

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Slip/Fall of Person Accident
June 9, 2011

Rocky Mountain Steel, Inc (7WU)
Montrose, CO

at

West Elk Mine
Mountain Coal Company, LLC
Somerset, Gunnison County, Colorado
MSHA I.D. No. 05-03672

Accident Investigators

Ronald Gehrke
Mining Engineer, District 9

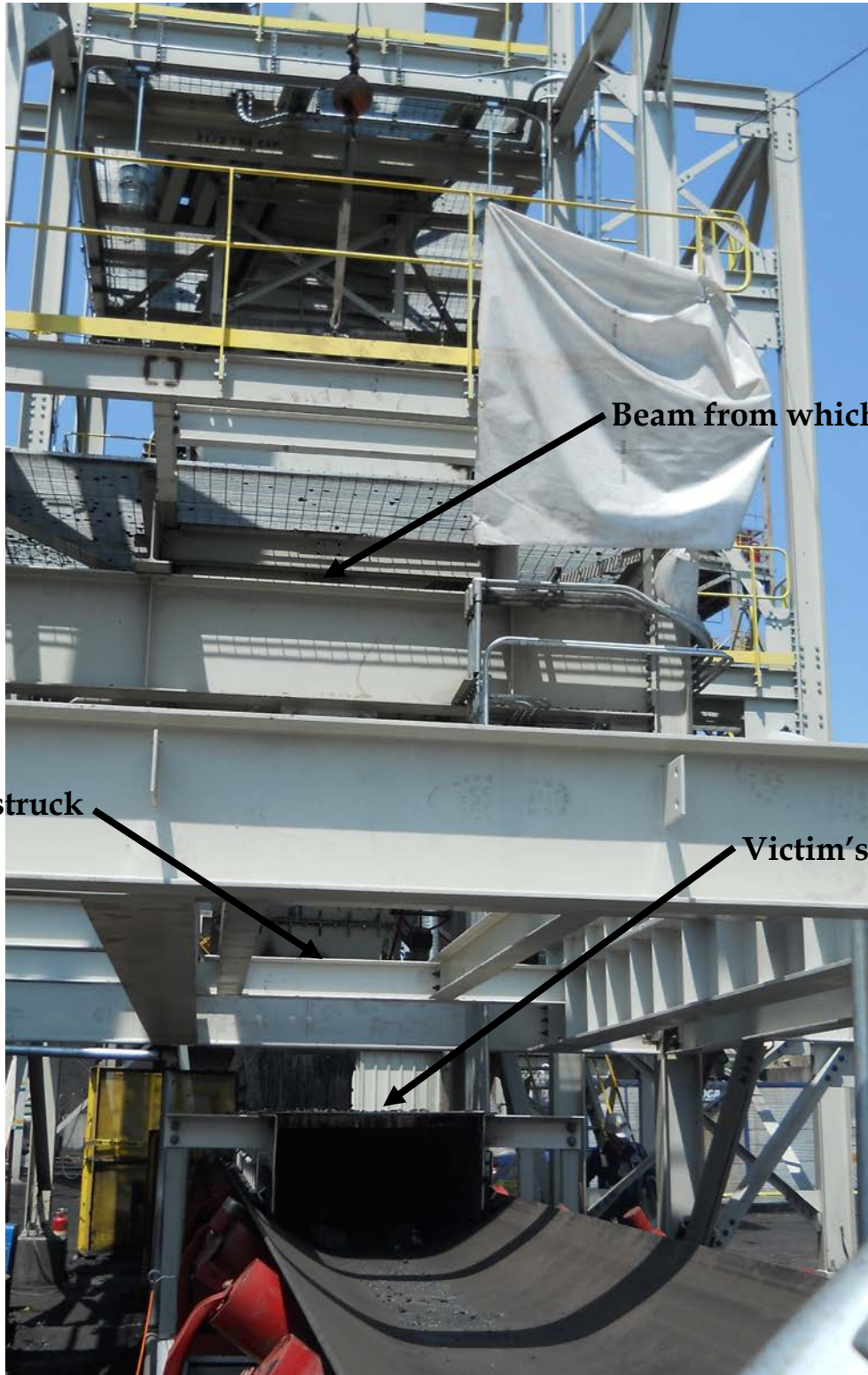
Danny C. Cerise
Coal Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
District 9
Denver Federal Center
2nd Street, Building 25
Denver, Colorado 80225
Allyn C. Davis, District Manager

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VIEW OF SCALPING TOWER ACCIDENT SITE



Beam from which victim fell

Cross Beam struck

Victim's final position

OVERVIEW

On Thursday, June 9, 2011, at approximately 10:22 a.m., Fred A. Benally (Victim), a 53 year old contract ironworker with 12 years mining experience, was killed when he slipped and fell from a beam at the scalping tower construction site. Benally and two other ironworkers were working on the second floor of the scalping tower to remove a chute plate. Benally was standing on an 11-inch wide steel beam, which was covered with coal, coal dust and chunks of coal. He unhooked the lanyard which was secured to a beam anchor. While positioning to climb up to the floor grating above to reattach his lanyard, Benally slipped and fell. After falling approximately 8 feet down, he struck a crossbeam with his chest before landing on his back on a conveyor belt cover.

