

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH
REPORT OF INVESTIGATION

Surface Coal Mine

Fatal Machinery Accident
September 15, 2014

Black Warrior Minerals, Inc.
Manchester Mine
Jasper, Walker County, Alabama
ID No. 01-01362

Accident Investigators

James Brodeur
Coal Mine Inspector - Surface

William Harbin
Coal Mine Inspector - Surface

Jarvis Westery
Coal Mine Inspector – Surface

Originating Office
Mine Safety and Health Administration
District 11
1030 London Drive, Suite 400
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Richard A. Gates, District Manager

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OVERVIEW



On Monday, September 15, 2014, at approximately 12:40 pm., a 53-year old bulldozer operator sustained fatal injuries when the bulldozer he was operating traveled over the highwall and fell 50 feet into the pit. The victim had been assigned to level a bench for drilling.

The bulldozer operator failed to maintain full control of his equipment while it was in motion in close proximity to the edge of the highwall. The victim was not wearing his seat belt.

GENERAL INFORMATION

The Manchester Mine is owned and operated by Black Warrior Minerals, Inc. and is located in Jasper, Walker County, Alabama. The mine has 37 employees, and operates two 10-hour shifts (6:00 am to 4:00 pm and 4:00 pm to 2:00 am), Monday through Friday.

The mine has one active pit. The mine is a surface bituminous coal operation, utilizing typical drill and shoot methods to break the overburden. This operation utilizes a Hitachi 1200 Excavator and two Caterpillar 992C front-end loaders to remove the overburden. The highwall in the area of the accident ranges from 50 to 60 feet in height. Once the overburden is removed, the coal seams are excavated utilizing front-end loaders and coal haulage trucks. The primary coal seams mined are the Jefferson and Lick Creek seams, averaging a total of approximately 28 inches in thickness. The daily production averages 840 tons.

The principal officials of the mine at the time of the accident were:

Roger W. Perry.....	Chairman
Rance D. Perry.....	President/Treasurer
Leah M. Perry-Haynie.....	Secretary
Rehana Perry.....	Staff Assistant
Jerry W. Aaron.....	Mine Superintendent

The last regular safety and health inspection was completed by the Mine Safety and Health Administration (MSHA) on July 9, 2014. The mine's Non-Fatal Days Lost (NFDL) incidence rate for 2013 was 1.71, compared to the national rate of .99 for mines of this type.

DESCRIPTION OF THE ACCIDENT

On Monday, September 15, 2014 Barry N. Duncan (victim) arrived at the mine for the day shift at approximately 5:00 am and traveled directly to his work area. Duncan was assigned to continue completion of a drill bench which he had been working on his prior shift.

Duncan's method for creating the bench was to push material to the edge of the bench, in effect creating a berm, which kept his bulldozer from getting close to the highwall edge. He continued to push material to the edge of the bench, keeping a berm, while also pushing material off the bench into the pit. Typically, Duncan moved his bulldozer perpendicular to the edge of the highwall while he was pushing the material.

As the remainder of the day shift employees arrived and throughout the day, Duncan carried on small talk over the citizen's band (CB) radio with the other equipment operators. Some of the other equipment operators observed Duncan working on the bench throughout the shift, but never observed anything unusual.

At approximately 12:40 p.m., the bulldozer operated by Duncan traveled over the highwall and fell approximately 50 feet to the Jefferson bench below. The bulldozer came to rest in the upright position. Johnnie Turner, Excavator Operator, noticed a cloud of dust in the area where Duncan was working and attempted to call Duncan over the CB radio several times with no response. Turner then called over the CB for mine personnel to investigate.

Barry Gilbreath, Rock Truck Operator, was the first to arrive at the accident scene. He found the victim on the floor of the bulldozer cab, not wearing his seatbelt, with his head face down in the operator's seat, unresponsive, and without vital signs. B.J. Myers and Gary Benson, Rock Truck Operators, arrived and started CPR. The coworkers called for medical assistance.

First responders from the Thach Volunteer Fire Department relieved mine personnel and continued CPR on the victim. An Automatic External Defibrillator (AED) was attached to the victim and indicated that the first responders should continue with CPR. Regional Paramedics of Jasper arrived and continued the efforts to revive the victim. The paramedics applied an electrocardiogram (EKG) and determined that there were no vital signs. Efforts to revive the victim were stopped and the coroner was called.

