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# **Virginia Department of Mines, Minerals & Energy**

## **Division of Mines**

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### **Accident Investigation Report Underground Coal Mine**

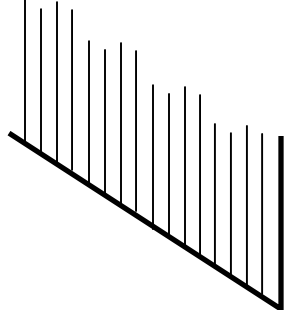
#### **Methane Ignition / Mine Fire Accident February 14, 2005**

#### **Consolidation Coal Company Buchanan Mine No. 1 Mine Index No. 11912AA Buchanan County, Virginia**

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#### **CONTENTS**

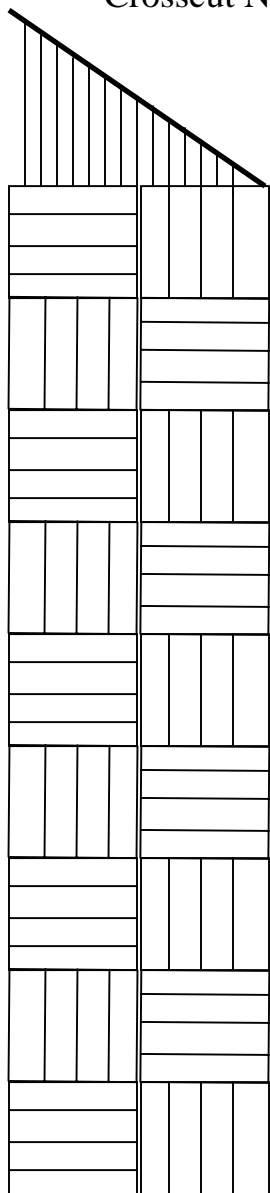
Sketches/Photographs . . . . .	1-19	Post-Event Ventilation and Fan Pressures	58
Introduction . . . . .	20	Mine, Bleeder and Gob Area Ventilation	59
Overview . . . . .	20	Sealing and Firefighting . . . . .	61
Commentary . . . . .	22	Roof Geology . . . . .	62
Statements From Mine Personnel . . . . .	30	Conclusion . . . . .	63
Discussion . . . . .	51	Enforcement Actions . . . . .	63
Physical Factors . . . . .	51	Recommendations . . . . .	64
Fuel and Ignition Sources . . . . .	54	Appendix . . . . .	66
Flames, Forces and Heat . . . . .	55		



