

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Cement)

Fatal Powered Haulage Accident

April 25, 2007

Essroc Cement Corp.
Riverton Investment Corp.
Martinsburg, Berkeley County, West Virginia
Mine I.D. No. 46-00007

Investigators

Victor C. Lescznske
Mine Safety and Health Inspector

Reecle C. Horn
Mine Safety and Health Inspector

Eugene D. Hennen, PE
Mechanical Engineer

James A. Young
Mine Safety and Health Specialist

Originating Office
Mine Safety and Health Administration
Northeast District
Thorn Hill Industrial Park
547 Keystone Drive, Suite 400
Warrendale, Pennsylvania 15086-7573
James R. Petrie, District Manager



View of haul truck on the 740 Level where it landed after rolling from roadway above.

OVERVIEW

Charles A. Wroe, truck driver, age 65, was fatally injured on April 25, 2007, when the truck he was driving drifted off a road, climbed over a berm, slid on its side, and rolled over a highwall onto a bench approximately 120 feet below. The victim was ejected and found 60 feet from the truck on an adjacent haul road.

The accident occurred because the victim did not maintain control of the truck; however, the investigators were unable to determine why he did not. The inspection of the truck did not identify any defects and the haul road was in good condition. The victim was not wearing a seat belt which contributed to the severity of his injuries.

GENERAL INFORMATION

Essroc Cement Corp., a surface quarry and cement plant, owned and operated by Riverton Investment Corp., was located in Martinsburg, Berkeley County, West Virginia. The principal operating official was Derek J. Nicholls, plant manager. The mine operated three 8-hour shifts per day, seven days per week, and total employment was 168 persons.

Limestone was drilled and blasted from multiple benches. The broken rock was loaded onto haulage trucks by a front-end loader and fed into the primary crusher. The crushed rock was conveyed to the plant where it was mixed with other materials to produce cement that was sold in bulk and bag for use in the construction industry.

The last regular inspection was completed on March 2, 2007.

DESCRIPTION OF THE ACCIDENT

On the day of the accident, Charles A. Wroe (victim) reported to the mine at 7:00 a.m. At 7:30 a.m., Keith H. Whetsel, quarry foreman, assigned Wroe to haul high-calcium rock from the 740 level of the quarry to the crusher and waste material to the waste dump site on the 870 level. Wroe went to the quarry and hauled material until 11:45 a.m. He took a lunch break with his coworkers in the quarry lunch room and returned to work at 12:15 p.m. About 2:40 p.m., the truck was loaded on the 740 level and Wroe drove approximately 1,200 feet and made a sharp left turn onto the haul road. He then drove approximately 1,500 feet to an intersection in the road where he had to negotiate a sharp right turn. He then drove 275 feet along a 10 percent grade to the top of a hill. As the road leveled out, Wroe drove approximately 825 feet to a point where the road made a slight turn to the right.

After the turn, tire tracks showed that the truck drifted to the right in a straight line for approximately 50 feet and then contacted and climbed the berm, traveled in a straight line for 30 feet, slid and rolled approximately 120 feet to the 740 level below. The waste dump was located approximately 1,000 feet from where the truck contacted the berm.

Charles F. Kursey, front-end loader operator, was working on the level below when he saw the truck sliding sideways down the hill and then roll. When the dust cleared, Kursey saw Wroe lying on the 740 level haul road about 60 feet from the truck. He immediately radioed Whetsel to inform him of the accident and call for emergency medical personnel.

Arnold T. Greenfield, front-end loader operator and trained emergency medical technician, checked Wroe but found him nonresponsive. Wroe was pronounced dead at 2:58 p.m. by the Berkeley County Coroner. The cause of death was blunt force trauma.

INVESTIGATION OF THE ACCIDENT

The Mine Safety and Health Administration (MSHA) was notified of the accident at 3:02 p.m. on April 25, 2007, by a telephone call from Daniel B. Lowe, safety manager, to James R. Petrie, district manager. An order was issued under the provisions of Section 103(k) of the Mine Act to ensure the safety of miners. An investigation was started the same day.

MSHA's accident investigation team traveled to the mine, made a physical inspection of the accident scene, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management, employees, miners' representative, and personnel from the West Virginia Office of Miners' Health, Safety & Training.

DISCUSSION

Location of the Accident

The accident occurred along the haul road leading from the 740 level to the waste dump on the 870 level. Along this section, the road was 27 feet to 32 feet wide and in good condition.

Weather

On the day of the accident, the weather was cloudy with a temperature of 69 degrees Fahrenheit. Weather was not considered to be a factor in the accident.