He was wearing a full body harness with dual lanyards, but neither lanyard was secured (tied off to a suitable connection) when he fell. The presence of coal and coal dust on the beam, which created a slipping hazard, was also a contributing factor.

GENERAL INFORMATION

The West Elk Mine, located one mile east of Somerset, Colorado, is operated by Mountain Coal Company, LLC, a subsidiary of Arch Coal, Inc., located in St. Louis, Missouri. The mine is a large underground mine, producing about 4.8 million tons of coal per year. The principal officers at the mine at the time of the accident were Jim Miller, General Manager; Chris Nyikos; Project Manager; and Alan Bill Olsen, Safety Director.

Mountain Coal Company, LLC began operating the West Elk Mine in 1998. Currently, coal is produced by two development (continuous mining machine) sections and one longwall section. The coal is transported from the underground mine to a raw coal pile on the surface. An overland belt transports the coal to a newly built preparation plant. The mine employs about 360 personnel, of which 45 miners work at the preparation plant.

Rocky Mountain Steel, Inc., MSHA contractor ID 7WU, had contracted with the mining company to do some iron work on the mine site. The project began Monday, June 6, 2011.

At the time of the accident, an MSHA E01 inspection of the West Elk Mine property was in progress. The event was opened on April 4, 2011. The last E01 inspection was completed on March 29, 2011. The non-fatal days lost (NFDL) incidence rate for the mine in 2010 was 1.04. The national NFDL incidence rate for surface coal mines in 2010 was 3.58.

DESCRIPTION OF ACCIDENT

On June 9, 2011, at approximately 6:45 a.m., Fred Benally reported for the start of his shift at the Rocky Mountain Steel trailer along with the others working on the construction crew. The other ironworkers were Steve Hoffbauer, Wally Martin, and Narron Martin (brothers). Donald Rule, Rocky Mountain Steel's project manager, gave a short safety meeting and discussed the day's work activities. Personal protective equipment (PPE), tie off with lanyards, and using flash guarding when welding was discussed during the safety talk.

After the meeting, the ironworkers gathered their tools and proceeded to the second floor of the scalping tower construction site to start the day's activities. Benally and N. Martin began cutting the metal plate loose from the east side of the chute.

W. Martin and Hoffbauer proceeded to weld the metal beams. The welding operations involved moving and repositioning a section of the floor grating near the chute. The floor grating was used as a work platform to weld the beams to the cross members. After completing the welding, Hoffbauer left the second floor of the scalping tower and continued installing cross bracing on the north side of the tower extension. A mobile manlift was used for the higher locations.

W. Martin, N. Martin, and Benally continued working on the second floor using cutting torches to remove a metal plate on the east side of the chute. They installed a metal eye on the plate and connected the line from a crane to this eyelet. Rule operated the crane to secure the load until the ironworkers could cut out the old chute.

Benally and N. Martin continued cutting on the sides of the plate. The crew then used pry bars to loosen the plate, but it was still secured to the chute. The crew determined the plate was possibly still connected to the chute by some welds and bolts located near the bottom of the chute at the level of the second floor grating.

Benally climbed off the second floor and stood on an 11-inch wide steel beam, located below the floor level. He connected his right lanyard to a beam by using a clamp, and the left lanyard was secured to a steel cable running across the front (east) side of the second floor. Benally cut the remaining welds and bolts that were believed to be holding the plate. He then used a hammer to dislodge the plate. The left lanyard, attached to the steel cable, interfered with this hammering and he disconnected it. The plate was loosened by the hammering and cutting. Benally prepared to climb back to his work location on the second floor grating.

Benally apparently disconnected the lanyard connected to the beam and was in the process of reconnecting the lanyard to the steel cable when his right foot slipped off the beam. At approximately 10:22 a.m., from his limited view from the crane, Rule saw

Benally's right foot slip and Benally fall from the beam. Rule stated, at that time, he saw Benally with the lanyard in his hand. Rule assumed Benally was climbing up when he unhooked. Benally fell approximately 8 feet and struck a 5-inch wide cross beam with his chest. Benally flipped over this cross beam and landed on the conveyor dust cover, 32-inches below the top of beam.

Rule exited the crane when he saw Benally land. When Rule got to Benally, he unlatched Benally's harness. W. Martin and N. Martin descended from the second floor and Rule told N. Martin to go to the office near the breaker building and call for the emergency medical technicians (EMT). Rule walked around the conveyor structure to the north side to gain better access to Benally. When Rule arrived, Benally was sitting up on the dust cover. Rule, W. Martin, and N. Martin helped him off the dust cover to the ground. Benally was kneeling on the ground and complained of chest pains and not being able to breathe. Benally walked around for a brief period after the fall, then was helped to Rule's pickup truck near the breaker building.

