

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Rib Fall Accident
February 6, 2018

Sentinel Mine
Wolf Run Mining LLC
Philippi, Barbour County, West Virginia
ID No. 46-04168

Accident Investigators

Michael Fasouletos – Mechanical Engineer
Coal Mine Safety and Health Specialist, Roof Control

Ronald Postalwait
Coal Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
District 3
604 Cheat Road, Morgantown, West Virginia 26508
Carlos T. Mosley, District Manager

Table of Contents

OVERVIEW.....	1
GENERAL INFORMATION	1
DESCRIPTION OF ACCIDENT.....	2
INVESTIGATION OF ACCIDENT	3
DISCUSSION	4
Accident Site	4
Roof-Control Plan	5
Examinations	5
Training Records	5
ROOT CAUSE ANALYSIS	6
CONCLUSION.....	7
ENFORCEMENT ACTIONS	8
APPENDIX A - Photograph of Piece of Fallen Rib	9
APPENDIX B - Photograph at Accident Scene.....	10
APPENDIX C - Drawing Showing Victim Location	11
APPENDIX D - Persons Participating in the Investigation	12
APPENDIX E - Victim Information.....	13



OVERVIEW

On Tuesday, February 6, 2018, Leonard Griffith, a 52-year-old electrician with over 13 years of mining experience, was fatally injured as a result of a rib roll. On the day of the accident, he was assigned to perform routine maintenance on a continuous mining machine. He was discovered at approximately 3:45 a.m., pinned under a large section of rib, adjacent to the continuous mining machine where he had been working. There were no witnesses to the accident.

The fatal accident was a result of the coal ribs not being effectively controlled in the work area. The rib support system used at this mine was not adequate for the geologic conditions.

GENERAL INFORMATION

The Sentinel Mine is an underground mine in the Clarion coal seam, located near Philippi in Barbour County, West Virginia. It is operated by Wolf Run Mining LLC. The mine employs 325 persons, with 271 working underground. The mine operates two production shifts and one maintenance shift six days each week. The mine produces 10,763 tons of raw coal daily from seven mechanized mining units (MMUs).

The mine is accessed by a dual-compartment slope and two shafts. A conveyor belt system is in one slope compartment and transports coal from the sections to the surface. A slope hoist is in the other compartment. The slope hoist and an elevator are used to transport miners and supplies into and out of the mine. Battery and diesel-powered rubber-tired vehicles are used to transport supplies and mine personnel underground. The mine liberates over four million cubic feet of methane in a 24-hour period and is on a five day spot inspection schedule in accordance with Section 103(i) of the Mine Act.

The principal officers for the mine at the time of the accident were:

Delbert Weaver..... General Manager
Mike Triplett..... Superintendent
Mark Westfall..... Mine Foreman
John Stemple..... Safety Director

A regular (E01) safety and health inspection began on January 2, 2018, and was ongoing at the time of the accident. The previous E01 inspection was completed on December 29, 2017. The nonfatal days lost (NFDL) injury incidence rate for the Sentinel Mine for 2017 was 1.16 compared to the national NFDL rate of 3.48 for mines of this type.

DESCRIPTION OF ACCIDENT

On Monday, February 5, 2018, Leonard Griffith started his shift at 11:00 p.m. He was assigned to perform routine maintenance on the continuous mining machine on the left side of the section. Griffith performed this task before and regularly worked in 3-Section. He rode with other miners in a diesel-powered personnel carrier to 3-Section, arriving at 11:56 p.m. Griffith walked to the tool car and then to the continuous mining machine located in the No. 1 entry. Earl Moats, Section Foreman, was conducting his initial examination of the section and briefly spoke to Griffith as he passed by the continuous mining machine at approximately 12:10 a.m.

Jason Harris, Dale Tenney, and Richard Chambers, Electricians, also regularly worked on 3-Section. Harris and Tenney were also assigned to repair a broken conveyor chain on the continuous mining machine on the right side of the section. Chambers initially helped Harris and Tenney find crib blocks to support the cutting head, before he went to help Griffith.

