

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
OFFICE OF THE ADMINISTRATOR
COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION
UNDERGROUND COAL MINE INUNDATION (BLACKDAMP)
Moss No. 3 Portal A Mine (I. D. 44-01642)
Clinchfield Coal Company
Duty, Dickenson County, Virginia

April 4, 1978

Originating Office - Mine Safety and Health Administration
4015 Wilson Blvd., Arlington, Virginia 22203

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Abstract

This report is based on an investigation made pursuant to the Federal Mine Safety and Health Amendments Act of 1977 (83 Stat. 742 as amended by 91 Stat. 1290).

At approximately 12:30 p.m., on Tuesday, April 4, 1978, the single entry Drainway on Fryingpan Creek of the Moss No. 3 Portal A Mine, Clinchfield Coal Company, Duty, Dickenson County, Virginia, was inundated by an inrush of blackdamp (oxygen deficient air). The Drainway that was being advanced by a continuous mining machine cut into a mined out inaccessible abandoned area of the same mine. Two of the four men that were in the face area when the Drainway entry cut through were killed by the blackdamp; the other two men (one dragged the other) retreated to the surface and survived. Three other men were killed by the blackdamp while attempting to rescue the two missing men. Two other men were overcome by the blackdamp while attempting rescue efforts and had to be assisted to the surface; and another man involved in rescue attempts reportedly came out of the Drainway unassisted at approximately 1:30 p.m., after having been underground for about 40 minutes.

The names of the victims, their ages, occupations, and mining experience are listed in Appendix A.

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PART I

INUNDATION (BLACKDAMP) AND RECOVERY

OPERATIONS

The Moss No. 3 Mine, Clinchfield Coal Company, located near Duty, Dickenson County, Virginia, was opened into the Thick Tiller Coalbed on October 11, 1957. Clinchfield Coal Company, a subsidiary of The Pittston Company Coal Group, is the operating company of the Moss No. 3 Mine. At the time of this investigation, corporate and supervisory officials were as follows:

The Pittston Company Coal Group

| | |
|----------------|-------------------------------|
| G. R. Swanson | President |
| J. E. Nypaver | Vice-President, Operations |
| J. W. Crawford | Director of Health and Safety |

Clinchfield Coal Company

| | |
|-------------------|---------------------------------|
| C. M. Bailes | Vice-President |
| Henry Kiser | General Manager |
| W. B. Couch | Division Manager |
| M. L. West | Manager, Safety Division |
| Strickler Mullins | Superintendent, Moss No. 3 Mine |
| Robert Yokum | Mine Foreman, Moss No. 3 mine |

The Moss No. 3 mine consists of Portal A, Portal B, Portal C, Portal D and the most recent opening, Portal A-2. The mine area associated with this accident was developed from the Moss No. 3 Portal A mine. See Appendix B for the general information for the Moss No. 3 Mine.

Mining Conditions Prior to Inundation

The main entries of the Moss No. 3 Portal A mine were developed in a southwesterly direction for a distance of approximately 12,300 feet. The coalbed dips northwest about 1.5 percent for approximately 8,600 feet from an elevation of about 1,600 feet at the portal entry to an elevation of 1,465 feet. The coalbed then rises about 0.7 percent for a distance of approximately 7,300 feet to the northwest property line. According to company estimates, 23,000,000 gallons of water enter the mine each 24 hours and 6,000,000 gallons per day were pumped from the mine. During development mining, the water was removed with pumps. However, as

areas were second mined, the pumps had to be removed which resulted in water accumulations at the lower elevations. At the time of the accident, mining in the areas of the mine below the 1,510 foot elevation had been completed and water had accumulated to the 1,495 foot elevation. See mine map in Appendix J. Parts of the 1 Right off 1 Right off 11 Right section along the northwest mine boundary and the 5 Right off 1 Right off the A Mains section, along the northeast boundary, were above the 1,495 foot elevation. These areas were not flooded but the rising water sealed the 1 Right abandoned area from the rest of the mine and this abandoned area became pressurized by the encroachment of the water.

