Excavation of the Hawk's Nest Tunnel, Gauley Bridge, WV, 1930-31, and Acute Silicosis

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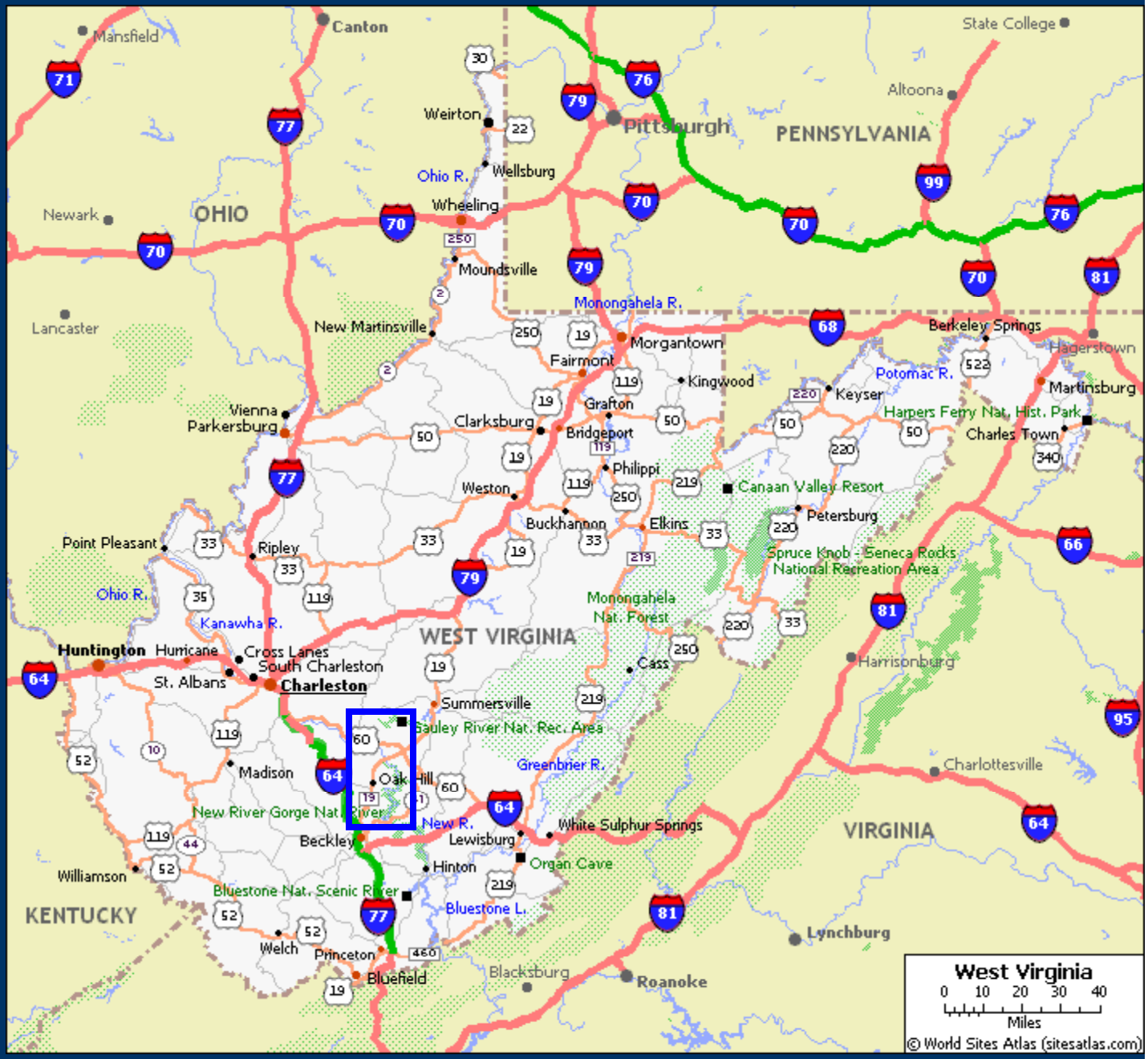
Information from

- The Hawk's Nest Incident: America's Worst Industrial Disaster
- by Martin Cherniack, M.D., M.P.H.
- 1986, Yale University Press

- Blueprints and black and white historical photographs are from the WV State Archives