Chambers walked toward the left side of the section to help Griffith but was redirected by John Payne, Contractor Crew Leader, to repair a scoop. Chambers contacted Frank Mullenax, Outby Electrician, to assist him in troubleshooting the scoop. At approximately 1:30 a.m., Mullenax arrived at the scoop.

The mine-wide tracking system shows that between 12:00 a.m. and 1:15 a.m., Griffith made several trips to the tool car and back to the continuous mining machine. Harris briefly spoke to Griffith at approximately 1:10 a.m. After that, no one had contact with Griffith. At approximately 3:45 a.m., Ben Poling, Maintenance Foreman/Emergency Medical Technician (EMT), and Harvey Glotfelty, Assistant Maintenance Superintendent, were walking across the section and discovered Griffith under the rib.

Poling and Glotfelty initially tried to move the large piece of rib on top of Griffith, without success. Poling then went to find help, and Glotfelty stayed with Griffith, removing smaller pieces of the rib that had fallen on him. Poling found Mullenax and Chambers and directed them to go to the accident scene. Poling continued across the section and contacted Moats who notified Anthony Moran, Dispatcher. Moran called 911 at 3:53 a.m.

Mullenax and Chambers arrived at the scene and helped Glotfelty remove the large piece of rib from Griffith (see Appendix A). They moved him away from the unstable rib to the rear of the continuous mining machine, a safe location. Poling and Glotfelty checked Griffith's vital signs; no pulse was detected. They placed him on a backboard and carried him to a 4-person diesel personnel carrier. He was driven across the section and transferred to a larger 14-person diesel personnel carrier. Poling, Everette Kalbaugh, Shift Foreman/Paramedic, Tim Tenney, Electrician/EMT, and Shane Wilfong, Utility Man, boarded the personnel carrier. Poling drove the carrier and Kalbaugh, Tenney, and Wilfong administered cardiopulmonary resuscitation (CPR) on the way to the elevator. Griffith was transported by elevator to the surface.

Emergency Medical Technicians (EMT's) from Barbour County Emergency Medical Services were waiting on the surface and took control of Griffith at 4:40 a.m. They continued CPR, as Griffith was transported to Broaddus Hospital in Philippi, West Virginia. Dr. Patrick O'Donnell examined Griffith and pronounced him dead at 5:35 a.m.

INVESTIGATION OF ACCIDENT

The Department of Labor (DOL) National Contact Center was notified of the accident on February 6, 2018, at 4:02 a.m.

The DOL Contact Center notified Steve Stankus, Bridgeport Field Office Supervisor, who contacted mine officials and notified them of their responsibility to preserve the accident scene. Mike Stark, Staff Assistant, assigned Michael Fasouletos, Coal Mine Safety and Health Specialist, Roof Control, and Ronald Postalwait, Coal Mine Safety and Health Inspector, to investigate the accident. Postalwait arrived at the mine at approximately 6:45 a.m. He issued a 103(k) order to prevent the destruction of any

evidence which would assist in investigating the cause or causes of the accident and to assure the safety of all persons at this operation.

The accident investigation was conducted in conjunction with the West Virginia Office of Miners Health Safety and Training (WVOMHST) and Wolf Run Mining LLC. The team conducted preliminary interviews with persons having knowledge of the facts and circumstances concerning the accident before going underground.

The investigation team traveled to 3-Section, took photographs and measurements at the accident site (see Appendix B), and developed a sketch of the area where Griffith was found (see Appendix C).

On February 8, 2018, Fasouletos travelled to the location of the accident with Mike Gauna, Mining Engineer, and Ryan Stephan, Mechanical Engineer, both from MSHA Technical Support. They evaluated the accident site and rib conditions.

On February 13, 2018, the investigation team conducted formal interviews at the WVOMHST Westover Office. A list of persons who were interviewed and who participated in the accident investigation is in Appendix D.

