Historical

Splash Dam #6 Mine Explosion

A gas and dust explosion occurred about 8:30 a.m. Monday, June 13, 1932 in the No. 6 mine of the Splash Dam Coal Corporation, Splash Dam, Virginia. The explosion was practically confined to the No. 6 main entry, and resulted in the death of the 10 men who were in the mine; of these one was killed outright by violence, three had severe burns, three slight burns and three were evidently killed by afterdamp alone.

The Norton Station of the Bureau of Mines was notified by telephone about 9 a.m. by the secretary of the Virginia Coal Operators' Association, C. B. Neel and shortly after by the District State Mine Inspector, D. E. Stanton. The Norton Safety Station rescue equipment was taken to the mine immediately in the Bureau trucks driven by J. F. Davies and E. H. Hodgson, arriving at 11:30 a.m.

Recovery work had been started at once by mine officials, but had been found defective by State Inspector D. E. Stanton on his arrival at 11:10 a.m.; changes in methods were made and, with the cooperation of the representative of the State, the mining company, the Virginia Coal Operators Association and the Bureau, all the bodies had been recovered by 3 p.m., June 14. Ventilation had been sufficiently restored by Wednesday, the 15th, so that the official investigation could be made. H. B. Humphrey of the Bureau arrived from Washington about 4 p.m., June 14. The official investigation was made on June 16, in which J. F. Davies, E. H. Hodgson, and H. B. Humphrey, of the Bureau of Mines, assisted. Air and dust samples were taken on June 17.

Previous Explosions

On March 24, 1927, gas from a crack in the roof over a longwall in No. 5 mine was ignited by an open light and eight men injured and burned. Standing water prevented the spread of this explosion. The gas accumulated because of a short-circuiting of the air in starting a new wall face.

Since that time, there have been numerous reports of occasional ignitions in these mines without violence or severe injuries.

Location

Mines 5 and 6 of the Spash Dam Coal Corporation are located at Splash Dam, Dickenson County, Virginia. The mine tipple is served by a siding of the C. C. & O, or Clinchfield Railroad, connecting at St. Paul, Virginia, with the N & W Railroad.

Employees and Production

Mines 5 and 6 are operated under one management, with a single general staff. The two mines employ about 165 men and produce about 800 tons per working day. Mine No. 6 employs 20 company men and 60 loaders, all on day shift. The output from this time was about 350 tons a day. Previous to the explosion, the mine was working two or three days a week.

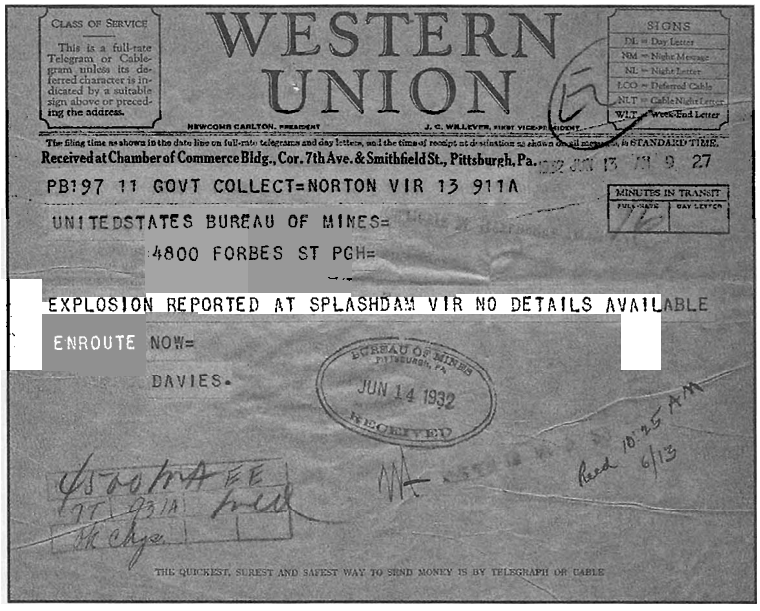
The Mine

Both mines have drift openings; there is one inside connecting entry, which is closed by a board stopping to provide separate ventilation. Mine No. 6 is opened by a double entry system 1,500 feet inby the portal to the 1st north cross entry, where it becomes a triple

entry system for 1,500 feet more to the face. However, there is a break at the rock fault where the 3rd entry is not connected. As far as the 1st north, the No. 6 main haulageway is used for intake and the air course for the main return to the fan.

