

UNITED STATES  
DEPARTMENT OF LABOR  
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Rib Fall Accident  
October 18, 2019

Mine Name: #1  
Calvary Enterprises, LLC  
Harold, Floyd County, Kentucky  
I.D. No. 15-19835

Accident Investigator

Saul Akers  
Roof Control Specialist

Originating Office  
Mine Safety and Health Administration  
Barbourville District  
3837 S U.S. Hwy 25E, Barbourville, Kentucky 40906  
Samuel R. Creasy, District Manager

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## PHOTOGRAPH OF ACCIDENT SCENE

### OVERVIEW

On Friday, October 18, 2019, James R. Senters, a 60-year-old electrician with 12 years of mining experience, was working between a coal pillar and a personnel carrier when coal/rock fell from the rib and pinned him against the carrier. The coal/rock rib that fell weighed approximately 1,250 pounds and measured 79 inches long, 26 inches wide, and 8 inches thick.

Lifeguard Ambulance Service transported Senters to the Pikeville Medical Center (PMC) for treatment of his injuries. He was released from the Medical Center on October 25, 2019. Senters was at home on November 4, 2019, when he complained that he was having trouble breathing and suddenly became unresponsive, slumping to the floor. He was taken by ambulance to PMC where he died later the same day.

The accident occurred because the mine operator did not effectively control the coal/rock ribs on the 001 Mechanized Mining Unit (MMU).

## GENERAL INFORMATION

The #1 mine, owned and operated by Calvary Enterprises, LLC, is an underground coal mine developed in the Elkhorn No. 3 coal seam. It is located approximately 3.5 miles from Harold, Floyd County, Kentucky. The #1 mine has one MMU and uses the room and pillar mining method. Coal is mined with continuous mining machines, transported by shuttle cars to a feeder, and transported to the surface via a conveyor belt system. Mining heights range from 6 to 10 feet. The mine operates one eight-hour shift per day, five to six days per week, employs 16 underground miners, and produces an average of 425 tons of raw coal per day.

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

Harold E. Akers..... Member  
Jim D. Akers..... Member  
Benny Honaker..... Mine Superintendent

The Mine Safety and Health Administration (MSHA) completed the last regular (E01) safety and health inspection on August 7, 2019. The non-fatal day's lost (NFDL) incidence rate for the mine in 2019 was 0, compared to a national NFDL rate of 3.17 for mines of this type.

## DESCRIPTION OF THE ACCIDENT

On Friday, October 18, 2019, at approximately 6:00 a.m., the day shift production crew traveled to the 001 MMU to begin work. James R. Senters, Electrician, arrived at the mine and entered the mine via a Johnson Industries personnel carrier at about 6:30 a.m.

Senters experienced mechanical problems with his personnel carrier en route to the 001 MMU. Senters parked the carrier in the right crosscut of the No. 3 entry at Survey Station 207, one crosscut outby the 001 MMU feeder (see Appendix A). He removed the lid from the carrier's control panel and examined the panel for defects. Uncertain of the circuit breaker configuration, he asked Corey Goodson, Section Foreman, about his personnel carrier, which was similar. After the discussion, Goodson said he would not need his carrier and Senters could examine it for the proper circuit breaker configuration. Senters agreed and began removing the lid from the control panel of Goodson's carrier. Goodson returned to the face area of the 001 MMU where the crew was producing coal.

At approximately 8:15 a.m., Brandon Hopson, Shuttle Car Operator, heard Senters call for help. Hopson observed Senters, conscious and pinned against Goodson's personnel carrier by a piece of rock. Senters told Hopson that the rib corner fell, striking him in the back while he was examining the carrier. Senters complained about pain in his rib and back. Hopson removed the rock and left to get Goodson who was also an Emergency Medical Technician. Goodson was located one crosscut inby the accident location. Goodson arrived at the scene and examined Senters. Goodson found that Senters was short of breath, but was not visibly bleeding. Senters said that he needed an ambulance. Goodson went to the feeder and phoned Benny Honaker, Mine Superintendent, concerning the accident and the need to call an ambulance. When Goodson returned to Senters' location, Goodson; Gary Miller, Electrician; and Rudy Boyd,

Shuttle Car Operator, placed Senters on a stretcher and put him on the 001 MMU personnel carrier. Goodson, Boyd, Miller and Christopher Gooslin, Continuous Mining Machine Helper, transported Senters to the mine surface arriving at approximately 8:50 a.m. Senters was talking and never lost consciousness on the way out of the mine.

The Lifeguard Ambulance Service arrived at the mine at approximately 9:00 a.m. Medical personnel placed Senters into the ambulance and transported him to the PMC, eighteen miles away.

Senters was diagnosed with broken ribs and a fractured back. Senters was released from PMC on October 25, 2019, to recuperate from his injuries at home.