DISCUSSION

Accident Site

The accident took place in the No. 1 entry just outby the No. 16 crosscut on 3-Section. The entry was mined uphill at a 15 percent grade from the No. 15 crosscut to follow a change in the orientation of the coal seam. The original mine entry at the accident site was approximately 7 feet high by 18 feet wide. The average width at the accident site after the rib roll occurred was 18.9 feet. The depth of cover was approximately 700 feet with no overmining or undermining in the vicinity.

The fallen rib measured approximately 18 feet long by 7 feet high and up to 14 inches thick. The fallen rib material had a fragmented texture with slabs and blocks of varying sizes. The large portion of the rib removed from on top of Griffith was 36 to 42 inches long by 28 inches high and up to 14 inches thick.

The rib roll occurred because of geologic features that were difficult to see. These features became apparent during the investigation. The rib was weakened by the interaction of coal cleats, inconsistent rock partings scattered within the seam, and barely perceptible small discontinuous slickenside structures, along with the normal pillar surface yielding after an area has been mined.

Roof Control Plan

The operator's approved roof control plan required rib bolt installation in the conveyor belt entry where heights are greater than 72 inches. This fatality occurred in the No. 1 entry, not the conveyor belt entry. Additionally, all pillar corners are required to be rib bolted with 3/4-inch-diameter, 4-foot-long fully-grouted fixtures with suitable bearing plates. There were three to four rib bolts installed within five feet of each pillar corner on 3-Section and the conveyor belt entry was rib bolted. Investigators found that the mine operator had complied with the approved roof control plan at the scene of the accident.

Examinations

A review of the pre-shift and on-shift records for examinations made prior to the accident indicate mine examiners did not report any adverse rib conditions. Moats also stated he did not observe adverse rib conditions when he traveled between the left side of the continuous mining machine and the solid coal rib during his initial examination. Interviews with miners and mine management revealed it was common practice for persons to identify hazardous rib conditions and scale ribs throughout the active mining sections.

Training Records

William Roberts, MSHA Training Specialist, reviewed the training records for Griffith. Griffith had been employed at this mine since January 5, 2015, and his last annual refresher training was conducted on January 6, 2018. Griffith had received his required task training; however, the documentation was incomplete. MSHA issued eight non-contributory citations for inadequate documentation of task training.

ROOT CAUSE ANALYSIS

MSHA conducted an analysis to identify the most basic causes of the accident that were correctable through reasonable management controls. A root cause was identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below is the root cause identified during the investigation and the operator's implemented corrective action to prevent a recurrence of this type of accident.

Root Cause: The rib support system used at the mine was not adequate for the geologic conditions at the location of the accident.

Corrective Action: The mine operator revised the roof control plan to require the installation of rib bolts in all entries on development.

CONCLUSION

On Tuesday, February 6, 2018, Leonard Griffith, a 52-year-old electrician with over 13 years of mining experience, was fatally injured as a result of a rib roll. On the day of the accident, he was assigned to perform routine maintenance on a continuous mining machine. He was discovered at approximately 3:45 a.m., pinned under a large section of rib adjacent to the continuous mining machine in the place where he had been working. There were no witnesses to the accident.

The fatal accident was a result of the coal ribs not being effectively controlled in the work area. The rib support system used at this mine was not adequate for the geologic conditions.

Signed by:

Carlos T. Mosley
District Manager

Date

ENFORCEMENT ACTIONS

1. Section 103(k) Order No. 9128334 was issued to Wolf Run Mining LLC, Sentinel Mine to ensure the health and safety of all miners until an examination and investigation could be completed.

An accident occurred at this operation on February 6, 2018, at approximately 3:30 a.m. This order is being issued under Section 103(k) of the Federal Mine Safety and Health Act of 1977 to prevent the destruction of any evidence which would assist in investigating the cause or causes of the accident and to assure the safety of all persons at this operation. It prohibits all activity at the 3-Section until MSHA has determined that it is safe to resume normal mining operations in this area.

