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

## **Division of Mines**

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### **Accident Investigation Report**

#### **Underground Coal Mine**

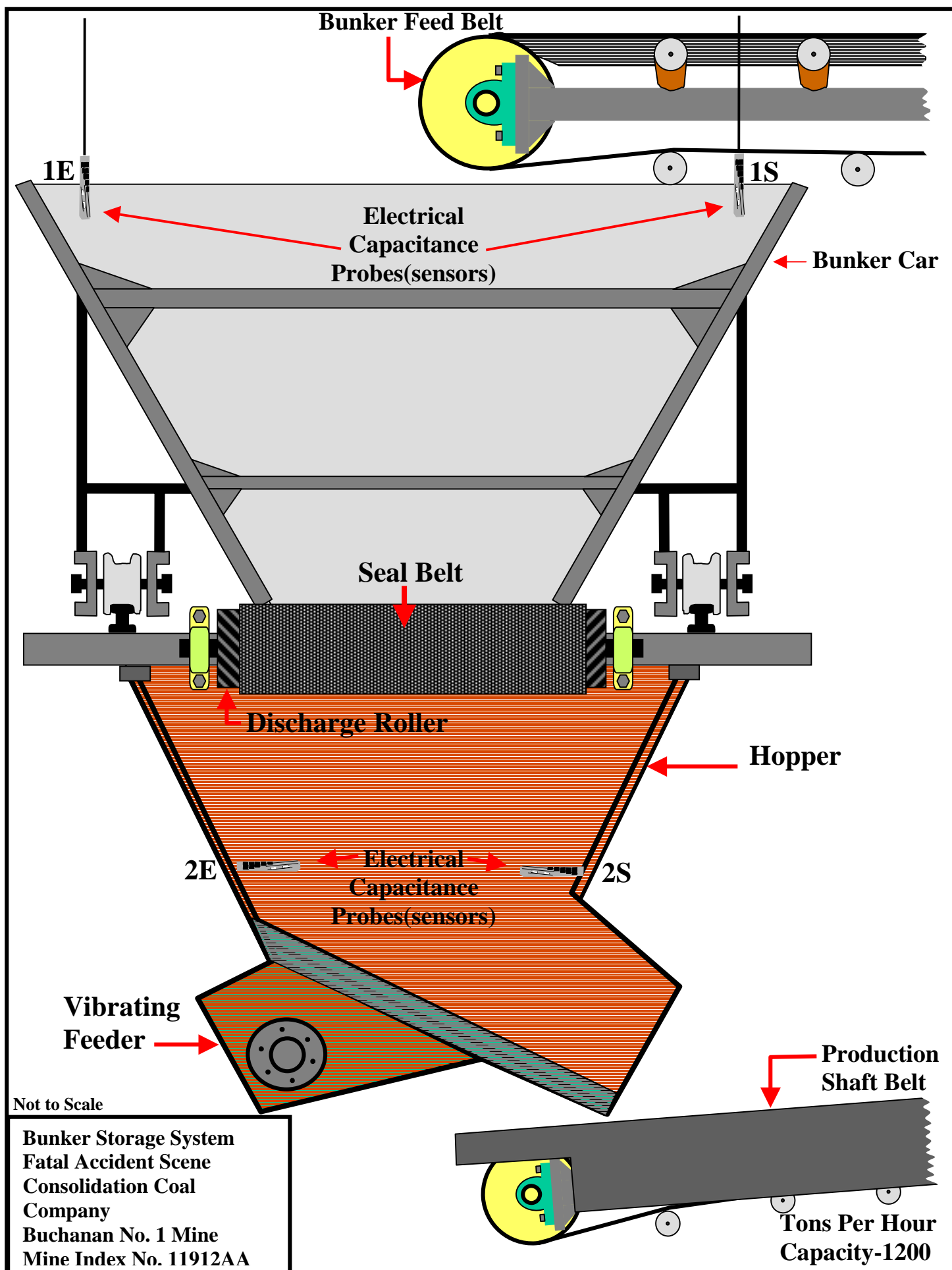
**Fatal Machinery Accident**  
**June 20, 2002**

