

**UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
COAL MINE SAFETY AND HEALTH**

REPORT OF INVESTIGATION

Surface Coal Mine

**Fatal Powered Haulage Accident
November 16, 2007**

**Rock Island Mine
Farrell-Cooper Mining Company
Rock Island, Le Flore County, Oklahoma
ID No. 34-01648**

Accident Investigators

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Coal Mine Safety and Health Inspector**

**Jimmy J. Stewart
Coal Mine Safety and Health Inspector**

**Wayne V. Johnson
Coal Mine Safety and Health Inspector**

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**Originating Office
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District 9
P.O. Box 25367, Denver, Colorado 80225
Allyn C. Davis, District Manager**

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VIEW OF TRUCK FROM POINT OF OVER-TRAVEL
177 FEET ALONG SLOPE FROM TOP OF DUMP TO TRUCK



OVERVIEW

On Friday, November 16, 2007, Jack Ward, truck driver, age 66, was fatally injured when the haul truck he was operating backed over the edge of the West pit spoil dump. The truck rolled down the dump slope and came to rest upside down in a pool of water at the bottom of the pit. The cause of death was drowning.

The causes of the accident included a lack of berms on the dump at the point of over-travel; inadequate training of the victim prior to being assigned normal work duties; lighting on the dump not sufficient to identify the edges of the dump site; and inadequate on-shift examinations that did not identify the hazards of the inadequate berms and inadequate lighting at the West pit spoil dump area.

GENERAL INFORMATION

The Rock Island Mine is a surface strip mine owned and operated by the Farrell-Cooper Mining Company. The mine is located at the southeast corner of Highway 112 at East 1265 Road, 1 mile south of Highway 120. Mining activities started at the mine on June 20, 2007. The mine has one pit and produces about 18,000 tons of coal per month. The mine uses two eleven-hour shifts per day, with 14 employees on the day shift and 6 on night shift. Overburden is moved using a cast blast/dozer push method to obtain a shorter highwall. A Hitachi 1800 hydraulic excavator and three 70-ton off-highway trucks move the overburden to the spoil dump. Coal is removed from the pit using a trackhoe and contracted 10-wheel dump trucks. Coal is mined from the Lower Hartshorne coal seam, which averages 44 inches in thickness. The coal seam is approximately 75 feet below the surface in the mining area.

The mine reported no coal production from 1999 through 2006. The most recent Mine Safety and Health Administration (MSHA) regular inspection was completed on June 11, 2003. A regular inspection for the semi-annual period ending March 31, 2008, had not yet been started. The non-fatal days lost (NFDL) injury incidence rate for the mine was 0.00 at the time of the accident, compared to the National NFDL rate of 1.56 for surface mines.

The principal officials at the mine were: William J. Cooper, President; Robert P. Cooper, Vice-President; Hanford Farrell, Jr., Secretary/Treasurer; Jay Jantzen, Operations Manager; and Greg Bryce, Mine Superintendent. Gary Gerald, Mining Development Services, performs contract services regarding MSHA compliance matters at the mine.

DESCRIPTION OF ACCIDENT

At 6:00 p.m., on November 16, 2007, Jack Ward, truck driver and victim, was assigned with two other haul truck drivers to operate Caterpillar 775E haul trucks in the West pit. All three trucks were assigned to receive overburden from the Hitachi excavator in the pit and transport the overburden to the West pit spoil dump. The operation proceeded without incident until approximately 8:30 p.m. when the loaded truck driven by Ward traveled to the dump location. The dump bulldozer operator was pushing the excess overburden near the mid-point on the east

side of the dump. Ward turned the truck around and backed toward the south end of the dump past the bulldozer. At approximately 8:48 p.m., the bulldozer operator looked toward Ward's location and saw Ward's truck overturning off the south end of the dump. Ward's truck rolled down the slope of the dump for approximately 177 feet, coming to rest upside down in a pool of water. The bulldozer operator notified the foreman of the accident by radio and the crew responded to assist Ward. Crew members entered the water and attempted to open the doors of the submerged truck cab but due to rocks and debris, the doors could not be opened. Local emergency services were notified and assisted in the rescue efforts. Attempts to free Ward from the truck were unsuccessful. A ramp was built to access the truck and the Hitachi excavator was used to lift the front end of the truck from the water to free Ward. Ward was under water for more than an hour before he was removed from the truck. An Oklahoma medical examiner pronounced Ward dead at the scene as a result of drowning.