Senters was home on November 4, 2019, when he complained that he was having trouble breathing and suddenly became unresponsive, slumping to the floor. His wife called 911. He was taken by ambulance to PMC where he was pronounced dead on November 4, 2019, at 8:28 a.m.

## INVESTIGATION OF THE ACCIDENT

On October 24, 2019, at approximately 9:15 a.m., Adam Akers, accident investigator for the Kentucky Division of Mine Safety (KDMS) called Billy Buchanan, MSHA Field Office Supervisor, and informed him that Senters was involved in a rib fall accident, which occurred on October 18, 2019. Since this was the first time MSHA was aware of the accident, a 104(a) non-contributory violation of § 50.10(b) was issued to the mine operator for not immediately reporting the accident.

Immediately after receiving the accident notification from KDMS, Buchanan traveled to the mine, and arrived at approximately 10:00 a.m. Buchanan met with Honaker, and discussed the accident. Buchanan traveled underground and took photographs and measurements of the accident scene. The accident scene had changed because production continued on the 001 MMU for about a week after the accident. Buchanan observed loose rib corners in the adjacent No. 4 belt entry near the accident area.

On November 4, 2019, KDMS informed MSHA that Senters had passed away. On the same day, Saul Akers, Roof Control Specialist/Accident Investigator, and Buchanan traveled to the mine. Akers and Buchanan held a meeting with Honaker to discuss the details of the accident. KDMS personnel, Adam Akers and Rick Wallen, Accident Investigators, were also present at the mine. The MSHA investigators reviewed and took pictures of the mine's training records, other pertinent records, and maps. S. Akers, Buchanan, A. Akers, and Honaker then traveled underground to the 001 MMU and took photographs and measurements of the accident scene.

On November 5, 2019, MSHA and KDMS conducted interviews with persons working with Senters on the day of the accident. See Appendix B for a list of persons who participated in the accident investigation.

On November 6, 2019, S. Akers and Argus Brock, Roof Control Supervisor, traveled to the mine and to the accident scene to continue the investigation. S. Akers and Brock evaluated the roof and rib conditions.

## DISCUSSION

### Chargeability Determination Process

When a miner's death is not conclusively determined to be chargeable to the mine operator, MSHA submits the case, including facts and supporting information, to the MSHA Chargeability Review Committee (Committee) for a decision. The Committee examined Senters' medical records from before the accident, during his recovery period, and at the time of his death. The Committee also reviewed the medical examiner and coroner's conclusions. Based on this review, the Committee concluded, on April 2, 2020, that the injuries Mr. Senters sustained in the mine accident on October 18, 2019, led to his death on November 4, 2019. The committee determined Mr. Senters' death to be chargeable to the mine operator.

### Accident Scene and Geologic Conditions

The #1 mine extracts coal from the Elkhorn No. 3 coal seam and is underlain by abandoned workings in the Elkhorn No. 1 coal seam. The interburden between the two seams averages approximately 78 feet. The overburden and mining height at the accident location are approximately 410 feet and 10 feet, respectively. Based on this mining height and the position of the victim, MSHA Technical Support engineers estimate that the rib block struck Senters with an impact force of approximately 5,400 pounds.

The accident occurred in the intersection of the No. 3 heading, at survey station 207, three crosscuts outby the working face (see Appendix A). Prior to the accident, the mining heights rarely, if ever, exceeded 6 feet. During the accident investigation, investigators found that the mine operator increased the mining height in order to mine the overlying coal rider. The coal rider had moved downward in elevation closer to the Elkhorn No. 3 coal seam. Typically, coal rider seams are mined because, when they are in close proximity to the mined coal seam, they are a weak plane of the mine roof which can detach from the main mine roof resulting in roof falls. The mining height had to be increased to about 10 feet to mine the coal rider. The additional height and presence of the rock partings led to instability of the unsupported ribs. Investigators observed some rib sloughage at pillar corners. Most of the sloughage appeared to be where the mining height was over 6.5 feet.

Pillar stability evaluations of the underlying Elkhorn No. 1 workings indicate that the pillars were likely stable, and multiple seam interactions were not a factor in the rib sloughage at the accident site. The coal/rock rib which injured the miner consisted of sandy shale with coal streaks (see Appendix C).

### Roof Control Plan

Prior to the accident, the mining height was generally no more than 6 feet, and rib stability was not an issue. Consequently, no rib bolting was required in the approved roof control plan. The mine operator was not installing rib bolts prior to the accident and addressed hazardous ribs by pulling them down,

Post-accident, the mine operator was required to revise the approved roof control plan to support the mine ribs. The revision requires rib bolts to be installed on-cycle with roof bolting when the mining height is above 6.5 feet. If the mining height is 6.5 to 8 feet, one row of rib bolts is required at a spacing of no greater than 8 feet. If the mining height is 8 feet or more, two rows of rib bolts at a spacing of 6 feet maximum are required. Regardless of the mining height, all rib bolts must be at least 4 feet long and installed with either pans, headers or straps. MSHA approved this revision on November 8, 2019.