2. A 104(a) citation was issued to Wolf Run Mining LLC, Sentinel Mine for a violation of 30 CFR § 75.202(a).

A fatal accident occurred at this operation on February 6, 2018. The solid side rib at the Number 16 crosscut, Number 1 entry of 3-Section, MMU 005, was not adequately supported or otherwise controlled to protect persons from hazards related to falls of rib. A large portion of the rib fell and struck an electrician who was servicing the continuous mining machine, causing fatal injuries. The fallen rib measured approximately 18 feet long by 7 feet high and up to 14 inches thick. The largest piece of rib pinning the victim measured 36 to 42 inches long by 28 inches high and up to 14 inches thick.

APPENDIX A
Photograph of Piece of Fallen Rib



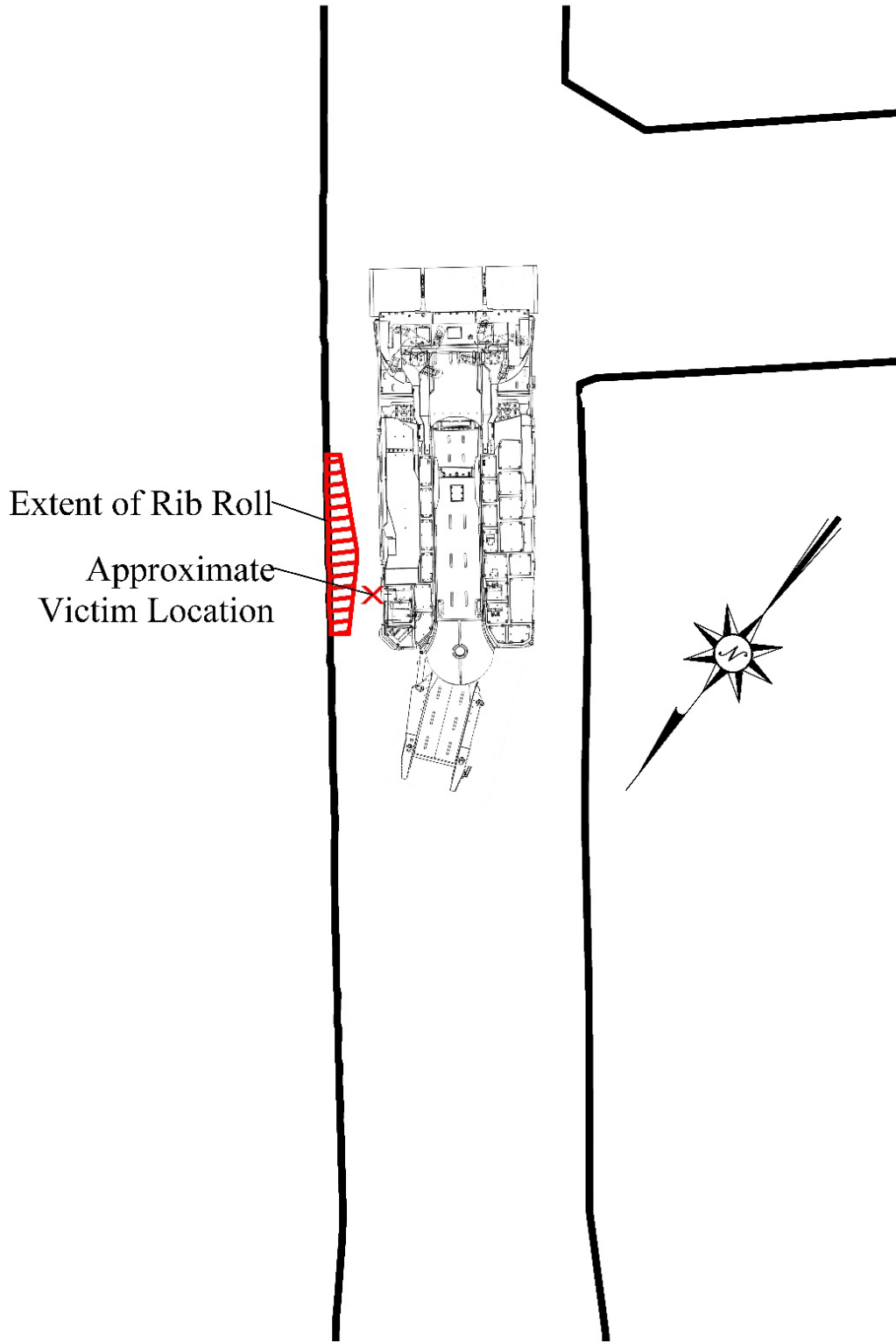
36 to 42 inches long by 28 inches high and up to 14 inches thick.