At approximately 10:30 a.m., Mountain Coal Company's EMT arrived on the scene and started to provide care for Benally. Benally was put on a back board, given oxygen, and placed into Mountain Coal Company's ambulance. They started towards the Delta County Hospital.

While traveling to the hospital, no pulse was detected on Benally, and the automatic emergency defibrillator (AED) was used. His pulse returned for a short time, then stopped. Cardiopulmonary resuscitation (CPR) was started but vital signs were not detected again. The Delta County Ambulance was met in route to Delta, Colorado. The Delta County EMTs boarded the Mountain Coal Company's ambulance and assisted with CPR until it reached the hospital. Benally was pronounced dead at the hospital.

INVESTIGATION

On Thursday, June 9, 2011, MSHA inspector Danny Cerise was on the mine property conducting an E01 inspection. Cerise was traveling the surface area of the underground mine, inspecting a variety of surface installations. At approximately 10:22 a.m., Cerise overheard a company radio report that a contractor at the scalping tower project was involved in an accident. The radio communication did not define the extent of injury.

At approximately, 11:00 a.m., Cerise traveled to the accident scene. While at the location, Cerise was informed that the injured miner, Fred Benally, could not be revived and was pronounced dead at the hospital.

Cerise met with management personnel from West Elk and Rocky Mountain Steel and discussed the accident. About this same time, the MSHA Call Center was notified of

the accident, who in turn notified District and Field Office Managers. Cerise issued a 103(k) order and secured the accident scene.

Shortly after 12:00 p.m., Delta Field Office Supervisor, Mark Brewer arrived at the West Elk Mine. Brewer had been at nearby Elk Creek Mine when he was notified of the accident. Brewer ensured the scene was secured and then he and Cerise conducted preliminary interviews.

An MSHA investigation team was assembled and arrived at the mine site on June 10, 2011. After a physical examination of the scene, the team arranged to conduct interviews with the witnesses to the accident and the individuals involved with the treatment and transportation of Benally. The accident scene was documented with photographs, maps, and measurements. Interviews were conducted with persons who were knowledgeable of the accident. A list of persons who participated in the investigation is contained in Appendix A.

DISCUSSION

Location of Accident

The accident occurred at the Unit 2020 Scalping Station tower construction site, located at the surface facilities of the West Elk Mine (see Appendix C). Rocky Mountain Steel is a contract iron works company in Grand Junction, Colorado, but has contracts throughout the western United States. Rocky Mountain Steel relies on Underground Staffing Connections, Contractor ID No. 9HI, an independent manpower company from Delta, Colorado, to fill laborer requests. On this project, Underground Staffing, Inc. provided four ironworkers and Rocky Mountain Steel had one supervisor on location to direct the workforce. These five individuals had worked together several times in the past on other iron work projects.

Rocky Mountain Steel began a project of refurbishing a chute on the overland belt to the preparation plant on Monday, June 6, 2011. This area was monitored by West Elk Mine using a video camera. Mine laborers rarely went to the location. The crew worked on the project on the subsequent three days, prior to the fatality. The iron workers were scheduled to work a 10-hour shift, Monday through Friday.

Scalping Tower Accident Site

The scalping tower is located about ¼ mile from the preparation plant. The coal from the underground mine is fed to the overland belt through a drawoff tunnel and is scalped at the tower location. The tower is monitored mostly by preparation plant personnel with a video camera due to its remote location. Personnel are not assigned routinely to work in the area.

The scalping tower was being modified to add a material sizer unit. The discharge chute on the second floor of the scalping tower was being modified to install a flop gate to divert coal into the sizer unit. Most of the exterior beams and columns had been installed and work was concentrating on removing the front east plate of the chute. The chute plate was about 7 feet long, by 4 feet high and irregular in shape due to the configuration of the discharge chute.

Extraneous material consisting of coal, coal dust, and chunks of coal were covering the steel I-beam where the victim was standing and working. The coal was dry and ranged from very fine particles, to about ½ inch in diameter. A section of grating had covered the I-beam when the crew first entered the work area that morning. In the process of modifying the chute, the grating had been moved away from the area, exposing the “I” beam.

The beam where the victim was standing was located about 25 inches below the floor level grating and was 11-inches in width. (see Appendix C). The 5¼-inch wide cross beam struck by the victim was located 96 inches below and 38 inches to the east of the 11-inch wide beam. The distance from this cross beam to the conveyor dust cover was 31½ inches. The conveyor cover was 36¾ inches wide and approximately 67 inches off the ground level. A diagram showing these beams is located in Appendix D.

Two ¾-inch steel cables were hung across the two columns on the second floor for use as tie off points for lanyards when working on the second floor of the scalping tower. The cables were positioned about 25 inches and 38 inches above the floor level and were secured to the columns with two cable clamps at each end (see Appendix E).