### Examinations

Investigators reviewed the preshift and onshift examination records for two months prior to the fatal accident. Examiners frequently documented rib hazards in these records after the mining height had increased to 10 feet or more. The increase of mining height started on or about September 26, 2019, and continued until the day of the accident. The examination records for this time frame showed that the mine operator scaled loose ribs at frequent intervals when observed. The preshift examination on the day of the accident, October 18, 2019, showed a notation regarding ribs: "Loose Corner" under the heading of "Hazardous Condition(s)," and "Pulled" under the heading, "Action Taken." The onshift examination record listed one remark concerning the ribs, "Loose Rib Pulled." In post-accident interviews, the 001 MMU miners, examiners, and supervisor indicated that they did not notice the specific rib that caused the accident was loose at any time. .

### Training

S. Akers reviewed Senters' training records and found no deficiencies. Senters was a qualified electrician for both surface and underground mines. He received experienced miner training on August 3, 2019, and annual refresher training on October 5, 2019.

## ROOT CAUSE ANALYSIS

MSHA conducted an analysis to identify the fundamental cause of the accident. Investigators identified a root cause that, if eliminated, would have either prevented the accident or mitigated its consequences.

The root cause identified during the analysis and the operator's corresponding corrective action, implemented to prevent a recurrence, are listed below.

Root Cause: The mine operator's rib support practices did not control the ribs to protect miners from rib fall hazards.

Corrective Action: The mine operator stopped mining in the area where the accident occurred and started mining in an area where the mining height would be 6 feet or less. The mine operator also submitted a revision to the roof control plan for areas where the mining height exceeds 6.5 feet. MSHA approved this revision on November 8, 2019, which requires all areas having a mining height of 6.5 feet and above to be rib bolted. One row of rib bolts is required at a maximum spacing of 8 feet, when the mining height is 6.5 to 8 feet. Two rows of rib bolts, at a maximum spacing of 6 feet, are required when the mining height is 8 feet or more. All rib bolts are at least 4 feet long and used with pans, headers, or straps.

On November 9, 2019, the operator trained all miners on the provisions of the revised roof control plan. The operator provided documentation that miners received the training.




## CONCLUSION

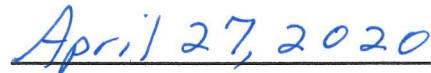
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The accident occurred because the mine operator did not effectively control the coal/rock ribs on the 001 Mechanized Mining Unit (MMU).



Samuel R. Creasy  
District Manager



Date

## ENFORCEMENT ACTIONS

1. 103(k) Order No. 8314906 was issued to Calvary Enterprises, LLC, on November 04, 2019.