The Coal Bed

The Splash Dam bed worked at this mine is a hard, bright, bituminous coal. The bed is flat lying, broken by slight faults and undulations due to the Russel Fork fault by which it is exposed at this point. The roof is a sandy shale and the floor is clay underlain by sandstone. The coal is from 40 to 44 inches thick, with a single rock parting of about 1.5 inches.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Received at Chamber of Commerce Bldg., Cor. 7th Ave. & Smithfield St., Pittsburgh, Pa. 1932 JUN 13 PM 9 27

PB197 11 GOVT COLLECT=NORTON VIR 13 911A

MINUTES IN TRANSIT: FULL RATE | DAY LETTER

UNITEDSTATES BUREAU OF MINES=
4800 FORBES ST PGH=

EXPLOSION REPORTED AT SPLASHDAM VIR NO DETAILS AVAILABLE

ENROUTE NOW=
DAVIES.

BUREAU OF MINES PITTSBURGH, PA. JUN 14 1932 RECEIVED

Rec'd 10:25 AM 6/13

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Splash Dam No. 6 Mine – *First telegram sent after the explosion.* *Photo Bureau of Mines*

Coal Analysis

The average analysis of the coal from the Splash Dam bed, as given in Technical Paper 365, "Analyses of Virginia Coal", is as follows: Moisture 2.4 percent, Volatile matter 29.3 percent, fixed carbon 62.7 percent, Ash 5.6 percent and Sulphur .8 percent. The ratio of volatile matter to total combustible, or volatile plus fixed carbon, is 3.18. To render dust of this kind of coal inert and to prevent propagation of an explosion in case no gas is present will require at least 61 percent of incombustible in the dust. Of this amount the moisture and ash content of the coal provide approximately 8 percent.

Coal Preparation

The coal from both No. 5 and No. 6 mines is prepared by screening at the tipple, and loaded into railroad cars by three loading tracks. Screens are of the shaker type, producing slack, 1.25 inch, 2.5 inch, 5 inch and larger lump sizes. About 50 percent is also shipped as "run of mine". A dry cleaning process is used to remove slate by machine operating on the principle of a jig.

Dust

Dust from coal, when suspended in the air, is explosive. From the evidence of propagation and coking, dust played the major part in this explosion. The haulage roads were heavy with dust from coal spilled and broken up in the tracks. The two track cleaners were loading out this fine material from the 1 north parting at the time of the explosion. The entry faces and rooms were also dusty. The "very dusty roads" were mentioned in the last State inspection report, posted in the foreman's office outside the mine on May 11, 1932.

Method of Mining

The double entry, room-and-pillar method of mining was used. About 300 tons of coal per day were taken in advance and 50 tons from pillar extraction. About 25 years is the estimated life of the mine.

All coal except small stumps is undercut by Goodman Lorain shortwall machines, with 6-½ foot cutter bars. It is shot with permissible explosives, fired by fuse and detonators. All coal is hand-loaded.

Rooms are 24 feet wide and are carried from

continued

the entry to the opposite air course. A row of posts 4 feet apart and 30 inches from the rail is set in the rooms, with a safety post at the face. On pillar slabbing a post is set for each car length out.

