

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

DISTRICT C

FINAL REPORT OF MAJOR MINE-EXPLOSION DISASTER  
COMPASS NO. 2 MINE  
CLINCHFIELD COAL COMPANY  
(DIVISION OF THE PITTSBURGH COMPANY)  
DOLA, HARRISON COUNTY, WEST VIRGINIA

April 25, 1963

By

William R. Park  
District Supervisor

John J. Dougherty  
Subdistrict Supervisor

Roy C. Estep  
Federal Coal Mine Inspector

Originating Office - Bureau of Mines  
Morgantown, West Virginia  
John J. Dougherty, Subdistrict Supervisor  
Morgantown, West Virginia, Subdistrict, Health and Safety District C

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INTRODUCTION

This report is based on an investigation made in accordance with provisions of the Federal Coal Mine Safety Act (66 Stat. 692; 30 U.S.C. Secs. 451-483).

A gas and coal-dust explosion occurred in the Compass No. 2 mine of the Clinchfield Coal Company (Division of the Pittsburgh Company), Dola, West Virginia, about 10:57 p.m., Thursday, April 25, 1963. Twenty-two men were killed by the explosion; all died from burns and/or forces. None of the other 36 men in the mine at the time of the explosion were injured, and they escaped without incident via the Rock Camp and Dola portals.

The names of the victims, their ages, marital status, occupations, and number of dependents are listed in Appendix A of this report.

Bureau of Mines investigators believe that the explosion originated in the face crosscut of No. 5 entry in 3 panel 3 right, where an explosive mixture of methane and air was ignited by electrical arcs or sparks from a loading machine operating at the crosscut face. The loading machine was not in permissible condition. Forces of the explosion extended throughout 2 and 3 panels 3 right, into 1 and 7 panels 3 right, throughout the 3 right entries to the junction of 3 right entries and southeast mains, and were dissipated as they traveled left toward southeast main faces and right along the mains and up the Olive intake air shaft.

GENERAL INFORMATION

The Compass No. 2 mine at Dola, Harrison County, West Virginia, is serviced by the Baltimore and Ohio Railroad.

The operating officials of the company are:

President	C. Kyle Tieche	Dante, Virginia
Executive Vice President	George W. McCaa	Dante, Virginia
Vice President	Stephen Canonico	Clarksburg, West Virginia
General Manager	E. L. Hemingway	Clarksburg, West Virginia
Safety Director	Jack Light	Clarksburg, West Virginia
Superintendent	Harry Chapman	Dola, West Virginia
Mine Foreman	Steve Povroznik	Dola, West Virginia

A total of 214 men was employed; 173 worked underground, 3 shifts a day, 5 days a week, and produced an average of 3,800 tons of coal daily, all of which was loaded mechanically. The mine is opened by 3 active drifts and seven 6-foot and one 7-foot diameter circular shafts into the Pittsburgh coal bed, which averages 96 inches in thickness in this area. The shafts range from 172 to 448 feet in depth.

Entrance to the Compass No. 2 mine is made by an elevator installed in the Rock Camp portal shaft located on Little Rock Camp Run and by a drift opening at Dola, West Virginia.

The immediate roof is about 12 inches of coal left to help support a fragile shale that varies in thickness. The main roof is laminated limestone; clay veins, rolls, slips, and horsebacks are encountered. The maximum cover is about 600 feet.

The analysis of a coal sample taken from the coal bed in this mine is as follows:

	<u>Percent</u>
Volatile Matter	41.10
Fixed Carbon	47.57
Ash	11.33

Numerous tests by the Bureau of Mines have shown that coal dust having a volatile ratio of 0.12 and higher is explosive. The volatile ratio of the coal in this mine as determined from the aforementioned analysis is 0.46 percent, indicating that the coal dust is explosive.

The last regular Federal inspection of the Compass No. 2 mine was completed February 25, 1963, and a spot check inspection was made March 21-22, 1963.

#### MINING METHODS, CONDITIONS, AND EQUIPMENT

Mining Methods: A block system of mining was practiced. Entries were driven in sets of 3 to 10. However, in the area of 3 right, involved entries were in

sets of 3 to 6, and crosscuts were about 85 feet apart. Entries and crosscuts were 12-1/2 to 16 feet in width. The 3 right entries had been developed and stopped approximately 3,300 feet from southeast mains, and all panels were developed to the right off No. 5 entry as follows:

The No. 1 panel was developed with conventional mechanical equipment; it was driven approximately 1,850 feet from the inby end of 3 right entries, then pillared back to within about 300 feet of 3 right and stopped.

The No. 2 panel, a set of three entries outby No. 1 panel, was advanced with a Joy borer-type continuous miner approximately 1,800 feet; then, places were driven about 150 feet from No. 1 entry of 2 panel to connect with 1 panel. The barrier between 2 panel and 1 panel as well as the pillars in 2 panel were being recovered with the borer-type continuous miner.

The No. 3 panel, a set of five entries outby No. 2 panel, was being driven with conventional mechanical equipment and had been advanced approximately 630 feet.

The No. 7 panel, a set of five entries near the mouth of 3 right, was developed with conventional mechanical equipment and had been advanced and stopped approximately 1,250 feet from 3 right entries.

Roof bolts were installed in all conventional loading sections in compliance with the plan approved by a roof-bolting representative of the Bureau of Mines. Wooden timbers were used to supplement roof bolts where abnormal roof conditions were encountered. Roof-bolt operations were performed with rotary-hydraulic equipment; compressed-air activated equipment was used for some repair work.

Explosives: Permissible-type explosives and instantaneous electric detonators were used for blasting, and they were stored properly in well-constructed magazines on the surface and transported into the mine in a specially constructed explosives car; they were usually stored in specially constructed and suitably located explosives-section boxes underground.

The coal in conventional equipment sections was topcut and sheared off center, then blasted with permissible explosives in one block and three regular shot holes. Water-filled plastic bags were used for stemming, and shots were fired with permissible blasting units. Blasting cables were in good condition and sufficiently long to permit the shot firer to get in a safe place around a corner during blasting operations.

Ventilation and Mine Gases: Ventilation in the mine is induced by an axial-flow fan installed on the surface at the Flag Run shafts; these twin 6-foot diameter circular and 448 feet in depth shafts are used as upcasts for the fan. The fan is equipped with all necessary safety devices, operates continuously, is exhausting, and develops a negative pressure of 6.9 inches of water gage. The volume of air measured at the bottom of the shafts

during the February 1963 Federal inspection was about 187,000 cubic feet a minute. Methane liberation in the air then returning to the fan was calculated to be 1,212,000 cubic feet in 24 hours.

The three active drifts and three shafts, a 6-foot diameter at Isaac Creek, a 6-foot diameter at Little Rock Camp, and a 7-foot diameter at Olive shaft, are used for intake air purposes. Overcasts and permanent stoppings were constructed of incombustible material. Doors installed in pairs to form air locks were used to control the air currents. Temporary plastic stoppings on wooden frames were used in some instances to conduct the air flow into face areas. Line brattices, check curtains, and auxiliary fans were also used to direct air to the faces. The quantities of air passing through last open crosscuts in developing entries and being delivered to the intake ends of pillar lines during the February 1963 Federal inspection were more than 6,000 cubic feet a minute. For several years sufficient intake air has not been available to provide a suitable split system of ventilation, and more than one working section has been ventilated with the same continuous current of air. The inadequacy of the ventilating practices was shown clearly during the February 1963 inspection when the analysis of an air sample collected in the immediate return of the 4 right section showed 1.20 percent methane; a check sample collected in this return after the ventilation was improved contained 0.70 percent methane.

During the February 1963 Federal inspection, 31,720 cubic feet of air a minute was measured at the regulator in No. 1 entry 3 right, and this air current contained 0.35 percent methane as shown with a methane indicator.

The mine is classed gassy by the State and the Bureau of Mines. Preshift examinations for gas and other hazards were made by certified officials before the first operating shift each day, and preshift examinations for succeeding shifts were made by the onshift officials during their regular tour of duty. Onshift examinations for gas and other hazards were made by face bosses, mine foremen, shot firers, and operators of face electrical equipment. The section foreman and four other employees in the 3 panel 3 right section had flame safety lamps at the time of the explosion, and the lamps were sent to the laboratories of the Bureau of Mines in Pittsburgh, Pennsylvania, for testing and examination. Four of the lamps did not ignite methane in any of the many tests made, and these lamps were in permissible condition. However, the Wolf lamp found on the bolting machine was determined to be in nonpermissible condition and was not tested. This lamp was dismantled and inspected, and the chimney collapsed into 36 pieces of glass. The chimney had no identification markings, the ends of the chimney were not fire-polished, and it was made of soft glass. The lamp had been subjected to relatively high temperatures, and laboratory analysis of the deposits of coal on the lamp indicated the temperature at which carbonization had occurred was 485° centigrade (905° F). Foremen, shot firers, and operators of electric face equipment were assigned flame safety lamps and were required to test for gas at stipulated times and locations. These men usually made such tests with a walking flame, including equipment operators whose lamps were kept

on the equipment at the working faces for prolonged periods. Gas wells penetrating the property were protected by blocks of coal left in place; four such wells were known to be in the 3 right area. An abandoned gas well is located slightly more than 400 feet in advance of the 3 panel working faces. This well penetrated two producing sands, the first was a gas sand about 1,000 feet below the Pittsburgh coal bed. Reportedly, the well was drilled and abandoned in 1940. It was plugged poorly, and examination of the well indicated that after the casing was pulled, the hole was filled with tree branches, lumber, fine dirt, and debris. The well was not concreted in the vicinity of the Pittsburgh coal bed, and the well was not vented. Because of the possibility that gas from this well had migrated to the 3 panel workings and entered into the explosion, air samples were collected from the face of No. 5 entry 3 panel on two different occasions and sent to the Pittsburgh laboratories for analysis to ascertain whether hydrocarbons other than methane were present. These results indicate that the hydrocarbon composition of these samples does not differ from that normally found in coal mine atmospheres.

At the time of the explosion, the 3 right area was ventilated by a continuous current of air directed through Nos. 4 and 5 entries of 3 right to the inactive 7 panel where it traveled in the Nos. 3, 4, and 5 entries to the faces and returned by way of the Nos. 1 and 2 entries to 3 right. The air was then conducted through Nos. 4 and 5 entries of 3 right to the active 3 panel section, where it was coursed through the Nos. 4 and 5 entries to the faces and returned through Nos. 1 and 2 entries to 3 right. The air from 3 panel passed through Nos. 4 and 5 entries 3 right to the active 2 panel section, where it was coursed via the No. 3 entry to the pillar workings, which were connected to the pillared area of No. 1 panel and a bleeder of dubious effectiveness; the major portion of this air returned by way of No. 1 entry 2 panel to 3 right. The air was then coursed via the Nos. 4 and 5 entries 3 right by the outer end of the pillared and worked-out No. 1 panel and across the inner end of the inactive 3 right section to Nos. 1 and 2 entries, thence to the return air courses of southeast mains.

A set of air-lock doors was erected in No. 4 entry 3 right opposite 3 panel to divert the air current into 3 panel. Reportedly, check curtains were erected near the outby ends of Nos. 3 and 4 entries to direct most of the air current into No. 5 entry 3 panel, and additional check curtains were installed in the crosscuts between 4 and 5 entries to keep the current flowing through No. 5 entry. The ventilation system in 3 panel required the erection of incombustible stoppings between Nos. 2 and 3 entries; three such stoppings had been erected, and the balance of the crosscuts (three) between Nos. 2 and 3 entries were closed with curtains. Backup curtains were installed just outby the last open crosscuts in each entry to keep the air current moving across the face areas. An established practice was to erect and extend line brattices to near the faces of all working places. This work was done by a bratticeman. Checks on the intake air side of the

entry were turned back for about 2 feet to prevent "choking" the air excessively; however, the checks were solid otherwise and the splitting and overlapping of checks to facilitate the movement of mobile equipment through the checks was not practiced.

The No. 3 belt entry in 3 right was on intake air; air movement was controlled by check curtains installed across No. 3 belt entry.

At the time of the explosion, the other two active sections in the mine, southeast mains and 1 left, were each ventilated by separate splits of air.

Employees and officials stated during the hearing that the main fan was not in operation for a period of 12 minutes about a week prior to the explosion. The underground power circuits were not deenergized during the period the fan was inoperative, and face employees in 2 and 3 panel 3 right sections continued normal production work at the faces. In fact, employees testified that they were not aware that the fan was not operating and did not learn of the nonoperation until a day or more later.

Dust: During the February 1963 Federal inspection, the mine surfaces varied from dry to wet. Many places, including some face areas and areas in parallel and back entries, were definitely wet at that time. Water was used to allay dust during cutting and continuous miner operations and to wet down shuttle-car roadways.

During the February 1963 Federal inspection, dangerous quantities of loose coal and coal dust were observed at several locations and rock-dusting was inadequate in several relatively small areas. The loose coal and dust were removed promptly, and additional rock-dusting was done in needed areas.

According to company officials, an employee was used each shift on the conventional loading sections and the continuous miner sections to clean coal spillage from along roadways, shuttle-car routes, and shuttle-car discharge points. This employee was also required to keep such areas wetted down when they became dry and dusty. Beltmen were also employed to service the belts and clean up spillage along the belt lines. However, beltmen at the hearing testified that they did not have time to clean up spillage at any location, except the loading zones, and roadmen testified that their other duties often took so much of their time they were unable to clean up effectively.

Rock dust in the active sections was applied by hand during the first and second shifts, and generalized rock-dusting of the face areas by machine was done between the second and third shifts. According to company records, 7 pounds of rock dust per ton of coal mined were distributed on the mine surfaces during 1962, and from January 1 to April 25, 1963, 5.5 pounds of rock dust were distributed per ton of coal mined. Dust produced during cutting operations was allayed by water from sprays mounted on the machine; dust produced during other mining operations was not considered excessive. Shuttle-car roadways were wetted down when necessary.