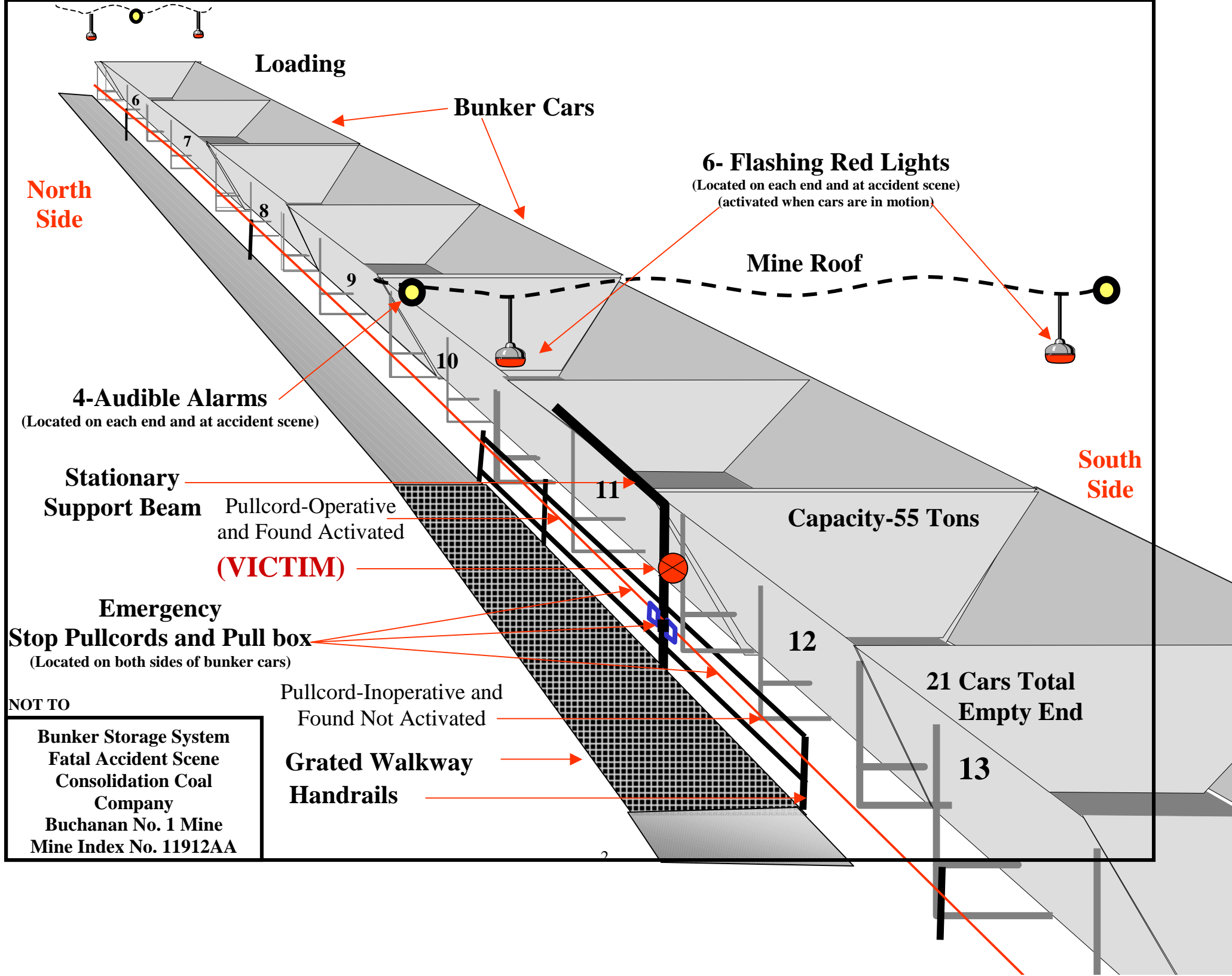
**Consolidation Coal Company**  
**Buchanan No. 1 Mine**  
**Mine Index No. 11912AA**  
**Buchanan County, Virginia**

