

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface
(Industrial Sand)

Fatal Drowning Accident
March 22, 2022

AMI Silica LLC
AMI Silica LLC
Hixton, Jackson County, Wisconsin
ID No. 47-03742

Accident Investigators

Amy Jackson
Mine Safety and Health Inspector

Linda Arzt
Mine Safety and Health Specialist

George Schorr
Staff Assistant

Originating Office
Mine Safety and Health Administration
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Duluth, MN 55802
Christopher Hensler, District Manager

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OVERVIEW

On March 22, 2022, at approximately 9:30 a.m., Tony Killian, a 44 year-old heavy equipment operator, with over six years of mining experience, died when a pump raft he was working on capsized, causing him and another miner to fall into a stormwater retention pond. Killian became entangled with the pump raft, causing him to drown.

The accident occurred because the mine operator: 1) did not provide safe access for miners to repair the pump and pump raft equipment, 2) did not properly train miners working on pump raft equipment and safe work procedures, and 3) used pump raft FVT-1 beyond the designed capacity intended by the manufacturer by allowing miners to use pump raft FVT-1 as a work platform while performing maintenance and repairs.

GENERAL INFORMATION

Athabasca Minerals Inc. and JMAC Energy Services LLC own AMI Silica LLC, which operates the AMI Silica LLC mine. The mine is a surface industrial sand mine located near Hixton, Jackson County, Wisconsin. AMI Silica LLC employs 39 miners and operates three shifts per day, seven days per week. The mine has been operated by AMI Silica LLC since June 2, 2021.

The principal management officials at the AMI Silica LLC mine at the time of the accident were:

Nathaniel Kitzrow
Chad Losinski

General Manager
Plant Manager

The Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection at this mine prior to the accident on October 27, 2021. The 2021 non-fatal days lost incident rate for AMI Silica LLC was zero, compared to the national average of 1.36 for mines of this type.

DESCRIPTION OF ACCIDENT

On March 22, 2022, at 5:30 a.m., Killian started his shift. At approximately 6:00 a.m., Killian, Daniel Grulkowski, Quarry Equipment Operator, and Ryan Schroeder, Quarry Lead, drove a pickup truck to Pond P15, a stormwater retention pond, to survey ice conditions. Schroeder had assigned the task of replacing the discharge pipes on the pumps to Killian and Grulkowski the previous day. Killian, Grulkowski, and Schroeder were checking whether the ice had melted so that they could access the pump rafts, which hold the pumps above water and in place on Pond P15.

Schroeder determined that Killian and Grulkowski could access the pump rafts because there was no ice restricting access to them. At approximately 8:00 a.m., Schroeder, Killian, and Grulkowski drove back to the main shop. Schroeder left Killian and Grulkowski at the main shop to start his duties as quarry lead. Killian and Grulkowski drove a pickup truck to the lower maintenance shop where they retrieved tools and supplies and drove back to Pond P15. Killian and Grulkowski donned lifejackets and took a 14-foot rowboat to pump raft FVT-1, where they removed a section of the pump's discharge pipe. Killian and Grulkowski took the boat to pump raft P-701, where they completed the re-connection of the discharge pipe. They returned to shore after completing the re-connection. Killian and Grulkowski drove to the lower maintenance shop to pick up materials to complete repairs to the pump at pump raft FVT-1.

After collecting the materials, Killian and Grulkowski returned to Pond P15, donned life jackets, and took the boat to pump raft FVT-1. They tied the boat to pump raft FVT-1, climbed out of the boat, and onto pump raft FVT-1 to begin installing the discharge line that they had previously removed. As Killian began bolting the discharge pipe to the pump, the float Killian was standing on detached and pump raft FVT-1 capsized, causing Killian and Grulkowski to fall into the water. Grulkowski surfaced and did not see Killian, so he began searching for Killian. Grulkowski was unable to locate Killian. When pump raft FVT-1 capsized, it caused water to fill the boat. Grulkowski swam to shore to call for help.

Schroeder stopped heavy equipment operation at the mine due to rainfall and picked up Sean Tracy, Heavy Equipment Maintenance Lead, and Nathan Gran, Heavy Equipment Operator. Schroeder, Tracy, and Gran drove to check on Grulkowski and Killian to assess if they should stop work at Pond P15 due to the rain. As Schroeder, Tracy, and Gran arrived at Pond P15, they observed Grulkowski running toward them waving his arms. Grulkowski informed Schroeder that pump raft FVT-1 had capsized, and that Killian had not surfaced and was still in the water.