Location


Canton
Mansfield
State College
Altoona
Pittsburgh
PENNSYLVANIA
Weirton
Wellsburg
Ohio R.
Wheeling
Newark
OHIO
Moundsville
Monongahela R.
Lancaster
New Martinsville
Morgantown
Fairmont
Berkeley Springs
Hagerstown
Potomac R.
Martinsburg
Kingwood
Keyser
Harpers Ferry Nat. Hist. Park
Charles Town
Vienna
Parkersburg
Grafton
Clarksburg
Bridgeport
Philippi
Weston
Canaan Valley Resort
Petersburg
Buckhannon
Elkins
Point Pleasant
Ripley
Spruce Knob - Seneca Rocks
National Recreation Area
Monongahela
Nat. Forest
Kanawha R.
WEST VIRGINIA
Huntington
Hurricane
Cross Lanes
South Charleston
St. Albans
Charleston
Cass
Harrisonburg
Summersville
Gauley River Nat. Rec. Area
Greenbrier R.
Charlottesville
Madison
Oak Hill
New River Gorge Nat. River
New R.
Beckley
Lewisburg
White Sulphur Springs
VIRGINIA
Organ Cave
Hinton
Williamson
Bluestone Nat. Scenic River
Bluestone L.
KENTUCKY
Welch
Princeton
Bluefield
Blacksburg
Roanoke
Lynchburg
West Virginia
0 10 20 30 40
Miles
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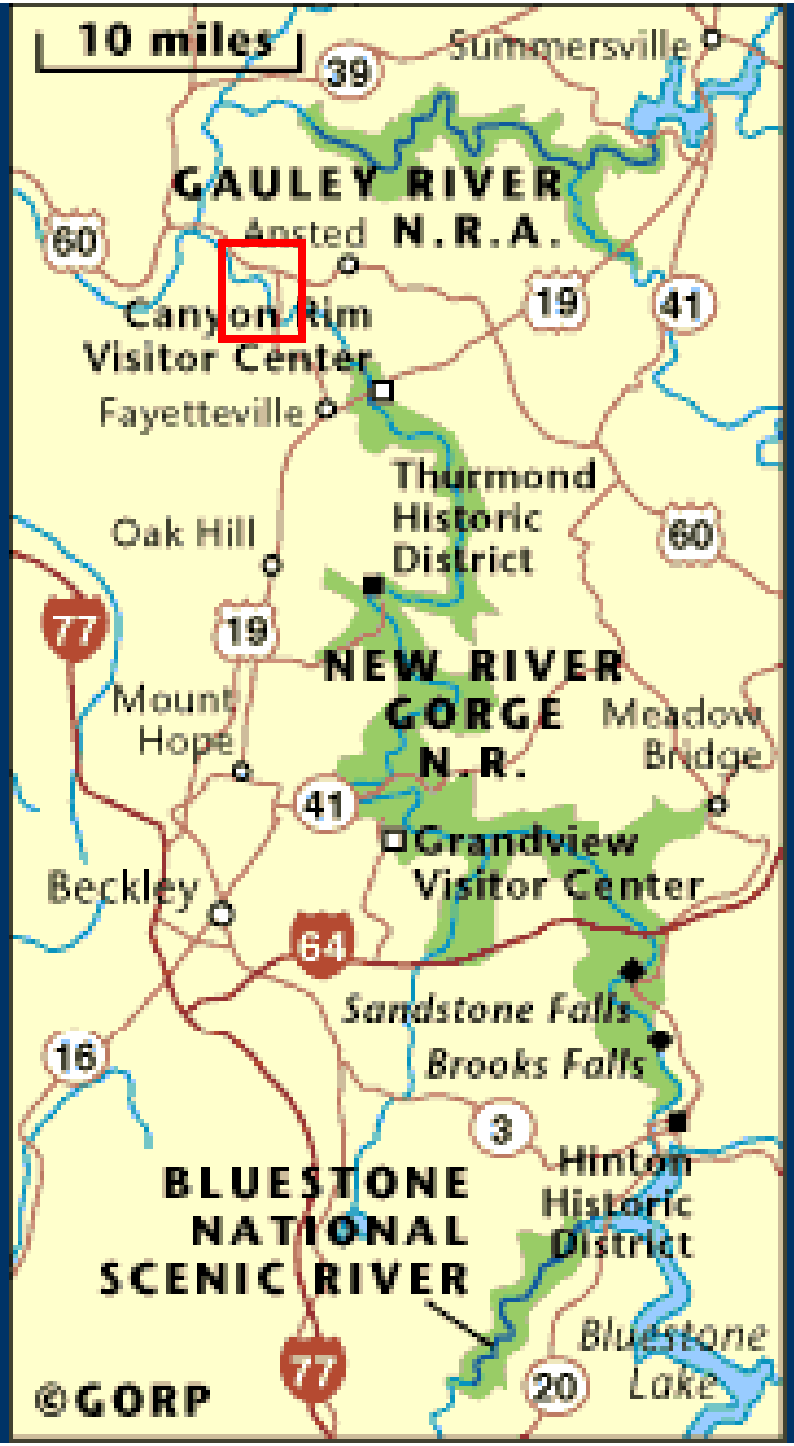
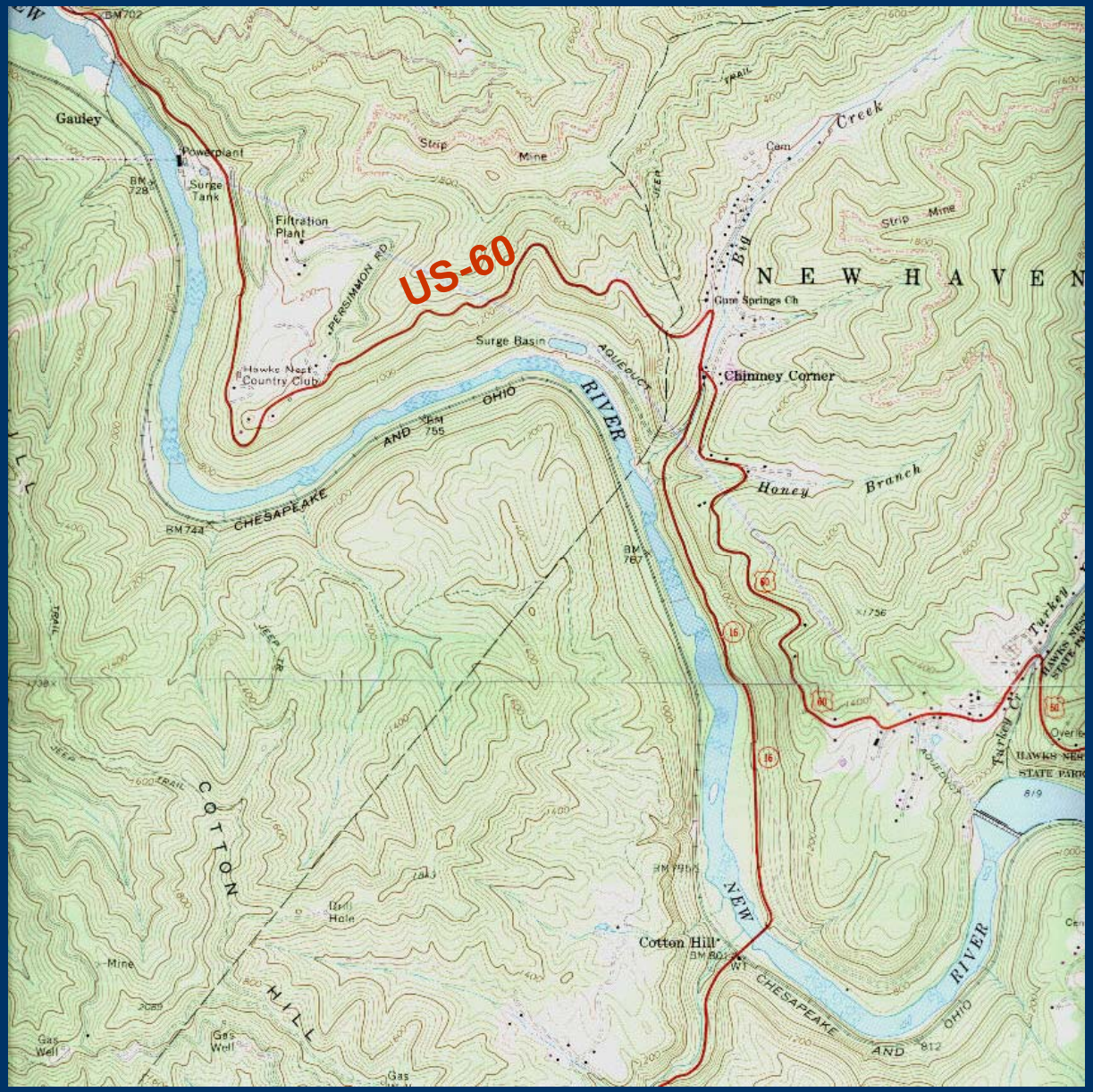
New River Gorge