The new Moss No. 3 Portal A-2 mine (see mine map, Appendix J) intersected the abandoned 5 Right section of the Moss No. 3 Portal A mine at the 1,504 foot elevation. The rising water in the abandoned areas of the Moss No. 3 Portal A mine presented a problem of eventual flooding of some of the active areas of the new Moss No. 3 Portal A-2 mine.

Near the first of March 1978, M. L. West, Manager, Safety Division, Clinchfield Coal Company, met with MSHA officials, Ray G. Ross, Frank C. Mann, Willis D. Ison, and James V. Bowman at Norton, Virginia, and discussed plans that would prevent flooding of the new Moss No. 3 Portal A-2 mine. The plan discussed at this meeting was to drill an 8-inch diameter horizontal hole from the surface into the abandoned 1 Right area, a distance of approximately 265 feet. This 8-inch borehole would permit monitoring of the atmosphere in the abandoned area and would serve as a centerline for an entry which would be driven with a continuous mining machine. According to the testimony of W. B. Couch, Division Manager, mine management considered enlarging the 8-inch diameter borehole to 24 or 30 inches; however, this part of the plan was not discussed at this meeting.

Shortly after the meeting with MSHA officials, the company employed a contractor to drill the 8-inch borehole. The borehole was drilled a distance of approximately 5 feet and the plan was abandoned due to the inability of the contractor to control the direction of the drill. West informed MSHA by telephone of the inability of the contractor to drill the 8-inch borehole, and received permission from MSHA to proceed with the plan to develop the Drainway entry with a continuous mining machine.

On March 17, 1978, West submitted a plan to MSHA for developing the Drainway entry. The plan stipulated that the entry would be developed by a continuous mining machine from the surface into an abandoned area a distance of about 225 feet; that adequate ventilation will be provided by a fan and venti-

lation tubing; that the roof will be supported with either conventional roof bolts or resin grouted rods and supplemented with timbers and/or crossbars where needed. The plan stated that, according to surveys, the abandoned area near the connection point did not contain water. Although the plan made no reference to the possibilities that the abandoned area might contain methane and/or blackdamp, it did provide that test drill holes will be kept 20 feet in advance of the face. The plan was received in the MSHA district office on March 21, 1978, and approved by the District Manager on March 24, 1978. See Appendix G Plan No. 1.

The development of the Drainway entry with a continuous mining machine was begun on Tuesday, March 28, 1978. Mining was done on three shifts each day. During the afternoon shift, (4:00 p.m. to midnight) on Friday, March 31, the continuous mining machine developed a mechanical problem and had to be brought to the surface for repair. The Drainway entry had been driven approximately 191 feet. At this time the first test boreholes were drilled.

On Monday morning, April 3, 1978, a second continuous mining machine was brought from the mine yard to the Drainway site to replace the malfunctioning machine. Glen Beverly, Ambrose Conley and Lawrence Shelby (victim), representatives from the National Mine Service Company, arrived at the Drainway site to repair the continuous mining machine.

At approximately 1:30 p.m., the same day, Ronald W. Franks and Vearle Hileman, MSHA District 5 personnel, arrived at the Drainway site. They had completed inspection duties at another mine and were enroute to their office in Norton, Virginia, via a mountain road (shortcut) which took them by the Drainway site. Although the Drainway entry was not part of their area of assignment, they decided to stop and investigate what appeared to them to be a new mine opening. According to Franks and Hileman there were two continuous mining machines on the surface. One machine was being repaired and the other was being serviced. No work was being done underground and the ventilation fan was not operating.

Franks and Hileman discussed the Drainway project with Henry Kiser, Manager of Mines, and Pete Capelli, Assistant to the General Manager. They were advised by Capelli that the company was concerned about encountering methane when the Drainway entry holed through into the abandoned area and that test boreholes were being drilled. The subject of blackdamp was not discussed by MSHA and company officials. The ventilation fan was started and Franks and Hileman checked the air movement in the drift opening and shortly afterwards left the mine site.

At the end of the midnight to 8:00 a.m. shift on Tuesday, April 4, 1978, the Drainway entry had been developed to within approximately 13 feet of the abandoned workings. The time remaining on the third shift did not permit the last advance of the Drainway to be roof bolted before the dayshift crew reported for work. See Appendix F, Photo 2. According to the preshift examination record book for the 8:00 a.m. shift at the Drainway entry, no unsafe conditions were found and 5,400 cubic feet a minute of air was measured at the inby end of the line curtain.

