CAI-2012-17

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Machinery Accident
November 17, 2012

Willow Lake Portal Mine
Big Ridge, Inc.
Equality, Saline County, Illinois
I.D. No. 11-03054

Accident Investigators

Dean Cripps
Electrical Engineer

Steven M. Miller
Supervisory Coal Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
District 8
2300 Willow Street
Vincennes, Indiana
Robert A. Simms, District Manager

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Photograph Of Accident Scene Showing Continuous Mining Machine And Coal Rib

OVERVIEW

On Saturday, November 17, 2012, at approximately 3:25 a.m., Chad Meyers, a 30-year-old continuous mining machine operator, was fatally injured while repositioning a continuous mining machine on the No. 5 working section. Meyers was backing the continuous mining machine out of the first cut of a crosscut being developed to the left of the No. 4 entry. As Meyers was repositioning the continuous mining machine to mine the right side of the crosscut, he was pinned between the continuous mining machine cutter head and the outby coal rib. (See Appendix B.)

The administrative controls and policies in place at the time of the accident were not adequate to prevent the practice of operating continuous mining machines from an unsafe location. Also, no engineering controls were in place to prevent this type of accident. The accident occurred because the victim operated the machine while he was located between the left side of the cutter head and the coal rib.

GENERAL INFORMATION

The Willow Lake Portal Mine is located near the town of Equality in Saline County, Illinois. The mine operator is Big Ridge Inc., a subsidiary of Peabody Midwest Operations, LLC. The United Mine Workers of America represents the miners at the Willow Lake Portal Mine.

The Willow Lake Portal Mine operates in the Illinois No. 5 coal seam with four ventilation shafts and a dual compartment slope. Miners and material are transported into the mine through the slope using diesel powered equipment. The mine operates four mining sections, utilizing the room and pillar method of mining, all of which use split air (fish tail) ventilation. Coal is mined by two continuous mining machines on each working section and transported from the working faces by battery powered coal haulers (ram cars). Coal is then transported to the surface via a conveyor belt system. The mine employed 454 people at the time of the accident and produced an average of 17,000 raw tons per day. The mine operated three production shifts each day, seven days a week, at the time of the accident.

The mine liberated 1.4 million cubic feet of methane in a 24-hour period and was on a 5-day spot inspection schedule for excessive methane.

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

Bert Hall	Operations Manager
Jamie Haantz	Superintendent
Todd Grounds	Compliance Manager

A regular (E01) Safety and Health Inspection by the Mine Safety and Health Administration (MSHA) was ongoing at the time of the accident. The previous regular Safety and Health Inspection of the mine was completed on September 26, 2012. The Non-Fatal Days Lost (NFDL) injury incidence rate for Big Ridge, Inc. was 3.59, compared to the National NFDL rate of 3.24.

On November 27, 2012, Peabody Energy announced they were closing the Willow Lake Portal Mine. The mine did not resume production after the November 17th accident.

DESCRIPTION OF THE ACCIDENT

Chad Meyers, victim, reported to work on Friday night, November 16th, for his normal 11:00 p.m. to 8:00 a.m. shift. Meyers usually operated a scoop on the No. 1 unit. Before going underground, Meyers was assigned to operate the continuous mining machines on the No. 5 unit. Typically two continuous mining machine operators are assigned to each working section, but on this shift, because of other miners being absent, Meyers was the only continuous mining machine operator assigned to the No. 5 unit. He traveled underground with the No. 5 unit crew, arriving on the unit at about midnight.

The shift proceeded without incident with Meyers first operating the left side continuous mining machine, mining coal in the No. 7 entry. Ram car operators Arval Van, Kevin Hawkins, and Aaron Hall transported the mined coal from No. 7 entry to the section feeder. After completing the cut in the No. 7 entry, Meyers parked the left side continuous mining machine. Roof bolting machine operators Chris Czuprynski and Josh McClendon began roof bolting the fresh cut in the No. 7 entry.

