

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION
(UNDERGROUND COAL MINE)

MULTIPLE FATAL INUNDATION (BLACKDAMP) ACCIDENT

No. 5 Mine (I.D. No. 15-05184)
Grays Knob Coal Company
Grays Knob, Harlan County, Kentucky

June 3, 1981

by

Harry J. Carter
Coal Mine Safety Specialist

Earnest C. Teaster, Jr.
Coal Mine Safety Specialist

Originating Office - Mine Safety and Health Administration
4015 Wilson Boulevard, Arlington, Virginia 22203
Joseph A. Lamonica, Administrator for Coal Mine Safety and Health

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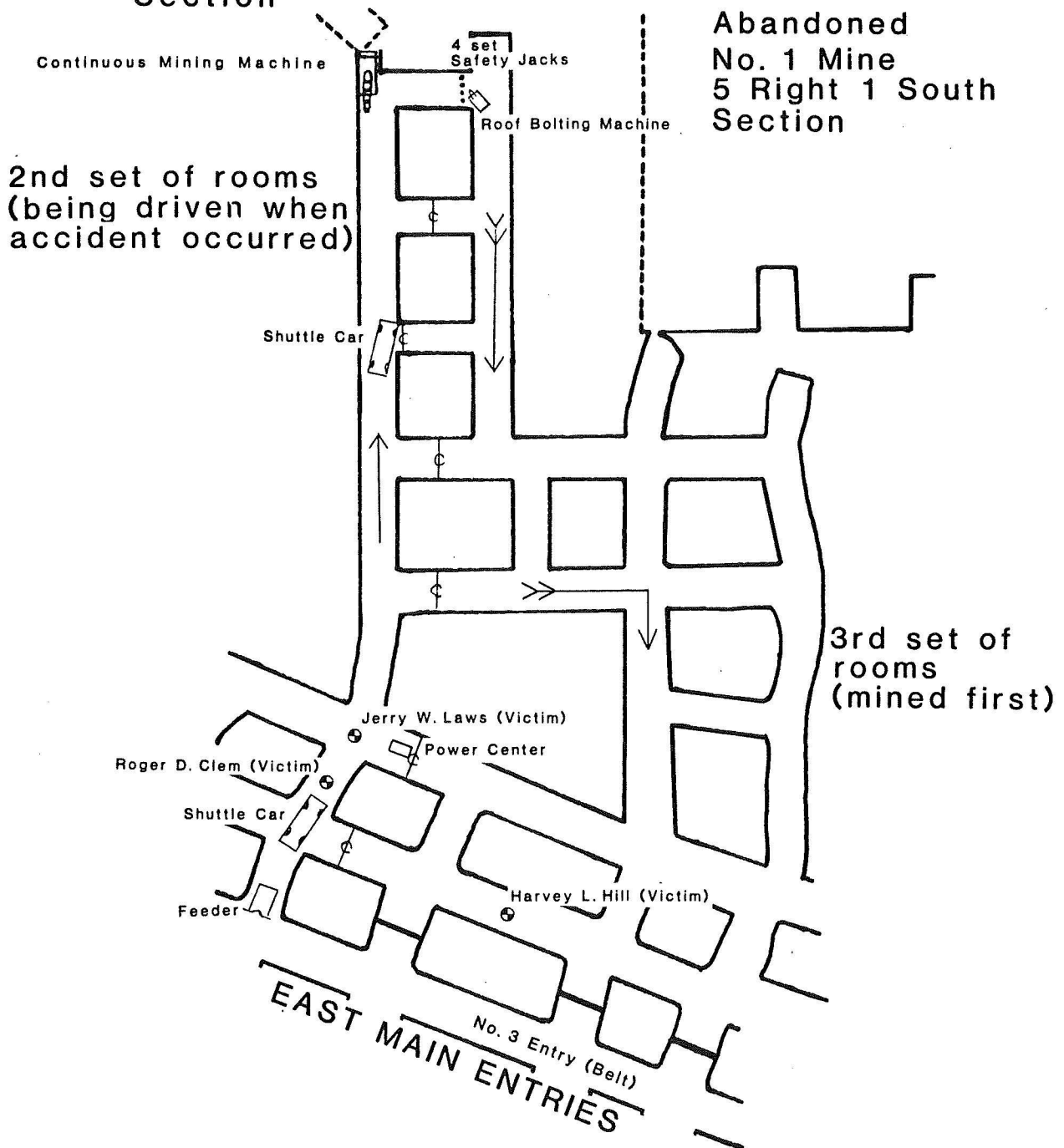
No. 5 Mine (I.D. 15-05184)
Grays Knob Coal Company
Grays Knob, Harlan County, Kentucky

