CAI-2013-12

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Rib Rock Burst
August 6, 2013

Huff Creek No. 1
Lone Mountain Processing, Inc.
Holmes Mill, Harlan County, Kentucky
ID No. 15-17234

Accident Investigator

Charles Ramsey
Coal Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
District 7
3837 South US Hwy 25E
Barbourville, KY 40906
Irvin T. Hooker, District Manager

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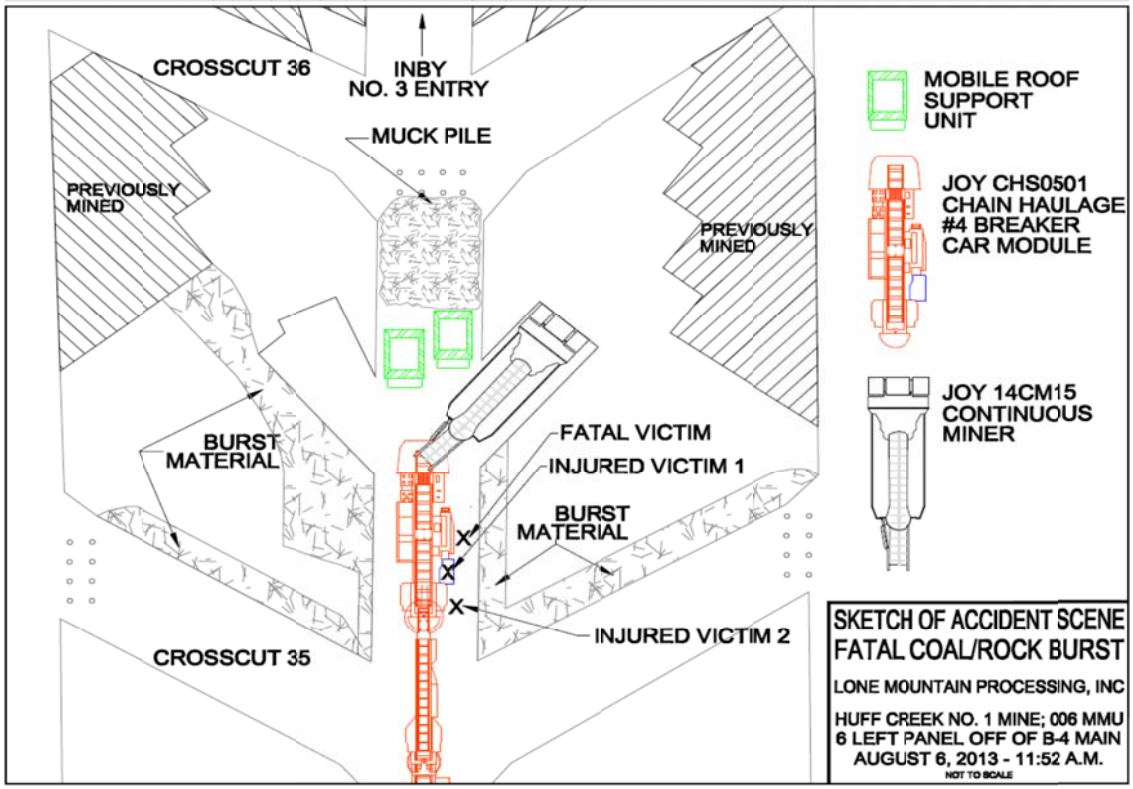
ACCIDENT SITE SKETCH



OVERVIEW

On Tuesday, August 6, 2013, a 56-year old Continuous Mining Machine Operator was killed by a coal/rock burst at Lone Mountain Processing, Inc.'s Huff Creek No. 1 Mine. A 48-year old Mobile Bridge Carrier (MBC) Operator received serious injuries and a 49-year old Mobile Roof Support (MRS) Operator received minor injuries. The 006 Mechanized Mining Unit (MMU) crew was retreat mining when the coal/rock burst occurred.

GENERAL INFORMATION

The Huff Creek No. 1 Mine is an underground coal mine owned and operated by Lone Mountain Processing, Inc., a subsidiary of Catenary Coal Holdings, Inc. The mine is located approximately 2 miles west of the Holmes Mill community in Harlan County, Kentucky and is developed in the Kellioka Seam. The mining height ranges from 5½ feet to 7 feet and the mine is accessed by 3 slope portals. At the time of the accident, the mine employed 102 underground miners and 13 surface personnel. The mine produces approximately 7,750 raw tons of coal per day with two MMUs operating two shifts per day using the room and pillar method. Maintenance is performed on third shift. Coal is extracted with Joy continuous mining machines and transported from the working faces to the section (MMU) loading point by means of a Joy detached continuous haulage system and then to the surface via belt conveyors. Miners and supplies are transported using rubber tired diesel mantrips and equipment.