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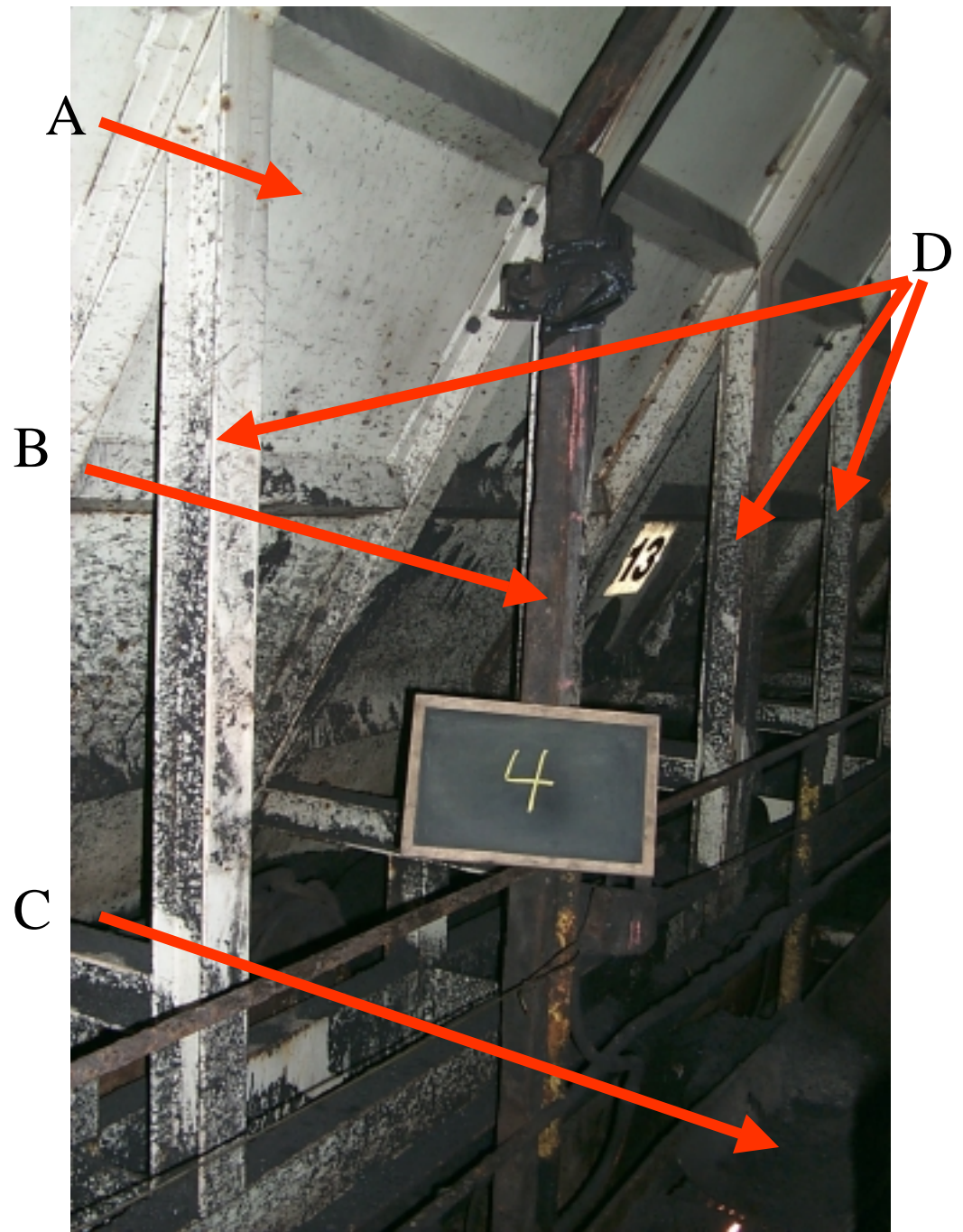
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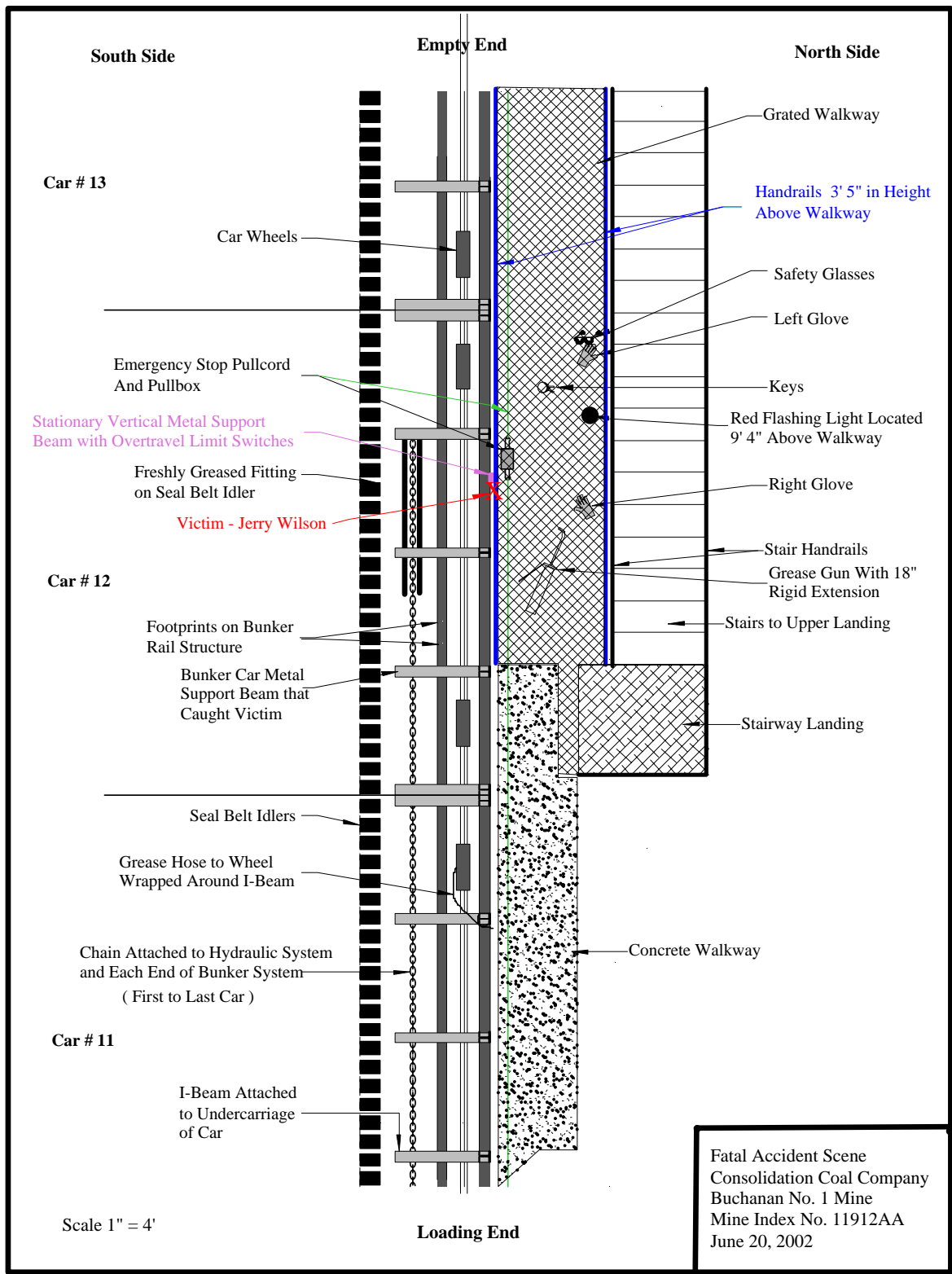