June 3, 1981

Sketch No. 1

Abandoned
No. 1 Mine
4 Left 2 South
Section

Abandoned
No. 1 Mine
5 Right 1 South
Section



Multiple Fatal Inundation Accident

No. 5 Mine

Grays Knob Coal Company

June 3, 1981

ABSTRACT OF INVESTIGATION

<p>Title of Investigation: Multiple Fatal Inundation (Blackdamp) Accident</p> <p>Report Release Date: MAR 26 1982</p> <p>Mine: No. 5 Mine</p> <p>Mine ID Number: 15-05184</p> <p>Company: Grays Knob Coal Company</p> <p>Town, County, State: Grays Knob, Harlan County, Kentucky</p> <p>Author(s): Harry J. Carter Earnest C. Teaster, Jr.</p>	<p>Mine Information</p> <p>Daily Production ...200 tons.....</p> <p>Surface Employment1.....</p> <p>Underground Employment8.....</p> <p>Name of CoalbedHarlan.....</p> <p>Thickness of Coalbed42" to 60".....</p> <hr/> <p>Last Quarter Injury Incident Rate (HSAC) for:</p> <p>Industry12.88.....</p> <p>This Operation0.00.....</p> <p>Training Program ApprovedYes.....</p> <p>Mine Profile RatingNone.....</p>
<p>Originating Office - Mine Safety and Health, Administration, Coal Mine Safety and Health, Office of the Administrator</p> <p>Address: 4015 Wilson Boulevard Arlington, Virginia 22203</p>	<p>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)</p>

Abstract

At approximately 2:30 p.m., on Wednesday, June 3, 1981, a mine inundation accident occurred at the face of the No. 1 room of the second set of rooms off east main at Grays Knob Coal Company's No. 5 mine. The accident resulted in the death of Harvey L. Hill, Roger D. Clem, and Jerry W. Laws. Hill, age 30, had a total of 8-1/2 years mining experience, the last 3 years at this mine as a section foreman. Clem, age 23, had a total of 5 years mining experience, the last 3 weeks at this mine as a roof-bolting machine operator. Laws, age 25, had 4 years mining experience, the last 2 weeks at this mine as a roof-bolting machine operator helper. The accident occurred when the continuous mining machine unintentionally penetrated the abandoned adjacent No. 1 mine, which allowed a sudden inrush of blackdamp (oxygen-deficient atmosphere) that permeated the entire section. Management's failure to require that boreholes be drilled in advance of the working faces was the cause of this accident.

Information for this report was compiled through a MSHA investigation that was started ... June 3, 1981

Company Officials:	Name	Address
President	Clyde V. Bennett III	Grays Knob, Kentucky 40829
Superintendent	Joe Felosi	Grays Knob, Kentucky 40829
Safety Director	Wallace Harris	Grays Knob, Kentucky 40829
Principle Officer - H&S ...	Wallace Harris	Grays Knob, Kentucky 40829
Labor Organization	Non-agreement	
Chairman - H&S Committee	N/A	

Commentary

On Wednesday, June 3, 1981, at 7 a.m., the section crew, under the supervision of Harvey L. Hill, section foreman, entered the Bob's Creek portal and traveled by way of a battery-powered scoop to the No. 3 belt conveyor (a distance of approximately 1,400 feet). The crew then transferred to the belt conveyor and rode to the second set of rooms off east main, arriving on the section at 7:20 a.m.

Hill instructed Roger D. Clem and Jerry W. Laws to complete the installation of roof bolts in the No. 2 room. Arlis Hensley, continuous mining machine operator, and Danny Stewart, continuous mining machine operator helper, serviced the mining machine while waiting for the roof bolts to be installed. The mining machine was trammed to the face of the No. 2 room and mining operations began. Mining was alternated between the Nos. 1 and 2 rooms until the face of the No. 1 room had been driven approximately 70 feet inby the last open crosscut. At that time, the face of the No. 1 room was stopped and a crosscut was turned right. Mining operations were then rotated between the developing crosscut and the No. 2 room. At approximately 2:10 p.m., the crosscut was mined through into the face of the No. 2 room.

Hensley then trammed the mining machine to the face of the No. 1 room, positioned the machine on the left side of the face, and continued mining operations. Clem and Laws installed safety jacks in the unsupported area of the recently mined through crosscut and began bolting operations. About 2:30 p.m., Hensley was in the process of loading the second shuttle car of coal when suddenly air started to rush in over the top of the machine. Hensley immediately shouted, "Let's get out of here, we have hit something," and he and Stewart began running down the No. 1 room. Hensley informed the other miners on the section of the occurrence as he traveled down the No. 1 room. However, the miners were already aware that something had occurred because the inrush of air, which reportedly sounded like a freight train, was very audible.

All of the miners, except Clem and Laws, assembled at the section dumping point and decided to escape by going out the mantrip route to Bob's Creek portal. They boarded a battery-powered scoop parked adjacent to the section loading point and started to the outside. The miners had traveled about 70 feet when Hill told them to stop. He instructed them to continue to the surface while he went back to find Clem and Laws. Enroute to the surface, the miners stopped at a telephone located at the No. 4 belt drive and made an unsuccessful attempt to inform personnel on the surface of the incident. The miners arrived on the surface at approximately 3 p.m. and notified personnel at the main portal of the occurrence. Hensley and Gerald Cornett, electrician, were taken to the local hospital where they were administered oxygen and released.

Kenneth Fee, Coal Mine Inspection Supervisor, Harlan, Kentucky, Mine Safety and Health Administration field office, was notified of the

occurrence at approximately 3:15 p.m., the same day. He and other inspectors immediately proceeded to the mine. Upon arrival at the mine, a decision was made by representatives of Grays Knob Coal Company, the Kentucky Department of Mines and Minerals, and MSHA to enter the main portal because Bob's Creek portal was on the return side of the ventilating current.

About 4 p.m., Grays Knob Coal Company officials and State and MSHA inspectors entered the mine to search for the missing miners. The atmosphere was continuously tested as they advanced, but no irrespirable atmosphere was encountered. The company officials and State and MSHA inspectors arrived at the second set of rooms off east main entries at approximately 5 p.m. Laws and Clem were found approximately 350 and 385 feet outby the face of the No. 1 room, respectively. Hill was found in the No. 2 entry of the east main entries about 120 feet inby the location where Clem was found (see sketch). No signs of life were detected and the miners were placed on stretchers and taken to the surface. Laws, Clem and Hill were transported to the local hospital where they were pronounced dead on arrival; death was attributed to asphyxiation.

Discussion and Evaluation

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

1. The No. 1 mine was opened sometime prior to 1950, and was abandoned in June 1980. The main entries of the mine were driven towards the west. Just inby the mine openings, the 1 south mains were turned left off of the west mains entries and developed about 4,150 feet. Five sections were turned right off of 1 south, driven approximately 2,000 feet, and all were retreated except the 5 right section which was left standing. Beginning at a point about 1,400 feet from the faces of the 1 south mains, the coal pillars were extracted in 1 south to within 200 feet of the west mains. When the west mains had been developed about 3,600 feet, the 2 south mains were turned left and were developed approximately 3,200 feet. Four sections were turned left off of the 2 south mains and driven towards the sections that had been mined on the right side of the 1 south mains. These four sections were mined to within about 150 feet of the section off of the 1 south mains and retreated. This created a solid block of coal that separated the mined out areas of 1 south mains and the 2 south mains. Water was frequently encountered in the 2 south area of the mine, and it is anticipated that the entrances to the sections turned left off of 2 south are completely filled with water. If this is true, the areas mined to the left off the 2 south mains are totally isolated from the other areas of the No. 1 mine. The 4 left 2 south section was the area that was penetrated when the accident occurred. The top end of the 4 left 2 south section was directly adjacent to the top end of the 5

right 1 south section with only 150 feet of solid coal separating the two sections. The 4 right 2 south section was mined in 1966. The No. 1 mine was owned and operated by the Grays Knob Coal Company.

2. The No. 5 mine was opened in April 1972. The main entries were driven in a southeast direction and had been developed approximately 10,800 feet underground. The mine workings of the No. 1 mine extended along the left side of the No. 5 mine. After the east main entries of the No. 5 mine had been developed about 9,000 feet underground, which was in close proximity to the top of the 5 right 1 south section of the abandoned No. 1 mine, management decided that the 5 right 1 south section should be dewatered. The east main cutout entries were turned right off of the east main entries to create an opening to the surface to minimize the distance the water would have to be pumped. This opening became known as the "Bob's Creek Portal." On August 5, 1980, the opening to the surface had been completed. At that time, the south main connection entries were turned off the east main entries in preparation of cutting into the old 1 south main entries that were left standing in the abandoned No. 1 mine. On November 4, 1980, drilled boreholes in the faces of the south main connection entries penetrated the old south main entries. The boreholes were on negative pressure with the air traveling inward toward the 1 south main entries. The faces were subsequently cut through into the 1 south mains. The 1 south main entries were rehabilitated and ventilation was established to beyond the junction of the 5 right section. The mining equipment was then moved back to the east main entries just outby the junction of the east main cutout entries where, on January 20, 1981, two rooms were turned left off east main. The purpose of developing these rooms was to penetrate the top end of the 5 right 1 south section to establish a pick-up point for the water from the 5 right section. The mine elevations of the No. 5 mine indicated that the rooms would be lower than the top end of the 5 right section. However, when the boreholes were drilled into the 5 right section, there were no indications of water. The boreholes were on negative pressure with the air traveling inward toward the 5 right section.

On February 3, 1981, a second set of rooms were turned off of east main about 300 feet outby where the first set had been turned. These rooms were driven toward the 4 left 2 south section of the abandoned No. 1 mine to determine if any water could be found in that area. On February 14, one of the boreholes that was being drilled in advance of the working face began emitting loud audible sounds. The borehole was on positive pressure toward the active workings. Concentrations of low oxygen and small

quantities of methane could be detected near the entrance of the borehole. A wooden plug was inserted into the borehole and no further mining was performed in this set of rooms. The mining equipment was then taken to the 1 south main entries of the abandoned No. 1 mine where, on February 19, 1981, two rooms were started in a block of coal that had been left between 4 right and 5 right sections. These rooms had been driven about 1,000 feet when water was encountered through the boreholes that were drilled in advance of the face into an old set of rooms that had been turned right off 5 right during the development of the 5 right section. At this time, rooms were turned to the right and driven towards the mined out areas of 4 right. When the boreholes were drilled into the mined out area, water was emitted from the holes. Additional holes were drilled and blasted to permit the water to flow from the mined out areas into the 5 right section. The equipment was then returned to the south main connection entries in the No. 5 mine.

On April 30, 1981, two rooms were turned left off the south main connection entries, approximately 600 feet in by the junction of the east mains. These rooms were driven to establish a gathering point for dewatering the 5 right section. When the section was penetrated by one of the rooms, no water could be found. The mining equipment was then taken to the first set of rooms that had been turned off east main. The face of the No. 1 room, in which boreholes had been previously drilled into the 5 right section, was cut through on May 20, 1981, but water could still not be found. Mine management could not understand why the water would not flow to this point because the elevations on the mine map indicated that the water should flow to these points. An engineering survey, made by company engineers, of the mine elevations revealed that all elevations in the No. 5 mine were 16 feet higher than indicated on the mine map, which explained why the water would not flow to the rooms. This engineering error was made on the surface when preparations were being made to open the mine. Mine management decided, based on the corrected elevations, to dewater the 5 right section by driving two rooms into the block of coal that was left intact in the abandoned No. 1 mine between 4 left 2 south and 5 right 1 south and penetrated the top center of the 5 right 1 south section. The development of these rooms was started on May 20, 1981, and were being driven when the accident occurred on June 3, 1981.

3. Coal was mined with a Lee Norse 265 continuous mining machine, loaded directly into shuttle cars and transported to the section loading point. The coal was then transferred into a belt feeder, discharged onto a belt conveyor and transported to the surface by a series of belt conveyors.

4. The two rooms being developed when the accident occurred were on 60-foot centers with connecting crosscuts every 70 feet. The No. 1 room had been driven approximately 345 feet in by east main when an opening about 30 inches by 30 inches was made in the lower left side of the face into the abandoned No. 1 mine. Test boreholes were not drilled in advance of the working faces during the development of these rooms. Reportedly, test boreholes were drilled in advance of the working faces, in accordance with Section 75.1701, Title 30, Code of Federal Regulations, Part 75, during all other approaches to the No. 1 mine.
5. The mine workings of the No. 1 mine were inaccurately shown on the mine map due to an apparent error which occurred during mine traverses of the 2 south area of the abandoned No. 1 mine. The 4 left 2 south section of the No. 1 mine had been developed approximately 75 feet closer to 5 right 1 south than indicated on the mine map.
6. None of the three sets of rooms turned off east main had been projected on the approved ventilation plan as anticipated mine development. However, the set of rooms turned off the south main connection entries and the mining into the 1 south mains of the No. 1 mine had been shown as anticipated on the approved ventilation plan.

Findings of Fact

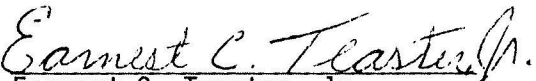
1. Boreholes were not drilled in advance of the working faces of the second set of rooms off east mains that were being driven within 200 feet of an abandoned mine, a violation of Section 75.1701, 30 CFR 75.
2. Projections for the development of the second set of rooms off east mains were not submitted to the District Manager for approval, a violation of Section 75.316-1, 30 CFR 75.
3. Records were not available to indicate that two of the victims had received the required training, a violation of Title 30, Code of Federal Regulations, Part 48.

Conclusion


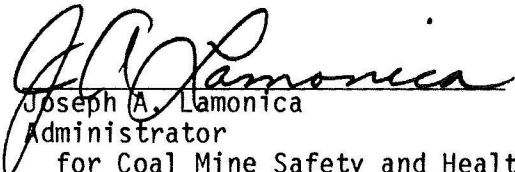
Management's failure to require that boreholes be drilled in advance of the working faces was the cause of the accident. Failure of the mine map to accurately show the workings of the adjacent No. 1 mine was a contributing factor. Management's failure to limit mining to only those areas projected to be mined on the approved ventilation plan may have indirectly contributed to the accident.

Respectfully submitted,


Harry J. Carter
Coal Mine Safety Specialist


Earnest C. Teaster, Jr.
Coal Mine Safety Specialist

Approved by:



Joseph A. Lamonica
Administrator
for Coal Mine Safety and Health

APPENDIX

The investigation was conducted by members of the Mine Safety and Health Administration, and those persons furnishing information and/or present during the investigation and interviews are listed below.

Grays Knob Coal Company Officials

Clyde V. Bennett III	President and General Manager
Joe Felosi	Superintendent
Wallace Harris	Safety Director

Grays Knob Coal Company Employees

Arlis Hensley	Continuous Mining Machine Operator
Gerald Cornette	Repairman
Daniel R. Stewart	Utility Man
Chester Turner	Utility Man
Loyde Moses	Belt Man
Dallas Blanton	Utility Man
Bert Curry	Surface Man

Chief Underwriters

Thomas Mullins	Agent
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Kentucky Department of Mines and Minerals

Dewey Middleton	District Supervisor
Charles Sargent	Coal Mine Inspector

Inspector General's Office

Thomas L. Self	Assistant U.S. Attorney
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Mine Safety and Health Administration

