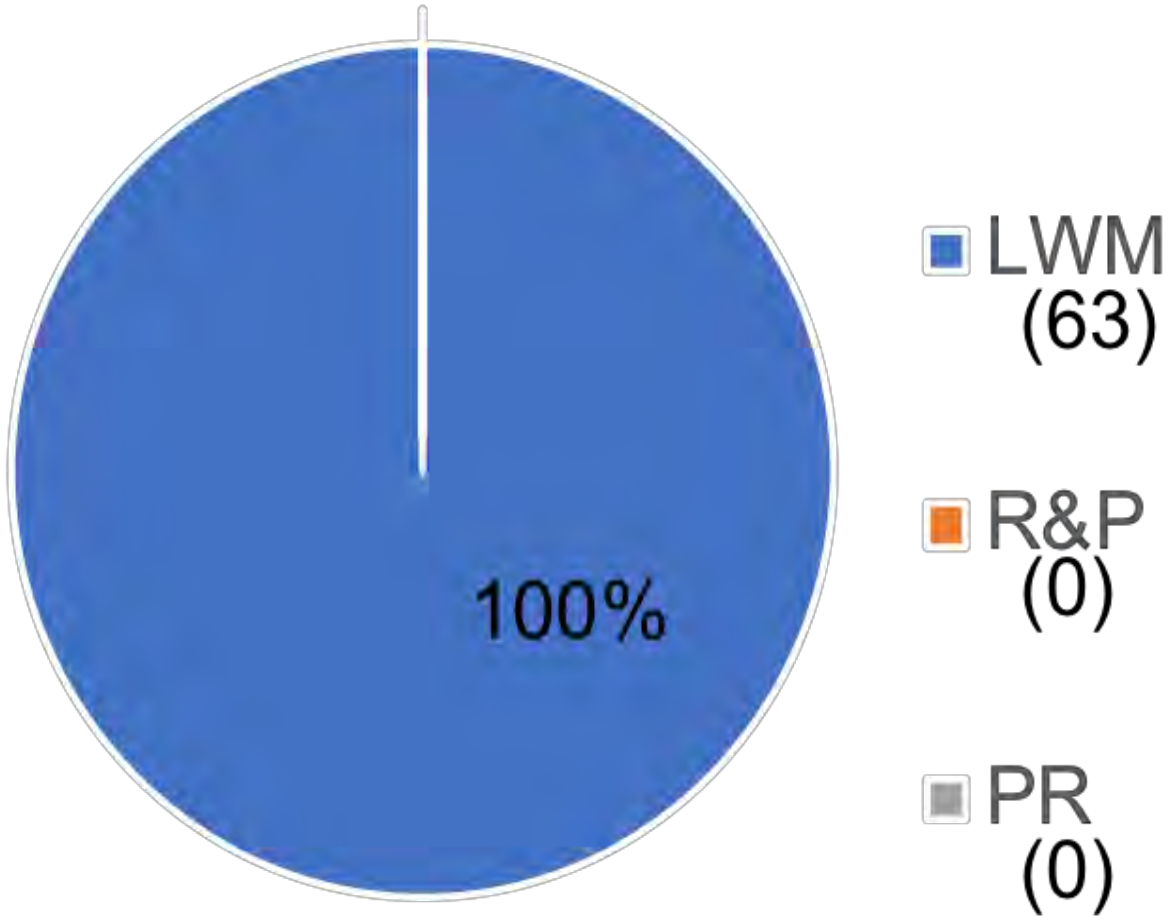
5th Period
2013-2018

MINE-LIABLE **WATER SUPPLY** RESOLUTIONS

5th Period

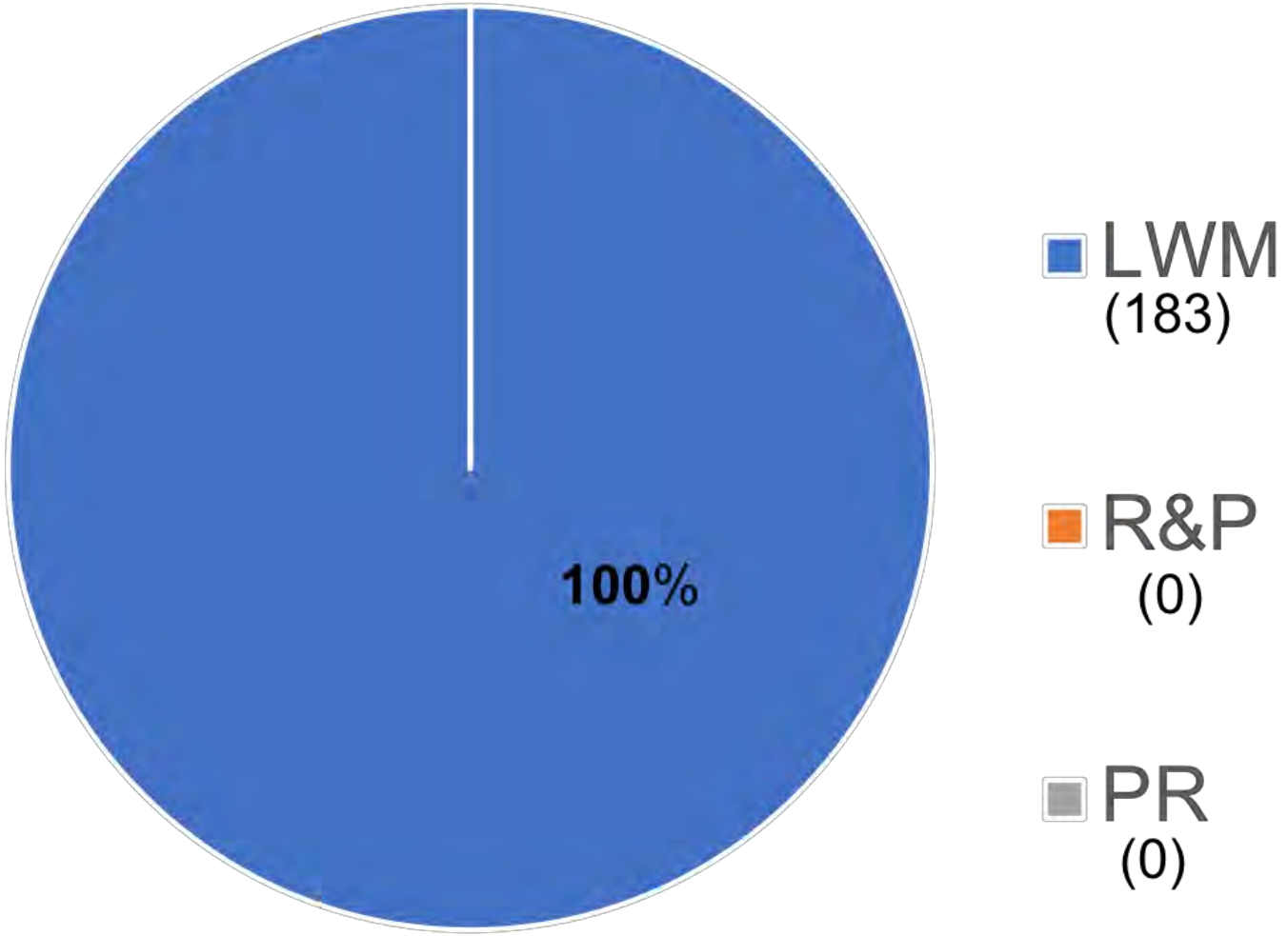


