DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

REPORT ON EXPLOSION

Harmar Mine

CONSUMERS MINING COMPANY

Harmarville, Allegheny County, Pa.

August 7, 1918.

Reported by -
George S. McCaa.

INTRODUCTION

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About 3:20 o'clock on the afternoon of August 7, 1918, an explosion of gas occurred near the bottom of the shaft of the Harmar Mine, located at Harmarville, Allegheny County, Pa. Of the eight men who were in the mine at the time - five were killed outright; the other three died a few days later from the effects of burns and noxious gases.

The mine was an old property which had not been operated for about ten years and the workings covered a small area of about an acre and a half. Dewatering of the mine had been completed a day or two before and five men were moving the pump from a point near the shaft to a place closer to the sump, a distance of about 60 feet, when the explosion occurred. The other three men were placing buntings and guides in the shaft.

LOCATION AND OWNERSHIP

The Harmar Mine is located at the town of Harmarville, Allegheny County, Pennsylvania, being in District No. 29 of the State Bituminous Inspection Department. Harmarville is on the Conemaugh branch of the Pennsylvania Railroad and lies about 12 miles northeast of Pittsburgh.

The Mine is owned by the Consumers Mining Company, which is a subsidiary corporation of the La Belle Iron Works of Steubenville, Ohio. R. W. McCasland is General Superintendent of mines with offices in the Bessemer Building, Pittsburgh, Pa., and R. B. Blackburn, Mine Superintendent at Harmarville, Pa.

GEOLOGY

The coal is about 90 feet below the surface, the shaft being sunk in an old quarry bed, the face of which is about 30 feet high and lies on the northwest side of the shaft. The Allegheny River is situated about 1500 feet to the south of the property and it is proposed by the Company to ship the coal both by water and rail to their steel plant at Steubenville, Ohio. The coal which has a slight dip to the southwest is the upper and lower Freeport seams combined. The two seams are separated by a slate and bony band from 4" to 12" thick, the upper seam averaging about 48" in thickness and the lower 36".

It is stated that the upper seam has a variable high ash and sulphur content, and that the lower seam contains about 4% of ash and less than 1% of sulphur.

ROOF

The roof is a good quality of shale. During the time the mine was standing idle and as a result of the explosion only a small .. amount has fallen.

FLOOR

The floor is a hard shale and heaving has not been experienced.

MOISTURE

At the time of the explosion the mine was very damp and wet on account of having just been pumped out. Drippers were ... noticed in many parts of the mine and indications are that the mine would be damp as development progressed.

GAS

It is understood that the mine, when previously operated, was considered non-gaseous and open lights were used. Two small gas feeders were noticed during the examination. Six air samples were taken after ventilation had been restored, the places where same were obtained being noted on the attached map. (See appendix for analyses). No examination for gas was made during the dewatering of the mine. Members of an engineering party, while surveying, had experienced trouble in keeping a light in Koehler flame safety-lamps and exchanged these for electric flash lights, which were used to finish the survey.

DEVELOPMENT AND DRAINAGE

One shaft comprised the only opening of the mine and the workings were very limited in extent. The water was pumped out of the shaft by an electrical driven centrifugal pump which delivered about 500 gallons of water per minute, the voltage being 250 D.C.

LIGHTING

The only lights that were supposed to have been used, excepting those carried by the surveying party, were incandescent lamps. A special feed wire was taken down the shaft to supply the light required by the men employed in moving the pump.

VENTILATION

Since there was only one opening to the mine, the west side of the shaft had been boarded off and was used for an air compartment. Prior to the explosion natural ventilation was employed, altho a fan had been installed. Put into operation a short time after the explosion occurred, the fan was delivering 2340 cubic feet of air per minute at the time of the investigation, which was several days later.

STORY OF THE EXPLOSION

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On the day of the explosion weather conditions were normal. The day was hot and clear as the weather had been for several days previous. The shift of eight men had changed at 3 P.M. Three men were placing bunting and guides in the shaft and five were moving the pump. The explosion occurred at 3:20 P.M. August 7, 1918, with such violence that the three men, who were working in the shaft, about 40 feet below the collar, were blown to the surface where they landed 30 or 40 feet away from the shaft. The hoisting equipment was also completely wrecked.

Within five minutes after the explosion, Superintendent Blackburn was at the shaft and upon calling down got an answer. A

...rope was obtained nearby and let down. Two men were then pulled out by hand and the rope was let down again and a third man was brought to the surface. No response could be gotten from the other two men who were in the mine. It was shown afterwards that they were killed instantly.

RECOVERY WORK

On the afternoon of the explosion at 3:45 o'clock the Bureau of Mines at Pittsburgh was notified of the explosion, aid being requested by General Superintendent R. W. McCasland. At 4:05 P.M. Rescue Truck No. 2 with the following party left Pittsburgh:-

G. S. McCaa, Asst. Coal Mining Engineer, U.S.Bureau of Mines
J.J.Bourquin, " " " " " " "
Bert W. Dyer, " Mine Safety Engineer " " "
John H. Zorn,Foreman Miner " " "
Harry Burdelsky, Laboratory Assistant " " "
Thomas Hammond, Inspector Hicks Coal Company,
W. N. Riggs, Inspector Associated Companies.

The latter two had just completed rescue training at the Pittsburgh Station. The party arrived at the scene of the explosion at 5:45 P.M. and held a conference with the mine officials.

The explosion had destroyed the air compartment of the shaft and before the arrival of the Bureau of Mines' party, the officials had lowered several lengths of brattice cloth down the shaft along the air compartment which tended to restore this compartment. It was considered advisable to start the fan and try to clear at least some of the after damp from the shaft, as it was felt certain that there was no fire in the mine on account of its wet condition.

The fan was started but shut down after about five minutes owing to the fact that its housing, which had been destroyed by the explosion and was being reconstructed, was not sufficiently completed to hold air without a very large loss.

At 6:40 P.M. McCaa and Zorn, wearing Gibbs rescue apparatus, were lowered into the mine in a bucket operated by a hemp rope and hand crab, these two being the first to enter the mine after the explosion. They explored the condition of the workings looking for the bodies of Smith and Zinck, the two men who were still in the mine. After an investigation which lasted about thirty minutes, they returned to the surface, reporting that they were unable to locate the bodies and other conditions that they had found.

The work of tightening the fan housing was completed about 7:30 P.M. and the fan started under the direction of State Inspector King,who had arrived about 7:00 P.M.

At 8:45 P.M. the hoisting bucket was lowered into the mine containing a lighted flame safety-lamp and canary bird. About ten minutes later it was brought to the surface and upon its arrival the lamp was still lighted and the bird showed no ill effects.

At 8:57 P.M. McCaa wearing rescue apparatus, and Inspector King, without apparatus, were lowered to the shaft bottom, inspecting the shaft and bottom, but not leaving the bucket. They returned to the surface at 9:10 P.M. and reported finding the body of Smith on a ledge of rock 15 feet above the shaft bottom pinned down by the discharge pipe of the pump which had broken and dropped upon him.

... A rope was then fastened around the discharge pipe near the surface and it was hoisted a short distance to clear the ledge and let down to the bottom.

Dyer and Zorn, wearing apparatus, entered the mine at 9:40 P.M. and at once sent the body of Smith to the surface. After this, they started cleaning the shaft bottom of debris, which was about four feet high, so as to be able to land the hoisting bucket and turn the air in the main aircourse. While cleaning this debris the body of Zinck was discovered.(Indicated on blue print as No.2). The work of cleaning up the wreckage, uncovered the body of Zinck, and turning air into main aircourse continued until 11 P.M., when they returned to the surface. Fagan and Fuge of the Ford Collieries Company's rescue team, which had arrived at the mine ten minutes ahead of the Bureau of Mines' party, and Hammond and Riggs of the Bureau's party, all wearing rescue apparatus, were lowered into the mine at 11:30 P.M. and the body of Zinck was brought to the surface. This ended the work for that day and the Bureau's party returned to Pittsburgh at 3 A.M. August 8th.

EVIDENCE

In addition to assisting in the recovery work, ... B. W. Dyer and the writer made an investigation of the accident on August 20, 1918. The dip workings on the west and south sides of the shaft showed no indications of violence from the explosion. It was found that the force had gone in three directions from a point marked "X" on the attached map which would indicate that the explosion

... originated there or nearby. Owing to the damp and wet condition of the mine evidence of coking was not observed. The explosive wave appeared to travel from the point marked "X" towards the faces of Butts A and B and then rebound out and up the shaft, the men who were working in the shaft being blown to the surface and hurled in various directions with great violence.

The two bodies which were found near the bottom of the shaft were badly burned and bruised. Smith had evidently been blown 15 feet up the shaft by the explosion, his body being pinned on a ledge by the discharge line of the pump which was broken off and forced to the west side of the shaft. The body of Zinck was covered with about four feet of debris some of which had come from the east side of the mine, the remainder having fallen down the shaft. A rubber boot which had been worn by Zinck, was found on the west side of the shaft about ten feet away. The three men who were rescued shortly after the explosion occurred, but died later from burns and the effects of the afterdamp, had been on the west side of the shaft moving the pump to its new location. As mentioned previously, electric lights were provided for the workmen underground by a cable which was carried down the shaft.

CONCLUSIONS

Analyses of air samples obtained in the mine at the time of the investigation show that methane was being liberated in several places. The circulation of air was very limited prior to the explosion owing to natural ventilation being employed and the difficulty in keeping safety-lamps lighted, which was experienced by the engineering party

.... several days prior to the explosion, would tend to prove that a body of explosive gas was accummulating for some time. Either Smith or Zinck must have ignited this body of gas near the point marked "X" on the attached map by means of an open light of some sort.

The explosion would probably have been avoided had the workings been examined for firedamp as soon as the water was lowered sufficiently to permit same. An explosive mixture having been detected the fan could have been put into operation and sufficient ventilation maintained so that an explosion would not have been probable even tho an open light were carried for any purpose. However, the use of open-flame lamps in the mine is not deemed advisable, permissible electric cap lamps being recommended. A thoro inspection of all accessible places by a competent fire-boss carrying a flame safety-lamp of an approved type before a shift begins work is essential. Another opening for the mine is very necessary in order to properly ventilate the workings and afford a second means of escape for the workmen in time of danger.

The Bureau is indebted to General Superintendent R. W. McCasland and the other officials of the Consumers Mining Company who extended every courtesy and cooperated with the investigators in accummulating data for this report.

Respectfully submitted,

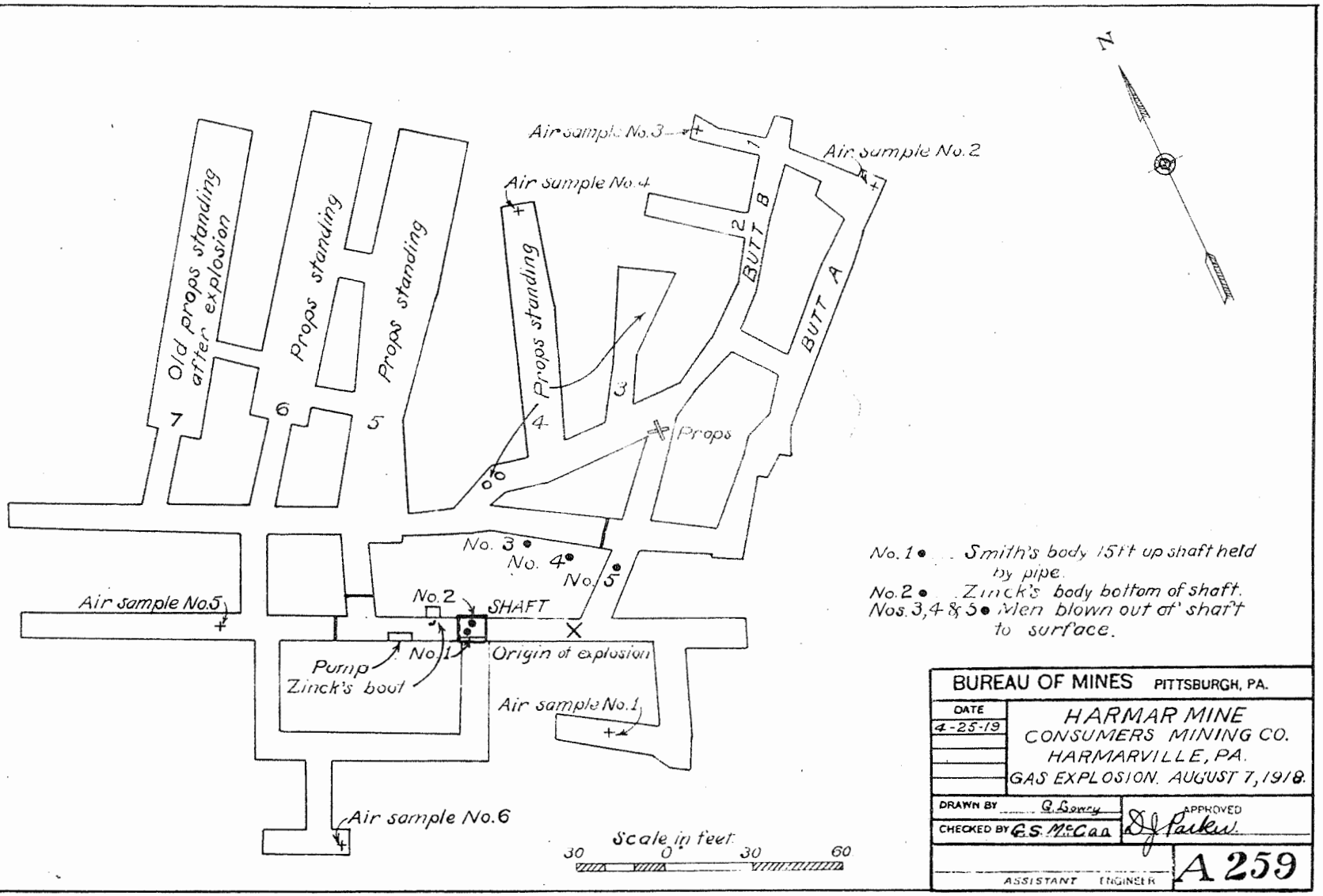
George S. McCaa

Assistant Mine Safety Engineer.

APPROVED:

J. W. Paul

Chief of Coal Mining Investigations.



No. 1 ● Smith's body 15 ft up shaft held by pipe.
No. 2 ● Zinck's body bottom of shaft.
Nos. 3, 4 & 5 ● Men blown out of shaft to surface.

BUREAU OF MINES PITTSBURGH, PA.	
DATE 4-25-19	HARMAR MINE CONSUMERS MINING CO. HARMARVILLE, PA. GAS EXPLOSION. AUGUST 7, 1918.
DRAWN BY G. Lowry	APPROVED D. J. Parker
CHECKED BY G.S. McCaa	ASSISTANT ENGINEER
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