This mine is ventilated by an exhaust mine fan on top of a vertical return shaft. The mine liberated approximately 307,712 cubic feet of methane in a 24-hour period, as of July 2013. The mine is subject to 15-day methane spot inspections under section 103(i) of the Mine Act. The principal officers for the mine at the time of the accident were:

Thurman Holcomb ..... General Manager
Ricky Johnson ..... Mine Manager
Wilburn Howard ..... Safety Manager

Prior to the accident, the Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection (E01) on June 27, 2013. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in 2012 was 0.0, compared to a National NFDL rate of 3.25.

DESCRIPTION OF ACCIDENT

On Tuesday August 6, 2013 at 6:02 a.m., eight members of the 006 MMU day shift production crew, under the direction of Billy Fox, Section Foreman, entered the mine. The crew arrived on the 006 MMU at approximately 6:30 a.m. and Fox began conducting an examination of the section. The remainder of the crew, including Lenny Gilliam (victim), began performing pre-operational equipment checks and examining ventilation controls prior to beginning production.

At approximately 6:45 a.m., the crew began retreat mining lift #44 in the #4 entry of crosscut #35 and proceeded to mine lifts #44 through #47 (See Pillar Recovery Plan Appendix A). While mining on the left side of the #4 entry, the cutter head on the Joy continuous mining machine stalled and the on-board electrical cutter-head breaker lost power due to pressure created by a coal/rock burst. Gilliam backed the continuous mining machine into the entry intersection at crosscut #35. Kenny Duff, Electrician, was called to restore power to the cutting head breaker. While the continuous mining machine's power was off a hydraulic fitting was repaired on the pan jack. After power was restored to the continuous mining machine, retreat mining resumed in the #4 entry with lift #48. Because of draw rock encountered, pillar lifts #49 and #50 were not mined.

Breaker posts were set in the #4 intersection, and two Fletcher MRS units were moved to the #3 entry. Because mine floor debris (muck) had been pushed into the #3 entry, the MRS units had to be set several feet outby the installed breaker posts. Gilliam partially mined lifts #51A and #51B on the left side of the #3 entry after the MRS units were set. The MRS units were moved outby a short distance and the continuous mining machine was used to partially clean the #3 entry. Gilliam then began mining lift #52B on the right side of the #3 entry. After the continuous mining machine had cut approximately 15 to 20 feet, a coal and rock burst occurred.

Gilliam was operating the continuous mining machine by remote control from a position approximately 4½ feet inby the deck of the #4 MBC when the burst occurred. Gilliam was covered by coal and rock from the burst, which also covered Terry Scott in the deck of the #4 MBC. Johnny Nantz, MRS Operator, was located outby Gilliam and Scott. Nantz received minor injuries from the burst. When the accident occurred, Fox was conducting a preshift examination on the 006 MMU for the next shift, which started at 2:30 p.m. Fox was in the #2 entry at crosscut #31, approximately 4 crosscuts outby the location of the accident. Fox notified Donnie Feltner, Mine Superintendent, of the accident at approximately 11:55 a.m. Fox and other crew members began removing the coal and rock debris from around Gilliam and Scott. When Scott was freed from the debris, he and Nantz walked to a diesel mantrip awaiting them and were transported to the surface. Because Gilliam did not have a detectable pulse, Fox began Cardio-Pulmonary Resuscitation (CPR) as soon as a sufficient amount of debris was removed. An Automatic External Defibrillator (AED) was brought to the accident site, but was not used, as the AED read "No Shock Advised," when the leads were affixed to Gilliam. CPR was administered continually while the crew members removed the remainder of debris from around Gilliam. After Gilliam was freed from the debris, Dave Thomas and

Johnny Bryant, Second Shift Foremen, transported him to the surface via a diesel mantrip while continuing CPR.

Scott was airlifted to the Holston Valley Hospital in Kingsport, Tennessee, and was treated there for life-threatening injuries. Nantz was transported via Harlan EMS to the Harlan Appalachian Regional Hospital, located in Harlan, Kentucky, where he was treated and released. Upon arriving at the surface at approximately 2:27 p.m., care of Gilliam was transferred to Keokee, Virginia Rescue Squad members, who continued to perform CPR while en-route to the Harlan Appalachian Regional Hospital. Gilliam was pronounced dead at the hospital by the Harlan County Coroner at 2:50 p.m.

INVESTIGATION OF THE ACCIDENT

MSHA personnel, Lester Cox, Supervisor; Robert Sparks, Coal Mine Inspector, and; Tommy Wright, Coal Mine Inspector, were at the Huff Creek No. 1 Mine when the accident occurred. Feltner notified Cox of the accident and Cox immediately issued a 103(k) order at 12:05 p.m. The MSHA National Call Center was notified at 12:10 p.m. by Wilburn Howard, Safety Manager for Lone Mountain Processing, Inc. He informed the call center that three miners had been injured with possible life-threatening injuries from a coal/rock burst.