Detailed Map of Hawk's Nest Area



New River upstream from Hawk’s Nest

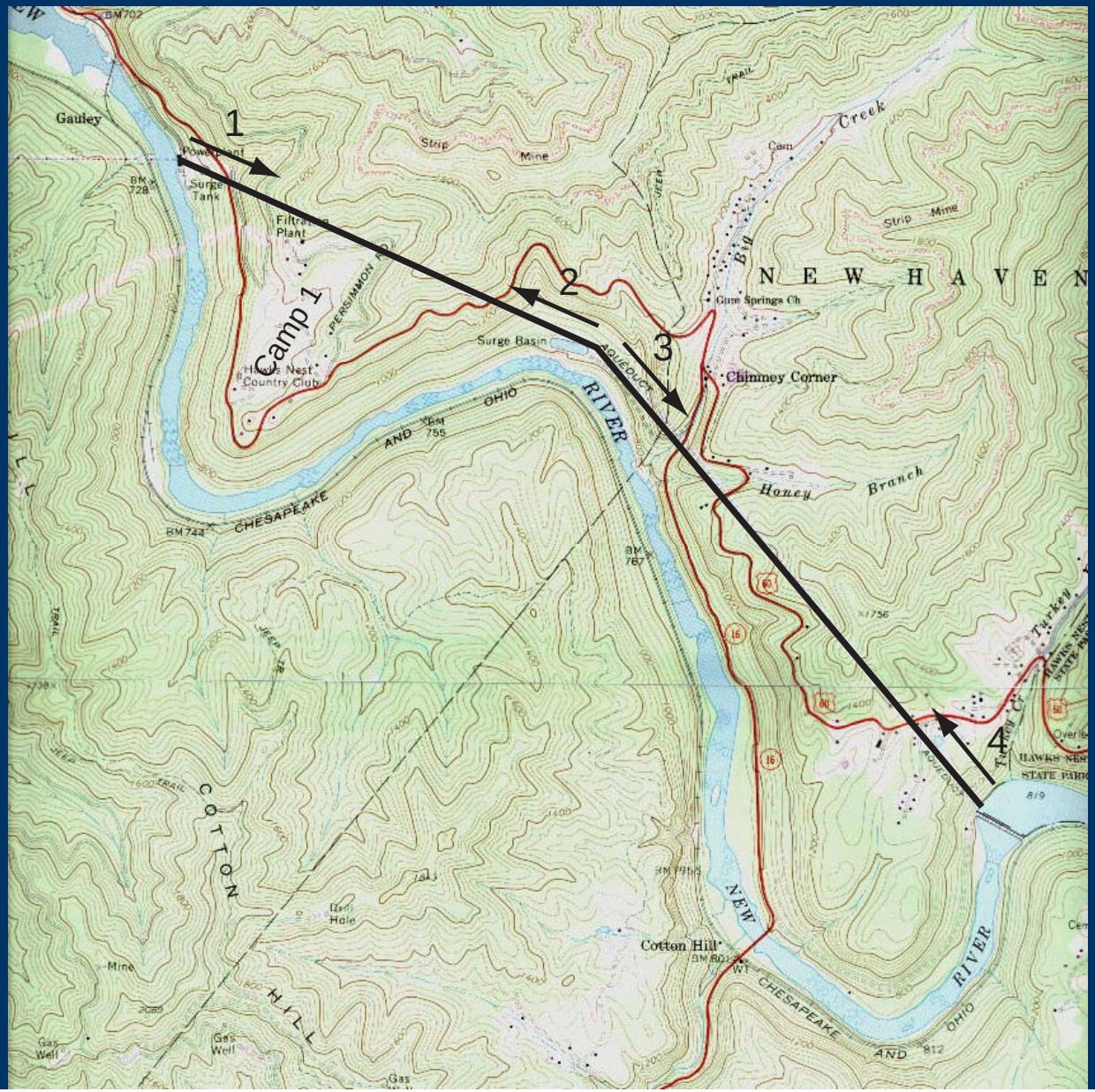
Setting the Stage

- Hawk's Nest tunnel was built in 1930-31 to provide hydroelectric power for a Union Carbide ferrosilicon alloy plant
- Choosing a location – steep gradient on New River
- Planning and permitting
- The Companies
  - Union Carbide (UC)
  - New Kanawha Power Company (NKPC; wholly owned subsidiary of UC)
  - Rinehart and Dennis (R&D) out of Charlottesville, VA – contracted by NKPC to build tunnel and dam

Tunnel (aqueduct) was excavated in 1930-31

- At the height of “the Great Depression”
- The New Kanawha Power Company, a wholly owned subsidiary of Union Carbide, designed and contracted the building of the Tunnel
- The contractor, Rinehart & Dennis, out of Charlottesville, VA, hired the workers and supervised the construction
- Most tunnel workers were black migrants from the South, some foremen and machinery operators were local white workers

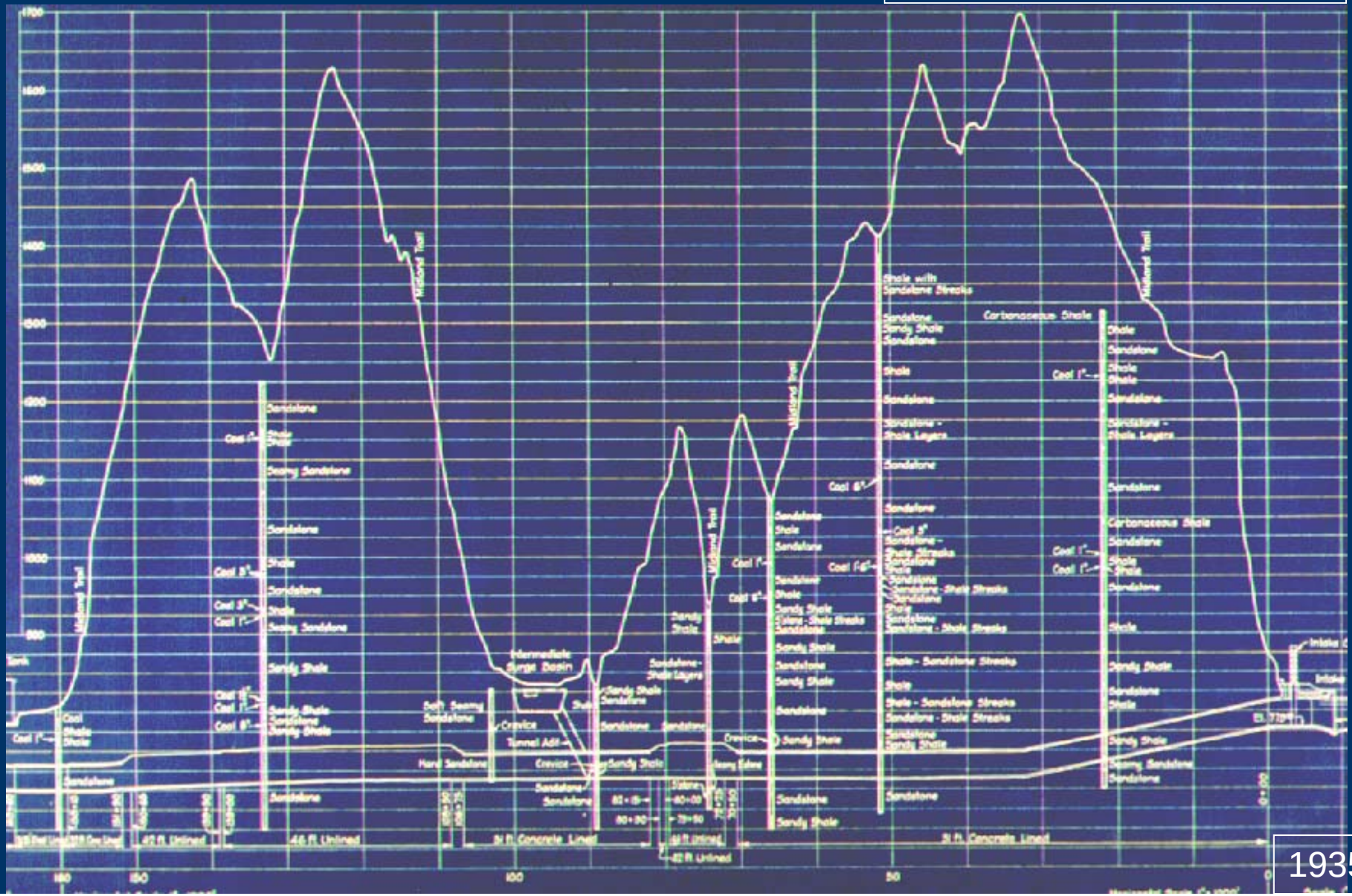
Plan of Hawk's Nest Tunnel (aqueduct)