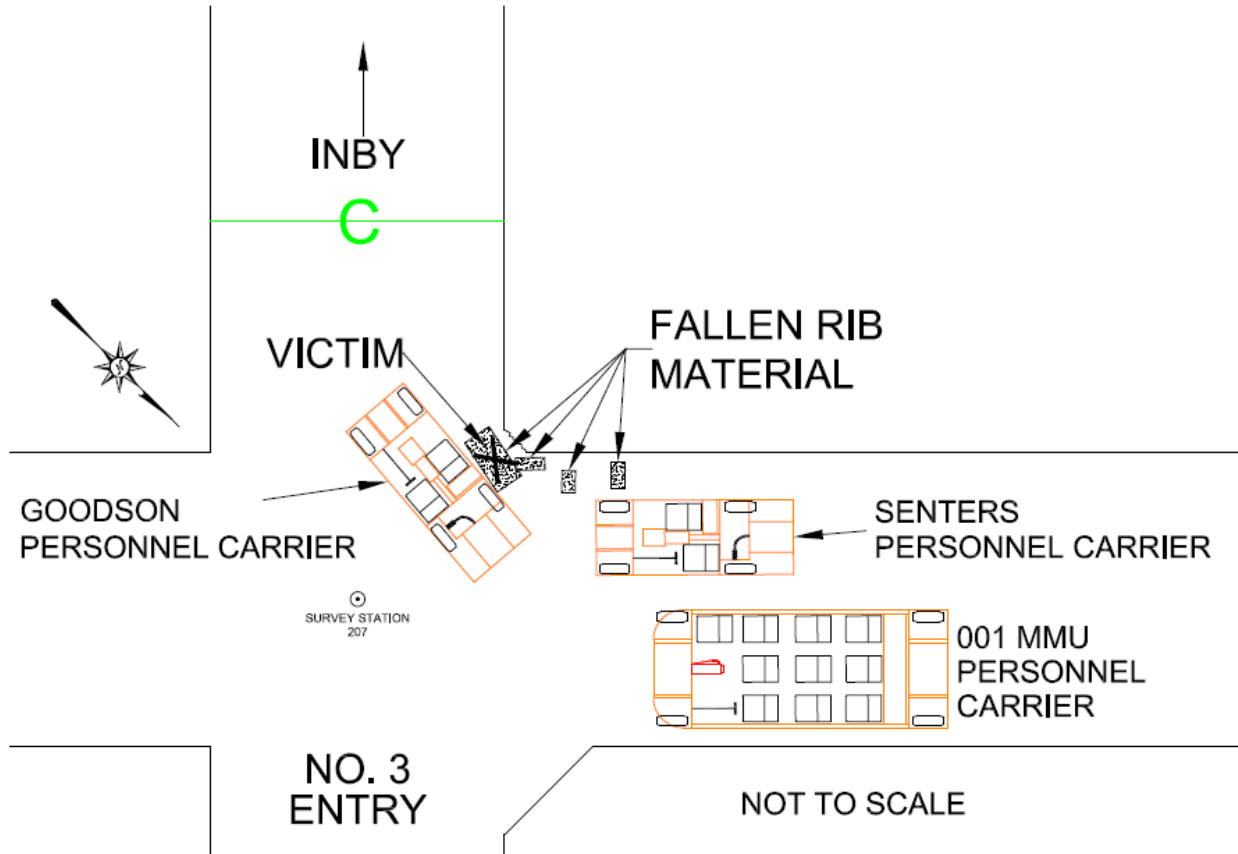
An injury accident occurred on 10/18/2019 at approximately 09:00 A.M. on the 001-0 MMU located on the Southwest Mains, approximately 10' in by survey station 207. The victim was working on a Johnson personnel carrier when a corner of the coal rib rolled off and struck him in the back, pinning him against the personnel carrier.

This order is issued to assure the safety of all persons at this operation. It prohibits all activity at this mine until MSHA has determined that it is safe to resume normal mining operations in the mine. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or restore operations to the affected area.

2. 104(a) Citation No. 8314909 was issued to Calvary Enterprises, LLC, on January 15, 2020, for a violation of 30 CFR § 75.202(a).

The operator is not fully supporting or otherwise controlling the coal/rock ribs on the 001-01 MMU located on the Southwest Submains where persons work or travel. The ribs are showing signs of weight and sloughing on numerous corners of the pillar blocks beginning approximately 150' in by survey station 194 and extending to the Last Open Crosscut in entries 1 thru 7 and connecting crosscuts. The signs of weight and sloughing occurred in areas where the coal rider was mined, creating mining heights approximately 10' high. On Friday October 18, 2019 an electrician was seriously injured when a portion of the coal/rock rib fell and struck him in the back. The portion of the rib that fell and struck the victim measured approximately 79 inches high, 26 inches wide and 8 inches thick.

APPENDIX A  
Location of the Accident



APPENDIX B  
Persons Participating in the Investigation

Calvary Enterprises, LLC. #1 Mine Officials and Employees

Jim D. Akers ..... Member  
Harold E. Akers ..... Member  
Benny Honaker ..... Mine Superintendent  
Corey Goodson ..... Section Foreman  
Gary Miller..... Electrician  
Brandon Hopson ..... Shuttle Car Operator  
Rudy Boyd ..... Shuttle Car Operator  
David Bartley ..... Shuttle Car Operator  
Michael Vance .....Roof Bolter  
Eric Prater .....Roof Bolter  
Raymond B. McCoy .....Belt Man  
Michael D. Lawson.....Belt Man  
Gary Adams ..... Supply Man  
Jason Rose..... Continuous Mining Machine Operator  
Christopher Gooslin ..... Continuous Mining Machine Helper  
Steven Hughes ..... Scoop Operator

Kentucky Division of Mine Safety

Donald Gatten ..... Director  
James Tackett..... Branch Manager  
Adam Akers ..... Accident Investigator  
Rick Wallen ..... Accident Investigator

Mine Safety and Health Administration

Craig D. Plumley .....Assistant District Manager  
Steven L. Sorke..... Accident Investigation Coordinator/Staff Assistant  
Billy Buchanan.....Field Office Supervisor  
Saul Akers ..... Roof Control Specialist/Accident Investigator  
Argus Brock ..... Roof Control Supervisor  
Robert Wise .....Mine Safety and Health Inspector  
Kevin L. Doan.....Roof Control Specialist

APPENDIX C  
Rock Strata at the Accident Site

10 FEET OVERALL HEIGHT