Haul Truck

The truck involved in the accident was an 85-ton Caterpillar 777C off-road haul truck manufactured in 1995. It was powered by a Caterpillar Model 3508, 870 HP, 8-cylinder diesel engine. The transmission was a Caterpillar electronically-controlled automatic power shift transmission with seven speeds forward and one speed in reverse. The truck weighed approximately 130,000 pounds empty and had a manufacturer's rated gross vehicle weight of 300,000 pounds.

Brake System

The truck was equipped with an air over hydraulic service brake system and a spring-applied hydraulic park brake system. The brake system used enclosed wet disc brake units at each of its four wheels. The brake units on the rear wheels were a combination of a hydraulically-applied service brake and a hydraulically-released, spring-applied park brake. Both the park brake and service brake in the rear brake unit used the same wet disc pack. The front brake units were hydraulically-applied enclosed wet disc brakes. When the service brake pedal was applied, the brake control system caused hydraulic pressure to apply both the front and rear brake units. The park brake toggle control was mounted in front of the gear shift lever. When the park brake

toggle control was pushed forward, the brake control system caused hydraulic pressure to release it. A toggle control had to be pulled back to apply the park brake.

The secondary brake, which acted as an emergency brake, was activated by a handle mounted to the left side of the steering column. When activated, the secondary brake was designed to apply both the front service brake and the rear park brake. The brake system had a retarder circuit controlled by a handle mounted to the right of the steering column. This control applied both the front and rear service brakes. The retarder controlled the speed of the haul truck while descending grades.

The truck had an engine-driven air compressor that supplied air pressure for the brake system controls and the air-applied hydraulic master cylinder for the service brake system. It supplied air pressure for two air tanks for the service brake system. A third air tank received air pressure from the service brake supply tanks and supplied the secondary brake system. The air compressor was controlled by a governor that maintained the air system pressure between 100 psi and 120 psi.

Steering

The truck had a hydraulic steering system with a separate reservoir. It had two steering cylinders and two steering pumps that provided hydraulic pressure to a steering control valve. The main steering pump was driven by the truck's engine. An electrical driven pump provided emergency steering in case the engine shut down or the main steering pump failed.

Investigators gathered information to determine why the wheels did not turn back toward the center of the road after the truck contacted the berm. The manufacturer stated that the truck would continue to travel in the direction set by the steering wheel except in situations where the front wheels made an extreme impact with an object. During this accident, the truck did not have an extreme impact with the berm; therefore, there would not be a change in the steering direction. Information obtained from the manufacturer revealed that the steering on the truck was not self-centering like an automobile's steering. When the steering wheel was turned, the truck would continue to turn even if the driver released the steering wheel. A test conducted on a truck that was identical to the truck involved in the accident confirmed the truck's steering actions.

Seat Belt

The seat belt was not damaged in the accident. The seat belt buckle latched, unlatched, and retracted properly when tested.

Summary

1. The evaluation of the truck involved in the accident did not reveal any defects.
2. The steering on the truck involved in the accident was not self-centering. The truck would continue to travel in the direction set by the steering wheel, except in situations

where the front wheels made an extreme impact with an object. The truck did not make an extreme impact with the berm during this accident.

3. The haul road was in good condition.
4. Tests were conducted on the haul road where the accident occurred using a loaded truck that was the same model as the truck involved in the accident. These tests showed that at a speed of 20 MPH, the truck traveled approximately 50 feet in less than 2 seconds.

Training

Charles A. Wroe had 42 years, 44 weeks, and 3 days mining experience. He had received training in accordance with 30 CFR, Part 46.

ROOT CAUSE ANALYSIS

A root cause analysis was performed and the following causal factors were identified:

Causal Factor: The truck driver did not maintain control of the truck he was operating.

Corrective Action: Procedures should be established to ensure that truck drivers operate mobile equipment safely.

Causal Factor: Management policies and procedures did not ensure that the truck driver wore his seat belt when operating the truck.

Corrective Action: Management should regularly check truck drivers to ensure seat belts are being worn.

CONCLUSION

The accident occurred because the victim did not maintain control of the truck; however, the investigators were unable to determine why he did not. The examination of the truck did not identify any defects. The victim was not wearing a seat belt which contributed to the severity of his injuries.

