FAI-6972101-1

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface
(Crushed and Broken Limestone)

Fatal Machinery Accident
March 15, 2023

Fort Pierce Mine
Florida Rock Industries Inc
Port Saint Lucie, Saint Lucie County, Florida
ID No. 08-00899

Accident Investigators

Timothy Schmidt
Mine Safety and Health Inspector

Edward White
Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
Birmingham District
1030 London Drive, Suite 400
Birmingham, AL 35211
Brian Thompson, District Manager

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OVERVIEW

On March 15, 2023, at approximately 1:15 p.m., Kenneth Wright, a 42 year-old excavator operator with nearly three years of mining experience, drowned when the bank of the pit sloughed, and the excavator he was operating toppled into 25 feet of water. The cab of the excavator submerged completely, and Wright was unable to escape.

The accident occurred because the mine operator did not: 1) use appropriate mining methods to ensure bank, slope, and ground stability where the excavator was required to work, and 2) examine, and where applicable, test ground conditions as warranted during the work shift.

GENERAL INFORMATION

Vulcan Materials Company owns Florida Rock Industries Inc, which operates the Fort Pierce Mine. This is a surface crushed and broken limestone mine located in Port Saint Lucie, Saint Lucie County, Florida. Fort Pierce Mine employs five miners and operates one ten-hour shift, five days per week. Miners drill and blast coquina limestone rock into an open, water-filled pit, and excavators remove the rock from the water to a temporary stockpile on shore. A front-end loader moves the rock to an onsite portable crushing plant where the rock is crushed and sized before it is again stockpiled and sold to the construction industry.

The principal management official at Fort Pierce Mine at the time of the accident was:

Steven Wakelee	Plant Supervisor

The Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection at this mine on December 12, 2022. The 2022 non-fatal days lost incident rate for Fort Pierce Mine was zero, compared to the national average of 1.26 for mines of this type.

DESCRIPTION OF THE ACCIDENT

On Wednesday, March 15, 2023, at 6:00 a.m., Wright, Quinton Williams, and Austin Williams, Equipment Operators, arrived at the mine to begin their shift. Wright's normal duties were to discuss and assign tasks to other hourly miners on-site, conduct workplace examinations, and operate the Caterpillar 390F L Excavator (excavator). According to interviews, during normal mining operations, Wright extracted previously blasted limestone from the water-filled pit with the excavator and stockpiled it on the ground adjacent to the pit. This extraction was done by operating the excavator on top of the previously blasted loose rock on the edge of the bank adjacent to the pit.

According to interviews, at approximately 1:00 p.m., Wright returned from a lunch break and resumed operating the excavator. At approximately 1:15 p.m., the edge of the bank where the excavator was operating became unstable and the excavator toppled into the water-filled pit. Q. Williams was operating a front-end loader in the plant area and witnessed the excavator topple into the water. Q. Williams drove the loader around the plant and walked to the edge of the water in the area where the excavator had been operating and could not see any part of the excavator. Q. Williams did not see Wright come to the surface of the water. Q. Williams called Wakelee on the radio and informed him what had happened. Wakelee traveled to the pit and could not see the excavator or Wright in the water. Wakelee called Iris Diaz, Scale Clerk, who called 911 at 1:15 p.m. and reported the accident.

At 1:31 p.m., the Saint Lucie County Sheriff's Office Search and Rescue Team was sent to the mine. The sheriff's officers used a submersible Remotely Operated Vehicle (ROV) to try and observe the conditions of the excavator under the water. James Wills, Lieutenant/Dive Team Commander for the Saint Lucie County Sheriff's Office, determined that conditions were too dangerous for divers to enter the water at this time.

On March 16, 2023, Underwater Engineering Services, Inc. (UESI), an underwater recovery specialist contractor, was brought to the site by the mine operator. UESI deployed their ROV and underwater sonar to evaluate the conditions under the water. At 6:10 p.m., Carson DeLeo, Diver for UESI, located the cab of the excavator, broke a window, and recovered Wright from the cab. DeLeo brought Wright to shore and David Dionisio, Detective for the Saint Lucie County Sheriff's Office, pronounced Wright dead at 6:10 p.m. Adrienne Sauder, Saint Lucie County Coroner, performed an autopsy and determined the cause of Wright's death was drowning.