Uniform dust surveys had been made in this mine over a period of several years, and during the February 1963 inspection, the dust surveys were picked up at the points of cutoff established during the previous inspection. Sample locations in southeast mains, 4 right, 3 right, and 1 left off southeast mains, all the active coal-producing areas, were brought forward to proximity of the face workings. In all, 174 samples of the mixed mine dusts were collected, of which 24 or 13.8 percent were substandard. Additional rock dust was applied to all areas where a deficiency was indicated (see Appendix E).

After the explosion, heavy coking was evidenced throughout the 3 panel section, and the exposed areas were dry and blackened with coal dust. Upon close examination, it was apparent the section had been rock-dusted up to at least the last open crosscuts with some hand rock-dusting having been done inby. Three cuts of coal were in the face and crosscuts of No. 4 entry, one cut in No. 3 entry, and one cut in the face, and about one-third of a cut in the crosscut of No. 5 entry. In addition, in the roadways from the last open crosscuts to the faces, excessive accumulations of coal dust and loose coal were present. The routes traversed by the shuttle cars contained accumulations of coal dust and coal spillage, and in the vicinity of the belt tailpiece or dumping point, the dust accumulation was exceptionally heavy. The belts from both Nos. 2 and 3 panels were believed to have been running empty at the time of the explosion. Obviously, the amount of rock-dusting that had been done in 3 panel section under the aforementioned conditions was insufficient to prevent the excessive coal dust from entering into and propagating the explosion. The relay belts on 3 right were also believed to be running empty, except for an aggregate of about 2 tons of coal near the transfer point near the outby end. However, excessive accumulations of coal spillage and coal dust were observed at the three transfer points of this belt.

It is believed that the satisfactory rock-dusting that was done in the entries adjacent to and outby 3 panel prevented the further spread of the explosion.

A recapitulation of the 941 samples of the mine dust collected in the areas affected by the explosion is shown on the next page. It will be noted from the analyses that the majority of the dust samples collected in the disturbed areas of 2 and 3 panels and the inby end of 3 right, except for the roof and rib samples of 2 panel, contained less than 65 percent incombustibles. It was obvious that considerable coal dust had been thrown into suspension and deposited on known rock-dusted surfaces, so as to decrease the incombustible content of the mixed dusts in these areas. However, it was apparent from the loose coal and coal-dust accumulations noted during the investigation in the face workings, shuttle-car routes, and just inby the dumping point of the belt conveyor in 3 panel that there was too much fuel to arrest or localize the explosion by the rock-dusting done in these areas. Propagation of the explosion was arrested as it moved through the well rock-dusted 3 right entries. The incombustible content of the dust samples collected in these areas increased progressively as the southeast mains were approached; in southeast mains 85.5 percent of the samples collected contained in excess of 65 percent incombustibles (see Table 2).

# RECAPITULATION OF THE 941 DUST SAMPLES COLLECTED DURING THE INVESTIGATION

LOCATION	KIND OF SAMPLE	TOTAL NUMBER OF SAMPLES COLLECTED	65 PERCENT AND OVER INCOMBUSTIBLES		BETWEEN 50 AND 65 PERCENT INCOMBUSTIBLES		UNDER 50 PERCENT INCOMBUSTIBLES	
			NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
3 panel off 3 right entries	Band	29	4	13.8	4	13.8	21	72.4
	Floor	29	5	17.2	1	3.5	23	79.3
	Roof and Ribs	29	9	31.0	7	24.1	13	44.9
3 panel off 3 right cross- cuts								
	Band	19	2	10.5	3	15.8	14	73.7
2 panel off 3 right entries	Band	56	25	44.6	28	50.0	3	5.4
	Floor	56	24	42.9	27	48.2	5	8.9
	Roof and Ribs	56	40	71.4	15	26.8	1	1.8
2 panel off 3 right cross- cuts								
	Band	36	15	41.7	18	50.0	3	8.3
7 panel off 3 right entries	Band	31	18	58.1	5	16.1	8	25.8
	Floor	31	16	51.6	6	19.4	9	29.0
	Roof and Ribs	31	15	48.4	12	38.7	4	12.9
7 panel off 3 right cross- cuts								
	Band	11	4	36.4	4	36.4	3	27.2
3 right off southeast mains entries	Band	95	55	57.9	37	38.9	3	3.2
	Floor	95	63	66.3	28	29.5	4	4.2
	Roof and Ribs	95	50	52.6	37	38.9	8	8.5
3 right off southeast mains crosscuts								
	Band	42	30	71.4	11	26.2	1	2.4
southeast mains entries								
	Band	200	171	85.5	24	12.0	5	2.5

NOTE: These samples were collected after the explosion and do not represent the actual condition that existed prior thereto.

Transportation: Coal was hauled in shuttle cars from the face regions to well-installed belt conveyors, which transported the coal approximately 4 miles to the surface. Beltmen were employed to travel along and regularly inspect assigned belts for spillage, defective or stuck rollers, the belt drives, and the slippage and sequence controls. The track and rolling stock, used primarily for supply haulage purposes, were in reasonably good condition. Employees, except several beltmen, the supply-haulage crew, and a mechanic who entered the mine at the Dola drift portal, all entered the mine by elevator at Rock Camp portal on Little Rock Camp Run and were transported to the working sections in self-propelled covered and open-type mine jeeps.

Electricity: Electric power, at 110, 220, 440, 2,300, and 12,000 volts alternating current and 250 volts direct current, was used on the surface, and 12,000, 4,160, and 440 volts alternating current and 250 volts direct current were used underground. The 12,000 volts alternating-current power is taken into the mine by three No. 2/0 single conductor, 15 K.V. (grounded) durasheath shield direct burial cables and a No. 2 T.W. ground wire, buried in a trench, 6-1/2 inches wide, 2 feet deep, covered by 8 inches of sand and 16 inches of clay bottom cuttings.

The 12,000-volt supply transformers are delta-wye connected and the neutral of the wye connected secondary was grounded through a grounding mat. A circuit breaker, provided in the system, was adjusted to open on a 100-ampere overload or a 10-ampere ground fault. The 12,000 volts alternating current was reduced to 4,160 and 440 volts alternating current for the operation of the power conversion units, pumps, and belt haulage motors. Direct-current power was provided by five rectifiers with a total rated capacity of 1,250 kilowatts. The substation equipment was properly ventilated and suitably housed in fireproof structures on the surface and underground; all equipment is interconnected for parallel operation with overcurrent protective devices at each substation. Power and trolley wires were satisfactorily installed, guarded where necessary, and had cutout switches at required locations. Floor insulation was provided at necessary places. Most of the off-track equipment was not frame-grounded. Permissible and nonpermissible electric face equipment was used. Trailing cables were fire-resistant and provided with a power tap and fuse or circuit breaker.

During the February 1963 Federal inspection, eight permissible-type shuttle cars, three loading machines, two cutting machines, two roof-bolting machines, and a rock-dusting machine were found to be in nonpermissible condition; this equipment was restored promptly to permissible condition by tightening five loose packing glands and three loose headlight lenses; replacing two missing stud bolts, a damaged power wire to a shuttle-car conveyor reverse, a damaged packing gland cover plate, and a nonpermissible motor on a rock-dusting machine; repairing three defective hose conduits; reducing openings around push rods to less than 0.010 inch in three control switches, openings in three contactor boxes to less than 0.004 inch, and the number of temporary splices in three trailing cables to less than four in each cable.

During the February 1963 Federal inspection, operators of electric equipment made suitable tests for methane before electric equipment was taken in by the last open crosscut and at frequent intervals while such equipment was being operated in the face regions.

At the time of the explosion, the permissible-type electric face equipment in No. 3 panel 3 right section consisted of two Sullivan 10-RU rubber-tire-mounted cutting machines, three Joy 10-SC shuttle cars, two Joy 11-BU loading machines, one M.S.A. Bantam rock-duster, and two Jeffrey 56-RDR roof-bolting machines. The electric equipment was thoroughly examined during the investigation, and the following permissibility and other defects were found:

1. The No. 3 Joy shuttle car in the second crosscut between Nos. 3 and 4 entries had openings in excess of 0.004 inch into the conveyor reverse compartment and the headlight resistance compartment, a bolt missing from the headlight resistance compartment, and a grounded right traction motor and pump motor.
2. The No. 2 Jeffrey roof-bolting machine in the slant between Nos. 4 and 5 entries had six temporary splices in the trailing cable.
3. The Bantam rock-duster in No. 4 entry had the control fuse lugs bridged with wire in the main control box.
4. The bottom inspection cover was missing from the main motor housing of the No. 1 Joy 11-BU loading machine at the face crosscut in No. 5 entry and broken armature band wires were found in the housing. When the main motor of this machine was disassembled for close study, it was found that the commutator had high and low bars and heavy arcing was indicated at the brushes. The insulating tapes and the insulating paint within the motor casing showed evidence of having been exposed to both fire and heat. The inspection also revealed a loose packing gland on the pump motor switch of this machine. The trailing cable showed evidence of having been run over by mobile equipment, contained eight temporary splices, and for circuit protection contained a 400-ampere fuse.
5. The No. 2 Joy shuttle car in No. 4 entry No. 4 crosscut had a loose packing gland on the headlight resistance due to insufficient packing, and the trailing cable was provided with a 400-ampere fuse for circuit protection.
6. The No. 1 Joy shuttle car in No. 4 entry near No. 4 crosscut had a lockwasher missing from a bolt, an opening in excess of 0.004 inch in the main contactor control compartment, six temporary splices in the trailing cable, and a 400-ampere fuse was provided in the trailing cable for circuit protection.

7. The No. 1 Sullivan cutting machine in No. 3 entry near No. 5 crosscut had a ground fault on the machine.

8. The No. 1 Jeffrey roof-bolting machine in No. 2 entry near No. 5 crosscut had openings in excess of 0.010 inch around push rods at control stations on the front and rear of the machine.

9. The No. 2 Joy loading machine in No. 1 entry near No. 5 crosscut had field coils grounded and a 400 ampere fuse provided circuit protection for the trailing cable; this loading machine was down for repairs.

10. The nipping station for this section was located at the junction of No. 4 entry and the last open crosscut. However, the return power wire for this station was extended in by the last open crosscut and terminated in No. 4 entry. A backup curtain was installed immediately adjacent to the nipping station, and operation of the mobile equipment caused the trailing cables of the equipment to damage and/or seriously disturb the effectiveness of the backup curtain.

An examination of the face permissible electrical equipment in all the other active sections of the mine conducted during the officials investigation revealed similar laxities to those found in 3 panel in the proper maintenance of permissible equipment.

Illumination and Smoking: Permissible electric cap lamps were used for portable illumination underground. Smoking was forbidden underground and had not been observed during any Federal inspection; searches for smokers' articles were conducted frequently. Smoking material was not found in the 3 right area or among the personal effects of the victims, which indicates strict compliance with the no-smoking requirement.

Mine Rescue and Fire-Fighting Facilities: A State trained and equipped mine rescue team, made up of company personnel, was maintained at the company's No. 1 mine at Philippi, West Virginia, and several other well-trained and equipped mine rescue teams of other coal companies were available at nearby mines.

Self-rescuers were provided for all employees underground; those for individuals who moved from place to place over a considerable area, such as pumpers, some foremen, and mechanics, were carried on the person, others were kept in boxes in the working areas of the various sections. Six Universal gas masks were stored in the mine office at Rock Camp portal, and twelve Chemox apparatus sets were kept in the safety director's office at the Dola portal.

Adequate and well-marked escapeways were available from each working section to the surface. The check-in and check-out system was inadequate; most employees did not have identification tags on their persons, and the number of the lamp given each man was not recorded.

Fire-fighting facilities included a 4-inch water line installed along the belt entries from the surface at Dola portal to near the face area of southeast mains; this line was supplemented by a similar line installed in the Olive intake air shaft and connected to a 14,000-gallon-capacity tank on the surface. Smaller 3-inch and 2-inch water lines extended along belt entries into the working areas. Outlets, extended through the stoppings to adjacent supply track haulageways, were provided at approximately 400-foot intervals along the water lines. Fire hoses, 2-1/2-inch, adaptors, nozzles, and other fittings were provided at strategic locations underground. Dry-type chemical fire extinguishers, 4, 10, and 20 pound sizes, some soda acid, and a few carbon tetrachloride extinguishers, and supplies of rock dust were also provided on equipment and at necessary places underground for fire-fighting purposes. A play-pipe-type extinguisher and a supply of detergent or foaming agent were provided in each active section face area, and a foam-generating machine (HiEx) and a supply of foaming agent were also available at Dola portal for fire-fighting purposes.

#### STORY OF EXPLOSION AND RECOVERY OPERATIONS

Participating Organizations: These include the Clinchfield Coal Company (Division of the Pittston Company), West Virginia Department of Mines, United Mine Workers of America, and United States Bureau of Mines. Mine rescue teams who assisted in recovery operations are listed in Appendix F.

Activities of Bureau of Mines Personnel: John J. Dougherty, subdistrict supervisor, was advised by a telephone call from Leslie C. Ryan, inspector-at-large, West Virginia Department of Mines, about 11:15 p.m., April 25, 1963, that an explosion had probably occurred in Compass No. 2 mine. Dougherty immediately called W. R. Park, district supervisor, who was in Morgantown, and other Bureau personnel, including James Westfield, assistant director. Dougherty instructed Inspector W. R. Melville of Clarksburg, West Virginia, to go to the mine immediately, ascertain what had happened, and then call him back promptly with details. Melville arrived at the mine about 12 midnight, and he was briefed immediately by company officials with all available details, including definite information that an explosion had occurred and 21 men were unaccounted for. Other employees had been contacted and removed from the mine. Melville called Dougherty by telephone and acquainted him with all the available information regarding the explosion. Inspector William M. Cordray arrived at the mine about 12:30 a.m., and Inspectors Roy C. Estep and Joseph J. Dobis shortly thereafter. Inspectors Cordray, Melville, and Dobis entered the mine promptly with the first mine rescue teams to locate affected areas and begin recovery operations. Estep remained on the surface to assist in organization of the rescue and recovery operations. District Supervisor W. R. Park and Subdistrict Supervisor Dougherty, accompanied by Inspectors William D. Baldwin, Merle W. McManus, and Anthony Puskas, arrived at the mine shortly before 2 a.m. After these men were briefed regarding the explosion damages and recovery operations, they entered the mine and assisted with the restoring of ventilation in the affected areas and the recovery of the bodies. Assistant Director James Westfield arrived at the

mine early, April 26, and he assisted with the recovery operations, investigations, and the official hearing. The following additional Bureau personnel arrived at the mine at various times April 26, and they assisted with recovery operations and the investigations: M. I. Duncan, T. J. Ward, H. T. Pigott, P. M. Shay, P. J. Compton, J. Marshalek, C. D. McMaster, J. F. Orlando, H. C. Summers, M. S. Childers, and A. J. Fumich.