Drawing Not  
to Scale



Crosscut No. 12



Wood  
Cribs



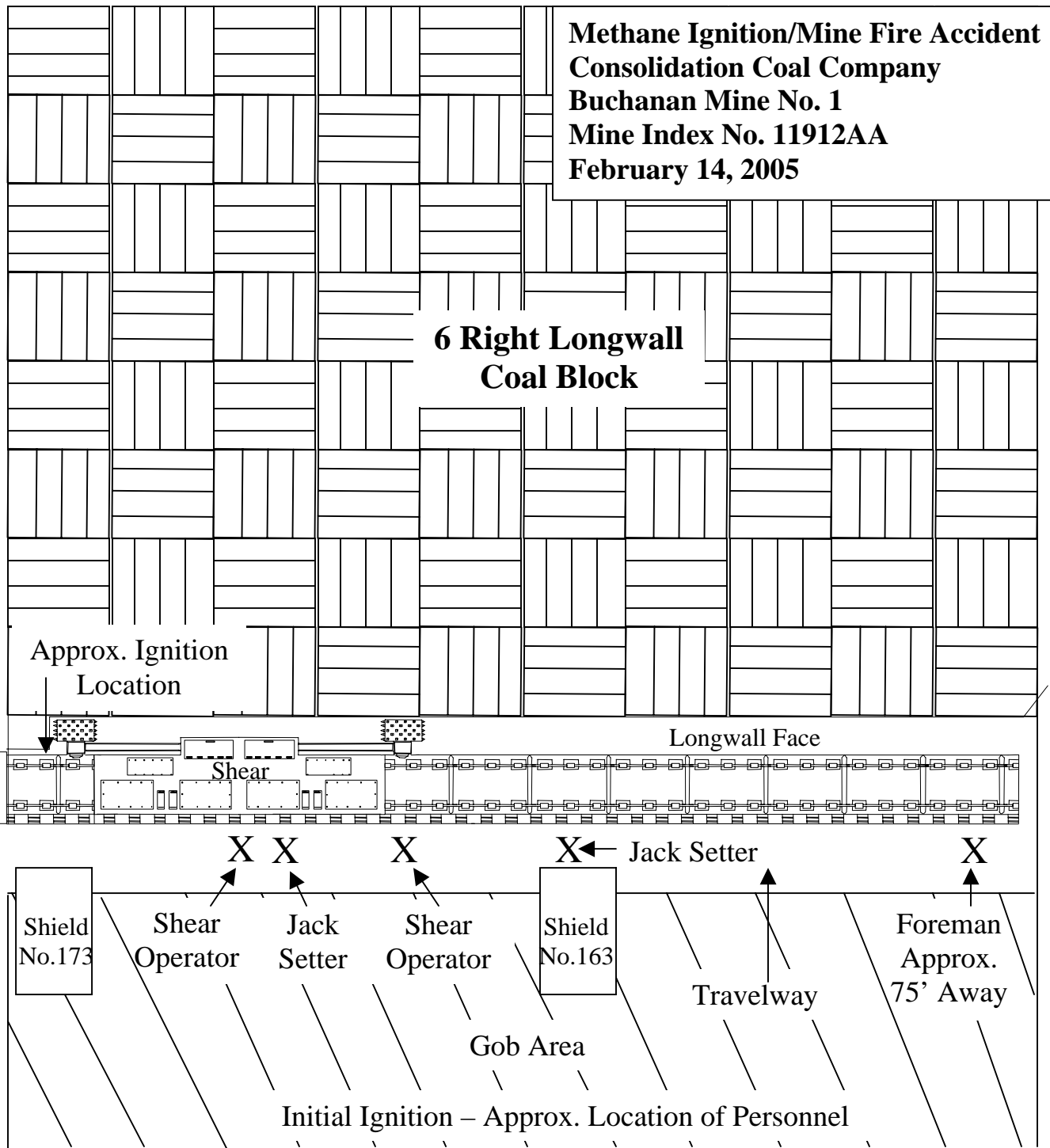
Outby

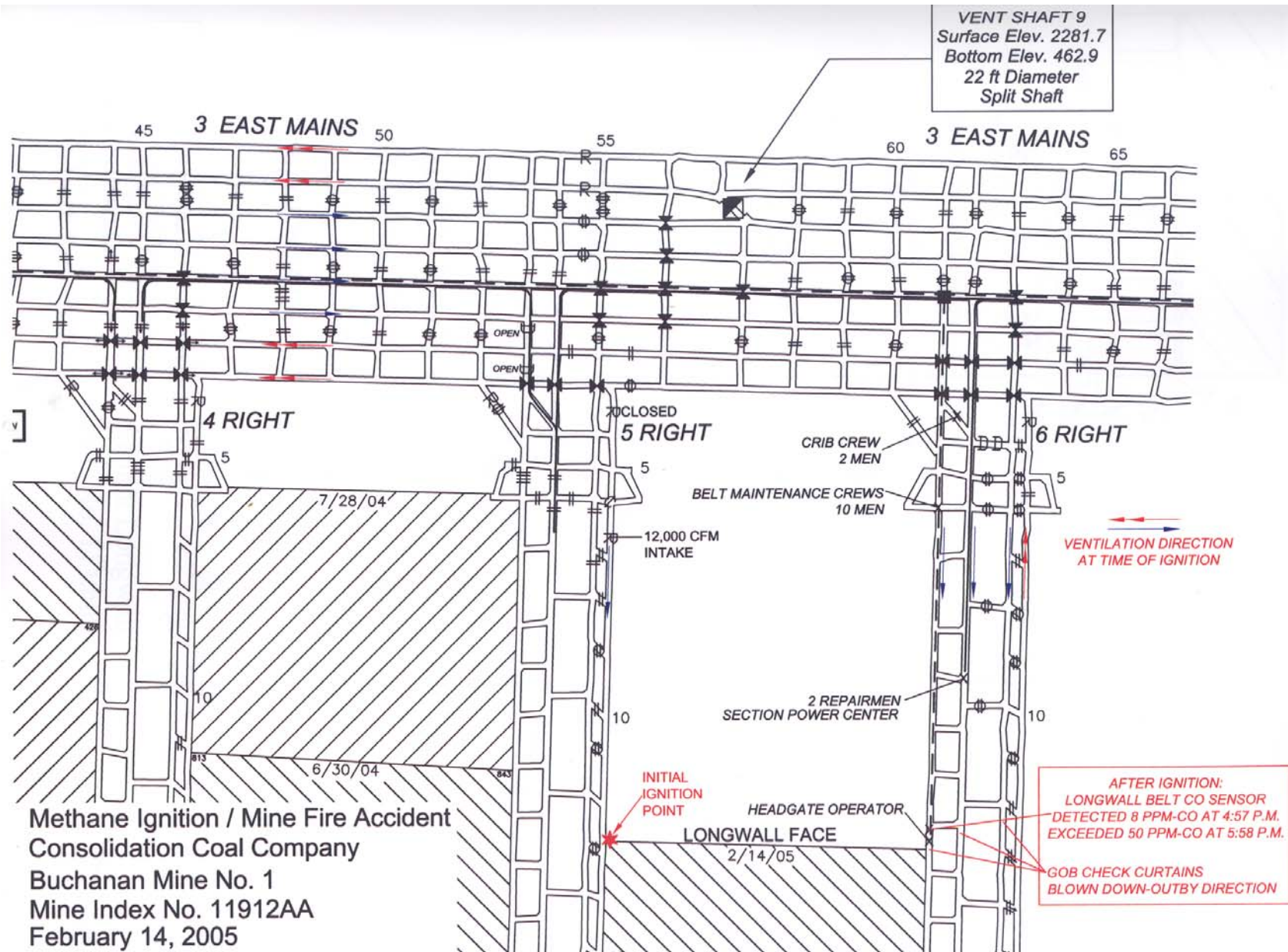


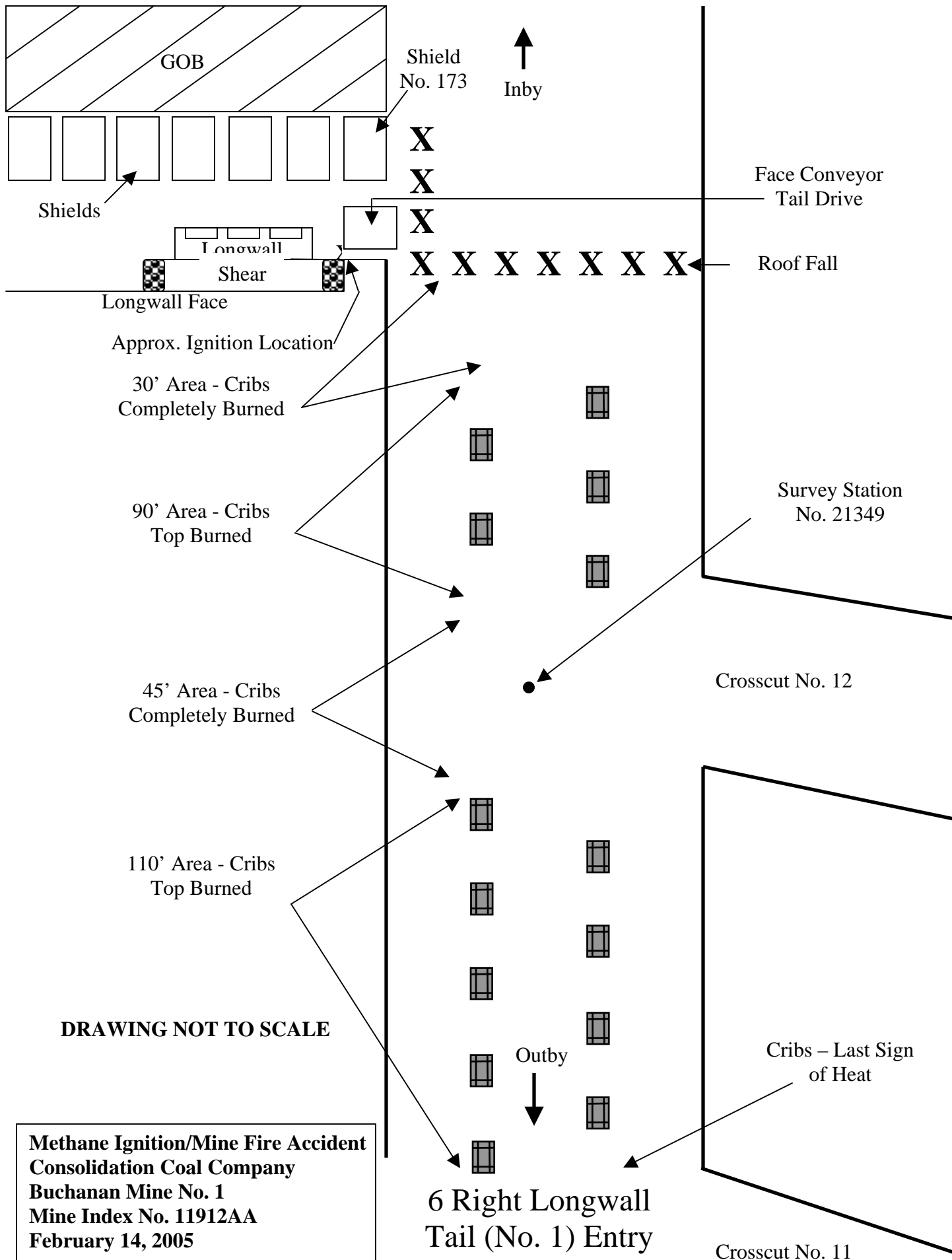
Tail  
Drive

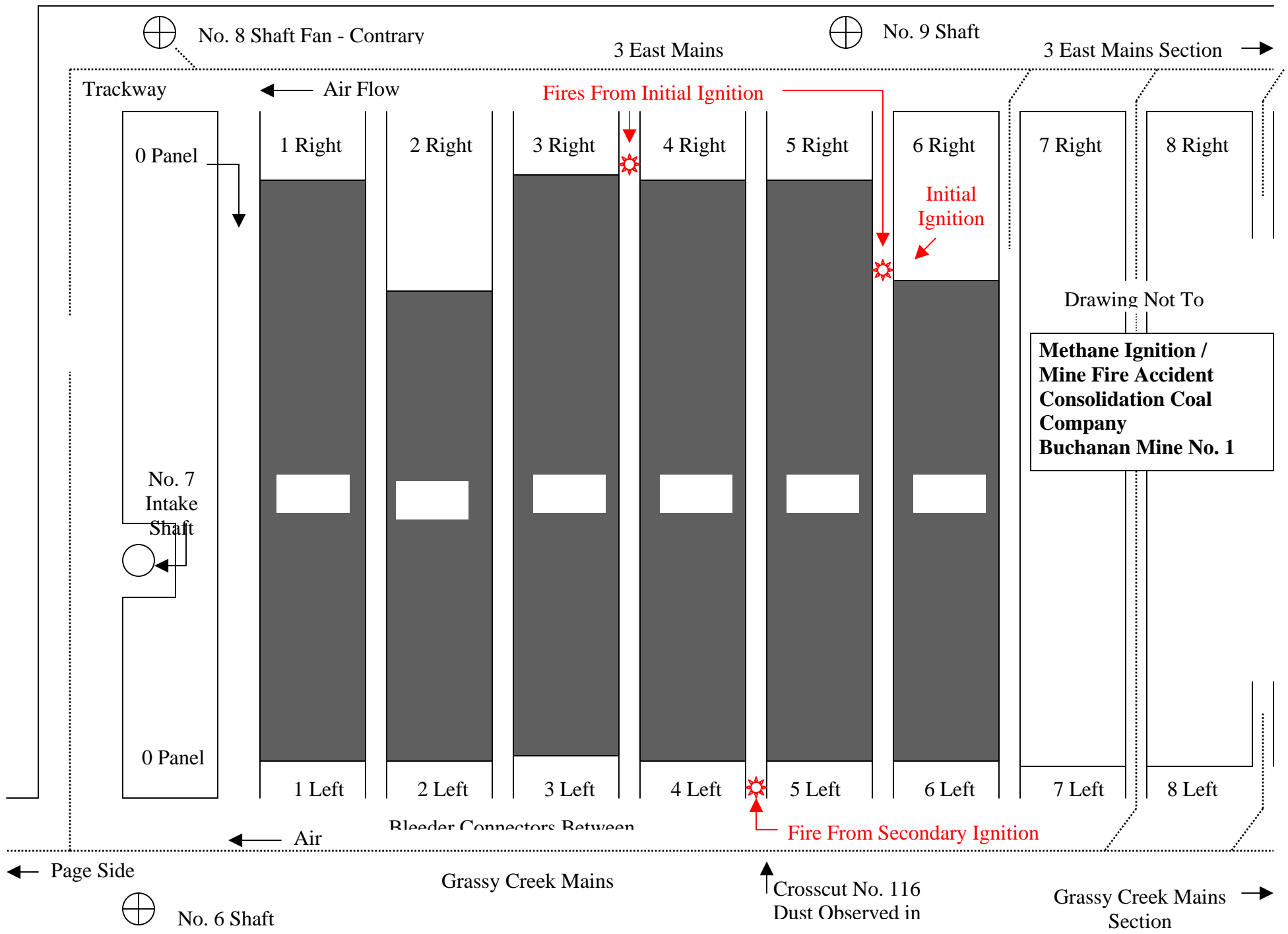
Tailgate  
Entry

Inby





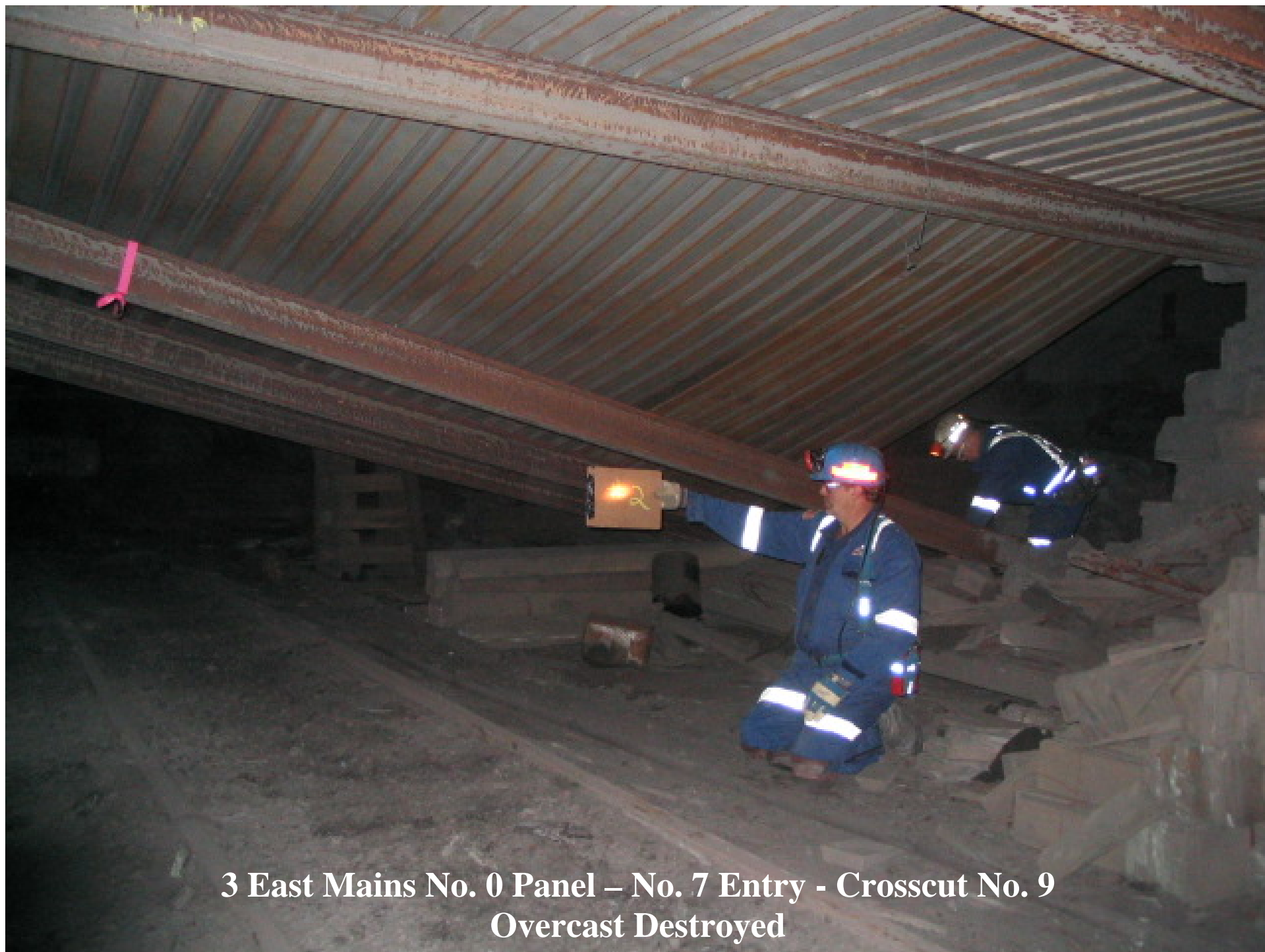






**No. 8 Shaft Bottom – Melted Plastic High  
Voltage Guard**





**3 East Mains No. 0 Panel – No. 7 Entry - Crosscut No. 9  
Overcast Destroyed**



### 3 East Mains Trackway Crosscut No. 32 - Melted Curtain



**3 East Mains Trackway  
Crosscut No. 37 – Partially  
Burned Shirt**



### 3 East Mains Trackway Crosscut No. 49 – Melted





### **3 Right Longwall Pull-Off - Burned Timbers**



**6 Right Longwall Tailgate Entry – Cribs Completely Burned - 45'**





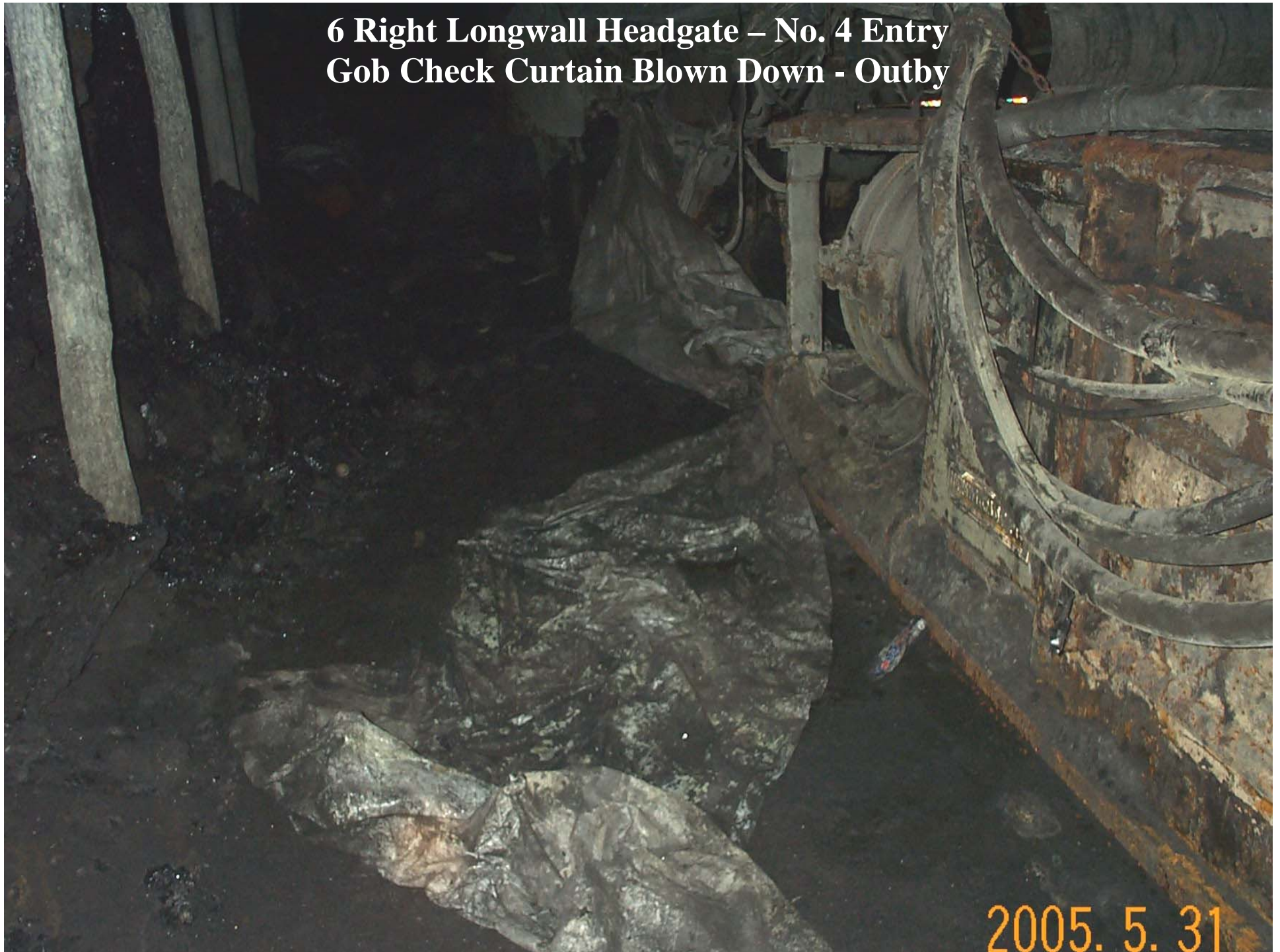
**6 Right Longwall Tailgate Entry - Cribs With Top Burned – 90'**







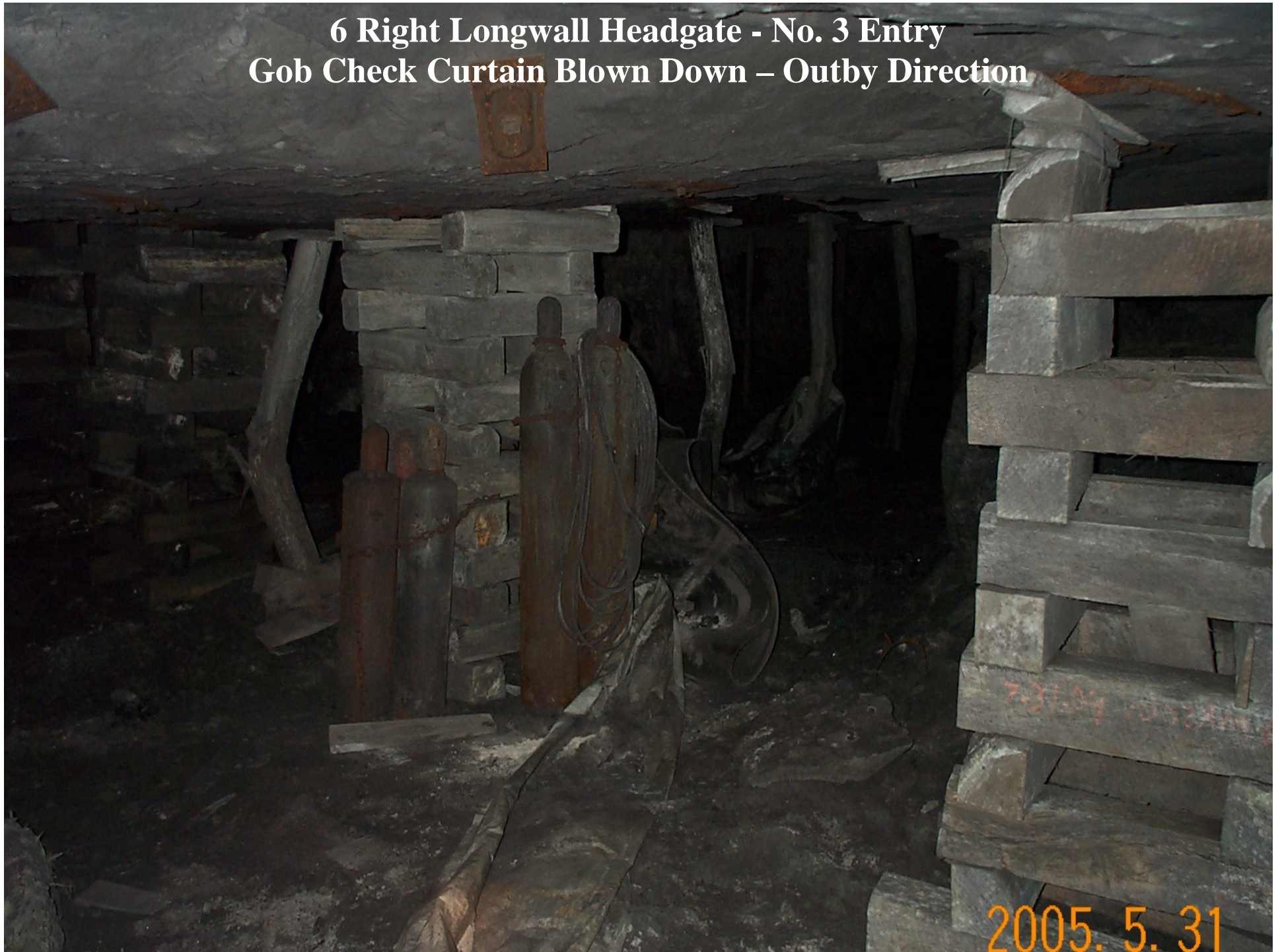
**6 Right Longwall Headgate – No. 4 Entry  
Gob Check Curtain Blown Down - Outby**



2005. 5. 31



**6 Right Longwall Headgate - No. 3 Entry  
Gob Check Curtain Blown Down – Outby Direction**



2005. 5. 31



**6 Right Longwall Tailgate Entry Roof Fall / Burned**





6 Right Longwall Face – Melted Shield Control Box Plastic and Line Curtain



**Grassy Creek Mains Crosscut No. 98 – 2 Left Longwall – Burned**





**Grassy Creek Mains 4 Left Longwall – No. 4 Entry Connector  
– Burned Cribs**



**Grassy Creek Mains Crosscut No. 114 - 4 Left longwall – Burned**



**METHANE IGNITION / MINE FIRE INVESTIGATION REPORT**  
**CONSOLIDATION COAL COMPANY**  
**BUCHANAN MINE NO. 1**  
**MINE INDEX NO. 11912AA**

## **INTRODUCTION**

On February 14, 2005, at approximately 4:20 p.m., an energy release at Consolidation Coal Company's Buchanan Mine No. 1, located near Oakwood, Virginia in Buchanan County, caused an underground shock bump and roof fall in the 6 Right longwall section gob area. The bump/roof fall contributed to a methane gas ignition that originated near the tail entry of the longwall face area, which propagated around the perimeter of the gob to the entrance of the 3 Right and 4 Left longwall panels. The ignition flame was sustained for a sufficient time duration to initiate mine fires in the tail entry of the longwall section, at the 3 Right longwall panel entrance (3 East Mains) and caused a secondary ignition and fire at the 4 Left longwall panel entrance (Grassy Creek Mains). The bump caused an inundation of rock/coal dust into the longwall face area and also caused a reversal in the direction of ventilation on the 6 Right longwall section and associated face area. The bump also caused rock/coal dust to be suspended in air courses at other locations in the mine including the 6 Right longwall section, 8 Right and 3 East Mains development sections. The secondary ignition damaged and/or destroyed ventilation controls and caused rock/coal dust to be suspended in the Grassy Creek Mains Nos. 2 and 3 entries at the 4 Left longwall panel entrance. Due to the initial ignition, reversal of ventilation on the 6 Right longwall section and magnitude of other areas affected by the bump, management officials directed a mine-wide evacuation of all underground personnel. All underground personnel were safely evacuated from the mine by approximately 5:30 p.m. Representatives from the Department of Mines, Minerals and Energy (DMME) and the Federal Mine Safety and Health Administration (MSHA) were notified at 4:45 p.m. and 5:00 p.m., respectively, and officials from both agencies responded immediately to initiate an accident investigation. This mine is scheduled to receive two regular inspections every six months. A regular inspection was ongoing at the time of the ignition/mine fire.

## **OVERVIEW**

The shock bump/roof fall that mine personnel described as occurring at 4:20 p.m. was recorded at 4:16 p.m. at the Virginia Polytechnic Institute and State University's seismograph as a seismic event that registered a magnitude of 3.0. A second seismic event that registered 3.1 was recorded at 9:36 p.m. and both events had epicenters located in the vicinity of the mine. Both events were attributed to mining activity based on seismic history and mine mapping. The extent of underground damage and overall effects caused by the two seismic events could not be determined during the investigation. The massive roof fall associated with the bump which occurred at approximately 4:20 p.m. was caused by the breaking or separation of a thick sandstone band lying immediately above the Pocahontas No. 3 coal seam and inby to the active 6 Right longwall section face area. The bump/roof fall and associated outrush of air, dust



and vibrations were followed immediately by a methane ignition on the 6 Right longwall face. The ignition originated at the longwall shear machine which was cutting coal approximately two feet from the tailgate entry. The tail shear machine operator suffered singed hair and reddening of the skin on the back of his neck. The section foreman was the only person who actually saw the ignition flame, although one other face worker did observe sparks near the tail shear operator when the ignition occurred. The bump and the pressure created by the sudden outrush of air altered and/or damaged ventilation controls located in both the headgate and tailgate entry areas.

The roof fall in the gob area caused a sudden outrush of air containing methane gas in the immediate vicinity where the shear machine was operating and was the most likely fuel source for the ignition. Immediately after the ignition occurred, all electrical power on the longwall face equipment deenergized because elevated methane levels had activated either the shear machine or face methane monitor. The outrush of air blew down the headgate gob check curtains in an outby direction and damages to ventilation controls located in the tail entries caused a reversal of the direction of the face ventilation air current.

The outrush of air also caused an inundation of suspended rock/coal dust into the longwall face area that reduced visibility to arm's length. The longwall section and face ventilation remained reversed as mine personnel evacuated from the mine.

The ignition that originated on the longwall face propagated around the perimeter of the gob to the 3 Right longwall panel entrance located on 3 East Mains and to the 4 Left longwall panel entrance located on the Grassy Creek Mains. The ignition propagation stopped at the 3 Right longwall panel entrance and encountered sufficient methane gas to maintain a flame for a sufficient time duration to initiate burning of coal ribs, timbers and wood cribs at this location. The initial ignition on the longwall face also propagated in the opposite direction around the perimeter of the gob and stopped at the 4 Left longwall panel entrance located on the Grassy Creek Mains.

At the 4 Left longwall panel on the Grassy Creek Mains bleeder connector entries, the propagating ignition flame encountered and ignited a greater quantity of methane gas that caused a secondary ignition of much greater magnitude which generated sufficient pressures and forces to damage and/or destroy ventilation controls. The effects of the damaged and/or destroyed ventilation controls were validated by thick dust blown into the Grassy Creek Mains (No. 2 - left return entry and No. 3 - trackway entry) as observed by mine personnel. This secondary ignition maintained a flame for a sufficient time duration to initiate the burning of coal ribs, timbers and wood cribs at this location.

The effects of the bump and multiple ignitions were felt or conditions observed on the surface and in other areas of the mine including: the 3 East Mains section, Grassy Creek Mains section, 8 Right section, along the Grassy Creek Mains trackway and adjacent left return aircourse entry at the entrance of the 4 Left longwall panel. All underground personnel were safely evacuated to the surface.

A source for the initial ignition that occurred on February 14, 2005, could not be determined with certainty; however, investigation officials have concluded that the bump and roof fall caused a movement of air and methane gas out of the longwall gob area into the face area. The heat source for the ignition could have been either sparks and heat generated from the tail shear cutter drum bits striking rock material or other frictional heat generated from operation of the face conveyor.

The bump and roof fall and the initial ignition at the 6 Right longwall face area and the secondary ignition at the 4 Left longwall panel damaged and/or destroyed underground

ventilation controls to the extent that a pressure loss from 9.0 inches to 6.3 inches of water gauge was recorded on the No. 8 shaft fan chart, and a loss from 15.6 inches to 14.9 inches was recorded on the No. 6 shaft fan chart. Handheld gas detection instruments were used initially to monitor mine gases at the shafts that provide ventilation to the affected longwall area. Gas tests at the No. 8 shaft fan at 5:10 p.m. revealed 92 parts per million (ppm) – carbon monoxide (CO) and gas tests at the No. 6 shaft fan at 6:00 p.m. revealed 52 ppm – CO. At approximately 5:15 p.m., mine personnel located on the surface observed possible smoke emitting from the upsweep structure of the No. 8 shaft fan. The atmospheric monitoring system (AMS) sensor, which monitors the 6 Right longwall belt haulage system, indicated eight ppm – CO at 4:57 p.m. and exceeded 50 ppm – CO at 5:58 p.m. Air quality monitoring continued during the night on February 14 and into the morning on February 15. Carbon monoxide levels continued to increase at the Nos. 6 and 8 shafts and at the Q35H degas borehole. The Q35H degas hole is located in the 6 Right longwall gob area on the tailgate entry side, approximately 300 feet in by the longwall face. By noon on February 15, dense smoke was emitting from the No. 6 ventilation shaft fan and light smoke was emitting from the No. 8 ventilation shaft fan. At this time, with confirmation of an underground fire, mine officials made the decision to seal the mine.

Company and mine personnel and independent contractors began sealing the nine (9) shafts and completed the sealing operations at approximately 10:30 a.m. on February 16. Partial resealing of the shafts was required periodically to prevent oxygen from entering the mine and keeping the fire active. Other ignitions and fires occurred at various locations after personnel were evacuated from the mine, and after the fans were stopped and the mine was sealed. The mine atmosphere was evaluated until May 4, at which time company and mine officials submitted a reventilation and reentry exploration plan to DMME and MSHA officials that was approved.

On Thursday, May 12, company and mine personnel began unsealing the mine shafts. On Saturday, May 14, the fans at ventilation shaft Nos. 9, 8, 6, 4 and 2 were restarted in a predetermined sequence. The five exhausting fans were monitored and the 16 boreholes that had been drilled into the mine were analyzed until May 20, at which time the underground mine atmosphere was evaluated and determined safe to allow personnel to reenter and explore the mine. On May 23, mine rescue, company, DMME and MSHA personnel began underground explorations of the mine. Exploration of the mine was completed on May 29. Mine rehabilitation work and a mine fire investigation was initiated on May 30. The fire investigation was completed on June 11, 2005.