3 miles (~5 km) long
162 ft (~50 m) drop
10 m/km gradient
Four different shafts

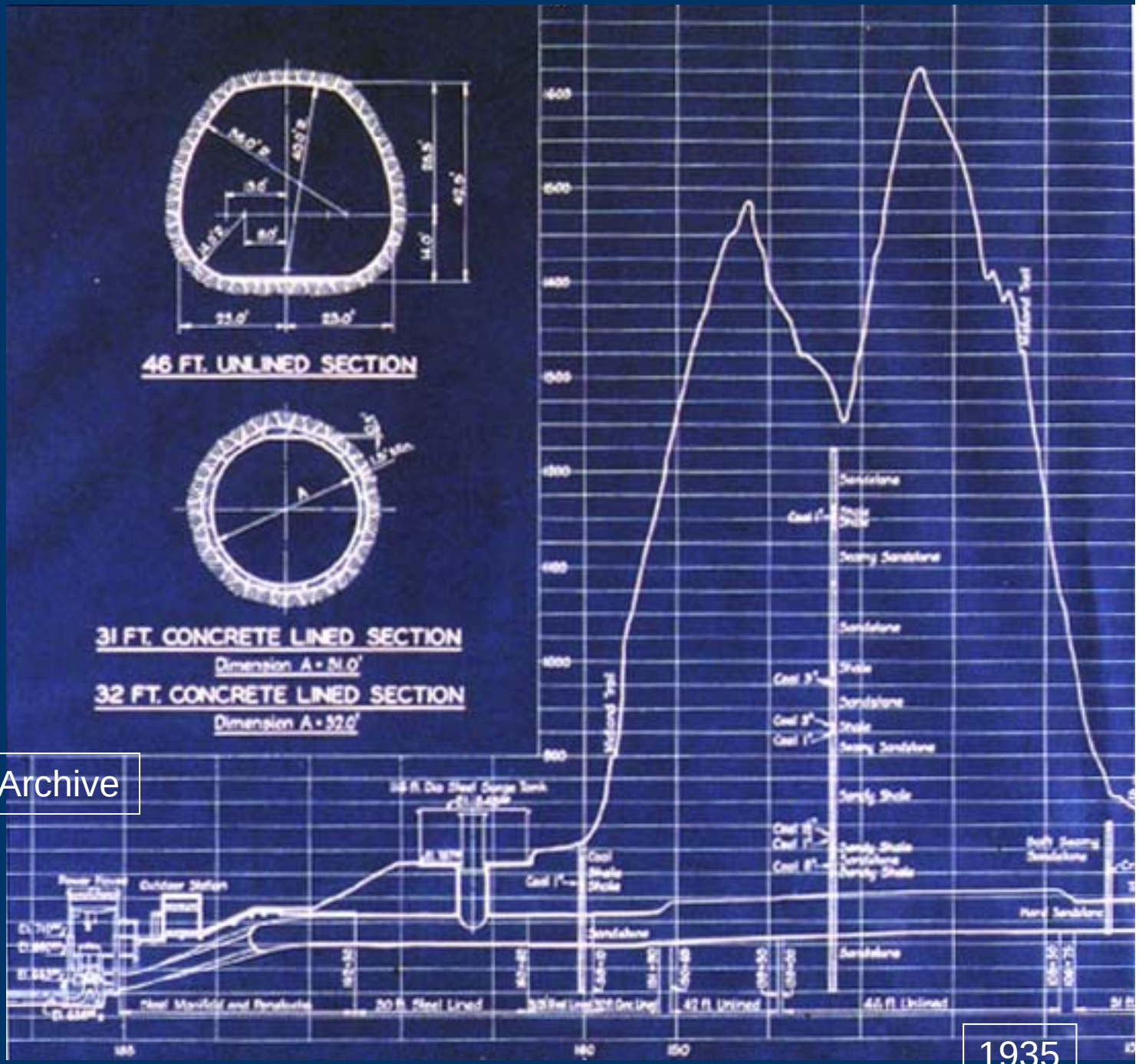
1935 Tunnel Blueprint

West Virginia State Archive



1935

Down-stream End



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1935

Lower Nuttall Sandstone

Lower member of the lower Pennsylvanian New River Formation - >97% quartz

HLang - 1998

Tunnel Completion Timetable

- Mar. 31, 1930 – ground was broken for tunnel
- Mid-June 1930 – significant tunnel excavation began
- Sept. 19, 1931 – tunnel “holed-through” in 17.5 months (10 weeks ahead of schedule), most workers were paid off and sent home
- Dec. 1, 1931 – Tunnel “trimming” was finished and remaining laborers were dismissed.
- 1934 Hawk’s Nest tunnel and dam were finished and opened

The Workforce

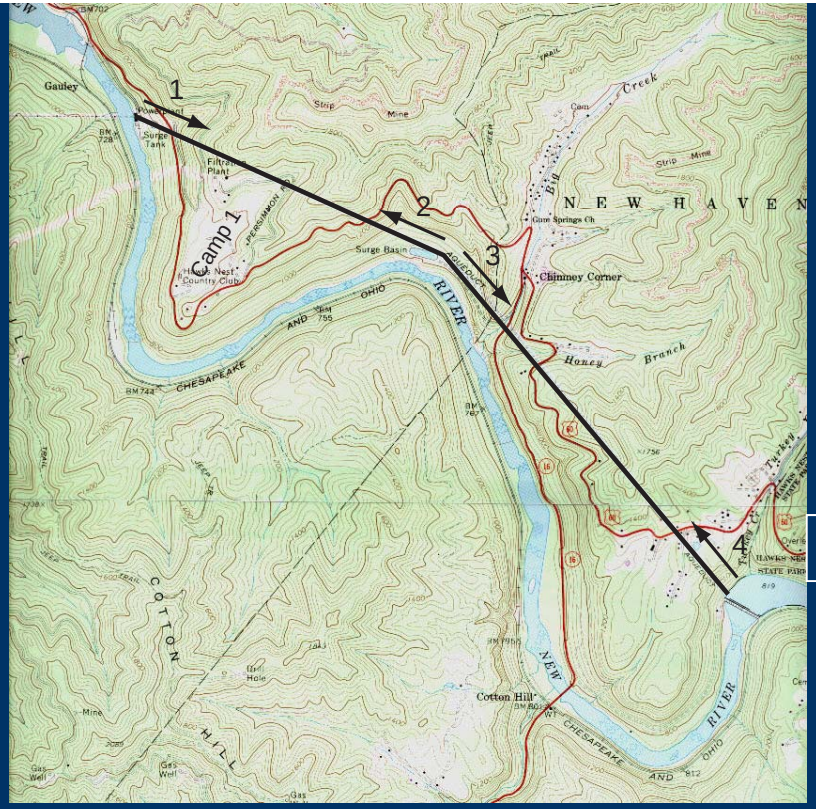
- Where did they come from?
- Racial makeup
  - Whites mostly local
  - Blacks mostly southern migrants
- Living conditions
  - Camps
- Working conditions
  - Worker treatment – whites vs. blacks
  - Worker protections?