- Bunker for storing coal.  
Bunker cars moves forward and backwards along walkway.
- Vertical metal support beam.  
Attached to walkway structure with overtravel limit switches mounted at top.
- Metal grating walkway.
- Bunker car support legs. These legs move by the vertical support beam (B) as the bunker cars move back and forth.



Fatal Accident Scene  
Consolidation Coal  
Company  
Buchanan No. 1 Mine  
Mine Index No. 11912AA  
June 20, 2002



**MACHINERY ACCIDENT FATALITY INVESTIGATION REPORT**  
**CONSOLIDATION COAL COMPANY**  
**BUCHANAN No. 1 MINE**  
**MINE INDEX 11912AA**

On Thursday, June 20, 2002, at approximately 2:50 a.m., an underground mine machinery fatal accident occurred at the Consolidation Coal Company, Buchanan No. 1 Mine, Mine Index No. 11912AA. Jerry Allen Wilson, a utility man, was fatally injured as a result of being entrapped between a coal bunker car metal support frame and a stationary, vertical, metal support beam. Mr. Wilson was performing maintenance work on the bunker unit while the bunker cars were in motion during normal operations. Mr. Wilson, age 55, had 31 years total mining experience with 14 years employment with Consolidation Coal Company, Buchanan No. 1 Mine. At approximately 3:55 a.m., June 20, 2002, the Department of Mines, Minerals and Energy's Division of Mines was notified of the accident, and a joint investigation with the Federal Mine Safety and Health Administration was initiated the same day. This mine is scheduled to receive two regular inspections every six months. A regular inspection was ongoing at the time of the accident.

**COMMENTARY AND STATEMENTS FROM MINE PERSONNEL**

Consolidation Coal Company, Buchanan No. 1 Mine, has two surface shafts located along State Route 632 and State Route 680, near Oakwood, Virginia, in Buchanan County. The underground shaft mine utilizes continuous mining and longwall mining methods, producing approximately 18,000 raw tons of coal daily from the Pocahontas No. 3 coal seam. The mine is developed approximately 38,000 feet into the coal seam underground and utilizes various coal haulage systems consisting of conveyor belts, a skip hoist and two underground coal bunker storage facilities. The coal bunker facilities are automated storage and distribution systems installed at two belt conveyor haulage transfer locations, with one located on the 1 East Mains belt conveyor system and the other located on the Grassy Creek Mains belt conveyor system. Mine personnel rotate work schedules and are utilized to operate three coal production shifts per day, seven days per week. This mine employs 424 personnel.

On June 19, 2002, at approximately 11:30 p.m., the third shift crews began work at the Consolidation Coal Company, Buchanan No. 1 Mine at which time Mr. Roy Hall, fill-in load out operator, and Mr. Jerry Wilson entered the mine at the Page surface shaft. After proceeding underground, Mr. Hall and Mr. Wilson boarded a transportation vehicle and traveled to the 1 East Mains coal bunker storage facility. At this time, Mr. Benny Patterson, second shift bunker operator, was completing his shift at the 1 East Mains bunker. Mr. Patterson smelled smoke as he was leaving the top platform level of the coal bunker indicating the presence of a hot conveyor belt roller in the vicinity of the bunker. Mr. Patterson searched for but was unable to immediately locate the hot roller. At approximately 11:40 p.m., as Mr. Patterson had returned from the 1 East Mains belt drive, he met Mr. Wilson and Mr. Hall who were arriving at the coal bunker. Mr. Hall traveled toward the A Shaft production shaft while Mr. Wilson and Mr. Patterson discussed conditions at the coal bunker. As Mr. Patterson traveled back toward the

coal bunker from A shaft, he called Mr. Steve Lyons, second shift load out operator, and instructed him to check the production shaft belt for a hot roller. Mr. Patterson informed Mr. Lyons that smoke was traveling toward the bunker, indicating that a hot roller was present at some location along the production shaft belt toward the "A" Shaft area. Mr. Patterson and Mr. Wilson continued to discuss conditions at the bunker. Mr. Lyons arrived at the coal bunker, departed the area and traveled to the surface with Mr. Patterson.