INVESTIGATION OF THE ACCIDENT

On March 15, 2023, at 1:21 p.m., Drew Taylor, Safety Coordinator for Vulcan Materials Company, contacted the Department of Labor National Contact Center (DOLNCC). The DOLNCC contacted David Allen, Assistant District Manager. Allen contacted Rory Smith, Staff

Assistant, who sent Scottie Sizemore, Supervisory Mine Safety and Health Inspector, and Richard Woodall, Mine Safety and Health Inspector, to the mine. At 3:45 p.m., Woodall arrived at the mine and issued an order under the provisions of Section 103(k) of the Mine Act to ensure the safety of the miners and preservation of evidence. At 4:35 p.m., Sizemore arrived at the mine to assist Woodall. Smith also contacted Timothy Schmidt and Edward White, Mine Safety and Health Inspectors, and sent them to the mine. Smith assigned Schmidt as the lead accident investigator.

On March 16, 2023, Schmidt and White arrived at the mine to continue the investigation. The investigation team conducted an examination of the accident scene, interviewed miners and mine management, and reviewed conditions and work practices relevant to the accident. See Appendix A for a list of persons who participated in the investigation.

DISCUSSION

Location of the Accident

The accident occurred in the south quarry pit area at the edge of the water (see Appendix B). Wright was operating the excavator on top of previously blasted, unconsolidated material on the water's edge. Wright had the excavator positioned at an approximate, 45-degree angle to the bank as had been company policy since a previous incident at the site involving sloughing material at the edge.

Weather

The weather at the time of the accident was 63-degrees Fahrenheit with cloudy skies and seven mile per hour winds. Investigators determined that weather did not contribute to the accident.

Mining Method

The mining at the Fort Pierce Mine is done by drilling, and blasting adjacent to the water-filled pit. The last blasting event before the accident occurred on February 28, 2023. The blasting fractures over 24 feet of rock, approximately three feet of which remains above the water's surface. The excavator is operated on top the loose blasted material to extract it from the water. The excavator operator mines material to a depth of 24 feet, which is the bottom of the preferred ore body. According to interviews, the excavator does not reach the bottom of the pit floor but extracts as much material as it can reach. The visibility through the water in the pit is extremely low and the excavator operator cannot see the material below the water's surface to observe the conditions of the pit bank beneath the excavator (see Appendix C).

This general mining method was consistent at the mine, including at the time of an incident approximately a year ago, when too much material was removed from the pit bank. This caused the pit bank to slough, and the excavator to fall into the water. The mine operator had to remove the excavator from the water. The mining method did not ensure the material the excavator operated on top of was stable. This previous event should have been sufficient to put the mine operator on notice of the potential ground failure because of the mining method used; however, the mine operator did not implement adequate changes to prevent a recurrence. Investigators determined this contributed to the accident.

Equipment Involved

The excavator involved in the accident was a 2017 Caterpillar Model 390F L Hydraulic Excavator (see Appendix D). As of the date of this report, the excavator remains in the water-filled pit and is not able to be viewed or physically inspected. From the statements provided by the divers, the excavator is lying on its side with the door of the cab on the downward side of the machine. This could not be visually confirmed as the water is very murky, providing less than 1 foot of visibility. According to interviews of the mine operator and miners, the excavator was equipped with a functional seat belt and a window breaking device. Wright also wore a CO2-inflated flotation device around his waist. When Wright was recovered from the excavator, the device was still around his waist and not inflated. Investigators were unable to determine if any safety defects existed that may have contributed to the accident.

Training and Experience

On March 16, 2023, Brett Chiccarello and Orlando Rivera, Mine Safety and Health Training Specialists, arrived at the mine to review training plans and records. Wright worked at the mine for nearly three years and operated the excavator for the last two years. Wright was a leadman at the mine for approximately one year and was responsible for assigning work to other miners and doing workplace examinations. Chiccarello and Rivera determined that Wright received MSHA Part 46 New Miner Training on April 7, 2020, and his last Annual Refresher Training on January 17, 2023. The mine operator gave Wright task training on the Caterpillar 390F L Hydraulic Excavator on August 4, 2021. All training was conducted in accordance with MSHA Part 46 training regulations.