Land Damage (63) Impacts



5th Period
2013 – 2018

Stream Damage (183) Impacts

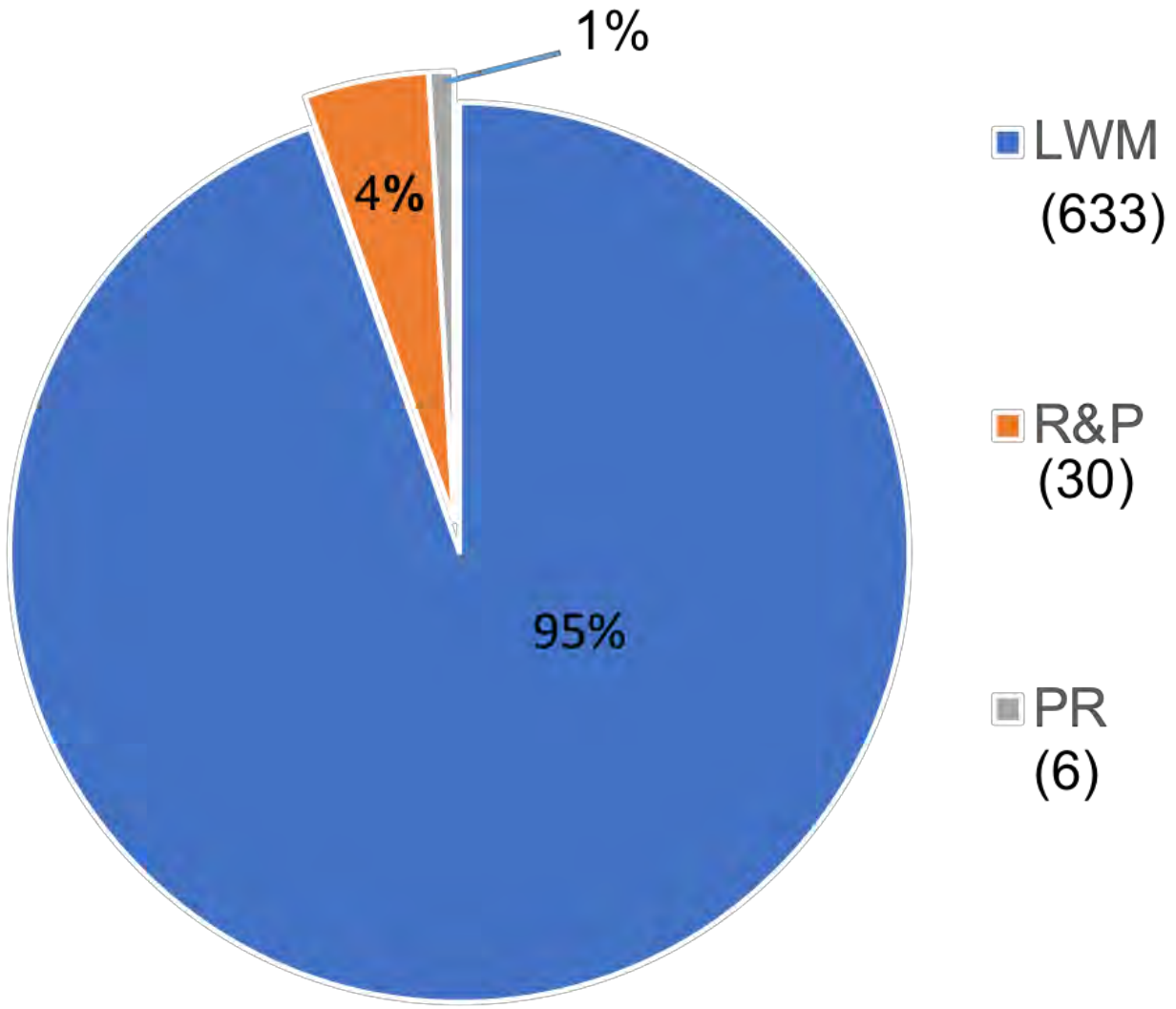


5th Period
2013-2018

Total Damage (669) Impacts

Includes:

Streams
Water supplies
Structures
Land



5th Period
2013-2018

WHAT DO WE KNOW ABOUT STREAM DAMAGE?