On April 26, 1963, a withdrawal Order was issued under Section 203(a)(1) of the Federal Coal Mine Safety Act, debarring all persons from the Compass No. 2 mine, except those needed for exploratory and recovery work. Before the Order was issued, management had withdrawn all men, except those mentioned above, from the mine.

Mine Conditions Immediately Prior to Explosion: The weather was cool and clear on April 25, 1963. Records of barometric pressure recorded at Benedum Airport at Bridgeport, West Virginia, from 6:55 p.m., April 24 to 5:40 p.m., April 26, 1963, are as follows:

6:55 p.m.	April 24, 1963	30.18
7:45 p.m.	April 25, 1963	30.15
5:40 a.m.	April 26, 1963	30.21

It is the opinion of the Bureau investigators that the slight variation in atmospheric pressure had no bearing on the explosion.

The reports of the examinations of the section foremen who made the preshift examinations for the 7 a.m. to 3 p.m. production shift, April 25, 1963, indicated that conditions on each section were normal, and each section operated satisfactorily. Gas was not found by these examiners, and the day-shift foremen who made the preshift examination for the 3 p.m. to 11 p.m. shift reported nothing unusual, except that the continuous miner in 2 panel section was not operating because of needed repairs. Gas was not reported by these examiners. Records of preshift examinations made by afternoon-shift foremen for the oncoming 11 p.m. to 7 a.m. shift were not made, as preshift reports are not telephoned to the surface, but are recorded by the examiners when they arrive on the surface at the end of their shift.

Evidence of Activities and Story of Explosion: The afternoon shift, consisting of 58 men, entered the mine about 3:30 p.m., April 25, 1963, and they were transported in special self-propelled man cars to their respective sections without mishap. Employees of the southeast mains and 3 panel 3 right conventional loading sections and the 1 left continuous miner section began producing coal promptly. Neither of these section crews reported difficulties or unusual conditions during their shift, which was almost completed when the explosion occurred.

The continuous miner in 2 panel had been in disrepair for several hours before the afternoon shift entered the mine, and this crew was assigned various duties pending repairs to the machine by company mechanics and representatives of the manufacturer.

It was reported by Joy Manufacturing Company representatives and the company maintenance superintendent that repairs on the continuous miner in 2 panel 3 right included some welding, and the repairs were completed about 9:30 p.m., April 25, 1963. Reportedly, tests for gas were made by Gunther Badorrek, section foreman, before welding was started. The two Joy representatives and the maintenance superintendent left No. 2 panel about 10 p.m.; they walked to No. 3 panel where they stated they found the air-lock doors closed and after opening each door to pass through they were reclosed. However, while traveling by portal bus toward the Rock Camp portal shaft, they reported that the inby door of the air lock at 7 panel 3 right had been dislodged from its supports and was leaning against the rib; the outby door was closed. These men were in the 1 left miner section when the explosion occurred.

Mining in 2 panel 3 right, with a crew consisting of a foreman, continuous-miner operator and helper, two shuttle-car operators, a loading-machine operator, and a mechanic, was started about 9:30 p.m., and at the time the explosion occurred, the continuous miner had advanced about 60 feet into the barrier pillar. The working place in the barrier pillar had been turned off No. 1 entry 2 panel and had been advanced about 151 feet ahead of the main air current; means to provide positive and adequate ventilation at the working face were not utilized. The last report from this section prior to the explosion was about 10 p.m., when the section foreman reported to the afternoon mine foreman that he was going to have the auxiliary fan with tubing installed to ventilate the barrier pillar place; however, the fan and tubing had not been moved to the face area, and the locations of the bodies of the crew indicated that coal was being mined when the explosion occurred. About 9:30 p.m., Section Foreman James Lester, on 3 panel 3 right, reported to the afternoon shift foreman that everything was satisfactory on the section; this was the last time any surviving employee was in contact with 3 panel face employees.

While the miner was being repaired, several members of this afternoon crew were instructed to bring a spool of "miner" cable from 2 panel to the entrance of 3 panel for transfer to 1 left where a second continuous miner was being operated. Because the 3 panel belt had been installed over the supply track in 3 right, the spool of cable was transported on the cutter bar of a cutting machine. At the inby entrance to 3 panel, it was necessary to tram the cutting machine up No. 1 entry past the inby end of the 3 panel belt; thereafter, the cutting machine was trammed through a row of crosscuts from No. 1 entry to No. 4 entry, and this necessitated that several plastic and curtain stoppings be removed to permit passage of the cutting machine. The "miner" cable was delivered to the supply locomotive in No. 4 entry 3 panel about 10 p.m. The cable was loaded and transported about 1 mile from 3 panel just outby the Rock Camp portal at 10:57 p.m., when the explosion occurred. The supply locomotive operator was shocked by the forces of the explosion, but he escaped unharmed through the Dola drift portal. The cutting machine was left on the outby side of 3 panel section after the "miner" cable was delivered, and it will never be known whether the stoppings that had to be removed for the tramping were replaced.



The first indication of trouble in the mine was noted by the afternoon-shift mine foreman, E. S. Buzzard, who was near the Rock Camp portal, when a strong gust of air swept by him. Buzzard knew something serious had occurred, and he suspected that it had been an explosion. He went to the surface immediately and attempted to contact the four working sections in the mine. The crew in 1 left section just outby Rock Camp portal was contacted without difficulty, and momentary contact was made with the southeast mains section, which was inby 3 right. Both section crews were advised that an explosion had occurred underground and they were to proceed to the surface with caution. The 1 left crew proceeded to the surface without incident, but the southeast mains crew encountered some difficulty escaping from the mine because of smoke and dust near the entrance to 3 right. Furthermore, the portal bus which they were riding and which would descend the prevailing 2 percent grade without benefit of power was derailed by debris from the explosion just inby 3 right, and the men had to go on foot the rest of the way to the Rock Camp portal. Fourteen men in southeast mains, eight in 1 left, and fourteen employed at any needed location throughout the mine escaped. Twenty-two men in 3 right sections were unaccounted for and could not be contacted. Immediately after Buzzard contacted all possible underground employees, advised them of the explosion, and instructed them to proceed to the surface with caution, he contacted higher company officials, who in turn called State and Bureau of Mines personnel and mine rescue teams. Examination of 3 right entries and 2 and 3 panel 3 right sections after the disaster revealed that the explosion originated in the 3 panel section. The afternoon shift crews' normal work time began at 3:30 p.m. and ended at 11:30 p.m.; therefore, the greater part of the shift activities had been completed and part of the 3 panel crew had started to their portal bus when the explosion occurred. The cutting-machine operator and helper, mechanic, and roadman had left the face areas and were on 3 right haulageway where they died; the cutting-machine operator was several hundred feet outby the section apparently proceeding for the portal bus. The two roof-bolt men were just outby the last open crosscut in No. 2 entry with their equipment; the foreman, bratticeman, and shot firer were in the last open crosscut between 2 and 3 entries; the shot firer had apparently just completed blasting at the face of No. 3 entry as the blasting cable had not been rolled up. The two shuttle-car operators were at the second crosscut outby the face of No. 4 entry; one car was loaded apparently enroute to the unloading point, and the second car was empty and apparently waiting to return to the loading machine as soon as the loaded car passed. The loading-machine operator and his helper had apparently been at the crosscut face in No. 5 entry. The crosscut had almost been cleaned up, about a shuttle car of coal remained at the face. It appeared that the loading machine had been pushing loose coal toward the left side of the face or had just pushed up loose coal and was being stopped when gas was ignited. The Joy operator and his helper moved about 96 feet outby the crosscut face; the operator had covered his mouth and nose with a bandana handkerchief, apparently when he observed the ignition. It was obvious that the Joy operator and his helper were the only men on the section who moved more than a few feet after the

explosion, and these two men were the only employees in a face area at the time of the ignition. Also, the loading machine was the only piece of face electric equipment at a working face at the time of the explosion.

The victims near the 3 panel faces were burned severely, and the coal roof and ribs in the inby parts of the section showed that considerable, intensive gas burning had occurred in these areas.

Examination of the 3 panel section after the explosion showed that ventilation to the face of No. 5 entry (where the loading machine was being operated) was short-circuited completely at the last open crosscut. The entire check curtain at this location had been rolled up and tied with wire; it was found lying along the right rib. It is also possible that ventilation was short-circuited from other working faces, as the shuttle cars were tramping from the face of No. 5 entry to the tailpiece of the belt in No. 3 entry through the second outby crosscuts and employees testified that check curtains were tied up frequently to facilitate shuttle-car haulage. Furthermore, the outby air-lock door on No. 4 entry of 3 right at the intersection of 3 panel was open, practically undamaged, and blocked behind the feeder cable after the explosion, but the inby door was destroyed completely. The location and nondamage of the outby door indicates that this door had been opened prior to the explosion; the opening of this door would help short circuit face ventilation in 3 panel, particularly from Nos. 4 and 5 entries. It is also possible that the man door in the plastic stopping between the supply road and the 3 right belt transfer point outby 3 panel was open; the opening of this door would short circuit most of the air from 3 panel. The serious interruption of ventilation in 3 panel for a considerable length of time and exudation of methane from freshly undercut and blasted cuts of coal in the working places resulted in an accumulation of methane sufficient to initiate the explosion. It is believed that a large body of methane was not liberated suddenly but rather that the methane accumulated gradually and failure to make sufficient and adequate tests for gas resulted in nondetection of accumulated methane and the ensuing explosion. Dangerous accumulations of coal and coal dust were found during recovery operations inby the conveyor tailpiece, along the shuttle-car roadways, and in the face regions in 3 panel, and rock-dust applications were inadequate in this section. Further evidence that safe mining operations were being generally ignored in No. 3 panel were power wires installed too close to the working faces, a loading machine needing electrical repairs had been moved to No. 1 entry into return air for repairs and to get it out of the way, and a roof-bolting machine and a cutting machine were left parked under check curtains used to direct the air current.

Evidence found during the investigation of this explosion as well as testimony offered at the official hearing showed clearly that in many instances men and officials in this mine, as has been true in nearly every other explosion, failed to follow known safe mining practices. The failure of supervisors and employees to follow and comply with known safe mining practices, company rules and regulations, and State and Federal laws was the basic cause of the explosion. This explosion again demonstrates conclusively that if such catastrophies are to be prevented, mine officials and workmen must be made completely aware of all dangers that might result from the performing of unintentional or deliberate unsafe acts. Management, union officials, and representatives of State and Federal inspection agencies should insist that mine employees and supervisors comply at all times with known safety practices, regulations, and laws.

Recovery Operations: The main fan was not damaged by the explosion, and it was not stopped during recovery operations (see Appendix C). Recovery operations were started as soon as help was available. The first mine-rescue crew accompanied by company, State, and Bureau of Mines personnel entered the mine through the Rock Camp portal about 1:05 a.m., April 26, 1963. Evidences of explosion forces were found about 1,000 feet inby the Rock Camp portal at the entrances to southeast mains, but the rescue party was able to advance to the entrances of 3 right off southeast mains about 4,700 feet from the Rock Camp portal where they found that stoppings were destroyed, the air short-circuited, and noxious gases permeated the atmosphere inby this point. It was decided to use air locks and re-establish ventilation only in explored areas of 3 right, so as to lessen the possibility of forcing an explosive mixture of methane air over an undiscovered fire during exploration of 3 right. A slight delay was occasioned at this time to await the arrival of additional mine-rescue teams. Most of the stoppings in 3 right were destroyed and carbon monoxide and methane instrument readings made in the 3 right area consistently showed 0.04 to 0.10 percent carbon monoxide and 1.0 to 4.2 percent methane; therefore, it was necessary to explore all entries in 3 right while wearing self-contained oxygen breathing apparatus to ascertain if fires were present and to extinguish them before ventilation was re-established. The following procedure was followed during recovery operations:

A mine rescue team using self-contained oxygen breathing apparatus would explore all entries for distances of 350 to 850 feet, erect temporary stoppings across all the entries at the inby end of exploration, and then return to the fresh air base. One or more fully equipped rescue teams were kept in readiness at the fresh air base to deal with any emergency arising during exploratory work. The area explored was ventilated progressively until all gas was diluted and removed and fresh air was extended to the advance barrier in all entries. A new base was then established at the barrier and aforementioned recovery procedures were repeated. One fire was found in 3 panel during exploratory work and two "hot" spots were discovered in 3 panel on Monday, April 29, or 4 days after the explosion. Plastic stoppings were used while reventilating the 3 right area, roof falls were not encountered, and recovery operations proceeded rapidly. The excellent roof-bolting of the entries likely prevented falls of roof and facilitated rapid recovery of the mine.

The successful completion of the recovery operations in the face of extremely hazardous conditions without a single injury demonstrated the competence and efficiency of all those who had to do with supervising and directing the operations. The Bureau of Mines recognizes the inestimable contribution made by the mine rescue teams in expediting the recovery operations, and highly commends the members thereof for performing their dangerous mission in such a safe, competent, and skillful manner.

The first body recovered, a cutting-machine operator, was found at 8:45 a.m., April 26, in No. 4 entry 3 right about 575 feet outby the entrance to No. 3 panel, it is believed he was enroute to get the portal bus to transport the 3 panel crew to the surface. The body of the last victim was located about 9:25 p.m., April 26, and all bodies were removed from the mine by 11 p.m., April 26, 1963.

When the last body was removed from the mine April 26, a decision was made to start the investigation April 28, 1963. The official hearing began May 7 and was completed May 9, 1963.