## **COMMENTARY**

The Consolidation Coal Company, Buchanan Mine No. 1, is a large shaft mine operation with two surface portal shafts located at Page, along State Route 632, and at Contrary, along State Route 680, near Oakwood, Virginia, in Buchanan County. The mine has three longwall development continuous miner sections and one longwall section that produce approximately 12,000 tons of clean coal daily from the Pocahontas No. 3 coal seam. The mine utilizes various coal haulage systems consisting of 27 underground belt conveyor systems, two underground coal bunker storage facilities and a production skip hoist. Mine personnel work rotating schedules

and are utilized to operate three coal production shifts per day, seven days per week. This mine employs 421 personnel.

The mine has nine (9) shaft openings. Shaft Nos. 6, 7, 8 and 9 are associated with the Contrary side of the mine while the other five shafts are associated with the Page side of the mine. The average underground mining height is approximately 72 inches. The mine is developed for support of longwall mining. Longwall panels are developed approximately 980 feet wide and 10,500 feet long. The longwall panel developments, consisting of four entries, are simultaneously developed right off 3 East Mains and left off Grassy Creek Mains until the panel entries intersect. The 4 Right panel off 3 East Mains is the same panel when development is completed as the 4 Left panel off Grassy Creek Mains. The shock bump/roof fall and initial ignition occurred on the sixth panel of the set of 10 projected panels and the headgate development was 6 Right off 3 East Mains.

Four fans ventilate the mine exhausting approximately 2.8 million cubic feet of air per minute. Air samples and analysis from the mine fans have revealed a methane liberation rate of 7.8 million cubic feet per day. The longwall face is ventilated from the headgate entries to the tailgate entry using intake belt/trackway and escapeway air. Normally, the three headgate entries located adjacent to the longwall face provide the required face ventilation while the fourth entry (future tailgate entry of the 7 Right panel) is ventilated separately away from the longwall face. Longwall face ventilation (intake air) combines with the intake air split that is coursed up the tailgate entry and then the combined air splits enter the gob area. The mine is equipped with an intrinsically - safe atmospheric monitoring system (AMS) that monitors methane concentrations and carbon monoxide (CO) levels at designated locations and is set to give a low-level CO alarm at six-ppm and a high-level CO alarm at eleven-ppm.

The underground coal production sections are located on the Contrary side of the mine, requiring the No. 8 ventilation shaft portal to be used as the primary portal by the majority of employees entering the mine. At the time of the accident, underground work activities included coal production on the 6 Right longwall Section, 8 Right longwall development section and Grassy Creek Mains development section. Mine personnel were assigned to complete an electrical power move on the 3 East Mains development section. Mine maintenance and equipment maintenance activities were also being conducted outby the production sections at various underground locations.

Normally, only a limited number of employees enter the mine using the Service Shaft located on the Page side of the mine. Work activities performed by mine personnel that enter the mine from the Page Service Shaft include: delivery of supplies from the Page surface supply area to the Contrary side; belt conveyor haulage operations and maintenance; coal storage activities at the underground coal storage bunker facilities; mine maintenance and equipment maintenance activities; Page production shaft and preparation plant operations and mine examinations. Diesel powered track haulage equipment is used to transport personnel and materials underground.

On Monday, February 14, 2005, evening shift mine personnel were relieving the day shift personnel between 3:45 p.m. and 4:30 p.m. on the various working sections. Ninety-three (93) personnel were underground when the accident occurred. The 6 Right longwall panel had been mined to within approximately 1,080 feet of completion when the accident occurred. The evening shift longwall production crew arrived on the 6 Right longwall section at approximately 4:00 p.m. and began relieving the day shift production crew at various locations on the section and longwall face area. The evening shift production crew consisted of: Mr. Ralph Justus, fill-in, longwall headgate operator; Mr. Michael Dehart, fill-in, longwall section mine foreman; Mr.

Kenny Stillwell, longwall head shear operator; Mr. Scott Honaker, longwall tail shear operator; Mr. Brock Barton and Mr. Keith Colley, longwall shield operators (jack-setters); Mr. Winston Boyd and Mr. Scott Bowman, longwall repairmen. This crew intended to produce coal only until the coal surge bunkers were full and then stop production to perform maintenance work on the shear machine. The evening shift shear operators commenced mining with the shear located at shield No. 115 and continued mining operations toward the tail of the longwall face. Both shear operators were aware of the sandstone layer of rock lying immediately above the coal seam and were also aware of the need to prevent the shear machine cutting bits from striking the sandstone roof, due to the potential for causing a methane ignition. The face tail methane monitor display unit, located at the headgate operator control station, indicated 0.4% methane when the evening shift mine personnel began production activities.

During this time, Mr. Bob Brewster and Mr. Mark Hilyea, evening shift mine foremen, and eight (8) other evening shift mine personnel had arrived at the mouth of the 6 Right longwall section and began making preparations to remove slack from the longwall section belt conveyor that would be completed later during the shift during scheduled shear maintenance activities. Mr. Larry Powers, general inside laborer, and a coworker were assigned to install wood cribs in the No. 1 entry of the 6 Right longwall section during this shift. The No. 1 entry would be the future tailgate entry for the 7 Right longwall panel.

Prior to departing the section with the day shift longwall production crew, Mr. Terry Hurley, day shift, fill-in, longwall section mine foreman, met Mr. Dehart upon his arrival at the headgate operator control station located in the headgate (No. 4) entry and discussed various longwall mining activities. After completing their discussion, Mr. Hurley joined the day shift production crew enroute to the surface. Mr. Dehart departed the headgate entry at approximately 4:15 p.m. and obtained an air velocity measurement of 1,060 feet per minute and a methane gas measurement of 0.1% methane at shield No. 12. Mr. Dehart continued traveling along the longwall face toward the tail where the shear was located when the shock bump / roof fall and ignition occurred. Mr. Dehart also conducted gas tests at various locations along the longwall face while traveling toward the shear and detected from 0.1% to 0.3% methane during his examinations.

During this time, Mr. Honaker and the longwall crew continued mining without incident toward the tail of the longwall face. Prior to stopping the shear at shield No. 160, methane tests conducted while mining operations continued toward the tail of the longwall face revealed 0.1% methane. Arriving at shield No. 160, Mr. Honaker stopped the shear machine and traveled with Mr. Barton to the tailgate entry to determine if the degas lines were located a safe distance from the location where the shear would cut out into the tailgate entry. At this time, Mr. Stillwell was located near the shear where he took a methane gas test at the longwall face and detected 0.5% methane.

After returning to the shear machine from the tailgate entry, Mr. Honaker and Mr. Stillwell resumed mining operations. As Mr. Honaker was operating the shear and the shear approached within two feet from cutting out into the tailgate entry, a shock bump / roof fall occurred followed immediately by a methane ignition at the face area near the location of the shear tail cutter drum. Immediately after the bump and ignition occurred, all electrical power on the longwall face equipment deenergized. Mr. Honaker was positioned near the tail side of the shear, approximately 10 feet from the head side of the shear, facing the headgate of the longwall. He was not looking at the tail face area where the ignition occurred and did not realize that an ignition had occurred. Mr. Honaker did hear a loud noise just prior to the bump and ignition that

caused a pressure change in his ears and he felt heat from the ignition. After Mr. Honaker arrived on the surface, he discovered that the ignition flame had singed the hair on the back of his neck.

Mr. Barton was located approximately five feet from Mr. Honaker, near the middle of the shear, when he heard the bump and felt a pressure change in his ears. The air pressure created by the bump pushed Mr. Barton toward the face conveyor pan-line. Mr. Colley, located at shield No. 163, was leaning against a shield when the bump occurred and felt an outrush of air pressure coming out of the gob from behind the shields that also pushed him against the face conveyor pan-line. Coal dust inundated the longwall face following the bump and limited Mr. Colley's perimeter of visibility to the width of two shields (approximately eight to ten feet). Mr. Barton did not see the ignition flame but did observe sporadic sparks of fire, similar to "campfire sparks", falling to the mine floor in the immediate vicinity of Mr. Honaker. The longwall face area was immediately inundated with a mixture of coal dust and rock dust limiting Mr. Honaker and Mr. Barton's perimeter of visibility in all directions from six inches to one-foot. At this time, Mr. Honaker informed Mr. Barton, Mr. Stillwell, and Mr. Colley that they needed to evacuate from the longwall face area and the crew proceeded to evacuate.

At this time, Mr. Dehart had arrived at a location on the longwall face approximately 15 shields, approximately 75 feet, away from the location of the shear, prior to the occurrence of the bump and ignition. Mr. Dehart felt the mine roof vibrating, which caused the shields to start "pinging", followed by a roof fall that occurred in the gob causing the ventilation to temporarily stall in the face area. Mr. Dehart then observed a red colored flame approximately eight feet in length which was visible for two seconds, located near the shear machine and longwall face. The electrical power provided for the longwall face equipment and shield area lights deenergized immediately. Mr. Dehart stated that dense dust inundated the longwall face area, limiting the perimeter of visibility at his location to approximately five feet. After the bump occurred, Mr. Dehart immediately proceeded toward the tail area where the face crew was located. Most likely, the massive roof fall in the gob area caused a sudden release of methane into the longwall face-tail area and activated the face and/or shear methane monitors that caused automatic deenergization of electrical power on the longwall face equipment, including the shear machine and shield area lights. As soon as the bump occurred, Mr. Justus began attempting to contact the face crew to check on their status. Mr. Colley responded using the face page telephone system and informed Mr. Justus that the face crew was alright and that they were evacuating from the face area toward the headgate. Mr. Dehart carried an Industrial Scientific MX-270 digital multiple gas detector equipped with audible and visual alarms, with the lower audible alarm limit set at 1.0% methane and 50 ppm carbon monoxide. During the time of the bump and evacuation from the face area, neither Mr. Dehart nor any of his crew heard an alarm from his gas detection instrument.

Immediately following the bump and ignition, Mr. Honaker left the shear machine water spray system activated as he, Mr. Barton, Mr. Stillwell and Mr. Colley departed the ignition location and met Mr. Dehart who was traveling toward the longwall tail area to check on them. Mr. Dehart joined the crew in their evacuation along the longwall face. While traveling toward the headgate, Mr. Dehart was not sure that the ignition flame extinguished and looked back toward the ignition area several times but did not observe any flames, although he could not see the area clearly due to the dust concentrations.

When the shock bump occurred, Mr. Ken Harvey, superintendent, Mr. Craig Chadwell, assistant superintendent, and Mr. Leonard Clarkson, general mine foreman, were located in the

Contrary mine office. The bump vibrated the mine office, rattled the ceiling tiles and caused dust to fall from the office ceiling. Mr. Harvey instructed Mr. Chadwell to contact the development and mains section personnel while he contacted 6 Right longwall section personnel. Mr. Harvey also dispatched mine personnel to the Nos. 6 and 9 ventilation shaft fans to monitor and test for mine gases with handheld instruments. Before Mr. Harvey could contact 6 Right longwall section personnel, Mr. Justus called Mr. Harvey and reported a bump / roof fall in the gob area and a possible methane ignition on the longwall face. Mr. Justus also reported that Mr. Dehart was enroute to the headgate and that he would inform Mr. Dehart to call him when he arrived at the headgate operator's control station. Mr. Harvey directed Mr. Chadwell to instruct all section personnel to assemble near a mine telephone at the end of the track on their sections while each section foreman obtained return air measurements on their respective sections.

As the longwall crew evacuated along the face area toward the headgate entry, they observed that the air current had reversed on the longwall face and was now traveling toward the headgate entry rather than the normal direction, toward the tail of the longwall. The face crew estimated that the quantity of air flowing in the reverse direction on the longwall face was at least equal to the normal quantity of air flowing in the proper direction. The face crew encountered dense dust along the longwall face as they evacuated toward the headgate entry. The evacuation from the ignition location to the headgate entry was estimated to have occurred within three to seven minutes. The crew did not encounter smoke or detect any odors associated with burning material as they evacuated from the face area.

After arriving at the headgate entry, the face crew observed dust suspended in the entry and the direction of ventilation was still reversed from its normal direction in the headgate No. 4 entry and in the adjacent No. 3 track entry. The dust in Nos. 3 and 4 entries was less concentrated than the dust encountered across the longwall face. Upon his arrival at the headgate (No. 4) entry, Mr. Dehart accounted for all his crew and then instructed them to travel to the, 6 Right No. 2 entry (intake smokefree escapeway), to get clear of the dust. Mr. Colley departed the headgate entry and traveled to the No. 1 entry to check on the status of Mr. Powers and his coworker who had been assigned to install cribs in the No. 1 entry, on the 6 Right longwall section. After discovering that Mr. Powers and his coworker were not in the No. 1 entry, Mr. Colley traveled to the intake escapeway and joined the other longwall section personnel who had assembled together, while awaiting further instructions. While enroute to the intake escapeway, Mr. Justus observed that the ventilation gob check curtains installed in the Nos. 2, 3 and 4 headgate intake entries of the 6 Right longwall section had been blown down in an outby direction, apparently caused by the sudden outrush of air created by the bump/roof fall. Mr. Dehart contacted Mr. Harvey, mine superintendent, who was located on the surface at the Contrary mine office, and reported that a bump had occurred and that a methane ignition had occurred at the longwall tail area. Mr. Harvey instructed Mr. Dehart to evacuate his crew from the mine.

Prior to the shock bump / roof fall, Mr. Scott Bowman and Mr. Winston Boyd, repairmen, located in the No. 3 entry at the 6 Right longwall section power center, heard three distinct bumps, from 15 to 30 seconds apart. The first and second bumps were small in comparison to the third bump, which they described as "massive". A few seconds following the third bump, the direction of ventilation reversed and appeared to be moving from the gob in an outby direction toward the mouth of the section. The No. 3 entry became inundated with rock dust followed by coal dust and obscured visibility at their location. A short time later, the vacuum circuit breakers deenergized, apparently as a result of Mr. Justus activating the

emergency stop switch at the headgate operator control station. Mr. Bowman used a mine telephone, located nearby, to call Mr. Justus, located at the headgate control station, to check on the status of the longwall crew. Mr. Justus informed Mr. Bowman that he was attempting to contact the face personnel. Mr. Bowman returned to the section power center and was instructed by Mr. Boyd to travel one crosscut inby and enter the No. 2 entry (intake smokefree escapeway). Mr. Boyd then traveled the No. 3 entry toward the longwall face where he met the longwall face personnel, who were enroute to the intake smokefree escapeway. After arriving in the intake escapeway, the crew assembled and waited for Mr. Dehart to arrive. The intake escapeway was clear of dust and after approximately 10 minutes elapsed, Mr. Dehart arrived and instructed the crew to evacuate from the mine. As Mr. Boyd was evacuating, he stopped at the section power center and locked out the electrical power to the section power center and cut off the valve for the water supply line for the shear machine. The dust concentrations in the No. 3 entry appeared to be dissipating during this time but the ventilation remained in a reversed direction.

When the bump occurred, Mr. Powers and his coworker were located in the sidetrack at the mouth of 6 Right longwall section, approximately 10 crosscuts outby the longwall face area. Assuming that a large roof fall had occurred, Mr. Powers observed that the direction of ventilation reversed and that the area became inundated with dense dust that obstructed their visibility. A short time later, Mr. Powers talked to Mr. Hurley's longwall production crew who were preparing to exit the section and asked the crew about what had happened; they did not know. Mr. Hurley and his crew continued traveling toward the No. 8 shaft portal and dust was encountered in the 3 East Mains trackway for the entire distance to the No. 8 shaft portal. Mr. Powers traveled the trackway to the 6 Right longwall section belt drive where he met the belt drive attendant who informed him that an ignition had occurred on the longwall face. As Mr. Powers and his coworker were evacuating from the mine, traveling toward the No. 8 shaft portal, they did not observe any damaged ventilation controls.

A number of other mine personnel located in areas outby the 6 Right longwall section also felt and observed the effects of the bump. The physical effects experienced by other individuals varied depending on their location in relation to the origin of the bump. Mr. Brewster and Mr. Hilyea, section mine foremen, and their crew of eight (8) mine personnel, located approximately seven crosscuts outby the longwall face area near the mouth of the 6 Right longwall section, did not hear anything but did feel a strong outrush of air pressure moving in an outby direction from the longwall face area. The force of the air pressure was of such magnitude that personnel had to brace themselves to be able to stand upright. Soon after the bump occurred, the direction of ventilation reversed and dense rock / coal dust inundated the mine atmosphere, limiting visibility at their location to approximately 20 feet.

Mr. Brewster and Mr. Hilyea accounted for all personnel in their crews and then Mr. Brewster used a mine telephone, located nearby, to contact Mr. Justus, located at the headgate operator control station. Mr. Justus informed Mr. Brewster that he was attempting to contact the longwall face crew, and at that time Mr. Brewster overheard Mr. Chadwell attempting to contact other mine personnel and directing various section mine foremen to obtain return air measurements on their respective sections. Mr. Chadwell instructed Mr. Brewster to travel to the 3 East Mains section and that he had been unsuccessful in contacting the section personnel, because they were located away from the mine telephone while performing power move work. Mr. Brewster instructed Mr. Hilyea to wait by the mine telephone with their crews and to prepare for evacuation. Mr. Brewster departed and traveled toward the 3 East Mains section. While traveling from the mouth of the 6 Right longwall section to the 3 East Mains section, Mr.

Brewster observed dust suspended in the air limiting his visibility along the trackway to approximately 100 feet.

The 3 East Mains section personnel were working on the section high voltage power move when the bump occurred. Although the section personnel never felt or heard the bump, Mr. Ray Kinder, section mine foreman, overheard conversations on the mine telephone and later observed light dust emerging on the section from the track (No. 5) entry, and a short time later he observed heavier dust concentrations coming up the adjacent intake smokefree escapeway (No. 4) entry. While suspecting that a roof fall may have interrupted the mine ventilation, Mr. Kinder instructed his crew to stay in the belt entry while he obtained section return air measurements. As Mr. Kinder was completing the air measurement in the left return split, Mr. Howard Sayers, general inside laborer, notified him that surface personnel had called and ordered an evacuation of the mine. Before departing the section, the crew deenergized the section electrical power and disconnected the section scoop batteries. As the crew prepared to depart the section, Mr. Brewster arrived on the section and they informed him that they had been notified to evacuate. As the crew departed the section, Mr. Kinder observed light to medium dust in the section track entry as they traveled toward the No. 8 shaft portal. Mr. Kinder observed light dust along the 3 East Mains trackway that appeared to dissipate at the 3 East Mains No. 3 belt drive. The visibility became normal and the direction of ventilation was normal, but the air quantity seemed to be reduced in the track entry.

After verifying that the 3 East Mains crew was evacuating, Mr. Brewster traveled back to the mouth of the 6 Right longwall section where he called Mr. Chadwell again. At this time, Mr. Chadwell instructed Mr. Brewster to travel to the 8 Right section to check on that crew. Mr. Brewster observed dusty conditions along the 8 Right trackway for a distance of approximately 3,000 feet, approximately one-half the distance of the section trackway.

The evening shift 8 Right section personnel had relieved the day shift production crew on the section and the day shift crew had already departed when the bump occurred. Mr. Tim Chafins, section mine foreman, felt a vibration and quake-like feeling at approximately 4:20 p.m. He immediately traveled to the section mine telephone, where he called surface personnel and was instructed by Mr. Chadwell to obtain section return air measurements and to make preparations to evacuate. At this time, Mr. Chafins observed light rockdust coming up the track entry toward the section. Mr. Chafins obtained the return air measurements and determined that the section ventilation was normal. As Mr. Chafins and his crew were boarding the mantrip to evacuate, Mr. Brewster arrived on the section to verify their evacuation status. The section crew proceeded to evacuate from the mine as Mr. Brewster departed the section.

