

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Electrical Accident
February 5, 2004

Ruby Energy
Spartan Mining Company, Inc.
Delbarton, Mingo County, West Virginia
I.D. No. 46-08808

Accident Investigators

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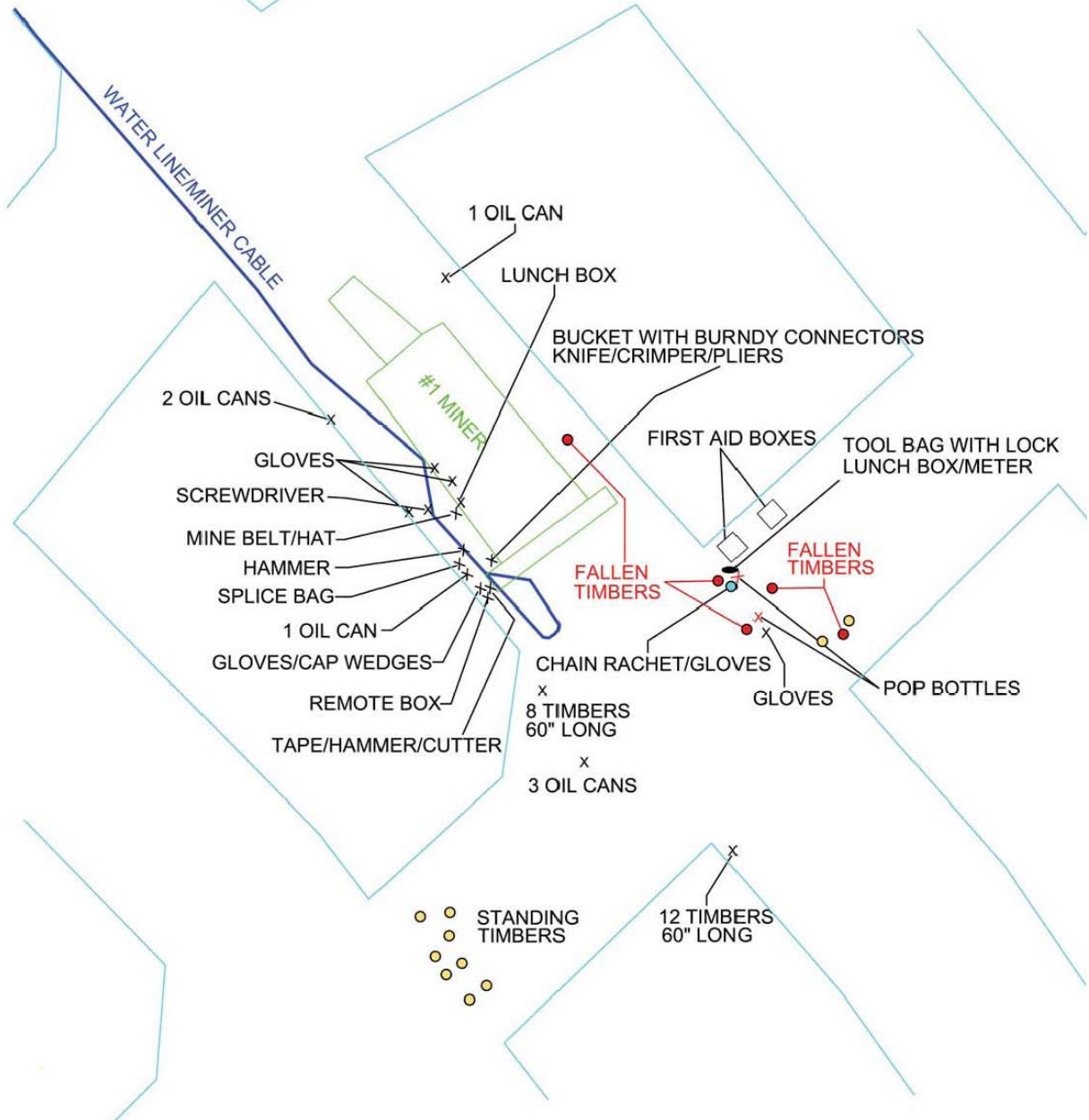
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Accident Site

Fatal Electrical Accident

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Ruby Energy Mine
Spartan Mining Company, Inc.
I.D. No. 46-08808