STREAM DAMAGE

from

LONGWALL SUBSIDENCE

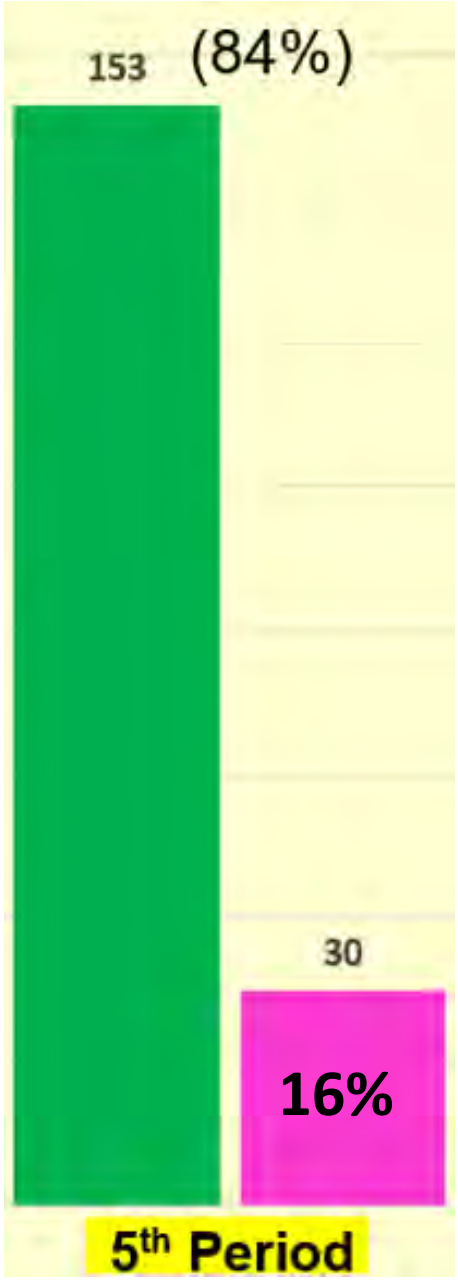
5th Period

27.4 miles
damaged/polluted:

Flow loss	**24.6 mi.**	**(90%)**
Pooling	**2.8 mi.**	**(10%)**

FLOW LOSS

POOLING



183 Incidents

FLOW LOSS

- Lowering groundwater table
- Direct draining of stream
- Impacts aquatic habitat

“FIXING” FLOW LOSS

- **Temporary fix**
  (augmentation)

- **Grouting** **(cement, bentonite)**
- **Liners**

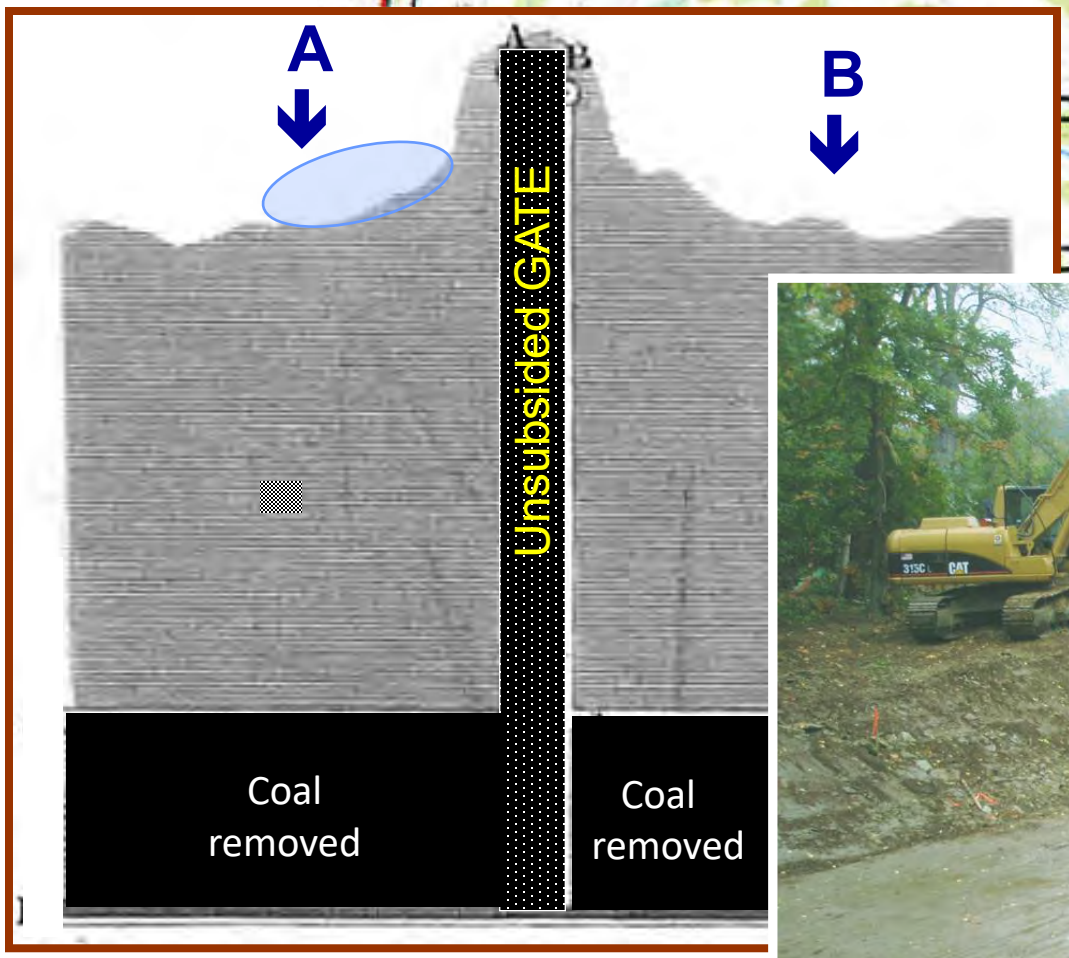
Are significant amounts of grout also pollution?