Workers

West Virginia State Archive

Camp 1- now Hawk's Nest Country Club

HLang - March, 1998



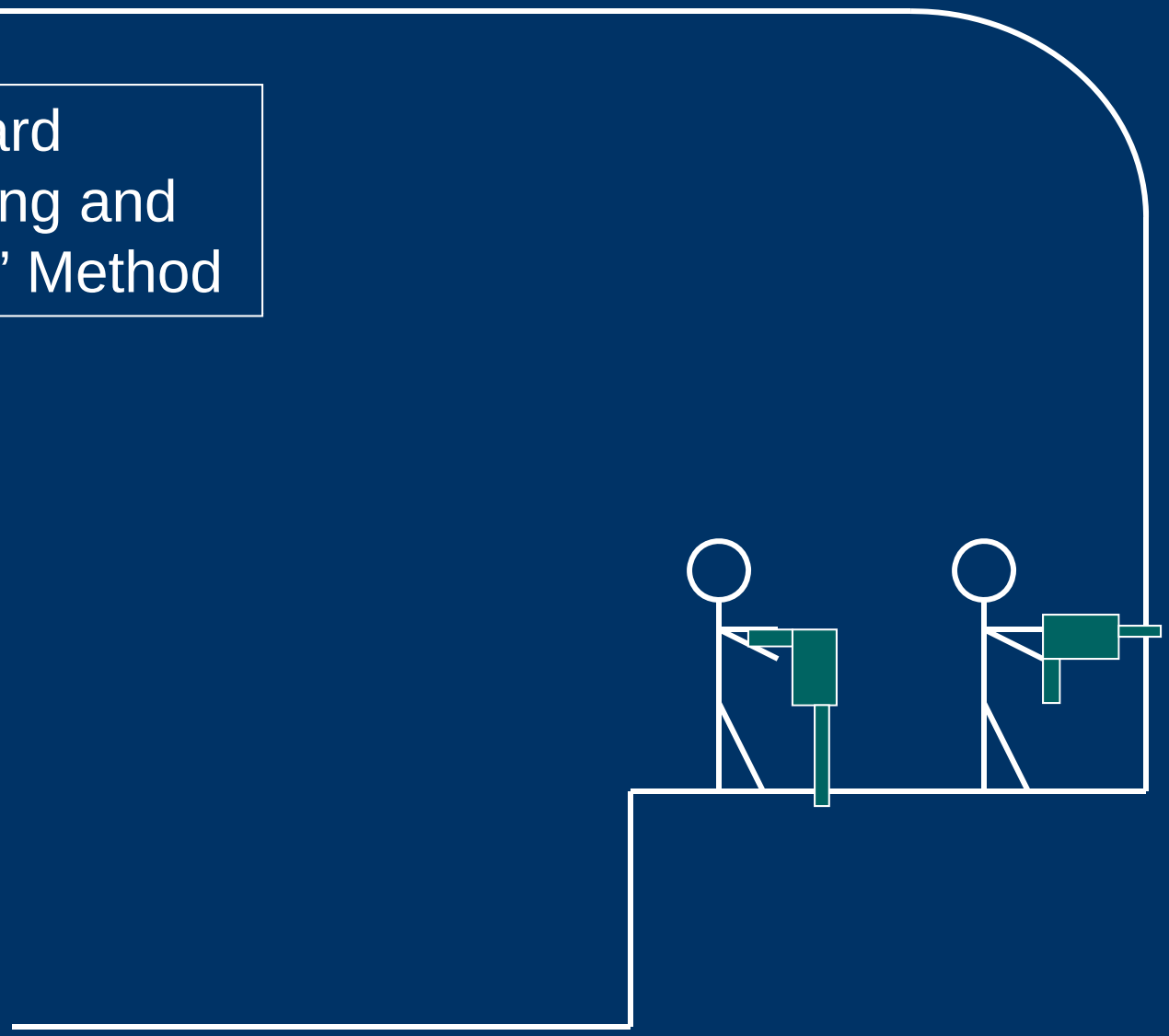
Anstead

Work Schedule

- Two shifts – 10 hours each
  - Muck out debris from previous shift
  - Drill
  - Blast
- About 45 workers at each heading during each shift
- 2 hours between shifts for dust to settle, theoretically, not always enforced

Drilling Technique

Standard "Heading and Bench" Method



Dinky Locomotive - Loading debris

West Virginia State Archive

Worker Protection(?)

- Time between shifts for dust to settle
- Wet drilling
- Respirators
- Ventilation pipe

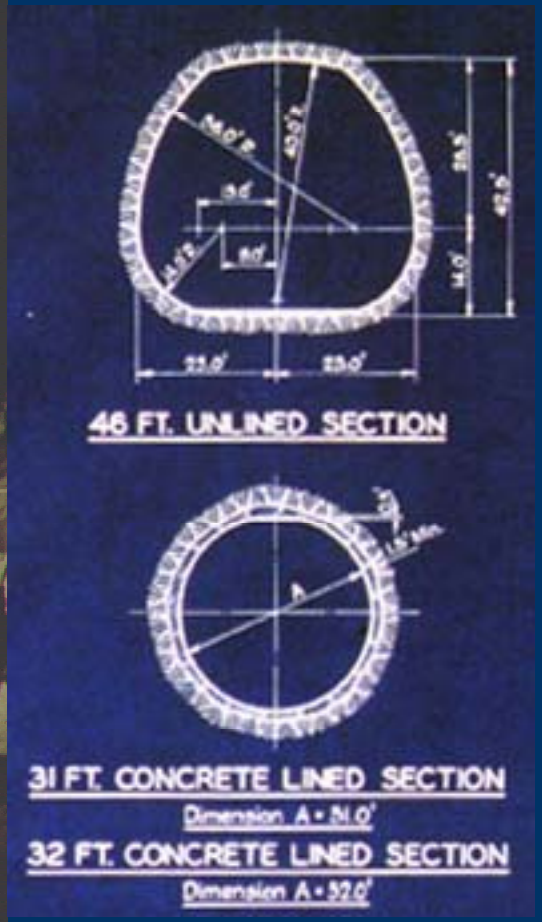
View from inside tunnel
Note Ventilation Tube

West Virginia State Archive

High Turnover

- 60% of men worked less than two months, 80% less than six months, 90% less than a year
- Average length of work was 15 weeks for a black worker, 16 for a white worker
- Why did so many work less than the total duration of the project, when jobs were very scarce and pay was relatively good?

View of the inside of the tunnel



Some parts lined, some parts unlined

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Excavation near tunnel opening

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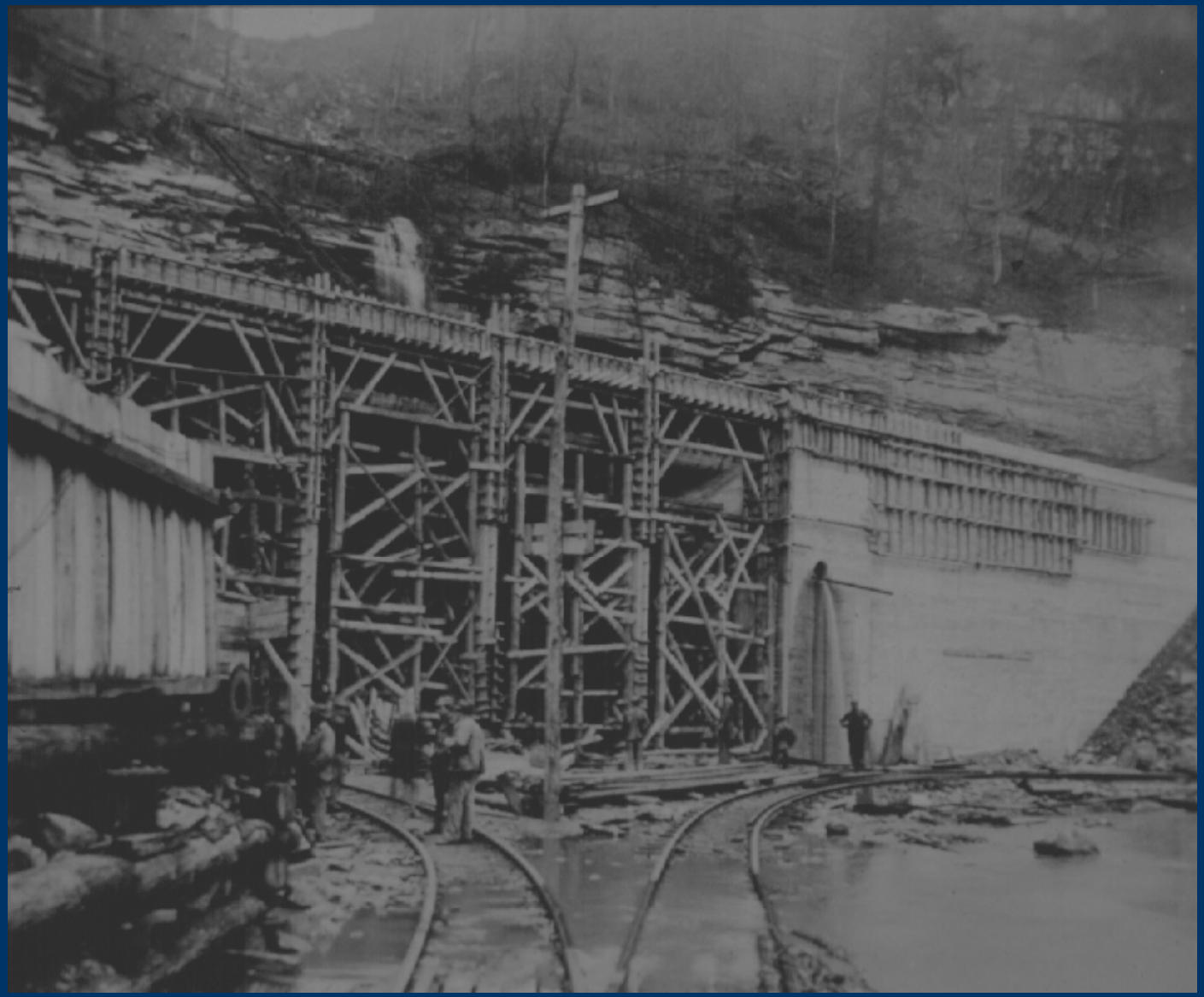
Completing Intake Structure