J.C. Poe, Walker County Coroner, arrived and pronounced the victim dead at 2:04 pm, September 15, 2014.

INVESTIGATION OF THE ACCIDENT

At approximately 12:50 pm, Jerry Aaron, Mine Superintendent, notified Coal Mine Inspector, Dean Harbin, of the accident. Harbin was conducting an inspection on mine property at the time of the accident. Harbin met Aaron at the accident scene. Harbin issued a 103(k) order to ensure the safety of all persons and to prevent the destruction of evidence during the accident investigation. Harbin called Jacky Shubert, Bessemer Field Office Supervisor, and advised him of the accident. Shubert replied that he would send an MSHA accident investigator to conduct the investigation. Bessemer Field Office Supervisor, Ed Boylen and Coal Mine Inspector, James Brodeur were dispatched to the mine. The Mine Safety and Health Administration (MSHA) Call Center was notified of the accident at approximately 1:24 pm, on Monday, September 15, 2014, when Aaron placed the call.

Harbin conducted a preliminary examination of the accident scene. Photographs and observations were made of the bulldozer's route of travel, resting place at the bottom of highwall, and the general condition of the highwall. Boylen and Brodeur arrived on site, began an investigation, and conducted initial interviews with mine employees. A physical examination of the Caterpillar D9L Bulldozer, company number 2 was conducted by Harbin and Brodeur.

The investigation was conducted in conjunction with the State of Alabama Department of Labor Inspections Division, Thompson Tractor Company Service Department, mine management, and employees from the mine. Those persons participating in the investigation are listed in Appendix A. Persons interviewed are listed in the Appendix B.

The investigation of the physical site of the accident was completed on September 17, 2014. Digital photographs, sketches, and relevant measurements, including a topographic survey of the accident area prepared by Perc Engineering Company, were developed as part of the investigation. The topographic survey is shown in Appendix C. The investigation also included a review of training records, mine and equipment and mine examinations records, and maintenance records. Additional interviews were conducted with persons who had knowledge of the accident on September 16 and 30, 2014. The interviews revealed that there were no eyewitnesses to the accident.

The physical examination and function tests performed on the Caterpillar Bulldozer were completed on September 30, 2014. Operational pressure tests for machine speed, brakes, and steering were performed by Morris Campbell, Thompson Tractor Company Service Technician. Thompson Tractor Company, Inc., the regional Caterpillar distributor, is contracted by the mine to provide mine site service and maintenance support of the mine's equipment.

DISCUSSION

Accident Site Observations

The accident scene consisted of a highwall in which the upper bench was being prepared for the drilling phase of the mining cycle. The lower pit level had already been mined. The highwall measured 50 feet in the area where the bulldozer traveled off the highwall. There were no cracks in the bench floor or areas where the highwall had broken. The inspection of the highwall revealed no evidence of ground failure. The weather conditions did not contribute to the accident. The day was a mostly cloudy with a temperature of 84 degrees Fahrenheit (°F). The bench area was dry.

The upper level of the highwall was in the construction phase. The investigation showed that normal mining practices were used in clearing and leveling the bench for drilling. A portion of the berm was not left on the edge of the bench, which was the area where the bulldozer traveled over the highwall.

On the push by the bulldozer when the accident occurred, there was a gouge in the bench floor close to the edge of the highwall. The bulldozer blade was dropped down when it should have been level or been raised prior to the bulldozer backing up for another push. The last push was the only location on the bench that showed evidence of this occurrence and was a change in the method of bulldozer's operation during the last push, as compared to the rest of the bench.

Equipment

The bulldozer was a Caterpillar D9L Bulldozer, serial no. 14Y3133. The bulldozer weighs approximately 126,600 pounds and has a turbocharged 12-cylinder engine with approximately 460 horsepower at the flywheel. The bulldozer has three forward gears and three reverse gears. The speed of the bulldozer going forward is as follows: 2.5 miles per hour (mph) in first gear, 4.5 mph in second gear, and 7.5 mph in third gear. The speed of the bulldozer going in reverse is as follows: 3.1 mph in first gear, 5.4 mph in second gear and 9.3 mph in third gear. The bulldozer was in neutral with the engine running when coworkers arrived at the accident site.