The Inundation

The Drainway crew consisting of Charles Breeding, continuous mining machine operator, Earl Castle Jr., shuttle car operator, William Arden, roof-bolting machine operator, Jack Nowlin, roof-bolting machine operator helper, and Marion Johnson, maintenance foreman, supervised by Richard Carson, Superintendent, began their work duties at 8:00 a.m., Tuesday, April 4, 1978.

Also Glen Beverly, Ambrose Conley and Lawrence Shelby, representatives from the National Mine Service Company, arrived at the Drainway site and began making repairs to the continuous mining machine that was located on the surface about 150 feet from the drift mouth.

At the start of the shift the crew trammed the continuous mining machine from the face of the Drainway entry to the surface. The roof-bolting machine was trammed from the surface to the face and the place was bolted. Strickler Mullins, Superintendent, arrived at the Drainway site about 9:30 a.m. He had been at the company shop having some shorter sections of drill steel augers made which would eliminate the whipping action that was occurring when test boreholes were drilled with the 10-foot auger sections. Mullins met Carson in the Drainway entry where they examined the face area for test boreholes that were drilled on the previous shift. They found a test borehole in the center of the entry, about 2 feet above the floor, and 8 1/2 feet deep. Breeding and Earl Castle Jr. extended the 8 1/2 foot borehole to a depth of approximately 13 feet where it penetrated the abandoned 1 Right area of the Moss No. 3, Portal A mine. The borehole was cleaned by allowing the drill auger to rotate freely as the drill augers were removed from the borehole. Air was flowing from the gob area into the Drainway. Breeding and Castle stated it blew dust 3 or 4 feet into the Drainway entry.

Immediately after the drill auger was removed from the hole, Mullins made tests for methane with an approved methane detector and found 0.15 percent. Carson's detector was inoperative and he obtained another from Mullins' vehicle. Mullins and Carson continued testing for methane and when very little could be detected, Mullins became concerned. He told Carson "that bleeder is three or four miles in there and there ought to be some methane coming out of the hole." Mullins instructed Breeding to go to the surface and get a flame safety lamp that was hanging on the canopy near the entry portal. Breeding and Castle were removing an air line from the face area to the compressor on the surface. The drills used to drill the test boreholes were operated by compressed air. Carson told Breeding to continue removing the air line and he would get the flame safety lamp. Carson returned with the flame safety lamp and started making tests for methane across the face of the Drainway entry. According to Mullins, the flame on the flame safety lamp "had a little red on it" and was extinguished as the safety lamp was passed across the front of the hole. Mullins, dissatisfied with Carson's method of testing, got the flame safety lamp from him, and either requested one of the workmen to take the flame safety lamp back from the face area and relight it or he took the flame safety lamp back from the face and relit it himself. Mullins adjusted the flame of the flame safety lamp to the first ring on the safety lamp glass chimney and made tests across the face of the Drainway entry but did not approach closer than 4 feet to the test borehole. The flame of the flame safety lamp was not extinguished and methane was not detected. Mullins stated that he gave the flame safety lamp back to "my boy" (person unidentified) and told him to take the safety lamp and to "put it back on the miner; set it up on a little square box on the miner (methane monitor) which they use for methane." However, as near as could be ascertained, the continuous mining machine had not been brought to the face at this time. After removing the air line from the Drainway entry to the surface, Breeding and Castle started tramming the continuous mining machine into the Drainway.

After completing the testing, Mullins returned to the surface, got into his vehicle, and traveled to the Bucu fan house located approximately 1,500 feet from the Drainway site. He telephoned Clarence Adkins (base operator) at the company office and told him to contact Henry Kiser, General Manager of Mines, or W. B. Couch, Division Manager, and advise them that a borehole had penetrated the abandoned area and that methane or water was not encountered. Mullins then returned to the Drainway entry. According to Mullins' testimony no

further tests were made with the flame safety lamp. Breeding stated that he did not know where the flame safety lamp was, and that someone told him it was on the machine somewhere but he did not remember seeing the flame safety lamp sitting on the "little box" located in front of the operator's station of the continuous mining machine. Breeding stated that the only thing he knew was that Mullins was the only one who had the flame safety lamp. However, Mullins stated that he saw the lighted flame safety lamp sitting on the continuous mining machine after the third shuttle car of coal had been loaded from the face.