The hot belt roller was found on the production shaft belt and at approximately 2:00 a.m., on June 20, 2002. Mr. Hall contacted Mr. Wilson requesting his help in replacing the roller. During this time, Mr. Steve Ball, utility mine foreman, was located at the Page surface shaft assisting with loading high voltage cable and other mining supplies to be transported underground. Mr. Hall notified Mr. Ball that a hot belt roller had been found that would require replacement, and that he had contacted Mr. Wilson who had informed him that a replacement belt roller was located at the coal bunker area. Mr. Ball instructed Mr. Hall to notify Mr. Wilson to gather the necessary tools to replace the roller. Mr. Ball departed the Page surface shaft a short time later and traveled underground to the 1 East Mains bunker area to assist with replacing the roller.

Upon arrival at the 1 East Mains coal bunker, Mr. Ball observed that the coal bunker feed belt was not operating. He traveled along the coal bunker feed belt to contact Mr. Wilson but did not observe him in the immediate work area. Mr. Ball traveled to a number of other work areas in the general vicinity of the coal bunker looking for Mr. Wilson. Mr. Ball traveled to the sump pump area, the offside and trackside of the coal bunker, and the back side of the coal bunker, including the loading end and empty end of the coal bunker. Upon arrival at the back of the coal bunker, Mr. Ball examined a water pump, located at the East corner of the coal bunker area, and then continued to travel to the No. 4 seal area located in the return aircourse adjacent to the coal bunker area to examine these seals.

When Mr. Ball returned to the coal bunker area from the No. 4 seal area, he met Ms. Bonnie Steele, construction foreman, located near the bunker manual control electrical station. Mr. Ball asked Ms. Steele if she had seen Mr. Wilson and she replied that she had not seen him. At this time, Mr. Ball traveled to the bunker main electrical control panel suspecting that an electrical problem may have occurred. While at this location, Mr. Ball called out for Mr. Wilson but received no response. Ms. Steele traveled to the bunker facility upper landing and back to the trackway entry while searching for Mr. Wilson. She returned to the bunker area and started down the stairway from the upper to lower landing, when she found Mr. Wilson entrapped between a bunker car support frame and the stationary, vertical, support beam. Mr. Ball returned to the bunker manual control electrical station where he met Ms. Steele again who informed him that she had found Mr. Wilson and that he was entrapped. Mr. Billy O'Quinn, utility man, arrived at the coal bunker and immediately traveled with Mr. Ball to Mr. Wilson's location.

Mr. Wilson was observed slumped over and entrapped between a bunker car metal support frame and a stationary, vertical, metal support beam. Mr. Wilson was unresponsive and positioned with his head facing downward on the loading end of the stationary beam and his feet positioned on the empty end of the stationary beam. Mr. Ball examined Mr. Wilson for vital signs and none could be found. Mr. Ball traveled to the mine telephone, located at the bunker



manual control electrical station and notified mine personnel of the accident and requested rescue squad assistance, additional management assistance and the delivery of emergency medical supplies to the accident scene. Mr. Don Ratliff, electrical repairman, heard Mr. Ball's conversation on the mine telephone and immediately transported emergency medical supplies to the accident scene. Mr. Ball returned to the accident scene and began to make preparations to free Mr. Wilson from the entrapment.

Mr. Ball observed that the coal bunker facility may have to be restarted (energized) and the bunker cars moved in order to free Mr. Wilson from the entrapment. The bunker car, loading end, emergency stop, pull cord had been activated and had deenergized the bunker system. Mr. Ball departed and traveled back to the mine telephone and contacted Mr. Hall, located at A Shaft, requesting his assistance with energizing and operating the coal bunker facility. Mr. Ball returned to the accident scene and attempted to reset the emergency pull cord, but it would not reset. Mr. Ball, anticipating some type of electrical problem, traveled to the electrical power center that provided power to the bunker main electrical control panel and the manual control station. Mr. Ball, while traveling back to the accident scene, met Mr. James Mullins, acting shift foreman, who also had arrived to assist. Mr. Mullins checked Mr. Wilson for vital signs and none could be found. Mr. Mullins determined that Mr. Wilson was entrapped in such a manner that he could not be physically pulled free from the entrapment without moving the bunker cars. Mr. Wilson's body was positioned inside the walkway platform hand railing with his head and upper body toward the loading end of the stationary, vertical, metal support beam with his face looking down at the walkway platform and his legs and lower body positioned on the empty end of the stationary, vertical, metal support beam. Mr. Sam Adams, utility mine foreman, who assisted with the recovery, estimated that the distance between the bunker car support beam and the stationary, vertical, support beam entrapping Mr. Wilson was approximately 12 inches in width. Mine personnel recovered Mr. Wilson by resetting the loading end, emergency, pull cord necessary to energize the bunker car electrical system, repositioning the bunker system control switch from the automatic mode to the manual mode, and moving the bunker cars toward the loading end of the bunker system, allowing Mr. Wilson to be recovered. Mr. Wilson was secured to a backboard and transported to the surface. Representatives of the Dismal River Ambulance Service, Inc., transported Mr. Wilson to Clinch Valley Medical Center where he was pronounced dead on arrival.