APPENDIX B
Photograph at Accident Scene



Approximate Location of Victim

APPENDIX C
Drawing Showing Victim Location
(Not to scale)



APPENDIX D

Persons Participating in the Investigation

(Persons interviewed are indicated by a * next to their name)

Wolf Run Mining LLC

Delbert Weaver.....General Manager
Mike Triplett..... Superintendent
Mark Westfall.....Mine Foreman
John Stemple..... Safety Director
Ryan Jeran..... Assistant Mine Foreman
Doug Conaway..... Vice President Safety Arch Coal
Chris Sykes..... President of Eastern Operations Arch Coal
Ken Cochran..... Senior Vice President of Operation Arch Coal
Jeff Warnick.....Assistant Belt Coordinator
*Earl Moats..... Section Foreman
*Harvey Glotfelty..... Assistant Maintenance Superintendent
*Ben Poling..... Maintenance Foreman/EMT
*Frank Mullenax.....Outby Electrician
*Richard Chambers..... Electrician
*Jason Harris..... Electrician
George Brooks..... Dayshift Shift Foreman
Everette Kalbaugh..... Shift Foreman/Paramedic
Anthony Moran..... Dispatcher

West Virginia Office of Miners Health Safety & Training

Greg Norman..... Director
Eugene White.....Deputy Director
Monte Heib.....Engineer
Ed Peddicord.....Inspector at Large
John Meadows.....Assistant to Inspector at Large
Jeff Bennett..... District Inspector
Tony Hanlon..... District Inspector
John Scott.....Electrical Specialist
Jack Rife.....Attorney

Mine Safety and Health Administration

Michael Fasouletos..... Coal Mine Safety and Health Specialist/Roof Control
Ronald Postalwait..... Coal Mine Safety and Health Inspector
Mike Evanto..... Acting Roof Control Supervisor
John Hayes..... Assistant District Manager, Technical Programs
William Roberts.....Training Specialist
Mike Gauna..... Mining Engineer, Technical Support
Ryan Stephan..... Mechanical Engineer, Technical Support

APPENDIX E Victim Information

Accident Investigation Data - Victim Information

U.S. Department of Labor
Mine Safety and Health Administration



Event Number:

6	2	7	8	5	8	7
---	---	---	---	---	---	---

Victim Information: 1																										
1. Name of Injured/Ill Employee: <i>Leonard W. Griffith</i>				2. Sex: <i>M</i>		3. Victim's Age: <i>52</i>			4. Degree of Injury: <i>01 Fatal</i>																	
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 02/06/2018 b. Time: 5:35</i>								6. Date and Time Started: <i>a. Date: 02/05/2018 b. Time: 11:00</i>																		
7. Regular Job Title: <i>002 Electrician</i>					8. Work Activity when Injured: <i>020 Electrician</i>					9. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																
10. Experience																										
a. This			b. Regular			c. This			d. Total			Years			Weeks			Days								
Work Activity:			Job Title:			Mine:			Mining:																	
<i>3</i>			<i>4</i>			<i>2</i>			<i>3</i>			<i>4</i>			<i>2</i>			<i>13</i>			<i>0</i>			<i>0</i>		
11. What Directly Inflicted Injury or Illness? <i>122 coal rib</i>								12. Nature of Injury or Illness: <i>170 crushing</i>																		
13. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>																										
14. Company of Employment: (If different from production operator) <i>Operator</i> Independent Contractor ID: (if applicable)																										
15. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input checked="" type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>																										
16. Part 50 Document Control Number: (form 7000-1)								17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>																		