Schroeder contacted Losinski by cell phone and asked him to call 911. At 9:33 a.m., Adam Johnson, Maintenance Manager, was standing next to Losinski, overheard the conversation, and called 911. Tracy and Gran donned life jackets and swam to pump raft FVT-1 to search for Killian but could not locate him.

At 9:46 a.m., the Jackson County Sheriff Department arrived, followed by Taylor Fire Department, Taylor First Responders, Hixton Fire Department, and Black River Falls Fire Department. A telehandler and a second boat were brought to Pond P15. Two members of the Taylor Fire Department boarded the boat and used the telehandler to push the boat to the capsized pump raft FVT-1. Taylor Fire Department attached tow straps to the capsized pump raft FVT-1 and pulled it near shore, at which point Killian was disentangled from the raft and removed from the water. Jean Spencer, Jackson County Deputy Coroner, pronounced Killian dead at 11:35 a.m.

INVESTIGATION OF THE ACCIDENT

On March 22, 2022, at 10:15 a.m., Kitzrow called the Department of Labor National Contact Center (DOLNCC). The DOLNCC contacted William Soderlind, Supervisory Mine Safety and Health Inspector. Soderlind contacted Gerald Holeman, Assistant District Manager, who sent Linda Arzt, Mine Safety and Health Specialist, and George Schorr, Staff Assistant, to the mine. Holeman also sent Amy Jackson, Mine Safety and Health Inspector, to the mine as the lead accident investigator. At 12:45 p.m., Arzt arrived at the mine and issued an order under the provisions of Section 103(k) of the Mine Act to assure the safety of the miners and the preservation of evidence. Arzt and Schorr interviewed witnesses and gathered preliminary evidence.

On March 23, 2022, at 8:54 a.m., Jackson arrived at the mine and continued the investigation by conducting an examination of the accident scene, interviewing miners and mine management, and reviewing conditions and work practices relevant to the accident. See Appendix A for a list of persons participating in the investigation.

DISCUSSION

Location of the Accident

The accident occurred at pump raft FVT-1, located on Pond P15 (see Appendix B). Pond P15 is a retention pond. The pond depth ranges from 8 to 11 feet and is approximately 145 feet wide, and 180 feet long. Water from Pond P15 is used to replenish process water when needed.

Weather

At the time of the accident, there was light rain with temperatures in the low 40s and variable winds of six to nine miles per hour. Investigators determined that weather at the time of the accident did not contribute to the accident.

From mid-December 2021 through mid-March 2022, thick ice developed on the pond that was likely at least 16 inches thick. The ice was estimated to be 4 to 6 inches thick the day before the accident. The ice pressure squeezed the portion of the floats below the ice surface level while

the steel frame restrained the portion of the floats above the ice surface level through the bolted connections at the slots in the floats. Due to this restraint at the top, the squeeze from the ice pressure put additional stress on the plastic shell near each of the four bolt locations on each float. The operating manual for the pump raft states, “It is recommended that pumping equipment not operated during freezing conditions be removed from the water to prevent damage from ice heaving and shifting.”

After the raft was removed from the water, investigators took custody of sections of the pump raft’s plastic floats and turned them over to MSHA Technical Support (TS). MSHA TS examined the materials and determined that pre-existing cracks at the bolt connection locations on the four floats (see Appendix E) were either:

1. Caused by high stress in the plastic due to ice pressure when it had been frozen in place each winter since it was purchased in 2017, or
2. Caused by a combination of the ice pressure and overtightening of the anchor bolts during installation or maintenance.

Investigators determined that leaving the pump raft in the pond during freezing weather conditions each winter since it was purchased in 2017 contributed to the accident.

Equipment Involved

The pump raft involved in the accident was a Turbi-Float Floating Pump System that was manufactured by Canfield Custom Pumps (Canfield). The floating pump system consisted of an Emerson 60-horsepower motor, a Canfield pump with a 500 gallons per minute capacity, a steel frame, and four floats manufactured by Carolina Waterworks, Inc. The pump raft was placed into service during the summer of 2017 and was in Pond P15 for five winters. Each plastic float was connected to the steel frame of the pump raft by four, 3/8-inch diameter by 4.7-inch-long bolts that passed through the frame and the slot in the top flange. A 1.75-inch diameter flat washer and nut on the underside of the flange secured the floats to the frame. The plastic floats were model E900, and each were two feet wide, two feet tall, and four feet long (see Appendix C).