The bulldozer is equipped with Roll-Over Protective Structure (ROPS). Although there were no eye witnesses to the accident, the post-accident condition of the bulldozer showed evidence of a rollover. There was damage to the exhaust stack, air pre-breather, lights around the cab, and dents in the cab frame. All windows were either broken out or damaged, and dirt was impacted inside of the operator's cab. Additionally, the seat belt in the bulldozer was in the retracted position and was partially covered with dirt. There was no evidence to indicate that the victim was wearing the seat belt at the time of the accident.

Pre-operational Equipment Checks and Maintenance

The mine operator requires that a pre-operational check list be filled out by all equipment operators on every shift. All pre-operational check lists for the two weeks prior to the accident were reviewed. There were no hazards or problems reported for the bulldozer. During the investigation of the accident site and bulldozer, the bulldozer pre-operational check record for Monday, September 15, 2014 could not be located. There were no mechanical problems with the bulldozer listed in any record that was reviewed.

A review was conducted of approximately the previous six months of the service/repair records for the bulldozer involved in the accident, and there was no evidence of any hazards or problems.

Field Testing of Bulldozer

There were no problems identified with the bulldozer steering, brakes, transmission, or engine decelerator control system. This bulldozer model had no electronic control module which would store diagnostic information. Manual diagnostic tests were performed by a service technician of Thompson Tractor Company, Inc. Pressure gauges were connected to the bulldozer ports to test the oil pressures of the speed clutch, forward and reverse direction clutches, brake pedal, left and right brake levers, and left and right steering clutch levers. Test results are attached in Appendix D. There was no evidence that an operational issue existed with the bulldozer at the time of the accident.

Work Experience and Training

The victim was an experienced bulldozer operator, having approximately 28 years of mining experience, with 15 years at this mine (see Appendix E).

An examination of training records revealed Duncan received required training in accordance with 30 CFR Part 48. Duncan received annual refresher training on May 10, 2014. Duncan received task training for a D9L bulldozer in 2002.

Additional Information

The Walker County Coroner listed the cause of death on the Alabama Certificate of Death as blunt force open head trauma due to a mining accident. No autopsy was performed on the victim.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted to identify the most basic causes of the accident, which could have been corrected through reasonable management controls. The following root causes, if corrected, could have prevented the accident or mitigated the outcome:

Root Cause: The mine operator failed to ensure that the bulldozer operator maintained full control of his machine while in motion and while working in close proximity to the edge of an existing highwall.

Corrective Action: The mine operator retrained all personnel on maintaining full control of their machine at all times and on the proper techniques of preventing over travel of a highwall or any areas of the mine where the machine may fall and/or turnover. A record of the training conducted was provided to MSHA.

Root Cause: The mine operator failed to ensure that seatbelts were used where there is a danger of overturning equipment.

Corrective Action: The mine operator retrained all personnel on wearing the machine's seat belt at all times where there is a danger of overturning equipment when the machine is in motion. A record of the training conducted was provided to MSHA.

CONCLUSION

The accident occurred because the bulldozer operator failed to maintain full control of his equipment while it was in motion in close proximity to the edge of an existing highwall. In addition, the victim was not wearing his seat belt where there was a danger of the equipment overturning.

Approved by:



Richard A. Gates
District Manager



Date

ENFORCEMENT ACTIONS

Violation Type: 103(k) Order:

Condition Description: A fatal accident occurred at this operation on September 15, 2014, at approximately 12:45 p.m. As rescue and recovery work is necessary, this order is being issued under Section 103(k) of the Federal Mine Safety and Health Act of 1977 to assure the safety of all persons at this operation. This order is also being issued to prevent the destruction of any evidence which would assist in investigating the cause or causes of the accident. It prohibits all activity at the entire mine until MSHA has determined that it is safe to resume normal mining operations in this area. This order applies to all persons engaged in the rescue and recovery operation and any other person onsite.

Violation Type: 104(a) Citation for a violation of 30 CFR § 77.1607(b):

Condition Description: The mine operator failed to ensure that the bulldozer operator maintained full control of his machine while in motion and working in close proximity to the edge of an existing highwall. While preparing a drill bench on top of the highwall, the bulldozer operator of the Caterpillar D9L Bulldozer, serial no. 14Y3133, company no. 2, failed to have full control of the bulldozer on 9/15/2014 at approximately 12:40 hours when he was pushing unconsolidated material and traveled over the edge of the highwall. The bulldozer fell approximately 50 feet to the Jefferson bench below and the operator received fatal injuries. The drill bench, highwall, and bulldozer were inspected for hazardous conditions, and none were found. The bulldozer was tested for hazardous operating conditions and none were found.

