MAI-2012-02

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

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Common Shale)

Fatal Fall of Highwall Accident
February 14, 2012

Rare Red Rock
Rare Red Rock
Graysville, Jefferson County, Alabama
Mine I.D. No. 01-03273

Investigators

Michael S. Cohen
Mine Safety and Health Inspector

James Croft
Supervisory Mine Safety and Health

Alan R. Coburn
Supervisory Mine Safety and Health Specialist

Eric Gottheld
Civil Engineer

Originating Office
Mine Safety and Health Administration
Southeast District
135 Gemini Circle, Suite 212 Birmingham, Alabama 35209
Michael A. Davis, District Manager


KOBELCO

OVERVIEW

William N. Fuller, Mine Owner, age 40, was killed on February 14, 2012, when the excavator he was operating was covered by falling material from a highwall. Fuller was using a rock breaker, attached to the excavator, to break and mine material from a near vertical wall when the face fell onto the cab of the excavator, crushing him.

The accident occurred due to management's failure to provide adequate procedures, mining methods, and training to protect persons from falling material. The mining methods employed by management failed to maintain wall, bank, and slope stability in places persons work or travel to perform their assigned tasks. The unconsolidated material was not sloped back to a safe angle and was excavated too steeply to maintain adequate stability. The victim had not received any required MSHA training.

Six weeks prior to the accident, the mine manager identified this hazard at the highwall and withdrew miners from it. Three weeks prior to the accident, an equipment operator reported to the mine manager the cracks in the highwall getting larger. The access road below this area was bermed to prevent entry; however, at Fuller's direction, the berm was removed on the day of the accident to construct a pad at the base of the highwall. The mine manager was not at the mine the previous week or the day of the accident. However, on February 6, 2012, he cautioned Fuller regarding the hazardous conditions in this area.

Additionally, a person experienced in examining and testing for loose ground was not designated by the mine operator to examine and, where applicable, test ground conditions in areas where work was to be performed prior to work commencing and as ground conditions warrant during the work shift.

GENERAL INFORMATION

Rare Red Rock, a common shale operation, owned and operated by Rare Red Rock, is located in Graysville, Jefferson County, Alabama. The principal operating official was William N. Fuller, President. The mine operates one 12 hour shift per day, 5 days per week. Total employment is seven persons.

The shale mined is a reddish colored material, referred to as "Red Dog," comprised of burnt coarse coal refuse, a waste product of the Flat Top underground coal mine. The coal mine was abandoned more than 30 years ago.

Excavators extract the shale from the pit. The excavator bucket is used to scrape the highwall from top to bottom. The shale is loaded by excavator into a haul truck and transported to stockpiles near a portable screen plant. A wheel loader is used to dump the material into two portable screens for sizing. The finished material is transported to stockpiles and sold for various uses as decorative rock and field dirt for baseball parks.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection at this operation on January 23, 2012.

DESCRIPTION OF THE ACCIDENT

On the day of the accident, February 14, 2012, William N. Fuller, (victim) reported to the mine at approximately 6:41 a.m. Fuller did not report to the mine on a regular schedule. He operated a Kobelco SK210 excavator with a hydraulic hammer attachment, breaking large lumps of red dog located on the east side of the haul road that accesses the pit. Mark Gurley, Equipment Operator, operated a Komatsu 200 excavator, assisting Fuller. This task continued until 11:30 a.m. when they took a lunch break.

At approximately 12:45 p.m., Fuller instructed Gurley to build a pad near the toe of the 40-foot vertical wall on the northern side of a mound of material, located on the west side of the haul road. Following the construction of the pad, Fuller positioned his excavator tracks approximately 10 to 15 feet from the toe of the highwall and hammered the face of the highwall attempting to extract material. Gurley operated his excavator beside Fuller's excavator. Gurley pulled material away from the toe of the highwall as Fuller hammered the highwall.