A warning label on each side of the pump raft states, “WARNING This float system is designed to support only specific matching models of pumps produced by Canfield Custom Pumps. Inc., and should not be used as a platform for any other purpose such as support of people, animals, or any other equipment (see Appendix D). Any use other than that prescribed by the manufacturer may result in a capsized condition, which may cause injury, damage, or death.” The warning labels are available to be viewed by anybody accessing the raft. According to statements by mine management, the mine operator previously brought the pump raft to shore to perform maintenance or repairs. The pump raft was used beyond the design capacity intended by the manufacturer when the miners used it as a working platform. Investigators determined that this contributed to the accident.

When Killian stood on Float 4 of pump raft FVT-1 to connect the discharge line to the floating pump system, his weight and the weight of the discharge line that he was supporting caused the pre-existing cracks on Float 4 to propagate and the four bolt connections to fail (see Appendix

F). Float 4 dislodged from beneath the frame and the pump raft FVT-1 capsized, trapping Killian underneath.

Safe Access

Bringing the pump raft to shore provides safe access to perform maintenance and repairs. The mine operator did not assure miners brought the pump raft to shore and had knowledge that the miners accessed the pump by climbing onto the pump raft. Investigators determined the mine operator did not provide safe access at the time of the accident, which contributed to the accident.

Training and Experience

Killian had over six years of surface mining experience, with 40 weeks of experience at the AMI Silica LLC mine. Killian's annual refresher training was conducted in accordance with MSHA Part 46 training regulations. As a part of this investigation, Killian's task training records were reviewed. Killian's training records did not include training on the assigned task of pump raft and pump equipment maintenance and repair. According to interviews, Killian and Grulkowski typically performed maintenance on the pumps and pump rafts. Investigators determined that maintenance of the pumps and pump rafts would have occurred at least seven times before the accident. Investigators determined that lack of training on safe work procedures for this change in the assigned task contributed to the accident.

Examinations

The mine operator assigned Killian to conduct the workplace examination of the area on the morning of March 22, 2022. Investigators were unable to find a record of the workplace examination, and the record is not required to be completed until the end of the shift. Therefore, investigators are unable to determine if Killian conducted a workplace examination.

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 provide safe access for miners to repair equipment on pump raft FVT-1.

Corrective Action: The mine operator will provide safe access on pump raft FVT-1 or any other pump rafts before miners repair pump equipment. The mine operator developed a new written procedure requiring miners to remove pump rafts from the water before performing maintenance or repairs and trained miners on this procedure. Additionally, the mine operator will comply with all warning labels and follow the known safe procedure.

2. Root Cause: The mine operator did not properly train miners assigned to work on pump raft equipment on safe work procedures.

Corrective Action: The mine operator updated the task training section of their training plan to include task training on pump raft and pump equipment maintenance and repair. The mine

operator provided training on health and safety aspects of tasks and safe work procedures to all miners required to work on pump raft and pump equipment.

3. Root Cause: The mine operator used pump raft FVT-1 beyond the designed capacity intended by the manufacturer by allowing miners on pump raft FVT-1 while performing maintenance and repairs.

Corrective Action: The mine operator developed a new written procedure requiring miners to remove pump rafts from the water before performing maintenance or repairs. The mine operator trained all miners on the procedure. Additionally, the mine operator will comply with all warning labels and follow the known safe procedure.

CONCLUSION

On March 22, 2022, at approximately 9:30 a.m., Tony Killian, a 44 year-old heavy equipment operator, with over six years of mining experience, died when a pump raft he was working on capsized, causing him and another miner to fall into a stormwater retention pond. Killian became entangled with the pump raft, causing him to drown.

The accident occurred because the mine operator: 1) did not provide safe access for miners to repair pump and pump raft equipment, 2) did not properly train miners working on pump raft equipment on safe work procedures, and 3) used pump raft FVT-1 beyond the designed capacity intended by the manufacturer by allowing miners to use pump raft FVT-1 as a work platform while performing maintenance and repairs.

Approved By:

Christopher Hensler
District Manager

Date

ENFORCEMENT ACTIONS

1. A 103(k) order was issued to AMI Silica LLC.

A fatal accident occurred on March 22, 2022, at approximately 9:30 a.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 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. A 104(a) citation was issued to AMI Silica LLC for a violation of 30 CFR 56.11001.

On March 22, 2022, a fatal accident occurred at this mine when a pump raft that two miners were working on capsized, causing one miner to drown. The miners were on the pump raft to make a repair and connect the discharge pipe. The mine operator did not provide safe access to allow for repairs and connection of the discharge pipe. The two miners climbed out of the boat onto pump raft FVT-1, which capsized causing both miners to fall into the water.

3. A 104(a) citation was issued to AMI Silica LLC for a violation of 30 CFR 46.7(b).

On March 22, 2022, a fatal accident occurred at this mine when a pump raft that two miners were working on capsized, causing one miner to drown. The two miners performed maintenance on the pumps and pump rafts at least seven times before the accident. However, this was the first time the miners were assigned to replace the discharge pipes on the pumps. Task training did not include the change in the assigned task of replacing the discharge pipes on the pumps.

4. A 104(a) citation was issued to AMI Silica LLC for a violation of 30 CFR 56.14205.

On March 22, 2022, a fatal accident occurred at this mine when a pump raft that two miners were working on capsized, causing one miner to drown. The miners were on the pump raft to make a repair and connect the discharge pipe. The raft was used beyond the design capacity of the manufacturer. A warning label on the raft stated that the raft is designed to support only specific models of pumps and should not be used as a platform for any other purpose such as support for people, animals, or any other equipment. Any use other than that prescribed by the manufacturer may result in a capsized condition, which may cause injury, damage, or death. The pump system has remained in the pond since purchased in 2017 and the owner's manual recommended that the pumping system be removed from the water during freezing temperatures to prevent damage from ice heaving and shifting.

APPENDIX A – Persons Participating in the Investigation

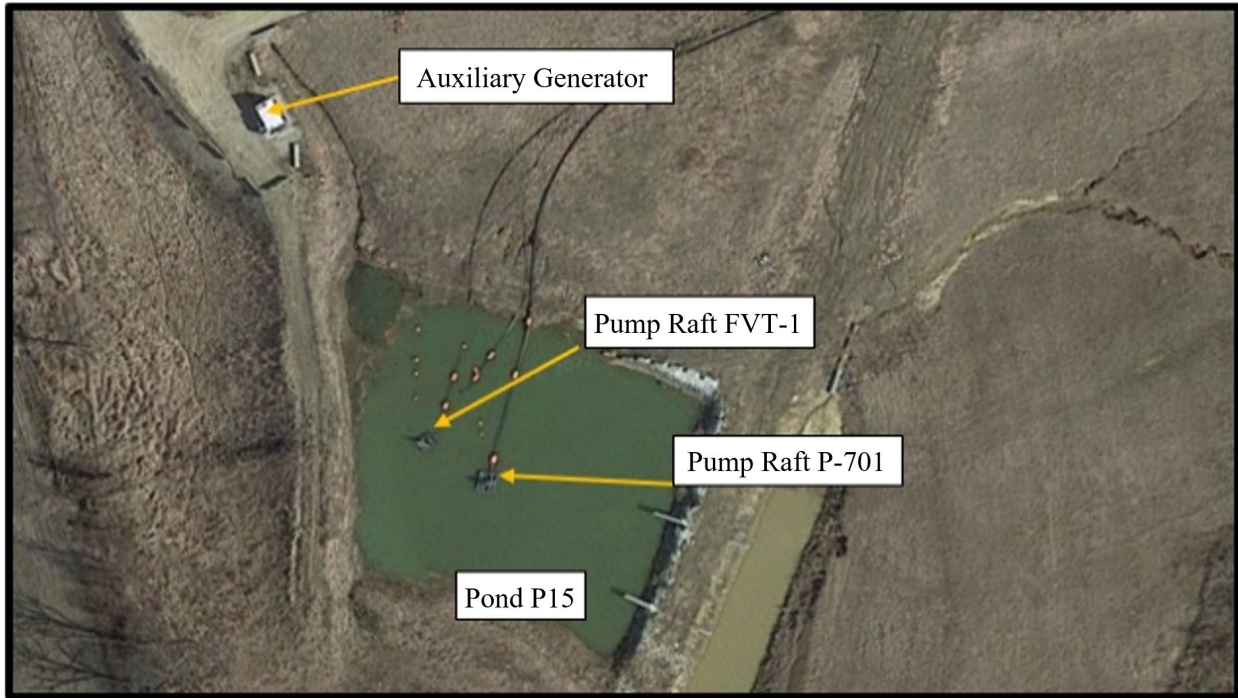
AMI Silica LLC

Dana Archibald	President
Nathaniel Kitzrow	General Manager
Wayne Stoner	Operations Manager
Chad Losinski	Plant Manager
Adam Johnson	Maintenance Manager
Sean Tracy	Heavy Equipment Maintenance Lead
Ryan Schroeder	Quarry Lead
Daniel Grulkowski	Quarry Equipment Operator
Nathan Gran	Heavy Equipment Operator

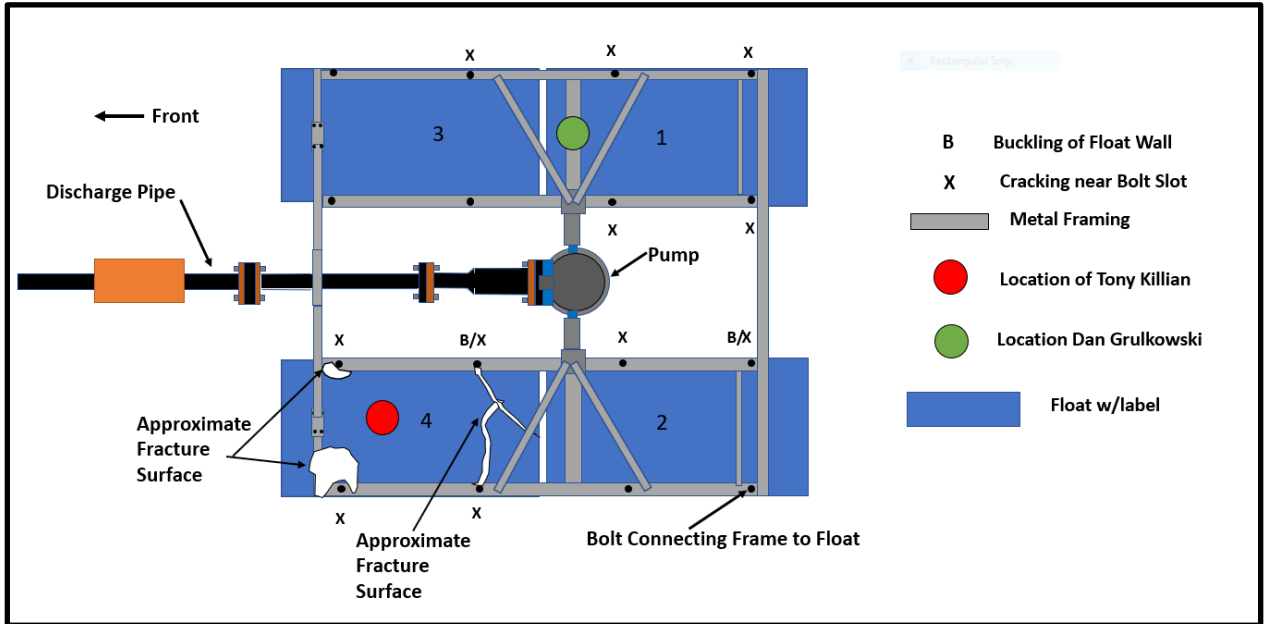
Mine Safety and Health Administration

George Schorr	Staff Assistant
Linda Arzt	Mine Safety and Health Specialist
Amy Jackson	Mine Safety and Health Inspector
Terence Taylor, P.E.	Senior Civil Engineer, Technical Support
Michael Superfesky, P.E.	Civil Engineer, Technical Support

APPENDIX B – Aerial View of Pond P15 Stormwater Retention Pond



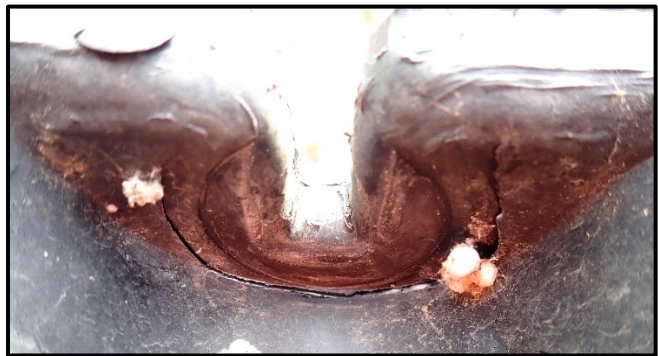
APPENDIX C – Plan View Diagram of Pump Raft FVT-1



APPENDIX D – Pump Raft FVT-1 Warning Label



APPENDIX E – Cracks in Other Three Floats



Float 1 – Plastic shell cracked at the rear inner and front inner bolt locations.



Float 1 – Plastic shell cracked at the front outer and rear outer bolt locations.



Float 2 – Plastic shell cracked at the front inner and rear inner bolt locations.



Float 2 – Plastic shell sidewall buckled at rear inner and Float 3 – Plastic shell cracked at rear outer bolt locations.

APPENDIX F – Float 4