The MSHA District 7 Office was notified of the accident by the call center at approximately 12:20 p.m. Steven Sorke, Accident Coordinator, contacted Kevin Doan, Accident Investigator, and dispatched him to the mine to begin the accident investigation. Tommy Wright, Coal Mine Inspector, was instructed to travel to the 006 MMU to assist in the recovery efforts before Doan arrived on the mine site.

The accident investigation was conducted jointly with personnel from the Kentucky Office of Mine Safety and Licensing (KOMSL). A list of persons participating in or present during the investigation is included in Appendix B.

Representatives of MSHA, KOMSL, and the mine operator traveled underground to the accident site on the day of the accident to examine the scene and take photographs and measurements for sketches of the existing physical conditions. MSHA and KOMSL accident investigators conducted joint miner interviews at the MSHA Harlan Field Office. A list of those interviewed is located in Appendix C.

The mine operator provided MSHA with maps and core drill hole data to assist in the investigation.

DISCUSSION

General Mine Conditions and Roof Control Plan Measures

The Huff Creek No. 1 Mine extracts coal from the Kellioka seam by the room and pillar mining method. Panels are typically developed with 5 entries, using 65° angled crosscuts to accommodate a continuous haulage system. The mining height in the vicinity of the accident site was approximately 6 ½ feet, consisting of 4 feet of coal and 2 to 3 feet of roof rock which was mined to facilitate equipment clearance. The maximum overburden of the mine is 2,200 feet. The mine is overlain by the Darby seam, which has been mined at various locations above. The interburden between the Kellioka and Darby coal seams ranges from approximately 43 to 50 feet. When mining beneath the "gob shadow"[1] of the overlying mine, mining conditions are typically good. Conversely, when mining in high cover and beneath an area where no mining has taken place, mining conditions are commonly adversely affected.

Primary roof support consists of five-foot, mechanically-anchored, resin-assisted bolts spaced at four foot centers lengthwise and crosswise in all entries and crosscuts. Supplemental support in entries consists of two, 12-foot-long cable bolts, installed every other row of roof bolts. Provisions of the approved Roof Control Plan required installation of two, 12-foot-long cable bolts every row for 200 feet inby and outby the point at which mining extended beyond the pillared out area in the overlying Darby coal seam. This area was characterized as a "gob-solid boundary." The area was 370 feet inby the accident site.. The pillars in the 6th Left Panel were developed on 80 feet by 120 feet centers.

For retreat mining, additional roof support was provided by two Fletcher MRS units in conjunction with wooden posts. The retreat mining sequence being used at the accident site was to mine the pillars in the 4 outside entries before mining and completing the row of pillars (closing out) in the middle entry of each pillar row. This retreat mining practice increased the amount of stress on the middle entry pillar where the accident occurred.

Stability and Geology

The coal and rock burst occurred in the 6th Left Panel off B-4 Main, between crosscuts #35 and #36 of the #3 Entry during retreat mining. At the time of the accident, retreat mining in the Kellioka seam had progressed 140 feet outby the extent of mining in the overlying Darby Seam. At the accident site, the Kellioka and Darby coal seam interburden was 43 feet and total overburden was 1,640 feet. The Darby seam had not been mined directly above the accident site. Retreat mining in previous panels of this mine (3, 4, and 5 Panels) had also been conducted beyond the limits of mining in the Darby seam. Retreat mining conditions on those panels above were similar to the panels at the 6th Left accident site, but without experiencing bursts, even though the depth of overburden in those panels was 1,850 to 1,900 feet.
The 6th Left panel was flanked by barrier pillars that isolated it from the previously mined

[1] Gob shadow refers to mining beneath old mine workings that have been pillared.

5th Left and 7th Left panels. The barrier pillar between 5th and 6th Left panels measured 280 feet, while the one between 6th and 7th Left panels measured 160 feet. The Stability Factor (SF) for both barrier pillars, calculated using the NIOSH Analysis of Retreat Mining Pillar Stability program, was above the recommended values. The recommended SF for the 5th and 7th Left panels was 1.30, and the actual SF was 1.79 and 1.58, respectively. The Stability Factor for the production pillars within 6th Left panel also exceeded the NIOSH recommended minimum. The recommended SF for the 6th Left panel was also 1.30 and the actual SF was 1.64.

At the accident site, the immediate roof consisted of a massive 25-inch thick layer of very hard, gray siltstone with no bedding partings. Core drill logs indicated that, concurrently, a substantial thickness of sandstone rose into the mine floor. At approximately 900 feet southwest of the accident site, a 26-foot layer of sandstone lies 18 feet beneath the Kellioka Seam. Approximately 650 feet southeast of the accident site, the sandstone has risen to within four inches beneath the Kellioka Seam. These conditions, of hard roof and floor, are commonly associated with burst activity and were defined at the accident site. The existence of these geological conditions was learned by the accident investigation team after obtaining the information from the mine operator's core drill logs.

A prominent joint zone runs through the left-hand pillar and the outby left corner of the right-hand pillar involved in the burst (See the Geology Map Sketch in Appendix E). Blocks of rock and coal were ejected from the left-hand pillar to a depth of approximately 12 feet and 5 feet wide along this zone. However, the right-hand pillar involved only coal, creating a 7-foot-deep void into the right-hand pillar remnant, with fist-sized pieces of coal littering the floor of crosscut #35 between the #3 and #4 entries and extending 14 feet from the burst pillar. Although the effect of the joint zone cannot be determined, it may have dismembered the roof and allowed a weight shift onto the pillar remnants on the inby edge of the joint zone.

Management Knowledge of Mining Conditions

Prior to the accident, mine management had several significant indicators that the retreat mining plan being used was inadequate for the prevailing mining conditions, but did not make any mining changes or plan modifications to prevent an accident. Core drill logs from drilling conducted by the mine operator prior to the accident were examined during the accident investigation. The drill logs showed that in the accident area, the floor and roof consisted of thick, hard sandstone and siltstone. No retreat mining was conducted above the accident area and the depth of cover was 1,640 feet. These conditions alone, with less mining cover are associated with coal/rock bursts during retreat mining. In similar mining conditions in the company's Darby Fork Mine, bump (burst) mitigation methods are deployed.

On April 3, 2013, MSHA provided mine management with a Pittsburgh Safety and Health Technology Center Roof Control Division Report, No. 13BA55, dated March 21, 2013, which referenced the 6-Left Panel where the fatal accident occurred on August 6,

2013. The following statement was made as a part of the technical report: "These panels have been retreat-mined with the exception of 6-Left, for which retreat-mining would be inadvisable at this time as it is now between two gobs." This statement in the technical report was another strong indication that mine management had an opportunity to reevaluate the conditions and retreat mining parameters in the 6 Left Panel before conducting retreat mining of the 6-Left Panel. Prior to the accident, the mine operator did not reevaluate the mining conditions or revise their mining after receiving the technical report provided to the company by MSHA.

Additionally, when mining in highly ground-stressed areas, it is important for the mine operator to extract the pillars systematically, to allow the stress or load on the pillars to be redistributed to the barrier pillars. This is accomplished by starting the mining at the most inby portion of the pillar and then methodically mining pillar lifts, working toward the outby end of the pillar. This technique was not performed by the mine operator at the accident location. While completing the row of pillars or "closing out" in the center entry, the first lifts mined were near the center of the pillar (See the Accident Site Sketch on page ii), which was the most highly stressed portion of the pillar. By mining in this manner, the mine operator was not allowing the stresses to redistribute and was, in fact, creating conditions conducive to the sudden release of the stored energy, or a burst.

With the geology changed to strong roof and floor, no over-mining to de-stress the roof in the area above the pillars being mined, and the high overburden depth, the company should have revised the plan for retreat mining to assure that lifts begin at the inby, or lowest stressed end of the pillar and continued in an orderly fashion to the outby end.

Lastly, it was revealed during the accident investigation that mine management had knowledge that a previous non-injury outburst occurred hours earlier on the 006 MMU, and prior to the fatal accident. This event was an even further indication that the retreat mining plan and method for pillar extraction being utilized at the time of the fatal accident was insufficient, yet the sequence of mining the pillars was not altered by the mine operator to address the prevailing geological conditions and no retreat mining plan changes were made by the mine operator. MSHA was not informed by the mine operator of the previous outburst on the day of the fatal accident. MSHA learned of the previous outburst event during the accident investigation interviews.

Experience and Training

Gilliam had 37 years of mining experience, including 16 years at this mine and 16 years at this work activity.

Nantz had 30 years of mining experience, including 17 years at this mine and 12 years at this work activity.

Scott had 29 years of mining experience, including 19 years at this mine and 18 years at this work activity.

Fox had 28 years of mining experience, including 18 years at this mine. Fox had been a foreman for 14 years.

During the accident investigation, MSHA examined the Experienced Miner and Annual Refresher training records of Fox, Gilliam, Scott, and Nantz. These training records were found to be current. The miners were trained in the provisions of the approved roof control plan being used at the time of the accident, however, the mine operator had not changed the method of retreat mining being used, or revised the roof control plan. Consequently, the training the miners had received was not effective.

The accident investigators also reviewed Task Training records for the victim and the two injured miners. The review indicated that the Task Training was current for Gilliam, Scott, and Nance.

ROOT CAUSE ANALYSIS

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

Listed below are the root causes identified during the analysis and their corresponding corrective actions implemented to prevent a recurrence of the accident:

1. *Root Cause:* The mine operator utilized pillar recovery methods which were incompatible with prevailing geological conditions of the 6 Left Panel (006 MMU).

   Corrective Action: The retreat mining portion of the mine operator's approved roof control plan was revoked by MSHA on August 9, 2013, after the occurrence of the accident, which was fatal to one miner and injured two other miners. No further retreat mining was permitted in the 6 Left Panel. The mine operator has not submitted a new plan to MSHA for approval to conduct retreat mining. If the mine operator submits a new plan for retreat mining, MSHA will carefully review the revised plan for compatibility with the prevailing geological conditions. If MSHA should approve a revised roof control plan, additional training in relation to new plan revisions will be required for any miners involved with retreat mining.

2. *Root Cause:* The mine operator failed to follow the approved roof control plan. The approved roof control plan allowed for different pillar recovery methods and sequences, based on changing geological conditions. Having knowledge of the prevailing geological conditions and a previous burst, the mine operator did not alter the retreat mining plan and sequence to complete the row of pillars or "close out" the row of pillars being mined against the solid coal barrier, which would have mitigated the likelihood of a coal or rock burst.

   Corrective Action: The retreat mining portion of the mine operators approved roof control plan was revoked on August 9, 2013, after the occurrence of the accident, which was fatal to one miner and injured two other miners. No further retreat mining was permitted in the 6 Left Panel. The mine operator has not submitted a new plan to MSHA for approval to conduct retreat mining. If the mine operator submits a new plan for retreat mining, MSHA will carefully review the revised plan for compatibility with the prevailing geological conditions. If MSHA should approve a revised roof control plan, additional training in relation to new plan revisions will be required for any miners involved with retreat mining.

3. *Root Cause:* The mine operator did not revise the approved roof control plan when mining conditions and geological information indicated the plan was not

suitable for controlling coal or rock bursts.

Corrective Action: The retreat mining portion of the operator's approved roof control plan was revoked by the District Manager on August 9, 2013, after the occurrence of the accident, which was fatal to one miner and injured two other miners. No further retreat mining was permitted in the 6 Left Panel. The mine operator has not submitted a new plan to MSHA for approval to conduct retreat mining. If the mine operator submits a new plan for retreat mining, MSHA will carefully review the revised plan for compatibility with the prevailing geological conditions. If MSHA should approve a revised roof control plan, additional training in relation to new plan revisions will be required for any miners involved with retreat mining.

CONCLUSION

This accident occurred because of the mine operator's failure to ensure proper pillar recovery methods were utilized for the prevailing mining conditions, which would mitigate coal/rock bursts. The mine operator failed to follow approved methods in the existing roof control plan that would have decreased the chance of a coal/rock burst when removing coal pillars. In addition, the mine operator failed to revise the roof control plan to address methods and steps in the recovery of coal pillars that would have mitigated the chance of coal and rock bursts in changing geological conditions.

Approved By:

Irvin T. Hooker, District Manager

3/12/14
Date

ENFORCEMENT ACTIONS

103(k) Order No. 8400861 was issued verbally to Donnie Feltner, Superintendent on August 6, 2013 at 12:05 P.M under the provisions of Section 103(k) of the Mine Act and then reduced to writing:

> This mine has experienced a serious injury accident on the 006 MMU. 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 the investigation into the cause of the accident. This order prohibits anyone from entering the 006 MMU except as necessary for removal of the victims.

104 (d)(1) Citation No. 8386694 was issued to Lone Mountain Processing, Inc. for a violation of 30 CFR § 75.223(a)(1):

> The mine operator did not propose revisions to the roof control plan when conditions at the mine indicated the plan was not adequate or suitable for controlling the roof, face, ribs or coal or rock bursts. On August 6, 2013 on the 006 MMU, the mine operator was aware no mining had occurred in the Darby coal seam, located approximately 43 feet - 50 feet above, negating the benefit from the gob shadow effect (mining beneath old mine workings which have been pillared) of the overlying Darby seam. The mine operator possessed core hole data indicating that the thickness and strength of the roof and floor rock increased on the 006 MMU. Earlier on the day of the accident, a non-injury burst incident (bump) occurred which was a further indication that the current roof control plan was unsuitable. In similar mining conditions, the mine operator utilized effective burst mitigation methods in its Darby Fork No. 1 Mine's roof control plan and the Huff Creek No. 1 Mine's roof control plan was not revised to incorporate these or similar methods. There were several obvious indications that the roof control plan was unsuitable, yet the plan was not revised.

104(d)(1) Order No. 8386695 was issued to Lone Mountain Processing, Inc. for a violation of 30 CFR § 75.203(a):

> While conducting retreat mining on the 006 MMU in the 6 Left Panel off the B-4 Mains, faulty pillar recovery methods were being used which resulted in a failure to effectively control the ribs and contributed to a fatal coal/rock burst. The following faulty pillar recovery methods were identified during the investigation: 1) the retreat mining plan utilized by the operator involved closing out, or concluding, the row of coal pillars in the #3 entry (center entry) where the maximum amount of stress was concentrated and where high overburden existed; 2) the initial pillar lifts were in the core portion of the pillar where the thickness and strength of the roof and floor rock had increased which did not allow the stored energy to safely redistribute. As a result, on August 6, 2013, these faulty

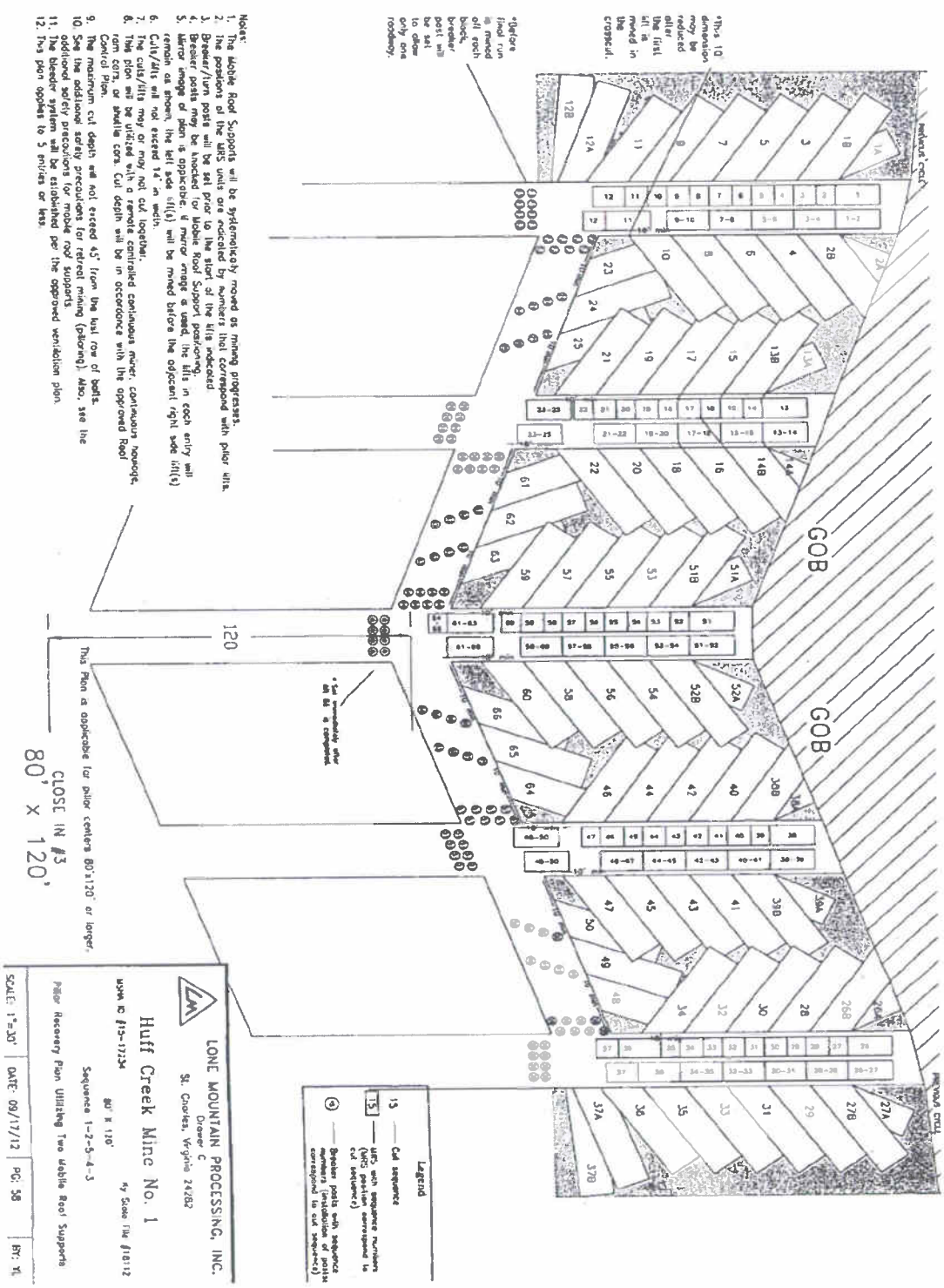
pillar recovery methods contributed to a sudden and violent failure of the coal pillars in the No. 3 entry of the 006 MMU. The instantaneous release of energy caused the coal/rock ribs to burst which fatally injured the continuous miner operator and injured two other miners.

104(a) Citation No. 8386696 was issued to Lone Mountain Processing, Inc. for a violation of 30 CFR § 75.220(a)(1):

The operator is not following the approved roof control plan dated January 23, 2013. On August 6, 2013 on the 006 MMU during retreat mining operations, a coal/rock burst occurred fatally injuring one miner and seriously injuring two others. During the course of the fatal accident investigation, geological records in the form of core samples obtained by the operator prior to the fatal coal/rock burst were provided by the mine operator. These samples indicated that hard roof and floor material thickened in the area of the accident which was under 1,640 feet of overburden, increasing the risk of a burst. The mine operator was using the pillar extraction method in which the "close out" is in the middle of each pillar row (#3 entry). This retreat mining method allowed increased pressure on the coal pillars in the #3 entry, from the thick and hard sandstone and siltstone in the mine roof and floor. Thus, the combination of these factors contributed to the occurrence of a coal/rock burst. The mine operator has other approved retreat mining plans for closing out in an entry closer to the barrier of the panel which would have mitigated the chance of a burst. However, the operator did not utilize such retreat mining plans for the 006 MMU nor were any additional measures taken to protect persons when unusual hazards were encountered. As a result, a coal/rock burst occurred resulting in three injuries, one of which was fatal.

APPENDIX A

Pillar Recovery Plan



APPENDIX B

Persons Participating in the Investigation
Mine Company Officials

Name	Title
Thurman Holcomb	General Manager
Ricky Johnson	Mine Manager
Donnie Feltner	Superintendent
Willard Hickey	Mine Foreman
Jeff Edwards	Mine Foreman
James Vicini	Safety
Melanie Kilpatrick	Attorney

Kentucky Office of Mine Safety and Licensing

Name	Title
Greg Goins	Deputy Chief Accident Investigator
Tim Fugate	Accident Investigator
Ernie Hawkins	Electrical Inspector
Billy Allen	Roof Control Specialist

Mine Safety and Health Administration

Name	Title
Irvin T. Hooker	District Manager
Clayton E. Sparks	Assistant District Manager
Dennis J. Cotton	Assistant District Manager
Steven L. Sorke	Accident Coordinator
William B. Sears	CMI Supervisor
Ryan K. O'Boyle	Roof Control Supervisor
Sandin Phillipson	Pittsburgh Technical Support
Christopher Mark	Principal Roof Control Specialist
Kevin Doan	Roof Control Specialist
George M. Jackson	Coal Mine Inspector
Otis Carroll	Coal Mine Inspector
Silas Brock	Coal Mine Inspector & Family Liaison
Jack Foster	Accident Investigator
Carla B. Marcum	Roof Control Specialist
Charlie Ramsey	Accident Investigator
Thomas Grooms	Office of Solicitor
Randall Lewis	Electrical Supervisor
Sean Davenport	Electrical Specialist

APPENDIX C

List of Persons Interviewed

Name	Title
Billy Fox	Section Foreman
Johnny Nantz	Mobile Roof Support (MRS) Operator
Lilly Ison, Jr	Mobile Bridge Operator
Darrell Smith	Mobile Bridge Operator
Howard Collins Jr	Roof Bolter Operator
Mark LeMaster	Mobile Bridge Operator
Kenny Duff	Electrician
Chris Cloud	3rd Shift Section Foreman
Ross Ewing	3rd Shift Continuous Miner Operator

