

COAL NONFATAL

UNITED STATES

DEPARTMENT OF LABOR

MINE SAFETY AND HEALTH ADMINISTRATION

OFFICE OF THE ADMINISTRATOR

COAL MINE SAFETY AND HEALTH

FINAL REPORT OF MAJOR COAL MINE

FIRE DISASTER AND RECOVERY

OPERATIONS

Blacksville No. 1 Mine
Consolidation Coal Company
Blacksville Operations

July 22, 1972

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ABSTRACT

This report is based on an investigation made pursuant to the Federal Coal Mine Health and Safety Act of 1969 (83 Stat. 742). This report refers to the enforcement agency as the Mine Safety and Health Administration (MSHA), Department of Labor, which reflects the changes brought about by the Federal Mine Safety and Health Amendments Act of 1977.

This report supplements and concludes the preliminary report of a mine fire disaster that occurred on July 22, 1972, in the Blacksville No. 1 Mine, Consolidation Coal Company, Blacksville Division, Blacksville, Monogalia County, West Virginia. The name of the company has since been changed to Blacksville No. 1 Mine, Blacksville Operations, Consolidation Coal Company.

A mine fire occurred about 7:30 p.m., Saturday, July 22, 1972, along the 3 North Main track haulageway, between the junctions of the A-1 and A-2 sections. The fire started when a continuous mining machine being transported along the 3 North Main track haulageway contacted the energized trolley and/or trolley feeder wires. At the time of the occurrence, 43 men were in the mine. Except for a foreman and eight employees working inby the fire area, all workmen in the mine escaped without incident via the service shaft portal.

Attempts to control and extinguish the fire were unsuccessful and the mine was sealed from the surface. The foreman and eight workmen engaged in miscellaneous duties inby the fire were entombed in the mine. The names of the victims, their ages, social security numbers, occupations and experience are listed in Appendix A of the preliminary report which is included as a part of this report (See Appendix 1).

The mine was reopened January 3, 1973, and the bodies of the nine victims recovered. However, before the fire area could be totally recovered, the fire rekindled and the area had to be resealed.

The Mining Enforcement and Safety Administration, now the Mine Safety and Health Administration (MSHA), was informed by Adler E. Spottee, Vice President, Blacksville Operations, that the company does not plan to open and recover the sealed area at the present time. The area was subjected to extreme heat and ignitions while sealed from July 25, 1972, until January 2, 1973, and massive roof falls have occurred. A

copy of the correspondence received from Mr. Spottee is appended herewith. (See Appendix II). The Mine Safety and Health Administration, aware of the effects of fire in the immediate strata overlying the Pittsburgh coalbed, has not objected to the company's decision.

The company's decision not to reopen the sealed fire area precludes any further investigation by MSHA.

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PART I

GENERAL INFORMATION

The Blacksville No. 1 Mine opened July 28, 1968, is located 1.2 miles east of Blacksville, Monongalia County, West Virginia, off State Route 7. The names of the operating officials are:

James L. Magro	Vice President
Donzel Ammons	General Superintendent
Robert Phillips	Superintendent
Charles E. Bane	Safety Director

Mining Methods, Conditions and Equipment

A description of mining methods, conditions, equipment, story of the fire fighting operations, rescue and recovery operations, and sealing of the mine on the surface are listed in the preliminary report. (See Appendix I).

PART II

Activities During the Period the Mine was Sealed

Employees and representatives of the Blacksville Division, Consolidation Coal Company, and representatives of the Christopher Coal Company and Mountaineer Coal Company, Division of Consolidation Coal Company, United Mine Workers of America, West Virginia Department of Mines, the Bureau of Mines, (MSHA) and fourteen mine rescue teams from the three divisions of the Consolidation Coal Company and from Eastern Associated Coal Corporation, attempted to control the fire and rescue the entrapped men until 1:10 p.m., July 24, 1972, when the volume percent of methane in the right and left return airways increased to 3.0 and 3.8 percent respectively. All persons were withdrawn to the 1 East Junction, outby the fire. The ventilation of the fire area was disrupted by falls of roof resulting from the fire. The increase in combustible gases in the return airways and the occurrence of an explosion, inby the fire, at 2:42 p.m., prompted removal of all persons from the underground areas of the mine, and sealing of all mine openings on the surface. The story of the fire and sealing operations is included in Part I, (Appendix I), of the report.