Meyers walked across the section to the face of the No. 3 entry. He began operating the right side continuous mining machine, mining the right crosscut off of the No. 3 entry at survey station 36+80. He mined the crosscut through into the No. 2 entry. Van, Hawkins, and Hall again transported the coal from the continuous mining machine to the feeder. After finishing the cut, Meyers backed the continuous mining machine out of the crosscut into the No. 3 entry. He then

trammed the continuous mining machine through the crosscut between the No. 3 and No. 4 entries and started mining the left crosscut off of No. 4 entry at survey station 36+80. Benji Reeves, Section Foreman, and Brian Duty, Lead Man, moved the right side roof bolting machine into the crosscut between No. 3 and No. 2 entries and began roof bolting the fresh cut. Czuprynski and McClendon relieved Reeves and Duty and continued roof bolting in the crosscut.

Meyers mined the first cut of the left crosscut off of the No. 4 entry approximately 25-feet deep. The last coal mined from this cut was loaded into Hawkins' ram car. After Hawkins' car departed, Meyers began backing the continuous mining machine out of the cut. Van began tramming his ram car in the No. 3 entry toward the face. Before turning left into the crosscut, Van noticed Meyers signaling with his cap lamp, which illuminated the inby rib of the crosscut. Van could not see Meyers or the cutter head of the continuous mining machine from his location. Van assumed Meyers was going to reposition the continuous mining machine to mine the right side of the cut. Van stopped his ram car and waited for Meyers to signal he was ready to commence mining. A short time later, Van heard the continuous mining machine shut off.

While Czuprynski and McClendon were still installing roof bolts in the right cross cut off of the No. 3 entry, McClendon noticed the lights on the continuous mining machine were not illuminated. McClendon thought the continuous mining machine had lost power and informed Czuprynski of such. Czuprynski turned and saw the rear-mounted methane monitor display illuminated, which indicated that the continuous mining machine still had power. Neither Czuprynski nor McClendon could see the cutter head of the continuous mining machine from their location. They continued installing roof bolts.

Upon returning from the feeder, Hall observed Van's ram car parked in the No. 3 entry. Hall parked his ram car in the No. 3 entry one crosscut outby Van's ram car and walked up to Van's ram car. Van and Hall waited for Meyers to signal them that he was ready to commence mining.

Hawkins returned from the feeder and parked his ram car behind Hall's ram car and walked up the No. 3 entry toward the face. Hawkins walked inby Van's ram car to see why the continuous mining machine was not operating. He observed Meyers pinned between the left side of the cutter head and the outby rib of the crosscut. Hawkins immediately yelled for help. Van ran to Meyers, traveling up the left side of the continuous mining machine. Meyers was facing toward the rear of the machine with one shoulder against the coal rib and the other shoulder against the side of the cutter head. Van checked Meyers for a pulse but found none.

Czuprynski ran around the coal block to the No. 4 entry and approached Meyers from the front of the machine. He and Van were unable to free Meyers. McClendon ran outby to get help. He encountered Brian Duty operating a scoop in the No. 7 entry and informed him of the accident. Duty ran to the scene. Van informed Duty that the remote control unit was pinned between the continuous mining machine and the coal rib. Duty attempted to operate the continuous mining machine manually by using the on-board controls. Duty was able to start the pump motor but could not get the tram function to operate. Duty informed Van that he had to have the remote control unit. Van freed the remote control unit and handed it to Duty. At approximately 3:37 a.m., Duty activated the right tram in reverse, which rotated the continuous mining machine's cutter head away from the rib, freeing Meyers.

Van and Czuprynski moved Meyers into the No. 4 entry. Gary Brasher, EMT, arrived at the scene as Meyers was freed and Brasher immediately began CPR. Meyers was not breathing and did not have a pulse. CPR was continued while Meyers was placed in a mantrip and transported to the surface. Meyers was pronounced dead on the surface at 4:40 a.m. by the Saline County Coroner.

An autopsy was performed at the request of the Saline County Coroner's office. The cause of death was asphyxiation due to thoracic compression due to blunt compression trauma.

INVESTIGATION OF THE ACCIDENT

The MSHA call center was notified of the accident at 3:52 a.m. on November 17, 2012, by Todd Grounds, Compliance Manager at Willow Lake Portal Mine. The call center notified Marty Gayer, Supervisory Conference and Litigation Representative for MSHA District 8 in Vincennes, Indiana. Chad Barras, Midwest Safety Director for Peabody Coal Company, contacted Steve Miller, Supervisory Coal Mine Inspector in the Benton, Illinois Field Office and informed him of the accident. Miller verbally issued a Section 103(j) order to Barras at 4:06 a.m. Miller and Dean Cripps, Accident Investigator, were immediately dispatched to the mine. Denzil Hughes, MSHA Educational Field Services, was also dispatched to the mine to assist in the investigation. The 103(j) order was modified subsequently to a Section 103(k) order to ensure the safety of persons at the mine. A noncontributing citation was issued for a violation of § 50.10 because this accident was not reported to MSHA at once, without delay, and within 15 minutes.