Mr. Brewster traveled back to the 6 Right longwall section to ensure that his crew had also been evacuated. After arriving at the mouth of the 6 Right longwall section, he discovered that all personnel located on the 6 Right longwall section had already evacuated from the mine. At this time, Mr. Brewster observed that dust on the section had cleared and that visibility was good from the end of the track for approximately 1,000 feet toward the section. As Mr. Brewster traveled the 3 East Mains trackway, while evacuating from the mine, he observed dusty conditions along the trackway entry from the mouth of the 6 Right longwall section to the 1 Right longwall panel, a distance of approximately 8,400 feet. As Mr. Brewster traveled the 3 East Mains trackway while evacuating from the mine, he observed man doors open at the 7 Right and 5 Right longwall intake overcasts and he stopped and closed the doors.

Mr. Curt Gibson, evening shift mine foreman, and Mr. Bill Dishman, evening shift utilityman, and three coworkers were performing belt maintenance activities and were located



along the 3 East Mains belt conveyor at crosscut No. 68 when the bump occurred. These mine personnel felt a vibration sensation in their ears when the bump occurred and the ventilation at their location appeared to stall briefly before returning to normal direction, only seconds later.

Mr. Jerry Pugalee, maintenance foreman, and two coworkers who were traveling the Grassy Creek Mains trackway (No. 3) entry, near the top end of the 4 Left longwall panel, at crosscut No. 116, did not hear anything but did feel pressure changes in their ears and chest and they felt the ventilation quantity increase in the track entry, approximately two to three times greater than the normal quantity. Approximately 20 seconds later, suspended dense coal dust appeared in the track entry and reduced visibility to arm's length. When Mr. Pugalee realized the intensity of the suspended dust concentrations, he stopped the personnel carrier and instructed his coworkers to travel into the adjacent (No. 2) entry, through a mandoor in a permanent stopping, to escape the dust concentrations in the track entry. The No. 2 entry was a return bleeder entry for the longwall panels on the Grassy Creek Mains side of the mine.

Mr. Pugalee remained in the track entry connecting a portable telephone to the underground telephone system. The coworkers returned to the track entry and reported that the adjacent (No. 2) entry was also inundated with dense coal dust. Mr. Pugalee completed connecting the telephone and contacted Mr. Chadwell and informed him of their location. Approximately four minutes later, with the dense dust still present, Mr. Chadwell called back instructing Mr. Pugalee to evacuate from the mine. Mr. Chadwell also instructed Mr. Pugalee to travel the Grassy Creek Mains to the 4 North Mains trackway and pick up three mine personnel located at the New Bunker and to clear the 4 North Mains trackway as he evacuated from the mine. Mr. Pugalee met various mine personnel located along the 4 North Mains trackway and instructed them to evacuate from the mine using their assigned Page or Contrary portal.

The evening shift Grassy Creek Mains section production crew was relieving the day shift production crew on the section when the bump occurred. Mr. Darrell Blackwell, day shift maintenance foreman, and his maintenance crew were repairing two continuous mining machines on the section in the last open crosscut of the No. 3 entry when they felt two separate incidents, approximately one minute apart, which caused pressure changes in their ears. After feeling the second pressure change, Mr. Blackwell traveled to the section mine telephone and called Mr. Chadwell who informed him that they were trying to determine what had happened in the mine. Mr. Blackwell informed Mr. Robert Baugh, evening shift section mine foreman, about experiencing the pressure changes and Mr. Baugh traveled to the section mine telephone and called Mr. Randy Cox, acting, second shift, assistant general mine foreman, and Mr. Chadwell. Mr. Chadwell instructed Mr. Baugh to obtain section return air measurements. Mr. Baugh traveled to the section right return and obtained an air measurement of 50,300 cubic feet per minute (cfm), which was a normal measurement.

Mr. Blackwell called Mr. Chadwell again approximately two minutes later and Mr. Chadwell instructed him and the other section personnel to evacuate from the mine. As Mr. Baugh was traveling across the section to obtain a left return air measurement, Mr. Larry Crouse, shuttle car operator, informed him that mine officials had called and ordered a mine evacuation. Mr. Baugh traveled back to the mine telephone and called surface personnel and was instructed to evacuate the mine using the 7 Right / 3 East Mains trackway travel routes to the No. 8 shaft portal. The two section production crews and maintenance crew departed the section at that time. While evacuating, Mr. Blackwell did not observe any dust or any abnormalities in the ventilation structures located along the 7 Right and 3 East Mains track entries and ventilation appeared normal. Later, Mr. Baugh was informed by Mr. Alex Presley, fill-in, day shift Grassy

Creek Mains section mine foreman, that one of the two doors in each airlock located along the 7 Right trackway apparently had opened when the bump occurred. Mr. Baugh did not observe any damaged ventilation controls as he was evacuating from the mine.

Mr. Harvey instructed Mr. Cox to travel to the No. 8 shaft bottom and to account for all day and evening shift personnel as they evacuated to the surface. Mr. Harvey also called mine management officials located on the Page side of the mine and instructed them to account for all mine personnel evacuating from that side of the mine. After all day and evening shift personnel had been evacuated from the mine, Mr. Harvey directed mine management officials to account for all underground personnel a second time. The second account of mine personnel was completed verifying that all underground personnel had been safely evacuated to the surface and accounted for.

## **STATEMENTS FROM MINE PERSONNEL AND OTHER FACTORS**

Interviews of 24 mine personnel were jointly conducted with MSHA officials on March 15, 16 and 24 at Consolidation Coal Company's office, located at Oakwood, Virginia. Statements from mine personnel interviews and other factors determined during the investigation revealed the following:

### **1. Scott Honaker – 6 Right Longwall Tail Shear Operator stated:**

- That he was located along the longwall face when the bump and ignition occurred with the following four (4) mine personnel: Mr. Kenneth Stilwell, head shear operator, Mr. Michael Dehart, fill-in, section mine foreman, Mr. Brock Barton, jack setter and Mr. Keith Colley, jack setter;
- That he relieved the day shift tail shear operator on the longwall face at shield No. 115;
- That he was mining the first production run toward the tail entry when the bump and ignition occurred;
- That he had made gas tests along the longwall face area while mining toward the tail entry and that he had detected less than 1% methane during all tests;
- That sandstone roof came down on top of the coal seam near the tail entry and that he normally tried to operate the shear machine cutting bits approximately 10 inches from the sandstone roof while cutting coal;
- That he was cutting coal when the bump and ignition occurred;
- That he was located on the tail-entry side of the shear, approximately 10 feet from the headgate side shear drum and facing the headgate entry when the bump and ignition occurred;
- That he was operating the shear approximately two feet from the tail entry cut-out point when the bump occurred;
- That he heard a "big noise" and then a bump and ignition occurred, almost at the same time;
- That he felt a pressure change in his ears when the bump and ignition occurred;
- That everything went black when the bump and ignition occurred and the electrical power for the longwall face equipment and shield area lights deenergized;

- That he did not see any flame or flash when the ignition occurred because he was facing the headgate side of the shear and was not looking at the ignition area and that he did not know an ignition had occurred;
- That he felt “heat” when the ignition occurred;
- That immediately after the bump and ignition occurred, a mixture of coal and rock dust completely inundated the longwall face area while reducing the visibility from six inches to one foot;
- That immediately after the bump occurred, the direction of longwall face ventilation reversed from its normal direction of travel;
- That from 10 to 20 seconds after the bump and ignition occurred, he and the other face workers began to evacuate from the longwall face area;
- That he left water sprays operating on the shear machine when he and the other crew members departed the ignition area to evacuate from the longwall face;
- That the coal and rock dust mixture inundated the entire longwall face area when the bump and ignition occurred;
- That it took approximately five minutes for the crew to evacuate from the longwall face (ignition area) to the headgate entry;
- That the electrical power to all longwall section equipment was deenergized when they arrived at the headgate entry;
- That upon arriving at the headgate entry, he and other crew members were directed by Mr. Dehart to go to the No. 2 entry (intake smokefree escapeway);
- That Mr. Dehart came to the intake smokefree escapeway later and directed the crew to evacuate from the mine;
- That while evacuating from the mine, he did not see any dust or damaged ventilation controls along the 3 East Mains trackway.

2. **Kenny Stilwell – 6 Right Longwall Head Shear Operator stated:**

- That the evening shift production crew intended to produce coal only for a few minutes until the bunker was full of coal and that they planned to stop production to perform shear maintenance work;
- That during the past couple of weeks, bigger and louder bumps had been occurring when the shear machine cut out into the tailgate entry; that the vibration from these bumps dislodged some of the area lights mounted on the shields;
- That the shear was not cutting rock and he did not observe any sparks or flame when the bump and ignition occurred;
- That no abnormal methane problems had occurred during this shift or in recent previous shifts;
- That he was located at the headgate side of the shear at shield No. 165 when the bump and ignition occurred;
- That the bump and ignition occurred approximately three minutes after mining had resumed, after Mr. Honaker and Mr. Barton had stopped the shear and traveled to the tail entry to verify the location of the degas line; that he took a methane gas test while the shear was stopped and that he measured 0.5% methane;
- That he did not take a methane gas test after the bump occurred;

- That he heard the bump and it sounded like it was back in the gob area and not close to the longwall face area;
- That air pressure created by the bump blew him against the face conveyor pan-line; that he was not struck by any outburst of coal when the bump occurred;
- That within a few seconds after the bump and ignition occurred, a massive amount of air pressure and dense dust inundated the longwall face area;
- That immediately after the bump and ignition occurred, the electrical power on the longwall face equipment deenergized; that he thought an inundation of methane gas into the longwall face area had activated the face methane monitor and caused the longwall face equipment and shield area lights to deenergize;
- That within 30 seconds after the bump and ignition occurred, the face workers began to evacuate from the longwall face area;
- That as the face workers were evacuating from the longwall face area, they met Mr. Dehart, section mine foreman, and everyone evacuated together from the longwall face area;
- That the bump had caused the longwall face ventilation to reverse from its normal direction;
- That it took approximately six to seven minutes for mine personnel to evacuate from the longwall face area to the headgate entry;
- That after the longwall face workers arrived at the headgate entry, they observed dust suspended in the air in both the headgate (No. 4) entry and the track (No. 3) entry as he and the other longwall face workers proceeded to travel to the No. 2 (intake smokefree escapeway); that the dust in the headgate entry appeared to be rock dust;
- That the intake smokefree escapeway entry was clear of dust;
- That while he and other longwall face workers were located in the intake smokefree escapeway entry, they heard someone attempting to communicate with the crew by mine telephone;
- That he and Mr. Dehart departed the intake smokefree escapeway entry and returned to the headgate (No. 4) entry to answer the mine telephone and at this time, Mr. Dehart was instructed by surface personnel to evacuate his crew from the mine;
- That while the longwall crew was evacuating from the mine, he observed dust suspended in the air from the longwall section to approximately the 4 Right longwall area;
- That this was the worst bump that he had ever been involved in during his 20 years of longwall mining experience.

3. **Brock Barton – 6 Right Longwall Shield Operator (Jack Setter) stated:**

- That the evening shift crew relieved the day shift crew at their work stations at a location somewhere beyond shield No. 100;
- That the evening shift crew mined for an undetermined distance and then stopped operation of the shear while he and Mr. Honaker traveled into the tail entry to verify that the degas lines were located a safe distance from where the shear would cut out into the tail entry; that nothing unusual was observed in the tail entry and that the mine roof appeared to be good in the tail entry area;

- That the evening shift crew had mined approximately 20 minutes when the bump and ignition occurred;
- That he heard but did not feel the bump and that it sounded far away; that it was not a real hard bump and he had felt stronger bumps on previous occasions;
- That almost simultaneously with the bump, he felt a major change in the air pressure that hurt his ears and felt like his ears sucked together;
- That air movement and pressure from the bump struck him in the back and pushed him toward the face conveyor pan-line;
- That when the bump occurred, he felt a sudden change in air pressure and thick dust inundated the longwall face approximately 30 seconds later;
- That the bump and ignition occurred almost simultaneously;
- That he was located near the midpoint of the shear and from three to five feet away from Mr. Honaker when the ignition occurred;
- That Mr. Honaker was cutting coal and he was positive that the shear was not cutting any rock when the ignition occurred;
- That he did not observe any sparks as Mr. Honaker was operating the shear before the ignition occurred;
- That Mr. Honaker was facing him when the ignition occurred and that he saw sparks, similar to “campfire sparks” falling to the mine floor where Mr. Honaker was located and the sparks dissipated rather quickly;
- That he did not feel any heat from the ignition and did not see or smell any smoke after the ignition;
- That after recovering from the sudden change in air pressure after the bump, he observed the ventilation air current along the longwall face had reversed from its normal direction and was now traveling from the tail entry towards the headgate entry;
- That when the bump occurred and had caused a reversal of face ventilation, dense dust inundated the longwall face and the crew decided to evacuate from the longwall face area;
- That while evacuating from the ignition area towards the headgate entry, the crew met Mr. Dehart, section mine foreman, and they traveled together to the headgate entry;
- That as the face crew and section foreman were evacuating from the longwall face, the ventilation remained in a reversed direction and they could see black dust moving by them towards the headgate entry;
- That upon their arrival at the headgate entry, they observed dust suspended in the air and that the ventilation was still moving in a reversed direction;
- That after arriving at the headgate entry, he and other longwall personnel traveled immediately to the No. 2 entry (intake smokefree escapeway);
- That the intake smokefree escapeway entry was free of dust and the ventilation seemed to be normal in both direction and quantity;
- That the longwall section crew departed the intake smokefree escapeway entry and evacuated from the mine to the surface.

4. **Keith Colley – 6 Right Longwall Shield Operator (Jack Setter) stated:**

- That he thought he relieved the day shift jack setter at approximately shield No. 124, although he was not sure;
- That Mr. Honaker stopped the longwall shear at approximately shield No. 160 while Mr. Honaker and Mr. Barton traveled to the tail entry to verify that the degas line was clear where the shear would cut out into the tail entry;
- That he was located at shield No. 163 when the bump and ignition occurred;
- That he heard two fairly small bumps followed by a “big bump” and he did not observe any outburst of coal when the bump occurred;
- That when the bump occurred, he was leaning against the shields with his back turned towards the gob area and that air pressure created by the bump came out of the gob area and pushed him slightly forward against the conveyor pan-line;
- That electrical power to longwall face equipment deenergized immediately when the bump occurred, and he thought that an inundation of methane gas into the longwall face area had activated the face methane monitor and caused the longwall face equipment and area lights to deenergize, but he did not know for sure what had caused the electrical power to deenergize;
- That when the bump occurred, Mr. Honaker informed the other face workers that they needed to evacuate from the longwall face area;
- That immediately after the bump occurred, he and the other face workers evacuated from the longwall face toward the headgate entry;
- That when the bump occurred, the ventilation along the longwall face reversed from the normal direction of travel;
- That immediately after the bump occurred, the visibility became obscured with coal dust almost immediately and that he could only see a distance of two shields (approximately eight to ten feet);
- That when the ventilation along the longwall face reversed, the quantity of ventilation moving in the reverse direction was greater than the ventilation that normally moved in the proper direction;
- That the coal dust extended along the entire length of the longwall face area and into the headgate entry;
- That after arriving at the headgate entry, he traveled to the No. 1 entry to check on a crew of men that had been assigned to install cribs in this entry;
- That dust was visible in the headgate (No. 4) entry and track (No. 3) entry but the intake smokefree escapeway (No. 2) entry was clear of dust;
- That while evacuating from the longwall section to the No. 8 shaft bottom, he observed coal dust suspended in the track entry to the mouth of the 6 Right longwall section.

5. **Michael Dehart – 6 Right Longwall Fill-In Section Mine Foreman stated:**

- That his regular occupation was longwall repairman and he was filling in as section mine foreman on this shift;
- That after arriving on the 6 Right longwall section at approximately 3:55 p.m., on February 14, 2004, he conducted a safety meeting with the crew;
- That his crew relieved the day shift crew at their work stations along the longwall face area;
- That he talked to and relieved Mr. Hurley, day shift section mine foreman, in the headgate entry at the master control station;
- That the evening shift crew began operating the longwall shear at approximately shield No. 115 (a total of 173 shields);
- That he departed the headgate area at approximately 4:15 p.m. and obtained a ventilation air velocity measurement of 1,060 feet per minute at shield No. 12 and was traveling toward the shear when the bump and ignition occurred;
- That he was located approximately 15 shields (60 to 75 feet) from the shear when the bump and ignition occurred;
- That prior to the bump, he had conducted gas tests along the longwall face area at various locations and had detected methane in ranges from 0.1% to 0.3%;
- That he felt the ensuing bump as the mine roof started “shaking” and the face shields starting “pinging”;
- That his crew was making their first production run toward the tail entry and production activities were normal until the bump and ignition occurred;
- That the following sequence of events occurred during the incident: the roof fall occurred, ventilation left the face area, the ignition occurred, the ignition flame was seen; the face ventilation reversed in direction of air flow and then dense dust inundated the longwall face area;
- That immediately after the ignition, the ventilation reversed along the longwall face area and was traveling from the tailgate entry toward the headgate entry instead of the normal air flow direction, from the headgate entry toward the tailgate entry;
- That the bump and ignition occurred within a four to five second time span;
- That he was facing the tailgate entry and shear machine when the ignition occurred and the ignition flame lasted approximately one to two seconds;
- That he observed a red ignition flame only near the longwall face area and the flame spanned approximately an eight-foot area;
- That when the ignition occurred and during the face evacuation, he did not smell any odor of smoke or burned material;
- That while evacuating along the longwall face area toward the headgate entry, he looked back several times toward the ignition area and did not see any flames, but the area was so dusty that he could hardly see;
- That within one to two seconds after the ignition occurred, dense dust appearing to be rock dust, inundated the longwall face area and reduced visibility to approximately four feet;
- That when the bump and ignition occurred, the electrical power for the longwall face equipment and shield area lights deenergized;

- That immediately after the dense dust inundated the longwall face area, he began to account for all his crew;
- That the longwall face personnel began evacuating toward the headgate entry when the dust appeared along the longwall face area;
- That while he and his crew were evacuating from the longwall face area, the ventilation air current was still reversed, striking them in their backs;
- That evacuation from the ignition area in the ensuing dusty conditions took approximately three minutes to reach the headgate entry area;
- That upon arriving at the headgate entry, he instructed his crew to go the No. 2 entry (intake smokefree escapeway);
- That upon arriving at the headgate entry, the dust in this area was about one-half as concentrated as the dust along the longwall face and that the ventilation air flow was still traveling in a reversed direction;
- That upon arriving at the headgate entry, he contacted Mr. Harvey by mine telephone and reported that a bump and ignition had occurred on the 6 Right longwall section;
- That Mr. Harvey instructed him and his crew to evacuate from the mine;
- That he accounted for all of the longwall crew and began evacuation from the mine;
- That Mr. Darrell Boyd, repairman, deenergized and locked out the electrical power to the section power center prior to the crew departing the section, while evacuating from the mine;
- That as his crew was evacuating from the mine, he observed the ventilation reversed at the longwall section power center.