## **PHYSICAL FACTORS**

The investigation of physical factors at the scene of the accident revealed the following:

1. The accident occurred at the 1 East Mains coal bunker storage facility – north side and was discovered on Thursday, June 20, 2002, at approximately 2:50 a.m. There were no eyewitnesses to the accident.
2. The 1 East Mains coal bunker storage facility is a Stamler, Model Number MCB-1000-B511-21-C-V, serial number 50003.
3. The 1 East Mains coal bunker storage facility had a list of scheduled maintenance to be



performed by personnel on each shift. The bunker maintenance work to be performed by third shift personnel on the North side of the coal bunker included servicing and or lubrication of the following:

- Every wheel on every bunker car
  - Every belt roller bearing on the seal belt (keep grease fitting in bearings)
  - Production shaft belt tailpiece
  - Bunker feed belt discharge roller and tailpiece
  - Pump station (keep full of hydraulic oil)
4. Physical evidence revealed that Mr. Wilson was performing maintenance (lubrication) work on the 1 East Mains coal bunker storage facility while the bunker system was in motion. Mr. Wilson had positioned himself on or inside the hand rail system and was located between the number 12 coal bunker storage car metal support frame and a stationary, vertical, metal support beam when the accident occurred.
  5. Footprints observed on the bunker car rail support structure were located approximately five feet and four inches from the stationary, vertical, metal support beam where the accident occurred.
  6. A hand operated grease gun equipped with a 18 inch rigid extension, was observed lying on the walkway platform positioned toward the loading end of the coal bunker storage facility and was located approximately three feet from the stationary, vertical, metal support beam where Mr. Wilson was found. Mine personnel stated that two grease guns were known to be used in servicing the bunker – one has a 18 inch rigid extension and the other has a 24 inch rigid extension.
  7. A right hand glove was observed on the walkway platform landing on the loading end of the coal bunker storage facility and was located approximately one foot and nine inches from the stationary, vertical, metal support beam. A left hand glove was observed on the walkway platform landing toward the empty end of the coal bunker storage facility and was located a distance of approximately three feet from the stationary, vertical, metal support beam.
  8. A set of keys was observed on the walkway platform landing toward the empty end of the coal bunker storage facility and was located approximately two feet from the stationary, vertical, metal, support beam.
  9. A pair of safety glasses was observed on the walkway platform landing toward the empty end of the coal bunker storage facility and was located a distance of approximately three feet and seven inches from the stationary, vertical, metal support beam.
  10. Investigation of the power system provided for the bunker operation revealed the following:
    - The 800 AMP, 600 VOLT Westinghouse circuit breaker, supplying power to the

coal bunker storage facility, was found energized when Mr. Wilson was found.

- The emergency stop switch located on the bunker main electrical control panel was found deenergized when Mr. Wilson was found.
- The hydraulic oil pump station designed to provide power to move the bunker cars was found deenergized when Mr. Wilson was found.

11. Examinations and tests of the bunker system conducted on June 20, 2002, revealed the following:

- The emergency stop switch provided on the bunker system, electrical, main, control panel was activated. This activation of the emergency stop switch would deenergize the electrical controls that provide power to the hydraulic system that supplies the force necessary to move the bunker cars. In essence, activation of this emergency stop switch would shut down the hydraulic system, thus preventing operation of the bunker system and movement of the bunker cars.
- An additional emergency stop switch associated with the manual operation of the bunker system was also activated. Activation of this emergency stop switch would also shut down the hydraulic system, thus preventing operation of the bunker system and movement of the bunker cars.
- The emergency pull cords located alongside both the North and South sides of the bunker car system were tested. The four emergency pull cords are designed to deenergize the bunker electrical and hydraulic systems, thus preventing movement of the bunker cars in the event of an emergency. The pull cords are constructed such that when any cord is pulled (activated), a mechanical arm located adjacent to each switch rotates downward and prevents the switch from becoming energized again until that particular pull cord and the bunker electrical system is manually reset. Four emergency pull cords are mechanically operated and electrically controlled by four, independent, electrical switches installed in two pull boxes that are located approximately midway of the bunker car system. One pull box was located in the immediate area where the accident occurred. The following are results of tests conducted on the four, emergency, pull cords:
  - a. North and South sides (bunker car loaded end). Both of these pull cords operated properly and would deenergize the electrical controls that provide power to the hydraulic system that supplies the force necessary to move the bunker cars. Activation of either would shut down the hydraulic system, thus preventing operation of the bunker system and movement of the bunker cars.
  - b. North side (bunker car empty end). This pull cord did not operate properly as designed. This cord would not activate the electrical switch to deenergize the electrical/hydraulic controls necessary to prevent movement of the bunker cars. A mechanical problem in the switch pull box prevented the electrical switch from operating properly.
  - c. South side (bunker car empty end). This pull cord did not operate properly as designed. The pull cord would activate the electrical switch to deenergize the electrical/hydraulic controls necessary to prevent movement of the bunker cars, but a malfunction prevented

the mechanical arm from rotating downward to prevent operation of the bunker system and movement of the bunker cars before the pull cord and the bunker electrical system were reset.

