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UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

DISTRICT 7

ACCIDENT INVESTIGATION REPORT
(UNDERGROUND COAL MINE)
NON-FATAL COAL OUTBURST ACCIDENT
NO. 37 MINE (I.D. NO. 15-04670)
ARCH OF KENTUCKY, INCORPORATED
CUMBERLAND, HARLAN COUNTY, KENTUCKY

JULY 25, 1990

BY

JAMES W. POYNTER
COAL MINE SAFETY AND HEALTH INSPECTOR

ORIGINATING OFFICE - MINE SAFETY AND HEALTH ADMINISTRATION
HC 66, BOX 1762, BARBOURVILLE, KENTUCKY 40906
JOSEPH J. GARCIA, DISTRICT MANAGER

REPORT OF INVESTIGATION
(UNDERGROUND COAL MINE)

NON-FATAL COAL OUTBURST ACCIDENT
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CUMBERLAND, HARLAN COUNTY, KENTUCKY

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Abstract of Investigation

U.S. Department of Labor
Mine Safety and Health Administration

Authority—This report is based on an investigation made pursuant to the Federal Mine Safety and Health Act of 1977, Public Law 91-173, as amended by Public Law 95-164.

Section A—Identification Data

1. Title of investigation: Noninjury Coal Outburst Accident
2. Date MSHA investigation started: 07-25-90
3. Report release date: 08/28/90
4. Mine: No. 37
5. Mine ID number: 15-04670
6. Company: Arch of Kentucky, Inc.
7. Town, County, State: Cumberland, Harlan County, Kentucky
8. Author(s): James W. Poynter

Section B—Mine Information

9. Daily production: 18,000 tons
10. Surface employment: 42
11. Underground employment: 263
12. Name of coalbed: Harlan
13. Thickness of coalbed: 96"

Section C—Last Quarter Injury Frequency Rate (HSAC) for:

14. Industry: 11.29
15. This operation: 6.51
16. Training program approved:
17. Mine Profile Rating:

Section D—Originating Office

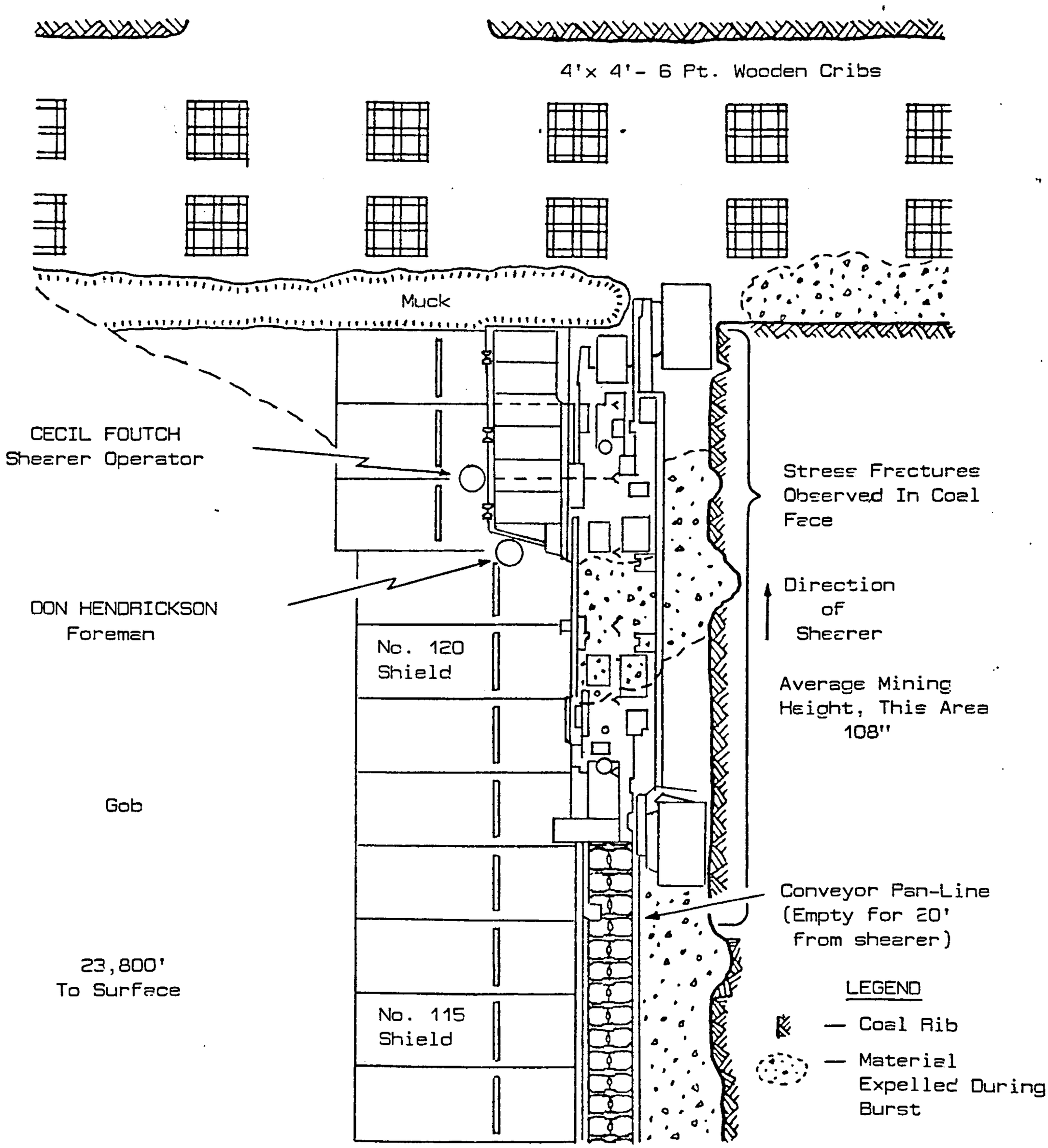
18. Mine Safety and Health Administration
Coal Mine Health and Safety District No.: 7
Address: HC 66 Box 1762, Barbourville, KY 40906