Fall Protection Equipment

The victim was wearing a “Pro by Protecta” full body harness, however, the lanyard was not secured or tied off at the time that the victim fell. The lanyard was a SALA ShockWave2 Shock Absorbing Lanyard, Lot 12867810, Model No. 122409 with a shock lanyard hook marked as Model S02078, S/N 3011464. The personal fall protection system worn by the victim was inspected as part of the accident investigation. The victim’s harness and lanyard showed minimal signs of wear. There were no indications that the harness or lanyard were subjected to an impact load caused by the fall, which is consistent with testimony from eye witnesses.

A metal clamping device with flanges (called a beamer), which easily attached to the web and flanges of steel I-beams, was used as an anchor point for securing lanyards. A beamer can be moved freely along the length of a beam or column and still provide anchorage for a lanyard. This beamer and its operation was inspected and appeared to be functional (see Appendix F).

Rocky Mountain Steel has a written policy requiring 100% tie off by all personnel in an elevated location. Prior to beginning the work day, Rule had a weekly safety meeting reiterating the policy.

Examinations

West Elk management personnel had been to the accident location throughout the week. The project manager had gone to the work site to monitor the progress of the project. The surface supervisor, randomly traveled past the location. The supervisor pointedly observed work practices, including persons being tied off when working in elevated locations. The West Elk management did not observe any obvious hazardous work practices.

Training and Experience

Training records were reviewed by the accident investigation team. Galen McDaniels, Certified Trainer for West Elk, gave four hours of Experienced Miner Training to the four members of the Rocky Mountain Steel crew. Because of the nature of the work, McDaniels stressed the need to tie off when working in elevated locations. The training did not address hazards of slips, trips, or falls. Following McDaniels' training, another trainer, Rod Wilson, took the crew on a work area tour and conducted the onsite Hazard Training.

The victim had contracted intermittently for Rocky Mountain Steel, Inc. for about 12 years, and he had previous experience with the same crew working as an iron worker at several construction projects at various mines.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted. Root causes were identified that could have prevented the accident or mitigated its severity. Listed below are root causes identified during the analysis and their corresponding corrective actions taken to prevent a recurrence of the accident.

Root Cause: Management failed to assure that the lanyards on the iron worker's fall protection harness were secured or connected (tied off) to a suitable anchor point to prevent the victim from falling and striking a steel beam.

Corrective Action: Management for Rocky Mountain Steel conducted and documented a safety meeting to reinforce the regulations and company policy concerning fall protection measures. The requirement to have a lanyard always connected (tied-off) to a suitable anchor, and when possible, tying off above waist level were stressed. The requirement to inspect and check the fall protection equipment (harness, lanyards, d-ring connectors, snap connectors, tie cables, beamers, and anchor points) prior to use was also discussed.

Root Cause: There were extraneous materials consisting of coal, coal dust, and chunks of coal present on the top walking surface work area of a steel beam which created a slip and trip hazard. Rocky Mountain Steel management failed to assure that work areas and travelways were maintained free of extraneous materials and coal.

Corrective Action: Management conducted and documented a safety meeting with the Rocky Mountain Steel employees and reiterated the need to ensure the work areas and travelways are free from extraneous materials and coal. Rocky Mountain Steel management has instituted a written policy, which states that all personnel will be trained prior to beginning work on any projects. The training will teach employees how to recognize and report all slip, trip, and fall hazards for corrective measures before commencing work in the areas identified with hazards.

CONCLUSION

The accident occurred when a contract ironworker slipped from an 11-inch wide steel beam and fell approximately 8 feet, striking a crossbeam with his chest before landing on his back on a conveyor belt cover. While positioning to climb up to the floor grating above, he slipped on the beam which was covered with loose coal, coal dust, and chunks of coal and fell.

The victim was wearing a full body harness with dual lanyards, but neither lanyard was secured (tied off to a suitable connection) at the time of the fall. The presence of loose coal, coal dust, and coal chunks on the beam where the victim was working was also a contributing factor.

Approved by:



Allyn C. Davis
District Manager



Date

ENFORCEMENT ACTIONS

1. A 103(k) Order, Number 8141160, was issued to Mountain Coal Company, L.L.C. to ensure the safety of persons at the accident site until an investigation could be conducted and operations could be safely resumed.
2. A 104(a) Citation, Number 6688945, was issued to Rocky Mountain Steel, Inc, for a violation of 30 CFR § 77.1710(g). Safety belts and lines were not used to protect a contract ironworker from the danger of falling. On June 9, 2011, a fatal accident occurred when this ironworker slipped from a steel beam, fell approximately 8 feet, and struck a crossbeam with his chest before landing on his back on a conveyor belt cover at the scalping tower construction site. This ironworker had unhooked the lanyard which had been secured to a beam anchor while he was standing on an 11-inch wide steel beam located 25 inches below the second floor grating of the scalping tower construction site. While positioning to reattach his lanyard so he could climb up to the floor grating above him, he slipped and fell. He was wearing a full body harness with dual lanyards, but neither lanyard was secured (tied off to a suitable connection) when he fell. Additionally, the steel beam was covered with coal, coal dust, and chunks of coal. The condition of the extraneous material consisting of coal, coal dust, and chunks of coal covering the steel beam constitutes a violation of 30 CFR § 77.205(b) and a citation was issued to Rocky Mountain Steel, Inc.
3. A 104(a) Citation, Number 6688946, was issued to Rocky Mountain Steel, Inc, for a violation of 30 CFR § 77.205(b). An 11-inch wide steel beam located 25 inches below the second floor grating of the scalping tower construction site was not kept clear of all extraneous material and other stumbling or slipping hazards, in that it was covered with coal, coal dust, and chunks of coal. The chunks of coal ranged from very small particles to about ½ inch in diameter. On June 9, 2011, an ironworker working on this beam stumbled and/or slipped on this extraneous material and fell while positioning to reattach his lanyard, as he prepared to climb up to the floor grating above. The iron worker was killed because of this fall. Additionally, though he was wearing a full body harness with dual lanyards, neither lanyard was secured (tied off to a suitable connection) when he fell. The condition of not having a safety line where there is a danger of falling constitutes a violation of 30 CFR § 77.1710(g) and a citation was issued to Rocky Mountain Steel, Inc.

Appendix A:

List of Persons Participating in Investigation

MOUNTAIN COAL COMPANY L.L.C.

| | |
|-------------------------|------------------------------------|
| A. Bill Olsen | Safety Manager |
| Page Jackson | Attorney/Mountain Coal Company LLC |
| Christopher G. Peterson | Attorney/Mountain Coal Company LLC |

ROCKY MOUNTAIN STEEL

| | |
|------------------|--------------------------------|
| Donald A. Rule | Project Manager |
| Hugh C. Thatcher | Attorney/Rocky Mountain Steel |
| Wyatt Bellman | Western Engineering consultant |

MINE SAFETY AND HEALTH ADMINISTRATION

| | |
|-----------------|---------------------------------------|
| Allyn C. Davis | District Manager |
| Ronald Gehrke | Coal Mine Safety and Health Engineer |
| Danny C. Cerise | Coal Mine Safety and Health Inspector |
| Dan Vetter | District 9 Staff Assistant |

Appendix B:

Persons Interviewed during Investigation

ROCKY MOUNTAIN STEEL, INC.

| | |
|------------------|-----------------|
| Steven Hoffbauer | Iron worker |
| Narron Martin | Iron worker |
| Wally Martin | Iron worker |
| Donald A. Rule | Project Manager |