Jerry L. Spicer	District Manager
Thomas R. Mark	Subdistrict Manager
Kenneth Fee	Coal Mine Inspection Supervisor
Edward Morgan	Special Investigator
Lawrence Spurlock	Accident Investigator
Robert E. Jones	Coal Mine Inspector
Harry J. Carter	Coal Mine Safety Specialist
Earnest C. Teaster, Jr.	Coal Mine Safety Specialist

Data Sheet



SECTION A—VICTIM DATA

1. Name: Harvey L. Hill 2. Sex M ☒ F ☐ 3. SSN: 402-72-5194
4. Age: 30 5. Job classification: Section Foreman
6. Experience at this classification: 3 years 7. Total mining experience: 8 years, 6 months
8. What activity was being performed at time of accident? Supervising crew of miners
9. Victim's experience at this activity: 3 years
10. Was victim trained in this task? _____
11. Health and Safety courses/Training received (related to accident) Records were not available. Date received _____
- _____
- _____
- _____

SECTION B—SUPERVISOR DATA (supervisor of victim)

12. Name: _____ 13. Certified: Yes ☐ No ☐
14. Experience as supervisor: _____ 15. Total mining experience: _____
16. Health and Safety courses/Training received (related to accident) _____ Date received _____
- _____
- _____
- _____
17. When was the supervisor last present at accident scene prior to the accident? _____
18. What did he do when he was there? _____
- _____
19. When was he last in contact with the victim? _____
20. Did he issue instructions relative to the accident? _____
21. Was he aware of or did he express an awareness of any unsafe practice or condition? _____
- _____
- _____

Data Sheet



SECTION A—VICTIM DATA

1. Name: Roger D. Clem 2. Sex M ☒ F ☐ 3. SSN: 406-88-5672
4. Age: 23 5. Job classification: Roof Bolter Operator
6. Experience at this classification: 3 weeks 7. Total mining experience: 5 years
8. What activity was being performed at time of accident? Roof bolts were being installed.
9. Victim's experience at this activity: 3 weeks
10. Was victim trained in this task? _____
11. Health and Safety courses/Training received (related to accident) Records were not available. Date received _____
- _____
- _____
- _____

SECTION B—SUPERVISOR DATA (supervisor of victim)

12. Name: Harvey L. Hill 13. Certified: Yes ☒ No ☐
14. Experience as supervisor: 3 years 15. Total mining experience: 8 years, 6 months
16. Health and Safety courses/Training received (related to accident) _____ Date received _____
- _____
- _____
- _____
17. When was the supervisor last present at accident scene prior to the accident? _____
18. What did he do when he was there? _____
- _____
19. When was he last in contact with the victim? _____
20. Did he issue instructions relative to the accident? _____
21. Was he aware of or did he express an awareness of any unsafe practice or condition? _____
- _____
- _____