INVESTIGATION

The MSHA National Call Center was notified of the accident by Consultant Gary Geraldts at 9:16 p.m., Central Standard Time (CST), on Friday, November 16, 2007. William Denning, Staff Assistant and Accident Investigation Coordinator for District 9, was notified of the accident by the Call Center at 9:31 p.m., CST. The Official Oklahoma Traffic Collision Report states that the accident occurred at 8:48 p.m., CST. An accident investigation team was dispatched to the mine. Inspector Jimmy Stewart from the McAlester, Oklahoma field office issued a Section 103(k) order to ensure the safety of persons at the mine. Photographs, measurements, and initial interviews were conducted at the accident scene. Formal interviews were conducted in Poteau, Oklahoma, in cooperation with the Oklahoma Department of Mines and company officials. The haul truck was examined to determine if any equipment related factors contributed to the cause of the accident. Refer to Appendix A for a complete list of persons that participated in the investigation.

DISCUSSION

Dump Information: The dump was approximately 336 feet long on the western edge, 75 feet wide at the widest point, and 22.5 feet wide at the point of over-travel. The southeast edge was 110 feet long and did not have adequate berms in place for the entire distance. The dump was flat and level and the weather was dry at the time of the accident. Refer to Appendix B for a sketch with dimensions of the dump.

Lighting: Illumination was not sufficient to provide safe working conditions on the West pit overburden dump site. Only the lights from the mobile equipment operating on the dump area were present. The nearest portable light plant was located 900 feet to the east of the dump area. The lights did not supply sufficient illumination; shadows were present along the edge of the southeast side and the south end of the dump site preventing identification of the edges of the dump. This condition contributed to the fatal accident that occurred on November 16, 2007.

Training and Experience: The approved training plan, dated July 31, 2007, permitted the mine to give each newly employed inexperienced miner an initial 8 hours of training prior to a work assignment with the remaining 16 hours to be provided within 60 days, reference 30 CFR 48.25(a). A form 5000-23 training certificate signed by Greg Bryce, an approved instructor, indicates that Ward received 8 hours of newly employed inexperienced miner training on November 2, 2007. Statements indicate that only 2 hours of training were provided and that after the training, Ward left the mine for a pre-employment physical. Ward returned to the mine on November 6, 2007, for his first day of work. Statements indicate that Ward received task training from an experienced haul truck operator on the safe operation of the 775E haul truck. Ward had no prior mining experience and had only 10 days mining experience at the Rock Island Mine prior to the accident. His employment application indicated that he had 2 years experience as a bulldozer operator and approximately 18 years as a commercial truck driver.

Miscellaneous: A similar incident occurred at the mine on October 30, 2007, during the night shift. The rear tires of a haul truck went over the berm near a curve on the east side of the pit close to the top of the highwall. The truck slid backwards down the slope approximately 50 feet. This resulted in a lost work day reportable injury.

Machine Information; The machine was a 2003 Caterpillar Model 775E, serial Number BEC00314, Company Number 1055, rigid body, rear dump quarry haul truck. The maximum operating weight is 235,000 pounds. The rated size class of the truck was 70 tons. Reportedly, the hour meter on November 12, 2007 was 16,596 hours. The truck was placed on its wheels, moved to a safe location, and pressure washed prior to the technical evaluation of the truck.

Engine: The truck was powered by a Caterpillar 3412; twelve cylinder, 762 horsepower, twin-turbocharged, after cooled, diesel engine. Due to the damage sustained during the accident, the engine could not be started.

Transmission: The truck had an electronically controlled, automatic transmission with seven forward speeds, neutral and one reverse. A single-lever shift control provided automatic shifting. The transmission lever was found in the neutral position during the equipment evaluation. However, the truck was moved to a safe location prior to the evaluation. The transmission's internal rotary selector spool was inspected and found to be in the reverse position. This was confirmed by the truck's electronic computer diagnostic interface.

The transmission was equipped with a reverse transmission neutralizer. The reverse neutralizer shifts the transmission into neutral from reverse if the hoist control lever is moved to the raise position. The neutralizer switch was tested for continuity and functioned. The hoist control was in the "hold" position, however, it was reported the bed was down at the time of the accident.