The accident investigation was conducted in cooperation with the Illinois Department of Natural Resources, Office of Mines and Minerals (IDNR). Interviews with eight persons who had knowledge of the accident were

conducted on November 19th at the IDNR offices in Benton, IL. An inspection of the accident scene and operational checks on the continuous mining machine were also conducted. Several components were removed from the continuous mining machine and sent to MSHA's Approval and Certification Center in Triadelphia, WV for testing.

DISCUSSION

Accident Scene

The accident occurred in the crosscut between No. 3 and No. 4 entries on the right side of the No. 5 unit at survey station 36+80 (See Appendix B). The victim had just completed the first cut in the left crosscut off of the No. 4 entry. This crosscut was being mined directly or "straight on" from the crosscut between No. 3 and No. 4 entries. The accident occurred as the continuous mining machine was being repositioned to mine the right side of the cut.

When investigators arrived at the accident scene, the continuous mining machine was located in the crosscut between No. 3 and No. 4 entries, with the head toward the No. 4 entry. The left side of the cutter head was approximately 34 inches from the outby rib of the crosscut. When Duty operated the continuous mining machine to free the victim, he activated the right tram in reverse just enough to free the victim. Using the tracks in the mine floor as reference, investigators repositioned the continuous mining machine to its approximate location before it was moved to free the victim. The distance between the left side of the cutter head and the coal rib measured approximately 14 inches.

Unit No. 5 utilized split air (fish tail) ventilation. The accident occurred on the right side of the unit. The continuous mining machine operator stood on the left side of the machine to operate it. The trailing cable entered the machine on the left side. At the time of the accident, the trailing cable was lying on the mine floor between the continuous mining machine and the outby rib of the crosscut.

The outby rib of the crosscut was angled inby from No. 4 entry toward No. 3 entry. When the victim backed the continuous mining machine out of the cut, the machine contacted the outby rib of the crosscut between No. 4 and No. 3 entries. This was evidenced by a groove, approximately 51 inches long, in the outby rib of the crosscut. The groove appeared to have been made by the trailing cable standoff rubbing the coal rib.

Equipment

The continuous mining machine involved in the accident was manufactured by Joy Mining Machinery, Model 14CM15, Serial No. JM5506B2, MSHA Approval No. 2G-4159A-0.

The remote control unit being used at the time of the accident was manufactured by Matric Limited, Model TX3, P/N 100509985, Serial No. 133305AJ025 F, Frequency 458 MHz, MSHA Approval No. 2G-4096-0.

Testing and Examination

The continuous mining machine involved in the accident was examined and functional tests were performed onsite with the same remote control unit that was used by the victim. All functions were tested, with emphasis on the tram operations. No operational irregularities or deficiencies were observed during functional testing. The emergency stop function on the remote control unit operated properly by de-energizing the pump while leaving only the lights and methane monitor energized. The on-board manual tram switches were tested and found to operate properly. The on-board pump control selector switch was set to allow the machine to be operated remotely. The on-board lighting selector switch was set to the headlights only position. The area lights would not be illuminated with the selector switch in this position. When the machine was initially energized during the investigation, only the headlights were illuminated. The remote control system is designed to allow the lights to be turned on and off from the remote control unit. However, only the lights that are selected by the on-board selector switch can be turned on and off from the remote control unit. Information gathered during interviews revealed that none of the lights on the continuous mining machine were illuminated when the victim was discovered. Investigators concluded that the headlights were turned off from the remote control unit. The area lights were not illuminated at the time of the accident based on the position of the lighting selector switch. A non-contributory citation was issued for operating the continuous mining machine without the area lights illuminated.

No large magnets, which could affect the operation of the Hall Effect (magnetic field) switches on the remote control unit, were found on the continuous mining machine or in the vicinity of the accident.

The continuous mining machine on the left side of the unit was idle at the time of the accident and its remote control unit was not connected to a power source.