Section E—Abstract

At 12:23 p.m., Wednesday, July 25, 1990, a noninjury coal outburst accident occurred on t longwall face of the 004 (G-2) section. The burst involved approximately 190 feet of the face from the Nos. 86 to 124 shields (tailgate). Material was also expelled from the longwall rib-line in the tailgate for a distance of approximately 100 feet outby the face No personal injuries were reported, however, the shearer was moderately damaged.

Section F—Mine Organization

Company officials:	Name	Address
19. President:	Tom Sawarynski	Box 787, Lynch, KY 40855
20. Superintendent:	Danny Stickel	Box 787, Lynch, KY 40855
21. Safety Director:	John Dzurino	Box 787, Lynch, KY 40855
22. Principle officer—H&S:	Danny Stickel	Box 787, Lynch, KY 40855
23. Labor Organization:	UMWA; Local 7425	P.O. Box 1185, Middlesboro, KY 40
24. Chairman—H&S Committee:	Bob Clay	101 Huff Ave., Cumberland, KY 40



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Scale: 1" = 10'

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GENERAL INFORMATION

The No. 37 Mine of Arch of Kentucky, Incorporated is located one mile south of U.S. 119 on Cloverlick Road, Cumberland, Harlan County, Kentucky. The mine began operation on or about August, 1973. The mine produces coal four shifts per day, five days per week, with two-hundred-sixty-two underground employees and forty-two surface employees.

The mine is a multi-unit mine with two advancing units and one longwall unit in production at this time. The advancing units utilize three to four entry systems with Joy 12CM remote control Continuous Miners, Joy 10SC shuttle cars, Fletcher roof bolting machines and S&S battery-powered scoops. The longwall utilizes a Mitsui Trojan 700 shearer, one-hundred-twenty-four Gullick-Dobson two support-leg shields, and a Halbach-Braun stage loader automatic face conveyor system across a six-hundred foot coal face. All units utilize belt conveyor coal haulage systems. Track haulage is used for mantrip and supply via battery and/or diesel-powered vehicles. The mine has a daily production of ten-thousand tons.

