INVESTIGATION OF EXPLOSION
AT KINLOCH MINE, VALLEY CAMP COAL COMPANY,
PARNASSUS, PENNSYLVANIA.

Explosion occurred at 7:15 to 7:20 A.M., Thursday, March 22, 1929.

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Testimony of Harvey Rearick, Carpenter.

"I was at the top of the slope picking coal off the conveyor, and loading my wheelbarrow, at about 7:20 A.M. I generally got a wheelbarrow load of coal from the conveyor first thing in the morning because this coal coming from Dabble Duck is the best coal for our stove in the carpenter shop. I saw the conveyor stop, then start back. The motor, which drives the conveyor was running idle. The colored boy, Taylor, was standing on the tipple steps about 12 steps from the top landing. I stepped back from the conveyor when I saw it coming back because I was afraid it would come through the guides and catch me. I got to within a few steps of the supply house when the explosion occurred. I was knocked down and struck my head against the supply house, but did not hear the explosion. The first thing I realized was that flames were around me and a piece of sheet iron fell on my back. I got up and started to run away from the slope, following William Holser, supply clerk.

Just before I was knocked down I could hear a rumbling sound which I thought was the conveyor rushing down the slope."

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Testimony of James Arnold, Tipple and Conveyor Operator.

"I got a signal to stop the tipple machinery, including the conveyor. I was about 15 to 20 feet from the controls when I got the

right off 10 face at No. 1 room, and also found

signals. I ran to the controls and got the big conveyor stopped and the power shut off. Immediately the crash came. The flames singed my hair and coat collar. The signal I got to stop the conveyor was unusually long. Walter Palwaski also heard the signal."

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Testimony of John Brim, Fire Boss (Not working on account of broken leg.)

"There is a three plunger pump located at the first cut-through in 4 butt left - 1 face. This pump was moved from the third cut-through to the first on account of a squeeze. My best recollection is that gas was found in 4 butt about 3 or 4 months ago. This pump got its power from the trolley line. 1, 2 and 3 butts left were sealed up. The cut-through into No. 1 room off 1 left butt was open. Blow torches were used in the machine shop at the foot of the slope. 4 left overcast was complete. Dust was piled up over shoe-tops on the entry to Dabble Duck section. The haulage roads were kept clean but the back entries were not kept clean."

"On February 8th, on my first run, I found gas on 24 butt right off 10 face at No. 1 room, and also found it at No. 7 room on 23 butt right. I fenced it off. This gas was moved that night."

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Testimony of William Holscher, Supply Clerk.

"I was sitting at my desk, in the supply house, when I heard the rumble. I thought it was the conveyor going down the slope. I went outside, and saw Bearick walking towards me. He said, "Listen to that son of a b--- going down the hole." Almost immediately the

explosion came. Flame, smoke and dust shot out of the slope. Before I came out of the supply house, I heard the load going off the conveyor motor, then I heard the rumble. The telephone operator said the first call about the explosion came through at 7:20 A.M."

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Testimony of James Wilson, Machinist.

"My duties require me to be on the tipple most of the time. I was in the toilet when I heard something roar. I thought it was empty railroad cars running away. I pushed the door open and saw the dust flying and heard the conveyor motor running irregular. Then the fire blew out of the slope. This all happened in 5 or 6 seconds. I had no reports that morning that the conveyor needed repairs. The links on the conveyor give the most trouble; they wear out in the eyes. The conveyor makes a complete revolution, when loaded, in 12 minutes; when empty, in 8 minutes. One revolution fills a 50 ton car. The hopper at the bottom of the slope holds 6 cars. The coal from the hopper is fed to the big conveyor by a small feeder conveyor. There is no motor in the pit. The signal wires are in a 2-inch conduit and are 110 volts. a.c. The pump at the foot of the slope is usually operated in the morning. The voltage on this pump is 250 volts d.c. Another 250 volt d.c. motor operates a short chain haul for loaded cars onto the dump. This motor was in operation. Both motors are open type. We used the cutting torch in the machine shop at the bottom of the slope. We had no orders when to use or when not to use the blow torch at the

bottom of the slope. We examined the conveyor the morning of the explosion. Charles Hempfield examined one side and I examined the other. This was done every morning. We have frequent breaks in the conveyor in cold weather."

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Testimony of Martin Fleischer, Blacksmith.