**6. Ralph Justus – 6 Right Longwall Fill-In Headgate Operator stated:**

- That his normal occupation was longwall systems operator and he was filling in as longwall headgate operator on February 14, 2005, when the bump and ignition occurred;
- That he had not observed any increase in the number, frequency or intensity of bumps during the last couple of weeks;
- That the longwall shear was located at shield No. 115 mining toward the tail entry when the evening shift personnel relieved the day shift personnel;
- That the face tail methane monitor, located near the conveyor face drive, displayed 0.4% methane when second shift mine personnel assumed production activities;
- That the evening shift crew was mining on their initial production run toward the tail entry when the bump occurred;
- That the bump occurred approximately between 4:20 p.m. and 4:25 p.m.;
- That he was located in the headgate (No. 4) entry, approximately 10 feet from the stage loader and mine telephone when the bump occurred;
- That the bump sounded like a big, hard roof fall similar to a mountain falling;
- That when the bump occurred, all the electrical power for the longwall face equipment had deenergized except the computer control panel display and that he deenergized the electrical power that controls the computer display panel by activating the emergency stop switch;



- That when the bump occurred that the ventilation gob check curtains installed in the headgate Nos. 2, 3 and 4 entries were blown down in an outby direction by the sudden force of air pressure created by the bump;
- That when the bump occurred, the mine ventilation at the stageloader, where he was located, reversed and was now moving from the longwall gob area in an outby direction;
- That when the mine ventilation reversed, dust appearing to be coal dust came out of the gob area into the longwall face and headgate (No. 4) entry;
- That all the events including the bump, reversal of section ventilation and dust inundating the longwall section area occurred within a “few seconds”;
- That within a few seconds after the bump occurred, the ventilation direction reversed and dust inundated his location and Mr. Donald Armstrong, 6 Right longwall belt-drive attendant, contacted him by mine telephone and informed him that dust had arrived at his location;
- That after the bump occurred and when the dust had cleared enough so that he could see to get to the longwall face telephone, he immediately began attempting to communicate with the longwall face workers; that Mr. Chadwell contacted him on the “yellow” mine telephone as he was attempting to contact the longwall face crew to determine if they were alright and that he informed Mr. Chadwell that he would call him back when he had verified that the face crew was alright; that Mr. Colley responded on the face telephone, and informed him that the crew was alright and they were evacuating from the longwall face area; that he heard Mr. Honaker say “let’s go, let’s go”;
- That Mr. Dehart and the face crew evacuated from the longwall face area and arrived at the headgate (No. 4) entry at the same time;
- That while he and the longwall face crew were located at the longwall operator control station in the headgate (No. 4) entry, Mr. Dehart talked to Mr. Harvey by mine telephone and after their conversation, Mr. Dehart instructed the longwall crew to prepare for evacuation from the mine;
- That during evacuation from the longwall section to the No. 8 shaft bottom, he observed dust appearing to be rock dust suspended in the air along the 3 East Mains trackway entry.

**7. Scott Bowman – 6 Right Longwall Repairman stated:**

- That on February 14, 2005, he was filling in as longwall section repairman because Mr. Dehart, who was the normal section repairman, was filling in as section mine foreman;
- That he was located in No. 3 entry near the 6 Right longwall section power center, loading rock dust on a battery powered scoop, when the bump occurred; that he was located near Mr. Boyd when the bump occurred (the section power center was located approximately four crosscuts outby the longwall face);
- That he heard three (3) distinct bumps from his location, within a five second time span; that the first bump was hard, loud and sharp and he felt a tingling sensation in his feet at this time; that the second and third bumps were more intense and much louder than the first bump but could not recall feeling any sensation in his feet from the last two bumps;

- That immediately following the third bump, within a couple of seconds, the longwall section ventilation reversed in direction as the air was now moving out of the gob area into the section headgate entries;
- That within a couple seconds after the third bump occurred, the track (No. 3) entry at his location was inundated with what appeared to be rock dust at first but later changed to black, coal dust;
- That shortly after the third bump occurred, he heard the vacuum circuit breakers which provides electrical power to all longwall face equipment start deenergizing; the vacuum circuit breakers were deenergizing because Mr. Justus had activated the emergency stop device located on the computer control station panel;
- That the visibility at his location was obscured to the extent that he had to hold onto a timber while awaiting for the dust to clear;
- That while located in the dense dust, he felt his way around until he found a mine telephone which was located beside the longwall section power center; that upon finding the mine telephone he called Mr. Justus, headgate operator, to check on him and the status of the longwall face crew and that Mr. Justus replied that he was attempting to contact the face crew;
- That after talking to Mr. Justus on the mine telephone, he began trying to find his way to the No. 2 entry (intake smokefree escapeway); that the intake smokefree escapeway entry was clear of dust;
- That Mr. Dehart gave the directive to the crew to evacuate from the mine;
- That as he and other crew workers were traveling off the 6 Right longwall section, the ventilation air movement was near zero as the dust seemed to be standing still and not moving in any direction;
- That while the 6 Right longwall crew was evacuating from the mine, he observed dust in the 6 Right longwall section trackway but did not observe dust along the 3 East Mains trackway entry.

**8. Winston Boyd – 6 Right Longwall Repairman stated:**

- That his normal work occupation is longwall section repairman;
- That during the past week, more bumps than normal had been occurring in the longwall gob area;
- That a couple shifts before this shift, he was located in the tail entry and a strong bump occurred that caused three mounted area lights to become dislodged from the shields;
- That on February 13, 2005, he had traveled into the tail entry and did not observe any abnormal roof conditions;
- That he was located near the longwall section power center looking for a pipe fitting when the bump occurred; that he was located near Mr. Bowman when the bump occurred (the section power center was located approximately three to four crosscuts outby the longwall face);
- That from this location, he heard three (3) distinct bumps, 15 to 30 seconds apart; that the first and second were small bumps and that the third bump was “big and massive”;

- That immediately following the third bump, the longwall section ventilation reversed in direction as the air was now moving out of the gob area into the section headgate entries;
- That the quantity of air moving in the reversed direction was greater than the amount that normally moves in the proper direction;
- That immediately after the third bump occurred, the track (No. 3) entry at his location was inundated with what appeared to be rock dust;
- That Mr. Bowman went to a mine telephone located near the section power center to contact Mr. Justus, headgate operator, to determine what had happened and he did not know anything about the conversation between Mr. Bowman and Mr. Justus;
- That when Mr. Bowman returned from the mine telephone, he instructed him to travel inby one crosscut and to go into the No. 2 entry (intake smokefree escapeway);
- That he started traveling inby in the track (No. 3) entry toward the longwall face to check on the status of the face workers and met the face workers traveling to the No. 2 entry (intake smokefree escapeway); that he traveled with the face workers to the No. 2 entry; that all the longwall face workers and Mr. Bowman congregated in the crosscut at the entrance of the intake smokefree escapeway entry while awaiting for the dust to clear; that the intake smokefree escapeway entry was clear of dust;
- That approximately five to ten minutes after the ventilation reversed, the air reversed again and began moving back in the proper direction toward the longwall face area; that the air moving in the proper direction toward the longwall face was evident as the dust began clearing;
- That after meeting the longwall face workers evacuating to the intake smokefree escapeway, he traveled back to the longwall section power center and “locked out” the electrical power to the section power center;
- That approximately 10 minutes elapsed after the bump occurred when the longwall crew began to evacuate from the mine;
- That while the longwall crew was evacuating from the mine, he observed dust suspended in the air from the longwall section to the 3 East Mains track entry.

9. **Terry Hurley – Day Shift 6 Right Longwall Fill-In Section Mine Foreman (regular occupation - longwall repairman) stated:**

- That he had filled-in as 6 Right longwall section mine foreman on the day shift, on February 14, 2005;
- That mining on the day shift was relatively normal but that several minor roof bumps had occurred, but had not caused any abnormal problems;
- That no abnormal roof conditions were observed along the longwall face area;
- That he thought the longwall “gob roof falls” appeared to be relatively tight as indicated by good ventilation traveling along the longwall face area;
- That he conducted the preshift examination for the oncoming evening shift and that all ventilation structures were intact and that section ventilation, roof conditions and methane tests appeared to be normal;
- That while conducting the preshift examination, he observed “gob check curtains” installed in all four entries on the headgate side of the longwall section;

- That what appeared to be sandstone roof rock had come down on top of the coal seam near the tail entry on the longwall face area;
- That his crew was relieved by the evening shift crew at their work stations;
- That his crew departed the 6 Right longwall section at approximately 4:30 p.m.;
- That as his crew departed the section they observed other evening shift mine personnel located at the mouth of the 6 Right longwall section;
- That his crew was located on the 6 Right longwall trackway, approximately one crosscut from the junction of the 3 East Mains trackway, when the bump occurred;
- That he heard and felt the bump and that it was as intense as he'd ever felt during his mining career;
- That the bump was very unusual and it felt like the mine floor "buckled";
- That shortly after the bump occurred, dense dust suddenly appeared to be coming up the 3 East Mains trackway towards the 6 Right longwall track entry, but the dust concentration appeared to become less as they continued travel on the 3 East Mains trackway towards the No. 8 shaft bottom area;
- That he felt like the ventilation quantity increased in the track entry after the bump occurred;
- That while traveling the 3 East Mains trackway enroute to the No. 8 shaft bottom, he did not observe any damaged ventilation structures, doors open, etc;
- That dust appeared to be present in the track entry along the entire length of the 3 East Mains trackway to the No. 8 shaft bottom.

**10. Bob Brewster – Section Mine Foreman stated:**

- That he and four (4) other mine personnel were located at the mouth of the 6 Right longwall section, approximately seven (7) crosscuts outby the longwall face area when the bump occurred;
- That Mr. Hilyea and four (4) other mine personnel were also located at the mouth of the 6 Right longwall section to assist him and his crew remove slack from the longwall belt;
- That at approximately 4:20 p.m., he felt a strong movement of air traveling from the longwall section in an outby direction and that the air movement was so strong that he had to brace himself to stand upright;
- That the longwall belt conveyor was operating when the bump occurred and that he did not hear anything;
- That when the bump occurred, he felt a strong movement of air traveling in an outby direction as the section ventilation reversed from its normal direction and immediately after the ventilation reversed, the area became very dusty; that the dust appeared to be rock dust;
- That after approximately five to ten seconds, while traveling back toward the 6 Right longwall face area, he thought the mine ventilation reversed again and returned to the proper direction;
- That after the mine ventilation started traveling back in the proper direction toward the longwall face area, the quantity of air was reduced by approximately one-half the normal quantity;

- That when the bump occurred, causing a reversal of mine ventilation from the 6 Right longwall section traveling in an outby direction, the area where he and Mr. Hilyea and their crews were located became very dusty and visibility was reduced to approximately 20 feet;
- That when the bump occurred, he was located near a mine telephone and immediately contacted Mr. Justus, longwall headgate operator; that Mr. Justus informed him that he was attempting to contact everyone located along the 6 Right longwall face area;
- That immediately after the bump occurred, he heard Mr. Chadwell, assistant mine superintendent, attempting to contact other mine personnel;
- That immediately after the bump occurred, he and Mr. Hilyea accounted for all mine personnel in their crews;
- That he heard Mr. Chadwell instructing foremen located on other working sections to obtain air measurements on their respective sections;
- That at approximately 4:30 p.m., Mr. Chadwell instructed him to leave the mouth of the 6 Right longwall section and travel to the 3 East Mains section, because he (Mr. Chadwell) had not received any communications from mine personnel located on the 3 East Mains section; mine personnel located on the 3 East Mains section had started a high voltage power move and were working a substantial distance from the mine telephone and thus could not hear Mr. Chadwell attempting to contact them; that he observed dusty conditions in the track entry for the entire distance from the 6 Right longwall section to the 3 East Mains section and that visibility was approximately 100 feet along the trackway entry;
- That he instructed Mr. Hilyea to stay near the mine telephone at this location and to prepare for evacuation of both crews of mine personnel while he traveled to the 3 East Mains section to check on personnel on that section;
- That when he arrived on the 3 East Mains section, the mine personnel were preparing for evacuation as instructed by Mr. Chadwell; that he and the 3 East Mains crew departed the section at approximately the same time;
- That while traveling on the 3 East Mains trackway enroute to the No. 8 shaft bottom, he stopped at the mouth of the 6 Right longwall section and talked to Mr. Chadwell again on the mine telephone; that Mr. Chadwell instructed him at this time to travel to the 8 Right section to check on these mine personnel;
- That when he arrived on the 8 Right section, mine personnel were boarding the mantrip to evacuate as instructed by surface personnel; that he and the 8 Right section crew departed the section at approximately the same time; that while enroute to the 8 Right section, the dusty conditions observed in the track entry began clearing about halfway (approximately 3,000 feet) on the 8 Right section trackway;
- That while evacuating from the mine, as he was traveling the 3 East Mains trackway, he returned to the 6 Right longwall section to ensure his crew had also been evacuated from the mine and upon arriving where he had left his crew at the mouth of the 6 Right longwall section, he observed that his crew and the longwall crew had already evacuated from the mine; that dust on the section had cleared and that visibility was good from the end of the track for approximately 1,000 feet toward the section;

- That while evacuating from the mine traveling the 3 East Mains trackway from the 6 Right longwall track entry, he observed dusty conditions in the track entry outby to the 1 Right longwall panel (approximately 8,400 feet).

**11. Larry Powers – General Inside Laborer stated:**

- That he and a coworker were located in a sidetrack at the mouth of the 6 Right longwall section, approximately 10 crosscuts outby the longwall face area when the bump occurred;
- That he felt something like a big roof fall and almost immediately the section ventilation reversed from its normal direction as the air began moving from the 6 Right longwall section toward the 3 East Mains area;
- That immediately after the bump occurred, the area became so dusty that you could hardly see, with visibility reduced to practically zero;
- That as the 6 Right longwall day shift crew were exiting the section, he asked them what had happened and they responded that they did not know;
- That he traveled on foot from the sidetrack into the track entry and observed airlock doors located between Nos. 2 and 3 entries intaking air, which was abnormal;
- That the area where he was located was still dusty after five (5) minutes and he and his coworker traveled to the 6 Right longwall section belt-head and asked the belt-head attendant if he knew what had happened, and the belt-head attendant informed them that he thought an ignition had occurred on the longwall face area;
- That while he and his coworker were evacuating from the mine on the 3 East Mains trackway to the No. 8 shaft bottom, he did not observe any damaged ventilation controls or open ventilation doors.

**12. William Dishman – Utilityman stated:**

- That he and other mine personnel had been assigned to perform belt maintenance work on the 3 East Mains belt conveyor and that he was located at crosscut No. 68;
- That he felt a vibration sensation in his ears when the bump occurred;
- That he did not hear anything when the bump occurred;
- That when the bump occurred, the ventilation seemed to neutralize which he described as coming to a “standstill” and that after a “short time – a matter of seconds”, the ventilation direction returned to normal;
- That while he and other coworkers were evacuating from the mine on the 3 East Mains trackway, he did not observe any deviations from normal mine ventilation and did not observe any dust in the trackway entry;
- That while evacuating from the mine, he did not observe any damaged ventilation controls located along the 3 East Mains trackway.

**13. Raymond Kinder – 3 East Mains Section Mine Foreman stated:**

- That he and his crew arrived on the 3 East Mains working section at approximately 4:00 p.m. and that they were assigned to complete a high voltage power move;
- That he discussed the power move procedures and designated work assignments with his crew;
- That he and most of his crew were located in the belt entry when the bump occurred;

- That he could hear numerous conversations on the mine telephone and, a short time later, he saw a substantial amount of dust moving up the intake air entry, which was adjacent to the belt entry; that while exiting from the mine Mr. Ron Padgett, roof bolting machine operator, informed him that he (Mr. Padgett) felt his ears “pop” when the dust appeared in the intake air entry;
- That after observing dust in the intake air entry, he instructed his crew to stay in the belt entry while he went to obtain section return air measurements;
- That he obtained an air measurement of 72,330 cfm in the section left return air split, which was about normal;
- That as he was completing the air measurement in the left return, Mr. Sayers informed him that surface personnel had notified them to evacuate from the mine;
- That before departing the section, his crew deenergized the section electrical power, disconnected scoop batteries and possibly disconnected two sets of spare batteries;
- That as his crew was departing the section, he observed “light to medium” dust in the track entry;
- That as his crew was evacuating from the mine on the 3 East Mains trackway, he did observe some “light dust” but that the overall visibility was practically normal;
- That as his crew was evacuating from the mine on the 3 East Mains trackway, the air quantity was less than normal but the air current was moving in the proper direction;
- That while traveling on the 3 East Mains trackway, the dust appeared to terminate at approximately the 3 East No. 3 belt drive;
- That he and his crew did not know what had happened until they arrived at the No. 8 shaft bottom and were preparing to board the hoist for transportation to the surface.

**14. Tim Chafins – 8 Right Section Mine Foreman stated:**

- That he and his section crew had relieved the day shift crew at approximately 3:55 p.m. on the 8 Right longwall development section;
- That before the bump occurred, his crew had completed clean-up runs in the Nos. 2 and 4 entries;
- That at approximately 4:20 p.m., he felt a vibration / quake-like sensation and that none of the other mine personnel said anything to him about feeling the vibration;
- That immediately after the bump occurred, he instructed Mr. Roger Neal, shuttle car operator, to go with him to the mine telephone while he called surface personnel to inquire about what had happened;
- That he contacted surface personnel by mine telephone and that Mr. Chadwell instructed him to obtain section return air measurements and to prepare for evacuation from the mine;
- That he observed “light” rockdust coming up the track entry toward the working section that gave a “hazy” appearance;
- That the ventilation air current seemed to be normal in both quantity and direction at the end of the 8 Right section track;
- That he obtained section return air measurements and they were in the normal range;
- That he and his crew evacuated from the mine traveling the 3 East Mains trackway, and while traveling to No. 8 shaft bottom, he did not observe any dust in the track entry, abnormal ventilation changes or damaged ventilation controls;

- That he had felt longwall bumps before but this bump was the most intense that he had ever felt.

**15. Jerry Pugalee – Maintenance Foreman stated:**

- That he and two coworkers were traveling along the Grassy Creek Mains trackway at crosscut No. 116 (near the top end of the 4 Left longwall panel) when the bump occurred;
- That he and his coworkers had been assigned to assist in repairing the two inoperative continuous mining machines located on the Grassy Creek Mains section;
- That at approximately 4:15 p.m., while traveling on the Grassy Creek Mains trackway, he and his coworkers felt a pressure change in both their ears and chest;
- That he and his coworkers did not hear anything abnormal when the pressure change occurred and later realized that the bump had occurred when they felt the pressure change;
- That 15 to 20 seconds after the bump occurred, suspended coal dust appeared in the track entry which reduced visibility to arm's length;
- That he felt the quantity of ventilation in the track entry may have doubled or tripled at this location after the bump;
- That the coal dust concentration increased in intensity and he instructed his coworkers to go through a door into an adjacent entry while attempting to get clear of the dust while he remained in the track entry to connect a portable telephone;
- That his coworkers returned from the adjacent entry and informed him that coal dust was just as bad in the adjacent entry; that this adjacent entry was a bleeder return entry for the top end of the longwall panels;
- That he completed connecting the portable telephone, contacted Mr. Chadwell and informed him where he was located; that four minutes later Mr. Chadwell called back and instructed them to evacuate from the mine;
- That the visibility began improving while traveling the Grassy Creek Mains trackway and visibility was fairly good along the trackway at the 3 Left longwall panel (approximately 1,000 feet outby their location when the bump occurred);
- That he and his coworkers stopped at the New Bunker and picked up three (3) mine personnel, who also had felt a pressure change and observed a substantial change in air quantity at their location;
- That he met a motor-supply crew on the 4 North Mains trackway and he instructed them to return to the Page shaft bottom while evacuating from the mine;
- That he also met Mr. Kenny Stiltner, belt conveyor rover, on the 4 North Mains trackway, and instructed him to return to the No. 8 shaft bottom to evacuate from the mine;
- That from the junction of the 4 North Mains and Grassy Creek Mains trackways, the dust had cleared as they traveled toward the No. 8 shaft bottom;
- That the mine ventilation seemed to be traveling in the proper direction and proper quantity along the 4 North Mains trackway;
- That he did not observe any damaged ventilation controls while traveling the Grassy Creek Mains and 4 North Mains trackways while enroute to the No. 8 shaft bottom.