Principal Mine Officials are:

Tom J. Sawarynski	President
Danny Stickel	Mine Manager, No. 37 Mine
Kenneth R. McCoy	Assistant Superintendent of Operations
John Dzurino	Manager of Safety and Employee Development

The Roof Control Plan, approved June 20, 1988, provides for full overhead support in all roof spans. The maximum entry width is twenty feet, with twenty-five foot widths for a longwall set-up room. Entries, crosscuts and rooms are developed with a minimum center distance of fifty feet. Rods, fully grouted with polyester resin are used on advancing sections. The minimum length of rods is thirty-six inches with installation on forty-eight inch and sixty-inch centers. Tensioned rebar combination bolts, with twenty-four inches minimum grouting, having a minimum length of forty-eight inches, installed on forty-eight and sixty-inch centers are also approved for use. The retreating longwall has full overhead support utilizing two-leg hydraulically powered "shields" with three-hundred-ninety-five tons yield capacity per leg. The shields are equipped with extensible plates for skin-to-skin protection on the roof beam and caving shield to provide immediate support behind the shearer. Lexan (plexiglass), installed on ten-foot centers from the No. 90 shield to the No. 121 shield on the tailgate end of the longwall face, is provided for protection from airborne material.

The last regular Health and Safety Inspection was completed on June 29, 1990.

DESCRIPTION OF ACCIDENT

On Wednesday, July 25, 1990, the Longwall day shift crew entered the mine under the supervision of Don Hendrickson, foreman. The crew traveled, via diesel mantrip, to the G-2 (004) Longwall section.

The crew usually changes out on the section with the preceding shift, however, production was delayed due to the event of an minor outburst occurring earlier that day.

Upon arriving on the section, Hendrickson met Rick Damron, Longwall Coordinator and David Boyle, Chief Electrician. Damron and Boyle had arrived earlier that morning to examine conditions on the section following the outburst.

Hendrickson, Damron and Boyle decided to alter the mining sequence to allow time for the coal face to crush-out and relieve the strain energy. Hendrickson proceeded to the dinner hole and informed the crew of the changes in the mining cycle. The operator's supplemental mining plan which consisted of reducing the speed of mining by making two complete passes with the shearer and idling for one hour was implemented. Mining then commenced and two (2) complete passes were taken and the shearer was idled at approximately 10:00 a.m. Production resumed at approximately 11:00 a.m. without incident until approximately 12:23 p.m. when another outburst occurred involving approximately 190 feet of the face of the 004 (G-2) section.

Flying material and the concussion from the outburst knocked Hendrickson and the shearer operator, Cecil Foutch, to the mine floor. Neither person was injured. The shearer and the conveyor pan-line continued to run after the outburst. The shearer was turned off at 12:23 p.m. by Hendrickson and the thermal overloads for the headgate and conveyor motor deenergized the conveyor pan-line. Although the shearer continued to run, the "split-flanges" between the major frame components were damaged.

Hendrickson and Foutch were not injured during the outburst but, for precautionary measures, were taken to the Lynch Clinic, Lynch, Kentucky, to be examined by a physician.

PHYSICAL FACTORS INVOLVED

The investigation revealed the following factors relevant to the occurrence of the accident:

1. The mine is located in the Harlan coal seam, one-half mile south of Cumberland, Harlan County, Kentucky. The immediate roof, throughout the mine, normally consists of ten feet or more siltstone and shale and the main roof consists of ten feet or more sandstone.

2. Coal is extracted from the longwall face by a Mitsui Trojan 700 twin-drum ripper-type shearer. The coal is transported across the six-hundred foot face by a Halbach-Braun conveyor pan-line.

3. The roof is supported across the face by one-hundred twenty-four Gullick Dobson two-leg shields with three-hundred ninety-five tons per leg yield capacity.

4. Four feet by four feet sheets of Lexan (plexiglass material) is installed between the travelway and the face conveyor along the longwall face, extending from shield number ninety to shield number one-hundred twenty-one. These shields were designed to deflect airborne material expelled from the face during mining operations or outbursts.