At approximately 4:30 p.m., Fuller signaled Gurley it was "quitting time". Gurley moved his excavator toward the haul road and heard Fuller hammer the highwall again. Gurley immediately noticed a massive rock about to strike his

excavator. He turned the boom of the excavator to defect the rock; however, the rock stopped short of striking it. Gurley saw Fuller's excavator covered with large rocks and ran to the mine office for help.

Gurley notified Belinda Mazurkiewicz, Office Manager, of the accident and she called Emergency Medical Service (EMS) at 4:38 p.m. Mazurkiewicz walked the short distance to the accident site and found Fuller unresponsive.

EMS arrived at 4:45 p.m. and began rescue operations. The Jefferson County Coroner/Medical Examiner arrived at 6:40 p.m. Unable to access the excavator, due to unstable ground conditions at the accident site, the Adamsville Police Department contacted Lonnie Brown of Brown Trucking to remove rocks from the excavator. Brown, using the Komatsu Excavator, began digging at 7:12 p.m. Fuller was removed from his excavator at 9:00 p.m.

Chris Moore, Jefferson County Coroner, pronounced Fuller dead. The cause of death was complications of being hit/buried by falling rocks.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident at 6:04 p.m. on February 14, 2012, by telephone call to the National Call Center from Belinda Mazurkiewicz, Office Manager. The Call Center notified Doniece Schlick, Assistant District Manager, and an investigation started the same day. MSHA verbally issued an order under the provisions of Section 103(j) of the Mine Act to ensure the safety of the miners. This order was later modified to a 103(k) of the Mine Act when the first Authorized Representative arrived at the mine. A Part 50 citation was issued for untimely reporting.

MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident scene, interviewed employees, and reviewed conditions and procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management and employees, Adamsville Police Department, West Jefferson Fire/Rescue and the Jefferson County Coroner/Medical Examiner's Office.

DISCUSSION

Description of Material

The mine is located on an old coal mine refuse area. The material mined is burnt coarse coal refuse, comprised of primarily shale, with some sandstone. The material is referred to by the mine personnel as red rock, but is more commonly referred to as "Red Dog." Due to the amount of coal remaining in the refuse and a lack of compaction during disposal, the infiltration of air can cause spontaneous combustion. This is a common occurrence in older coarse coal refuse piles.

The heat generated within the smoldering refuse pile apparently fused the refuse together, creating varying degrees of hardness within the pile. Although the material is unconsolidated, it is weakly to moderately bonded or fused together giving it some initial unconfined strength. The undisturbed red dog material varies significantly in strength and hardness.

The material that fell from the slope varied greatly in size, but was predominately in large chunks of fused red dog material. The investigators observed chunks as large as 8 feet across at the accident site. These large chunks, sometimes referred to as large rocks by the mine personnel, are actually comprised of smaller granular red dog material bonded together. The gradation of the base refuse material varied from a fine gravel to 2-inch to 6-inch cobbles. The refuse pile was stratified in layers of poorly graded refuse, i.e. there were distinct layers of red dog with similar gradation. The surface of a chunk revealed finer red-dog material and a shiny, wet-looking appearance with striations, typically associated with slickenside materials. Slickensides are considered an indicator of previous shearing through a soil material (usually clay-like soils) and generally observed along the slide plane of a slope failure.

Although the red dog chunks appeared to have a significant strength, they were also easily friable by hand. The compressive strength was also anisotropic, appearing to be greater perpendicular to the stratification layers than parallel to the layers.

Mining Method

Previously, a dozer ripped the red rock material from the refuse pile until December 2010, when it was taken out of service for maintenance problems. When the dozer was operating, the Komatsu 200 excavator and a Volvo 330 BLC excavator were used to load material into the portable crushers and haul trucks. The haul trucks delivered the material from the pit to the stock yard. Rubber tired loaders loaded customers' trucks.

After the dozer was taken out of service, the Komatsu 200 excavator and a Volvo 330 BLC excavator were used to mine the material. Over time, this mining method created near vertical walls ranging from 30 to 50 feet above the pit floor. The equipment operator used the excavator bucket to scrape the highwall from the top to the pit floor. However, with this mining method there were often conditions, due to the hardness of the material, the excavator could not mine. When the top portion of the highwall became too hard for scraping, the material was undercut to cause it to fall.