Therefore, interference from this remote control unit was not considered a factor in the accident.

The remote control unit involved in the accident was taken into custody by MSHA and tested at the Matric Limited facility in Seneca, Pennsylvania. Functional testing of the remote control unit demonstrated that the remote control unit operated properly with no reported or observed problems. All of the remote control unit switches appeared to be present and in good condition with no damage to the rubber switch boots.

Two USB flash drives (memory sticks) containing stored data were removed from the continuous mining machine and taken into custody by MSHA. The data on the flash drives was analyzed by Joy Mining Machine representatives and engineers from MSHA Technical Support. The data revealed the last commands received from the remote control unit prior to the victim being discovered by co-workers were two stop commands, four seconds apart, indicating the stop button on the remote control unit was actuated two separate times. Two seconds before the first stop command was received, the tram enable switch was operated. In order to tram the continuous mining machine, the tram enable switch must first be operated and then one or both of the tram switches must be operated. If the tram switches are not operated within two seconds, the tram enable must be reset before the machine will tram. The data does not indicate whether the machine was actually moving when the stop button was operated, only that the tram was enabled and the machine may have been moving. However, other evidence indicates the continuous mining machine was moved during this two second period, pinning the victim.

Analysis of the data also revealed the amount of time that elapsed between the victim being pinned and the machine being moved to free him. The time between the stop command being received when the victim was pinned, and the tram enable command when the machine was moved to free the victim, was approximately 12 minutes.

Roof Control Plan

Precautions for remote control operation of continuous mining machines were included in the approved roof control plan in effect at the time of the accident. The following statement was included in the plan:

> While repositioning the continuous mining machine within the working place, all persons involved shall be positioned in a safe location away from any part of the continuous mining machine. During place changing, all persons involved with the move shall be

positioned in a safe location away from the continuous mining machine while the machine is being trammed. (See Sketch 23)

In addition, the roof control plan requires that "If more than one continuous mining unit is present on a working section, each non-tethered remote control station for the continuous mining machine must operate on a different frequency."

"Red Zone"

The mine has a written "Red Zone" policy that states employees caught operating equipment in the "Red Zone" are subject to discipline, which may include discharge. This written policy is posted in several locations in the mine office, bathhouse, rest rooms, and ready room. Mine management also emphasized that the "Red Zone" was discussed in annual retraining and safety meetings. However, mine management could not produce any documentation or evidence that any employee at this mine had ever been disciplined or discharged for being in the "Red Zone."

Eight employees were interviewed during this investigation. All eight were questioned whether they had observed persons operating equipment in the "Red Zone." Six of the eight stated they had observed persons operating continuous mining machines while in the "Red Zone." One of the six stated a miner was observed in the "Red Zone" during the last full shift that he worked. Several stated they had observed continuous mining machine operators tramming the continuous mining machine while leaning against the machine with their feet on the trailing cable. One employee stated this was a common practice.

Training and Experience

The victim began working at Willow Lake Portal Mine as a contractor in July of 2009 and was hired permanently in March of 2010. This was the only coal mine at which he had worked.

The annual refresher training and task training records for the victim were reviewed. No record was provided to show that he had received task training to operate the continuous mining machine. The investigation revealed that the victim started operating the continuous mining machine approximately six months prior to the accident. He often relieved the continuous mining machine operator out for lunch. Meyers' supervisor on No. 1 unit, Eric Davis, and a continuous mining machine operator stated the following about Meyers: he was a good operator, he was familiar with the machines controls, and he was aware of the "Red Zone." These two employees stated that they specifically asked the victim if he had been task trained on the continuous mining machine and he told

them that he had. The lack of a record of the task training was determined not to have contributed to the accident. A non-contributory citation was issued for not providing a record of task training.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the underlying cause of the accident that was correctable through reasonable management controls. Listed below is the root cause identified during the analysis and the corresponding corrective action implemented to prevent a recurrence of the accident:

Root Cause: The mine operator did not ensure compliance with provisions of the approved roof control plan requiring that all persons be in a safe location away from any part of the continuous mining machine when the machine is being repositioned or trammed. The continuous mining machine operator was located in the "Red Zone" between the continuous mining machine and the coal rib while the machine was being repositioned.

Root Cause: The operator did not enforce its Red Zone policy. Accident investigators found that Red Zone violations were a practice.