The machine was trammed into position at the face of the Drainway entry about 11:45 a.m. and mining of coal was started. Mullins and Carson, thinking there should be methane in the abandoned area, positioned themselves on either side of the continuous mining machine in by the operator, and continuously tested for methane with approved detectors during mining operations. Marion Johnson, maintenance foreman, was standing behind the operator's position observing mining. See sketch, Appendix I, Figure 1.

About 12:30 p.m. the fourth shuttle car of coal was loaded and the shuttle car left for the surface. Breeding was operating the continuous mining machine cutting coal from the face for the next shuttle car when the cutting head mined through into the abandoned 1 Right area on the left side of the entry. Mullins stated that he felt a blast of air and immediately called to Breeding "hold it, I believe the thing is through." See Appendix F., Photo Nos. 3 and 4. Breeding stopped the machine immediately. At that time Mullins heard someone hollering and struggling on the opposite side of the continuous mining machine. He crossed under the boom of the machine to investigate. Breeding stated, "When we cut through Dick Carson hollered and said, Boys I am feeling dizzy. I'm going to get out of here and then it seems like just a matter of seconds that everything seemed like it blacked out." Mullins, after crossing under the miner boom, attempted to drag Marion Johnson but was unable to do so because of Johnson's size. Mullins then dragged Breeding toward the surface for a distance of approximately 150 feet. At this point Mullins became too weak to drag Breeding any further and continued to the surface without him. While hanging on to the canopy support at the portal, Mullins waved his arms to get attention of workmen on the surface.

Recovery Operations

The following description of the recovery operation, and the account and time of the activities that took place following the accident are not considered absolute. Considering the extreme emergency that existed immediately following the inundation, and the physical effect the oxygen deficient atmosphere had on the persons involved in the rescue attempts it is understandable that areas of conflict could exist concerning their activities.

Earl Castle Jr. had just unloaded a shuttle car of coal onto the surface storage pile and was returning toward the portal when he saw Mullins waving his arms. He recognized Mullins was excited and heard him say "We got some boys down; come on let's help them." Castle stopped the shuttle car and went into the Drainway entry. He found Breeding lying on the floor near the water hole, approximately 80 feet in by the Drainway portal. He turned him over and wiped the mud from his face, loosened his clothing and saw he was breathing.

William Arden and Jack Nowlin had just finished their lunch and were walking toward the Drainway portal when they also saw Mullins waving his arms and heard him holler. Mullins, Arden and Nowlin followed Castle into the Drainway to where Breeding was lying. Apparently Mullins and Nowlin assisted Breeding a short distance toward the portal and Mullins returned the remainder of the way to the surface alone. Nowlin went back to the water hole where he was overcome. In the meantime, Arden and Castle continued toward the face. Castle later stated that he went to within 10 or 12 feet of the boom of the continuous mining machine and found Carson lying near the line brattice and another man near him. He also saw Arden, who had been overcome, lying on his face and turned him over. Realizing he could not help the overcome men, Castle started to run. He ran two or three steps toward the surface and was overcome.

Lawrence Shelby, Glen Beverly, and Grayson Conley, the National Mine Service Company representatives, who were repairing the continuous mining machine about 150 feet from the Drainway portal had just finished their lunch. Shelby and Beverly were seated on some crib blocks near the machine when they saw Mullins waving his arms; Conley had gone to his automobile for a drink of water. Beverly went to the Drainway portal to ascertain the problem and Mullins informed him of the situation. Beverly returned to his automobile for a cap lamp. Enroute he met Ray G. Ross, District Manager, District 5, MSHA, Frank C. Mann, Supervisory Mining Engineer, Willis D. Ison, Subdistrict Manager, and M. L. West, Manager Safety Division, Clinchfield Coal Company, who had stopped at the Drainway site while enroute to Dante from duties

at the nearby McClure No. 2 mine. Ross, Mann, Ison, and West saw someone at the Drainway portal, later identified as Mullins, waving his arms, but thought he was only trying to get the attention of workmen in the area. As they neared the portal they became aware that something was wrong. West started running toward the portal followed by Ross, Mann, and Ison. Mullins told them he had men down on bad air. At this time there were six men underground: Richard Carson, Superintendent; Marion Johnson, Maintenance Foreman; Charles Breeding, continuous mining machine operator; Earl Castle Jr., shuttle car operator; William Arden, roof-bolting machine operator; and Jack Nowlin, roof-bolting machine operator helper.