If the excavator couldn't reach the top of the wall, a ramp was constructed using loose material. The ramps typically ranged approximately six to eight feet high off the pit floor. When the excavator was positioned on top of the ramp, the excavator bucket reached the top of the wall. The equipment operator used the bucket to chip and pound the harder material from the top of the highwall until it fell.

When the equipment operators encountered material that was too hard to break, the area was left/abandoned and mining resumed in another area of the pit. These abandoned areas formed mounds with near vertical sides and could be observed in various locations at the mine.

Location of the Accident

The accident occurred on the northern side of a mound of material located on the west side of the haul road accessing the pit. This mound was described as one of the abandoned hard material areas that was more difficult to mine. The mound was approximately 33 feet wide, 60 feet long, and 40 feet high on its northern side. Previous mining around the mound resulted in a near vertical highwall on the northern side. This mound was above and to the east side of the current pit. Recent mining in the pit approached the mound from the west side.

Mining of this mound had been attempted several times prior to the day of the accident. Unsuccessful attempts to break up the hard material by accessing the top of the 40-foot-high mound with the excavator/hammer were made on February 11 and 12, 2012. The accident occurred two days later on February 14, 2012. These previous attempts to mine the hard material from on top of the mound were reportedly unsuccessful.

On the day of the accident, Fuller positioned his excavator on the north side of the mound, approximately 8 to 10 feet from the toe of the highwall, and attempted to mine the hard material to access the more sought-after red rock material underneath. There was an area of particularly hard grayish material

near the top of the mound and weaker reddish material below. Mine personnel indicated the stability of this material was notably unpredictable.

During interviews, the investigators learned the highwall that failed had near vertical cracks on the eastern and western sides about 10 to 15 feet from the north-facing wall. Accounts of the width of the cracks vary, but mine personnel stated that the conditions had worsened and the highwall was unstable. One equipment operator stated that he expected the highwall to fall at any time. The highwall was near vertical and the top of the highwall higher than the excavator could reach when fully extended. At the time of the accident, loose material, sloped at approximately 30 degrees from horizontal, covered the toe of the highwall. The upper portion of the wall was near vertical or averaged about 78 degrees from horizontal.

Weather

Rain, measuring 0.12 inches, fell on the area the day of the accident with temperatures reaching 51 degrees Fahrenheit. The weather was not a contributing factor to the accident.

Equipment

The excavator involved in the accident is a Kobelco excavator, Model SK210. The excavator's boom has a 26-foot reach with an 8-foot hydraulic hammer attached to the end of it. The height of the operator's cab is 9 feet 6 inches from ground level. During interviews, the investigators learned the excavator's operator cab and boom were being operated perpendicular to the wall. The excavator's tracks were parallel to the wall and approximately 10 to 15 feet from the toe of the wall on top of a pad, created earlier that day. At the time of the investigation, the excavator was approximately 40 feet from the face of the remaining highwall, the tracks were about parallel to the wall, the boom was about 30 degrees from parallel with the tracks and the cab located on the highwall side of the boom.

Training and Experience

During the past eight years, William N. Fuller's (victim) mining experience included working approximately 7 to 10 days per month at this mine, performing various tasks. A representative of MSHA's Educational Field Services staff conducted an in-depth review of the mine operator's training records and determined Fuller did not receive any training required by MSHA for the past 8 years.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following root cause was identified:

Root Cause: Management failed to provide adequate procedures that included safe mining methods, required examinations, and training to protect persons working near the vertical walls of unstable material.

Corrective Action: Management established Standard Operating Procedures (SOP) for mining loose unconsolidated material at a safe slope angle. Before mining resumed, a blasting contractor was employed to drill and shoot the mounds of harder material to reduce the near vertical walls to a slope angle that was safe to mine. Safe mining methods were established for future mining. These methods include having a person conduct required examinations, and conducting required training for all persons working near the highwalls.