NOT TO SCALE



OVERVIEW

At 1:30 p.m. on Thursday, February 5, 2004, Kenneth Adrian McNeely, a 33-year old electrician with 6 years of mining experience, was fatally injured at Spartan Mining Company, Inc.'s Ruby Energy mine. During a mine-wide power outage, the victim and the continuous mining machine operator were repairing the damaged area of a continuous mining machine trailing cable. While the victim prepared the third and final power phase to be spliced together, electrical power was restored to the underground mine and the electrical circuit breaker was closed causing a fatal electrical shock. The visual disconnecting device, or cable plug, for the continuous mining machine trailing cable was not disconnected, locked-out, or suitably tagged from its receptacle on the power center.

GENERAL INFORMATION

Massey Energy's Spartan Mining Company, Inc., Ruby Energy mine, I.D. No. 46-08808, is located near Delbarton, Mingo County, West Virginia. The mine is accessed by four drift openings into the Lower Cedar Grove Seam. The coal seam averages 42 inches in thickness, with a total mining height of 63 inches at the accident site.

The mine employs 37 underground and 3 surface employees. An average of 3,500 tons of coal is produced daily by one mechanized mining unit (MMU). The production section uses two continuous mining machines and the arrangement is referred to as a walk-thru section. The mine produces coal two shifts per day, six days per week. Coal is transported from the continuous mining machines to the section loading point with shuttles cars. Belt conveyors transport coal from the sections to the surface. A track haulage system is used to transport supplies, materials, equipment, and employees into and out of the mine.

The mine is ventilated by one main fan in a blowing configuration. The mine liberates approximately 4,320 cubic feet of methane every 24 hours. During development, face areas are ventilated using a blowing line curtain configuration and scrubbers on the continuous mining machines. When pillaring, the eight-entry working section uses sweep ventilation and operates one of the two continuous mining machines at a time.

The roof control plan in effect at the time of the accident was approved by the Mine Safety and Health Administration (MSHA) on March 20, 2003. The immediate mine roof consists of gray shale. The main roof is 25' gray and sandy shale.

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

Macs E. Hall	President
Steven Neace.....	Mine Superintendent
Eugene Vance	Mine Foreman
Frank Foster	Corporate Safety Director

Prior to the accident, the Mine Safety and Health Administration completed the last regular safety and health inspection on December 31, 2003. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in year 2003 was 0.00 compared to a National NFDL rate of 8.20.

DESCRIPTION OF ACCIDENT

On February 5, 2004, at 7:20 a.m. the day shift crew arrived on the MMU-001 working section. James Hatfield, the left continuous mining machine operator, started second mining pillars from the No. 4 entry and continued mining the line of pillars to the No. 1 entry on the left side of the section. Upon completion of mining in the No. 1 entry, Hatfield backed the continuous mining machine two crosscuts outby the pillar line in the No. 3 entry. Hatfield and Kenneth McNeely, section electrician (victim), serviced the continuous mining machine while the right continuous mining machine was used to mine the next row of pillars from the No. 8 entry to the No. 5 entry. McNeely left the area after the left continuous mining machine was serviced.

William Sada, section foreman, instructed Hatfield to move the continuous mining machine into position in the No. 4 entry to start mining as soon as the right continuous mining machine finished mining in the No. 5 entry. The left continuous mining machine was located just outby the last open crosscut in the No. 3 entry when Hatfield lined the machine up with the entry by moving it forward before backing it out of the entry (see Appendix C). While moving the machine forward he accidentally let the ripper cutting drum down onto the continuous mining machine trailing cable and water supply line. A bit lug on the right side of the ripper drum damaged the cable, bursting the inner voltage insulation, allowing two power phases to contact each other. The resulting phase-to-phase short circuit nearly burned through the conductors and caused mine power (underground and outside) to deenergize, including power to the mine fan and the preparation plant. The left side continuous mining machine circuit breaker also opened.

Sada and Kenneth Collins, shuttle car operator, were a few feet outby the left continuous mining machine when the trailing cable was damaged. Collins went to the end of the section supply track to get a scoop to help get the trailing cable from under the ripper head. He met Charles Smith, scoop operator, who was operating a scoop in the No. 3 entry, 5 cross-cuts outby the left continuous mining machine. Collins explained to Smith that a scoop was needed to help get the left continuous mining machine ripper head raised to free the machines trailing cable.