Examinations

Wakelee conducted a workplace examination and ground condition examination in the south quarry area on the day of the accident at approximately 6:30 a.m. Wakelee did not report any adverse safety conditions. According to a MultiBeam Hydrographic Survey taken during the investigation, the bank where Wright was operating the excavator was undercut at some point during Wright's shift (see Appendix E). An adequate ground condition examination as the conditions changed during the shift would have identified the undercut bank that created the unstable ground. Investigators determined that the mine operator did not examine, and where applicable test, ground conditions as warranted during the work shift, which contributed to the accident.

Equipment operators conducted pre-operational inspections of their equipment. Due to the submerged excavator and the pre-operational inspection record being in the cab, investigators are unable to determine if Wright conducted a pre-operational inspection of the excavator on the day of the accident. According to interviews, Wright did not verbally report any defects or problems with the excavator on the day of the accident.

Communication

According to interviews, the excavator and front-end loader were equipped with citizens band (CB) radios. Wright did not report any problems or hazards after returning to the excavator and did not issue an emergency call over the radio when the accident happened. Investigators determined that communication issues did not contribute to the accident.

ROOT CAUSE ANALYSIS

The accident investigation team conducted an analysis to identify the underlying causes of the accident. The team identified the following root causes, and the mine operator implemented the corresponding corrective actions to prevent a recurrence.

1. Root Cause: The mine operator did not use appropriate mining methods to ensure bank, slope, and ground stability where the excavator was required to work.

   Corrective Action: The mine operator has developed and implemented new policies and procedures, and has changed their mining methods by replacing the excavator with a dragline which places the miner back from the hazard of the edge of the pit. The mine operator has trained all miners on the new policies and procedures.

2. Root Cause: The mine operator did not examine, and where applicable test, ground conditions as warranted during the work shift.

   Corrective Action: The mine operator's new mining method reduces exposure to hazardous ground conditions at the edge of the bank while draglines excavate material. The mine operator developed and implemented a new written procedure for conducting ground condition examinations as conditions warrant for the new mining method. The mine operator trained all miners on the new procedure.

CONCLUSION

On March 15, 2023, at approximately 1:15 p.m., Kenneth Wright, a 42 year-old excavator operator with nearly three years of mining experience, drowned when the bank of the pit sloughed, and the excavator he was operating toppled into 25 feet of water. The cab of the excavator submerged completely, and Wright was unable to escape.

The accident occurred because the mine operator did not: 1) use appropriate mining methods to ensure bank, slope, and ground stability where the excavator was required to work, and 2) examine, and where applicable, test ground conditions as warranted during the work shift.

Approved By:

_____ _____

Brian Thompson Date
District Manager

ENFORCEMENT ACTIONS

1. A 103(k) order was issued to Florida Rock Industries Inc.

   A fatal accident occurred on March 15, 2023, at approximately 1:15 p.m. This order is being issued under the authority of the Federal Mine Safety and Health Act of 1977, under Section 103(k) to insure the safety of all persons at the mine, and requires the operator to obtain the approval of an authorized representative of MSHA of any plan to recover any person in the mine or to recover the mine or affected area. This order prohibits any activity in the affected area. The operator is reminded of the obligation to preserve all evidence that would aid in investigating the cause or causes of the accident in accordance with 30 CFR 50.12.

2. 104(d)(1) citation was issued to Florida Rock Industries Inc for a violation of 56.3130.

   On March 15, 2023, at approximately 1:15 p.m., a fatal accident occurred at this mine when an excavator operator drowned after the bank of the pit sloughed, causing the excavator he was operating to topple into 25 feet of water. The cab of the excavator submerged completely, and the excavator operator was unable to escape. The excavator was operated on top of broken, loose rock at the edge of the bank and the excavator operator was not able to see the slope or position of the rock below the water. The mine operator did not use appropriate mining methods to ensure bank, slope, and ground stability where the excavator was required to work. The mine operator engaged in aggravated conduct constituting more than ordinary negligence in that they were aware of the potential for the excavator to topple into the water. This violation is an unwarrantable failure to comply with a mandatory standard.