"I was in my shop and heard a crash, the shop filled with dust and I saw flames outside the shop. I started to run to the side door and there saw smoke coming out of the fan. I then ran to the opposite side door and up the railroad tracks and home. A few minutes afterward I came back to the mine. I did not hear anything unusual before the crash."

Testimony of Lewis Dustin, C. & I. Police.

"About 5 minutes before the explosion I was standing on the steps leading down the slope. I had left there and gone to the old machine shop, and had just stepped out of there when I heard the signal to stop the tipple machinery. An instant later the explosion came. I saw flames and smoke over the tipple.

While I was at the slope, before the explosion, I saw Wm. Taylor on the left side of the tipple. Wm. Nash spoke to me as he started down the slope.

Cramer was with me when the explosion came and my first impression was of a heavy concussion of air that forced us back through the shop door. Then the flames swept almost to the door. The air was full of debris. I knew that an explosion had happened and ran to get ropes to guard the slope mouth. Before anyone ar-

rived, I had ropes stretched part way around the grounds.

I do not search the men for matches or smoking articles. I think that is the job of the assistant foreman and fire bosses.

I saw Rearick picking coal off the conveyor before I left the slope mouth.

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Testimony of E. R. Jobes, Assistant Mine Foreman.

Nine and eleven face section - east side of mine.

"The total number of men on my section is 78. There are 4 assistants and 4 fire bosses in the mine. The fire bosses enter the mine at 2:00 to 3:00 A.M. and get out from their first run at 6:00 to 6:15 A.M.

The morning of the explosion there was no gas reported in my section. The last report of gas on the section was in 12 right stumps 11 face. That was some time ago.

I brought 135 men out of the mine following the explosion. We came out through the old Valley Camp mine.

On the morning of the explosion I had started my company men to work and was sitting in my shanty on 11 face. John Callaghan, motorman, was greasing his motor in front of the shanty. He jumped in the shanty and said, "My God, something has happened." I went out on the entry and noticed that the velocity of air was unusually high, going inby. This air seemed warm. In a minute or so the direction of flow of the air reversed and the air got cold as though coming from the Valley Camp shaft. I figured that there had been an explosion and started out toward 9 face. At 9 face and 15 right

I met Joseph Spolnick, check 120, and could smell the afterdamp on his clothes. He was covered with rock-dust. This man told me there were other men down at 7 face 15 right. I went on out and met two more men, Pick, a roadman, and George Adams, roadman. Hogan, my fire boss, and I were together and we traveled outward 250 feet from 9 right toward 7 face on 15 butt and there smelt smoke. I did not see any men who had been knocked down by the explosion. I short-circuited the air at 9 face between 14 and 15 right by opening a door. I then returned to the shanty and sent men to the different entries to gather up the men who were working. I sent one man to each entry.

When we got all of our men gathered up, we started out toward Valley Camp. Five of our men were missing but we did not know it. These men had been notified but they did not come at once and the party had started off without them. These men were found later overcome by afterdamp.

Hogan and I short-circuited the air again 15 right at 11 face, then started out with 76 men up 11 face to 20 left, to 10 face and there notified 9 more men. We added these to our party and proceeded up 10 face to 24 left down 24 left to 1st chute and there saw 3 men from Haas' section working in their places. We told them about the explosion and took them with us. We crossed into 23 left and met another man. Then we met Haas and Kearney, the assistant and fire boss on the section. I told them about the explosion and told them to round up their men and follow us out Valley Camp. Haas and Kearney followed us and we all got out Valley Camp drift.

Shooting was done at anytime during the day by shot firers

Using permissible explosives, electric detonators and single shot batteries. There were two machines in my section but they were not in operation at the time of the explosion.

The power went off about one-half minute before the concussion of the explosion. All haulage roads on my section are rock-dusted but none of the trackless entries are rock-dusted. We have a few rock-dusted barriers in the airways. These barriers consist of 4 troughs. The main entries were rock-dusted the Friday previous to the explosion. Brim was fire boss on Haas' section until the day he had his leg broken.

The door across the main haulage road was located just outby 4 butt. This door was intended to prevent the dust from the dump from entering the mine.

In getting through to Valley Camp drift, we waded water up to our waists in places. One of these places was about 700 feet long. We might have gotten out sooner by going up the shaft but I was afraid to trust the steps in the shaft with so many men.

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Testimony of John C. Bryson, Outside Foreman.