Violation Type: 104(a) Citation for a violation of 30 CFR § 77.1710(i):

Condition Description: The mine operator failed to ensure seatbelts were used where there is a danger of overturning equipment. While preparing a drill bench on top of the highwall, the bulldozer operator of the Caterpillar D9L Bulldozer, serial no. 14Y3133, company no. 2, failed to wear the bulldozer seatbelt protective device on 9/15/2014 at approximately 12:40 hours when he was pushing unconsolidated material and traveled over the edge of the highwall. The bulldozer fell approximately 50 feet to the Jefferson bench below and the operator received fatal injuries. Interviews revealed that the victim was found in the cab of the bulldozer without the seatbelt being worn. The seatbelt had to be dug out of compacted dirt in the cab. The bulldozer seatbelt was field-tested for defects and none were found.

APPENDIX A

Persons Participating in the Investigation

BLACK WARRIOR MINERALS

Jerry Aaron.....Mine Superintendent

STARNES, DAVIS, FLORIE LLP

P. Andrew Laird, Jr.....Attorney

STATE OF ALABAMA DEPARTMENT OF LABOR INSPECTIONS DIVISION

Jimmy Rivers.....Chief of Mine Inspections Division

Buddy Herren.....Mine Inspection Supervisor

MINE SAFETY AND HEALTH ADMINISTRATION

Ed Boylen.....District 11 Field Office Supervisor

James Brodeur.....District 11 Coal Mine Inspector – Surface

William Harbin.....District 11 Coal Mine Inspector – Surface

Thomas O'Donnell.....District 11 Staff Assistant

Jacky Shubert.....District 11 Field Office Supervisor

Jarvis Westery.....District 11 Coal Mine Inspector – Surface

THOMPSON TRACTOR COMPANY, INC.

Morris Campbell.....Service Technician

Bill Fuqua.....Investigator

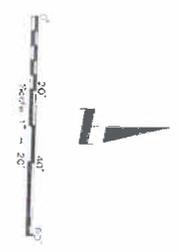
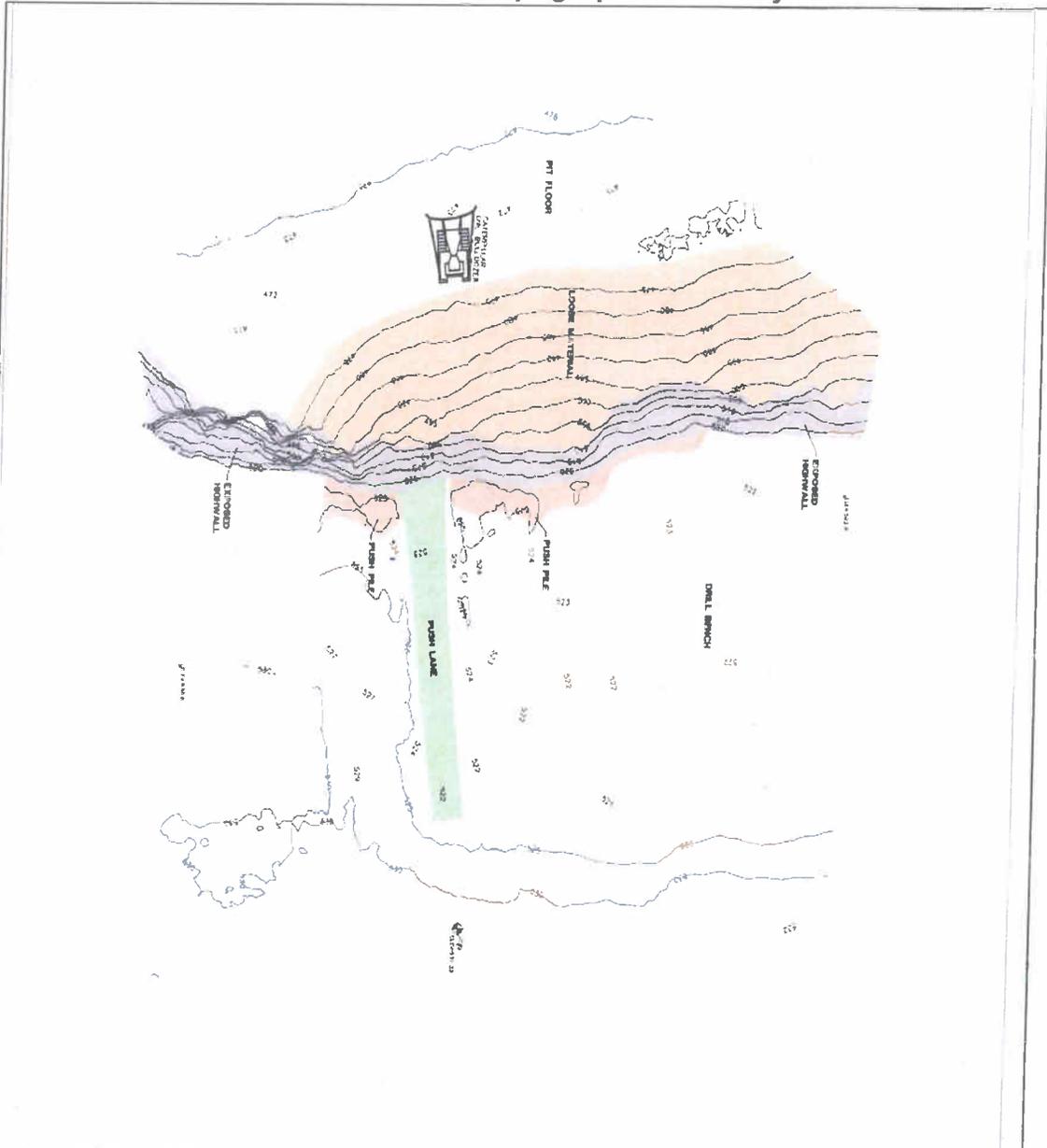
APPENDIX B