Condition of the Truck: The truck was found on its top as a result of the accident. The right side of the frame was broken behind the rear axle. The front of the bed and top of the Rollover Protective Structure/Falling Object Protective Structure (ROPS/FOPS) were damaged. The hydraulic line for the bed lift on the left side was broken and the cylinder tilted towards the frame. The left and right side mirrors were broken. The ladders and railings on the truck and the

ROPS/FOPS were bent. The fuel cap was missing. The left door was bent. The right rear window was the only one in place; reportedly the windows were cracked out during the move and not from the accident. The operator's compartment contained mud and rocks after removal from the water. The cab was washed to remove the debris. Reportedly, the right side door could not be opened at the accident scene but functioned during the evaluation.

Service Brake Systems Design: The 775E haul truck was equipped with air-over-hydraulic actuated, caliper disc brakes on two front wheels and oil cooled air-over-hydraulic actuated wet disc brakes on the rear wheels. A control on the dashboard allowed the driver to switch off the front brakes if desired. Cooling oil was circulated through the rear service brake disc packs. The service brakes were controlled by a foot operated pedal.

Parking Brake Systems Design: The parking brake system consisted of a spring-applied, hydraulically released system that applied the rear service brake disc packs. The parking brake was activated by an unmodulated two position toggle switch on the console to the operator's right. If the parking/secondary tank loses air pressure, the parking brakes activate.

Secondary Brake System Design: The secondary brake system consisted of spring applied; hydraulic pressure released wet disc brakes on the rear wheels and pressure actuated air-over-hydraulic caliper-disc brakes on the front wheels. The secondary brakes were controlled through a fully variable foot operated pedal. The secondary brake system will activate the front brakes, even if switched out of service.

Retarder Design: The retarder system provided modulated engagement of the rear service brakes and was controlled by a friction lever on the right side of the steering column. The position of the retarder control lever determines the amount for the retarding force.

Service Brake System Evaluation and testing: The engine could not be started and air was supplied from a service truck. Air pressure of 120 psi was provided to the truck's brake system air tanks. This was within the normal operating range, cutout pressure, of 225-125 psi specified in the CAT manual RENR6513-05. A pressure gauge was installed in the hydraulic line for the front brakes. With the service brake applied the oil pressure measured 2500 psi. Caterpillar specifies 2185-2760 psi as normal operating pressure, CAT manual RENR6513-05. A pressure gauge was installed at the input to the slack adjuster and at both rear wheels to measure the oil pressure to the wet disc brakes. With the service brakes applied the hydraulic pressure was 700 psi at all three locations. Caterpillar specifies 630-790 psi as normal operating pressure, CAT manual RENR6513-05.

The "Service Brake Discs- Check" procedure in the CAT manual was performed, reference CAT SMCS Code 4255-535. Since the truck could not be operated to retract the parking brake piston a portable hydraulic unit was used to supply approximately 700 psi hydraulic pressure to retract the parking brake piston. There was no cooling oil present as required in CAT'S procedure, since the truck could not be operated.

Right Side

Parking Brake Off- 1.054”

Parking Brake On- 0.840”

0.214”- this corresponds to 0% disc wear

Left Side

Parking Brake Off- 1.058”

Parking Brake On- 0.847”

0.211”- this corresponds to 0% disc wear

Parking Brake Evaluation: The parking brakes had to be retracted by a portable hydraulic unit for the previous service brake test. Reportedly, the rear wheel dragged when the machine was moved from the accident scene. Both items indicate the parking brakes had holding capabilities when applied.

Secondary Brake Evaluation and testing: The engine could not be started and air was supplied from a service truck. Air pressure of 120 psi was provided to the truck’s brake system air tanks. This was within the normal operating range, cutout pressure, of 115-125 psi specified in CAT manual RENR6513-05. A pressure gauge was installed in the hydraulic line for the front brakes. With the secondary brake fully applied, the oil pressure measured 2250 psi. The application of the rear axle brakes by applying the secondary brake was not evaluated since the engine was not operational. The oil pressure in the front brake line indicates the secondary brake was functioning.