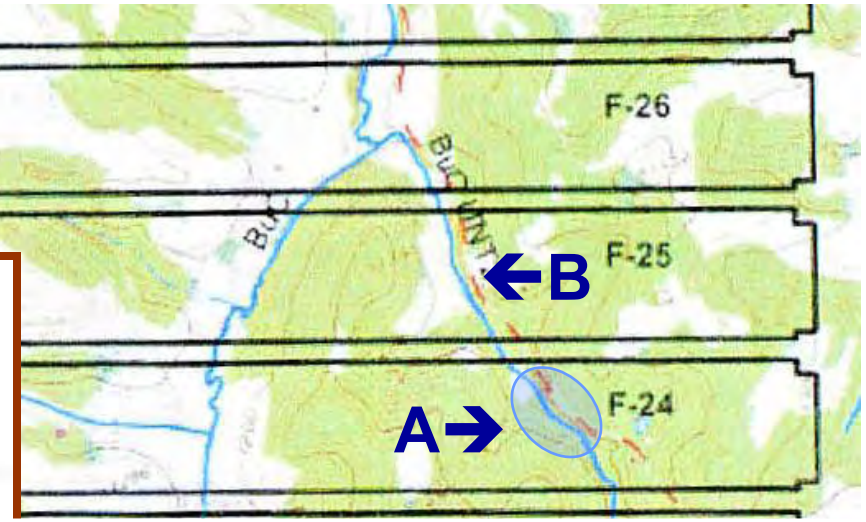
Pooling in Buffalo Creek (HQ-WWF)
by Enlow Fork Mine, July 2018

POOLING

- Increases sedimentation
- Raises water temperature
- Alters aquatic life

“FIXING” POOLING





Gate cutting -- to allow flow once again (but then is it natural?)

“Fixing” Streams
Not easy - Not guaranteed - Not quick

PA DEP and EHB:
TEMPORARY DAMAGE MAY BE OKAY

Chapter 105 Program: “temporary” = up to 1 year

Bur. of Mining Programs: “temporary” = not permanent
(too vague and unenforceable)

Technical Guidance

(October 2005)

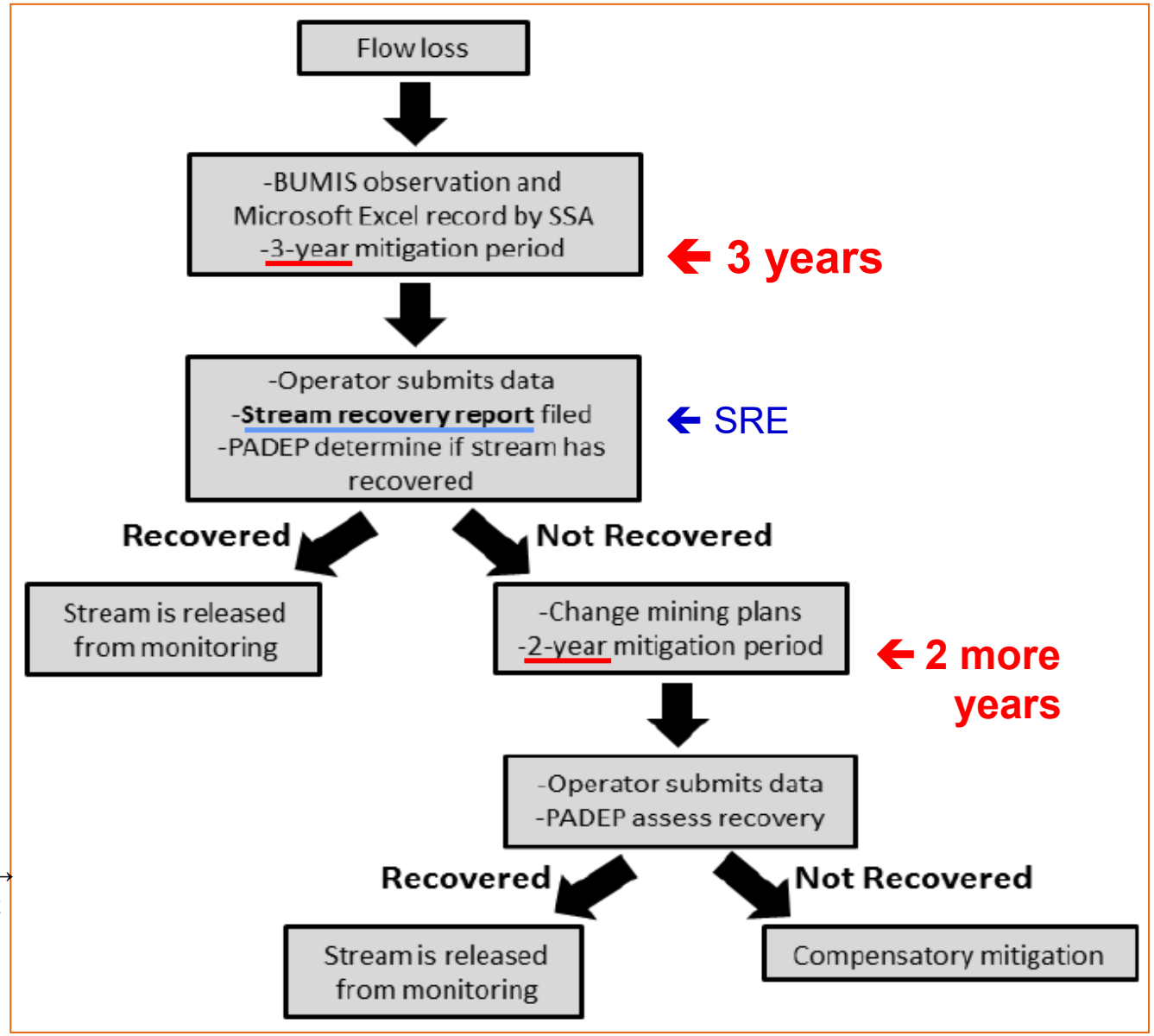
DOCUMENT NUMBER: 563-2000-655

TITLE: Surface Water Protection – Underground Bituminous Coal Mining Operations

TGD: "5 year-limit"

Even 5 years stream damage
- excessive

Actual stream damages
- much longer



Flowchart → from 4th Act 54 Report

POOLING (42 pooled streams restored/"released")

- nearly **8 years** (average) from damage to PA DEP release
- nearly **14 years** (longest) from damage to PA DEP release
- only 8 of 42 (19%) deemed restored in 5 years or less

FLOW LOSS (Based on SREs submitted during 5th Period)

- 44 streams remained damaged more than 5 years
- some damaged >10, even >15, years **SOME IRREPARABLE**

LONGWALL MINING

Subsidence is "*planned and predictable*"

Mining regulations: §89.35 – *Prediction of Hydrologic Consequences*

Mine permit application: must predict "*location, magnitude, and duration*" of flow loss and pooling

Damages predicted vs not-predicted not addressed in any Act 54 Report

LONGWALL MINING

Subsidence is "*planned and predictable*"

But… only **one model** predicts *any* stream damage

"Peng" model predicts **Pooling**

Based on:
- Depth of mining
- Rock type
- Stream gradient

25+ years old now
Not always accurate
Accuracy never reported

Flow Loss <u>never</u> predicted (no model)

LONGWALL MINING

Subsidence is "*planned and predictable*"

Act 54 Reports documented subsidence impacts far beyond the limits of assumptions used by PA DEP:

- 35° rebuttable presumption zone (RPZ) – for water supplies
- 30° angle of influence
- 200-foot buffer around permit area
- 1,000-foot buffer around permit area

↖ 4th Period: 50% (186 of 371) water supply damages occurred outside RPZ

PA DEP must re-evaluate and update assumptions

Looking Ahead: What Can Be Done

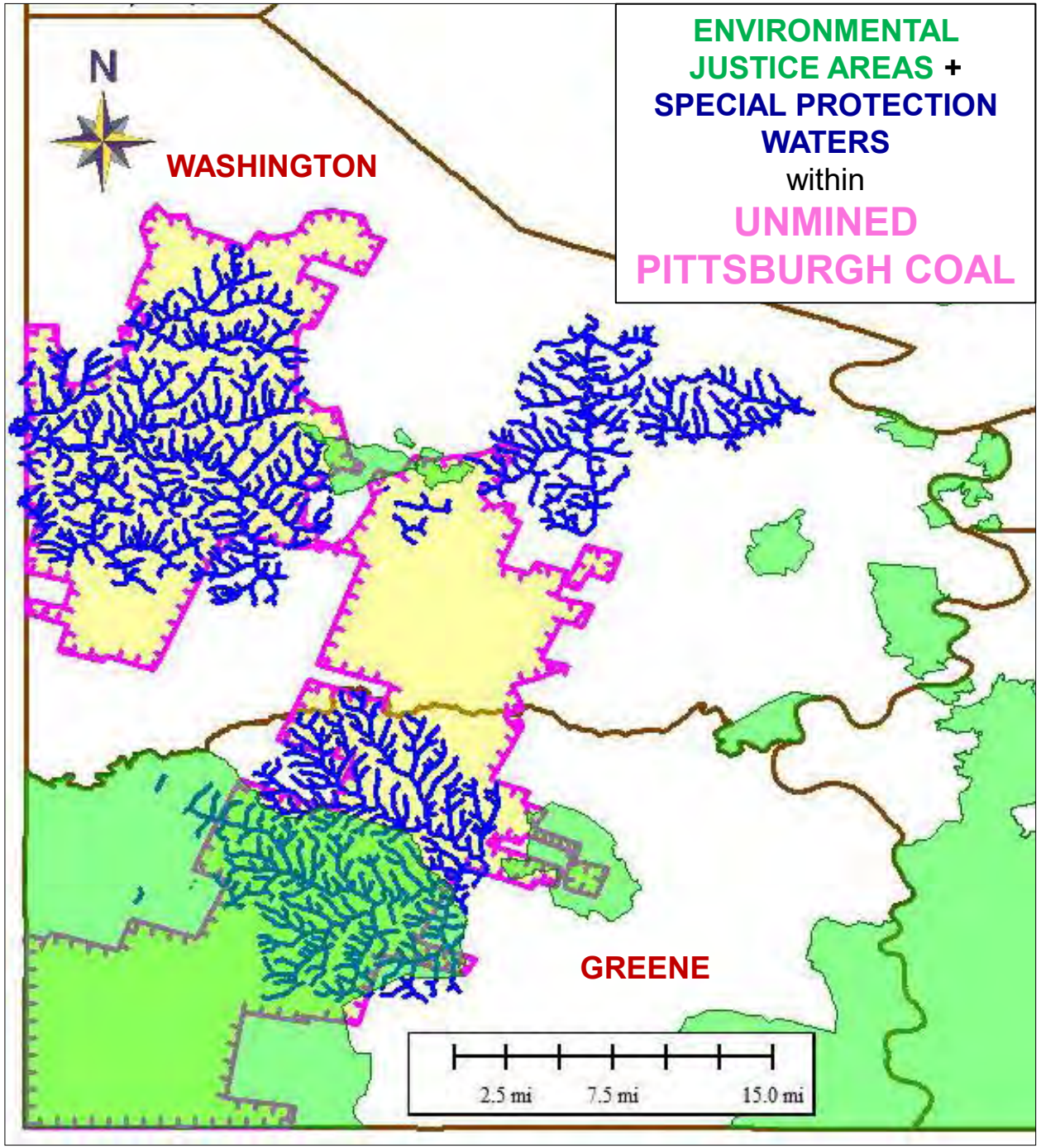
"*At current mining rates and conditions, 40 years of longwall mining remain in the Pittsburgh coalbed of Pennsylvania.*"

(page 3-24, 5th Act 54 Report)

Unmined Pittsburgh Coal: 277,400 acres

Special Protection Waters and Environmental Justice Areas:

71%



What is Needed?

- Better ID of resources at risk
- Prevent damages – prevent pollution
- Improve future predictions
- Avoid/Minimize impacts - Adjust size/location/orientation
- Adjust methods of mining

PA DEPARTMENT OF ENVIRONMENTAL PROTECTION

SHOULD:

- Develop a model to predict flow loss
- Suspend longwall mining beneath streams until model is developed and implemented
- Protect water resources
- Enforce laws/regulations
- Honor its trustee obligations
- Continue 5-Year Reporting per Act 54

THE END

Questions?