Persons Interviewed

MANCHESTER MINE

Jerry Aaron.....	Mine Superintendent
Gary Benson.....	Rock Truck Operator
Barry Gilbreath.....	Rock Truck Operator
Tim McDonald.....	Front-End Loader Operator
Nick Medders.....	Front-End Loader Operator
Jason Miller.....	Welder
B.J. Myers.....	Mechanic
Jason Nelson.....	Rock Truck Operator
Daniel Skinner.....	Rock Truck Operator
David Smith.....	Night Shift Bulldozer Operator
Johnnie Turner.....	Excavator Operator

APPENDIX C - Topographical Survey



LEGEND

---	SUBSTANTIAL CONTAINMENT
---	200' x 200' (100')

NOTES

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



I hereby certify that all parts of this survey and showing have been made in accordance with the provisions and requirements of the Standards of Practice for Surveying in the State of Alabama to the best of my knowledge, information, and belief.

Surveyor's Signature: *James W. Baker*

Issuing License on: 08/09/2014

TOPOGRAPHIC SURVEY

FOR
BLACK WARRIOR MINERALS, INC.
MANAGER EAST MINE
September 15, 2014 Building Accident
WALKER COUNTY, ALABAMA

| | |
|------|------------|
| DATE | 08/17/2014 |
| DATE | 09/18/2014 |
| DATE | 01/20/2015 |
| DATE | 01/20/2015 |

PERC ENGINEERING CO., INC.

