CAI-2014-07

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Surface Coal Mine
Fatal Machinery Accident
June 04, 2014

Rogers Construction Inc. (S843)
Whitewood, South Dakota

at

North Antelope Rochelle Mine
Peabody Powder River Mining LLC
Wright, Campbell County, Wyoming
ID No. 48-01353

Accident Investigators

Lois Duwenhoegger
Coal Mine Safety and Health Inspector

Wayne Johnson
Coal Mine Safety and Health Inspector

Chad Simpson
Coal Mine Safety and Health Inspector (Electrical Specialist)

Kathy Cattles
Training Specialist, Educational Field Services

Originating Office
Mine Safety and Health Administration
District 9
P.O. Box 25367, Denver, Colorado 80225
Russell J. Riley, District Manager

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Photograph 1: Scoria Pit Overview

OVERVIEW

At approximately 5:35 a.m. on June 4, 2014, Joshua L. Wishard was fatally injured when he was crushed between the upper and lower frame of an impact crusher. Wishard and Chris Wells, Supervisor, were feeding raw scoria (volcanic rock with tiny holes) into the crusher unit (see Appendix A, Photo 2) when a large rock became lodged in the crusher feeder. Wells and Wishard used an excavator to remove the rock from the crusher. Wells then moved the Caterpillar 330 excavator to the fuel island to be refueled. Wishard started the motor of the crushing unit and raised the upper frame off the safety arm (removing the blocking mechanism) then positioned his body under the raised upper frame. The unblocked upper frame lowered and fatally crushed Wishard. There were no witnesses to the accident.

The accident occurred because the upper frame was not blocked against motion and the right cylinder that raises the upper frame of the crusher was not maintained to assure safe operation.

GENERAL INFORMATION

North Antelope Rochelle Mine (NARM) is operated by Peabody Powder River Mining LLC, a subsidiary of Peabody Energy. NARM is located 27 miles southeast of Wright, Wyoming, on Antelope Road. The mine produced approximately 111 million tons of coal in 2013 and employs 1,517 miners. Miners work a 12 hour rotating shift schedule, seven days per week. The mine can have more than 300 contract employees on site at any given time.

Rogers Construction Inc. (RCI) employs 11 people, nine of which were working at NARM at the time of the accident. RCI employees work a 13-hour rotating shift schedule, seven days per week. NARM contracted RCI to crush scoria at various locations on the mine property.

The last regular inspection (E01) conducted by the Mine Safety and Health Administration (MSHA) was completed on March 7, 2014. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine for 2013 was 0.21, compared to the National NFDL rate of 0.99 for surface mines of the same type.

Principal officials for NARM at the time of the accident were:

Alan E. Aldrich.....Operations Manager
Duane Myers.....Director Safety Operations

Principal officials for RCI at the time of the accident were:

James W. Rogers.....Corporate Owner/President
John W. Rogers.....Corporate Manager
Christopher A. Wells.....Supervisor

DESCRIPTION OF ACCIDENT

On June 3, 2014, at 5:43 p.m. Chris Wells, Supervisor/Equipment Operator, and Josh Wishard, Equipment Operator, checked in at NARM's entrance and traveled to the Rail Loop East scoria pit. John Rogers, Corporate Manager; Morgan Rogers, Equipment Operator; and Blake Bauer, Equipment Operator, were on site. The crews overlap a half hour to have a meeting, perform required inspections of the work area, perform pre-operational examinations on equipment, and fuel equipment. John Rogers, Morgan Rogers, and Bauer checked out at the guard shack at 6:48 p.m.

After shift change, Wells started the crusher system and belt conveyors. Wells then took the Caterpillar D9 bulldozer to the raw scoria pile to push material to Wishard who was operating the Caterpillar 336D excavator (backhoe) to load the material into the feeder hopper.

At approximately 4:30 a.m., on June 4, 2014, Wells noticed a large scoria rock, 38"x 36"x 25" lodged in the feeder (see Appendix A, Photo 3). Wells processed the raw material through the system to clear the crusher and belt conveyors in preparation to remove the large rock. Wells shut the system down in sequence and locked out and tagged the electrical power to the machine. Wells then positioned the Caterpillar 330 excavator on the right side of the crusher and put the bucket of the excavator in the feeder so Wishard could attach the metal chokers and nylon straps/slings in the first attempt to remove the rock from the feeder (see Appendix A, Photo 4). During the first attempt, the rock slipped out of the rigging through the feeder opening into the crusher hopper.

After the failed attempt, the locks were removed and power to the crusher was restored. The upper frame of the crusher was raised and the left safety arm was set on its pin to hold the upper frame in the open position. The right safety arm was damaged sometime prior to this work shift, and was not secured on the right side. The crusher was once again locked out, and the same process was used to attempt to remove the rock from the crusher. The second attempt was successful. Wells lifted the rock out of the crusher, backed the excavator up, and set the rock on the ground. Wells exited the 330 excavator to remove the sling basket from the rock and take his lock and tag off the crusher. Wells then moved the 330 excavator from the crusher to the fuel storage area, and started to refuel it.

While Wells was moving the excavator, Wishard removed his lock and tag and started the diesel engine. Wishard then raised the upper frame of the crusher off the left safety arm and removed the safety arm from its support position to allow the upper frame to return to its normal position. For an unknown reason, Wishard positioned his body between the lower frame of the crusher and the raised upper frame (see Appendix A, Photo 5). While Wishard was leaning over the lower frame, the upper frame slowly moved down, fatally crushing Wishard.

Wells left the fuel area and returned to see if Wishard needed help. Wells saw Wishard had been pinched between the upper and lower frame of the crusher. Wells lifted the upper frame, set the left safety arm, shut off and locked the diesel motor, then called for help at 5:40 a.m.

The mine dispatch announced an emergency on the mine site and then called county emergency services at 5:41 a.m. Surface Mine Emergency Team (SMET) members Nick McGraw and Darrin Cope arrived at the accident location at 5:48 a.m. and SMET members Jake Miller and Maria Kautz arrived shortly thereafter. McGraw and Cope found Wishard between the crusher frames. SMET members removed Wishard, started CPR, and attempted the use of an Automated External Defribrillator (AED). The AED advised "no shock" for the victim. Wishard was placed into the mine ambulance and it exited the mine at 6:06 a.m. Chad Reid and Denny Bohne, EMT paramedics who were in the Campbell County ambulance, met the mine ambulance on the access road. Reid and Bohne left their ambulance and entered the mine ambulance. The mine ambulance

resumed travel to Campbell County Memorial Hospital. Wishard was pronounced dead at 6:22 am by Dr. Johnathan Hayden.

INVESTIGATION OF THE ACCIDENT

At 5:53 a.m., on June 4, 2014, Duane Myers, NARM's Director of Safety Operations, notified the MSHA Call Center of an accident. Peter Saint, MSHA Electrical Supervisor, received the notification from the Call Center at 6:03 a.m. Saint immediately contacted NARM and verbally issued a 103(j) order at 6:10 a.m. to secure the accident scene and assure miners safety at the mine. Saint then notified Todd Jaqua, Gillette Field Office Supervisor, of the accident. Jaqua and Inspector Wayne Johnson traveled to NARM and arrived at 8:15 a.m. Johnson modified the 103(j) order to a 103(k) order. Jaqua and Johnson, along with NARM personnel and Cary Ashley, Wyoming Deputy State Mine Inspector, traveled to the accident scene at the Rail Loop East scoria pit.

Lois Duwenhoegger, MSHA Lead Accident Investigator, arrived at the mine site at 11:30 a.m. Initial measurements and photographs were taken at this time.

The investigation team conducted preliminary examinations of the mobile equipment, the crushing unit, and the surrounding area. MSHA's Educational Field Services also assisted with the investigation.

On June 10, 2014, the onsite portion of the investigation was completed. A list of persons who participated in the investigation is shown in Appendix B. The accident investigation team conducted twenty-one interviews. A list of persons interviewed is shown in Appendix C.

DISCUSSION

Location of Accident and Conditions

The accident occurred at the Rail Loop East scoria pit, approximately 5 miles from the West Change House at NARM. At the time of the accident, the temperature was approximately 53 degrees and overcast with 12 mph wind from the south. The physical conditions at the accident site (temperature, ground conditions, etc.) did not contribute to the cause of the accident.

General Machine Information

The crusher is a 2005 Metso Lokotrack LT1213S Impact Crusher and is owned and operated by RCI. The crusher has been used at NARM since August 2010 and has been moved to different scoria pits throughout the mine.

The complete crusher weighs 27,000 lbs. The upper frame weighs 10,700 lbs. There are two single action hydraulic cylinders that raise and lower the upper frame. One

cylinder is on each side of the crusher. The crusher is equipped with two safety arms, one on each side near the cylinders. These safety arms secure the upper frame in the open position.

John Rogers; Wells; Kevin Scott, Foreman; Elijah Bezpaletz, Foreman; Carl Bruce, Foreman; Morgan Rogers, and Bauer, stated that the upper frame of the crusher had not been raised for almost a month before the day of the accident.

Hydraulic Cylinders

The left hydraulic cylinder and safety arm were not damaged.

The right hydraulic cylinder had a substantial visible hydraulic leak (see Appendix A, Photo 6). This leak was present at the time of the accident and caused the upper frame to slowly fall onto the victim. Investigators could not determine, however, if the oil leak existed before the accident.

On the day of the accident, the upper frame of the crusher was raised two times. Wells lifted it the first time to remove the large rock. This is the time the upper frame lowered and crushed the victim. The controls to lift the upper frame are on the left side of the crusher. Therefore, the right cylinder would have been out of sight from Wells. Wells also did not notice anything that would have indicated hydraulic problems when he raised the upper frame.

The second time it was raised, the upper frame was raised off the victim to render first aid.

The oil leak was discovered by MSHA before the crusher frame was raised for the function test during the investigation. The oil accumulation below the cylinder was 9" wide x 69" long. This was the first time anyone saw evidence of an oil leak. The right cylinder had a film of hydraulic oil covered in scoria dust on it. The crushed scoria under the right cylinder had stains of hydraulic oil present. The scoria was a darker color due to the oil and was moist, indicating a fresh leak.

Before the function test was performed on the crusher, the hydraulic oil was in the operating range on the site glass. There is no evidence of anyone adding hydraulic oil to the crusher. During the function test, the upper frame fell in 2 minutes and 12 seconds.

When one cylinder is leaking oil and losing pressure, it will cause the other cylinder to lose pressure as well. Since the right side cylinder was not maintained in safe operating condition and no safety arm or other blocking material was in place, the hydraulics bled off and the upper frame lowered and crushed Wishard. The manufacturer indicated

that had both cylinders been properly maintained they would have held the upper frame in the raised position.

Right Cylinder Safety Arm and Access Door

The pin that the right safety arm locked onto was covered by crushed scoria rendering it unusable, and indicated that it had not been recently used. The manufacturer stated that one of the safety arms was sufficient to hold the weight of the raised frame.

There is an access door on the upper frame to enter the crusher hopper without raising the upper frame but it was not used.

Examinations

The crusher area was examined prior to the start of the shift and documented by Chris Wells. The on-shift examination records do not indicate any hazards or safety defects observed during the examination.

Pre-operational examination lists from May 23, 2014 through June 3, 2014 for the crusher were reviewed. Rogers; Wells; Scott; Nathen Klutz, Foreman; Bezpaletz, and Bruce performed the pre-operational examinations during this timeframe. No defects affecting safety, including leaks or hazards, were noted. When interviewed, none of these certified persons recalled a leak on the crusher.

The mine operator conducted random safety audits, one to two times per week at irregular intervals, on the crushing equipment and RCI operators as well. No record of hazards, defects or training issues were noted.

Experience and Training Records

RCI has a training plan, approved July 2013. All miners involved had received all required Part 48 training. During the investigation, Rogers, Wells, Bruce, and Scott were asked about the task training they received on the crusher. They stated that the task training addressed avoiding pinch points, blocking against motion, the proper use of the safety arms, the access door, lock-out tag-out, and how to recognize oil leaks. Training compliance was not a factor in this accident.

Toxicology

A toxicology analysis was conducted. The results of the toxicology indicated that the victim tested "positive" for THC (marijuana), Methamphetamine (stimulant) at 18ng/mL, and Amphetamine (stimulant) at 10ng/mL.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic causes of the accident that were correctable through reasonable management controls. These root causes, if corrected, would have prevented the accident or mitigated the outcome. The following root causes were identified.

1. *Root Cause:* The contractor failed to ensure that raised equipment was blocked against motion. The upper frame of the crushing unit was in the raised position without using the safety arms to secure the upper frame in the raised position.

   Corrective Action: RCI established an additional written Standard Operating Procedure (SOP) to emphasize key aspects of their current task training program. The SOP explains that if employees need to reach into the crusher, all power must be first locked out and tagged properly. The SOP requires both safety arms to be in place when the upper frame is in the raised position, or that the inspection door is used if reaching into or inspecting the crusher. RCI retrained all employees by using the new SOP.

2. *Root Cause:* RCI failed to maintain the crusher in a safe operating condition. The right cylinder for lifting the upper frame had an oil leak that allowed the hydraulic pressure bleed off allowing the frame to lower unintentionally. Also, there was an accumulation of scoria present on and around the pin for the right safety arm so that it could not be used.

   Corrective Action: RCI established an additional written Standard Operating Procedure (SOP) to emphasize key aspects of their current task training program. The SOP addresses identifying safety issues to maintain equipment and repair/eliminate oil leaks. Also, the crushing unit was removed from the mine site for repairs. The crusher was inspected by an MSHA inspector to assure safe operating condition prior to it being used again at a mine.

CONCLUSION

The accident occurred because the upper frame of the impact crusher was raised and not blocked in place. Another contributing factor was the failure to maintain the right hydraulic hoist cylinder for the upper frame which allowed the hydraulic pressure to bleed off and the upper frame to lower unintentionally.

Russell J. Riley
District Manager

11/04/2014
Date

ENFORCEMENT ACTIONS

1. A 103(j) Order No. 8476954 was issued to ensure the safety of all miners during and after any recovery actions for the affected area and equipment. This order was modified to a 103(k) at 8:15 on June 4, 2014.

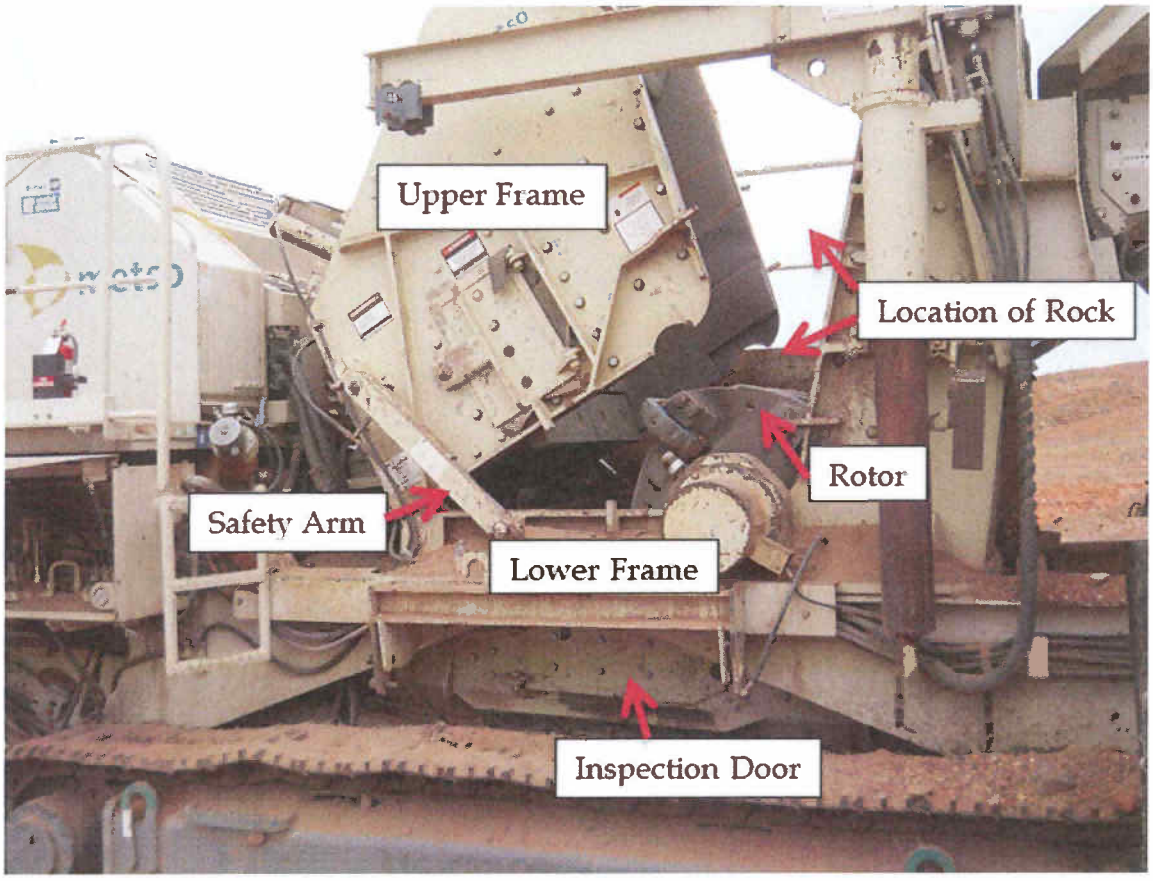
2. A 104(a) citation No. 8476466 was issued for the violation of 30 CFR §77.405(b). The contractor Roger Construction Inc., failed to insure that work was not performed under raised equipment until it was blocked in a secure position. The 10,700 lb. upper frame was not blocked against motion.

   On June 4, 2014, at 5:35 a.m., a contract employee was fatally injured when the upper frame of a Metso Lokotrack 1213S Impact Crusher, serial number 72990, drifted down crushing the victim. The crusher is located in the Rail Loop East Scoria Pit on North Antelope Rochelle Mine property.

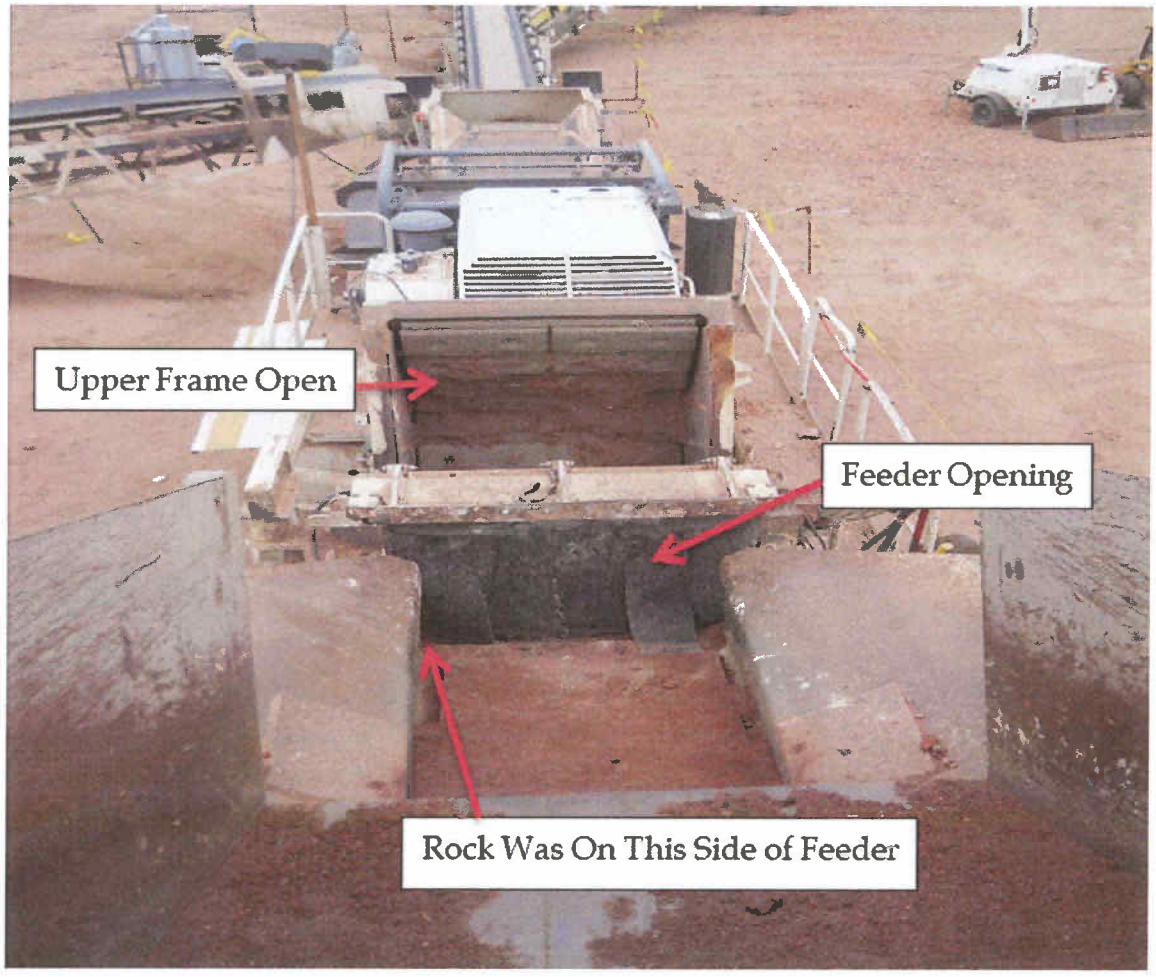
3. A 104(a) citation issued to RCI No. 8476467 is issued for the violation of 30 CFR §77.404(a). The contractor Roger Construction Inc., failed to maintain the Metso Lokotrack 1213S Impact Crusher, serial number 7299 in a safe operating condition. On June 4, 2014, at 5:35 a.m., a contract employee was fatally injured when the upper frame of an impact crusher drifted down crushing the victim. The crusher is located in the Rail Loop East Scoria Pit on North Antelope Rochelle Mine property. The hydraulic cylinder, located on the opposite side of the operator's controls, was leaking oil which allowed the 10,700 lb. upper frame to lower unintentionally. The oil accumulation below the cylinder was 9" wide x 69" long. The pin that the safety arm, located on the side opposite the operator's controls, rests on when the upper frame is in a raised position was not maintained because the pin was buried by crushed scoria so the safety arm was not operable.

Appendix A

Photographs



Photograph 2: Crushing Unit, Upper Frame In Raised Position

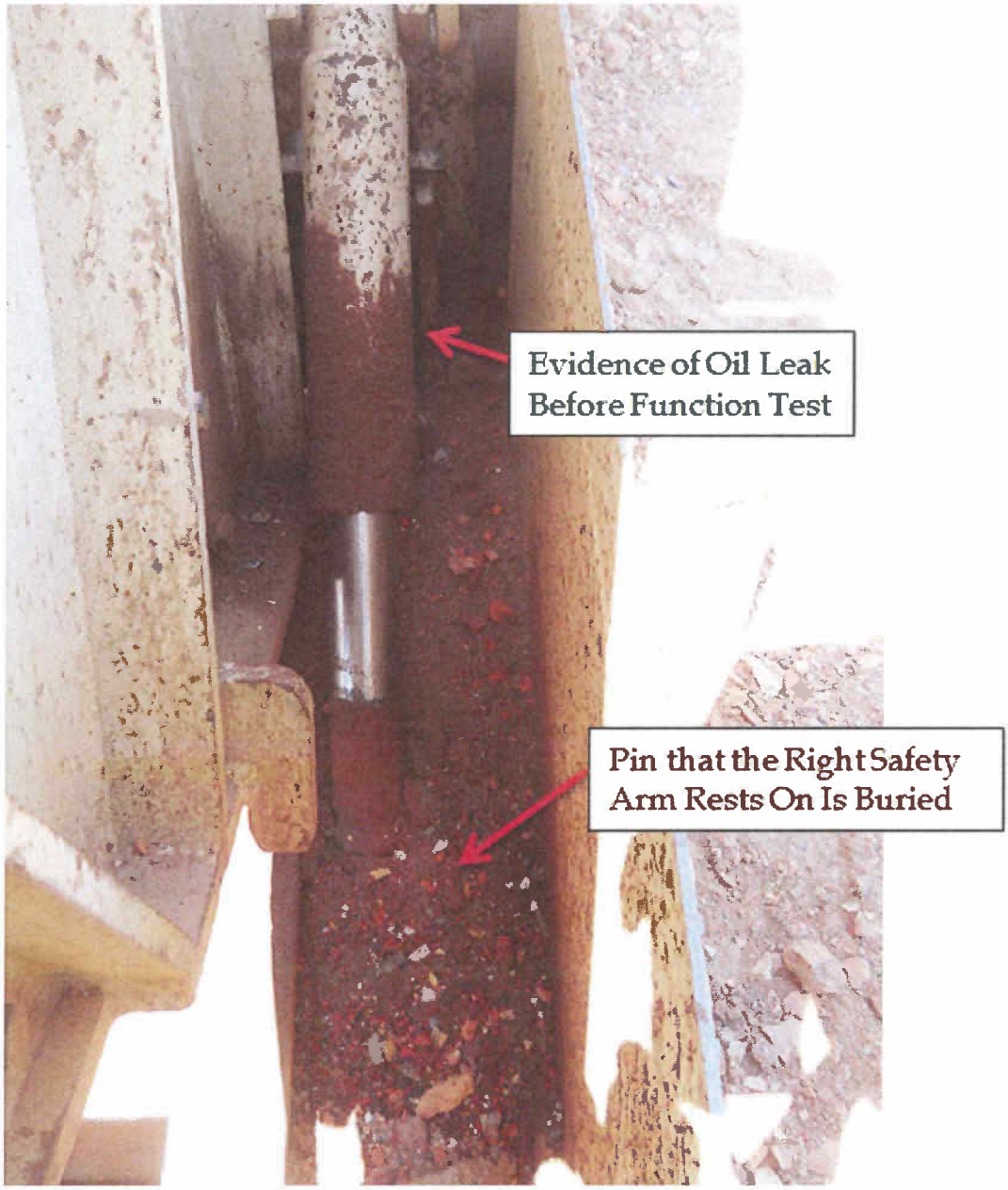


Photograph 3: Feeder

Photograph 4: Straps and Excavator Used To Make a Basket to Remove Rock

Appendix A Continued

Photograph 5: Victim Location



Photograph 6: Right Cylinder

Appendix B

List of persons participating in the investigation

Peabody Powder River Operations

Scott Durgin .....President
Keith Haley.....SVP Peabody Midwest
Matthew Pedersen-Howard.....VP Health and Safety
Chuck Burggraf.....SVP Safety America
Kemal Williamson.....Corporate Office
D.L.Lobb..... Corporate Office
Chris Whittenauer.....Corporate Office

North Antelope Rochelle Mine (NARM)

Alan E. Aldrich.....Operations Manager
Jack Laakso.....Production Director
Deborah L. Diedrich.....Director PRB Safety
Duane Myers.....Director Safety Operations
Jeff Ternes.....Safety Team Leader
Jeff Nelson.....Safety Supervisor

NARM Miner's Representative

Gary Anderson.....Compliance Officer

Wyoming Department of Workforce Services
State Mines Devision

Terry Adcock.....State Mine Inspector
Doug Bailey.....Deputy State Mine Inspector
Carey Ashley.....Deputy State Mine Inspector

Metso Minerals

Stephane Barrault.....Technical Support Manager
Stan Szupica.....Tech Support NPT Impacters

Jackson Kelly PLLC

Karen Johnston.....Attorney

Quarles & Brady

Patrick Nolan.....Attorney

Campbell County Officials

Tom Eekhoff.....Coroner

Mine Safety and Health Administration Accident Investigators

Lois Duwenhoegger.....Lead Accident Investigator
Wayne Johnson.....Accident Investigator
Chad Simpson.....Accident Investigator
Kathy Cattles.....Educational Field Services

Appendix C

List of Persons Interviewed (NARM)

Nick McGraw.....SMET/Mechanic
Vede Jacob Miller.....SMET/Pit Tech
Trenton J. Russell.....SMET/Plant Maintenance
Darren Cope.....SMET/Shovel Operator
Marcia Kautz.....SMET/Production
Logan Perino.....SMET/Production
Sean Seems.....SMET/Field Maintenance
Maria Ruggiero-Roenfeld.....EMT/Guardsmark
Christopher Gardner.....EMT/Guardsmark
Darrell Swisher.....Safety
Don Dorn.....Safety
Allan Schaefer.....Truck Trainer
Keith Engle.....Contractor Trainer

List of Persons Interviewed (RCI)

James W. Rogers.....RCI Corporate Owner/President
John W. Rogers.....RCI Corporate Manager
Chris Wells.....RCI Equipment Operator/Supervisor
Morgan Rogers.....RCI Equipment Operator
Blake Bauer.....RCI Equipment Operator
Carl Bruce.....RCI Equipment Operator
Kevin Scott.....RCI Equipment Operator
Elijah Bezpaletz.....RCI Equipment Operator/Supervisor

Appendix D

Victim Information

Accident Investigation Data - Victim Information

Event Number: 4 2 6 8 3 5 3

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:
Joshua L. Wishard	*M*	*25*	*01 Fatal*

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 06/04/2014 b.Time: 6:22	*a. Date: 06/04/2014 b.Time: 5:35*

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
173 Backhoe Operator	*098 Operating Upper Frame on Impact Crusher*	Yes [ ] No [X]

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	*0*	*18*	*0*	b. Regular Job Title:	*0*	*18*	*0*	c: This Mine:	*0*	*18*	*0*	d. Total Mining:	*0*	*24*	*0*

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
076 Impact Crusher	*170 Crushing*

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

14. Company of Employment: (If different from production operator)
Rogers Construction, Inc.
Independent Contractor ID: (if applicable) *S843*

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: *9999* *None (No Union Affiliation)*