APPENDIX D

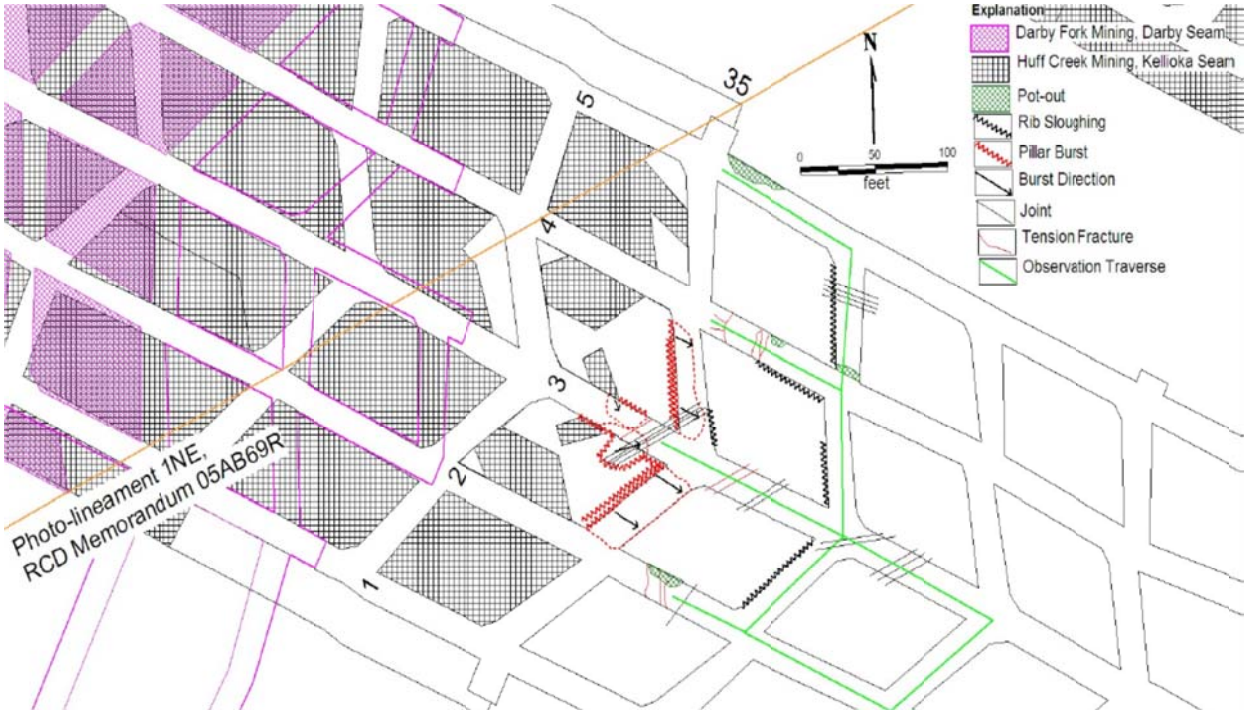
PHOTOGRAPH #1

PHOTOGRAPH #2

PHOTOGRAPH #3

APPENDIX E

GEOLOGY MAP SKETCH



APPENDIX F

Accident Investigation Data - Victim Information
Event Number: 6 4 2 8 4 0 7

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
Lenny Gilliam	M	56	0 1 Fatal

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: a. Date: 08/06/2013 b. Time: 14:50

6. Date and Time Started: a. Date 08/06/2013 b. Time 11:52

7. Regular Job Title	8. Work Activity when Injured	9. Was this work activity part of regular job?
0 3 6 Continuous Miner Operator	0 7 3 Operating Continuous Miner	Yes X No

10. Experience	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days
	a. This Work Activity: 16	0	0	b. Regular Job Title: 16	0	0	c. This Mine: 16	0	0	d. Total Mining: 37		

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness
1 2 2 Coal/Rock Outburst	3 7 0 Blunt Force Injuries: Head, Neck, Chest

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

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: X | CPR: X | EMT: X | Medical Professional: | None:

16. Part 50 Document Control Number: (form 7000-1) | 17. Union Affiliation of Victim:

Victim Information: 2

1. Name of Injured/Ill Employee	2. Sex	3. Victim's Age	4. Degree of Injury
Terry Scott	M	48	0 2 Permanent total or partial disability

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: a. Date: b. Time:

6. Date and Time Started: a. Date 08/06/2013 b. Time 11:52

7. Regular Job Title	8. Work Activity when Injured	9. Was this work activity part of regular job?
0 7 2 Mobile Bridge Operator	0 7 3 Operating Mobile Bridge	Yes X No

10. Experience	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days
	a. This Work Activity: 18	0	0	b. Regular Job Title: 18	0	0	c. This Mine: 19	0	0	d. Total Mining: 29	0	0

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness
1 2 2 Coal/Rock Outburst	3 7 0 Cracked ribs, punctured lung, neck & back

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

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: X | CPR: | EMT: X | Medical Professional: | None:

16. Part 50 Document Control Number: (form 7000-1) | 17. Union Affiliation of Victim:

Victim Information: 3

1. Name of Injured/Ill Employee	2. Sex	3. Victim's Age	4. Degree of Injury
Johnny Nantz	M	49	0 3 Days away from work only

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: a. Date: b. Time:

6. Date and Time Started: a. Date 08/06/2013 b. Time 11:52

7. Regular Job Title	8. Work Activity when Injured	9. Was this work activity part of regular job?
0 1 2 Roof Bolter Operator	0 4 2 Observing Mining Cycle	Yes X No

10. Experience	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days
	a. This Work Activity: 12	0	0	b. Regular Job Title: 12	0	0	c. This Mine: 17	0	0	d. Total Mining: 30	0	0

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness
1 2 2 Coal/Rock Outburst	1 8 0 Small cuts, abrasions, and back pain

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

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: | Medical Professional: | None: X

16. Part 50 Document Control Number: (form 7000-1) | 17. Union Affiliation of Victim:

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