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Dam and Intake nearly finished – Gate Down 1933

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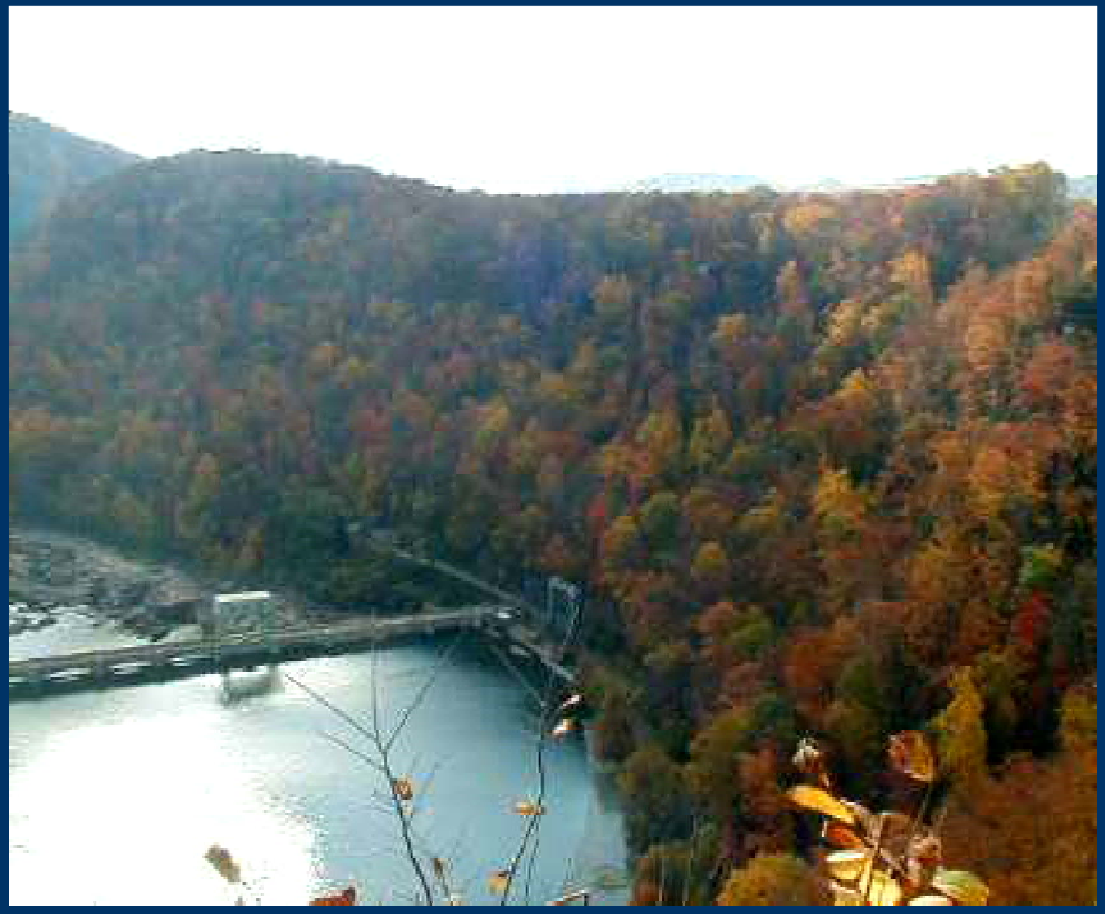
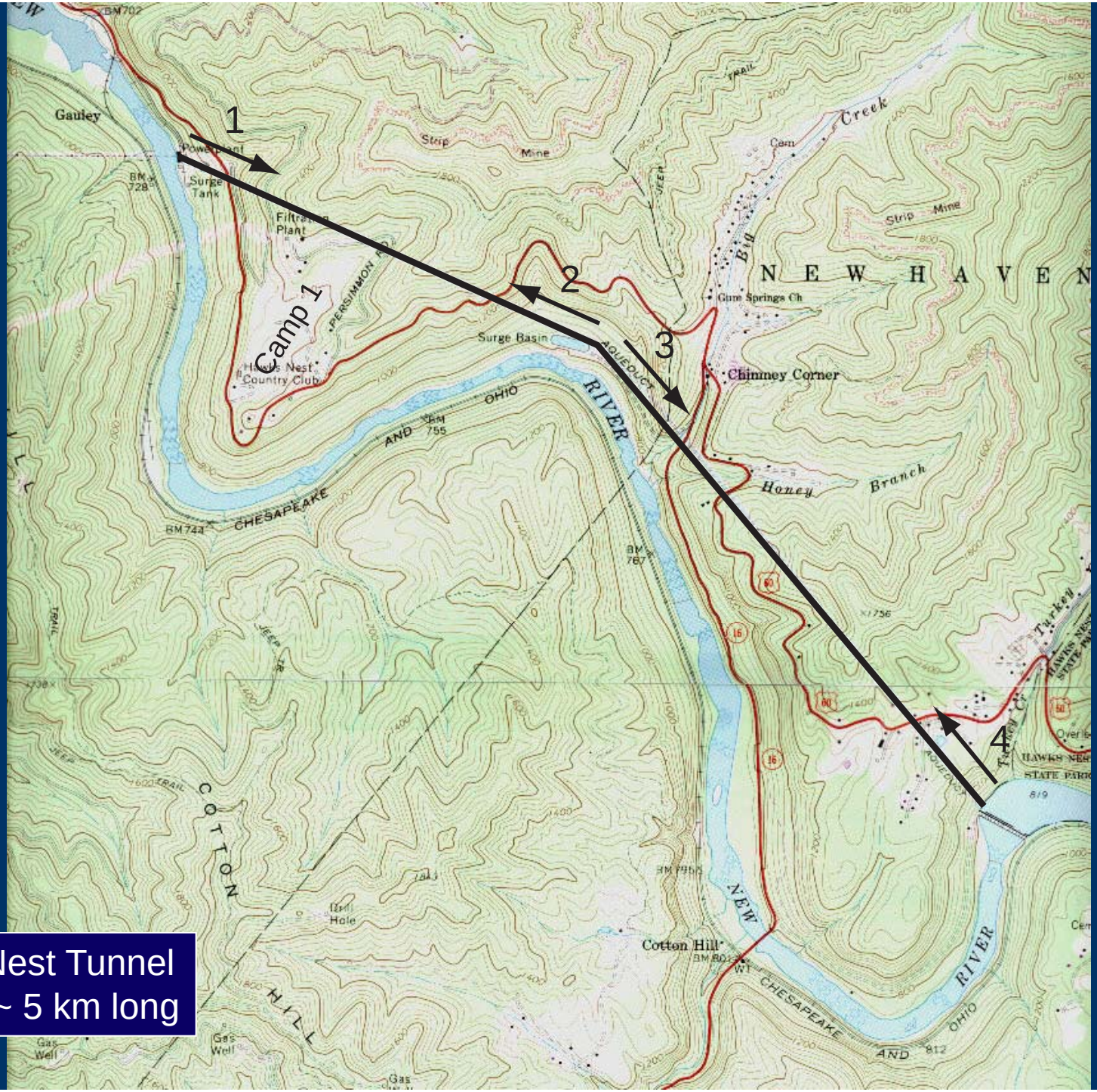
Dam and Intake now – Gate Up, Tunnel Open