In the meantime, the drilling of a 5-5/8 inch borehole from the surface into the A-3 section, 400 feet outby the face, which was started at 7:00 p.m., Sunday, July 23, 1972, was continued. The borehole was completed at 3:45 p.m., Monday, July 24, 1972. A two-inch diameter two-way communications probe was lowered into the hole and monitoring of the mine area was done without success from 1:00 a.m. to 2:00 a.m., Tuesday, July 25, 1972. The communications probe was removed and a geophone was lowered into the mine. During the monitoring period, only the sound of water was heard. No seismic events were recorded during this period.

During construction of the seals over the portal, skip, and Renner shafts and on the borehole into the A-3 section, provisions were provided to permit sampling of the sealed mine atmosphere. When the seals were completed, all persons were withdrawn to a safe distance from the shaft areas.

Inasmuch as the mine was liberating 6,000,000 cubic feet of methane in a 24-hour period it was the consensus of the four agencies that the gases in the sealed mine would be above the explosive range within 72 hours. Therefore, no one was permitted near the seals during this period. Daily

sampling of the sealed mine atmosphere was initiated and continued for one week until a methane-oxygen trend could be established. After one week, the methane content of the sealed mine atmosphere exceeded 39 percent, the oxygen content was below 6.3 percent, and the sampling interval was extended. Two boreholes, one just outby and another inby the origin of the fire was drilled during August and September, 1972, respectively, and provisions for collecting samples from the mine were installed. All the samples of the mine atmosphere collected were analyzed at the MSHA laboratories at Mt. Hope, West Virginia. The analytical results of samples collected during the time the mine was sealed are listed on Table I (See Appendix III).

Mine management developed plans for reentering and recovering the mine and requested a meeting of representatives from the United Mine Workers of America, West Virginia Department of Mines, and the Mining Enforcement and Safety Administration (MSHA). The meeting was held on December 14, 1972, with the following persons in attendance:

Consolidation Coal Company

Adler E. Spottee	President, Blacksville Division
James L. Magro	Vice President, Blacksville Division
C. V. Zickafoose	Safety Director, Blacksville Division
Harold Suter	Vice President, Consolidation Coal Co
C. William Parisi	Corporate Safety Director, Consolidation Coal Co.
W. T. Simon	Safety Director, Christopher Division, Consolidation Coal Co.

United Mine Workers of America

L. Pnakovich	Vice President
Kermit Wells	Safety Director
Charles Tarasuk	Safety Division, Assistant to Director
Donald Poland	Safety Coordinator, UMWA., District 31
Richard Green	Chairman, Safety Committee, UMWA, Local 1588
Stanley Osecky	Member, Safety Committee, UMWA, Local 1588
Ronnie Statler	Member, Safety Committee, UMWA, Local 1588

West Virginia Department of Mines

John Ashcraft	Director
Leslie C. Ryan	Inspector-at-large, Northern Division
Walter O. Miller	Assistant Inspector-at-large, Division

Mining Enforcement and Safety Administration

John W. Crawford	Assistant Administrator
James D. Micheal	District Manager, District 3
W. R. Park	District Manager, District 4
J. W. Krese	District Manager, District 4
Joseph Marshalek	Assist. District Manager, District 3
Harrison C. Summers	Supervisory Training Instructor

After a discussion of the reopening and recovery plan, and a review of the analyses of samples collected from the sealed mine, a target date of 8:00 a.m., Tuesday, January 2, 1973, was agreed to by the four agencies for removal of the mine seals. Additional air samples would be collected and analyzed prior to opening. The analysis of samples collected December 5, 1972 are as follows:

	<u>Carbon Dioxide</u>	<u>Oxygen</u>	<u>Methane</u>	<u>Carbon Monoxide</u>	<u>Nitrogen</u>
Shaft Portal Intake	10.8	0.17	85.87	.0015	4.03
Portal Shaft Return	9.63	0.5	86.10	.0016	3.99
Skip Shaft	10.27	0.10	84.89	.0016	4.58
Renner Intake	9.24	0.10	86.13	.0015	4.45
Renner Return	9.63	0.10	85.76	.0020	4.42
Section borehole A-3	11.44	0.12	83.95	.0016	4.29
No. 1 Nitrogen	12.55	0.10	82.8	.0016	4.36
No. 2 Nitrogen	12.84	0.10	82.29	.0018	4.59

The analyses of the samples of the atmosphere in the sealed area indicated conditions were favorable for reentry and it was agreed by the representatives of the four agencies that removal of the mine seals would be started on the target date established during the December 14 meeting.