5. The headgate and tailgate entries for the affected panel were developed as three-entry systems on one-hundred forty feet centers. The yield pillars crosscut widths are driven on fifty feet centers and the abutment pillars driven on one-hundred sixty feet centers.

6. The total amount of overburden at the affected area was approximately 2,000 to 2,200 feet.

7. Holes from one-hundred to one-hundred twenty feet in depth were drilled on one-hundred twenty feet maximum centers. The holes were pressurized with hydraulic emulsion fluid, at four-thousand seven-hundred pounds per square inch, from the high pressure side of the face support shields. This high-pressure infusion was induced to fracture the coal in advance of the coal face.

8. The operator's supplemental mining plan, which consists of reducing the speed of mining by making two complete passes with the shearer and idling for one hour, had been implemented due to a minor coal outburst. This mining cycle was implemented immediately prior to the outburst. Their intentions were to allow the coal face to fracture and relieve stress to prevent the shearer from inducing a outburst, which had occurred on three previous occasions.

9. The immediate roof in the affected area was thirty-five feet sandstone.

10. Approximately seventy tons of material was dislodged from the coal face. Moderate amounts of material was expelled from the coal face into the walkway and support shields, to depths up to six inches, from the number eighty-six shield to the number one-hundred fifteen shield. Material, in depths to four feet filled the conveyor pan-line from the number one-hundred shield to the number one-hundred thirteen shield.

11. The shearer and the face conveyor continued to run for a short period immediately following the accident. The face conveyor transported the material approximately twenty feet from the shearer to where the thermal overloads for the four-hundred fifty horsepower headgate-end conveyor motor deenergized the power circuit. No physical damage was reported to have occurred to the automatic face conveyor system.

12. Damage, reported to have occurred to the shearer, involved the split-line connecting flanges between the tailgate gear head and the tailgate haulage unit; the tailgate haulage unit and main motor; the main motor and the headgate haulage unit. This damage apparently was the result of the shearer dropping onto the conveyor pan-line after being upheaved by the forces of the outburst.

13. Don Hendrickson, Foreman and Cecil Foutch, Tailgate-end Shearer Operator, were knocked from their feet by the concussive forces of the burst. Both were taken to the Lynch Medical Clinic, Lynch, Kentucky., Hendrickson and Foutch were examined for injuries and released.

14. The face support advance rams on the number one-hundred to number one-hundred twenty-one shields showed signs of being over pressurized and lateral movement of up to ten inches. The pressure relief valves, set at five-thousand pounds per square inch, showed accumulations of hydraulic emulsion on the vent part of the relief valves.

15. There was no prior warning of indication that the outburst was about to occur. The only indications that a outburst had occurred was the concussive forces that were felt by the persons in the area and the noise heard by persons located at the headgate and the "dinner hole".

16. After this occurrence, the longwall was relocated to another area where different geologic conditions existed.

CONCLUSION

The accident occurred due to excessive pressure at the tailgate end of the working face, created by approximately two-thousand feet of overburden and a sandstone channel anomaly. A contributing factor to the occurrence was the de-stressing hole drilled into the coal rib, tailgate side, not being pressurized and did not aid in relieving stress on the coal face.

VIOLATIONS

There were no violations observed as contributing factors to the accident:

I. A 103-K Order was issued July 25, 1990, for the purpose of investigation of the accident.

Respectfully submitted,

James W. Poynter
Coal Mine Safety & Health Inspector

Approved by:

Carl E. Boone, II
Snbdistrict Manager

and

Joseph J. Garcia
District Manager

APPENDIX

List of persons furnishing information and/or present during the investigation:

Arch of Kentucky, Incorporated

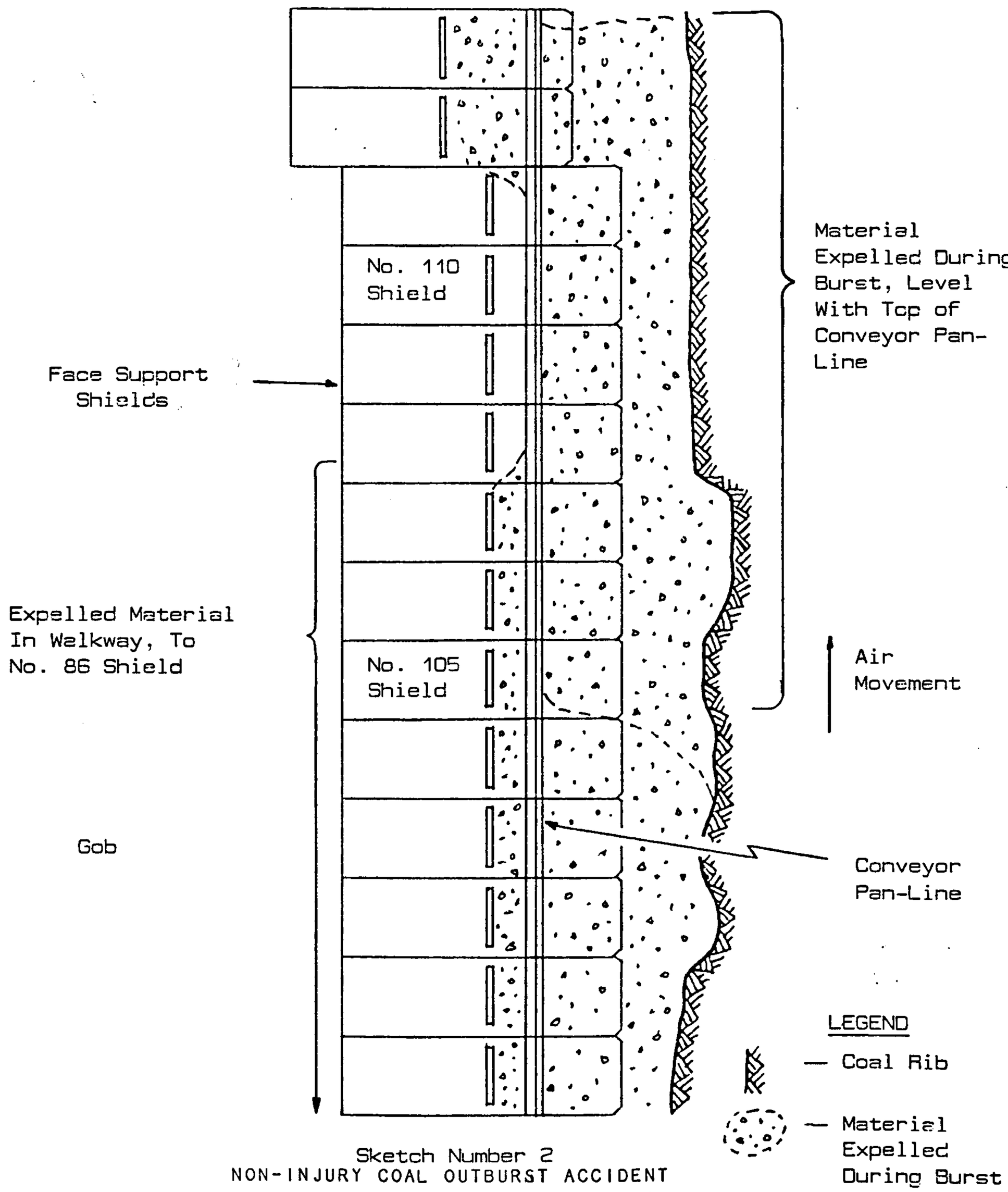
Kenneth McCoy	Asst. Superintendent of Operations
Dan F. Stickel	Mine Manager
Don Hendrickson	Section Foreman
Rick Damron	Longwall Coordinator
Joe R. Estep	Safety Supervisor

United Mine Workers of America

Bob Clay	Chairman-Health & Safety Committee
Phillip King	Safety Committeeman
Bill Miller	Headgate Cornerman