HLang - 1997-1998

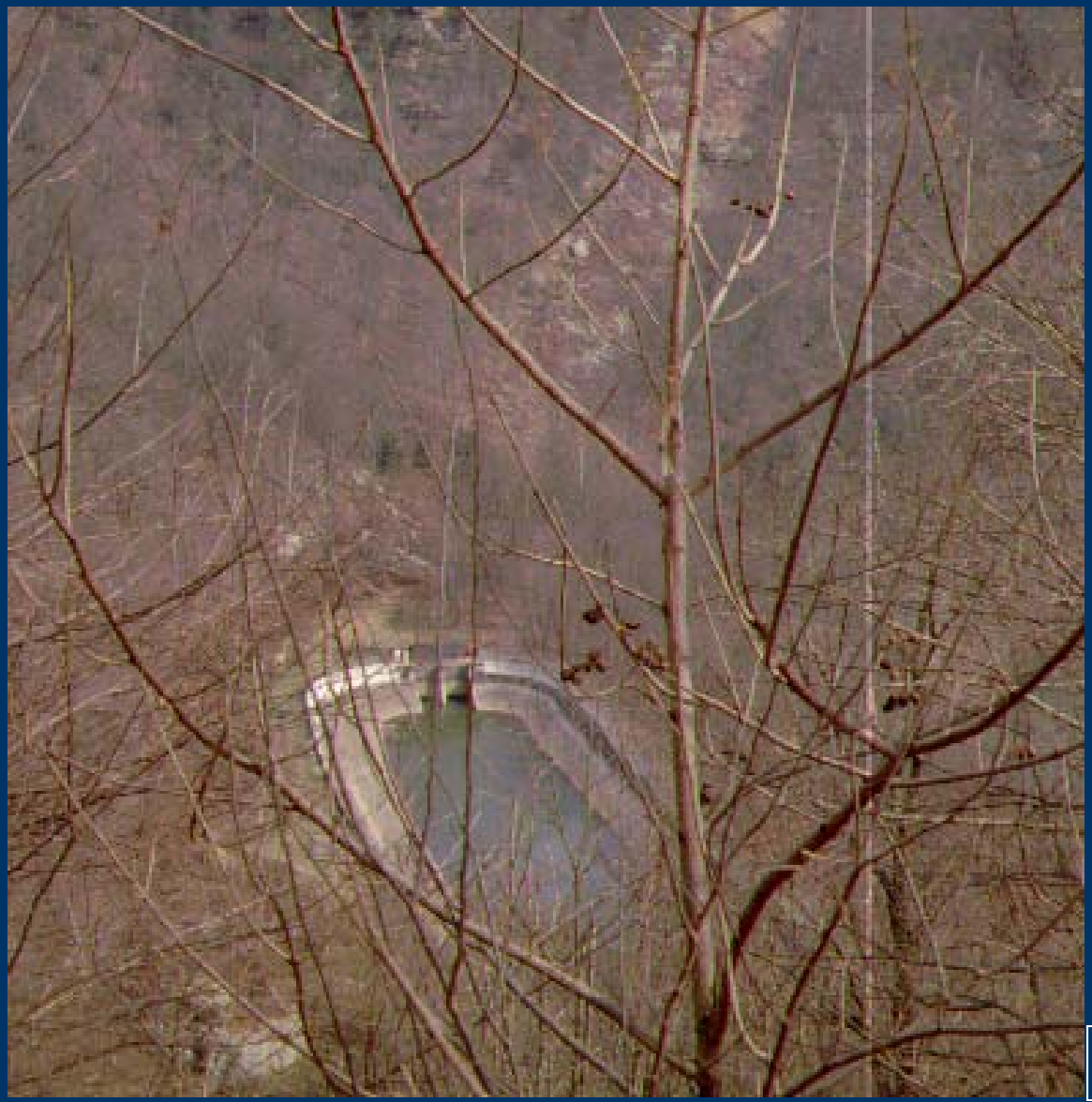
Hawk’s Nest Dam with “Drys”

HLang - August 1997



Hawks Nest Tunnel
3.08 mi ~ 5 km long

Surge Basin – junction Shafts 2 & 3



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Power plant & Surge Tank

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Power Plant is still operating

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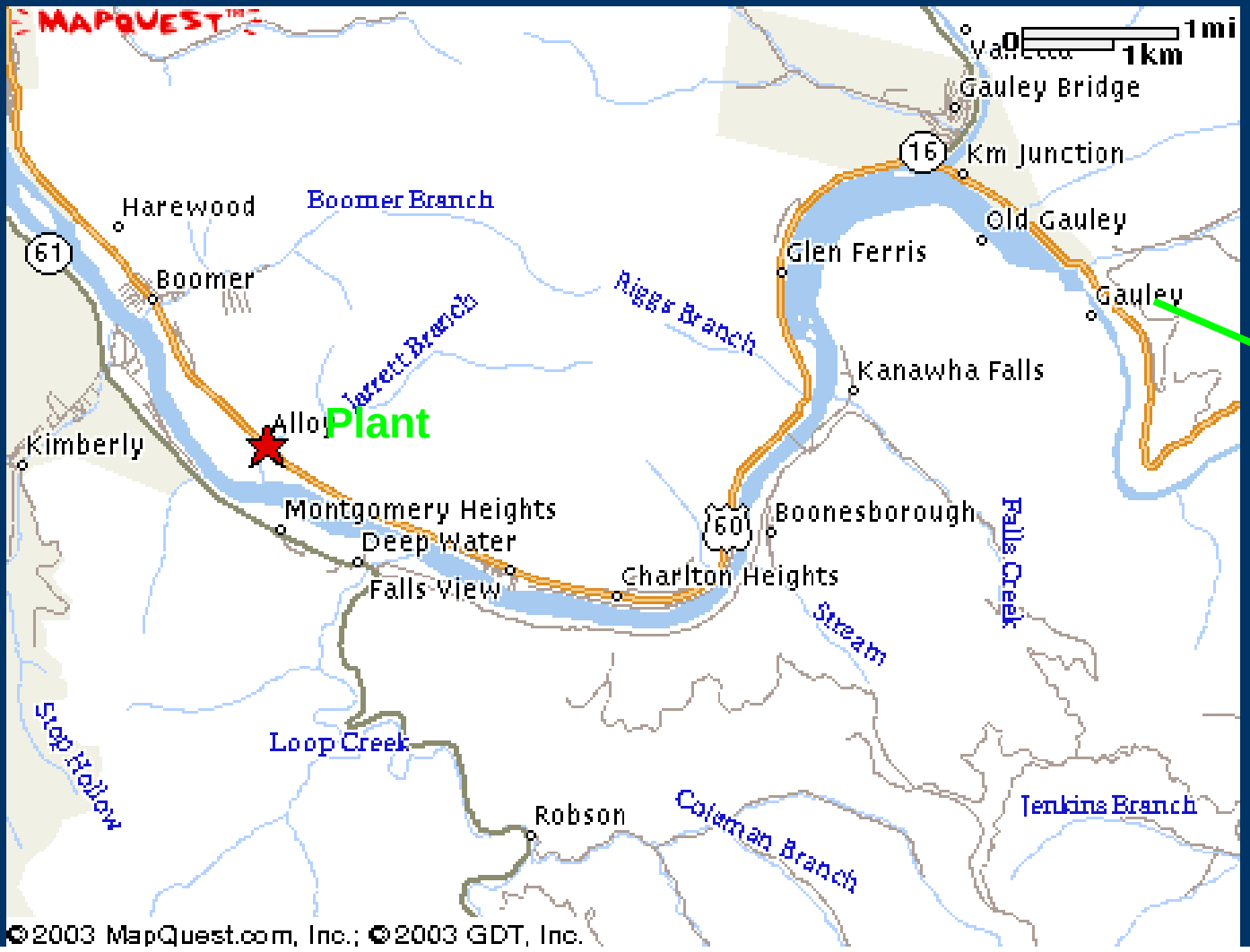
Elkem, a Norwegian company, now operates the ferroalloy plant (for which HN power is used) in Alloy, WV