Retarder Evaluation and Testing: The engine could not be started and air was supplied from a service truck. Air pressure of 120 psi was provided to the truck’s brake system air tanks. This was within the normal operating range, cutout pressure, of 115-125 psi specified in the CAT manual RENR6513-05. A pressure gauge was installed at the right rear wheel to measure the oil pressure to the wet disc brakes. With the retarder applied, the hydraulic pressure was 650 psi. Caterpillar specifies 530 psi maximum operating pressure with 80 psi air pressure, CAT RENR6513-05. The retarder is designed to limit maximum delivery air pressure to 80 psi. The pressure was maintained for the five minutes of testing.

Front Brake Evaluation: The front brake discs were measured. The minimum right side disc thickness was .736 in. and the minimum lining thickness was .375 in. The minimum left side disc thickness was .745 in. and the minimum lining thickness was .375 in. According to Caterpillar, the minimum disc thickness is .625 in and the minimum lining thickness is .125 in.

Control positions as found: The parking brake control was found in the “off” position. The retarding system control handle was found in the fully applied position. The front brake cutoff control switch was found in the “on” position. The transmission gear shift selector was in the neutral position. The hoist control was in the “hold” position. The retarder handle, service brake pedal, secondary brake pedal and the accelerator pedal moved freely.

Rollover Protective Structure/Falling Object Protective Structure (ROPS/FOPS): The top of the ROPS/FOPS were dented. No certification plate was found on the ROPS/FOPS.

Mirrors: The truck was equipped with two rear view, side mirrors. The mirrors were broken from their frames. The frames and the support arms of the frames were also damaged.

Seat Belt: The truck was equipped with a seat belt and the victim was found in the seat with the seat belt correctly fastened. The seat belt latched and unlatched when tested.

Other than the damage caused by the accident; no braking, retarder or other defects affecting the safe operation of the truck were found.

ROOT CAUSE ANALYSIS

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

1. *Root Cause:* Hazardous conditions consisting of the lack of berms and inadequate lighting were not identified and corrected by management before assigning miners to work in the West pit. The lack of berms and lighting contributed to the cause of this accident.

Corrective Action: The mine operator shall require thorough on-shift examinations and have all hazards corrected and documented in the record book.

2. *Root Cause:* Mine management assigned the victim work duties prior to completing the 8-hours of new miner training required under the approved training plan.

Corrective Action: The Part 48 training plan should be revised to eliminate the 8/16-hour split training alternative and require the full 24-hours of new miner training to be given prior to having work duties assigned.

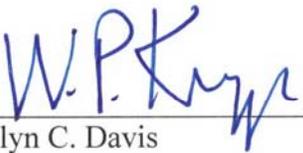
3. *Root Cause:* Unsafe dumping practices of attempting to dump over the edge of the dump when no berm is in place and backing up at an angle to the edge of the dump contributed to the accident. When backing up at an angle to the edge, the driver may not realize that the tires opposite the driver's side are closer to the edge than intended.

Corrective Action: Drivers should be trained to back up perpendicular to the edge of the dump and to use properly constructed berms at the edge as guides for stopping and dumping the load. Berms should not be used to help stop the truck and rear tires should not run up on berms so that material can be dumped over the edge.

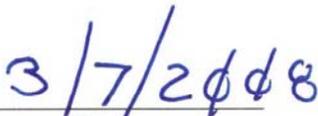
CONCLUSION

The accident occurred when the haul truck over-traveled the south edge of the West pit spoil dump as it was backing up to dump a load of spoil. The causes of the accident included a lack of berms on the dump at the point of over-travel; inadequate training of the victim prior to being assigned normal work duties; lighting on the dump not sufficient to identify the edges of the dump site; and inadequate on-shift examinations that did not identify the hazards of the inadequate berms and inadequate lighting at the West pit spoil dump area.

Approved by:



Allyn C. Davis
District Manager



Date

ENFORCEMENT ACTIONS

1. A 103(k) order, number 7285256, was issued to Farrell-Cooper Mining Company to ensure the safety of persons involved in the recovery work at the fatal accident site in the West pit area.
2. A 104(d)(1) citation, number 7610686, was issued to Farrell-Cooper Mining Company, for a violation of 30 CFR 77.1713(a). An examination for hazardous conditions during each working shift in each active working area at this mine was either not conducted by a certified person or the mine operator failed to note hazards found during such examinations and the mine operator failed to correct hazards found during such examinations. Inspection showed that at least 675 feet of elevated roadways and dump site locations throughout the mine had deficient berms as noted in Citation No. 7285257. 75 feet of berms were found to be inadequate on the Upper East Side spoil dump location as noted in Citation No. 7285258. Such failure to examine, note and correct obvious and extensive hazardous conditions contributed to two accidents including one fatality and one lost work day injury. The mine has experienced two separate haul truck accidents within 17 days where the trucks traveled off dump locations. The first accident occurred on 10-30-2007 and resulted in a lost time injury as noted in Citation No. 7285259. The second accident occurred at the West Pit spoil dump on 11-16-2007, resulting in a fatality. 110 feet of berms were inadequate at this location, as noted in Order No. 7610684. This violation is an unwarrantable failure to comply with a mandatory standard.
3. A 104(d)(1) order, number 7610683, was issued to Farrell-Cooper Mining Company for a violation of 30 CFR 48.25(a). Jack Ward (employee # 1780) was assigned normal work duties prior to completion of the on site portion (the first 8 hours) of the newly employed inexperienced miner training as described in the approved training plan. Mr. Ward started employment on November 2, 2007. The approved training plan, dated July 31, 2007, allowed the mine to give each newly employed inexperienced miner an initial 8 hours of training prior to work assignment, with the remaining 16 hours provided within 60 days. An MSHA Form 5000-23 training certificate signed by Greg Bryce, an approved instructor, indicates that Ward received 8 hours of Newly Employed Inexperienced Miner training on November 2, 2007. Statements indicate that only 2 hours of training were provided and that after the training, Ward left the mine for a pre-employment physical. Ward returned to the mine on November 6, 2007, for his first day of work. Mr. Ward had no previous mining experience. Mr. Ward received fatal injuries during an accident on November 16, 2007. The Federal Mine Safety and Health Act of 1977 declares that an untrained miner is a hazard to himself and to others. This violation is an unwarrantable failure to comply with a mandatory standard.
4. A 104(d)(1) order, number 7610684 was issued to Farrell-Cooper Mining Company for a violation of 30 CFR 77.1605(l). Berms, bumper blocks, safety hooks, or similar means were not provided to prevent over travel and overturning at the West Pit spoil dump. On November 16, 2007 at 20:48, a Caterpillar 775E haul truck (company number 1055) over

traveled and overturned causing fatal injuries to the operator of the truck. No berms, bumper blocks, safety hooks, or similar means were present along the southeast side of the dump for the entire 110 feet in length. The mine experienced a reportable accident on October 30, 2007, due to a similar circumstance, citation 7285259 was issued for that circumstance and citation 7285258 was issued for another part of the mine during the E01 inspection conducted concurrent with this E06 investigation for this standard. A total of 185 feet of berms were missing at dumping locations throughout the entire mine including the area of the fatal accident. This violation is an unwarrantable failure to comply with a mandatory standard.

5. A 104(a) citation, number 7610685, was issued to Farrell-Cooper Mining Company for a violation of 30 CFR 77.207. Illumination was not sufficient to provide safe working conditions on the west pit overburden dump site. Only the lights from the mobile equipment operating on the dump area were present. The nearest portable light plant was located 900 feet to the east of the dump area. Those lights did not supply sufficient illumination, shadows were present along the edge of the southeast side and the south end of the dump site preventing identification of the edges of the dump. This condition contributed to the fatal accident that occurred on this dump on November 16, 2007, at this mine.

Appendix A

List of persons participating in the investigation:

Farrell-Cooper Mining Company Officials

Jay Jantzen	Operations Manager
Greg Bryce	Mine Superintendent
Gary Geraldts	Mining Development Services/ Consultant

Farrell-Cooper Mining Company Employees

Night Shift

David Butler	Track hoe operator/ Night shift foreman
James Fleetwood	Dozer Operator
Justin Wheatley	Truck Driver
Chris Roxin	Truck Driver
Robert Pierce	Dozer Operator

Day Shift

James Green	Blaster Helper
Josh Sparger	Truck Driver
Clayton Bryce	Truck Driver
Gabriel Aguilar	Truck Driver
Pam Pickworth	Payroll Clerk