**16. Darrell Blackwell – Day Shift Maintenance Foreman stated:**

- That when the bump occurred, he and two (2) electrical troubleshooters and two (2) maintenance trainees were located on the Grassy Creek Mains section repairing two inoperative continuous mining machines;
- That he did not hear anything when the bump occurred, did not see any dust and did not observe any change in the section ventilation;
- That he and his four electrical coworkers felt two (2) pressure changes in their ears approximately one (1) minute apart and that after the second pressure change, he went to the mine telephone and called Mr. Chadwell; Mr. Chadwell informed him that they were evaluating what had happened in the mine;
- That he called Mr. Chadwell a second time approximately two (2) minutes later and Mr. Chadwell instructed him and other mine personnel to evacuate from the mine;
- That his crew and the dayshift and evening shift production crews departed the section enroute to the No. 8 shaft bottom at the same time;
- That Mr. Chadwell instructed them to evacuate from the mine and to travel the 7 Right and 3 East Mains trackways to the No. 8 shaft bottom;
- That he and his crew did not observe any dust in the 7 Right and 3 East Mains track entries as they evacuated from the mine;
- That the mine ventilation seemed normal in the 7 Right and 3 East Mains track entries and he did not observe any damaged ventilation controls as they evacuated from the mine;
- That when he arrived on the surface, at approximately 5:35 p.m., Mr. Harvey instructed him to deenergize the four (4) electrical borehole feed circuits which provided underground power for the mine (the four borehole feed circuits enter the mine at the Nos. 6, 8, 9 and Page shafts);
- That he deenergized the electrical borehole feed circuits at the Nos. 6 and 9 shafts; that the No. 8 shaft circuit had already been deenergized and that he instructed other mine personnel to deenergize the borehole feed circuits on the Page side of the mine;
- That he started deenergizing the electrical borehole feed circuits for the various shafts at approximately 6:00 p.m.

**17. Robert Baugh – Day Shift Grassy Creek Mains Section Mine Foreman stated:**

- That when the bump occurred, he and eight (8) coworkers were switching out with the evening shift crew on the working section;
- That he did not feel anything when the bump occurred;
- That both continuous mining machines on the section were inoperative and Mr. Darrell Blackwell, day shift maintenance foreman, and other maintenance personnel were located on the section to repair the mining machines;
- That Mr. Blackwell informed him that he (Mr. Blackwell) and his coworkers felt a pressure change in their ears and that he (Mr. Baugh) should call surface personnel to ensure that everything was alright in the mine;
- That after talking to Mr. Blackwell, he went to the mine telephone and talked to Mr. Randy Cox, acting second shift assistant general mine foreman, and Mr. Chadwell and either Mr. Cox or Mr. Chadwell instructed him to obtain air measurements in both section returns;

- That he had completed the air measurement in the section right return and measured 50,300 cubic feet per minute (cfm), which was about normal;
- That as he was traveling back across the section to get a left return air measurement, Mr. Larry Crouse, shuttle car operator, informed him that surface personnel had called and instructed them to evacuate from the mine;
- That he returned to the mine telephone and contacted Mr. Cox who instructed him and his crew to evacuate from the mine and to travel the 7 Right and 3 East Mains trackways;
- That his crew, the day shift production crew and Mr. Blackwell's maintenance crew departed the working section enroute to the No. 8 shaft bottom at the same time;
- That Mr. Alex Presley, fill-in, day shift section mine foreman, informed him later that one of two doors in each airlock located along the 7 Right track entry was open;
- That he and his crew did not observe any dust in the 7 Right and 3 East Mains track entries as they evacuated from the mine;
- That the mine ventilation seemed to be normal in both quantity and direction along the 7 Right and 3 East Mains track entries, and he did not observe any damaged ventilation controls as they evacuated from the mine.

**18. Ken Harvey – Mine Superintendent stated:**

- That in the recent past, no out-of-the ordinary bumps, roof falls or abnormal methane problems had occurred on the 6 Right longwall section and associated gob area;
- That he, Mr. Chadwell and Mr. Clarkson, general mine foreman, were located in the No. 8 shaft mine office discussing routine shift work and future mining plans when they felt vibration resulting from the bump;
- That the bump occurred at approximately 4:20 p.m.;
- That immediately after the bump occurred, mine personnel were dispatched to the Nos. 6 and 9 shaft fans to monitor and test for mine gases with handheld instruments;
- That immediately after the bump occurred, he instructed Mr. Chadwell to contact all personnel located on the sections by mine telephone except the 6 Right longwall section and that he would contact the longwall section personnel; that before he could contact longwall personnel, Mr. Justus, longwall headgate operator, called outside and informed him that a bump had occurred and he thought an ignition had occurred on the longwall face; and that Mr. Dehart was enroute to the headgate entry and that Mr. Dehart would contact him when he arrived at the headgate telephone; that Mr. Dehart called and informed him that an ignition had occurred on the longwall face and the ventilation had reversed on the section;
- That he notified Mr. Mack Ruble, safety supervisor, who was preparing to depart from the mine, that something had happened underground and he needed him to stay at the mine;
- That he instructed Mr. Chadwell to contact personnel on all sections and to instruct them to assemble all mine personnel at the end of the track near the mine telephone, while each section foreman was obtaining return air measurements;
- That neither he nor Mr. Chadwell had been able to establish communications with the 3 East Mains section personnel, because they were assigned to complete a high voltage power move and were working away from where the mine telephone was located;

- That Mr. Brewster, section mine foreman, was located at the mouth of the 6 Right longwall section when he called and reported dust suspended in the air at his location;
- That personnel located on the 8 Right section had called surface personnel reporting dust suspended in the air;
- That at this time, with reports of suspended dust and ventilation problems in various areas of the mine, he realized he needed to account for all underground personnel and to stage all mine personnel at the end of the track on each section, should a mine-wide evacuation become necessary;
- That Mr. Chadwell had contacted personnel located on the Grassy Creek Mains section, and these personnel reported feeling a pressure change but had not observed any dust suspended in the air;
- That Mr. Pugalee and two coworkers, who were traveling along the Grassy Creek Mains trackway, called and reported a pressure change and coal dust suspended in the air at their location (Mr. Pugalee identified this location as crosscut No. 116 – near the top end of the 4 Left longwall panel);
- That after receiving information that dust was suspended in the air on the 6 Right longwall section, at the mouth of the 6 Right longwall section, 8 Right section and Grassy Creek Mains, near the 4 Left longwall panel, he instructed Mr. Chadwell to account for all underground mine personnel and to evacuate everyone to the No. 8 shaft bottom, where the hoist transportation to the surface is located;
- That he planned to evacuate all mine personnel to the No. 8 Shaft bottom, then have certified mine foremen re-examine the mine to evaluate the situation and determine what had happened;
- That he initially thought a permanent ventilation stopping had crushed out somewhere between the 5 Right longwall section and the No. 8 shaft fan and the mine ventilation had been short-circuited;
- That all shift and section mine foremen had been notified and all underground mine personnel were accounted for and everyone in the mine had been instructed to evacuate to either the No. 8 shaft bottom or the Page side of the mine;
- That when he and Mr. Terry Suder, general manager, traveled to the No. 8 shaft fan to check the ventilation water pressure gauge, they observed either smoke or rock dust emitting from the No. 8 shaft fan upsweep structure, but were not sure if it was smoke or rock dust; that there was no odor and the smoke or rock dust cleared temporarily;
- That after observing the smoke or rock dust on the surface at the No. 8 shaft fan upsweep structure, he instructed Mr. Randy Cox, evening shift acting shift foreman, to evacuate all mine personnel from the shaft bottom to the surface and to account for all day and evening shift personnel;
- That 15 to 20 minutes after everyone was on the surface and accounted for, he instructed Mr. Cox to verify and account for all mine personnel that entered the mine at both the No. 8 shaft and Page portals a second time;
- That he was not sure exactly when all mine personnel had evacuated and arrived on the surface at the respective No. 8 shaft and Page portals;
- That with all mine personnel accounted for and out of the mine, personnel were assigned to monitor the Nos. 6, 8 and 9 shaft fans for mine gases with hand-held instruments;

- That he instructed Mr. Ruble to report the ignition and evacuation to DMME and MSHA officials, that DMME was notified at approximately 4:45 p.m. and MSHA was notified at approximately 4:50 p.m.

**19. Craig Chadwell – Assistant Mine Superintendent stated:**

- That in the recent past, no out-of-the ordinary bumps or roof falls or abnormal methane problems had occurred on the 6 Right longwall section and associated gob area;
- That sandstone roof came down on top of the coal seam near the tail entry;
- That he was located in his office located at the No. 8 shaft mine office when the bump occurred and the mine office building shook, ceiling tiles rattled and dust fell from the ceiling;
- That the first indication he had that something had occurred underground was when 6 Right longwall personnel called to the surface, by mine telephone, reporting that a bump had occurred and they thought an ignition may have occurred and the ventilation had reversed on the longwall face, and Mr. Dehart, section mine foreman, was enroute to the headgate telephone;
- That immediately after the bump occurred, mine personnel located on various working sections began calling to the surface reporting that they had felt a bump and were inquiring about what had happened; that at this time he instructed section mine personnel to remain at the telephone and for the foreman to obtain return air measurements on their respective sections;
- That Mr. Dehart, 6 Right longwall section foreman, called Mr. Harvey and verified that an ignition had occurred, that ventilation had reversed on the section and dense dust had inundated the longwall face;
- That he began contacting section personnel who had not already called the surface, and he could not contact 3 East Mains section personnel;
- That he instructed Mr. Brewster, located at the mouth of the 6 Right longwall section, to travel to the 3 East Mains section to check on the status of the crew because he had been unable to contact them;
- That Mr. Harvey had directed him to notify all mine personnel located on the working sections and to instruct them to withdraw to their respective section power centers, to get out of the dust while the situation was being evaluated;
- That approximately five to ten minutes after the bump occurred, security personnel called the mine office reporting that methane gas in the bleeder areas had increased from 1.1% to 1.8% and it was increasing rather quickly; that the bleeder areas had increasing methane gas levels at checkpoints Nos. 1, 2 and 3, located along the Grassy Creek Mains bleeder area; that the directive to evacuate all mine personnel to the surface had not been given at that time;
- That Mr. Pugalee, who was traveling along the Grassy Creek Mains trackway, called and reported coal dust suspended in the air at his location (Mr. Pugalee identified this location as crosscut No. 116 – near the top end of the 4 Right longwall panel) and he instructed Mr. Puaglee to remain at that location at that time;
- That he contacted another person, unknown, who was located at the 4 North short belt and instructed him to stop the personnel who had been assigned to examine the degas lines;

- That the ventilation in particular areas of the mine was still reversed 15 to 20 minutes after the bump occurred;
- That with confirmation that an ignition had occurred in the longwall face area and with the section ventilation reversed, the decision was made to evacuate all personnel from the mine;
- That he contacted mine personnel located on various sections and everyone who was listening on the mine telephone who had previously been instructed to stage at their respective locations, were now directed to evacuate from the mine;
- That he contacted Mr. Brewster again, who was located on the 3 East Mains section, and directed him to instruct all personnel to evacuate from the mine;
- That he could not contact 8 Right section personnel to order the evacuation, so he dispatched Mr. Brewster from the 3 East Mains section to the 8 Right section; that while Mr. Brewster was enroute to the 8 Right section, he finally contacted the 8 Right section crew and instructed them to evacuate to the surface;
- That while evacuating from the mine, Mr. Chafins observed rock dust suspended in the air along the 8 Right section trackway;
- That the air measurements and methane gas tests obtained by the respective section foremen located on the Grassy Creek Mains, 8 Right and 3 East Mains development sections were in their normal range;
- That after all mine personnel were accounted for and located on the surface, Mr. Blackwell, day shift maintenance foreman, was instructed to deenergize all electrical power going underground;
- That Mr. Randy Cox, evening shift, acting shift foreman, was assigned the responsibility to account for and ensure all mine personnel were evacuated from the mine;
- That he thought the evacuation of all personnel from the mine was completed by approximately 5:00 p.m.;
- That after the evacuation was completed, security personnel reported a carbon monoxide (CO) alarm located at the 6 Right longwall tailpiece indicated 50 parts per million (ppm) CO;
- That the CO monitoring system is equipped with a dry-cell battery backup system which provides power to the CO system, in the event that mine power is lost.

The following is a summary of events and conditions observed at the applicable locations during and following the bump / roof fall and ignition as stated by mine personnel:

**No. 8 Shaft mine office** - The bump / roof fall vibrated the mine office, rattled the office ceiling tiles and caused dust to fall from the ceiling. The mine office is located approximately 2,000 feet above and 7,200 feet away from the suspected roof fall area.

**6 Right longwall face** - The bump / roof fall occurred; ventilation temporarily left the face area; the ignition occurred; the face ventilation reversed in direction of airflow; dense dust inundated the longwall face area.



**6 Right longwall headgate entries from the headgate operator station outby to the mouth of**

**6 Right** - The bump / roof fall caused a strong movement of air to travel in an outby direction out of the gob area toward the mouth of the section; the strong air movement required mine personnel to hold onto timbers, etc. to be able to stand upright; the section ventilation reversed from the normal direction of airflow and began moving in an outby direction; the headgate Nos. 2, 3 and 4 entries were inundated with dense dust; the ventilation apparently reversed again a short time later and began traveling back toward the longwall face area; the headgate gob check curtains installed in the Nos. 2, 3 and 4 entries were blown down in an outby direction.

**Trackway entry from 6 Right longwall section to the 3 East Mains and 8 Right development sections**

- A mine foreman who traveled from the mouth of the 6 Right longwall section to the 3 East Mains section observed dust that limited visibility to approximately 100 feet for the entire distance. This foreman also observed dust halfway up the 8 Right section trackway entry, approximately 3,000 feet.

**3 East Mains development section** - Mine personnel did not feel or hear anything; the section mine foreman initially observed a substantial amount of dust moving up the intake air entry toward the section and the section crew observed light to medium dust in the section track entry as they were evacuating from the mine. One person felt his ears “pop” when the dust appeared in the intake entry.

**8 Right development section** - The section mine foreman felt a “vibration / quake-like” sensation and observed “hazy-dust” coming up the track entry toward the section. The foreman stated that the section ventilation seemed to be normal in both direction and quantity.

**Grassy Creek Mains development section** - Mine personnel did not hear anything but did feel two pressure changes in their ears, approximately one minute apart. The section mine foreman obtained a right return entry air measurement that was determined to be normal.

**Grassy Creek Mains trackway at crosscut No. 116, near the 4 Left longwall development panel**

- Mine personnel were traveling the trackway at this location and did not hear anything but did feel a pressure change in their ears and chest. These personnel also felt that the quantity of ventilation in the track entry may have “doubled or tripled” at this location. These personnel stated that approximately 15 to 20 seconds after the change in ventilation occurred that suspended dense coal dust suddenly appeared in the track entry, which reduced visibility to an “arm’s length”. Two mine personnel also observed dust in an adjacent bleeder return entry where they had traveled while attempting to get clear of the dust. As these mine personnel were evacuating from the mine, they observed that the dust in the track entry began to clear when they arrived at the 3 Left longwall panel, located approximately 1,000 feet outby the 4 Left longwall panel.

## DISCUSSION

A disparity exists between what personnel at this mine describe as a “bump” and what the Coal Mining Dictionary defines as a “bump”. The Coal Mining Dictionary defines a bump as: a sudden, violent expulsion of coal from one or more pillars, accompanied by loud noise and earth tremors, and that bumps occur in coal mines where a strong, thick massive sandstone roof rests directly on the coal with no cushioning layer of shale in between. A “shock bump” is defined as the breaking of a thick, massive strata above the coalbed which causes a great hammerlike blow to be given to the immediate roof which transmits it as a shock wave to coal pillars. Mine personnel stated that no outburst or expulsion of coal was observed when the bump occurred. The term “bump”, however, will be used in this report to describe the roof fall that precipitated this accident.

## PHYSICAL FACTORS

The investigation of physical factors related to the accident was not possible until after the mine was recovered on May 29, 2005. The physical factors at the scene of the accident revealed the following:

1. An energy release (shock bump) occurred in the 6 Right longwall section gob area due to a roof fall of the massive sandstone band overlying the coal seam. This release registered a magnitude of 3.0 and was of such strength that it shook the mine office, located approximately 7,200 feet away and 2,000 feet above the suspected epicenter.
2. The shock bump / roof fall and ensuing methane ignition occurred at approximately 4:20 p.m., on February 14, 2005, near the tail face area of the 6 Right longwall section.
3. The longwall section personnel began retreat mining of the 6 Right longwall panel on August 4, 2004. The longwall panel was 10,500 feet long and the face was approximately 980 feet wide. At the time of the bump / roof fall and ignition, the tail of the longwall face was located approximately at tailgate entry retreat No. 1,080 feet and the head of the longwall face was located at headgate entry retreat No. 1,071 feet.
4. The 6 Right longwall face equipment included a Joy 0-7LS 1A double drum shearer, serial No. 292B, 173 Gate and Joy face shields, a Joy Model 01PL01-1062 face conveyor and a Joy Model 1SL01 stageloader.
5. The electrical systems and permissible components provided for the 6 Right longwall face equipment were examined and no deficiencies were found that could have been considered as a possible methane ignition source.
6. The head and tail shear cutter drum bits were not worn and there were no bits missing from the cutter drums. A physical examination of the mine roof immediately above the shear cutter drum bits did not reveal any marks that are commonly associated with bits striking the mine roof. Although the face coal had sloughed off at the location of the tail shear cutter drum, making measurements unavailable, the shear tail cutter drum appeared to have been located a short distance from cutting out into the tailgate entry, concurring with mine personnel statements. The tail cutter drum was positioned below the roof-line of the coal seam at approximately mid-seam height. The longwall face-line was relatively straight with

no apparent elevation dips across the face from the head to the tail. The travelway height across the longwall face from the head to the tail ranged from 54 inches to 78 inches.