3. A 104(a) citation was issued to Florida Rock Industries Inc for a violation of 56.3401.

   On March 15, 2023, at approximately 1:15 p.m., a fatal accident occurred at this mine when an excavator operator drowned after the bank of the pit sloughed, causing the excavator he was operating to topple into 25 feet of water. The cab of the excavator submerged completely, and the excavator operator was unable to escape. According to a MultiBeam Hydrographic Survey taken during the investigation, the bank where Wright was operating the excavator was undercut at some point during Wright's shift. An adequate ground condition examination as the conditions changed during the shift would have identified the undercut bank that created the unstable ground. Investigators determined that the mine operator did not examine, and where applicable test, ground conditions as warranted during the work shift.

APPENDIX A – Persons Participating in the Investigation

Vulcan Materials Company

Gregory Duckett	Area Safety Manager
Drew Taylor	Safety Coordinator

Florida Rock Industries Inc

Steven Wakelee	Plant Supervisor
Austin Williams	Equipment Operator
Quinton Williams	Equipment Operator
Iris Diaz	Scale Clerk

Underwater Engineering Services, Inc.

Randall Bazemore	Supervisor
Jesse Buford	Diver
Carson DeLeo	Diver
Jeremiah Duncan	Diver
Eric Maringione	Diver

Saint Lucie County Sheriff's Office

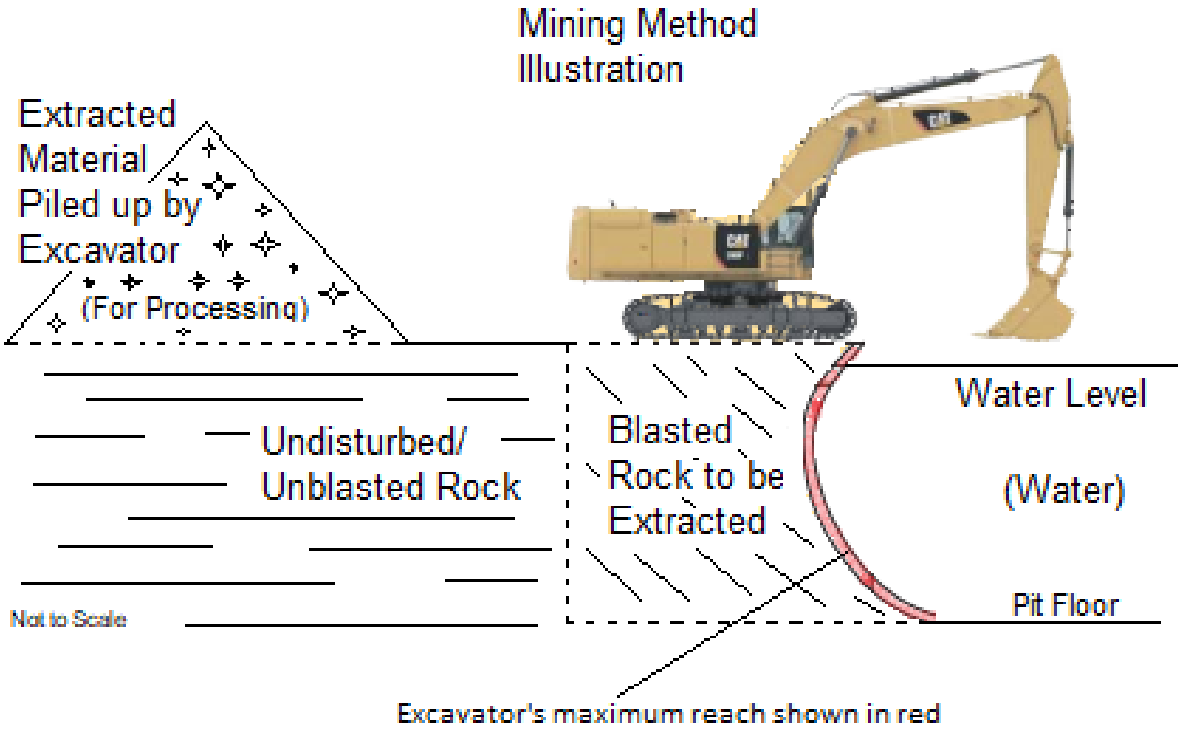
David Dionisio	Detective
James Wills	Lieutenant/Dive Team Commander
Kayla Lee	Crime Scene Investigator