- The bunker system was equipped with four, audible alarm devices designed to alert anyone in the bunker area that the hydraulic system required for bunker car movement is about to become energized and that the potential of car movement is forthcoming. The audible alarms are activated and emit a buzzing sound when the hydraulic pump that controls the bunker car movement is energized. The audible alarms are controlled by timers and sound an alarm for approximately 25 seconds. After 25 seconds, the audible alarms will cease and the hydraulic pump will start, which provides potential for bunker car movement. One alarm device was located at each end of the train of bunker cars and two were located near the midpoint area of the bunker cars (one on each side), with one located in the immediate area where the accident occurred. The audible alarms located on the South side and at each end of the bunker cars operated properly. The alarm located on the North side in the immediate area where the accident occurred failed to operate.
- The bunker car area was provided with six, flashing, red lights designed to alert anyone in the area that the bunker cars are in motion. Three lights are located on the North and South sides, respectively, with one located near each end and one located near the midpoint of the bunker car area. One flashing, red light was located in the immediate area where the accident occurred. All of the flashing, red lights operated properly as designed. Amber-colored lights are also provided at various locations along the North and South sides of the bunker cars and are designed to alert anyone in the bunker area that hydraulic power is available and potential bunker car movement is possible. The amber-colored lights operated properly.

12. Tests conducted to simulate operation of the 1 East Mains coal bunker storage facility during coal transfer operations revealed that the coal bunker storage cars traveled a distance of approximately one foot per three seconds during normal operation.

## **BUNKER OPERATION**

1. The coal bunker storage system consists of a train of wheel mounted, bottomless cars coupled together while forming a continuous coal storage bin that can be moved in a forward and reverse direction, depending on the amount of coal provided by the bunker feed belt equalizing the amount of coal needed to maximize the coal carrying capability of the production shaft belt. A chain is connected to each end of the train of cars and is powered by a hydraulic pump and electrical motor system that provides the forward and reverse movement of the bunker cars.
2. A conveyor belt, commonly referred to as the “seal belt”, is located directly underneath the train of bunker cars. The seal belt actually forms the bottom of the bunker car storage

area. Belt rollers, or idlers, located directly underneath the seal belt, are closely spaced to support the belt in order to prevent belt sagging and to enable the belt to make a good seal with the bottom of the bunker cars. The seal belt is designed such that it is controlled by and moves with the bunker cars. As long as the “bunker feed belt” and the “production shaft belt” are handling the same amount of coal, the bunker storage system is idle and the bunker cars remain stationary.

3. The bunker storage system operates and the bunker cars move only when either not enough or an excess of coal is being delivered to the production shaft belt. The production shaft belt is designed to operate normally with a delivery of 20 tons of coal per minute. If less than 20 tons per minute is being supplied from the bunker feed belt for delivery to the production shaft belt, or if the bunker feed belt stops operating, then the bunker system is activated and the bunker cars move to unload coal while providing supplement coal to equal the 20 tons per minute capability of the production shaft belt. If more than 20 tons per minute is being supplied from the bunker feed belt, then the bunker system is activated and the bunker cars move to load and store the coal that exceeds the 20 tons per minute capability of the production shaft belt.
4. The activation of the bunker storage system and movement of the bunker cars are controlled by electrical capacitance probes, or sensors, which detect and react to either the presence or absence of coal. The probes operate in conjunction with other electrical circuits that energize the electrical motor, which powers the hydraulic pump that provides the mechanical force to move the bunker cars. The 1E and 1S probes are suspended into the bunker cars and are designed to detect an excess of coal while activating the bunker system causing the bunker cars to move and load coal. The 1E and 1S probes operate independently and the detection of coal by either probe may activate the bunker system. However, the system is designed such that either sensor serves as a backup for the other one.
5. The 2E and 2S probes are located near the bottom of the hopper and are designed to detect an absence of coal while activating the bunker system causing the bunker cars to move and unload coal. The 2E and 2S probes also operate independently and detection of the absence of coal by either probe may activate the bunker system. This system is also designed such that either sensor serves as a backup for the other one.

## CONCLUSION

On June 20, 2002, at approximately 2:50 a.m., an underground machinery accident occurred at Consolidation Coal Company, Buchanan No. 1 Mine. Jerry Allen Wilson, a utility man, received fatal injuries as a result of being entrapped between a coal bunker car metal support frame and a stationary, vertical, metal support beam. Mr. Wilson was performing maintenance work on the coal bunker storage facility while the coal bunker cars were in motion during normal operations.