West, Ross, Ison, Shelby, and Mullins entered the Drainway with Mann following closely behind. They found Breeding approximately 50 feet inby the portal. After determining he was in no immediate danger, West, Ross, Ison, and Shelby continued inby toward the waterhole. Mann and Mullins assisted Breeding to the surface. At this time Mullins told Mann they had cut into an abandoned area and that men were down on bad air.

West and Ross, after traveling just inby the waterhole, became dizzy and disoriented. Realizing they were in trouble, they decided to retreat and struggled to the surface. Ison and Shelby continued on toward the face area where they too were overcome by the blackdamp. Beverly who had returned to his vehicle for a cap lamp entered the mine last. He stated that as he started underground he met two men coming out toward the surface. He did not recognize them, but later they were identified to be West and Ross. On reaching the waterhole Beverly found someone with a red T-shirt lying on the floor. It was later ascertained that Nowlin was wearing a red T-shirt. Beverly was overcome at this point. At this time there were eight men underground.

On arriving back on the surface, West informed Ross that they didn't have communications at the Drainway site and that he was going back to the McClure No. 2 mine site to get Henry Kiser, who had a vehicle equipped with a two-way radio and he would call the office for assistance. According to statements from Ross and Mann, after gaining composure, they reentered the Drainway entry to the waterhole where they found Nowlin, in a semi-conscious condition, lying partially in the water. They assisted him to the surface. Ross and Mann reentered the Drainway entry a third time and traveled to the waterhole where they found Glen Beverly and assisted him to the surface. At approximately 1:00 p.m. rescue efforts temporarily ceased with Carson, Johnson, Ison, Arden, Shelby and Castle still underground.

statements from Mullins differ from the statements from Ross, Mann and Beverly regarding their activities during recovery efforts. Mullins stated that he helped rescue Beverly who had entered the Drainway before the arrival of Ross, Mann, Ison and West to help rescue Breeding. Beverly stated, that before he went underground and while he was enroute from the Drainway portal to his automobile to secure a cap lamp, he met four men walking toward the Drainway portal who were later identified as Ross, Mann, Ison and West. According to statements from Ross and Mann, Breeding was found in a semi-conscious condition about 50 feet inby the Drainway portal and Mann and Mullins assisted Breeding to the surface. Ross and Mann reentered the Drainway entry and found Beverly down near the waterhole and they assisted him to the surface.

In the meantime, West contacted Henry Kiser at the McClure No. 2 mine and informed him of the accident at the Drainway. Immediately they departed for the Drainway in separate vehicles. Enroute Kiser attempted to contact the base operator with his radio but because of terrain and weather conditions he did not make contact. They arrived at the Drainway site where Ross informed them that Ison was still underground. Kiser put his cap lamp on and started toward the portal with the intention of entering the Drainway. West and Ross restrained him and told him the mine was unsafe and protective equipment was needed.

Ross, Mann and West talked to Breeding in an effort to try and determine what had occurred in the face of the Drainway entry and to determine what course of action to take. Breeding told them that the Drainway entry had cut through into old works, and as well as he could remember the line curtain was 20 to 30 feet from the face. Mann stated that he checked the air movement into the Drainway entry and found very little air entering.

Ross, Mann, Kiser and West discussed the Drainway ventilation system and agreed to reverse the fan which would change the exhaust system to a blowing system of ventilation; theorizing that the exhaust system of ventilation could be pulling oxygen deficient air from the abandoned area into the Drainway entry. The fan was stopped at 1:05 p.m. and turned around to operate blowing. The fan was restarted at 1:08 p.m.

While the fan was being turned around Kiser went to his vehicle and contacted the base operator by radio. He advised the base operator about the accident at the Drainway and told him to have oxygen breathing apparatus delivered to