Mine Safety and Health Administration

James Poynter	Coal Mine Inspector



Sketch Number 2
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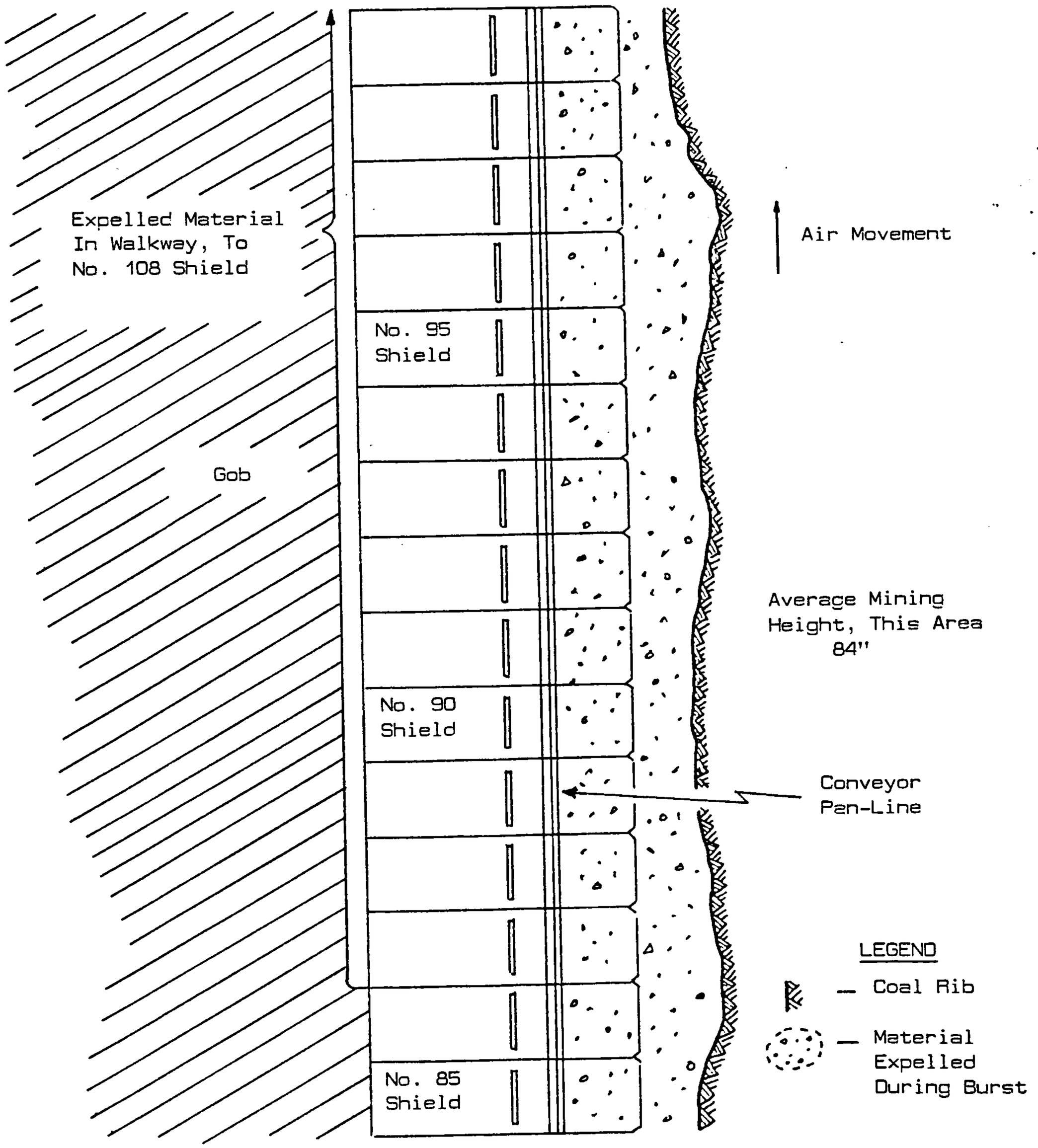