## ENFORCEMENT ACTION

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

1. An order of closure, No. JSA0002709, 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 accident pending an investigation. The order of closure was modified to allow mine examinations and operation of the East conveyor belt and production belt at the Page shaft. The order of closure was also modified to allow operation of the Page coal bunker facilities pending implementation of an action plan.
2. An order of closure, No. JSA0002719, was issued under Section 45.1-161.91.A.(i) of the Coal Mine Safety Laws of Virginia. On June 20, 2002, at approximately 2:51 a.m., an accident occurred at the Page shaft coal bunker, Stamler Model number MCB-1000-B511-21-C-V, serial number 50003, near car number 12, located on the North side of the 1 East Mains coal bunker storage facility of the Consolidation Coal Company, Buchanan No.1 Mine. Mr. Jerry Wilson, a utility man, received fatal injuries when he was entrapped between the number 12 bunker car metal support frame and a stationary, vertical, metal support beam. An imminent danger was present in that Mr. Wilson was servicing the bunker while the unit was in motion, and he positioned himself on the bunker support structure in a pinch point area.
3. Notice of violation number JSA0002720 was issued under Section 45.1-161.140 of the Coal Mine Safety Laws of Virginia: An inspection of the Page shaft coal bunker revealed that the emergency stop pull cords were inoperative, located on the North and South sides discharge end of this work area, in that the emergency stop pull cord when pulled would not deenergize the electrical control circuit for the coal bunker.

## RECOMMENDATIONS

1. While equipment is in operation or is being trammed, no miner shall position himself or be placed in a pinch point between such equipment, or another piece of equipment in the mine.
2. Machinery shall not be repaired or serviced while the machinery is in motion unless safe remote devices are used.
3. All coal bunker operators should be trained in safe procedures for lubrication of bunker components when positioned inside of the emergency pull cord areas. The training should include detailed, specific instructions to be adhered to at all times such as:
  - Deenergizing power
  - Locking and tagging out procedures
4. The stationary, vertical, metal, support beam with attached overtravel limit switches should be redesigned to prevent a potential pinch point.

## **SIGNATURE SHEET**

This report is hereby submitted by David Elswick and approved by Frank A. Linkous.

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DAVID ELSWICK, TECHNICAL SPECIALIST

DATE

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FRANK A. LINKOUS, CHIEF

DATE

## **APPENDIX**

VICTIM DATA SHEET

PERSONS PRESENT DURING THE INVESTIGATION

MINE LICENSE INFORMATION



## **VICTIM DATA SHEET**

Name:	Jerry Allen Wilson
Occupation:	Utility man
Mailing Address:	P.O. Box 324 Mullins, West Virginia 25882
Date of Birth:	November 30, 1946
Total Mining Experience:	Thirty-one years
Experience with Present Company:	Fourteen years
Experience in Present Occupation:	Fourteen years

## **PERSONNEL**

The following personnel provided information and/or were present during the investigation:

### **CONSOLIDATION COAL COMPANY**

Barry Dangerfield	Vice President of Operations	
Walt Scheller	Vice President – Consol Energy	
David Berry	Safety Manager	
Rick Marlowe	Corporate Safety Inspector	
Elizabeth Chamberlain	Corporate Safety Director	
Terry Mason	Supervisor of Human Resources	
Lee Blackburn	Safety Inspector	
Danny Crutchfield	Mine Foreman	Day Shift
Charlie Asbury	Bunker Operator	Day Shift
Terry Mitchell	Bunker Operator	Day Shift
Sam Beavers	Chief Electrician	Day Shift
Benny Patterson	Bunker Operator	Second Shift
Bonnie Steele	Acting Assistant Shift Foreman	Third Shift
James Mullins	Acting Shift Foreman	Third Shift
Steve Ball	Utility Mine Foreman	Third Shift
Sam Adams	Utility Mine Foreman	Third Shift
Roy Hall	Utility man	Third Shift
George Shelton	Utility man	Third Shift
Billy O’Quinn	Utility man	Third Shift
Don Ratliff	Electrical Repairman	Third Shift
Danny Damewood	Mine Examiner	Third Shift

### **MINE SAFETY AND HEALTH ADMINISTRATION**

Ray McKinney	District Manager
Edward Morgan	Assistant District Manager, Technical Division
Ben Harding	Supervisory, Coal Mine Safety and Health Inspector
Larry Coeburn	Supervisory, Coal Mine Safety and Health Inspector
David Woodward	Mining Engineer, Ventilation
Charles Upchurch	Coal Mine Safety and Health Inspector
Russell Dresch	Electrical Engineer
James Hackworth	Educational Field Services Specialist
Kimera Collier	Program Analyst

## **VIRGINIA DIVISION OF MINES**

Frank Linkous  
Opie McKinney  
Carroll Green  
Joseph Altizer  
Dwight Miller  
David Elswick  
Danny Altizer

Chief, Division of Mines  
Mine Inspector Supervisor  
Mine Inspector Supervisor  
Coal Mine Inspector  
Coal Mine Technical Specialist  
Coal Mine Technical Specialist  
Coal Mine Inspector

## **MINE LICENSE INFORMATION**

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