Elkem, a Norwegian company, operates the ferrosilicon alloy plant in Alloy, WV

HLang - March, 1998

Engineering Marvel, but raises these serious questions – Cherniack 1986

- Did the Companies know that Gauley Mountain was composed mainly of Ss with a very high SiO_2 content?
- Were they aware of the danger to the workers from silicosis, a disease which had long been well known?
- What steps, if any, did they take to protect the workers?
- What was the purpose in widening the tunnel, thereby increasing the hazard to the workers?
- How many men died as a direct result of work in the tunnel?

The Aftermath - Disease

- Did the Companies know about silicosis?
- Recognition of a new aggressive form of silicosis
  - Acute silicosis
    - Caused by massive overexposure to freshly fractured, high-silica dust
    - Very deadly, kills within a few years, after as little as 2 months exposure
    - Looks different on chest X-rays than classic chronic silicosis, confused doctors
    - Highly associated with tuberculosis

Lawsuits

- $4 million in lawsuits settled for $130 thousand
- Half (+$20k secret deal) to attorneys, who agreed not to further prosecute the Companies
- All plaintiffs' records were turned over to defense (most important)
- Meager compensation for each litigant
  - Unmarried black man $400
  - Married black man $600
  - Unmarried white man $800
  - Married white man $1000

The Aftermath – Workers' Compensation Laws

- March 1935 – WV House of Delegates enacted a new Workmen's Compensation law that compensated silicosis
- "Unmitigated disgrace" according to Cherniack
- "Nearly every clause protected the employer (Union Carbide) from responsibility for the unique conditions that had prevailed in the Hawk's Nest Tunnel."
- One other case came up, denied on the basis of limitations in the Workman's Compensation law
- By the end of 1937, forty-six states had enacted laws covering workers afflicted with silicosis

The Aftermath – National Recognition

- Phillipa Allen, leftist social worker from New York went to Gauley Bridge in 1934 to investigate rumors of disease and death among workers
- Articles based on her investigation appeared in leftist, labor press in New York
- Caught the attention of NY Congressman Marcantonio, who arranged a Congressional Hearing before the Subcommittee on Labor
- Subcommittee asked for full investigation, nothing came of it, but minor national publicity

How many died?
Cherniack's conservative estimate

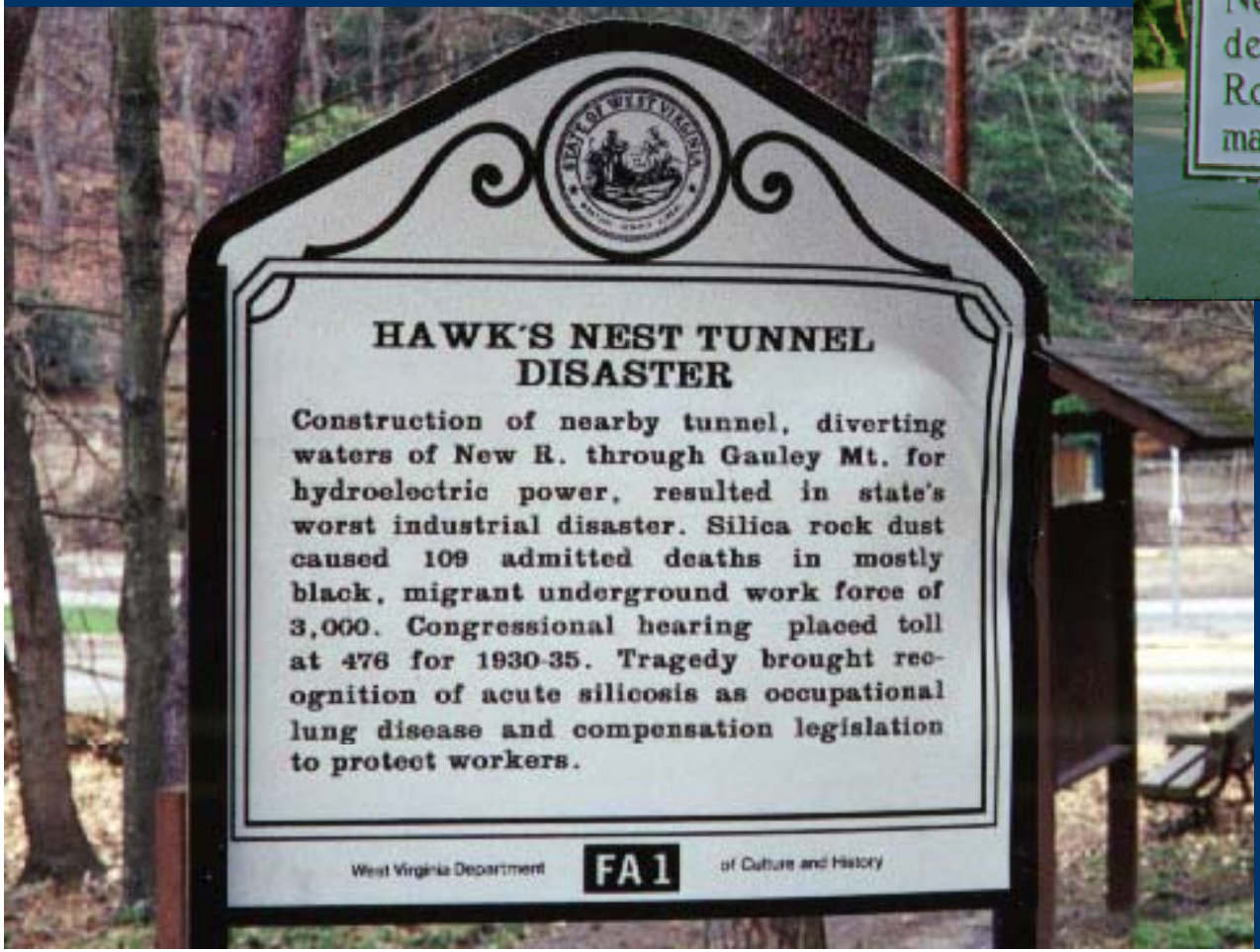
- Cherniack determined that there were 135 excess deaths among white males in Fayette County 1931-1937 compared to neighboring counties and WV
- He attributed all those deaths to work in the tunnel
- He calculated that 63% of local white men, who worked more than 2 months in the Tunnel, died within 6 years of acute silicosis
- Applying that percentage to all who worked more than 2 months in the Tunnel, he estimated that at least 764 men died of acute silicosis as a result of having worked in the Hawk's Nest Tunnel!

The Aftermath – Imprint on Popular Culture

- A few articles in Time, Newsweek, the New York Times, Engineering News Record
- One unnoticed novel, one briefly heard song
- More workers died from drilling the Hawk's Nest Tunnel than in the Triangle Shirt Waist fire (1911, 145 deaths), the Sunshine Mine disaster (1907, Monongah, WV, 362 deaths) and the Farmington Mine disaster (1968, 78 killed) **combined!**
- But it had no enduring imprint on popular culture. Why not?

New sign recognizes Hawk's Nest tragedy

Old sign



New sign

BHowe - 1997

Cemetery in the town of Gauley Bridge

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