Ventilation and Gases

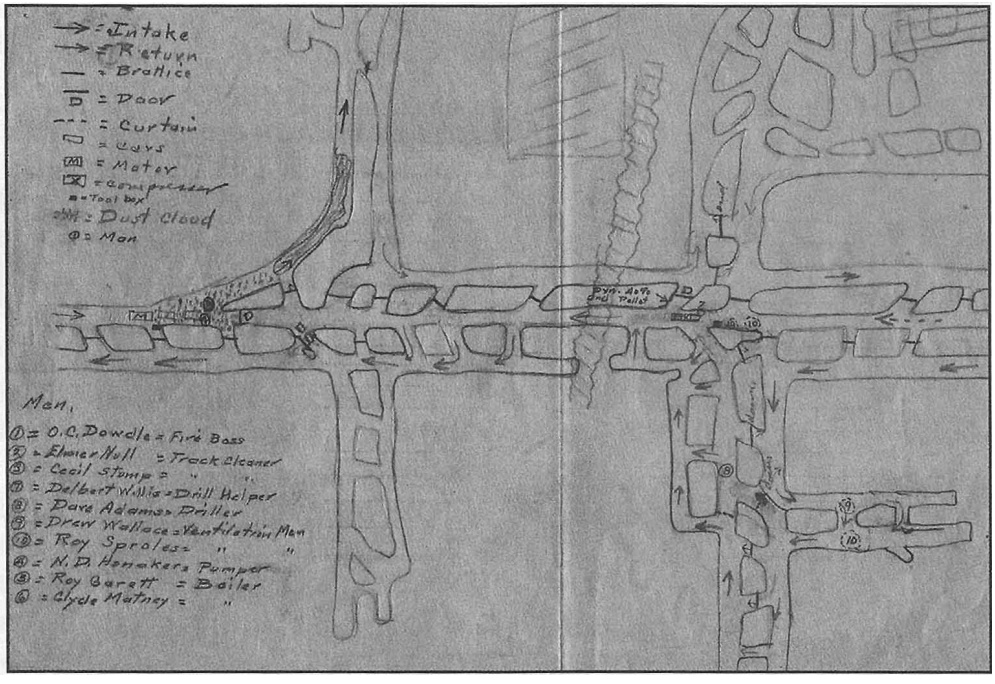
The mine was rated as non-gassy by the Virginia Department of Mines, although gas was known to be present, ignitions had occurred, and a lax fire boss examination was made as a precaution. No record was kept of these examinations.

A Jeffrey disc fan, 6 feet in diameter, operates exhausting at the mouth of the main air course. The water gauge is unknown, but the volume was 33,800 cubic feet per minute as measured on June 16. This is probably more than the normal circulation before the explosion, as the air was not being carried to all sections, some doors not yet having been replaced. The fan is driven by a patent-composition rope drive from a 15 horsepower, 220 volt, alternating-current motor.

The mine was ventilated by a continuous current, with the active advance faces on the last before return to the fan. Ventilation was interrupted by "shorting" the air past idle sections and by shutting down the fan when the mine was idle. Although air was reported as "fair", only a small part of the total intaking air could have reached the active faces, the major part being lost through leaking doors and stoppings. Stoppings were variously pack wall, plastered with clay, brick or board.

The fact that the fan was not damaged was due to the non-propagation of the explosion through the air course.

During later recovery of the faces of the east entries off 1 north, some accumulations of methane were encountered, formed during the time ventilation was cut off.



Splashdam No. 6 Mine – *Map of the No. 6 mine before the accident.* Photo Bureau of Mines

Rock-Dusting and Watering

No rock-dusting has been done in this mine, and no watering is done to allay dust.

Conditions Immediately Prior to the Explosion

The fan was shut down Thursday night, run from early Friday morning to Saturday noon, and was "down" till Monday morning except for the period between 2 and 6 p.m. Sunday. At about 6:45 a.m., June 13, the fan was started before 11 men went into the mine to perform jobs which were necessary or had been left for an idle day. The inside foreman, who acted as fire boss, went in. A rock crew, consisting of a driller, his helper, and a company man, took a motor and compressor outfit to the face of 6 main, and drilled a brushing hole. The fire boss returned to 2 south, where two brattice men were waiting for instructions.