Mine Safety and Health Administration

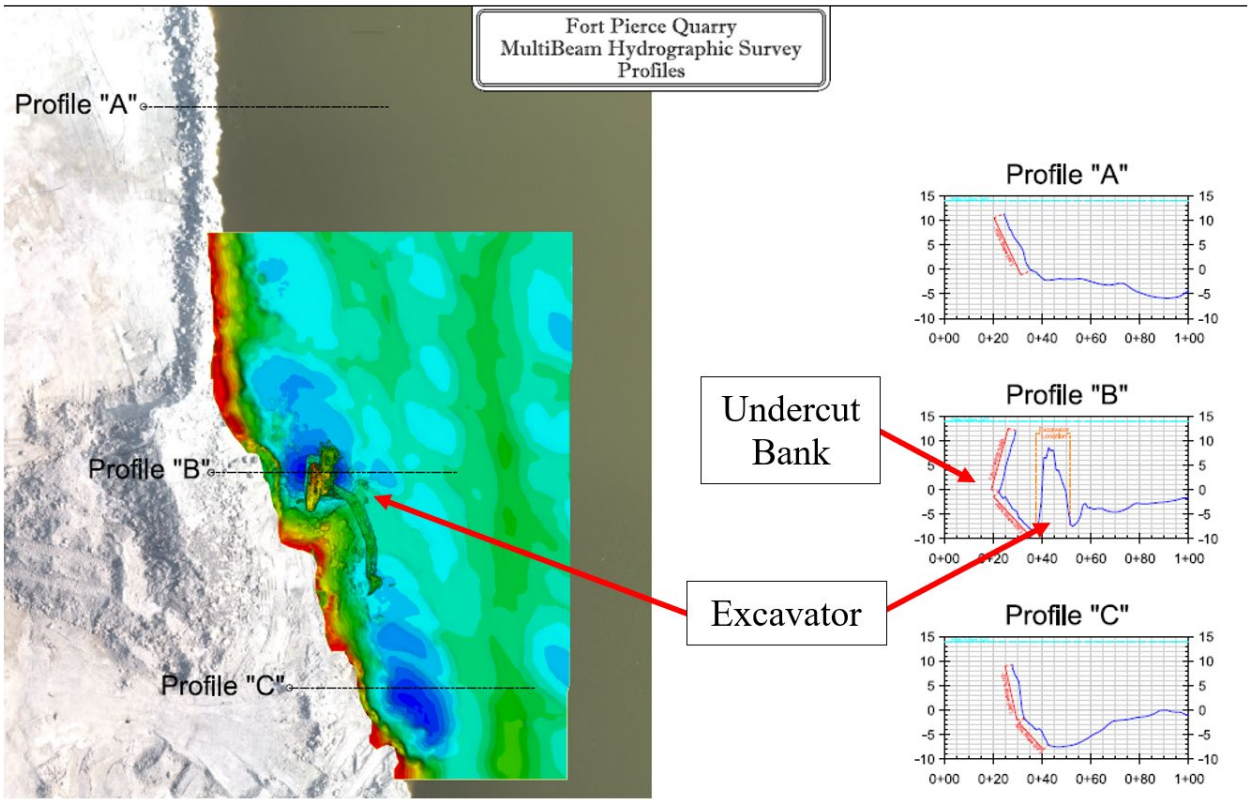
Scottie Sizemore	Supervisory Mine Safety and Health Inspector
Timothy Schmidt	Mine Safety and Health Inspector
Edward White	Mine Safety and Health Inspector
Richard Woodall	Mine Safety and Health Inspector
Brett Chiccarello	Mine Safety and Health Training Specialist
Orlando Rivera	Mine Safety and Health Training Specialist

APPENDIX B – Aerial View of Mine

APPENDIX C – Mining Method Illustration



APPENDIX D – Caterpillar Model 390F L Hydraulic Excavator


Fort Pierce Quarry
MultiBeam Hydrographic Survey
Profiles
Profile "A"
Profile "B"
Profile "C"
Undercut Bank
Excavator
Profile "A"
Profile "B"
Profile "C"
15
10
5
0
-5
-10
0+00
0+20
0+40
0+60
0+80
1+00