7. The shear machine methane monitoring system consisted of a CSE Corporation Model 140IR digital display control unit with a detector unit mounted on the tail drum side of the shear machine. The face methane monitoring system consisted of an Appalachian Corporation Model 202A digital display dual control unit equipped with a headgate detector unit and a face tail detector unit mounted at the tail drive assembly. The face methane monitoring system was set to give a low alarm when 1.0% methane is detected and to deenergize the longwall face equipment with a high alarm when 1.5% methane is detected. The face tail detector unit was replaced prior to calibration and testing of the longwall face methane monitoring systems. The shear methane monitor and the face methane monitors were calibrated, tested and all of the methane monitors operated properly. The original settings provided for the methane monitoring system was changed to give a low alarm at 0.7% methane and to give a high alarm at 1.0% which would deenergize the electrical power on all longwall face equipment.
8. The emergency stop switch provided at the 6 Right longwall headgate operators control station was observed in the activated position and the 4,160 volt shear electrical power disconnecting unit was observed in the energized position. The 13,200 volt vacuum load break switch, which provides electrical power to the longwall high voltage power center, was observed in the deenergized position. The power center was located in the No. 3 (track) entry at crosscut No. 13, approximately 600 feet outby the longwall face.
9. The cut off valve provided for the 6 Right longwall section water supply line was observed in the off or closed position. The waterline is installed in the No. 3 entry adjacent to the longwall pumping station, located inby the longwall section power center at crosscut No. 13. The cut off valve provided for the shear / face water supply line was also observed in the closed position, and the longwall belt control switch located at the headgate operator control station was observed in the on position.
10. The gob check curtains, originally installed with timbers and fence wire in the Nos. 2, 3 and 4 (headgate) entries, were blown down in an outby direction indicating that sudden forces exited the gob area on the 6 Right longwall section. The gob check curtain which was blown down in the No. 3 entry was wrapped around a timber installed in the entry, and a section of used conveyor belt at this location was rolled up on the mine floor against a wood crib.
11. Fourteen permanent stoppings located between crosscuts Nos. 13 through 29, and installed between the No. 1 entry (7 Right longwall future tailgate) and No. 2 (gob) entry were blown out toward the No. 1 entry, immediately inby the 6 Right longwall face. A force of at least five (5) psi pressure was required to damage / destroy the 14 permanent stoppings.
12. The intake air in the No. 4 (headgate) entry, outby the stageloader on the 6 Right longwall section, had minimal air movement, which was immeasurable. The ventilation across the longwall face was reversed with the direction of air flowing from the tail toward the headgate entry. The reversed airflow was traveling from the No. 4 (headgate) entry toward the No. 3 entry and measured 12,204 cfm, measured in the first open crosscut outby the longwall face and the head face velocity measured 440 feet per minute at shield No. 10. A gas test taken at shield No. 10 revealed 0.2% methane and gas tests taken in the Nos. 1, 2, 3 and 4 entries on the 6 Right longwall section also revealed methane levels ranging from 0.1% to 0.2% and 20.8% oxygen. Float coal dust was also accumulated on rock dusted surfaces on the mine floor and roof in the crosscut located between No. 3 and No. 4 entries.

13. The 5 Right longwall, pull-off, No. 1 entry stopping, being used as a ventilation control for coursing intake air up the tailgate entry of the 6 Right longwall section, was partially knocked out, with concrete blocks blown out of the stopping in an outby direction. A number of wood cribs installed in the tailgate entry were either completely or partially burned or indicated evidence of extreme heat. A roof fall had occurred in the tailgate entry blocking access to the 6 Right longwall face from the tailgate entry (see Flames, Forces and Heat – Initial Ignition for further details of heat and / or fire damage in the tailgate entry).
14. Evidence of heat was observed at the tail face conveyor drive unit, located at shield No. 173, on the 6 Right longwall face and extending from the tail drive unit across the face toward the headgate entry, ending at shield No. 168 (see Flames, Forces and Heat – Initial Ignition for further details of heat damage). It could not be determined if the signs of heat were caused by the initial ignition or by the subsequent fire that occurred in the tailgate entry when the wood cribs were burning.
15. The headgate entry on the 6 Right longwall section measured approximately 77 inches in height and 19.4 feet in width. The coal seam height measured 74 inches at the head of the longwall face. The headgate and tailgate entries were permanently supported with 72-inch fully - grouted resin rods installed with oversized bearing plates. Supplemental roof supports consisting of a double row of wood cribs were also installed in the tailgate entry of the 6 Right longwall section.
16. The headgate operator control station on the 6 Right longwall section was equipped with three permissible telephone systems consisting of a National Mine Service page mine telephone system, a Gal-Tronics face page system and a Gal-Tronics Mine Dial / page mine telephone system (referred to by mine personnel as the yellow telephone).
17. A carbon monoxide (CO) sensor unit, Rel-Tek, FireBoss 100B, providing fire detection on the longwall belt haulage system, was installed at mid-entry height adjacent to the stageloader assembly in the headgate entry, approximately 33 feet outby the longwall face. The CO monitoring system is part of the underground AMS system manufactured by American Mine Research (AMR) which is utilized to monitor the belt entry intake air used to ventilate working sections, in accordance with a plan approved by the Division of Mines. The CO sensors are located at designated locations to monitor intake air in belt haulage entries and are equipped with a digital display meter covering a scale from 0 to 25 ppm, and the CO monitoring system is equipped with a four-hour, dry-cell, battery backup capability. The monitoring system CO sensors activate a low-level alarm at 6.0 parts per million (ppm) and a high-level alarm at 11.0 ppm. When an alarm level is detected by the CO monitoring system, an audible / visual alarm is activated at the surface master station and the alarm type and location are displayed on a printer and a computer screen. The surface master station is located at the mine entrance security office and is continuously monitored by security personnel. The CO monitoring system records revealed that the AMS system detected 8.0 ppm carbon monoxide at the 6 Right longwall tailpiece at 4:57 p.m. and the carbon monoxide exceeded the sensor range of 50 ppm at 5:58 p.m., on February 14. Mr. Chadwell stated that approximately five to ten minutes after the bump occurred on the 6 Right longwall section, a security person, who monitors the surface master station, called the mine office reporting that methane gas levels in the bleeder areas located along the Grassy Creek Mains at checkpoints Nos. 1, 2 and 3 had increased from 1.1% to 1.8% and were increasing rather quickly.
18. The ventilation fan information consisted of the following: No. 2 ventilation shaft fan – Jeffrey Axial 8HUA-117, 4,000 volts, 1,000 horsepower (hp); No. 4 ventilation shaft fan –

Jeffrey Axial 8HU-117-66, 4,000 volts, 2,000 hp; No. 6 ventilation shaft fan – TLT Babcock Axial 31.5 / 18.0-1, 4,000 volts, 2,500 hp; No. 8 ventilation shaft – TLT Babcock Axial 28.0 / 18.0-1, 4,000 volts, 2,500 hp; No. 9 ventilation shaft fan – TLT Babcock Axial 28.0 / 18.0-1, 4,000 volts, 2,500 hp. The ventilation fans were inspected and evaluated for safe operating condition and the fan re-start procedures, as outlined in a plan approved by Division of Mines and MSHA officials, were monitored.

19. A mine fire occurred on the surface at the No. 8 shaft seal on March 6, 2005. Subsequent damage on the surface and the No. 8 shaft equipment as a result of the mine fire included: the three steel ropes provided for the No. 8 shaft hoist revealed signs of heat damage requiring the hoist ropes to be replaced prior to initiating underground exploration / recovery operations. Damage to the hoist ropes was verified by an x-ray of the ropes. The incoming high voltage power supply cables installed inside the No. 8 shaft also sustained heat damage and were replaced. All of the shaft hoist facilities were inspected and evaluated for safe operating condition and the hoist recovery procedures, as outlined in a plan approved by Division of Mines and MSHA officials, were monitored.
20. The day shift, preshift examination records as reported by Mr. Hurley, revealed that from 12:30 p.m. to 2:25 p.m., on February 14, 2005, he observed the following: Head - 0.3% methane, Face – 0.5% methane; Tail - 0.8% methane; Outby – 0.2% methane; total intake – 89,220 cfm; longwall headgate – 1,075 feet per minute (fpm) and longwall tail – 695 fpm.
21. The mine examination date board installed at the 6 Right longwall section power center had the following date, time and initials marked on the date board: 2/14/05, 12:45 p.m., TH (Terry Hurley).
22. The total methane liberated at this mine during 2004 - fourth quarter was 7,524,000 cubic feet in a 24-hour period, according to MSHA reports of laboratory analysis of return air samples.
23. There was no evidence indicating that coal dust contributed to the ignition forces.

## **FUEL AND IGNITION SOURCES**

A fuel source for the initial ignition that occurred on February 14, 2005, could not be determined with certainty; however investigation officials have concluded that the bump and roof fall caused a movement of air and methane gas out of the longwall gob area into the face area. The heat source for the initial ignition could have been either sparks and heat generated from the tail shear cutter drum bits striking rock material or other frictional heat generated from operation of the face conveyor. A physical examination of the mine roof immediately above the shear cutter drum bits did not reveal any marks that are commonly associated with bits striking the mine roof. No deficiencies were observed in the permissibility or electrical systems associated with the longwall face equipment which could have been considered as a possible heat source for the ignition.

Other ignitions occurred underground after personnel were evacuated from the mine. Methane accumulations provided the fuel source and mine fires at various locations provided the heat source for the other ignitions.



## FLAMES, FORCES AND HEAT

Flames, forces and heat associated with the event are divided into two categories: (I) the initial ignition (three locations) and; (II) subsequent ignitions (four or more locations) that occurred after personnel were evacuated from the mine.

### I. Initial Ignition

**6 Right longwall face equipment and tail entry area** - Signs of heat were observed from shield No. 168 (total face shields – 173) to the tail entry and consisted of the following: blistering on rubber hydraulic hoses and electrical cables; melted ventilation curtain; melted plastic face covers on shield control boxes and the shear machine and; burned conveyor belt on top of the shear machine. It could not be determined if these signs of heat were caused by the initial ignition or by the subsequent fire that occurred in the tail entry when the wood cribs were burning. The initial ignition sustained a flame in the tail entry for a sufficient time duration to initiate burning of the wood cribs. Signs of wood cribs that were completely or partially burned were observed in accessible areas of the tailgate entry. A roof fall occurred at the longwall tail conveyor unit and tail entry at some time after the initial ignition that limited access and investigation in this area. In the accessible area immediately outby the longwall face in the tail entry, a double row of cribs had completely burned for a distance of approximately 30 feet. While continuing outby in the tail entry, the cribs were still standing but were partially burned for a distance of approximately 90 feet. While continuing outby in the tail entry from the 90 foot area of standing cribs, the cribs had completely burned for a distance of approximately 45 feet. While continuing outby from the 45 foot area of burned cribs and beginning at the first standing crib, the cribs were charred and burned near the mine roof for a distance of approximately 110 feet. It could not be determined why cribs installed in the tail entry would completely burn for a distance of approximately 30 feet, partially burn near the mine roof for the next 90 feet and then completely burn again for a distance of approximately 45 feet.

**3 Right longwall off East Mains** – Signs of heat were observed at the entrance of the 3 Right longwall panel (headgate pull-off rooms). Coal ribs, wood cribs and timbers had burned at this location. The initial ignition propagated around the perimeter of the gob area to this location and encountered a sufficient quantity of methane gas to maintain a flame for a sufficient time duration to initiate burning of wood cribs and timbers. A reading of 92 ppm – CO at 5:10 p.m. at the No. 8 shaft fan that receives ventilation from this area supports the initiation of burning wood products at that location at that time. Presumably, some time later, with the wood products burning in the immediate area, the coal ribs caught fire and burned.

**4 Left longwall off Grassy Creek Mains** – Signs of heat were observed at the entrance of the 4 Left longwall panel. Coal ribs, timbers and wood cribs had burned at this location. The initial ignition propagated around the perimeter of the gob to this location and encountered a greater quantity of methane gas that caused a secondary ignition. The secondary ignition generated sufficient pressures and forces that damaged and/or destroyed ventilation controls at the 4 Left bleeder connectors on the Grassy Creek Mains. The pressure drop observed at the No. 6 shaft fan can be partially attributed to the damaged and/or destroyed regulators located in the 4 Left – No. 1 and No. 4 bleeder connectors. The secondary ignition maintained a flame for a sufficient time duration to initiate the burning of wood cribs and timbers. A reading of 52 ppm – CO at 6:00 p.m. at the No. 6 shaft fan that receives ventilation from this area supports the initiation of burning wood products at that location at that time. Also, mine personnel, while

evacuating from the mine observed dense coal dust in the No. 2 entry and No. 3 (track) entry at crosscut No. 116 along the Grassy Creek Mains. The visible dense dust in this area verifies that a secondary ignition occurred at this location while damaging and/or destroying ventilation controls which allowed the dust to be visible where mine personnel were located at crosscut No. 116. Presumably, some time later with the wood products burning in the immediate area, the coal ribs caught fire and burned.

## **II. Subsequent Ignitions**

**No. 8 shaft bottom to crosscut No. 19 on 3 East Mains** – A significant ignition of methane gas involving the shaft, shaft bottom area, 3 East Mains and top end of 4 North Mains most likely occurred on March 6, 2005, when a fire discovered at the top of the shaft seal ignited gas that had accumulated in the shaft and around the shaft bottom area. The fire at the top of the shaft was most likely caused by the chemical reaction of two different types of foam sealing agents. One type foam had been applied while initially sealing the shaft and a different type foam had been used for resealing when the fire occurred. Signs of heat were observed at the shaft bottom including melted plastic on the following items: lighting structures, AMS control box and the hoist control box. Signs of heat were also observed in the vicinity of the No. 8 shaft bottom – 3 East Mains junction with the 4 North Mains including: melted plastic degas line; melted nylon cord; burned telephone line insulation; cap wedges burned on top of permanent stoppings and; melted plastic on J-hooks. These signs of heat at the No. 8 shaft bottom – 3 East Mains junction with the 4 North Mains extended inby along the 3 East Mains and terminated at crosscut No. 19. Melted plastic insulation on the mine telephone line and burned or bubbled insulation on the AMS sensor line were observed in the No. 5 (track) entry from the shaft bottom to crosscut No. 19. This event which created a significant amount of heat around the shaft bottom that terminated along the 3 East Mains trackway at crosscut No. 19 was separate and distinct from any of the other areas that were affected by heat.

**3 East Mains – 2 Right, 3 Right, 4 Right and 5 Right longwall panel areas** – A significant ignition and/or multiple ignitions of methane gas occurred in the vicinity of the 3 Right and 4 Right longwall panel gob areas after personnel were evacuated from the mine. Strong forces and pressures and flames exited from the 3 Right and 4 Right longwall gob areas into the 3 East Mains entries. It is believed that the event causing strong forces, pressures and flames to exit the 3 Right and 4 Right longwall panels occurred on February 17 when the No. 9 shaft seal was partially disrupted. Numerous overcasts and permanent stoppings were damaged and/or completely destroyed from the forces and pressures that exited from the 3 Right and 4 Right longwall panel gob areas. Signs of heat were observed along the 3 East Mains – No. 5 (track) entry from crosscut No. 32, located between the 2 Right and 3 Right longwall panels, and extended to crosscut No. 53, located at the entrance of the 5 Right longwall panel. These signs of heat included: burned ventilation curtain; melted items including electrical cable insulation, telephone line insulation, plastic reflectors, electrical tape and plastic soda containers. Signs of an extensive fire involving timbers, wood cribs and coal ribs were observed at the 3 Right longwall headgate pull-off rooms. The overcast located at crosscut No. 37 (3 East Mains trackway – 3 Right longwall panel area) was totally destroyed that would have prevented travel through this area when personnel evacuated from the mine. The overcast located at crosscut No. 46 (3 East Mains trackway – 4 Right longwall panel area) was severely damaged (top bowed down) such that mine personnel would have observed this condition if it had been present when they evacuated from the mine.

**Grassy Creek Mains – 4 Left, 3 Left and 2 Left longwall panel areas** – A significant ignition and/or multiple ignitions occurred at the entrance of the 2 Left longwall panel gob area and migrated outby into the Nos. 1, 2 and 3 entries of the Grassy Creek Mains after personnel were evacuated from the mine. Strong forces exited from the 2 Left longwall panel gob area which destroyed and/or damaged overcasts, regulators and permanent stoppings located at the 2 Left longwall entrance and in the Grassy Creek Mains. An extensive fire involving wood cribs also occurred in this area that contributed to numerous roof falls. Other signs of heat in this area included melted plastic degas line, melted ventilation curtain and melted insulation on electrical wiring. Wood cribs and coal ribs burned for a distance of approximately 1,100 feet in the No. 1 (left bleeder return entry) between the 3 Left and 4 Left longwall panels of the Grassy Creek Mains which resulted in numerous roof falls and deteriorated roof which prevented investigation access to the 3 Left longwall panel set-up entries. Wood cap wedges installed on top of permanent stoppings built between the Nos. 1 and 2 entries from crosscut No. 107 to crosscut No. 112 also revealed signs of burning. Wood cribs also burned at the entrance of the 4 Left longwall panel set-up entries which also contributed to roof falls that blocked investigation access to the longwall set-up area. Other signs of heat at this location included burned ventilation curtain and melted plastic reflectors. The initial ignition propagated around the perimeter of the gob to the 4 Left longwall panel entrance, resulted in a secondary ignition, and then initiated the burning of cribs inby the No. 1 (left bleeder return entry). The investigation findings support that the fire which occurred on the Grassy Creek Mains side of the mine originated at the 4 Left longwall panel entrance and that the fire migrated out into the No. 1 entry and quickly spread with the increased air current toward the 3 Left and 2 Left longwall panel areas. The increased levels of CO and dense smoke that were emitting from the No. 6 shaft fan by noon on February 15 also further support this sequence and timing of events.

**6 Right longwall headgate entries** – A significant ignition of methane gas exited the longwall gob area at crosscut No. 18 and propagated into the headgate Nos. 1 and 2 entries after personnel were evacuated from the mine. This ignition propagated into the No. 2 entry at crosscut No. 18 and then split in direction while traveling outby to crosscut No. 12 and inby to crosscut No. 29. The following evidence was observed between Nos. 2 and 3 entries at crosscut No. 18 to verify this ignition propagated into the No. 2 entry at that location: melted ventilation curtain hanging from the mine roof; discolored roof and ribs demonstrating signs of heat and; a partially burned rock dust bag. None of the other crosscuts between the gob area and No.'s 2 and 3 entries in the headgate area revealed any similar signs of heat. The split point of this ignition and exiting of strong forces and pressures was demonstrated by the fact that wood cribs installed in No. 2 entry – outby crosscut No. 18 were blown down in a outby direction and the cribs installed inby crosscut No. 18 were blown down in an inby direction. The split point was also demonstrated by rock/coal dust compacted on the inby side of roof bolt plates from crosscut No. 18 to crosscut No. 13 and on the outby side of roof bolt plates from crosscut No. 18 to crosscut No. 29. This dust compaction on the applicable sides of roof bolt plates is consistent with the split point at crosscut No. 18 and traveling in outby and inby directions, respectively. The strong forces and pressures created by this significant ignition partially and/or completely destroyed 14 permanent stoppings located between Nos. 1 and 2 entries from crosscut No. 13 through crosscut No. 29.

The permanent stoppings were constructed of dry stacked, solid concrete blocks with a premixed sealant applied to one side. Wood cribs which had been installed in the No. 1 entry (future tailgate entry for the 7 Right longwall panel) and in direct line with the 14

damaged/destroyed permanent stoppings were blown down toward the No. 1 entry which verifies the strong forces came from No. 2 entry toward the No. 1 entry. The evidence of heat extending in an outby direction in No. 2 entry was last observed between crosscuts Nos. 13 and 14 and, extending in an inby direction, at crosscut No. 23. The strong forces observed at this location reveal this event occurred after personnel were evacuated from the mine or else the 15 personnel located in the headgate entries from crosscut number thirteen through crosscut number four would have felt and experienced a much greater level of violence. When the initial bump and ignition occurred, these 15 mine personnel experienced moderate forces and pressures, which required them to hold onto timbers to maintain balance on their feet. With the strong forces and pressures created by this ignition, these personnel would have been subjected to a more violent event. A force that generates five (5) to six (6) pounds per square inch (psi) pressure is required to damage / destroy permanent stoppings constructed of dry stacked, solid concrete blocks. A force that generates five (5) psi pressure would have the strength to rupture a persons ear drums. A force that generates one (1) psi pressure would have the strength to knock a person off their feet. A force of at least five (5) psi pressure was required to damage / destroy the 14 permanent stoppings which were constructed of dry stacked, solid concrete blocks. Due to the facts that the 14 permanent stoppings constructed of dry stacked, solid concrete blocks were damaged / destroyed and that none of the 15 mine personnel located in the headgate entries were knocked off their feet or received any type of ear injuries or hearing impairment verifies this event occurred after personnel were evacuated from the mine.