These men had come in with the rock crew. Two track cleaners brought a motor and two cars to 1 north parting and started to clean track. A pump man and two bailers took a motor and some cars, secured brattice lumber in the mine yard, and brought it in. The pump man got off at 1 north and walked in to the pump at the head of that entry. The bailers took the lumber to 2 south at 1 east, outby the curtain, unloaded it, and went into 6 east off 1 north. The company man left the face of 6 main after the hole was drilled and loaded. He passed the fire boss at 2 south and saw the brattice men near by. At the parting to 1 north, he passed the two track cleaners, and found the dust cloud so thick it choked him and made the lights a dim red. He reached the outside and waited in an old drift opening around a curve to see the superintendent about further duties in No. 5 mine. The fire boss gave his Baby Wolfe safety lamp and a flashlight to the bailers as they came out of 2 south, to take with them into 6 east. He then started outside. The driller and his helper had evidently, in the meantime, shot the hole in the face of 6 main and come back to 2 south switch. Here another hole was drilled to provide greater clearance.

When the explosion occurred, the fire boss was about 900 feet from the portal, the drill helper was completing the hole in the rib in 6 main at 2 south, the driller had gone into 2 south presumably to get a rock hammer left at the 1 east switch, and the two brattice men were in 6 main inby the drill helper or in 1 east off 8 south. The explosion occurred about 8:30 a.m.

The flames of the explosion burned leaves for almost 300 feet outby the portal. The fire boss was killed by violence, and the track cleaners by severe burns and suffocation. The drill helper was badly burned above the waist; his lower half protected by the empty car beside him, and fell in his tracks. The driller died immediately from slight burns and suffocation. The two brattice men were burned about the head, but crawled to a point in 2 south air course before being overcome. The pumper and the two bailers were in no danger, as an extensive pool of water stopped the explosion from passing up 1 north. They came out, as shown by the clear foot prints in the dust left by the explosion, and died at once on reaching the parting at 6 main. Had they stayed at 1 east, or broken through to No. 5 mine, they probably would have been saved. Had they been equipped with self-rescuers, they might have been able to pass through the gases and reach outside.

Rescue and Recovery Work

The superintendent, Mr. G. K. Beavers, was about 200 feet from the portal when the explosion occurred. He called the general manager, Mr. G. J. Walker, at Lebanon, Virginia and then went into No. 5 mine and brought out the three men working there who knew nothing of the explosion until told; then put a crew to work placing canvas curtains into the crosscuts between the main haulageway and the main return. These were found to be ineffective by District Inspector Stanton and J.F. Davies of the Bureau, on their arrival.

After studying the map and conferring with Mr. Beavers, it was decided to rebuild the brattices with wood and plaster them with clay. Inasmuch as the fan was not damaged and the main haulage was on the intake, the restoring of ventilation and progress into the mine was rapid.

The first body, that of the fire boss, was found about 900 feet inby the portal of the mine. This body was very badly mutilated and burned. Bodies two and three, which were the motorman and brakeman who were cleaning roads, were found about 1,400 feet inby the portal of the mine; these bodies were burned.

Bodies four, five, and six were found about 75 feet inby the mouth of the first north; these men were undoubtedly overcome by carbon

continued

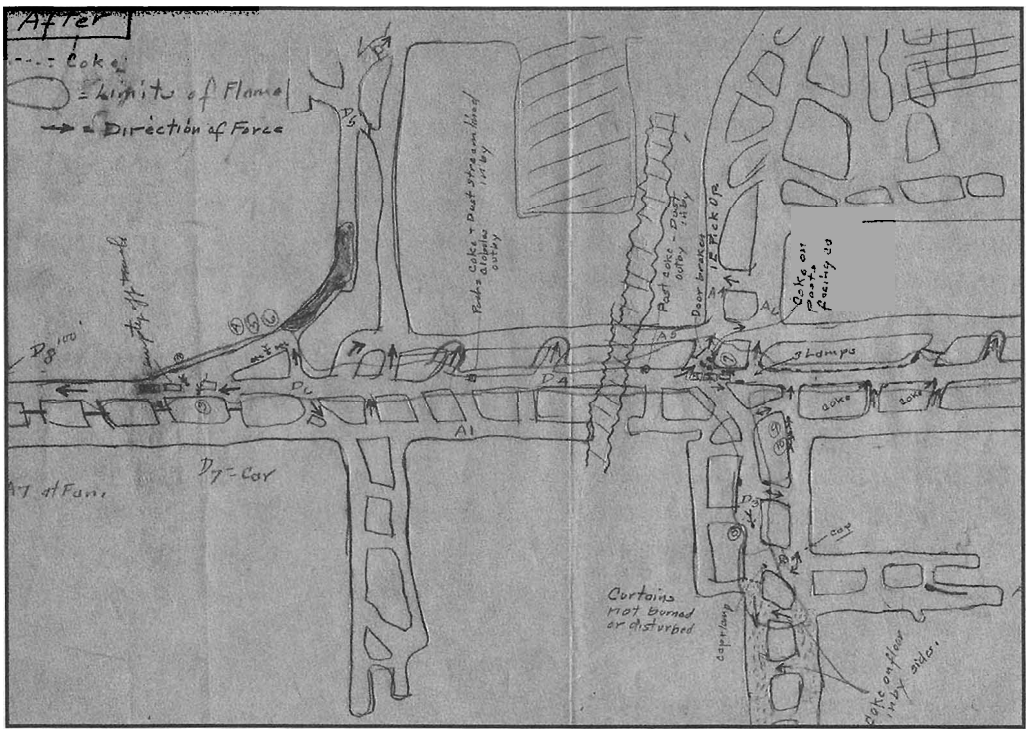
monoxide after traveling for a distance of 2,000 feet. The rescue party, after satisfying themselves that no dangerous gases were coming out of the 1st north, proceeded up the main heading to a distance of about 1,700 feet from the portal. At this point it was necessary to direct the fresh air up the air course on the left and use the main haulage for the return air. This procedure slowed up the work considerably, as the roof in the left-hand entry had not been brushed and was very low.

It was necessary to travel the air course for a distance of 350 feet, which enabled the rescue party to get to the 1st east pick-up. At this point carbon monoxide was encountered bleeding off the 1st east pick-up air course. For a time the fresh air was short circuited through a crosscut to the main heading, where one of the drillers' bodies was found. At this point, realizing it would require some time to clear this condition, it was agreed to withdraw the men to the outside for a short rest while this was being done. However, a curtain was erected in the 1st north, to deflect more air into this section to speed up the clearing.

On re-entering the mine, the main heading was explored to the face and found to be free of carbon monoxide. The rescue party then proceeded to explore the 2 south heading. Body number eight, the driller, was found about 150 feet in the 2 south haulageway. Proceeding up the 2 south haulageway, carbon monoxide was again encountered about 200 feet in. The party retreated to the main heading and erected a canvas brattice across the heading which deflected the fresh air into the 2 south and cleared it in a few minutes. The two missing bodies were found in the 2 south air course.

Mine Conditions After the Explosion

The official underground investigation was made by representatives of the mining company, the State Mining Department, the U.S. Bureau of Mines, and interested Virginia mine officials. The principal damage to the mine found was the blowing out of the stoppings and doors. The force and flame of the explosion apparently picked up in violence from 1 north to the outside. Inby from 1 north to the 5th crosscut from 1 east pick-up, there is evidence of flame in 6 main heading; coke and light soot streamers being found which show movement toward the face. The flames, soot, and coke swept away into 2 south and passed under the curtains the face of the heading slowly and with no violence. Expansion and possible pools of water reduced the



Splash Dam No. 6 Mine – *Map of the No. 6 mine after the accident.* Photo Bureau of Mines

force of the explosion in 1 north; doors were blown out in the east entries off 1 north, as far as 6 east, but no other damage was done.

From the evidence of force and flame observed, and the information gained of the movements of the men, the most probable cause of the explosion appeared to be an ignition of gas at some point in 2 south, which was strengthened and propagated by the dust cloud in 5 main.

Possibly the gas was liberated by the shot fired in the face of the 6th main and was carried slowly along the air course, then into the 2 south and 2 east off 2 south and ignited by an open light worn by the driller or a brattice-man; possibly the concussion of the 6 main shot started a methane accumulation in the face of 1 east off 2 south or in the face of 2 south to move to places where open lights caused the ignition.

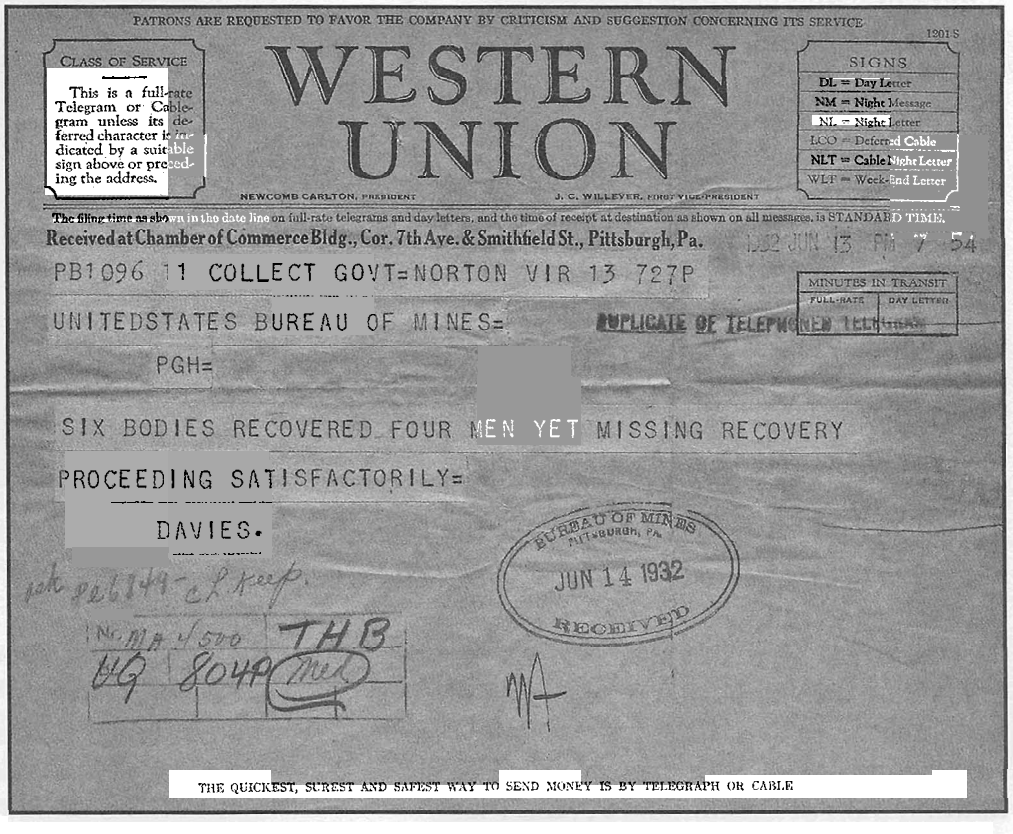
No evidence of a gas ignition previous to the dust explosion was seen, except possibly the condition of the drill helper who was burned above the waist standing between a car and the rib. Two other possible points of origin were gas in 1 east off 2 south and dust in 6 main at 1 north. At any of these points, an open light must have been the source of ignition.

Summary of Evidence to the Cause, Origin and Propagation of the Explosion

Appreciable quantities of gas had been encountered in the 1st east off 2 south, which necessitated the use of a line of brattices for about 40 feet. However, its use had been discontinued for several days prior to the explosion, as gas had gradually decreased. During the official inspection, and as shown by the samples taken, gas in appreciable quantities was found in the 1 east and 2 south faces.

The fan had been down for a period long enough for gas to accumulate in explosive mixtures in several faces, particularly 2 south and 1 east off 2 south.

In all probability, no inspection was made for gas beyond the curtains in 2 south.
The air was not actively circulated past the faces of 2 south or 1 east, and the circulation was weak in the haulway.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UNITEDSTATES BUREAU OF MINES=

PGH=

SIX BODIES RECOVERED FOUR MEN YET MISSING RECOVERY

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MINUTES IN TRANSIT

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Splash Dam No. 6 Mine – *Update telegram sent to the Bureau of Mines.* Photo Bureau of Mines