McNeely called the surface from the mine phone located at the belt head and asked Steven Neace, mine superintendent, what Sonny Vance, chief electrician, did to deenergize the high voltage. Neace replied that he did not know and that all underground personnel would have to come outside if the mine fan did not resume operation within 15 minutes.

Sada, still at the left continuous mining machine, instructed Hatfield to look at the trailing cable to evaluate the extent of the damage. After observing the cable, Hatfield informed Sada that he did not believe the damage was too bad. Sada went to the mine

phone at the section loading point, located three crosscuts inby the section belt head, and called Neace about the mine power. Sada learned that the mine fan was down. Neace told Sada to call back shortly. Sada then returned to the left continuous mining machine.

While Sada was at the mine phone, Collins and Smith, scoop operator, took the scoop to the continuous mining machine. After completing his call, Sada walked to the intersection immediately outby the left continuous mining machine. He heard the scoop being operated in front of the continuous mining machine and could see the top of the scoop's canopy. McNeely was sitting on his personnel carrier, which was parked in the cross cut adjacent to Sada's position, between No. 3 and No. 2 entries. Sada told McNeely that the power was off, the mine fan was down, and they would have to go outside in 15 minutes.

Smith bumped the scoop against the ripper drum; after which Hatfield was able to pull the trailing cable free. At that time, McNeely arrived at the continuous mining machine and told the men that he needed to check the damaged area of the trailing cable. He also informed them that the fan was off and that they only had 15 minutes until they had to leave the section. McNeely began cutting the outer jacket off the trailing cable at the damaged area. Smith took the scoop back to the section belt head.

Meanwhile, Sada traveled to the right side of the section and informed the remaining miners that they would have to leave the section unless power was restored. He then returned to the mine phone to talk to Neace concerning when it was time to travel outside due to the fan outage.

McNeely and Hatfield continued repairing the cable as Collins pulled on the waterline in an attempt to remove it from under the ripper drum. McNeely cut about 14" of the outer jacket off the trailing cable, exposing the three power phases, ground, and monitor wires. Two of the power phases were burned and needed to be cut and spliced. The the outer jacket on the third power phase was damaged and needed to be reinsulated. The ground and monitor wires were not damaged. McNeely walked to his personnel carrier to get tape and connectors. He returned on his personnel carrier, parking it behind the continuous mining machine.

As McNeely worked on the second power phase, Hatfield heard a humming noise and felt air movement. He asked Collins to go to the section power center to see if the power had come back on. After repairing the first two phases, McNeely began work on the third phase. He cut the third phase apart and prepared both ends for the connector.

Sada was sitting at the dumping point area, waiting for the call from Neace, when he noticed air pressure on the back-up check curtains. This was an indication that the

mine fan was operating again. After a minute or two, he heard the take-up jack on the belt take-up engage, indicating that the mine power had been restored.

Sada went to the section power center and started closing the circuit breakers for all the face equipment. All cable plugs were still attached to their receptacles on the power center. He first closed the circuit breaker for the right continuous mining machine. Next, he closed the circuit breaker for the left continuous mining machine. It closed, immediately tripped out, and centered. McNeely, who was still working on the third power phase, received the fatal electrical shock when Sada closed the left continuous mining machine circuit breaker. Sada continued to engage the circuit breakers for the shuttle cars, scoop chargers, and pumps.

As Collins walked toward the power center to see if the power had come back on, he saw Sada closing the circuit breakers. Collins called out to Sada, telling him not to put the breaker in on the left continuous mining machine. He heard Sada say, "Oh, no."

Hatfield checked McNeely for vital signs and called for help. He immediately started performing CPR. The right continuous mining machine operator, who was in the No. 4 entry, heard Hatfield calling for help and called out to Sada and Collins to go to the left continuous mining machine. Randy Mahon, the right continuous mining machine operator traveled to the mine phone at the section dump point and called outside to Neace. He told Neace that a person had been electrocuted and that an ambulance was needed. Sada, Collins, Jerry Vance, supply man, and other members of the crew helped with first aid and transportation of McNeely out of the mine.

Stat Ambulance Service was notified by Neace at 1:20 p.m. The ambulance arrived at the mine site at 1:35 p.m., just before McNeely was brought to the surface. The ambulance left the mine with McNeely at 2:08 p.m., arriving at Williamson Memorial Hospital at 2:40 p.m., where McNeely was pronounced dead.

INVESTIGATION OF THE ACCIDENT

The MSHA Logan Field Office was notified of the accident at 2:15 p.m. on February 5, 2004. MSHA accident investigators were dispatched to the mine and a 103(K) order was issued to insure the safety of all persons at the mine. The investigation was conducted in cooperation with the West Virginia Office of Miners' Health, Safety, and Training (WVMHST), with the assistance of the mine operator and employees. A list of those persons who participated, were interviewed, and/or were present during the investigation can be found in Appendices A and B of this report.

The investigation team traveled to the accident scene to conduct an investigation of existing physical conditions. Photographs and relevant measurements were taken.

Sketches were made and a survey was also conducted at the site. A 33 ½" section of the 2/0 SHD trailing cable, including the outer jacket of insulation that was being worked on by the victim, was retained by MSHA for testing.

Formal interviews were conducted at the Spartan Mining Company, Inc., office in Delbarton, West Virginia, on February 8, 2004. Two follow-up interview sessions were conducted on February 10 and 23, 2004.

DISCUSSION

Trailing Cable Damage

Sada requested that the continuous mining machine be moved from the No. 3 entry to the No. 4 entry when the servicing of the continuous mining machine was completed. Three persons, Sada, Hatfield, and Collins, were located in the area when the continuous mining machine was being moved. The 2/0 SHD trailing cable was not moved to a safe location to prevent damage by the continuous mining machine, while it was being repositioned.

The trailing cable was damaged to the extent that the two power phases needed to be cut apart, a connector installed, and reinsulated. The third power phase only needed to be reinsulated. The monitor wire and the ground wire were not damaged. Had the monitor wire and ground wire not been intact, the circuit breaker would not have engaged in the reset mode without kicking back. However, since they were intact, this allowed the circuit breaker to be engaged in the closed position.

Mine management policy concerning damaging trailing cables was to issue warning slips to persons involved in causing trailing cable damage. A second offense for damaging a trailing cable could result in the person(s) responsible being laid off several days without pay. A third offense could result in discharge. The policy had not been enforced in the two years preceding this accident.

None of the persons interviewed indicated that they knew when or how McNeely first learned that the trailing cable was damaged. Collins stated that when he went to get the scoop, he saw McNeely's personnel carrier at the belt head. This is consistent with Neace's statement that he spoke with McNeely on the mine phone before speaking with Sada. It is possible that McNeely heard Collins talking to Smith at the section belt head and traveled to the continuous mining machine in order to determine if his services were needed. Sada stated that McNeely was in the crosscut between the No. 2 and No. 3 entries, just outby the continuous mining machine, when he first left the continuous mining machine to talk to Neace about the mine power; McNeely was still there when he returned. McNeely may have overheard the miners working to free the

trailing cable from that location. Fourteen minutes had elapsed after the trailing cable was damaged when electrical power was restored underground. Information received from Appalachian Electric Power Company's metering base monitoring system confirms a drop in milli-watts at 1:01 p.m. and back to normal at 1:15 p.m. The mine's carbon monoxide monitoring system showed a power loss during the same time frame. The amount of repair work completed on the trailing cable prior to the accident indicates that McNeely was not sitting on his personnel carrier very long.

Sada did not look at the damaged area of the trailing cable to determine the severity of the damage. Sada asked Hatfield about the damage twice and was told both times that it didn't look too bad. Sada stated that he did not make any comments about possible trailing cable damage to Neace or McNeely prior to the accident. Neace apparently did not learn of the damaged trailing cable until after the accident. After observing the continuous mining machine lose power upon sustaining the cable damage and learning that power to the entire section and mine ventilating fan had also been disrupted, Sada did not inform McNeely to disconnect the trailing cable plug from the circuit breaker receptacle at the section power center or instruct him to perform the necessary troubleshooting, testing, and repair work on the trailing cable to restore it to a safe condition.

Underground Power Outage and Resulting Main Mine Fan Stoppage

Spartan Mining Company, Inc., operates an underground mine and a preparation plant at this same location. The electrical power is supplied by Appalachian Electric Power Company, and is available at the mine's re-closer switch. The re-closer is mounted on a utility pole located where power first enters mine property.

The short-circuit response time of the re-closer was improperly set. When the continuous miner cable was damaged, the short circuit current caused the re-closer to trip. This disrupted power to the surface and underground working areas and also caused the fan to stop.

Sada, upon recognizing the power outage and that the main mine ventilation fan was down, did not take proper action as required by 30 CFR 75.313(a). This safety standard would have required everyone to be withdrawn from the working sections, to a point outby the loading point, when the main fan stopped. It also would have required electrically powered equipment in the working section to be de-energized and other mechanized equipment in the working section to be shut off. However, Sada allowed persons to perform work with an energized scoop inby the section loading point, one crosscut outby the pillar line, after knowing that the main mine fan was down. Sada stated that he heard a scoop operating on the inby side of the left continuous mining machine and saw the top of the scoop canopy on the inby side of the continuous mining machine. Sada was aware that Hatfield and Collins were trying to free the continuous

mining machine trailing cable and he communicated with several other miners during this time period. At no time did Sada direct these persons to travel outby the section loading point.

Examinations after Mine Fan Restoration

The examinations for methane as required by 30 CFR 75.313(b) were not performed when mine ventilation was restored in less than 15 minutes. This standard would have required certified persons to examine for methane in the working places and in other areas where methane is likely to accumulate before work was resumed and before equipment was energized or re-started in these areas. However, Sada traveled from the section loading point to the section power center and began engaging circuit breakers on the section power center to energize the electric equipment on the working section without first checking for a methane accumulation across the pillar line or other areas where methane may have accumulated.

Hazards for which 30 CFR 75.313 was intended to provide protection, namely those associated with accumulations of methane caused by fan stoppages, did not contribute to the accident. Therefore, enforcement actions relevant to violations of this standard were issued during an inspection that was conducted concurrently with the accident investigation. However, due care toward compliance with this standard would have provided several coincidental opportunities to prevent the accident by removing persons from the section. Also, if Sada had made the required examinations after ventilation was restored, his route of travel would have taken him through the area close to where McNeely and Hatfield were working on the continuous mining machine trailing cable, increasing the likelihood of him recognizing that electrical work was being performed.

Procedure for Disconnecting, Locking and Tagging

Hatfield, Collins, and Smith thought that since McNeely knew of the damaged trailing cable that he had already traveled to the section power center to disconnect, lock and tag the disconnects before coming to the left continuous mining machine. McNeely knew he was working on a limited time schedule due to the mine ventilation fan being down. He did not take the time to travel to the section power center to disconnect the trailing cable, disconnect the plug from the receptacle, and lock and tag the plug. He may have thought he could make the repairs before the electrical power was restored or before having to travel outside. He may have also been working under the assumption that the damage to the cable had tripped the breaker at the section power center and was not expecting anyone else to close the breaker.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted. The following causal factors were identified:

Causal Factor: The continuous mining machine's trailing cable was not placed in a safe location out of the way while the continuous mining machine was repositioned.

Corrective Action: Mine management had a policy in place to take action against persons responsible for damaging trailing cables. Management should monitor how trailing cables are protected and handled during equipment moves to ensure that available resources and procedures are adequate to prevent damage to the cables.

Causal Factor: The section foreman was present when the continuous mining machine cable was damaged and observed the loss of power resulting from the damage. The section foreman failed to remove this piece of equipment from service due to the damaged cable.

Corrective Action: Mine management should retrain foreman and other mining personnel about the hazards of a damaged trailing cable. All mining personnel should be instructed in the corrective actions that should be followed when possible damage to a power cable has occurred, including first removing the unsafe condition. Persons should be instructed to disconnect, lock and tag, allowing a qualified person to troubleshoot, test, and do repair work to restore the power cable or equipment to a safe condition.

Causal Factor: The qualified person performing electrical work did not disconnect the plug from the circuit breaker receptacle, and lock and tag the disconnect plug.

Corrective Action: Mine management should reinstruct all personnel on proper procedures to be followed when repairing power cables or performing repair work on equipment. Persons should deenergize equipment or power cables, disconnect at the power source, lock, and tag.

Causal Factor: The person engaging the circuit breaker on power cables and equipment did not first see that all persons were in the clear before energizing the power cables to the equipment.

Corrective Action: Management should develop and implement a policy that power cables and/or equipment are not to be energized before ensuring that all persons are in the clear of the cable and/or equipment being energized.

CONCLUSION

The continuous mining machine trailing cable was not adequately protected to prevent damage while moving the continuous mining machine. The accident occurred because management did not ensure that persons were protected against potential electrical hazardous after the left continuous mining machine damaged the trailing cable. The section foreman did not direct the section electrician to remove the trailing cable to the out-of-service mode (disconnect, lock and tag) until troubleshooting, testing and restoring the trailing cable to a safe condition was completed. The certified person performing electrical work did not disconnect the trailing cable plug from the circuit breaker receptacle, lock the disconnect device and tag. The accident occurred when the unlocked and untagged trailing cable was re-energized while repairs were being performed and without first ensuring that all persons were in the clear of the cable.

ENFORCEMENT ACTIONS

1. A 103(k) Order No. 7208343 was issued to Ruby Energy on February 5, 2004, to ensure the safety of persons until an investigation of the accident could be completed.
2. A 104(a) Citation No. 7224651 was issued to Ruby Energy for violation of 30 CFR 75.606. On February 5, 2004, the 2/0 SHD trailing cable that provides 995 volt power to the Joy 14CM15 left side continuous mining machine, serial no. 1408, was not protected to prevent damage by mobile equipment. When the continuous mining machine, which was parked about 20' outby survey station 3463, was trammed forward about 21", a bit lug on the ripper head mashed the trailing cable.
3. A 104(d)(1) Citation No. 7224652 was issued to Ruby Energy for a violation of 30 CFR 75.1725(a). On February 5, 2004, the operator, after witnessing the creation of an unsafe condition on a piece of mobile equipment, failed to cause the equipment to be immediately removed from service. When the 995 volt Joy 14CM15 left side continuous mining machine, serial no. 1408, trammed onto its 2/0 SHD trailing cable, the section foreman was present and knew that the cable was damaged. He also witnessed the continuous mining machine losing power when this occurred. Afterward, the section foreman closed the circuit breaker, thereby energizing the trailing cable, without first: (A) causing the cable plug to be immediately disconnected from its receptacle and (B) instructing the section electrician to do the necessary troubleshooting, testing, and repair work on the cable to restore it to a safe condition.

4. A 104(a) Citation No. 7224650 was issued to Ruby Energy for a violation of 30 CFR 75.511. On February 5, 2004, the section electrician and the continuous mining machine operator performed electrical work on a distribution circuit while the disconnecting device was not locked out nor suitably tagged. They were splicing and repairing a damaged area in the 2/0 SHD trailing cable which provided 995 volts to the Joy 14CM15 left continuous mining machine, serial no. 1408, while the cable plug was connected to the plug receptacle. While performing this work, the circuit breaker was closed, causing the section electrician to be electrocuted.

Approved By:

John M. Pyles
Acting District Manager

Date

APPENDIX A

List of persons furnishing information and/or present during the investigation:

Spartan Mining Company, Inc.

Mac E. Hall..... President
Steven Neace..... Superintendent
Eugene Vance..... Mine Foreman
Mark Heath..... Counsel for Spartan Mining

Massey Energy

Drexel Short..... Vice President
Frank Foster..... Corporate Safety Director
Keith Hainer Assistant Maintenance Manager

Rawl Sales

Forrest Sammes..... Safety Director

West Virginia Office of Miner's Health, Safety, and Training

Terry Farley..... Accident Investigator
Donald Crawford..... District Electrical Inspector
Eugene White..... District Inspector
Dennis Ballard..... District Inspector

Mine Safety and Health Administration

James R. Humphrey..... Accident Investigator/
Coal Mine Safety and Health Inspector
Marcus Smith..... Electrical Engineer/
Wayne Carey..... Electrical Engineer, A&CC
Dennis Holbrook..... Coal Mine Safety and Health Inspector
Minness Justice..... Coal Mine Safety and Health Inspector
(Electrical)
William Blevins..... Supervisory
Coal Mine Safety and Health Inspector
Ray Saunders..... Acting Assistant District Manager, Division II