## **POST-EVENT VENTILATION AND FAN PRESSURES**

The conclusions derived in this section pertaining to the damage of ventilation structures that existed prior to and during the evacuation of miners are based on the following: (1) direction of forces observed during the investigation; (2) observations made by mine personnel during the investigation; (3) interview statements of mine personnel, and; (4) fan pressures. At the time of the underground investigation, ventilation short circuits existed at the following locations: (1) between the intake and return air entries at the return overcasts of the 3 East Mains – right return (overcasts located near the No. 8 shaft bottom at the top of 4 North Mains); (2) 3 East Mains at the Nos. 0, 2, 3 and 4 Right longwall panels; (3) 3 East Mains – between the return/bleeder entries and gob areas at Nos. 2, 3 and 5 Right longwall panels and; (4) Grassy Creek Mains – between the return/bleeder entries and gob areas at Nos. 1, 2 and 4 Left longwall panels. The investigation also revealed a short circuit along the Grassy Creek Mains – between the track entry and 2 Left and 4 Left longwall panels. The short circuit between the 2 Left longwall panel and the No. 5 (track) entry did not exist at the time of the evacuation. The permanent stoppings and/or regulators at the 4 Left longwall bleeder connectors were damaged or destroyed by a secondary ignition that existed prior to the evacuation as supported by mine personnel observing dust in the No. 3 (track) entry at this location during the evacuation. The Grassy Creek Mains – 3 Left longwall bleeder entry connectors were inaccessible due to roof falls and deteriorated roof which was most likely caused by the heat of burning cribs in this area. The status of the 3 Left longwall bleeder connector ventilation controls is unknown due to the inaccessibility of this area. The bump, initial ignition at the 6 Right longwall face area and the secondary ignition at the 4 Left longwall panel destroyed and/or damaged underground ventilation controls to the extent that a pressure loss from 9.0 inches to 6.3 inches of water gauge

was recorded on the No. 8 shaft fan chart and a loss from 15.6 inches to 14.9 inches was recorded on the No. 6 shaft fan chart. It is believed that the pressure drop at No. 8 shaft fan resulted from a damaged ventilation control located between the intake and right return of the 3 East Mains – either at the No. 0 panel or the No. 3 Right panel. Also, the pressure drop at the No. 8 shaft fan can be attributed to disruptions of the 5 Right – No. 1 entry intake regulator and the permanent stopping located between the No. 4 entry and the pull-off entry. It is believed that the pressure drop at the No. 6 shaft fan resulted when the 6 Right longwall headgate gob check curtains were blown down and the 4 Left longwall – No. 1 and No. 4 bleeder connector regulators were damaged and/or destroyed. It is also believed that both pressure drops resulted when the bump/roof fall and initial ignition occurred and prior to the evacuation of mine personnel.

## **MINE, BLEEDER AND GOB AREA VENTILATION**

The ventilation of the mine associated with the areas affected by the ignitions and fires was provided by the Nos. 6, 7, 8 and 9 shafts and applicable fans.

The **No. 6 fan shaft** is a split (intake/return) shaft and is equipped with an exhausting fan. The No. 6 fan provides ventilation for the following areas: (1) Grassy Creek Mains development section (intakes and returns), and; (2) bleeder returns for longwall panels Nos. 1 Left through 6 Left.

The **No. 7 shaft** is a single intake shaft that provides intake air splits for the following areas: (1) 4 North Mains – intakes, and; (2) 4 North Mains – left seals.

The **No. 8 fan shaft** is a split (intake/return) shaft and is equipped with an exhausting fan. The No. 8 fan provides ventilation for the following areas: (1) bleeder returns/pull-off areas for longwall panels Nos. 1 Right through 6 Right; (2) 3 East Mains – left side – two intakes and two returns from No. 8 shaft to near No. 9 shaft; (3) 6 Right longwall tailgate entries – partial and; (4) 6 Right longwall headgate intakes – partial.

The **No. 9 fan shaft** is a split (intake/return) shaft and is equipped with an exhausting fan. The No. 9 shaft provides ventilation for the following areas: (1) 3 East Mains development section; (2) 8 Right longwall development section; (3) 7 Right and 7 Right longwall set-up entries; (4) 6 Right longwall headgate intakes – partial and; (5) 6 Right longwall tailgate entries – partial.

The mine bleeder system consisted of the following prior to the initial ignition:

### **3 East Mains**

- No. 6 Right longwall headgate intakes – a total of 141,340 cfm
- No. 5 Right longwall tailgate intake – No. 1 entry – 12,000 cfm
- No. 4 Right longwall panel – returning – 45,018 cfm
- No. 3 Right longwall panel – returning – 28,088 cfm with air movement flowing across the pull-off entries between the No. 3 Right and No. 2 Right panels.
- 0 panel – intaking – 38,156 cfm

### **Grassy Creek Mains**

- No. 6 Left longwall panel – air leakage out of regulator
- No. 5 Left longwall panel – exhausting 35,035 cfm out the No. 1 entry regulator and 6,228 cfm out the No. 4 entry regulator
- No. 4 Left longwall panel – air movement out the No. 1 entry regulator and exhausting 6,552 cfm out the No. 4 entry regulator
- No. 3 Left longwall panel – air leakage out both the Nos. 1 and 4 entry regulators
- No. 2 Left longwall panel – air leakage out both the Nos. 1 and 4 entry regulators
- No. 1 Left longwall panel – exhausting 9,054 cfm out the No. 1 entry regulator and air leakage out the No. 4 entry regulator.
- 0 panel – exhausting 17,968 cfm out the No. 1 entry regulator and 132,200 cfm exhausting out the No. 4 entry regulator.

### **Fan Pressures – prior to the initial ignition**

- No. 9 shaft fan – 6.5 inches water gauge
- No. 8 shaft fan – 9.0 inches water gauge
- No. 6 shaft fan – 15.6 inches water gauge

The gob areas of this mine, as well as other mines with similar size gobs, are primarily ventilated by air currents flowing around the outer perimeter of the caved areas. Limited air movement can be coursed through the tail gate chain pillars inby the tail of the longwall face after the first few thousand feet of coal is extracted from a new panel. Air flow through the chain pillars within the older areas of the gob is restricted. The impermeable nature of the interiors of these gob areas greatly restricts and/or prevents air flow through their interiors. This same impermeability would also prevent pressures and forces generated along the perimeter of the gob from being transmitted through the gob interior. This impermeability, combined with high methane liberations, results in the interior of the gob having non-explosive elevated methane levels, and consequently, flammable/explosive methane concentrations would be in inaccessible areas located around the perimeter of the gob areas.

The elevated methane levels located within the gob area interiors are managed by the use of vertical methane drainage systems to assist in controlling the methane levels at the perimeter of the mine level gob areas. The width and location of this explosive gas zone are directly dependent upon the interior airflow, which is greatly influenced by the permeability of the perimeter of the gob. The permeability of the gob at the mine level and the resultant width of this zone are primarily influenced by the characteristics of the immediate mine roof and gob area created by falling roof. Generally, the methane levels located within these gob areas rise to above the flammable/explosive range at elevations above the coal bed horizon.

An ignition of the methane within this flammable/explosive zone can result in the entire gob area perimeter becoming involved. The flame propagates either as unconfined flame or by ignitions dependent upon confinement and volume of flammable/explosive gases involved. Where adequate volumes of gas are present and sufficiently confined, more significant ignitions may result and damage ventilation controls with evidence observed at the closest pressure relief point into adjacent open areas of the mine such as regulated and worked out gate entry gob connectors, active gate roads, or active faces.



## **SEALING AND FIREFIGHTING**

At approximately 5:00 p.m. on February 15, mine personnel and independent contractors began sealing the mine shafts. The seals were constructed of steel beams laid across the shaft openings with sheets of plywood laid over the beams with ventilation line curtain placed on top of the plywood and expanding foam applied to seal the remaining holes. The sealing process was completed at approximately 10:30 a.m. on February 16. Sampling tubes were placed in each of the shafts as the seals were being installed, with tubes installed in each side of the applicable split shafts. The sampling tubes were installed to locations 300 feet or more from the shafts so that monitoring of underground mine gases could be done remotely to protect monitoring personnel. Company officials identified 16 strategic locations surrounding the 3 East Mains and Grassy Creek Mains areas, including the 6 Right longwall section for drilling boreholes into the mine to inject fire-fighting agents and for monitoring fire gases. The fire fighting agents consisted of a mixture of water, foam and nitrogen. Some of the boreholes were drilled for monitoring the underground mine atmosphere during the sealing process, while other boreholes would be used later for monitoring during the reventilation and underground exploration phases associated with reopening the mine.

Natural ventilation pressures developed by the elevation and temperature differentials would normally cause the higher elevation shaft openings to exhaust when the surface temperature is less than the ambient mine air temperature, and the opposite would occur when the surface temperature is greater than the ambient mine air temperature. The buoyancy of elevated methane gas accumulating in the higher elevations and deeper shafts caused those shafts, particularly No. 9 shaft, to try to exhaust. The higher elevation and deeper shafts were those which were located nearest the areas affected by the mine fire. The methane gas buoyancy effect and the shaft elevation/temperature differential pressures resulted in natural ventilation at No. 9 shaft that exceeded 10 inches of water gauge pressure. These natural ventilation pressures created seal leakage and thus periodic resealing of the shaft seals was necessary to maintain airtight integrity. Additional weight was required to be placed on top of some of the seals to hold the plywood panels in place. Eventually, a metal cap was fabricated and installed over the intake side of the No. 9 shaft to provide an effective seal.

After the shafts were effectively sealed, the mine atmosphere was monitored through the shaft sampling tubes, boreholes and methane degas holes. Mine atmosphere samples and trends continued to be analyzed during the interim period and on May 4; a reventilation and reentry exploration plan was approved by MSHA and DMME officials.

Unsealing operations began on May 12. On May 14, the fans at ventilation shafts Nos. 9, 8, 6, 4 and 2 were restarted in a predetermined sequence and at settings lower than for normal operations with the intake side of the shafts regulated to ensure ventilation throughout the mine. The boreholes and exhausting sides of the shafts continued to be monitored and evaluated for nine days while the fans were operating. On May 23, mine rescue, company, DMME and MSHA personnel began underground explorations of the mine that were completed on May 29. Mine rehabilitation work that would not affect the mine fire investigation was initiated on May 30.

## ROOF GEOLOGY

The shock bump and roof fall incident may be attributed to the following factors associated with longwall mining of the coal panels located between the 3 East Mains and Grassy Creek Mains areas of the mine:

- The roof fall incident, referred to as a bump that occurred on February 14, 2005, at 4:16 p.m., caused a release of forces and energy that resulted in a seismic event which registered a magnitude of 3.0;
- The total coal extraction from longwall mining within the affected areas extending from the 1 Right panel through the 6 Right panel created over 1,980 square acres (approximately three square miles) of active gob area;
- Overburden on the tailgate side of the longwall mining areas had gradually increased from approximately 1,700 feet to 2,400 feet as mining retreated from the Grassy Creek Mains side to the 3 East Mains side of the mine;
- The solid wall of the 7 Right panel and the gob area from the 5 Right panel created the potential for abutment stresses, particularly where roof strata transition zones may be prevalent along the longwall face, tailgate and headgate areas;
- Isopach geologic maps revealed a sandstone channel lying within the gob area at intervals immediately above the Pocahontas No. 3 coal seam at distances ranging from one foot to ten feet;
- The inner burden between the Pocahontas Nos. 3 and 4 coal seams varies from 56 feet to approximately 90 feet, as verified from e-log and gas well-drill log information. In the area of the 6 Right longwall panel, the inner burden between the Pocahontas Nos. 3 and 4 coal seams is 65 to 70 feet. This inner burden contains a sandstone band which varies in thickness, from zero to seventy feet. Immediately above the 6 Right longwall face area, the sandstone is 40 to 50 feet in thickness and increases to 70 feet in thickness, approximately 1,000 feet in by the longwall face. The sandstone layers are often laced with thin bands of shale and/or sandy-shale material which create transition zones along certain potential stress areas. Also, depending on its location and thickness, the Pocahontas No. 4 coal seam becomes a weakened, rider seam that has very little adherence with the sandstone and/or sandy-shale bands which create the potential for abrupt roof falls;
- Mine maps and drill log data revealed a transition zone from shale/sandy-shale to sandstone in the proximity of the 6 Right longwall face – tailgate area;
- Thick sandstone layers have the potential to cantilever and increase the possibility of severe abutment stresses and to “break off” or fall when a critical point has been reached;
- Geologic features and discontinuities can contribute to roof failure and falls. Lineament tracking information, as identified from the United States Geological Survey plotted within the gob areas between the Grassy Creek Mains and 3 East Mains, revealed the intersection of several lineaments approximately 1,000 feet in by the 6 Right longwall face area. This lineament factor combined with the factors previously discussed could have created a sudden, massive roof fall within the area.

## **CONCLUSION**

On February 14, 2005, at approximately 4:20 p.m., an energy release caused an underground shock bump and roof fall in the 6 Right longwall section gob area. The bump/roof fall contributed to a methane gas ignition that originated near the tail entry of the longwall face area which propagated around the perimeter of the gob to the entrance of the 3 Right and 4 Left longwall panels. The ignition flame was sustained for a sufficient time duration to initiate mine fires in the tail entry of the longwall section, at the 3 Right longwall panel entrance (3 East Mains) and caused a secondary ignition and fire at the 4 Left longwall panel entrance (Grassy Creek Mains). The bump caused an inundation of rock/coal dust into the longwall face area and also caused a reversal in the direction of ventilation on the 6 Right longwall section and associated face area. The bump also caused rock/coal dust to be suspended in air courses at other locations in the mine including the 6 Right longwall section, 8 Right and 3 East Mains development sections. The secondary ignition damaged and/or destroyed ventilation controls and caused rock/coal dust to be suspended in the Grassy Creek Mains Nos. 2 and 3 entries at the 4 Left longwall panel entrance. Due to the initial ignition, reversal of ventilation on the 6 Right longwall section and magnitude of other areas affected by the bump, management officials directed a mine wide evacuation of all underground personnel.

## **ENFORCEMENT ACTION**

The following enforcement action was taken as a result of the investigation:

1. An order of closure, No. JEB0005260, was issued under Section 45.1-161.91.A. (ii) of the Coal Mine Safety Laws of Virginia to control and preserve the scene of the ignition accident pending an investigation. The order of closure was modified by approved procedural plans allowing necessary actions for sealing operations, reventilation, exploration and recovery operations. The order of closure was also modified to allow the implementation of an action plan addressing procedures to prevent a similar occurrence.

## RECOMMENDATIONS

1. Mine officials should evaluate the use and effectiveness of modern “through the earth warning system technology” to enhance communications between surface and underground personnel. This system would be instrumental in alerting underground personnel of the need to evacuate, particularly in instances where personnel are located in remote areas of the mine. Modern communication packages offered for underground voice and data transmission can be reviewed at:  
[http://coalage.com/ar/coal\\_getting\\_word\\_underground/](http://coalage.com/ar/coal_getting_word_underground/).
2. Mine officials should evaluate using noncombustible supplemental roof supports equal to the desired strength in the tailgate entry of longwall panels.
3. Mine officials should evaluate borehole core log data to identify areas with sandstone roof conditions similar to conditions that resulted in this accident, and develop and implement control procedures to safely and effectively mine these areas with the longwall method.
4. Mine officials should regularly review, through safety meetings and other training methods, proper response procedures for mine fire and other emergency evacuation from the mine.

## **SIGNATURE SHEET**

This report is hereby submitted by Terry A. Ratliff and approved by Frank A. Linkous.

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TERRY A. RATLIFF, COAL MINE INSPECTOR

DATE

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FRANK A. LINKOUS, CHIEF

DATE

## **APPENDIX**

PERSONS PRESENT DURING THE INVESTIGATION

MINE LICENSE INFORMATION



## PERSONNEL

The following personnel provided information and/or were present during the investigation. An asterisk \* denotes those personnel that were interviewed.

### CONSOLIDATION COAL COMPANY

John Zachwieja	Vice President,	
Elizabeth Chamberlin	Central Appalachia Operations	
Spike Bane	General Manager, Safety	
Kenneth Harvey*	Manager, Safety - Mining	
Craig Chadwell*	Mine Superintendent	
Michael Canada	Assistant Mine Superintendent	
Archie Ruble	Chief Inspector	
Terry Hurley*	Supervisor of Safety	
Darrell Blackwell*	Longwall Fill-In Section Mine Foreman	Day Shift
Mike DeHart*	Maintenance Foreman	Day Shift
Bob Brewster*	Longwall Fill-In Section Mine Foreman	Evening Shift
Robert Baugh*	Section Mine Foreman	Evening Shift
Tim Chafins*	Section Mine Foreman	Evening Shift
Ray Kinder*	Section Mine Foreman	Evening Shift
Jerry Pugalee*	Maintenance Foreman	Evening Shift
Ralph Justus	Longwall Fill-In Headgate Operator	Evening Shift
Scott Honaker*	Longwall Tail Shear Operator	Evening Shift
Kenneth Stillwell*	Longwall Head Shear Operator	Evening Shift
Brock Barton*	Longwall Jack Setter	Evening Shift
Keith Colley*	Longwall Jack Setter	Evening Shift
Scott Bowman*	Longwall Repairman	Evening Shift
Winston Boyd*	Longwall Repairman	Evening Shift
Larry Powers*	General Inside Laborer	Evening Shift
Bill Dishman*	Utilityman	Evening Shift
Ron Padgett*	Roof Bolting Machine Operator	Evening Shift
Larry Stanford*	Weekly Mine Examiner	Evening Shift
Dan Tucker*	Weekly Mine Examiner	Third Shift

## **Virginia Department of Mines, Minerals and Energy**

Frank Linkous	Chief, Division of Mines
Carroll Green	Mine Inspector Supervisor
Opie S. McKinney	Mine Inspector Supervisor
Wayne Davis	Technical Specialist
Gary Davis	Technical Instructor
David Elswick	Technical Specialist
Robert Garrett	Technical Specialist
Dwight Miller	Technical Specialist
Danny Altizer	Coal Mine Inspector
Joe Altizer	Coal Mine Inspector
John Brown	Coal Mine Inspector
Bill Messick	Coal Mine Inspector
Terry A. Ratliff	Coal Mine Inspector

## **Mine Safety and Health Administration**

Edward Morgan	District Manager
Allen Dupree	Assistant District Manager
Larry Worrell	Supervisory Coal Mine Safety and Health Inspector
Jessee D. Persiani	Supervisory Coal Mine Safety and Health Inspector
Arnold D. Carico	Mining Engineer
Dale Hess	Mining Engineer
Jason Lane	Electrical Engineer
Bill Francart	Mining Engineer - Ventilation Division - Technical Support
Thomas L. McGloughlin	Roof Control Specialist (Geologist)
Dennis Belcher	Coal Mine Safety and Health Inspector (Electrical)
Clarence Boone	Coal Mine Safety and Health Inspector
Paul McGraw	Coal Mine Safety and Health Inspector
Clark Blackburn	Coal Mine Safety and Health Inspector
Carl Duty	Coal Mine Safety and Health Inspector

## **MINE LICENSE INFORMATION**

Official Corporation:	Consolidation Coal Company
Official Business Name of Operator:	Consolidation Coal Company
Person with Overall Responsibility:	Kenneth Harvey
Person in Charge of Health and Safety:	Kenneth Harvey