The mine entry and recovery plan, agreed to by representatives from the four agencies, provided for a systematic removal of the mine seals, starting of the mine fans, and the ventilation of the entire mine. When the methane content of the air exhausting from the mine stabilized at the lowest attainable level, which had to be below an established maximum value of 2 percent, the mine would be entered via the portal service shaft. Representatives from the four agencies would proceed on foot to the fire area. The fire area would be examined and provisions made to provide water at the fire area, should it be needed. The remainder of the mine would then be examined. All examinations and recovery outby the 3 north mains and throughout the remainder of the mine was to be made in a respirable atmosphere. Pockets of methane encountered would be removed by directing ventilation to the area.

A communication center was established in the mine superintendent's office and communications established to each location where seals were to be removed. During removal of the seals, all telephones would be disconnected except those more than 500 feet from a mine opening. Remote starting controls were installed for the mine fans, at the Portal and Renner shafts, and auxiliary ventilation fans and tubing were provided to ventilate the fan housings. The fans would be monitored and the exhaust air sampled continuously for methane and carbon monoxide.

Nine trained mine rescue teams from the Blacksville Division and other Consolidation Coal Company Divisions were selected to participate in the recovery operations. Equipment, including nonsparking tools, and supplies were provided.

All persons who were to participate in the recovery operations were briefed in the recovery plan and procedures.

PART III

Unsealing of the Mine and Recovery Operations

At 8:00 a.m., January 2, 1973, removal of the concrete seals on the Renner and Portal intake and return compartments, and on the skip shaft was started. At 5:50 p.m., when the seals over the Renner and Portal shaft had been removed, the representatives of the four agencies agreed to start the portal fan. At 6:30 p.m., when all persons had been removed from the portal area, the fan was started by remote control. The Renner fan was similarly started at 11:30 p.m. the same day. The mine return air was monitored continuously with hand-held instruments and air samples were collected. The air samples were analyzed at the mine using a portable Orsat. When a series of samples collected indicated a favorable mine atmosphere, representatives of the United Mine Workers of America, Company, State and MESA agreed to enter the mine. The mine elevator was examined and operated up and down several times to assure it was in proper operating condition. About 8:21 a.m., January 3, 1973, 11 men including a mine rescue team carrying self-contained oxygen breathing apparatus, entered the mine via the portal shaft. The men explored the track entry to the fire area. Exploration of entries other than the track entry was not done at this time in order that the men could reach the fire area as soon as possible. The exploration crew arrived at the fire area at approximately 9:30 a.m., explored the fire area and found no evidence of an active fire. They found several stoppings knocked out by forces from an explosion that occurred during firefighting operations during July, 1972. When the investigation crew reported conditions favorable in the fire area, other crews were lowered into the mine to thoroughly explore all areas of the mine. The explorations and recovery was done in fresh air and under direction from the control center via telephone. Each exploration crew carried a portable telephone and tapped into the mine telephone line and reported to the communication center periodically. Representatives from the four agencies were at the communication center at all times while persons were underground. When all areas of the mine, except inby the 3 north fire area, had been examined, routine patrols of the areas were made by certified persons accompanied by a representative, or representatives from participating agencies. In the meantime, exploration and recovery work continued in the fire area. The return airways immediately outby the fire area and the main fans were monitored continuously by MESA (MSHA) personnel for methane and carbon monoxide. All data was telephoned to the communication center where a complete log of the operations was being kept.

At 6:10 p.m., another crew, relieving the first crew, continued the exploration in the 3 north area. The exploration was accomplished by advancing ventilation controls and ventilating the areas during advance. Although the exploration and recovery was done without the use of self-contained oxygen breathing apparatus, equipped mine rescue teams accompanied the exploration crews while working inby the fire area.

The first body was located in the No. 8 heading, 3 north mains, between Nos. 13 and 14 crosscuts, about 50 feet inby the junction with No. 1 entry, A-2 section. Shortly thereafter, about 7:21 p.m., three more bodies were located in the same entry, 100 and 150 feet respectively, inby the location of the first body. The No. 8 heading was a designated return escapeway. (See map, Appendix IV). Self-rescuers were found attached to the faces of the four victims. The men apparently traveled the escapeway from the face area of the A-3 section where they were working when the fire occurred. The four bodies were removed to the surface by 9:30 p.m.