CONCLUSION

The accident occurred due to management's failure to provide adequate procedures, mining methods, and training to protect persons from falling material. The mining methods employed by management failed to maintain wall, bank and slope stability in places persons work or travel to perform their assigned tasks. The unconsolidated material was not sloped back to a safe angle and was excavated too steeply to maintain adequate stability. The victim had not received any required MSHA training.

Additionally, a person experienced in examining and testing for loose ground was not designated by the mine operator to examine and, where applicable, test ground conditions in areas where work was to be performed prior to work commencing and as ground conditions warrant during the work shift.

ENFORCEMENT ACTIONS

Issued to Rare Red Rock

Order No. 8641259 -- Issued on February 14, 2012, under the provisions of Section 103(j) of the Mine Act:

An accident occurred at this operation on February 14, 2012, at approximately 4:30 p.m. As rescue and recovery work is necessary, this order is being issued, under Section 103(j) of the Federal Mine Safety and Health Act of 1977, to assure the safety of all persons at

this operation. This order is also being issued to prevent the destruction of any evidence which would assist in investigating the cause or causes of the accident. It prohibits all activity at the quarry its access road until MSHA has determined that it is safe to resume normal mining operations in this area. This order applies to all persons engaged in the rescue and recovery operation and any other persons on-site. This order was initially issued orally to the mine operator at 7:00 p.m. and has now been reduced to writing.

Order No. 8641259 -- Modified to 103(k) on February 14, 2012, at 8:10 p.m.

The initial order is modified to reflect that MSHA is now proceeding under the authority of Section 103(k) of the Federal Mine Safety and Health Act of 1977. This Section 103(k) Order is intended to protect the safety of all persons on-site, including those involved in rescue and recovery operations or investigation of the accident. The mine operator shall obtain prior approval from an Authorized Representative of the Secretary for all actions to recover and/or restore operations in the affected area. Additionally, the mine operator is reminded of its existing obligations to prevent the destruction of evidence that would aid in investigating the cause or causes of the accident.

The order was terminated on April 18, 2012. The 103(k) order was terminated based upon management providing and following a new mining plan.

Citation No. 8641260 -- Issued on February 20, 2012, at 2:36 p.m. under the provisions of Section 103(k) of the Mine Act:

The mine operator continued to operate the Komatsu PC200 excavator in the east corner of the quarry in the face of the 103(k) order #8641259 issued by MSHA for a fatal accident. This order required the mine operator to obtain prior approval from an Authorized Representative of the Secretary for all actions to recover and/or restore operations in the affected area of the mine.

This citation was terminated on February 20, 2012, after management ceased mining operations at the mine.

Citation No. 8636093 -- Issued on April 16, 2012, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR, 56.3130:

A fatal accident occurred at this mine on February 14, 2012. The victim was the owner of the mine and was operating an excavator with a rock breaker attachment. He was breaking and mining material from a near vertical wall when the face fell onto the cab of the excavator, crushing him. Management did not use mining methods that maintained wall, bank, and slope stability in places where persons work or travel in performing their assigned tasks. The material being mined is an old coal mine spoil pile or refuse area. This material is unconsolidated with no consistency. A dozer was used to rip the red rock

material from the refuse piles until December, 2010. The dozer was taken out of service due to maintenance problems. At that time, management began mining with excavators. This new mining method created near vertical, unstable walls that ranged from 30 to 50 feet above the pit floor. Management engaged in aggravated conduct constituting more than ordinary negligence when using a mining method that did not maintain wall stability. This violation is an unwarrantable failure to comply with a mandatory standard.

This citation is a "Rules to Live By" priority standard.