Department of Mines, State of Oklahoma

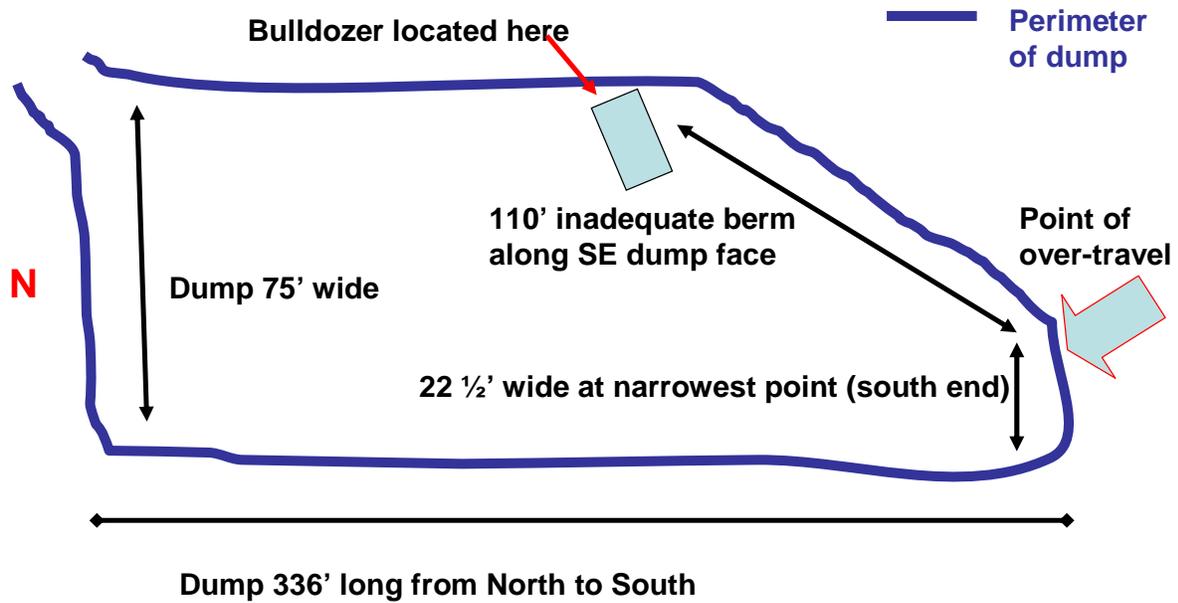
Mike Darneal	Mine Inspector
Kevin Woody	Mine Inspector
Doug Cross	Reclamation Inspector/ Argonomist
Rhonda Dossett	Administrator of Coal Program

Mine Safety and Health Administration

Scott A. Markve	Lead Accident Investigator
Jimmy J. Stewart	Accident Investigator
Wayne Johnson	Accident Investigator
George Nadzadi	Educational Field Services Supervisor
Jeffrey S. Moninger	Mechanical Engineer

Appendix B

West Pit Spoil Dump Measurements



Appendix C

View of Dump from North Persons Standing Near Point of Over-Travel Tire Marks from Truck Visible on Dump Surface



Appendix D

Close-up View from North End of Dump at Point of Over-travel Tire Marks Visible on Dump Surface



Appendix E

View of Pit with Shovel Located Approximately at Location when Accident Occurred - Path of Truck from Dump to Pit



Appendix F

Haul Truck after Removal from Water



Appendix G

**Light Plant Located in Circle
Approximately 900 Feet from
Point of Truck Over-Travel on Dump**



Appendix H Victim Data Form

Accident Investigation Data - Victim Information

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



Event Number:

Victim Information:

1. Name of Injured/Ill Employee: <i>Jack Ward</i>		2. Sex <i>M</i>	3. Victim's Age <i>66</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: 11/16/2007 b. Time: 20:48</i>				7. Date and Time Started: <i>a. Date: 11/16/2007 b. Time: 18:00</i>	
8. Regular Job Title: <i>176 Truck driver</i>		9. Work Activity when Injured: <i>055 Operate haul truck</i>			10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
11. Experience a. This Work Activity: <i>0 1 3</i>		b. Regular Job Title: <i>0 1 3</i>		c. This Mine: <i>0 1 3</i>	
12. What Directly Inflicted Injury or Illness? <i>126 Water</i>				13. Nature of Injury or Illness: <i>110 Drowning</i>	
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input checked="" type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment: (If different from production operator) <i>Operator</i>				Independent Contractor ID: (if applicable)	
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>					
17. Part 50 Document Control Number: (form 7000-1) <i>220073270033</i>			18. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>		

Victim Information: