MAI-2018-11

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Dimension Granite Mine)

Fatal Falling, Rolling, or Sliding Rock Accident
October 11, 2018

Jet Mist tm Quarry
Georgia Stone Industries, Inc.
Rapidan, Culpeper County, Virginia
Mine ID No. 44-00141

Investigators

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Mine Safety and Health Inspector

Jason J. Dibble
Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
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OVERVIEW

Rony Gustavo Acosta Ordonez, a 26-year old Laborer with approximately one year of experience at the mine, was fatally injured on October 11, 2018, while performing secondary breakage operations on a block of granite. Acosta Ordonez was standing on a previously sawed slab of granite, attempting to further separate the slab from the highwall. He fell between the slab and the highwall when the slab broke free.

The accident occurred because the mine operator did not: (1) ensure that work was being performed from a location that did not expose persons to danger during the secondary breakage operation; (2) examine ground conditions; (3) provide adequate task training; and (4) make sure miners were using fall protection.

GENERAL INFORMATION

Georgia Stone Industries, Inc. owns and operates Jet Mist tm Quarry, a surface dimension granite mine located in Rapidan, Culpeper County, Virginia. Antonio C. Ramos, President, is the principal official and Patrick Bouchard, Quarry Foreman, is in charge of health and safety at the mine. The mine operates five days a week with one, ten-hour shift per day and employs twelve miners.

The granite is sawed into slabs and sized at trimming stations inside the quarry. Three to four large slabs of granite are prepared for sequential removal from the highwall by drilling vertical holes from the top of the highwall and horizontal holes at the base of the highwall face. An electrically powered, track-mounted diamond wire saw is used to cut through the drilled holes to produce a 6-foot slab from the 50-foot highwall. After cutting, expandable hydro-bags are placed in the cut and a portable pressure washer is used to inflate the hydro-bags to move the slab away from the highwall. Next, an excavator is used to push or pull the slab onto the pit floor. When the slab cannot be pushed from the top of the highwall with hydro-bags, the excavator is used to pull it down. The slabs are then sawed into smaller pieces or blocks at onsite trimming stations. The mine sells the finished product to the dimension stone industry.

The Mine Safety and Health Administration (MSHA) completed its last regular inspection of the operation on July 26, 2018.

DESCRIPTION OF ACCIDENT

Approximately three weeks prior to the accident, the top portion of a slab along the south facing highwall dislodged at a fault and was removed from the highwall leaving a partial slab. On October 11, 2018, Rony Gustavo Acosta Ordonez (victim) began work at 7:00 a.m., his normal starting time. For approximately 4.5 hours, Acosta Ordonez operated a saw at a trimming station located to the east of the south facing highwall on the first level of the quarry. When Acosta Ordonez completed trimming at approximately 11:30 a.m., he placed a portable 28-foot extension ladder at the base of the partial slab and climbed to the top to assess conditions since he intended to start the slab removal process later that day.

After a lunch break, at approximately 1:30 p.m., Acosta Ordonez and Fredy Pablo Francisco, Wire Saw Operator, returned to the south facing highwall and began the slab removal process. Acosta Ordonez accessed the top of the partial slab using the extension ladder and strategically placed two steel inflatable hydro-bags into the sawed cut between the slab and the highwall. Francisco stood on the first level of the quarry near the pressure washer, approximately 50 feet away. When Acosta Ordonez signaled Francisco, he activated the pressure washer to inflate the hydro-bags. As the hydro-bags were inflating, Acosta Ordonez placed small rocks into the widening gap to keep the cut open. However, after approximately 24 minutes, the slab broke along a faulted plane near the bottom of the highwall and the slab began to fall, breaking into large pieces. Acosta Ordonez was not wearing fall protection and fell in between the large broken pieces of the slab and the highwall. Francisco witnessed Acosta Ordonez disappear behind the crumbling slab.

Deltwan Tramone Payne, Sr., Front-End Loader Operator, was hauling large rocks from the pit to the waste pile located at the top level of the quarry. On his return to the lower level of the quarry, Payne noticed several miners near the shop area looking toward the south facing highwall and waving to get his attention. Payne knew Acosta Ordonez and Francisco were working near the highwall. Payne stopped his front-end loader near the mine office and went inside to notify Bouchard he suspected something occurred in the pit.

Bouchard immediately left the office and traveled to the pit. Francisco informed Bouchard what had happened and they could not see where Acosta Ordonez had fallen. Bouchard repeatedly called out for Acosta Ordonez, but there was no response. At 2:00 p.m., Bouchard returned to the mine office and called 911 to request emergency assistance. At approximately 2:11 p.m., Captain Nicholas R. White and Lieutenant Ashleigh K. Baughan of the Culpeper County Sheriff Department arrived onsite and began an initial assessment of the accident scene. At 3:03 p.m., first responders reached Acosta Ordonez, who was wedged behind a block of stone and pronounced him dead. Since a large amount of broken granite had to be moved, the victim's body was not recovered until approximately 8:45 p.m. that evening.

INVESTIGATION OF THE ACCIDENT

Bouchard called Joseph Bosley, Staunton, Virginia Field Office Supervisor, at 2:00 p.m. on October 11, 2018, to inform him of the accident and that they could not locate Acosta Ordonez. Bouchard said this was probably a fatality and he needed to call 911. At 2:30 p.m., Bouchard informed Bosley that they located Acosta Ordonez under a fallen slab of granite and emergency medical crews were onsite. At that time, Bosley issued an order under the provisions of Section 103(k) of the Mine Act to ensure safety of the miners.

MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident site, interviewed miners, and reviewed conditions and work procedures relevant to the accident. See Appendix A for persons participating in the accident investigation. MSHA conducted the investigation with the assistance of inspectors from the Commonwealth of Virginia Department of Mines, Minerals, and Energy, mine management and miners.

DISCUSSION

Location of Accident

The accident occurred along the south facing highwall on the first level of the quarry. (See Appendix C Figures 1 and 2 for accident scene photos).

Weather

Weather reports on the day of the accident indicated partly cloudy skies with a temperature of 79˚ F. Investigators did not consider weather conditions to be a factor in the accident.

Mining Method

The mine's operating procedure is to remove a granite slab in one piece (50 feet tall by 6 feet thick in various lengths). Approximately three weeks prior to the accident when attempting to pull the entire slab from the south facing highwall, the top portion of the slab dislodged along a fault and had to be removed from the highwall. Mine management was aware of the occurrence. According to miners interviewed, the top portions of slabs dislodge about two to four times per month. Since the mine pulls approximately ten slabs per month, this equates to approximately 30 percent of total production being pulled in a similar manner. The mine operator did not, however, establish additional safety precautions for times when slabs break off at various heights and miners have to follow up by pulling partial slabs. At the time of the accident, the victim and a coworker had begun to remove the remaining portion of the slab (23 feet tall by 6 feet thick) from the south facing highwall.

Equipment Involved

The victim used a 28-foot fiberglass extension ladder to access the top of the partial slab for placement of the hydro-bags. The investigators found the ladder to be in good operating condition.

At the time of the accident, the victim was installing hydro-bags into the cut along the south facing highwall. The expandable hydro-bags were metal and 39 inches long by 39 inches wide. The hydro-bags were filled with high pressure water to create an approximate 4-inch to 5-inch opening behind the slab.

Fall Protection

When fall protection is used, the miners install an anchor point (drilled hole with metal bar inserted 6 feet back from the edge of the highwall) and attach sufficient lengths of lanyard for each job task. All necessary equipment (jack-hammer, airlines, air compressor, steel bars, etc.) is provided and available for the miners. The investigators found three completely functional, full body safety harnesses and enough lanyards, of varying lengths, to provide adequate fall protection for the victim. However, climbing from the ground level to the top of the slab would have necessitated dropping an anchored lanyard from the top of the highwall to the slab below for the victim's use. The victim's coworker stated, prior to the accident, he had asked the victim whether or not the victim was going to use fall protection. According to the coworker, the victim answered he was only going to be on top of the slab for a few minutes and did not use fall protection.

Training and Experience

Rony Gustavo Acosta Ordonez had 3 years and 22 weeks mining experience. A representative of MSHA's Educational Field and Small Mines Services (EFSMS) staff conducted a review of the mine operator's training plan and records. In November 2017, Acosta Ordonez completed 8

hours of Newly Hired Experienced Miner training. In September 2018, he received 8 hours of Annual Refresher Training.

In November 2017, the victim received task training for wire saw operation and slab pulling procedures. The victim worked at the Jet Mist tm Quarry for approximately one year and was familiar with the work environment.

The mine operator's training records indicated all mine personnel, including the victim, were trained in the use of fall protection.

The mine operator's established procedures only addressed pulling large slabs in one piece and miners were trained accordingly. However, even though slabs were not always pulled as intended, the mine operator did not provide task training to miners, including the victim, on additional safety precautions necessary once the upper portion of a slab had been removed, which occurred frequently during the mining process.

ROOT CAUSE ANALYSIS

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

- Root Cause: Management did not have policies, procedures and controls for secondary breakage**.** In preparation for secondary breakage, mine management did not ensure that work was being performed from a location that did not expose persons to danger.

  Corrective Action: Mine management developed policies, procedures and new training materials for secondary breakage. The workforce at the mine was retrained using the new policies, procedures and training materials, with additional emphasis on procedures to remove partial slabs. This plan addresses where personnel are to be positioned during the various phases of slab pulling.

- Root Cause: Mine management did not examine ground conditions, including evidence of prominent faulting, along the south facing highwall prior to work commencing in the area. Approximately three weeks prior to the accident, the upper portion of the slab dislodged along a fault and was removed. Mine management did not evaluate and test the stability of the slab and take necessary steps to prevent a recurrence.

  Corrective Action: Mine management developed policies, procedures and new training materials for secondary breakage. The workforce at the mine was retrained using the new policies, procedures and training materials, with additional emphasis on procedures on examining ground conditions. This plan addresses examinations of ground conditions and actions to be taken to address any hazardous conditions found.

- Root Cause: Mine management did not provide adequate task training to the victim in order to perform his assigned duties safely, including safe work procedures and where to position oneself, once the upper portion of a slab has been removed.

  Corrective Action: The mine operator trained miners in a newly developed task training plan with procedures for secondary breakage. This plan addresses safe work procedures and where personnel are to be positioned during the various phases of slab pulling.

- Root Cause: The mine operator did not assure miners used fall protection where there was a danger of falling. Management did not have policies, procedures and controls for using fall protection when partial slabs, created during secondary mining, were removed.

  Corrective Action: The mine operator purchased additional fall protection equipment and trained miners in a newly developed plan with procedures for secondary breakage. This plan addresses and requires the use of fall protection in any area where there is a danger of falling.

CONCLUSION

Rony Gustavo Acosta Ordonez was fatally injured when the partial slab of granite he was standing on, as he attempted to separate it from the highwall, broke and he fell between the slab and the highwall. The accident occurred because the mine operator did not: (1) ensure that work was being performed from a location that did not expose persons to danger during the secondary breakage operation; (2) examine ground conditions; (3) provide adequate task training; and (4) make sure miners were using fall protection.

ENFORCEMENT ACTIONS

Order No. 9411867 – Issued on October 11, 2018, under the provisions of section 103(k) of the Mine Act.

> *A fatal accident occurred at this operation on October 11, 2018, when two miners were attempting to move a large block of diabase trap rock from the wall. A verbal 103k order was issued at 1430 hrs via telephone to Patrick Bouchard, manager, by field office supervisor, Joseph Bosley. This order is issued to assure the safety of all persons at this operation. It prohibits all activity at the No. 1 and No. 22 bench and surrounding floor until MSHA has determined that it is safe to resume normal mining operations in the area. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or restore operations to the affected area.*

Citation No. 9416657 – Issued January 18, 2019, under the provisions of Section 104(a) of the Mine Act for a violation of 56.3400:

104(a) S&S Occurred-Fatal-High Negligence

> *On October 11, 2018, a laborer was fatally injured at this mine as a result of falling from the top of a previously sawn slab (or block) of granite along the south facing highwall. The laborer stood on top of the slab and placed two inflatable metal water bags into the sawed cut between the slab and the highwall to widen the cut. As the bags were inflated, the slab suddenly dislodged along a faulted plane near its base. The abrupt downward movement of the slab caused the victim to fall between the crumbling pieces of the slab and the highwall, resulting in fatal injuries. This was not an unusual occurrence at the mine where approximately 30 percent of the slabs similarly dislodge along faults and the remaining portions of the slabs had to be removed at a later date. A prominent fault near the base of the remaining portion of the slab should have alerted mine management to potential failure. In preparation for secondary breakage, mine management failed to take necessary steps to ensure that work was being performed from a location that did not expose persons to this danger.*

Citation No. 9416658 – Issued January 18, 2019, under the provisions of Section 104(a) of the Mine Act for a violation of 56.3401:

104(a) S&S Occurred-Fatal-High Negligence

> *On October 11, 2018, a fatal accident occurred at this mine when a laborer fell from the top of a previously sawn slab (or block) of granite along the south facing highwall. The laborer had stood on top of the partial slab and placed two inflatable metal water bags into the sawed cut between the slab and the highwall to widen the cut. As the bags were inflated, the slab suddenly dislodged along a faulted plane near its base. The abrupt downward movement of the slab caused the victim to fall between the crumbling pieces of the slab and the highwall, resulting in fatal injuries. Mine management failed to examine ground conditions, including evidence of prominent faulting, along the south facing*

highwall prior to work commencing in the area. Approximately three weeks prior to the accident, the top portion of the slab had dislodged along a fault and was removed. Mine management failed to, examine, evaluate, and test the stability of the partial slab, and take necessary steps to prevent miners from being exposed to dangerous ground conditions.

Citation No. 9416659 – Issued January 18, 2019, under the provisions of Section 104(a) of the Mine Act for a violation of 46.7(a):

104(a) S&S Occurred-Fatal-High Negligence

On October 11, 2018, a fatal accident occurred at this mine when a laborer was fatally injured as a result of falling from the top of a previously sawn slab (or block) of granite along the south facing highwall. The laborer stood on top of the slab and placed two inflatable metal water bags into the sawed cut between the slab and the highwall to widen the cut. As the bags were inflated, the slab suddenly dislodged along a faulted plane near its base. The abrupt downward movement of the slab caused the victim to fall between the crumbling pieces of the slab and the highwall, resulting in fatal injuries. Approximately three weeks prior to the accident, the top portion of the slab dislodged along a fault and had to be removed. The victim accessed the top of the remaining portion of the slab by climbing up a ladder from the base of the slab. Mine management failed to provide adequate task training to the victim in order to perform his assigned duties safely, including safe work procedures and where to position himself, once the upper portion of a slab had broken off and been removed.

Citation No. 9416660 – Issued January 18, 2019, under the provisions of Section 104(a) of the Mine Act for a violation of 56.15005:

On October 11, 2018, a fatal accident occurred at this mine when a laborer was fatally injured as a result of falling from the top of a previously sawn slab (or block) of granite along the south facing highwall. The laborer stood on top of the slab and placed two inflatable metal water bags into the sawed cut between the slab and the highwall to widen the cut. As the bags were inflated, the slab suddenly dislodged along a faulted plane near its base. The abrupt downward movement of the slab caused the victim, who was not wearing fall protection, to free fall between the crumbling pieces of the slab and the highwall, resulting in fatal injuries.

Approved By: _____ Date: _____

Peter J. Montali
District Manager

Appendix A
Persons Participating in the Investigation
(Persons interviewed are indicated by an * next to their name)

Georgia Stone Industries, Inc.

Fredy Pablo Francisco*	Wire Saw Operator
Patrick Bouchard*	Quarry Foreman
Timothy Rex Mullins*	Foreman
Juan Alberto Meza*	Mechanic
Samuel Hernandez Carballo*	Trim Saw Operator
Alber Vazquez Rodriguez*	Articulating Truck Operator
Wilson Martinez Lopez*	Equipment Operator
Deltwan Tramone Payne Sr.*	Front-End Loader Operator
Clemente Gonzalez Francisco*	Equipment Operator
Nicolas D. Philemon	New Miner/ Trim Saw Trainee
Antonio C. Ramos	President
Ann Marie Ramos	Chief Financial Officer (CFO)

Quarry Permit Environmental Training Services LLC

David H. Cress*	President

Culpeper County Sheriff Office

Ashleigh K. Baughan	Lieutenant
Nicholas R. White	Captain
Jose L. Vazquez	Detective (Translator)

Office of the Medical Examiner – Manassas, Virginia

Wayne Perry	Investigator
Megan Kessler*	Doctor

Commonwealth of Virginia Department of Mines, Minerals, and Energy

Bruce Hutchinson	Mine Inspector
John Guth	Mine Inspector
Paul E. Saunders	Mine Inspector Supervisor

Mine Safety and Health Administration

Dennis A. Yesko	Assistant District Manager
Rodney L. Rice	Supervisory Mine Safety and Health Inspector
Michael J. Wynkoop	Mine Safety and Health Inspector
Jason J. Dibble	Mine Safety and Health Inspector
Jose A. Morales	Mine Safety and Health Inspector
Ricky Boggs	Mine Safety and Health Specialist (EFSMS)

Appendix B
Victim Information

Accident Investigation Data - Victim Information

Event Number: 6 8 1 5 6 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:
Rony G. Acosta Ordonez	*M*	*26*	*01 Fatal*

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 10/11/2018 b.Time: 15:03	*a. Date: 10/11/2018 b.Time: 7:00*

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
116 Slab pulling	*099 Slab pulling*	Yes X No

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	*0*	*46*	*6*	b. Regular Job Title:	*0*	*48*	*0*	c: This Mine:	*0*	*48*	*0*	d. Total Mining:	*3*	*22*	*2*

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
089 Broken granite rocks fell on victim.	*170 Broken granite rocks fell on victim.*

13. Training Deficiencies:

Hazard: | New/Newly-Employed Experienced Miner: | Annual: | Task: X

14. Company of Employment: (If different from production operator)

Operator

Independent Contractor ID: (if applicable)

15. On-site Emergency Medical Treatment:

Not Applicable: | First-Aid: | CPR: | EMT: | Medical Professional: | None: X

16. Part 50 Document Control Number: (form 7000-1)

17. Union Affiliation of Victim: *9999* *None (No Union Affiliation)*

Appendix C
Accident Scene Photos

Figure 1 - Expanded View of the South Facing Highwall (Accident Scene)

Figure 2 - Close-up View of the Location where the Victim was Found