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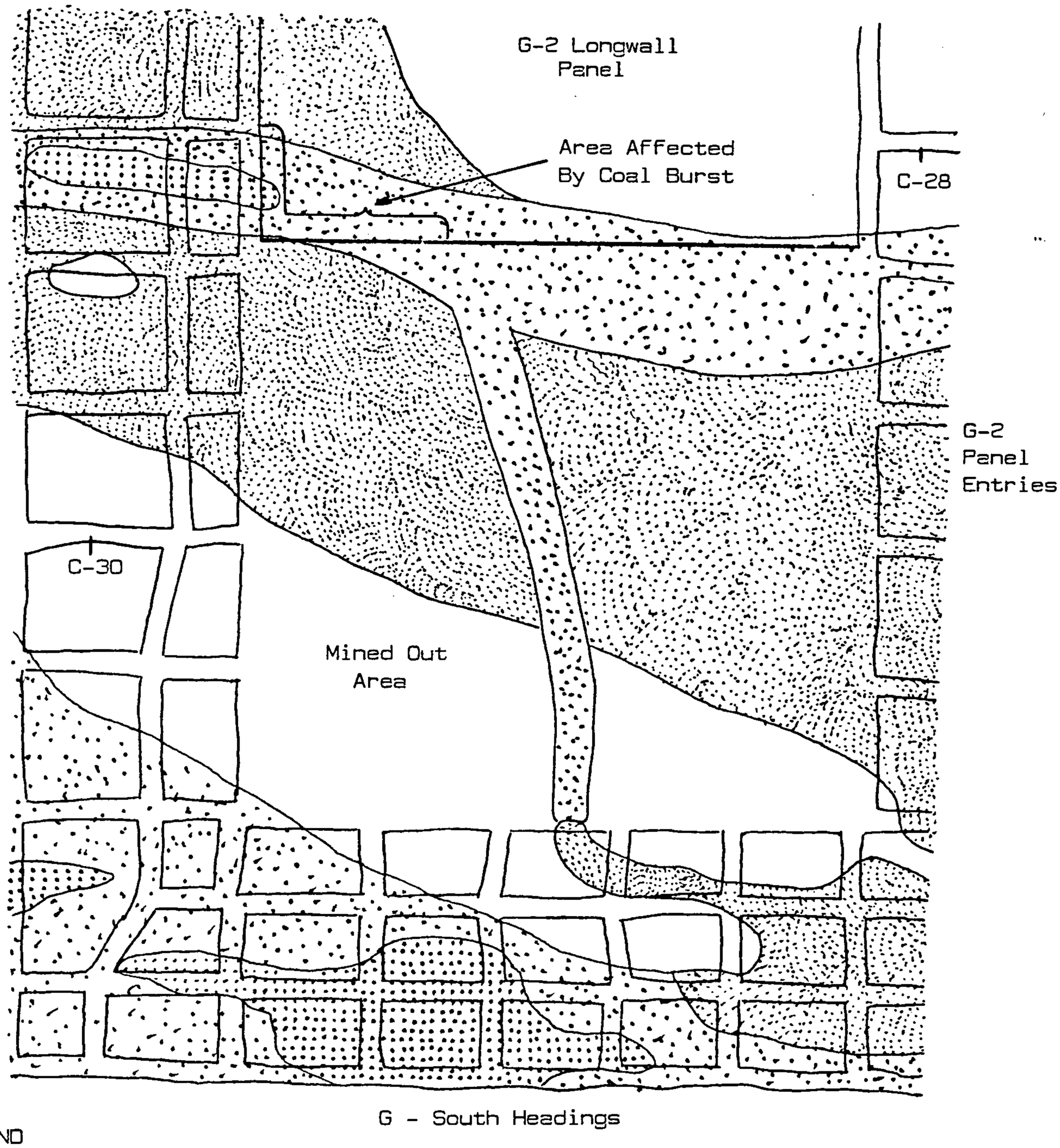

LEGEND

- Shale
- Sandstone With No Scouring
- Sandstone With Light Scouring
- Sandstone With Moderate Scouring