A crew of men began replacing permanent stoppings in 3 panel April 28; thereafter, the explosion area and the belt entries were cleaned up and rock-dusted, ventilation was restored, face equipment was placed in permissible condition, and power lines were reinstalled in intake air.

A special inspection was made of Compass No. 2 mine on May 24-26, 28-29, and 31, 1963, and the danger described in the withdrawal Order issued April 26, 1963, was found to be totally abated with the following reservations:

Only one producing unit is to be operated on a single split of air and Nos. 7 and 3 panels are to be fire bossed as long as they are on the intake air current for the producing section of 3 right. The row of crosscuts in 3 panel is to be completed before 2 panel is started. The Director annulled the Order on May 31, 1963.

#### INVESTIGATION OF CAUSE OF EXPLOSION

##### Investigation Committee:

##### Clinchfield Coal Company

G. W. McGaa	Executive Vice President
Stephen Canonico	Vice President
E. L. Hemingway	General Manager
Jack Light	Safety Director

##### United Mine Workers of America

Charles Ferguson	Director, Safety Division
Cecil J. Urbaniak	President, District 31
Leonard Pnakovich	Vice President, District 31
James A. Bennett	President, Local 9854
Wilbur Sturms	Chairman, Safety Committee
Goff McKinney	Safety Committee
Stanley Tichenor	Safety Committee

West Virginia Department of Mines

Leonard J. Timms  
W. F. Eigenbrod  
Leslie C. Ryan  
John M. Ashcraft

Director  
Safety Engineer  
Inspector-at-Large  
Assistant Inspector-at-Large

Ewell Snuffer  
E. H. John  
Charles P. Turley

District Mine Inspector  
District Mine Inspector  
District Mine Inspector

United States Bureau of Mines

James Westfield  
W. R. Park  
John J. Dougherty  
Roy C. Estep  
W. M. Cordray  
M. S. Childers  
C. D. McMaster

Assistant Director--Health and Safety  
District Supervisor  
Subdistrict Supervisor  
Federal Coal Mine Inspector  
Federal Coal Mine Inspector (Roof Control)  
Federal Coal Mine Inspector (Electrical)  
Federal Coal Mine Inspector (Electrical)

A detailed examination of the area affected by the explosion was carefully made by the entire investigating committee. To expedite the work, the committee was divided into two groups, each composed of representatives of the respective agencies. Each group was provided with a mine map properly inscribed so that when the examination was completed each agency had a complete record of the findings.

The electrical equipment in the explosion area was studied by electrical inspectors of the interested groups, and their findings have been recorded heretofore in this report.

An analysis of the fan chart of the main ventilating fan serving the Compass No. 2 mine is given in Appendix C.

The hearing conducted by the West Virginia Department of Mines beginning May 7, 1963, at the Harrison County Courthouse at Clarksburg, West Virginia, was headed by Leonard J. Timms, Director, assisted by other State personnel. Mr. Timms invited representatives of the United Mine Workers of America, the Clinchfield Coal Company, and the Bureau of Mines to participate in the interrogation of anyone who might have knowledge of events prior to the explosion or practices which might have set the stage for the disaster.

Methane as a Factor in the Explosion: The following evidence indicates that methane was liberated rather freely in the southeast and 3 right sections of Compass No. 2 mine:

1. The official record books kept at the mine show that gas had been found in 3 right section, although not often; gas had been found frequently in the southeast mains section. Reportedly, gas had not been detected in the 3 panel 3 right section.
2. Air samples collected during the Federal inspection completed February 25, 1963, showed a methane liberation of 1,212,000 cubic feet in 24 hours from the mine. Also, 1.20 percent methane was found in the immediate return from 4 right working section.
3. Methane in concentrations up to 5 percent was detected in the explosion area (3 right) during recovery operations. Methane was also found near the roof at No. 5 entry face 3 panel off 3 right with a methane detector during the investigation.
4. During the investigation an accumulation of methane was present in the 1 panel 3 right bleeder No. 6 entry. Bottle sample No. C-4109 indicated 1.44 percent methane.
5. Air samples collected April 30, 1963, in 2 panel and 3 panel 3 right returns showed 72,000 and 36,000 cubic feet of methane in a 24-hour period, respectively (Bottles C-4110 and C-4087). (See Table 1.) A sample of air in 3 right return collected May 9, 1963, after the ventilation had been partially restored showed 224,000 cubic feet of methane was being liberated in a 24-hour period.
6. On Monday, June 3, 1963, loading operations were resumed in the faces of 3 panel, so as to complete connecting crosscuts from the face of No. 1 entry through to No. 5 entry. While preparing to load a cut of coal at the face of No. 5 entry, more than 10 percent methane was found close to the roof with a methane detector. On June 5, 1963, more than 10 percent methane was detected with a methane indicator at small holes in the roof at this face; 17,000 cubic feet of air a minute was measured at the inby end of the line curtain in the place at this time. More than 5 percent methane was detected with a methane indicator close to the roof and faces of Nos. 2, 3, and 4 entries on June 5, and 1.8 percent methane was found close to the face and roof in No. 1 entry. Line curtain was installed in each of these places, and relatively large quantities of air were reaching all faces.
7. Unquestionably, the disaster resulted from the ignition of a large quantity of methane that was liberated in No. 5 entry and possibly No. 4 entry 3 panel. The coal roof and ribs in the face areas of 3 panel showed evidence of intensive gas burning.

Flame: Very heavy soot deposits were found in the face areas of working places in 3 panel 3 right and heavy deposits of coke were found at numerous places throughout 3 panel, the outby end of 2 panel, and 3 right entries inby 2 panel (see Appendix B). Other evidence of flame included burned papers, melted plastic brattice cloth, and a plastic pipe burned apart about 500 feet outby 3 panel in No. 5 entry 3 right. The flame extended from the faces of 3 panel 3 right into and throughout 3 right inby and outby 3 panel (see Appendix B). The farthest outby evidence of fire was charred rock-dust bags near the intersection of 3 right and southeast mains. Dust samples collected in the explosion area contained traces to very heavy, extra large coke particles (see Appendix D).

Forces: Statements of witnesses and evidence in the mine indicated that the forces of the explosion radiated from the faces of 3 panel 3 right, traversed all entries in 3 right, 1 and 2 panels 3 right, about half of 7 panel 3 right, along southeast mains for about 1,000 feet inby 3 right, and in the southeast mains and the main entries for about 5,000 feet outby 3 right.

Violence occurred throughout the 3 right area as evidenced by blown-out stoppings (74 in number) and twisted and torn pan lines for conveyor belts.

Point of Origin: Bureau of Mines investigators believe that the explosion originated at the face of the crosscut in No. 5 entry, 3 panel 3 right.

Factors Preventing Spread of Explosion: Rock-dust surveys brought up to date during the Federal coal mine inspection completed February 25, 1963, indicated that the entire mine was well rock-dusted. The 3 right main conveyor belt contained very little coal at the time of the explosion; the lack of coal on this belt helped prevent the forces of the explosion from spreading into other parts of the mine. The excessive coal-dust accumulations in 3 panel section were responsible for the greater part of the propagation of the explosion from 3 panel, but the excellent rock-dusting of other parts of the mine prevented the explosion from covering the entire mine.

Summary of Evidence: Conditions observed in the mine during recovery operations and the investigation following the disaster, together with information available from previous Federal Coal mine inspection reports and that obtained from a hearing and from company officials, workmen, and mine records, provided evidence as to the cause and origin of the explosion. The evidence from which the conclusions of the Federal investigations are drawn is summarized as follows:

1. There was one explosion in which both methane and coal dust were involved.

2. The explosion occurred at 10:57 p.m., April 25, 1963. The time was corroborated by the fan chart and several stopped watches worn by the deceased.
3. All the victims working in the 3 right area of the mine at the time of the explosion died in a relatively short time.
4. No blasting was being done at the time of the ignition.
5. Methane was being liberated in the face areas.
6. The explosion was propagated through the adjacent 2 panel section and considerable portion of the 3 right entries by coal dust.
7. The adequate rock-dusting in the 3 right entries confined the explosion.
8. The feeder and relay belts in 3 right were running practically empty of coal.
9. The first of the air-lock doors on the haulage road of 3 right used to divert the air into 3 panel was found open while the other door was destroyed by the forces of the explosion.
10. With the first air-lock door open considerable air would escape along the conveyor belt line from the section to the return and bypass working places in 3 panel.
11. The possibility of the man door between the supply road and the 3 right belt transfer point outby 3 panel being open thereby permitting most of the air to be short-circuited from 3 panel is not entirely ruled out.
12. The main check curtain used to deflect the air behind the line brattice and into the face of 5 entry was found rolled up and wrapped with wire. This caused a complete short circuit of the air current from the face of No. 5 entry.
13. Evidence elicited during the formal hearing from employee witnesses who had worked on the other shift in 3 panel verified investigation findings that the rolling up of key check curtains to facilitate the movement of shuttle cars transporting coal was commonplace.
14. All checks and curtain and plastic stoppings in 3 panel were burned and destroyed. Small pieces of the material were blown and scattered throughout the section. Therefore, there was no way of ascertaining whether checks in addition to the one in the last crosscut in No. 5 entry were rolled or tied up.



15. A large spool of "miner" cable was transported on the bar of a cutting machine during the 3:30 p.m. to 11:30 p.m. shift from 2 panel through 3 panel for shipment to the 1 left section. The route traversed necessitated passing through stoppings and check curtains in by the tailpiece in 3 panel, and it is possible that these stoppings and/or curtains were left down or rolled up thereby short-circuiting ventilation from the face workings.
16. The amount of methane that had accumulated as evidenced throughout the explosion area points to a major ventilation interruption of extended duration.
17. There was no evidence found during or following the investigation that there was an unusual or out-of-the-ordinary liberation of methane in the 3 panel section during the fateful shift.
18. Loose coal and coal dust were observed along shuttle-car routes, near the belt tailpiece, and in all the face areas in 3 panel; all faces had been driven 90 feet and crosscuts were in the process of being turned.
19. A loading machine was at the face of No. 5 entry 3 panel when the explosion occurred; no other face electrical equipment was at a working face in 3 panel.
20. The greater part of the permissible-type electrical face equipment in the mine was not maintained in permissible condition.
21. It is presumed that the loading machine at the face of the crosscut in No. 5 entry 3 panel was operating. The loading head was canted toward the left rib and contained cuttings and spillage pushed up from the floor or from along the left rib as the operator positioned the machine for resumption of loading. One loaded shuttle car had left the place enroute to the dumping point while an empty shuttle car was enroute for loading. The loading unit was equipped with push-button controls, the holding coils of which release contact when the power is cut off; these controls functioned normally when the power was cut off the section during the explosion.
22. It is believed that arcing at the exposed commutator brushes of the main motor of the loading machine in operation in the face crosscut of 5 entry 3 panel was the source of ignition.
23. The points at which the bodies of both the loading-machine operator and his helper were found in 5 entry, 96 feet outby their duty stations, strongly indicate they both saw and knew what was taking place and were hurriedly evacuating the place.
24. Considering the amount of methane that was obviously present in 3 panel when the explosion occurred and the fact that five men of the crew were provided with flame safety lamps, it is apparent that gas testing practices were inadequate or gross laxity in making gas tests occurred.

25. The workmen and officials testified that their tests for gas with a flame safety lamp were made with a walking flame.

26. The flame safety lamps found in 3 panel withstood the rigid tests to which they were subjected in the Bureau of Mines testing laboratory at Pittsburgh and are ruled out as a source of ignition.

Cause of Explosion: This disaster was caused by the ignition of a body of methane by a spark or electric arc. The methane was liberated in No. 5 entry and probably No. 4 entry of 3 panel and accumulated because of a prolonged interruption of the face ventilation. The ventilation was interrupted by one or more of the following: A ventilation door at the entrance to 3 panel left open, a man door open in a stopping between the supply road and belt outby 3 panel, one or more temporary stoppings removed for haulage purposes, and backup curtains, check curtains, and/or line curtains tied up for movement of mobile equipment.

#### RECOMMENDATIONS

The following recommendations are made to prevent similar disasters:

1. Air in sufficient quantity shall be directed to the working faces at all times so as to prevent accumulations of explosive gases or noxious fumes.
2. On entries, other than room entries, stoppings in crosscuts between intake and return airways should be built of solid, substantial, incombustible material, such as concrete, concrete blocks, brick, or tile.
3. Only one coal-producing unit should be worked on a single air split.
4. Mine projections should be planned so as to eliminate the use of air-lock doors for ventilation purposes; the projections should also incorporate a system of ventilation that will minimize the use of check curtains across routes negotiated by mobile equipment.
5. Check curtains shall not be deliberately opened or raised and fastened in place under any circumstances. If it is necessary to open or raise a check curtain or curtains to permit equipment to pass through, the check curtain or curtains shall be put back in place as soon as the equipment has passed. Equipment shall never be parked under check curtains.
6. Checks should be split and overlapped or otherwise installed so as to permit passage of mobile equipment with a minimum of damage to the checks.
7. Line curtains should be installed in a manner that will assure adequate ventilation at the working faces.
8. The capabilities of men required to use safety lamps should be checked periodically.

9. Examinations for gas in face workings shall be made at intervals sufficiently frequent to detect the presence of methane before it reaches dangerous proportions. The locations in which foremen and men are required to make tests for gas shall be clear to all and the required testing practices shall be strictly enforced.
10. A capping flame should be used in working places when making the gas tests with a flame safety lamp. In turbulent atmospheres other suitable instruments should be used to supplement the flame safety lamp in testing for gas.
11. Only bonafide parts shall be used in permissible flame safety lamps.
12. Rock dust shall be applied and kept within 40 feet of the faces in all working places that are not definitely wet, including the open crosscuts.
13. Rock dust shall be distributed uniformly on the roof, ribs, and floor and maintained in such quantity that the incombustible content of the combined rock dust, coal dust, and other dust will not be less than 65 percent, plus 1 percent for each 0.1 percent of methane present in the ventilating current.
14. To aid in prevention of widespread explosions, in addition to required rock-dust applications, erection of effective rock-dust barriers near the working faces and along belt conveyors should be given serious consideration by management.
15. Permissible equipment shall be maintained in permissible condition at all times.
16. The number of splices in trailing cables shall be kept to a minimum and in no case shall they exceed five in number.
17. Trailing cables should not be run over with mobile equipment.
18. Nips of trailing cables should be equipped with fuses of the proper sizes and capacities.
19. Multiple power conductors or nipping stations shall be kept reasonable distances from working faces and in no case shall they be in by the last open crosscut.
20. Electrical repairs to equipment should be made in intake air.