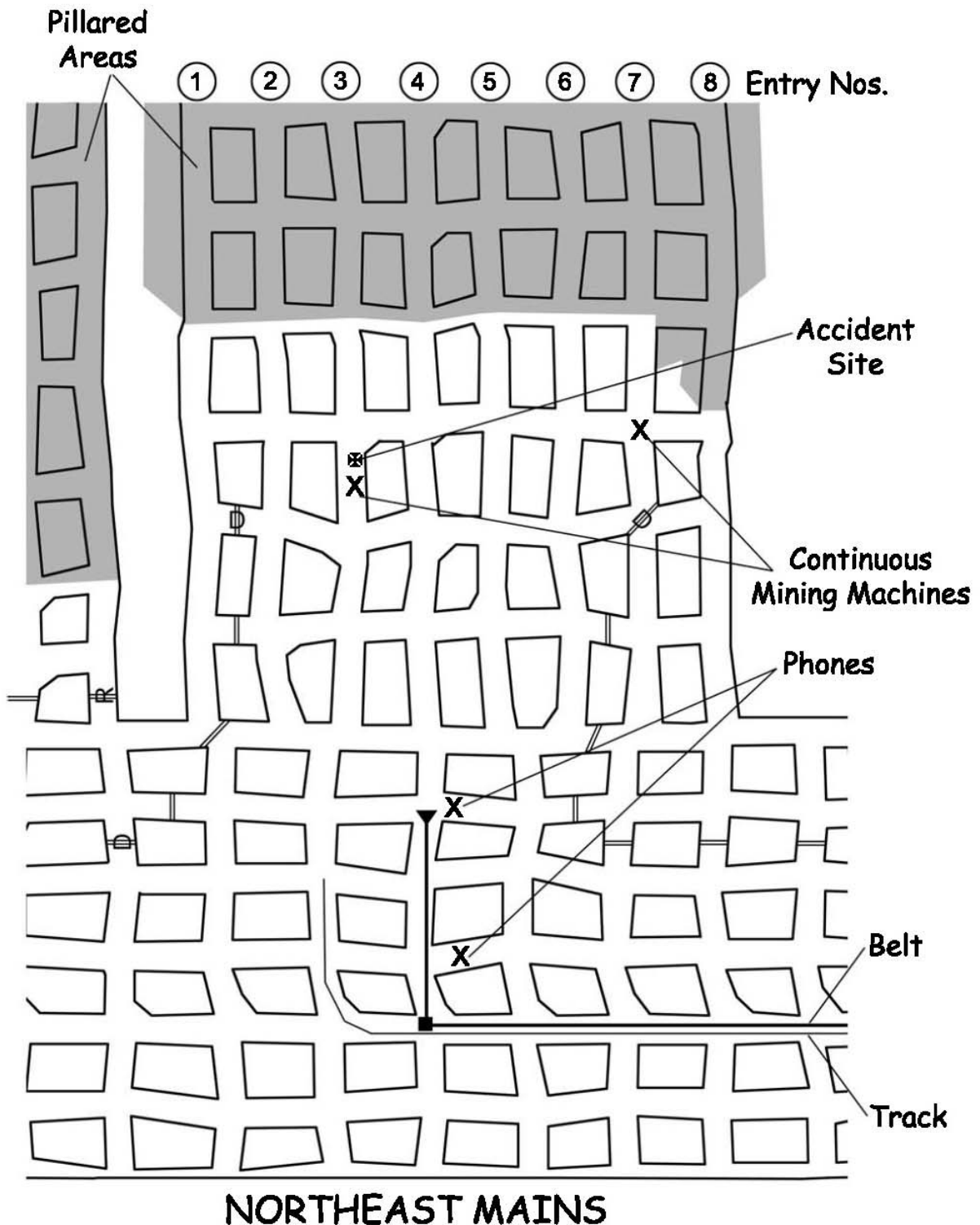
APPENDIX B

List of Ruby Energy personnel interviewed:

Kenneth Collins.....	Shuttle Operator
James Hatfield.....	Continuous Miner Operator
William Sada.....	Section Foreman
Keith Sturgell.....	Section Foreman
Jerry Vance.....	Supply / Belt Examiner
Steven Neace.....	Superintendent
David Smith.....	Scoop Operator
Daniel Wallace.....	Outside-Electrician/Maintenance
Sonny Vance.....	Chief Electrician

APPENDIX C

Map of Working Section



NOT TO SCALE