Sketch Number 4

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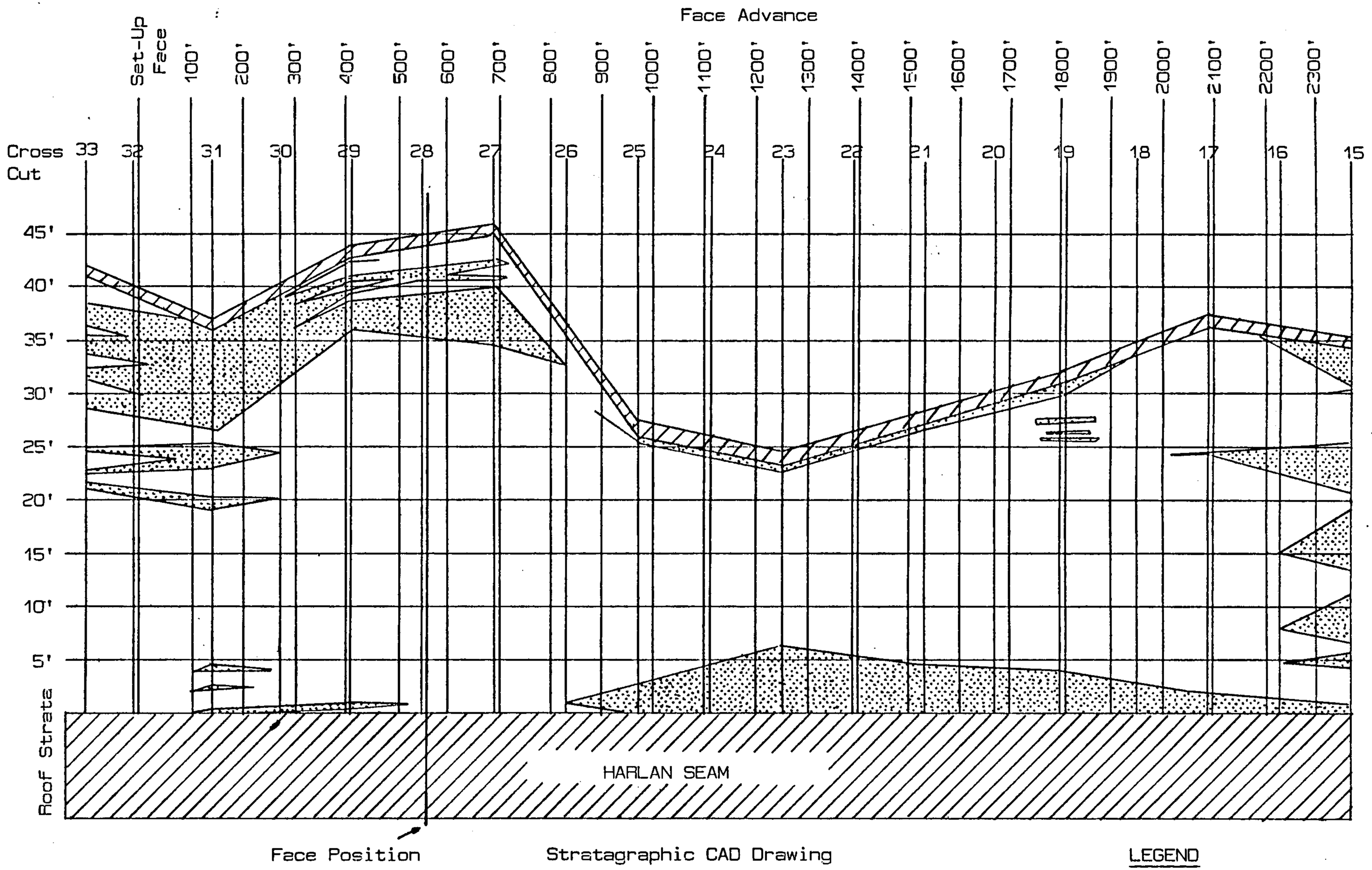
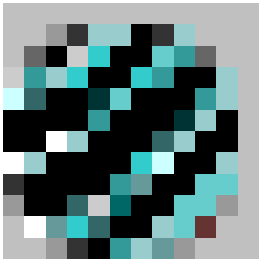
Not To Scale



Stratagraphic CAD Drawing

LEGEND

- Shale or Sandy Shale
- Sandstone
- Coal

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