1000 The Woodlands Blvd., Suite 100, Wetumpka, GA 30182
 770.424.8800

APPENDIX D - Pressure Test Results

| Pressure Reading Description | Service Manual Minimum Requirement | Service Manual Maximum Requirement | Minimum Test Pressure | Maximum Test Pressure |
|---|---|---|-----------------------------|------------------------------|
| Speed Clutch (P1) | Maximum of 70 psi less than the pressure at Maximum RPM. Pump pressure at maximum RPM = 420 psi. (420 - 70 = 350 psi) | 370 ± 10 psi with selection lever in any forward or reverse speed. | 370 psi | 370 psi |
| Direction Clutch (P2) | 55 ± 5 psi less than the pressure at Maximum RPM. Selection lever in any forward or reverse speed. (350 - 55 = 295 psi) | 55 ± 5 psi less than the pressure at Maximum RPM. Selection lever in any forward or reverse speed. (350 - 55 = 295 psi) | 305 psi in gear at low idle | 320 psi in gear at high idle |
| Brake Pedal Pressure Reading Description | Service Manual Pressure to Both Brakes | | Left Brake | Right Brake |
| Engine at Maximum RPM & No Brake Pedal Movement | 365 psi minimum | | 420 psi | 420 psi |
| Engine at Maximum RPM & Brake Pedal Pushed Completely | 0.0 psi | | 0.0 psi | 0.0 psi |
| Brake Lever Pressure Reading Description | Service Manual Steering Brake Pressure at Engine Maximum RPM | | Left Brake Lever | Right Brake Lever |
| No Steering Lever Movement | 365 psi minimum | | 420 psi | 420 psi |
| Steering Lever Pulled Completely Back | 75 ± 10 psi | | 65 psi | 65 psi |
| Steering Clutch Pressure Reading Description | Service Manual Steering Clutch Pressure at Engine Maximum RPM | | Left Steering Clutch | Right Steering Clutch |
| No Steering Lever Movement | 10 ± 5 psi † | | 0 psi * | 0 psi * |
| Steering Lever Pulled Completely Back | 325 ± 25 psi ‡ | | 260 psi * | 250 psi * |

† The required pressure allows oil to continuously flow through the steering clutches to keep them lubricated while they are not in use.
‡ The required pressure affects the machine's travel speed and the machine's torque to push material. * The low pressures would affect the travel speed of the machine and reduce the weight of material that could be pushed by the machine.

APPENDIX E

Victim Information

| Victim Information: 1 | | | | | | | | | | | | | | | | | |
|---|-------------------------------------|----|---------------------|--|-------------------------------|--|------------|--|------------|-------|--|-----------|-------|----------|-------------------------------------|----------|--|
| 1. Name of Injured/Ill Employee:
<i>Barry N. Duncan</i> | | | 2. Sex:
<i>M</i> | | 3. Victim's Age:
<i>53</i> | | | 4. Degree of Injury:
<i>01 Fatal</i> | | | | | | | | | |
| 5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:
<i>a. Date: 09/15/2014 b. Time: 14:04</i> | | | | | | | | 6. Date and Time Started:
<i>a. Date: 09/15/2014 b. Time: 6:00</i> | | | | | | | | | |
| 7. Regular Job Title:
<i>169 Bulldozer/Tractor Operator</i> | | | | 8. Work Activity when Injured:
<i>047 Operate Bulldozer/Tractor</i> | | | | 9. Was this work activity part of regular job?
<table style="width: 100%; border: none;"><tr><td style="text-align: center;">Yes</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;">No</td></tr></table> | | | | | | Yes | <input checked="" type="checkbox"/> | No | |
| Yes | <input checked="" type="checkbox"/> | No | | | | | | | | | | | | | | | |
| 10. Experience | | | | | | | | | | | | | | | | | |
| a. This | | | | | | | | | | | | | | | | | |
| Years | | | Weeks | | Days | | b. Regular | | | Years | | | Weeks | | Days | | |
| Work Activity: | | | <i>12</i> | | <i>0</i> | | <i>0</i> | | Job Title: | | | <i>12</i> | | <i>0</i> | | <i>0</i> | |
| c. This | | | | | | | | | | | | | | | | | |
| Years | | | Weeks | | Days | | d. Total | | | Years | | Weeks | | Days | | | |
| Mining: | | | <i>28</i> | | <i>0</i> | | <i>0</i> | | | | | | | | | | |
| 11. What Directly Inflicted Injury or Illness?
<i>076 Surface Mining Machine</i> | | | | | | | | 12. Nature of Injury or Illness:
<i>370 Multiple Injuries</i> | | | | | | | | | |
| 13. Training Deficiencies: | | | | | | | | | | | | | | | | | |
| Hazard: <i>New/Newly-Employed Experienced Miner</i> Annual: Task: | | | | | | | | | | | | | | | | | |
| 14. Company of Employment (If different from production operator)
<i>Operator</i> Independent Contractor ID: (if applicable) | | | | | | | | | | | | | | | | | |
| 15. On-site Emergency Medical Treatment: | | | | | | | | | | | | | | | | | |
| Not Applicable: First-Aid: CPR: EMT: <input checked="" type="checkbox"/> Medical Professional: None: | | | | | | | | | | | | | | | | | |
| 16. Part 50 Document Control Number: (form 7000-1) | | | | | | | | | | | | | | | | | |
| 17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i> | | | | | | | | | | | | | | | | | |