The following recommendation had no bearing on the explosion but its adoption should receive careful consideration.

1. When the main fan fails or stops, immediate action should be taken to cut off the power and withdraw the men from the face regions of the mine. If ventilation is restored in a reasonable time, the face regions and other places where methane is likely to accumulate should be re-examined by certified or competent supervisors and, if found to be free from explosive gas, power may be restored and work resumed. If ventilation is not restored in a reasonable time, all underground employees should be removed from the mine.

The following good mining practices were inaugurated by management when mining was resumed upon recommendation by the Bureau:

1. A suitable check-in and check-out system.
2. Metal identification tags were riveted to the belts of all underground personnel.
3. Operating safety standards pertinent to all work categories.
4. A program of proper clean ups and rock-dusting in face areas, shuttle-car routes, along belt lines, and at both dumping and transfer point of belts.
5. A program for the proper maintenance and follow-up of such work for permissible electrical equipment.

ACKNOWLEDGMENT

The writers acknowledge gratefully the courtesies extended and the help given by officials and other members of the United Mine Workers of America, officials and employees of the operating company, and representatives of the West Virginia Department of Mines and the United States Bureau of Mines.

Respectfully submitted,

*William R. Park*

William R. Park

*John J. Dougherty*

John J. Dougherty

*Roy C. Estep*

Roy C. Estep

Approved by:

*James Westfield*

James Westfield  
Assistant Director--Health and Safety

*Marling J. Ankeny*

Marling J. Ankeny  
Director

# ANALYSES OF AIR SAMPLES

TABLE 1

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY W. D. Baldwin  
W. M. Cordray  
W. R. Melville

DATE	LOCATION IN MINE	BOTTLE NO.	CARBON DIOXIDE	OXYGEN	METHANE	NITROGEN	CUBIC FEET AIR PER MINUTE	CUBIC FEET METHANE IN 24 HOURS
4/30 and 5/1/63	Return No. 1 entry 2 panel 3 right	C-4110	0.14	20.80	0.24	78.82	20,900	72,000
do.	Bleeder No. 6 entry 1 panel off 3 right	C-4109	0.45	19.84	1.44	78.27	Still air	
do.	Return No. 5 entry 3 panel 3 right	C-4087	0.09	20.81	0.23	78.87	10,800	36,000
do.	Return at No. 1 entry (regulator) 3 right	C-4760	0.10	20.73	0.32	78.85	35,400	163,000
do.	Main return left approach Flag Run Shaft	C-4690	0.24	20.29	0.34	79.13	91,200	447,000
do.	Main return right approach Flag Run Shaft	C-4761	0.16	20.54	0.43	78.87	93,500	579,000
5/9/63	Return from 7 panel 3 right	A-7992	0.05	20.87	0.07	79.01	12,320	12,000
do.	Return from 1 and 2 panels 3 right	B-5830	0.16	20.60	0.53	78.71	29,325	224,000
do.	Return 3 panel 3 right	C-2192	0.07	20.84	0.17	78.92	8,645	21,000

LAB. NOS. 67331-67348

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY T. J. Ward

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
3A-1 3A-1 3A-1	band floor roof & ribs	EXPLOSION SAMPLES No. 1 (back entry) No. 3 panel off No. 3 right station No. 1594 40 feet = 0, samples taken every block	small	84.8
3A-2 3A-2 3A-2	band floor roof & ribs		small	82.6
			trace	84.5*
3A-3 3A-3 3A-3	band floor roof & ribs		large	72.6
			large	67.6
			trace	79.2
3A-4 3A-4 3A-4	band floor roof & ribs		large	44.4
			large	40.1
			large	38.0
3A-5 3A-5 3A-5	band floor roof & ribs		very large	42.2
			very large	39.7
			small	56.6
3A-6 3A-6 3A-6	band floor roof & ribs		very large	31.9
			very large	27.1
			large	29.7
			small	30.0*
			trace	26.0*
			trace	15.0*

\*By Volumeter

LAB. NOS. 67349-67366

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY A. Puskas & M. McManus

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE EXPLOSION SAMPLES	ALCOHOL COKE TEST	AS-RECEIVED	
				PERCENT	INCOMBUSTIBLE
3B-1 3B-1 3B-1	band floor roof & ribs	No. 2 entry 3 panel off 3 right, 3B-1 sample = station 1577 / 40 = 0, samples taken every block	large	71.9	
			large	74.3	
			trace	85.0*	
3B-2 3B-2 3B-2	band floor roof & ribs		large	65.6	
			large	72.1	
			large	70.9	
3B-3 3B-3 3B-3	band floor roof & ribs		very large	42.6	
			very large	37.9	
			large	63.2	
3B-4 3B-4 3B-4	band floor roof & ribs		very large	50.4	
			very large	37.2	
			large	70.5	
3B-5 3B-5 3B-5	band floor roof & ribs		very large	35.5	
			large	37.6	
			large	41.5	
3B-6 3B-6 3B-6	band floor roof & ribs		trace	22.0*	
			large	33.0	
			trace	69.0*	

\*By Volumeter



LAB. NOS. 67367-67384

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE EXPLOSION SAMPLES	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		No. 3 entry of 3 panel off 3 right, 3C1 samples, station 1563 in No. 5 entry 3 right / 45 feet, samples collected every block		
3C-1	band		large	61.6
3C-1	roof-ribs		small	56.0
3C-1	floor		very large	48.4
3C-2	band		large	44.8
3C-2	roof-ribs		large	63.3
3C-2	floor		large	24.1
3C-3	band		large	38.3
3C-3	roof-ribs		small	54.0
3C-3	floor		large	42.0
3C-4	band		large	58.2
3C-4	roof-ribs		large	78.3
3C-4	floor		large	42.3
3C-5	band		large	27.5
3C-5	roof-ribs		large	28.4
3C-5	floor		very large	24.8
3C-6	band		trace	26.0*
3C-6	roof-ribs		none	19.0*
3C-6	floor		trace	23.5*

\*By Volumeter

LAB. NOS. 67385-67402

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY P. M. Shay

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 4 entry No. 3 panel off No. 3 right		
		3D-1 sample = station 1545 / 40 feet, samples collected in every block		
3D-1	band		small	49.2
3D-1	floor		large	52.2
3D-1	roof & rib		small	48.3
3D-2	band		large	42.4
3D-2	floor		large	46.6
3D-2	roof & rib		small	53.0
3D-3	band		large	49.4
3D-3	floor	rock-dusted after explosion	large	72.5
3D-3	roof & rib	rock-dusted after explosion	small	82.6
3D-4	band		very large	35.8
3D-4	floor		very large	35.6
3D-4	roof & rib		large	28.4
3D-5	band		large	32.1
3D-5	floor		large	30.2
3D-5	roof & rib		large	25.9
3D-6	band		small	25.9
3D-6	floor		small	27.3
3D-6	roof & rib		small	24.5

IAB. NOS. 67403-67417

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 5 entry No. 3 panel off 3 right, 3E-2 sample = station 2318 in No. 4 entry / 40 feet = 0, samples taken every block		
		not developed, no sample		
3E-1	band		large	43.5
3E-2	roof & ribs		large	46.4
3E-2	floor		large	46.1
3E-3	band		very large	41.8
3E-3	roof & ribs		large	31.0
3E-3	floor		very large	39.7
3E-4	band		large	30.1
3E-4	roof & ribs		large	51.4
3E-4	floor		very large	29.5
3E-5	band		trace	50.0*
3E-5	roof & ribs		trace	60.5
3E-5	floor		trace	44.0*
3E-6	band	64 feet outby face	trace	47.5*
3E-6	roof & ribs	64 feet outby face	trace	72.0*
3E-6	floor	64 feet outby face	trace	42.0*

\*By Volumeter

LAB. NOS. 67312-67330

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
1	band	all crosscuts in No. 3 panel 3 right, samples collected from left to right (1 to 5 entries)	large	69.4
2	"	No. 1 crosscut off No. 1 entry	large	66.1
3	"	No. 1 crosscut off No. 2 entry	large	52.9
4	"	No. 1 crosscut off No. 3 entry	large	36.0
5	"	No. 2 crosscut off No. 1 entry	large	39.1
6	"	No. 2 crosscut off No. 2 entry	large	40.1
7	"	No. 2 crosscut off No. 3 entry	large	59.0
8	"	No. 2 crosscut off No. 4 entry	large	53.4
9	"	No. 3 crosscut off No. 1 entry	large	40.5
10	"	No. 3 crosscut off No. 2 entry	very large	39.9
11	"	No. 3 crosscut off No. 3 entry	large	47.1
12	"	No. 3 crosscut off No. 4 entry	very large	44.2
13	"	No. 4 crosscut off No. 1 entry	large	35.9
14	"	No. 4 crosscut off No. 2 entry	large	37.9
15	"	No. 4 crosscut off No. 3 entry	large	41.2
16	"	No. 4 crosscut off No. 4 entry	large	33.1
17	"	No. 5 crosscut off No. 1 entry	large	30.5
18	"	No. 5 crosscut off No. 2 entry	large	34.1
19	"	No. 5 crosscut off No. 3 entry	large	38.4
		No. 1 crosscut off No. 4 entry not developed		

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY T. J. Ward

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 1 entry No. 2 panel off No. 3 right section beginning station No. 1643 / 35 feet, samples taken every block		
		No. 1 back entry		
4A-1	band		trace	61.2
4A-1	floor		trace	73.5*
4A-1	roof & ribs		trace	65.7
4A-2	band		trace	72.0*
4A-2	floor		trace	76.5*
4A-2	roof & ribs		trace	69.0*
4A-3	band		trace	67.0*
4A-3	floor		trace	78.0*
4A-3	roof & ribs		trace	76.5*
4A-4	band		small	83.9
4A-4	floor		small	82.3
4A-4	roof & ribs		trace	75.0*
4A-5	band		small	70.6
4A-5	floor		small	71.1
4A-5	roof & ribs		trace	73.5*
4A-6	band		small	67.3
4A-6	floor		small	61.8
4A-6	roof & ribs		trace	65.5*
4A-7	band		trace	69.0*
4A-7	floor		small	71.6
4A-7	roof & ribs		trace	69.0*

IAB. NOS. 67881-67937

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY T. J. Ward

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4A-8	band		trace	64.8
4A-8	floor		trace	63.9
4A-8	roof & ribs		trace	71.5*
4A-9	band		small	70.5
4A-9	floor		small	69.2
4A-9	roof & ribs		trace	71.0*
4A-10	band		trace	53.8
4A-10	floor		small	53.8
4A-10	roof & ribs		trace	66.0*
4A-11	band		small	63.9
4A-11	floor		small	61.8
4A-11	roof & ribs		trace	75.5*
4A-12	band		small	74.9
4A-12	floor		trace	73.5*
4A-12	roof & ribs		trace	87.0*
4A-13	band		trace	70.0*
4A-13	floor		small	65.2
4A-13	roof & ribs		trace	61.4
4A-14	band		trace	63.9
4A-14	floor		small	68.0
4A-14	roof & ribs		trace	66.8
4A-15	band		small	67.6
4A-15	floor		small	65.5
4A-15	roof & ribs		trace	67.0*

IAB. NOS. 67881-67937

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY T. J. Ward

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4A-16	band	42 feet outby face region	trace	65.5*
4A-16	floor		trace	65.8
4A-16	roof & ribs		trace	69.5*
4A-17	band		large	61.9
4A-17	floor		large	60.4
4A-17	roof & ribs		trace	63.7
4A-18	band		small	53.3
4A-18	floor		small	49.1
4A-18	roof & ribs		trace	62.3
4A-19	band		small	57.1
4A-19	floor		small	54.6
4A-19	roof & ribs		trace	67.0

\*By Volumeter

LAB. NOS. 67938-67955

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY H. T. Pigott

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4B1	band	EXPLOSION SAMPLES crosscuts between Nos. 1 and 2 entries in No. 2 panel off 3 right, No. 4B1 sample at station 2041 / 40 feet, samples taken at every crosscut	trace	70.5*
4B2	"		trace	73.5*
4B3	"		trace	75.0*
4B4	"		small	70.5
4B5	"		trace	75.0*
4B6	"		large	62.4
4B7	"		large	48.5
4B8	"		trace	57.8
4B9	"		trace	52.0*
4B10	"		large	74.7
4B11	"		large	55.8
4B12	"		large	54.6
4B13	"		trace	50.5*
4B14	"		small	64.8
4B15	"		trace	70.5*
4B16	"		trace	83.0*
4B17	"		large	47.5
4B18	"		large	43.9

\*By Volumeter



IAB. NOS. 67956-68009TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 2 entry of 2 panel off 3 right station 1632 / 15 feet = sample 4C-1, samples collected every block		
4C-1	band		trace	51.0*
4C-1	roof-ribs		small	58.4
4C-1	floor		small	51.9
4C-2	band		trace	62.4
4C-2	roof-ribs		trace	68.0*
4C-2	floor		trace	66.0
4C-3	band		trace	51.5*
4C-3	roof-ribs		trace	73.0*
4C-3	floor		trace	48.0*
4C-4	band		small	48.6
4C-4	roof-ribs		small	72.5
4C-4	floor		small	54.1
4C-5	band		small	69.3
4C-5	roof-ribs		trace	76.0*
4C-5	floor		small	56.6
4C-6	band		trace	66.0*
4C-6	roof-ribs		trace	66.5*
4C-6	floor		small	52.2
4C-7	band		small	65.8
4C-7	roof-ribs		trace	62.1
4C-7	floor		large	61.6