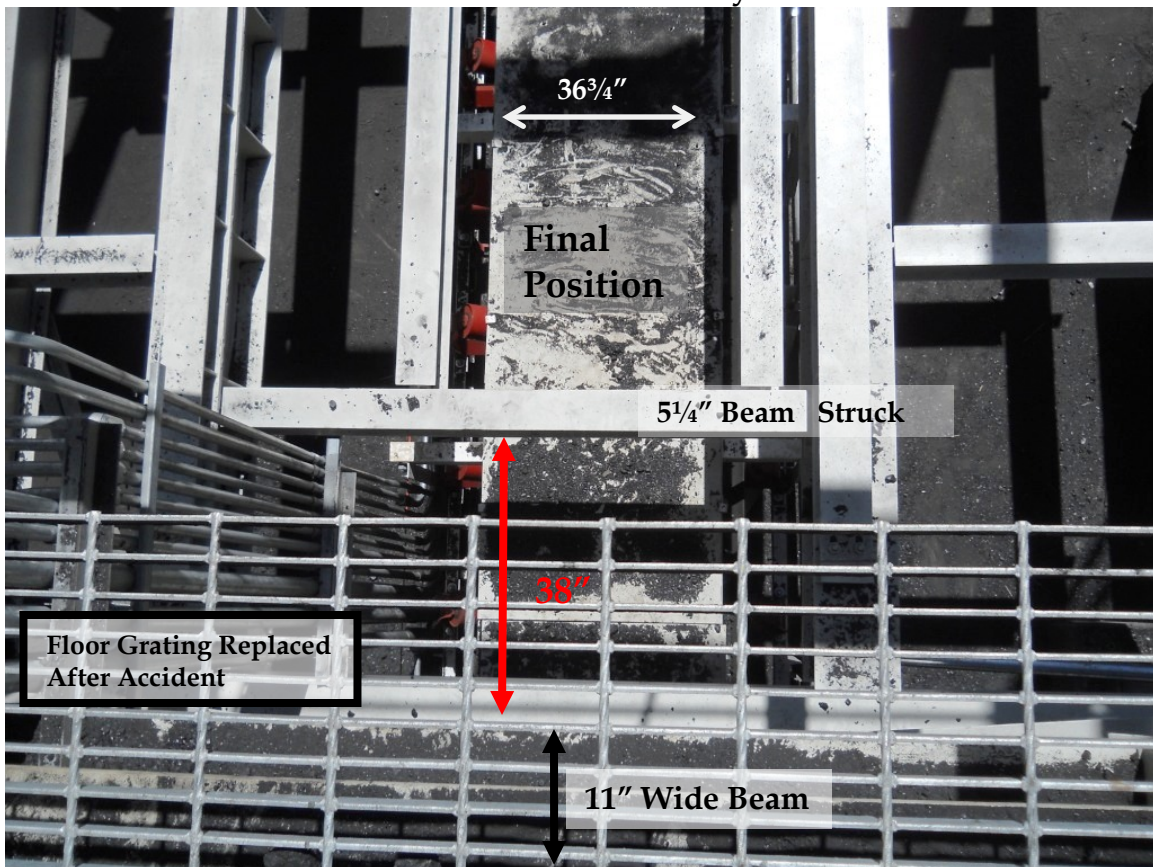
MOUNTAIN COAL COMPANY, LLC

| | |
|------------------------|-------------------------------|
| Cyrus Gillenwater | Raw Coal Stockpile Supervisor |
| Rosslyn Hall | Processing Engineer/EMT |
| Galen "Tiny" McDaniels | Production Trainer |
| Chris Nyikos | Project Manager |
| Jane Watson | Safety Clerk/EMT |
| Rodney O. Wilson | Coal Handling/Surface |

Appendix C:
General Accident Site

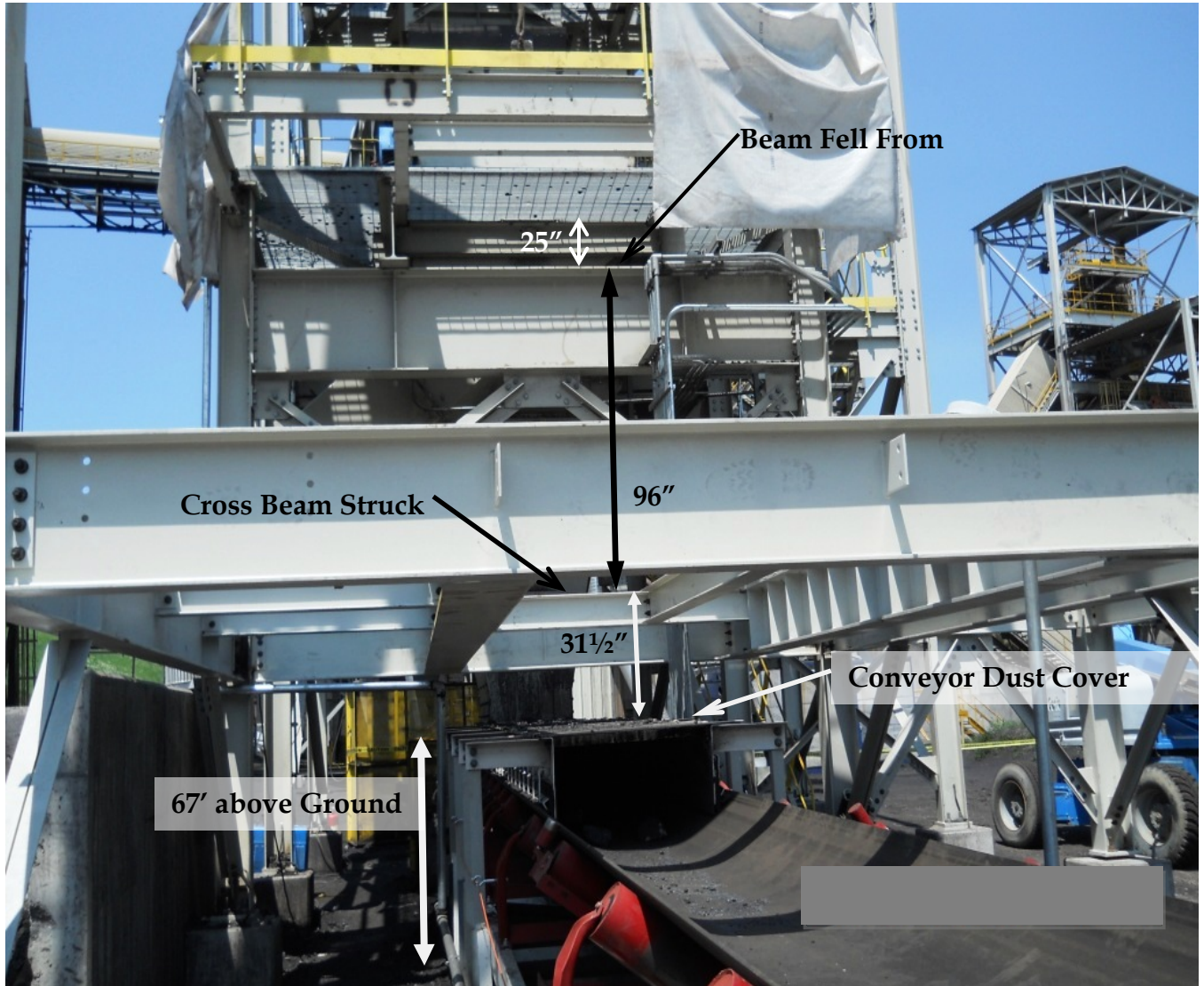


Photo of Cross Beam Struck by Victim:

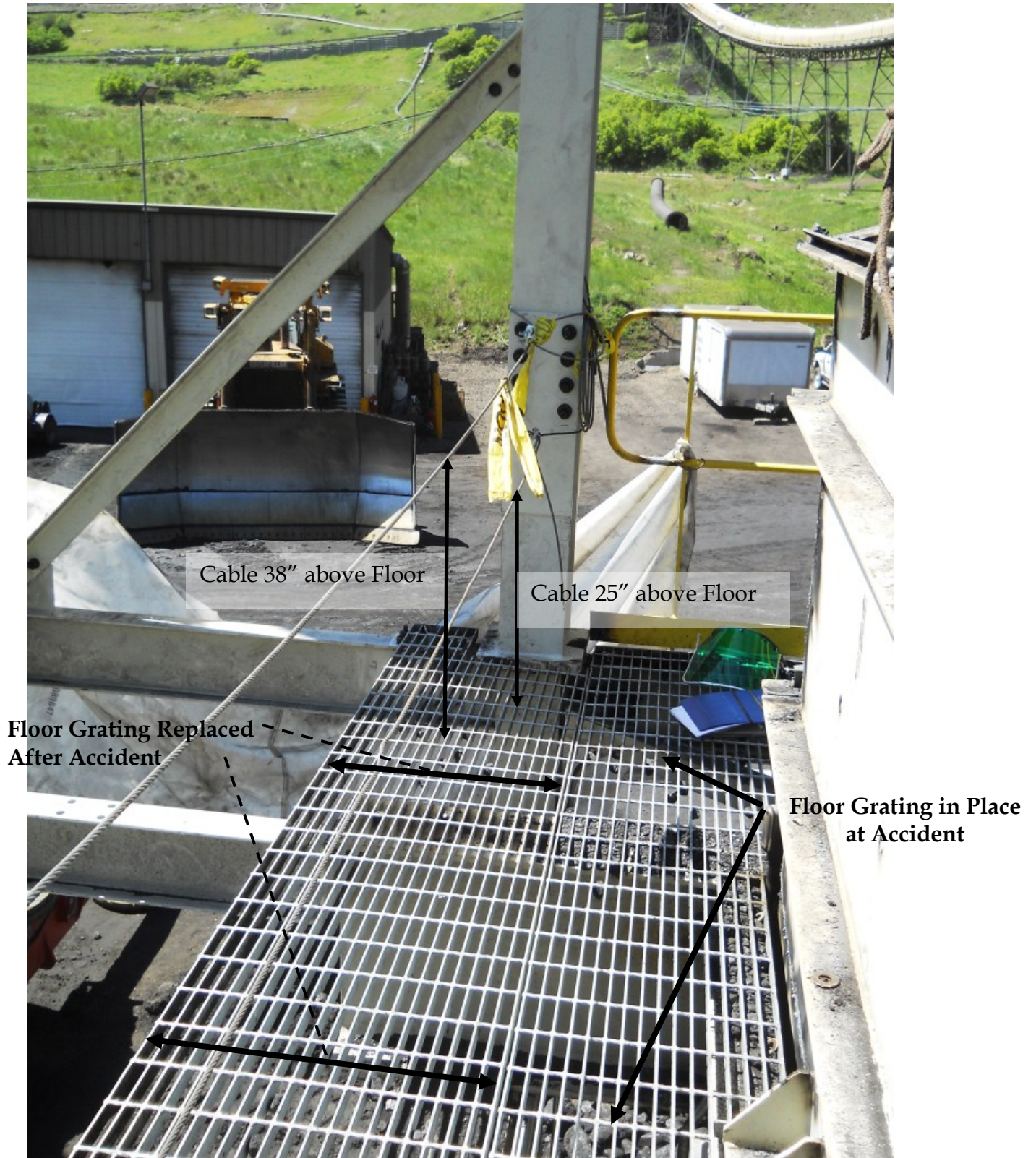


Appendix D:

Photo of Scalping Tower Accident Site

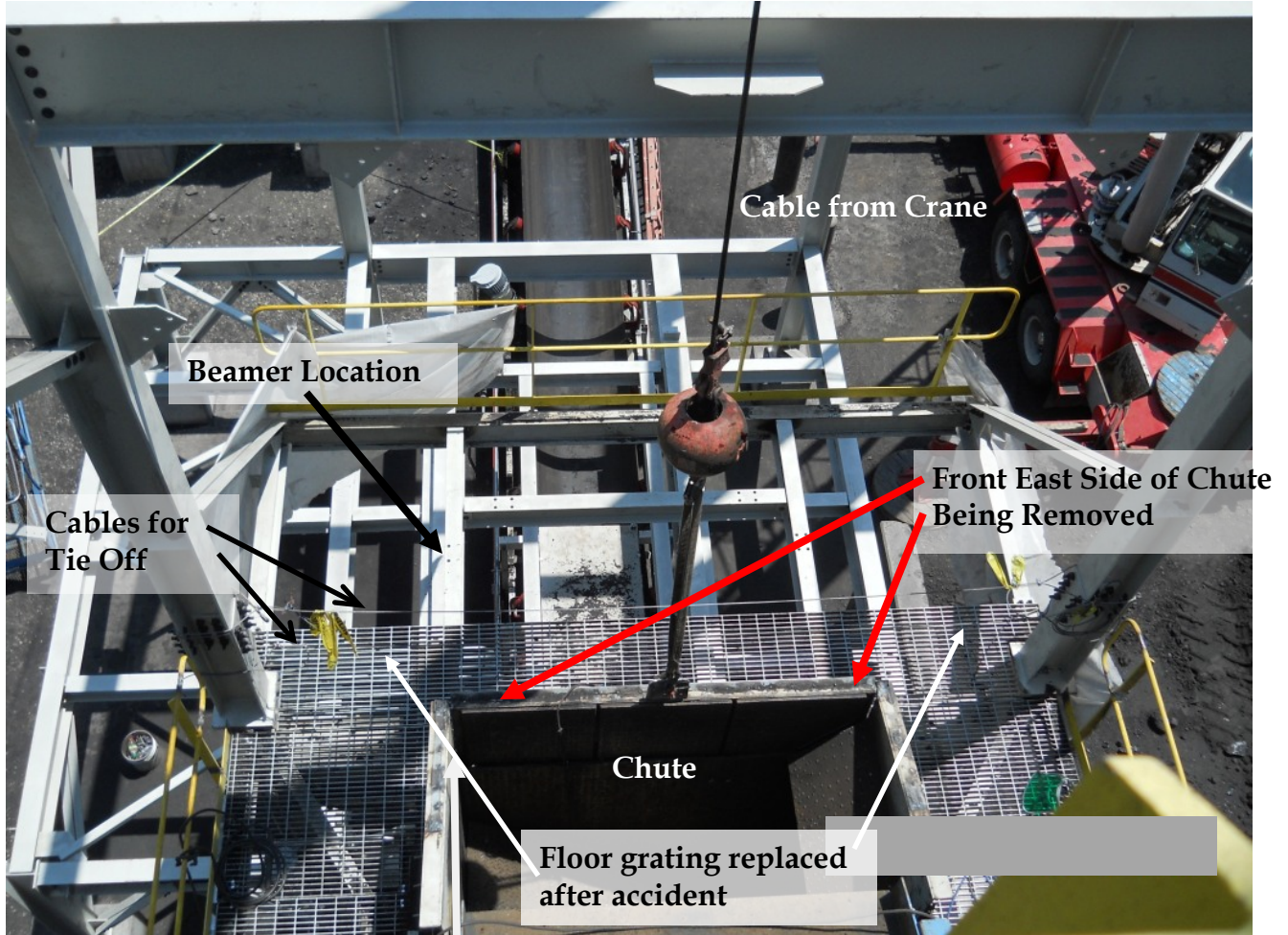


**Appendix E:
Photo of Steel Cable Tie Offs**



Appendix F:

Photo of Chute on Second Floor



Appendix G:

Victim Information

Accident Investigation Data - Victim Information

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



Event Number: 4 4 8 0 7 0 1

Victim Information: 1

| | | | | | |
|---|--|--|--|---|--|
| 1. Name of Injured/Ill Employee: <i>Fred A. Benally</i> | | 2. Sex <i>M</i> | 3. Victim's Age <i>53</i> | 4. Last Four Digits of SSN: | 5. Degree of Injury: <i>01 Fatal</i> |
| 6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 06/09/2011 b. Time: 11:53</i> | | | | 7. Date and Time Started: <i>a. Date: 06/09/2011 b. Time: 7:00</i> | |
| 8. Regular Job Title: <i>110 Ironworker</i> | | 9. Work Activity when Injured: <i>093 Cutting with a torch</i> | | | 10. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 11. Experience a. This Work Activity: <i>12 0 0</i> | | b. Regular Job Title: <i>12 0 0</i> | | c. This Mining: <i>0 1 0</i> | |
| 12. What Directly Inflicted Injury or Illness? <i>084 Falling on Beam</i> | | 13. Nature of Injury or Illness: <i>370 Internal injuries with hemorrhage</i> | | | |
| 14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/> | | | | | |
| 15. Company of Employment:(If different from production operator) <i>Rocky Mountain Steel, Inc.</i> | | | | Independent Contractor ID: (if applicable) <i>7WU</i> | |
| 16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input type="checkbox"/> EMT: <input checked="" type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/> | | | | | |
| 17. Part 50 Document Control Number: (form 7000-1) <i>220111740022</i> | | | 18. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i> | | |