ENFORCEMENT ACTIONS

Order No. 6047633 was issued on April 25, 2007, under the provisions of Section 103(k) of the Mine Act:

On April 25, 2007, a fatal accident occurred at this operation. A haul truck driver was fatally injured when the 85-ton Caterpillar haul truck serial # 4XJ00946 passed through a 5-1/2 foot

high berm on level two of the quarry, falling about 100 feet to level three of the quarry below. This order is issued to assure the safety of persons at this operation and prohibits any work in the affected area until MSHA determines that it is safe to resume normal operations as determined by an Authorized Representative of the Secretary of Labor. The mine operator shall obtain approval from an Authorized Representative for all actions taken to recover and/or restore operations in the affected area.

The order was terminated on May 4, 2007, and the mine may resume normal mining operations.

Citation No. 6040432 (S&S – None Negligence) was issued on June 13, 2008, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 56.9101:

On April 25, 2007, a fatal accident occurred at this mine when a haulage truck traveled over a berm along a haul road and fell approximately 120 feet to a quarry bench. The driver of the Caterpillar 777C 85-ton haul truck did not maintain control of the vehicle while it was in motion.

The citation was terminated on June 30, 2008. The mine operator held safety talks with all its employees on the safe operation of mobile equipment, provided all their heavy equipment operators with additional training including the safe operation of mobile equipment, disciplined personnel found operating equipment in a reckless manner, and inspected and improved their berms.

Citation No. 6040427 (S&S – Low Negligence) was issued on June 13, 2008, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 56.14131(a):

On April 25, 2007, a fatal accident occurred at this mine when a haulage truck traveled over a berm along a haul road and fell approximately 120 feet to a quarry bench. The driver of the truck was not wearing the seatbelt provided at the time of the accident and, following the accident, he was found lying outside of the truck.

The citation was terminated on June 30, 2008. The mine operator issued a revised seatbelt policy to all its employees, held safety talks reinstructing them on the requirement to use seatbelts when operating mobile equipment, and disciplined employees found violating its seatbelt policy.

Approved:

James R. Petrie
District Manager

Date:

APPENDICES

- A. Persons Participating in the Investigation
- B. Victim Data Sheet
- C. Map Showing Path of Travel and Photos of Accident Scene

APPENDIX A

Persons Participating in the Investigation

Riverton Investment Corp.

Derek J. Nicholls	plant manager
Bruce B. Springer	director of safety
Daniel B. Lowe	safety manager
Mark A. Fleming	packer engineering
Keith H. Whetsel	quarry superintendent
Victor P. Coffinburger	maintenance leadman
Donald A. Mabin	miners' representative
Eric G. Harding	president, Local 208D
Pre D. Batten, Jr.	quarry utility person (hydraulic hammer operator)
Arnolt T. Greenfield	quarry utility person (front-end loader operator)
John R. Kinkaed	quarry utility person (haul truck driver)
Charles F. Kursey	quarry utility person (front-end loader operator)
K. C. McMeans	quarry utility person (haul truck driver)
Walter C. Woolam, Jr.	quarry utility person (dozer operator)

Patton Boggs LLP Attorneys at Law

Willa B. Perlmutter	attorney
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West Virginia Office of Miners' Health, Safety & Training

Ronald L. Wootin	director
Alan A. Condel	inspector at large
John J. Meadows	assistant inspector at large
Thomas E. Shingleton	inspector

Mine Safety and Health Administration

Victor C. Lesczenske	mine safety and health inspector
Reecle C. Horn	mine safety and health inspector
Eugene D. Hennen, PE	mechanical engineer
James A. Young	mine safety and health specialist

APPENDIX B

Victim Data Sheet

Accident Investigation Data - Victim Information

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



Event Number: 0893091

Victim Information: 1

1. Name of Injured/III Employee: <i>Charles A. Wroe</i>		2. Sex: <i>M</i>	3. Victim's Age: <i>65</i>	4. Last Four Digits of SSN:	5. Degree of Injury: <i>01 Fatal</i>
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 04/25/2007 b. Time: 15:05</i>				7. Date and Time Started: <i>a. Date: 04/25/2007 b. Time: 7:00</i>	
8. Regular Job Title: <i>176 surface truck driver</i>			9. Work Activity when Injured: <i>055 operating surface haulage truck</i>		10. Was this work activity part of regular job? <div style="text-align: center;">Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></div>
11. Experience a. This Work Activity: <i>40</i> <i>36</i> <i>3</i>		b. Regular Job Title: <i>7</i> <i>0</i> <i>1</i>		c. This Mine: <i>42</i> <i>44</i> <i>3</i>	
12. What Directly Inflicted Injury or Illness? <i>002 Bodily motion</i>				13. Nature of Injury or Illness: <i>370 Multiple injuries</i>	
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment: (If different from production operator) <i>Operator</i> Independent Contractor ID: (if applicable)					
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input type="checkbox"/> EMT: <input checked="" type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>					
17. Part 50 Document Control Number: (form 7000-1)				18. Union Affiliation of Victim: <i>2473 Int. B. of Boilermakers</i>	