IAB. NOS. 67956-68009TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4C-8	band		small	66.0
4C-8	roof-ribs		trace	66.0*
4C-8	floor		small	71.1
4C-9	band		large	69.2
4C-9	roof-ribs		trace	71.5*
4C-9	floor		very large	62.9
4C-10	band		large	55.2
4C-10	roof-ribs		trace	68.0*
4C-10	floor		large	63.5
4C-11	band		small	81.4
4C-11	roof-ribs		small	80.3
4C-11	floor		very large	64.6
4C-12	band		large	51.1
4C-12	roof-ribs		trace	66.9
4C-12	floor		small	58.1
4C-13	band		small	57.5
4C-13	roof-ribs		trace	51.5*
4C-13	floor		small	64.5
4C-14	band		large	71.5
4C-14	roof-ribs		trace	65.4
4C-14	floor		small	74.0
4C-15	band		large	66.9
4C-15	roof-ribs		trace	67.5*
4C-15	floor		small	76.3

LAB. NOS. 67956-68009

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4C-16	band	50 feet outby pillar gob line	small	49.7
4C-16	roof-ribs		trace	50.0*
4C-16	floor		small	43.2
4C-17	band	50 feet outby pillar gob line	small	42.0
4C-17	roof-ribs		small	60.3
4C-17	floor		large	32.7
4C-18	band	50 feet outby pillar gob line	large	53.1
4C-18	roof-ribs		trace	63.6
4C-18	floor		large	34.1

\*By Volumeter

LAB. NOS. 68010-68027

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY P. M. Shay

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4D-1	band	EXPLOSION SAMPLES crosscuts between Nos. 2 and 3 entries in No. 2 panel off No. 3 right, 4D1 sample at station 2041 / 40 feet, samples taken at every crosscut	large	83.4
4D-2	"		trace	64.8
4D-3	"		large	65.9
4D-4	"		small	68.6
4D-5	"		large	67.4
4D-6	"		large	59.2
4D-7	"		large	75.4
4D-8	"		large	80.8
4D-9	"		large	59.5
4D-10	"		large	60.0
4D-11	"		large	58.2
4D-12	"		large	62.2
4D-13	"		small	51.9
4D-14	"		small	71.6
4D-15	"		large	62.2
4D-16	"		small	60.5
4D-17	"		large	55.9
4D-18	"		large	51.0

IAB. NOS. 68028-68084

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 3 entry No. 2 panel off 3 right, sample 4E-1 = station 1618 in No. 5 entry 3 right 40 feet, samples taken every block		
4E-1	band		small	64.0
4E-1	roof & ribs		small	56.8
4E-1	floor		small	62.3
4E-2	band		small	61.1
4E-2	roof & ribs		trace	71.5*
4E-2	floor		trace	63.0
4E-3	band		trace	65.5*
4E-3	roof & ribs		trace	57.4
4E-3	floor		trace	68.5*
4E-4	band		trace	62.6
4E-4	roof & ribs		trace	71.5*
4E-4	floor		small	66.0
4E-5	band		trace	64.1
4E-5	roof & ribs		none	69.5*
4E-5	floor		trace	68.0*
4E-6	band		trace	64.2
4E-6	roof & ribs		trace	72.0*
4E-6	floor		trace	65.9
4E-7	band		trace	67.4
4E-7	roof & ribs		none	70.0*
4E-7	floor		small	64.3

IAB. NOS. 68028-68084

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4E-8	band roof & ribs floor		small	68.9
4E-8			trace	68.0*
4E-8			small	67.2
4E-9	band roof & ribs floor		small	70.9
4E-9			none	82.5*
4E-9			small	66.7
4E-10	band roof & ribs floor		trace	51.0*
4E-10			trace	54.0*
4E-10			small	55.4
4E-11	band roof & ribs floor		small	60.1
4E-11			none	72.0*
4E-11			small	55.8
4E-12	band roof & ribs floor		trace	66.5*
4E-12			trace	80.5*
4E-12			small	66.6
4E-13	band roof & ribs floor		trace	53.5*
4E-13			none	77.0*
4E-13			trace	58.5
4E-14	band roof & ribs floor		small	58.7
4E-14			none	64.0
4E-14			trace	53.0*
4E-15	band roof & ribs floor		trace	54.0*
4E-15			none	61.4
4E-15			small	55.8

IAB. NOS. 68028-68084

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
4E-16	band		small	55.7
4E-16	roof & ribs		none	51.0*
4E-16	floor		small	59.7
4E-17	band		trace	63.6
4E-17	roof & ribs		none	71.0*
4E-17	floor		small	60.5
4E-18	band		small	57.0
4E-18	roof & ribs		none	48.5*
4E-18	floor		small	61.1
4E-19	band	40 feet outby pillar fall	trace	70.0*
4E-19	roof & ribs		trace	68.5*
4E-19	floor		small	54.5

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 29-30, 1963

T. J. Ward &amp;

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY W. D. Baldwin

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
EXPLOSION SAMPLES				
No. 1 entry 3 right off southeast mains, No. AA-1 samples = 1063 / 45 feet, samples taken every other block				
AA-1	band	0 / 00	trace	77.0*
AA-1	floor		small	73.4
AA-1	roof & ribs		small	71.4
AA-2	band		trace	78.0*
AA-2	floor		trace	83.0*
AA-2	roof & ribs		trace	65.0
AA-3	band	station 1187 / 35'	small	78.7
AA-3	floor		trace	75.5*
AA-3	roof & ribs		trace	78.0*
AA-4	band		large	65.1
AA-4	floor		large	65.0
AA-4	roof & ribs		small	59.5
AA-5	band	station 1309 / 45'	small	70.7
AA-5	floor		trace	74.0*
AA-5	roof & ribs		small	65.4
AA-6	band		small	69.5
AA-6	floor		large	63.8
AA-6	roof & ribs		trace	72.0*
AA-7	band		large	72.7
AA-7	floor		large	67.7
AA-7	roof & ribs		trace	70.5*



TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29-30, 1963

T. J. Ward &amp;

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY W. D. Baldwin

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
AA-8	band	station 1480 / 45'	large	62.7
AA-8	floor		large	70.8
AA-8	roof & ribs		trace	70.5*
AA-9	band		large	55.8
AA-9	floor		large	62.5
AA-9	roof & ribs		small	64.8
AA-10	band		large	68.2
AA-10	floor		large	67.2
AA-10	roof & ribs		small	66.5
AA-11	band		large	56.2
AA-11	floor		small	67.0
AA-11	roof & ribs		small	55.3
AA-12	band		large	77.9
AA-12	floor		small	73.6
AA-12	roof & ribs		small	67.0
AA-13	band		large	75.3
AA-13	floor		large	75.3
AA-13	roof & ribs		trace	67.5
AA-14	band		large	66.2
AA-14	floor		large	71.0
AA-14	roof & ribs		trace	49.5*
AA-15	band		large	80.5
AA-15	floor		large	76.0
AA-15	roof & ribs		small	62.1

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 29-30, 1963

T. J. Ward &amp;

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY W. D. Baldwin

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
AA-16	band		large	81.0
AA-16	floor		large	79.7
AA-16	roof & ribs		trace	61.1
AA-17	band		large	68.0
AA-17	floor		large	67.0
AA-17	roof & ribs		trace	53.5*
AA-18	band		large	65.4
AA-18	floor		large	70.2
AA-18	roof & ribs		small	57.2
AA-19	band		small	76.8
AA-19	floor		large	86.4
AA-19	roof & ribs		trace	63.2

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29, 1963  
 MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY A. Puskas & M. McManus

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 2 entry 3 right off southeast mains, BB-1 sample = station 1062 / 45', samples taken every other block		
BB-1	band		trace	70.0*
BB-1	floor		trace	68.0*
BB-1	roof & ribs		trace	80.5*
BB-2	band		large	61.6
BB-2	floor		large	63.4
BB-2	roof & ribs		trace	64.4
BB-3	band		small	69.7
BB-3	floor		small	68.5
BB-3	roof & ribs		trace	66.8
BB-4	band		large	67.0
BB-4	floor		large	65.2
BB-4	roof & ribs		small	60.4
BB-5	band		large	72.1
BB-5	floor		large	71.2
BB-5	roof & ribs		small	76.0
BB-6	band		large	66.7
BB-6	floor		large	68.3
BB-6	roof & ribs		small	69.4
BB-7	band		small	69.6
BB-7	floor		large	73.8
BB-7	roof & ribs		small	64.7

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY A. Puskas &amp; M. McManus

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
BB-8	band		large	52.9
BB-8	floor		large	54.2
BB-8	roof & ribs		small	52.6
BB-9	band		large	61.0
BB-9	floor		large	67.6
BB-9	roof & ribs		large	46.0
BB-10	band		very large	67.1
BB-10	floor		very large	69.4
BB-10	roof & ribs		large	51.5

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY H. T. Pigott

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
BB-11	band		large	54.9
BB-11	floor		very large	50.0
BB-11	roof & ribs		large	50.2
BB-12	band		large	64.6
BB-12	floor		large	66.5
BB-12	roof & ribs		small	64.3
BB-13	band		small	62.0
BB-13	floor		large	60.2
BB-13	roof & ribs		large	64.5
BB-14	band		large	72.7
BB-14	floor		large	79.6
BB-14	roof & ribs		small	76.3
BB-15	band		large	62.3
BB-15	floor		large	68.6
BB-15	roof & ribs		large	64.5
BB-16	band		large	54.9
BB-16	floor		large	55.0
BB-16	roof & ribs		large	54.9
BB-17	band		very large	53.5
BB-17	floor		very large	50.2
BB-17	roof & ribs		large	66.9

IAB. NOS. 68200-68226

Sheet No. 7

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY H. T. Pigott

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
BB-18	band		large	53.7
BB-18	floor		large	52.0
BB-18	roof & ribs		small	46.2
BB-19	band		large	34.0
BB-19	floor		large	35.5
BB-19	roof & ribs		large	33.7

TABLE 2

ANALYSES OF DUST SAMPLES

DATE COLLECTED

April 29-30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 3 entry of 3 right mains off southeast mains, CC-1 sample = station 964 in No. 6 entry south-east mains / 40 feet, samples taken every other block		
CC-1	band		small	77.5
CC-1	roof-ribs		trace	76.5*
CC-1	floor		small	80.2
CC-2	band		small	61.6
CC-2	roof-ribs		small	62.8
CC-2	floor		large	47.5
CC-3	band		small	68.2
CC-3	roof-ribs		small	62.3
CC-3	floor		small	71.8
CC-4	band		small	79.3
CC-4	roof-ribs		small	71.9
CC-4	floor		large	69.4
CC-5	band		large	82.9
CC-5	roof-ribs		small	76.0
CC-5	floor		large	81.8
CC-6	band		large	72.1
CC-6	roof-ribs		large	77.8
CC-6	floor		large	73.8
CC-7	band		large	61.6
CC-7	roof-ribs		large	70.4
CC-7	floor		very large	55.7

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29-30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
CC-8	band		very large	65.9
CC-8	roof-ribs		very large	61.1
CC-8	floor		very large	65.7
CC-9	band		large	60.7
CC-9	roof-ribs		large	67.0
CC-9	floor		large	63.8
CC-10	band		large	58.2
CC-10	roof-ribs		large	63.8
CC-10	floor		large	60.8
CC-11	band		large	58.4
CC-11	roof-ribs		large	59.4
CC-11	floor		large	54.9
CC-12	band		very large	64.6
CC-12	roof-ribs		very large	62.7
CC-12	floor		very large	72.9
CC-13	band		very large	62.9
CC-13	roof-ribs		very large	56.2
CC-13	floor		very large	58.8
CC-14	band		very large	54.1
CC-14	roof-ribs		large	65.2
CC-14	floor		large	55.4
CC-15	band		very large	53.3
CC-15	roof-ribs		small	57.3
CC-15	floor		large	53.8



IAB. NOS. 68227-68286

Sheet No. 10

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29-30, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
CC-16	band		large	69.2
CC-16	roof-ribs		large	61.4
CC-16	floor		large	67.0
CC-17	band		very large	58.8
CC-17	roof-ribs		very large	60.3
CC-17	floor		large	51.5
CC-18	band		large	63.9
CC-18	roof-ribs		large	65.3
CC-18	floor		large	72.4
CC-19	band		large	47.6
CC-19	roof-ribs		large	51.6
CC-19	floor		large	48.5
CC-20	band		large	56.1
CC-20	roof-ribs		large	46.0
CC-20	floor		large	56.9

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 29 and May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY P. M. Shay

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 4 entry No. 3 right DD-1 sample = station 962 / 40 feet, samples collected every other block		
DD-1	band		trace	85.5*
DD-1	floor		trace	92.0*
DD-1	roof & rib		trace	68.0*
DD-2	band		small	78.0
DD-2	floor		small	77.3
DD-2	roof & rib		trace	71.0*
DD-3	ribs & floor		large	72.7
DD-3	floor	(roof not included, too high)	trace	86.0*
DD-4	band		small	83.7
DD-4	floor		small	81.5
DD-4	roof & rib		small	87.4
DD-5	band		small	80.7
DD-5	floor		large	79.4
DD-5	roof & rib		small	77.1
DD-6	band		small	80.2
DD-6	floor		small	85.8
DD-6	roof & rib		small	67.9
DD-7	band		small	85.5
DD-7	floor		small	86.6
DD-7	roof & rib		small	68.7

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 29 and May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY P. M. Shay

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
DD-8	band		large	62.9
DD-8	floor		large	69.1
DD-8	roof & rib		small	67.5
DD-9	band		large	62.2
DD-9	floor		large	58.3
DD-9	roof & rib		small	66.7
DD-10	band		very large	60.6
DD-10	floor		large	59.3
DD-10	roof & rib		small	62.6
DD-11	band		large	63.1
DD-11	floor		large	72.3
DD-11	roof & rib		large	65.1
DD-12	band		very large	63.0
DD-12	floor		very large	61.5
DD-12	roof & rib		large	60.5
DD-13	band		very large	66.6
DD-13	floor		very large	67.9
DD-13	roof & rib		large	67.6
DD-14	band		very large	72.1
DD-14	floor		very large	69.0
DD-14	roof & rib		small	67.4
DD-15	band		large	66.2
DD-15	floor		large	67.2
DD-15	roof & rib		small	47.9