About 8:30 p.m., evidence of heat was discovered in the fallen roof material in the No. 7 heading, 3 north mains, just inby the origin of the fire. Water was applied to the heated area and tests for carbon monoxide were made regularly; the area was monitored continuously. Meanwhile, exploration of the area inby the fire continued and at 12:44 a.m., January 4, 1973, a crew exploring in the A-2 section discovered the fifth and sixth bodies along the belt entry, near the No. 13 crosscut. The Nos. seven, eight and nine bodies were located at 1:10, 4:55 and 6:25 p.m., along the same entry. The bodies were covered by fallen top coal. The ninth body was brought to the surface by 7:50 p.m.

Continuous monitoring of the fire area was maintained while crews continued exploring the 3 north area. About 6:03 p.m., January 4, 1973, 0.001 percent carbon monoxide was detected at the No. 10 crosscut, No. 7 heading, 3 north mains. Explorations inby the fire were discontinued and all persons were withdrawn to outby the fire area.

At this time, representatives of the four participating agencies agreed that it may become necessary to seal around the fire area. Management developed a plan for sealing the area. The plan, agreed to by all agencies, required a sequential and systematic construction of seals providing maximum safety for persons underground. Seals were to be constructed across 3 north entries near the junction with 2 east entries and across 1 east entries, near the junction of

1 east and 2 north. The seals on the inby side of 3 north mains at the junction of 3 north mains and 2 east would be approximately 11,000 feet from the portal shaft. Because of the time that would be involved in transporting materials to the site and constructing four seals, it was decided that construction of seals at this location would be started immediately. A large man door would be built in each seal and the doors would be left open until such time as it became necessary to seal the fire area. At that time, a rescue team could be lowered into the area via the Renner escape shaft. The rescue team could close the doors, and return to the surface via Renner shaft, minimizing exposure of the workmen. The four seals were completed at 5:15 a.m., January 5, 1973. Sites for the outby seals were also selected and prepared near the mouth of 1 east, outby the fire area. (See map Appendix IV). While this work was in progress, reports from persons monitoring the fire area indicated the fire was rekindling. At 11:45 p.m., when the methane content increased and 0.02 percent carbon monoxide was detected, all persons were instructed to retreat to near the mouth of 1 east and start constructing seals across the 1 east entries.

The 1 east main consisted of 8 entries. Numbering from left to right, Numbers 1, 2, 6, 7, and 8 entries were return airways. The Numbers 3, 4, and 5 entries were intake airways. The Number 5 entry was also the track haulage entry. As specified in the plan for sealing, seals were constructed across the Nos. 1, 7, and 8 return airways. Seals were then constructed across the Nos. 3 and 4 headings, intake airways. The seals across the Nos. 2 and 6 headings, return airways, and across the No. 5 entry, an intake airway, were constructed simultaneously. The construction was coordinated by company, State and MESA personnel. The sealing plan allowed for ventilation to be maintained until immediately prior to completion of the sealing of the fire area and would permit all persons to evacuate the mine before the atmosphere in the sealed fire area reached the lower explosive limit. Methane and combustible gases from the fire would build up rapidly when the ventilation was removed from the fire area. The closing and sealing of the doors in the inby seals was coordinated with the completion of the 1 east seals. A rescue team, carrying self-contained oxygen breathing apparatus, was lowered into and raised from the 2 east area via the Renner shaft escape facility to minimize exposure of the men. The doors in the seals at the juncture of 3 north and 2 east were closed and sealed at 3:37 a.m., January 6, 1973. At 4:24 a.m., the fire area was sealed and all persons had been returned to the surface. The electrical power was removed from the underground and

surface areas of the mine except those circuits operating the Portal and Renner ventilating fans. Ventilation was maintained in the unsealed areas of the mine. No one was permitted near the mine opening or fan areas for a period of 72 hours. Access roads to the mine and mine fan locations were guarded. The 72 hour time period would allow the methane content in the sealed area to accumulate to above the upper explosive limit and the oxygen content would decrease. The resultant methane-air mixture would be incapable of exploding. An analysis of air samples collected from the fan exhausts after the waiting period showed the methane content in the unsealed areas of the mine had stabilized and there was no carbon monoxide indicating the seals around the fire area were holding. An inspection group comprised of representatives of management, the employees, the State and MESA entered the mine and examined the seals. All seals were then reinforced with additional concrete blocks and ventilation was directed across the front of the seals.