Data Sheet

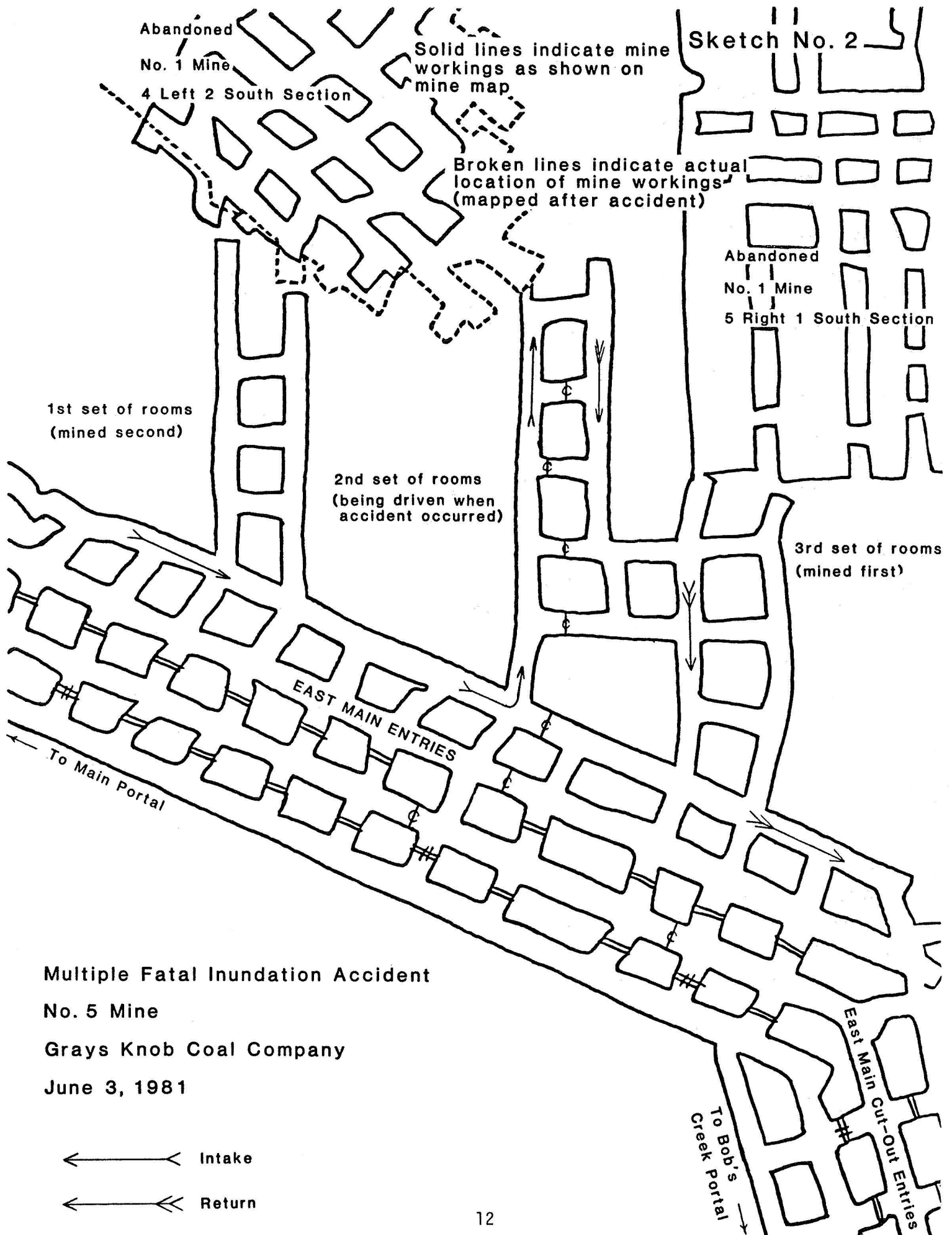


SECTION A—VICTIM DATA

1. Name: Jerry W. Laws 2. Sex M ☒ F ☐ 3. SSN: 405-84-7278
4. Age: 25 5. Job classification: Roof Bolter Helper
6. Experience at this classification: 2 weeks 7. Total mining experience: 4 years
8. What activity was being performed at time of accident? Roof bolts were being installed.
9. Victim's experience at this activity: 2 weeks
10. Was victim trained in this task? No
11. Health and Safety courses/Training received (related to accident) Records were not available. Date received _____
- _____
- _____
- _____

SECTION B—SUPERVISOR DATA (supervisor of victim)

12. Name: Harvey L. Hill 13. Certified: Yes ☒ No ☐
14. Experience as supervisor: 3 years 15. Total mining experience: 8 years, 6 months
16. Health and Safety courses/Training received (related to accident) _____ Date received _____
- _____
- _____
- _____
17. When was the supervisor last present at accident scene prior to the accident? _____
18. What did he do when he was there? _____
- _____
19. When was he last in contact with the victim? _____
20. Did he issue instructions relative to the accident? _____
21. Was he aware of or did he express an awareness of any unsafe practice or condition? _____
- _____
- _____



Sketch No. 3

2 South Mains
No. 1 Mine

West Mains No. 1 Mine

GRAYS BR.
ABANDONED
No. 1 Main

Coal between sections not mined

4 Left 2 South
No. 1 Mine

5 Right 1 South No. 1 Mine

Accident
occurred
here

Main
portal

1st set of rooms

2nd set of rooms

3rd set of rooms

No. 5 Mine

SOUTH MAIN CONNECTION ENTRY

to Bob
Creek Portal

South Mains (No. 1 Mine)

No. 5 Mine