LAB. NOS. 68287-68341

Sheet No. 13

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29 and May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY P. M. Shay

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
DD-16	band		large	75.6
DD-16	floor		large	71.0
DD-16	roof & rib		small	72.2
DD-17	band		small	57.6
DD-17	floor		large	56.4
DD-17	roof & rib		large	58.1
DD-18	floor		large	58.9
DD-18	rib & floor	roof too high	large	48.5
DD-19	band		large	36.2
DD-19	floor		large	36.1
DD-19	roof & rib		large	68.2

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 29 and May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 5 entry 3 right of southeast mains, EE-1 sample = station 955 in No. 8 entry southeast mains / 40 feet, samples taken every other block		
EE-1	band		trace	70.0*
EE-1	roof & ribs		trace	70.0*
EE-1	floor		trace	73.5*
EE-2	band		trace	78.0*
EE-2	roof & ribs		trace	78.0*
EE-2	floor		trace	85.0*
EE-3	band		trace	72.0*
EE-3	roof & ribs		trace	65.5*
EE-3	floor		trace	76.0*
EE-4	band		small	75.9
EE-4	roof & ribs		small	77.4
EE-4	floor		small	74.3
EE-5	band		small	73.9
EE-5	roof & ribs		trace	63.9
EE-5	floor		small	79.0
EE-6	band		small	79.4
EE-6	roof & ribs		small	88.0
EE-6	floor		trace	83.0*
EE-7	band		small	78.0
EE-7	roof & ribs		large	70.9
EE-7	floor		large	75.8

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29 and May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
EE-8	band roof & ribs floor		large	64.5
EE-8			small	63.0
EE-8			large	54.5
EE-9	band roof & ribs floor		large	64.2
EE-9			large	75.4
EE-9			large	66.9
EE-10	band roof & ribs floor		large	61.6
EE-10			large	55.2
EE-10			large	61.9
EE-11	band roof & ribs floor		large	68.2
EE-11			large	57.2
EE-11			very large	72.5
EE-12	band roof & ribs floor		very large	58.1
EE-12			small	54.5
EE-12			large	56.8
EE-13	band roof & ribs floor	very large	71.6	
EE-13		large	61.1	
EE-13		very large	67.2	
EE-14	band roof & ribs floor	large	72.1	
EE-14		small	93.2	
EE-14		very large	65.7	
EE-15	band roof & ribs floor	large	67.2	
EE-15		small	70.4	
EE-15		small	75.0	

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29 and May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
EE-16	band	fall, no sample	small	72.7
EE-16	roof & ribs		trace	77.0*
EE-16	floor		small	71.2
EE-17	band		large	71.0
EE-17	roof & ribs		small	70.7
EE-17	floor		small	68.6
EE-18	band		large	55.8
EE-18	roof & ribs		large	59.4
EE-18	floor		large	54.7
EE-19				

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 29 and May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
1X-1	band	crosscuts in No. 3 right off southeast mains	trace	80.5*
2X-2	"	No. 1 crosscut off No. 1 entry	none	89.0*
3X-3		No. 2 crosscut off No. 2 entry		
		gobbed with rock, no sample, No. 3 crosscut off		
4X-4		No. 3 entry		
3X-5	"	No. 4 crosscut off No. 4 entry	trace	74.0*
2X-6	"	No. 5 crosscut off No. 3 entry	trace	70.0*
1X-7	"	No. 6 crosscut off No. 2 entry	trace	74.0*
2X-8	"	No. 7 crosscut off No. 1 entry	trace	80.0*
3X-9	"	No. 8 crosscut off No. 2 entry	none	70.5*
4X-10	"	No. 9 crosscut off No. 3 entry	trace	88.0*
3X-11	"	No. 10 crosscut off No. 4 entry	trace	84.0*
2X-12	"	No. 11 crosscut off No. 3 entry	large	68.8
1X-13	"	No. 12 crosscut off No. 2 entry	large	67.0
2X-14	"	No. 13 crosscut off No. 1 entry	large	69.4
3X-15	"	No. 14 crosscut off No. 2 entry	large	66.7
4X-16	"	No. 15 crosscut off No. 3 entry	small	79.5
3X-17	"	No. 16 crosscut off No. 4 entry	small	79.8
2X-18	"	No. 17 crosscut off No. 3 entry	large	64.5
1X-19	"	No. 18 crosscut off No. 2 entry	large	61.5
2X-20	"	No. 19 crosscut off No. 1 entry	trace	53.0*
3X-21	"	No. 20 crosscut off No. 2 entry	large	77.7
4X-22	"	No. 21 crosscut off No. 3 entry	very large	59.4
3X-23	"	No. 22 crosscut off No. 4 entry	large	84.1
2X-24	"	No. 23 crosscut off No. 3 entry	very large	55.1
1X-25	"	No. 24 crosscut off No. 2 entry	large	56.3
2X-26	"	No. 25 crosscut off No. 1 entry	large	61.3
3X-27	"	No. 26 crosscut off No. 2 entry	large	72.3
4X-28	"	No. 27 crosscut off No. 3 entry	small	93.4
		No. 28 crosscut off No. 4 entry	large	67.6



IAB. NOS. 68396-68437

Sheet No. 18

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 29 and May 1, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
3X-29	band	No. 29 crosscut off No. 3 entry	large	71.3
2X-30	"	No. 30 crosscut off No. 2 entry	large	64.8
1X-31	"	No. 31 crosscut off No. 1 entry	trace	80.0*
2X-32	"	No. 32 crosscut off No. 2 entry	small	72.5
3X-33	"	No. 33 crosscut off No. 3 entry	large	78.0
4X-34	"	No. 34 crosscut off No. 4 entry	large	78.5
3X-35	"	No. 35 crosscut off No. 3 entry	large	80.5
2X-36	"	No. 36 crosscut off No. 2 entry	small	66.7
1X-37	"	No. 37 crosscut off No. 1 entry	large	77.7
2X-38	"	No. 38 crosscut off No. 2 entry	large	71.4
3X-39	"	No. 39 crosscut off No. 3 entry	large	54.2
4X-40	"	No. 40 crosscut off No. 4 entry	large	60.6
3X-41	"	No. 41 crosscut off No. 3 entry	large	74.4
2X-42	"	No. 42 crosscut off No. 2 entry	very large	56.9
1X-43	"	No. 43 crosscut off No. 1 entry	very large	45.6

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co., Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
5A-1		No. 1 entry 7 panel off 3 right - 5A-2 sample =		
5A-2		station 1998 / 40 feet, samples taken every		
5A-2		other block		
5A-2		no sample taken, not developed	none	59.6
5A-3	band		none	57.4
5A-3	floor		none	50.5*
5A-3	roof & ribs		none	71.5*
5A-3	band		none	81.0*
5A-3	floor		none	63.2
5A-3	roof & ribs		none	78.5*
5A-4	band		none	86.0*
5A-4	floor		none	76.0*
5A-4	roof & ribs		none	
5A-5		no sample taken, rock dusted after explosion		
5A-6		no sample taken, rock dusted after explosion		
5A-7		no sample taken, rock dusted after explosion		

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY H. T. Pigott

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 2 entry 7 panel off 3 right, 5B-1 sample = station 1210 in No. 5 entry 3 right / 40 feet		
5B-1	band		small	73.5
5B-1	floor		small	69.1
5B-1	roof & ribs		trace	86.0*
5B-2	band		trace	65.8
5B-2	floor		none	66.0*
5B-2	roof & ribs		none	65.1
5B-3	band		none	72.0*
5B-3	floor		none	84.0*
5B-3	roof & ribs		none	74.5*
5B-4	band		none	71.5*
5B-4	floor		none	75.5*
5B-4	roof & ribs		none	65.8
5B-5	band		none	49.0*
5B-5	floor		none	44.0*
5B-5	roof & ribs		none	56.5
5B-6	band		none	44.0*
5B-6	floor		none	42.0*
5B-6	roof & ribs		none	44.0*
5B-7	band		none	35.0*
5B-7	floor		none	23.0*
5B-7	roof & ribs		none	49.0*

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY T. J. Ward

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 3 entry 7 panel off 3 right - 5C-1 sample - station 1202 in No. 5 entry 3 right / 40 feet		
5C-1	band		trace	58.6
5C-1	floor		trace	64.0
5C-1	roof & ribs		trace	65.4
5C-2	band		trace	70.0*
5C-2	floor		trace	72.0*
5C-2	roof & ribs		trace	65.9
5C-3	band		trace	77.5*
5C-3	floor		none	75.0*
5C-3	roof & ribs		none	69.0*
5C-4	band		none	72.5*
5C-4	floor		none	82.0*
5C-4	roof & ribs		none	67.0*
5C-5	band		none	40.5*
5C-5	floor		none	39.5*
5C-5	roof & ribs		none	51.0*
5C-6	band		none	49.5*
5C-6	floor		none	46.0*
5C-6	roof & ribs		none	65.2
5C-7	band		none	44.5*
5C-7	floor		none	45.0*
5C-7	roof & ribs		none	25.5*

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 4 entry 7 panel off 3 right, 5D-1 sample = station 1186 in No. 5 entry 3 right / 40 feet		
5D-1	band		none	81.0*
5D-1	floor		none	77.0*
5D-1	roof & ribs		none	73.0*
5D-2	band		none	76.5*
5D-2	floor		none	77.0*
5D-2	roof & ribs		none	51.5*
5D-3	band		none	66.6
5D-3	floor		none	57.1
5D-3	roof & ribs		none	74.0*
5D-4	band		none	36.0*
5D-4	floor		none	30.5*
5D-4	roof & ribs		none	64.4
5D-5	band		none	42.5*
5D-5	floor		none	39.5*
5D-5	roof & ribs		none	63.4
5D-6	band		none	62.7
5D-6	floor		none	59.4
5D-6	roof & ribs		none	48.5*
5D-7	band		none	69.0*
5D-7	floor		none	55.3
5D-7	roof & ribs		none	71.0*

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
5E-1 5E-1 5E-1	band floor roof & ribs	EXPLOSION SAMPLES No. 5 entry 7 panel off 3 right - 5E-1 sample = station 1244 in No. 5 entry 3 right / 40 feet	none	86.5*
5E-2 5E-2 5E-2	band floor roof & ribs		none	86.0*
5E-3 5E-3 5E-3	band floor roof & ribs		none	59.9
5E-4 5E-4 5E-4	band floor roof & ribs		none	69.5*
5E-5 5E-5 5E-5	band floor roof & ribs		none	66.0*
5E-6 5E-6 5E-6	band floor roof & ribs		none	78.5*
5E-7 5E-7 5E-7	band floor roof & ribs		none	87.0*
			none	89.5*
			none	81.0*
			none	64.7
			none	73.0*
			none	69.0*
			none	87.0*
			none	89.5*
			none	69.0*
			none	67.0*
			none	62.5
			none	52.5*
			none	47.5*
			none	35.5*
			trace	58.9

\*By Volumeter

## TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED May 2, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
2X1		in crosscuts in No. 7 panel 3 right, samples collected from left to right (1 to 5)		
		no sample, crosscut not developed off No. 1 entry		
2X2	band	No. 2 crosscut off No. 2 entry	none	75.0*
2X3	"	No. 3 crosscut off No. 3 entry	none	72.5*
2X4	"	No. 4 crosscut off No. 4 entry	none	54.0*
2X5	"	No. 5 crosscut off No. 3 entry	none	78.5*
2X6	"	No. 6 crosscut off No. 2 entry	none	71.5*
2X7	"	No. 7 crosscut off No. 1 entry	none	52.5*
2X8	"	No. 8 crosscut off No. 2 entry	none	50.5*
2X9	"	No. 9 crosscut off No. 3 entry	none	43.0*
2X10	"	No. 10 crosscut off No. 4 entry	none	44.0*
2X11	"	No. 11 crosscut off No. 3 entry	none	50.0*
2X12	"	No. 12 crosscut off No. 2 entry	none	38.0*
2X13		no sample, No. 13 crosscut off No. 1 entry		
		rock-dusted since explosion		
		no sample, No. 14 crosscut off No. 2 entry		
2X14		rock-dusted since explosion		

\*By Volumeter

DATE COLLECTED April 28, 1963

ANALYSES OF DUST SAMPLES

2

TABLE

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY W. D. Baldwin

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
A-1	band	EXPLOSION SAMPLES No. 1 entry southeast mains No. A-1 sample = station 140 / 40 feet = 0, samples taken every other block	none	89.0*
A-2	"		none	83.0*
A-3	"		none	84.0*
A-4	"		none	84.0*
A-5	"		none	84.5*
A-6	"		none	75.5*
A-7	"		none	86.5*
A-8	"		none	88.0*
A-9	"		none	91.0*
A-10	"		none	86.5*
A-11	"		none	80.5*
A-12	"		none	87.0*
A-13	"		none	81.0*
A-14	"		none	86.0*
A-15	"		none	87.0*
A-16	"		none	82.5*
A-17	"		none	85.5*
A-18	"		none	94.5*
A-19	"		none	88.0*
A-20	"		none	92.0*
A-21	"		none	98.0*
A-22	"		none	88.0*
A-23	"		none	87.5*
A-24	"		none	95.0*
A-25	"		none	57.1
A-26	no sample, fall			
A-27	no sample, fall			



LAB. NOS. 67418-67443

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY W. D. Baldwin

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
A-28 A-29 A-30 A-31	band	no sample, wet no sample, wet no sample, wet	none	92.5*

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 28, 1963

A. Fuskas &amp;

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. McManus

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
B-1	band	EXPLOSION SAMPLES No. 2 entry southeast mains No. 1 sample = station 138 / 25 = 0, samples taken every other block	none	79.5*
B-2	"		none	78.0*
B-3	"		none	84.5*
B-4	"		none	68.5*
B-5	"		none	86.5*
B-6	"		none	83.0*
B-7	"		none	74.5*
B-8	"	no sample, roof fall	none	78.0*
B-9	"		none	80.5*
B-10	"		none	73.5*
B-11	"		none	61.7
B-12	"		none	86.0*
B-13	"		none	57.9
B-14	"		none	86.5*
B-15	"	B entry terminates at this point	none	88.0*
B-16	"		trace	83.5*
B-17	"		none	84.0*
B-18	"		none	83.5*
B-19	"		none	69.5*
B-20	"		none	63.8
B-21	"		none	83.0*
B-22	"	*By Volumeter	none	81.5*
B-23	"		none	