Corrective Action: On November 27, 2012, Peabody Energy announced that they were closing the Willow Lake Portal Mine. The mine did not resume production after the November 17th accident. The mine operator submitted an action plan to the District Manager describing how the continuous mining machines would be removed from the mine.

As of June 12, 2013, this mine is in the process of being sealed. The air shafts have been capped and the bore holes have been grouted. Within the next few days, a fence will be installed around the slope opening.

To prevent this type of fatal accident, mine operators must strictly adhere to the requirements of their approved roof control plans, which includes strictly following policies and procedures that keep miners from entering Red Zones. Also, proximity detection systems should be installed on all continuous mining machines.

CONCLUSION

The victim was fatally injured when he was backing the continuous mining machine away from the face of the left crosscut off of No. 4 Entry, and became pinned between the machine and the coal rib. The administrative controls and policies in place at the time of the accident were not adequate to prevent the practice of operating continuous mining machines from an unsafe location. Also, no engineering controls were in place to prevent this type of accident.

Approved By:

Robert A. Simms
District Manager

6/24/13
Date

ENFORCEMENT ACTIONS

1. A Section 103(j) Order, No. 8431904, was issued to prevent the destruction of any evidence that would assist in investigating the cause or causes of the accident and to ensure the safety of all persons until an investigation of the accident could be completed. The Section 103(j) Order was modified to a Section 103(k) Order to ensure the safety of miners until the investigation could be completed.

2. A 104(d)(1) Citation, No. 8431929, was issued citing 30 CFR 75.220(a)(1). The operator's approved roof control plan was not being complied with on the No. 5 Unit (MMU 005). The plan states "While repositioning the continuous mining machine within the working place, all persons involved shall be positioned in a safe location away from any part of the continuous mining machine. During place changing, all persons involved with the move shall be positioned in a safe location away from the continuous mining machine while the machine is being trammed." Interviews with rank-and-file miners show that working in the "Red Zone" was a common practice when tramming continuous mining machines to reposition or to change places.

   On November 17, 2012, Chad Meyers, Continuous Miner Operator, was fatally injured when he was pinned between the continuous mining machine and the coal rib while moving the continuous mining machine out of the first cut of the crosscut left off No. 4 entry at Survey Station 36+80.

   The mine operator has displayed aggravated conduct constituting more than ordinary negligence. This violation is an unwarrantable failure to comply with a mandatory standard.

   Standard 75.220(a)(1) was cited 40 times in two years at mine 1103054 (40 to the operator, 0 to a contractor).

Appendix A

Persons Participating in the Investigation

Mine Safety and Health Administration

Mary Jo Bishop	Assistant District Manager, Enforcement
Steve Miller	Supervisory Mine Safety and Health Inspector
Dean Cripps	Electrical Engineer, Accident Investigator
Denzil Hughes	Educational Field Services
Terry Hudson	Electrical Specialist
Terry Garrison	Electrical Engineer, MSHA Technical Support
Dave Barkand	Electrical Engineer, MSHA Technical Support

State of Illinois Department of Natural Resources, Office of Mines and Minerals

Mike Simpson	Inspector
Don McBride	Inspector at Large
Larry Jenkel	Inspector

Big Ridge, Inc., Peabody Coal

Chad Barras	Midwest Safety Director
Todd Grounds	Compliance Manager
Clint Underhill	Safety Director
Jamie Haantz	Superintendent
Clint Joiner	Maintenance Manager
Calvin Melvin	Maintenance Foreman
David Teal, Jr.	Maintenance Foreman