APPENDIX C

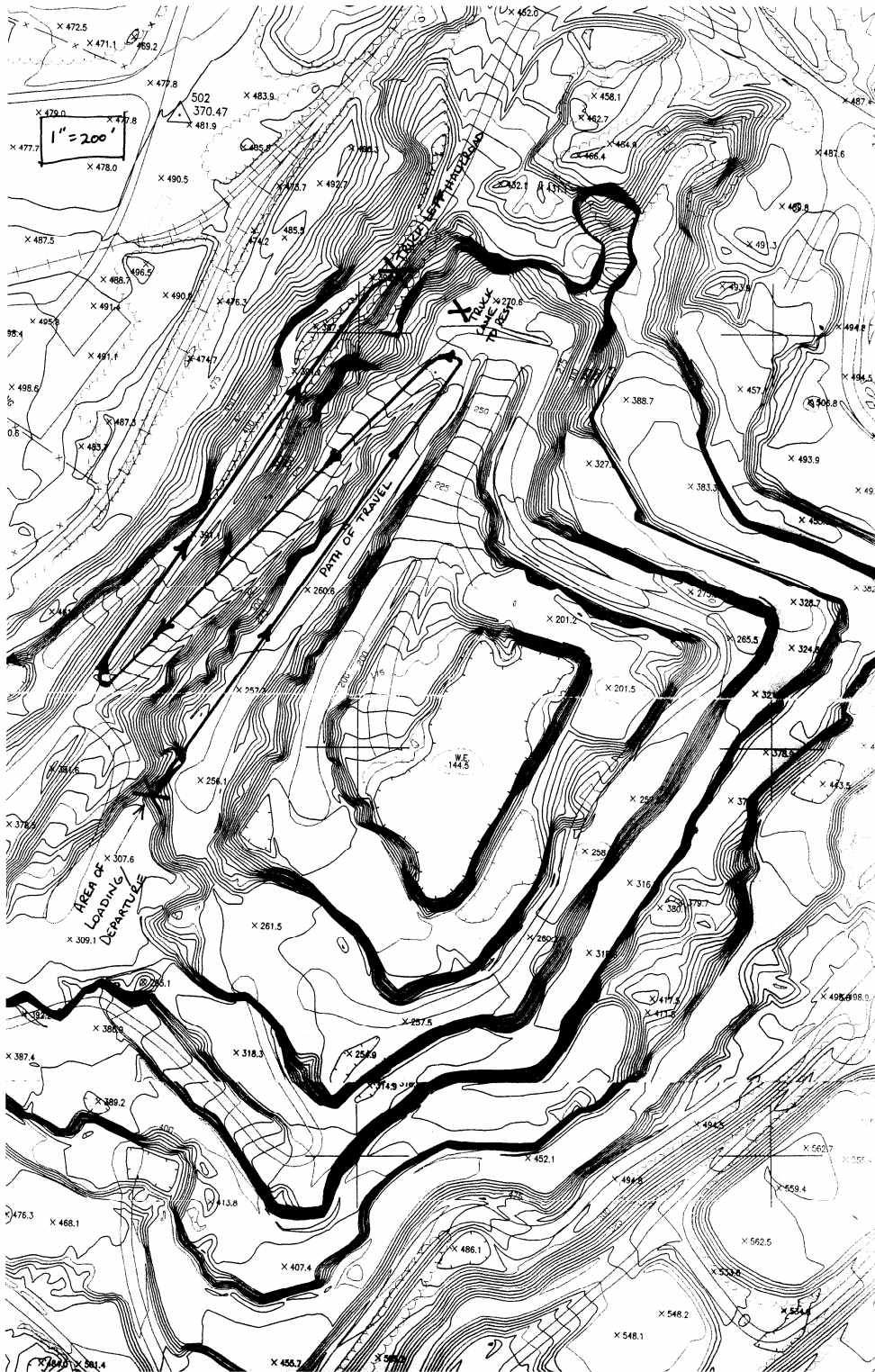


Figure 1 – Map showing the path of travel for the haul truck



Figure 2 - Photo showing locations where truck left the haul road.



Figure 3 - Photo showing where truck came to rest on the 740 Level