LAB. NOS. 67466-67496

Sheet No. 4

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY P. M. Shay

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 3 entry southeast mains No. 1 sample = station 137 / 40 = 0, samples taken every other block		
C-1	band	station 137 / 40 feet	none	85.5*
C-2	"		none	77.0*
C-3	"		none	83.0*
C-4	"		none	73.0*
C-5	"		none	83.5*
C-6	"		none	76.0*
C-7	"		none	78.5*
C-8	"		trace	85.0*
C-9	"		none	79.0*
C-10	"		none	81.0*
C-11	"		none	84.5*
C-12	"		none	86.0*
C-13	"		trace	75.0*
C-14	"		trace	79.5*
C-15	"		trace	87.5*
C-16	"		trace	83.5*
C-17	"		none	93.0*
C-18	"		none	81.5*
C-19	"		none	89.5*
C-20	"		none	83.5*
C-21	"		none	82.5*
C-22	"		none	82.0*
C-23	"		none	77.0*
C-24	"		none	75.0*
C-25	"		none	84.5*
C-26	"		none	81.0*
C-27	"		none	38.0*
C-28	"		none	67.0*

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY P. M. Shay

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
C-29	band		none	59.7
C-30	"		none	47.5*
C-31	roof & rib		none	52.0*
				*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 4 entry southeast mains		
		No. 1 sample = station 132 / 40' = 0, samples taken every other block		
D-1	roof-ribs		none	70.5*
D-2	roof-ribs		none	85.0*
D-3	roof-ribs		none	79.0*
D-4	band		none	77.0*
D-5	"		none	71.0*
D-6	"		none	61.4
D-7	"		none	64.4
D-8	"		none	68.5*
D-9	"		none	70.5*
D-10	"		none	82.0*
D-11	"		none	75.5*
D-12	"		none	75.0*
D-13	"		none	82.5*
D-14	"		none	82.5*
D-15	"		trace	72.5*
D-16	"		trace	71.5*
D-17	"		trace	72.5*
D-18	"		none	83.5*
D-19	"		none	71.0*
D-20	"		trace	63.5
D-21	"		none	65.5*
D-22	"		none	62.0
D-23	"		none	61.9
D-24	"		none	78.0*
D-25	"		none	87.5*
D-26	roof-ribs		none	86.0*
D-27	band		none	62.3

IAB. NOS. 67497-67526

Sheet No. 7

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 28, 1963MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY M. I. Duncan

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
D-28	band		none	57.6
D-29	"		none	83.5*
D-30	roof-ribs		none	41.5*

\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
E-1	band	EXPLOSION SAMPLES No. 5 entry southeast mains No. 1 sample = station 133 / 40 = 0, samples taken every other block	none	84.5*
E-2	"		none	82.5*
E-3	"		none	88.5*
E-4	"		none	68.0*
E-5	"		none	77.0*
E-6	"		none	68.0*
E-7	"	no sample, roof fall	none	84.5*
E-8	"		none	75.0*
E-9	"		none	80.5*
E-10	"		none	68.5*
E-11	"		none	84.0*
E-12	"		none	67.5*
E-13	"	no sample, roof fall	none	82.5*
E-14	"		none	70.5*
E-15	"		none	82.0*
E-16	"		none	54.0*
E-17	"		none	89.0*
E-18	"		none	59.7
E-19	"		none	84.5*
E-20	"		none	69.5*
E-21	"		none	73.0*
E-22	"		none	70.0*
E-23	"		none	71.5*
E-24	"		none	65.1
E-25	"			
E-26	"			

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
E-27 E-28 E-29 E-30 E-31	band	no sample, wet no sample, wet no sample, wet no sample, wet	none	47.3

\*By Volumeter



TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY J. J. Dobis

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
F-1	band	No. 6 entry southeast mains, No. 1 sample = station 134 / 30 = 0, samples taken every other block	none	88.0*
F-2	"		none	86.0*
F-3	"		none	84.0*
F-4	"		none	79.5*
F-5	"		none	87.0*
F-6	"		none	72.0*
F-7	"	EXPLOSION SAMPLES  no sample, roof fall	none	84.5*
F-8	"		trace	60.2
F-9	"		none	54.2
F-10	"		none	66.0*
F-11	"		none	81.5*
F-12	"		trace	77.0*
F-13	"		trace	68.5*
F-14	"		trace	74.5*
F-15	"		small	80.0
F-16	"		trace	83.0*
F-17	"		none	91.0*
F-18	"		none	93.0*
F-19	"		none	71.5*
F-20	"		none	77.5*
F-21	"		none	

\*By Volumeter

DATE COLLECTED April 28, 1963

TABLE 2 ANALYSES OF DUST SAMPLES

DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
		No. 7 entry southeast mains, No. 1 sample = station 135 / 30 feet = 0, samples taken every other block		
	roof & ribs			
G-1	band		none	83.0*
G-2	"		none	89.0*
G-3	"		none	81.0*
G-4	"		none	85.5*
G-5	"		none	82.0*
G-6	"		trace	70.5*
G-7	roof & ribs		none	80.5*
G-8	band		none	79.0*
G-9	"		none	59.8
G-10	"		none	67.5*
G-11	"		none	80.0*
G-12	"		none	54.0*
G-13	"		none	83.5*
G-14	"		none	81.5*
G-15	"		none	77.5*
G-16	"		trace	69.0*
G-17	"		trace	78.0*
G-18	"		trace	90.5*
G-19	"		none	71.0*
G-20	"		none	61.3
G-21	"		none	82.0*
G-22	"		none	81.5*
G-23	"		none	91.5*
G-24	"		none	73.5*
G-25	"		none	62.3
G-26	"		none	68.5*
G-27	"		none	63.0
G-28	"		none	81.0*

\*By Volumeter

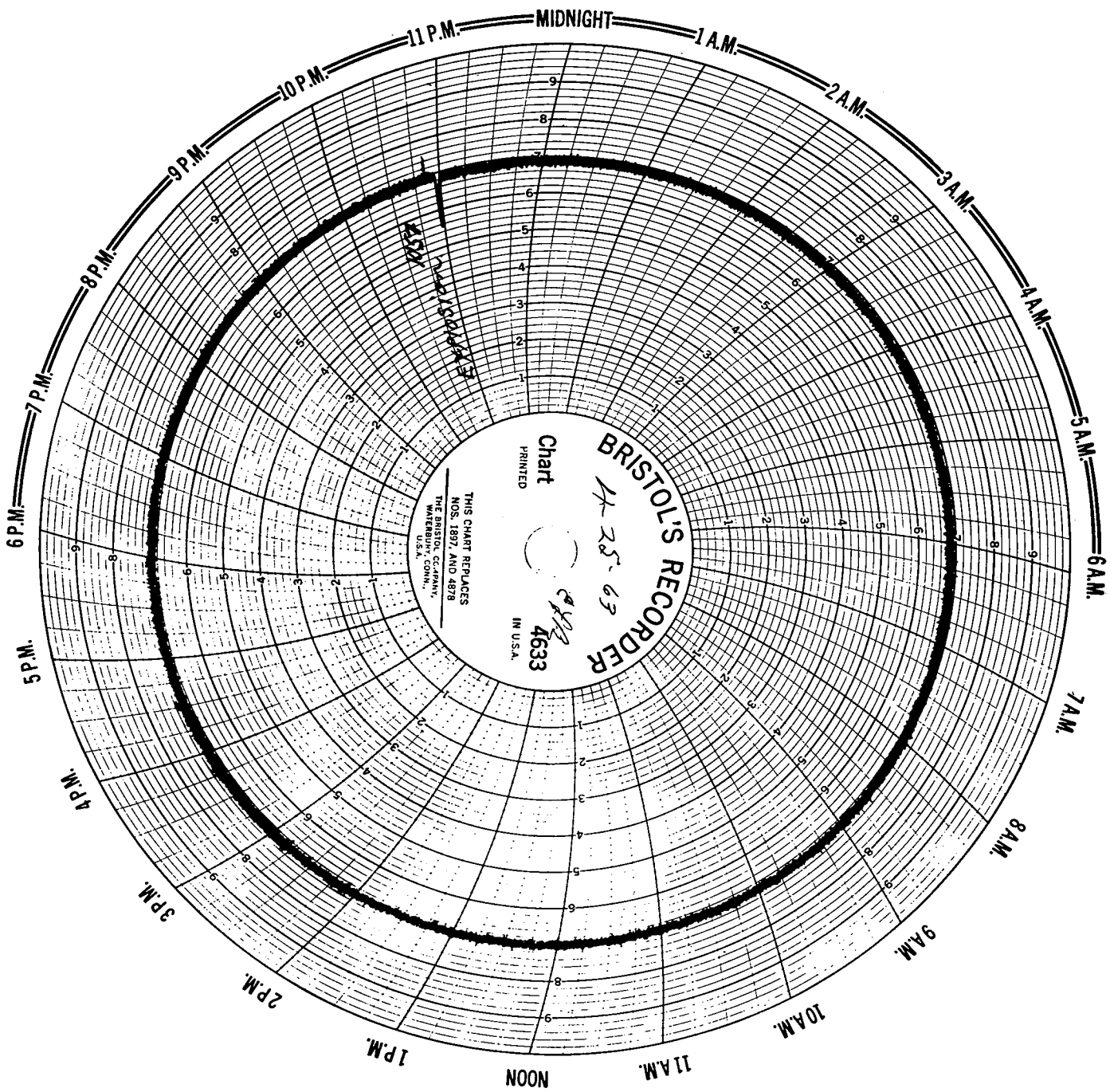
\*By Volumeter

TABLE 2 ANALYSES OF DUST SAMPLES DATE COLLECTED April 28, 1963

MINE Compass No. 2 COMPANY Clinchfield Coal Co. (Div. of the Pittston Co.) COLLECTED BY Joseph Marshalek

SAMPLE NO.	SAMPLE OF DUST FROM	LOCATION IN MINE	ALCOHOL COKE TEST	AS-RECEIVED PERCENT INCOMBUSTIBLE
		EXPLOSION SAMPLES		
H-1		No. 8 entry southeast mains, No. 1 sample =		
H-2	roof & ribs	station 136 / 30 feet = 0, samples taken every	none	87.5*
H-3	roof & ribs	other block	none	95.5*
H-4	band	rock gobbled 10" of roof, no sample	none	82.5*
H-5		floor wet		
H-6	roof & ribs	floor wet	none	74.5*
H-7	band	wet, no sample	none	78.0*
H-8	"	floor wet	none	91.5*
H-9				
H-10	roof & ribs	fall, no sample	none	37.5*
H-11	band	floor wet	none	85.5*
H-12	"		none	56.9
H-13	"		none	78.0*
H-14		rock gobbled 10" roof, no sample	none	
H-15	"		trace	90.0*
H-16	"		large	72.4
H-17	"		large	69.2
H-18				
H-19	roof & ribs	wet, no sample	none	85.5*
H-20		floor wet		
H-21	band	wet, no sample	none	82.0*
H-22				
H-23		wet, no sample		
H-24	"	sump hole, no sample	none	70.0*
H-25	"		none	79.0*
H-26				
H-27	roof & ribs	wet, no sample	none	62.1
H-28		floor wet		
H-29		wet, no sample		
		wet, no sample		

\*By Volumeter



APPENDIX C  
FAN CHART  
COMPASS NO. 2 MINE

APPENDIX F

Names of Personnel of Mine Rescue Teams That  
Participated in Recovery Work After the Explosion

Clinchfield Coal Company, Compass No. 1 Mine Team

Audrey R. Collins, Captain  
Paul Skidmore  
Dale See  
Ernest Collins  
Clyde Bennett  
Francis Skidmore

Jack Light, Safety Director, in charge of this team

Mountaineer Coal Company, No. 9 Mine Team

Harry Floyd, Captain  
William Floyd  
George Glover  
John G. Metz  
George Hennis  
Charles Daft

Mountaineer Coal Company, Williams Mine Team

Frank Smith, Jr., Captain  
Shirley B. Kittle  
Martin W. Kiser  
Stephen Dukich  
Henry J. Bingman

Mountaineer Coal Company, Loveridge Mine Team

Ernest Shafferman, Captain  
Owen J. Stevens  
Robert Johnson  
John Koval  
Sam Lopez  
Frank Yarish

Jesse G. Bowers, Safety Director, in charge of  
Mountaineer Coal Company Teams

APPENDIX F (con.)

Christopher Coal Company, Pursglove No. 15 Mine Team

Louie Krushansky, Captain  
Paul Evanoff  
Perry Sheets  
Johnny Pysh  
Luther B. Simpson  
Phillip Hines

Christopher Coal Company, Arkwright No. 1 Mine Team

Louis Tolka, Captain  
Louis Lovrie  
Louis Peterson  
Lewis Loretta  
Vernon Smith  
Willard Skidmore  
Paul Phillips

Jack Williamson, Inspector, in charge of Christopher  
Coal Company Teams

Eastern Gas and Fuel Associates, Coal Division, Federal No. 1 Mine, Team No. 1

Anthony M. Harris, Captain  
Samuel Bocco  
Thomas K. Lake  
Charles T. Ice  
Walter A. Hurt  
William E. Straight  
Frank L. Simpson

Eastern Gas and Fuel Associates, Coal Division, Federal No. 1 Mine, Team No. 2

Albert J. Horab, Captain  
Jack Hess  
Charles E. Moody  
Lawrence W. Tucker  
Lenza Rinehart  
Lawrence R. Welch  
Lawrence L. Layne

Carl Shaffer and Ben Powell of the safety department  
in charge of Eastern Gas and Fuel Associates, Coal  
Division, Federal No. 1 Mine Teams