Order No. 8636094 -- Issued on April 16, 2012, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR, 56.3200:

A fatal accident occurred at this mine on February 14, 2012. The victim was the owner of the mine and was operating an excavator with a rock breaker attachment. He was breaking and mining material from a near vertical wall when the face fell onto the cab of the excavator, crushing him. The 40-foot high near vertical wall located on the west side of the haul road accessing the pit had large vertical cracks in the face and sides. This hazardous condition was found by the mine manager more than 6 weeks before the accident occurred. However, management did not take appropriate action to take down or support the loose, unconsolidated wall that created a hazard before other work or travel was permitted in the affected area. The area was not posted with a warning against entry and no barrier was installed to impede unauthorized entry. Management engaged in aggravated conduct constituting more than ordinary negligence in that they were aware of the hazardous condition allowed miners to enter the hazardous area without taking action to safely take down the ground conditions that made the wall unsafe. This violation is an unwarrantable failure to comply with a mandatory standard.

This order is a "Rules to Live By" priority standard.

Order No. 8636095 -- Issued on April 16, 2012, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR, 46.8 (a)(1):

A fatal accident occurred at this mine on February 14, 2012. The victim was the owner of the mine and was operating an excavator with a rock breaker attachment. He was breaking and mining material from a near vertical wall when the face fell onto the cab of the excavator, crushing him. It was determined that the required 8 hour training had not been given for each of the past 8 years. The plant manager was aware of the training requirements. The Federal Mine Safety and Health Act of 1977 declares that an untrained miner is a hazard to himself and to others. Mine management acted with aggravated conduct constituting more than ordinary negligence in allowing the miner to work untrained. This violation is an unwarrantable failure to comply with a mandatory standard.

Approved: _____ Date: 9/5/12

Michael A. Davis
District Manager

APPENDICES

APPENDIX A: Persons Participating in the Investigation

APPENDIX B: Victim Information

APPENDIX A

Persons Participating in the Investigation

Rare Red Rock

Larry Stephens	Vice-President
Joey Blackwell	Plant Manager
Mark Gurley	Equipment Operator
Steve Daugherty	Mechanic
Belinda Mazurkiewicz	Office Manager
John Kruk,	Equipment Operator
Steve Glover	Equipment Operator

State of Alabama Dept of Industrial Relations

Dale Johnson	Mine Safety & Inspection
Ken Knight	Mine Safety & Inspection

West Jefferson Fire/Rescue

James Nix	Fire Chief
Ben Wilson	Assistant Chief

Adamsville Police Department

Robert Carter	Chief of Police
Elvis Leniger	Lieutenant

J. R. Peterson	Evidence Technician
Pam Palmer	Adamsville Mayor

Jefferson County Coroner/ Medical Examiner Office

Chris Moore	Deputy Coroner
C. A. Robinson, Ph.D.	Director, Forensic Toxicology
Gary T. Simmons, M.D.	Associate Coroner/Medical Examiner

Mine Safety and Health Administration

Michael S. Cohen	Mine Safety and Health Inspector
James Croft	Supervisory Mine Safety and Health Inspector
Alan R. Coburn	Supervisory Mine Safety and Health Specialist
Michael A. Evans	Safety and Health Specialist (Acting)
Eric Gottheld	Civil Engineer

APPENDIX B

Accident Investigation Data - Victim Information

Event Number: 6 5 8 4 0 7 4

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

Victim Information: 1

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Degree of Injury:
William N. Fuller	*M*	*40*	*01 Fatal*

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 02/14/2012 b.Time: 16:30	*a. Date: 02/14/2012 b.Time: 6:41*

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
149 Mine Owner	*065 Operating excavator with hammer*	Yes | | No | X |

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	*8*	*17*	*5*	b. Regular Job Title:	*8*	*17*	*5*	c: This Mine:	*8*	*17*	*5*	d. Total Mining:	*8*	*17*	*5*

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
089 Highwall collapsed onto excavator cab	*170 Victim was crushed by falling highwall*

13. Training Deficiencies
Hazard: | | New/Newly-Employed Experienced Miner: | | Annual: | X | Task: | X |

14. Company of Employment: (If different from production operator)
Operator
Independent Contractor ID: (if applicable)

15. On-site Emergency Medical Treatment
Not Applicable: | | First-Aid: | | CPR: | | EMT: | X | Medical Professional: | X | None: | |

16. Part 50 Document Control Number: (form 7000-1)
17. Union Affiliation of Victim: *9999* *None (No Union Affiliation)*