On January 26, 1973, a 104(a) order of withdrawal was issued barring the removal of seals in 1 east and 3 north at the junction with 2 east.

During construction of the seals in 1 east and across 3 north near the junction with 2 east, provisions were made to permit sampling of the atmosphere within the sealed area. On February 23, 1973, the analysis of samples collected from within the sealed area indicated the atmosphere was incapable of supporting a fire or explosion, and the methane/oxygen content within the sealed area had stabilized. The 104(a) order of withdrawal issued July 23, 1972, was modified to permit normal mining in all areas of the mine except in areas within 100 feet of the sealed area.

PART IV

Investigation, Discussion, and Evaluation

The Bureau of Mines, with the assistance of attorney from the Solicitor's Office, United States Department of the Interior, as part of the preliminary investigation of the mine disaster, took sworn statements from 30 company officials and 25 rank and file miners in Morgantown, West Virginia, on July 26-29, 31, and August 1 and 9, 1972. Statements were obtained from all surviving men who were working in the mine when the fire occurred.

Representatives of the West Virginia Department of Mines, at the Bureau's invitation, fully participated in the phase of the investigation. Representatives from the United Mine Workers of America and Consolidation Coal Company officials were present while statements were being given.

Information obtained through these statements is summarized in the preliminary report.

The Office of Hearings and Appeals, United States Department of the Interior, upon request of the Secretary of the Interior, conducted a public hearing at Morgantown, West Virginia, between October 10 and 19, 1972. A copy of the report on the hearings is appended as part of this report (See Appendix V).

Inasmuch as the fire area has not been totally recovered and is sealed, the investigation of the area has never been completed. Data for this report of investigation was obtained from observation at the scene during recovery operations and from statements of persons interviewed during July 26-29, 31 and August 1 and 9, 1972.

Factors Affecting the Fire Ventilation

The 3 north mains were developed off 1 east and were ventilated from the portal fan until the 3 north entries mined into 2 east. At that time, the ventilation was rearranged. Common intake airways along 3 north mains directed air to the sections. The air from A-1, A-2 and A-9 sections was returned to the surface via the portal fan. The air from the A-3 advancing section was returned to the surface via the No. 8 entry 3 north to 2 east return airways and the Renner fan. Each section was ventilated by a separate split of air off the 3 north airways. The system of ventilation had no effect on the cause or magnitude of the fire. From all indications the fire had burned to the point where the integrity of the escapeway system had been destroyed resulting in smoke and carbon monoxide reaching the workmen in the A-2 and A-3 sections.

Methane

The Blacksville No. 1 mine was liberating approximately 6,125,000 cubic feet of methane in a 24 hour period at the time of the fire. Methane was not a factor in the cause of the fire; however, when the ventilation in 3 north was disrupted by falls of roof and dislodged stoppings, as a result of the fire, the methane build up inby and subsequent explosion was the main factor in the decision by the four participating agencies to seal the mine on the surface on July 24, 1922.

Electricity

The fire resulted when a continuous mining machine being transported on an equipment carrier along the 3 north track haulageway contacted the energized trolley and/or trolley feeder wire. The resulting arcing ignited the oil and other combustible material on the continuous mining machine or equipment carrier. The trolley system was protected by circuit breakers; however, there were conflicting statements concerning deenergizing of the 3 north trolley system when the continuous mining machine contacted the energized wires. The foreman stated he was stationed near the circuit breaker, about 700 feet out by the continuous mining machine, and he deenergized the breaker manually when he saw the arcing. The members of the moving crew stated the foreman was near the machine when the machine contacted the energized wire and after two or three minutes, the circuit breaker automatically deenergized the 3 north trolley system. The circuit breaker was tested by a Federal inspector and was found to be operating properly. It appears that a high-resistance low-current ground fault occurred when the machine contacted the energized wire. Under such a condition there would not have been a sufficient current demand to open the circuit breaker and disconnect power to the 3 north trolley system. It is conceivable that two or three minutes elapsed before the current demand exceeded the 3,000 amperes necessary to operate the circuit breaker. Such a ground fault could generate sufficient heat to ignite any hydraulic oil on the machine. A complete description of the mine electrical system is included in the preliminary report.

Firefighting Facilities

A complete description of the mine firefighting facilities are listed in the preliminary report. The facilities appeared adequate; however, according to statements from workmen, there was some confusion when the water cars were brought to the fire scene and water was not used on the fire. Attempts to extinguish the blaze using a dry chemical extinguisher were unsuccessful.