United Mine Workers of America

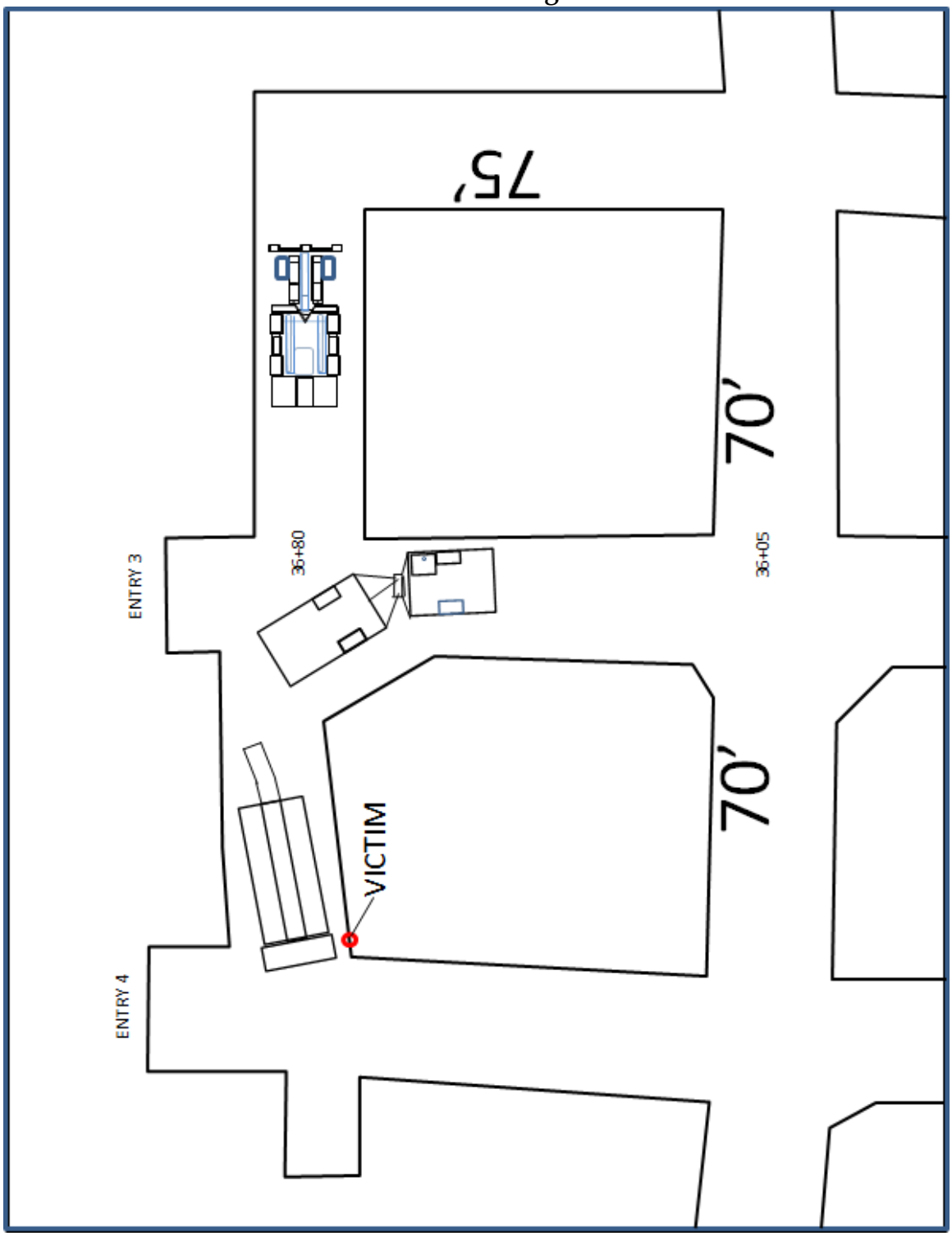
Greg Fort	Local President
Rodney Shires	Miners Representative
Edgar "Butch" Oldham	International Representative

Jackson Kelly

Arthur Wolfson	Attorney

Appendix B

Unit Drawing



Not to Scale

Appendix C

Victim Information

Accident Investigation Data - Victim Information
Event Number: 4 2 5 2 1 1 1

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:
Chad W. Meyers	*M*	*30*	*01 Fatal*

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 11/17/2012 b.Time: 4:40	*a. Date: 11/16/2012 b.Time: 23:00*

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
028 Scoop operator	*049 Operate continuous miner*	Yes [ ] No [X]

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	*0*	*32*	*0*	b. Regular Job Title:	*3*	*26*	*0*	c: This Mine:	*3*	*26*	*0*	d. Total Mining:	*3*	*26*	*0*

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
077 Underground mining machine	*170 Crushing*

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

16. Part 50 Document Control Number: (form 7000-1)
17. Union Affiliation of Victim: *2555* *United Mine Workers of Amer.*

Appendix D

Sketch 23 Roof Control Plan, Red Zone Drawing

SKETCH No. 23