"I was at the end of the tipple facing the loading boom. I had left the slope mouth about 1 minute before the blast. I did not hear the horn signal before the blast nor did I hear a rumbling noise. The flame scorched my hand. As soon as I heard the crack, I ran down the railroad track. A few minutes later I returned to the tipple which I found was in flames. William Taylor was lying

on the ground badly burned. I helped him all I could. We had ten men on the tipple. These came off by themselves.

The conveyor is not only greased but also examined every day. There are four signal horns on the conveyor - one of them is at the bottom of the slope. The voltage is 20 on signal wires while the pump part way down the slope is operated by 440 volts a.c. All signal wires on the slope are insulated - 20 volts a.c. Other wires were not in use. The only wires in use were those of the pump and signal. There are two rotating sprinklers (inch pipe) at the dump to keep down the dust when the coal is dumped. There is an 8-inch pipe cut into the hopper which is connected with the return airway. We were not issued orders telling when the blow torches should be used. From the dump and extending back 300 feet, we had 800 pounds of calcium chloride. This is the first time the conveyor ever broke on the loaded or upper side. We have had breaks on the under side. This conveyor made a revolution in 15 minutes. When filled, it holds 70 tons."

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Testimony of William Powers, Assistant to the General Manager.

"The pump on 4 left is at No. 4 room. Four left as well as 1 and 2 left are intakes. There has been no active work in 4 left for two or three months. Between 3 and 4 left nearly half way up the butt, there is a door in the cut-through. This door opened from 3 to 4 left."

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Testimony of Walter Palowski, Outside Laborer.

"My job is tending to trucks hauling domestic coal. I

was on the first floor of the tipple at the time of the explosion. I looked out of the window of the tipple and saw William Taylor, colored boy, pushing the signal button which gives the signal to stop the tipple machinery. The signal which Taylor gave this time was unusually long. Then I saw flame and started to run. I fell over the guard on a gear wheel but got up and ran to the back steps where I got out of the tipple. I have worked here two years and have seen the conveyor break before, but never the top strand, and go down the hole.

My lips and the back of my head was burnt a little. I have seen Heupfield examine the conveyor."

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Testimony of William Mason, Fireboss, Dabble Duck Section.

"I examined my section Wednesday afternoon for the night shift, and found it clear of gas. I was at home when the explosion occurred. I have never examined 1, 2, 3 and 4 left butts. Dabble Duck Section does not generate much gas. There are three splits in the ventilation of Dabble Duck. I have heard that 1, 2 and 4 left butts were intakes and also that a pump was in 4 butt left. I have walked up 1 and 2 left butts to the water; that was about a year ago. I have seen them use a blow-torch in the machine shop when the dump was in operation. They rock-dust around the shop and the bottom about every week. I have been there when they were dumping coal and it was pretty dusty. The motor hauled around the bottom in Dabble Duck Section; this coal was hauled at night. With few exceptions the places in Dabble Duck are dry. There are two rock-dust barriers in my section; each barrier has 4 troughs. Peter Kearney is the assistant on my section. I made no weekly examinations nor was I instructed to make any. I did not know of any being made although I have heard the assistant say he would have to make his weekly examination."

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Testimony of James Hogan, Fireboss.

"My section is from 7 fact to 11 face. Jobes is the assistant foreman on this section. I was standing in the door of the assistant's shanty on 15 butt when Callaghan the motorman came

running in and said that something had happened. (Jobes and Callahan were together and their stories agree). I found no gas on my section that morning; 12 butt stumps would show gas if the air was cut off. My section was rock-dusted the Saturday morning before the explosion. There is a barrier set in each back entry at each set of butts. There are 4 troughs to each set. I have nothing to do with the work around the bottom. It is very dusty when they are dumping coal at the bottom. The electric lights show dim through the dust. I have heard of blow-torches being used in the machine shop. I knew there was a pump in 4 left butt off the mains. From what I could learn it ran continuously. Two years ago the big conveyor broke and it took them 10 days to repair it."

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Testimony of John J. Murhamer, Assistant Mine Foreman.

"I was on 15 and 16 butts off 5 face and I was leaving to go to 1 face when I met smoke. I met a colored man and he asked me if I did not know that an explosion had happened. I knew something was wrong. I kept walking back and forth from 15 butt to 1 face. We barricaded ourselves in and told the men to stay. I opened the regulator in 12 right off 1 face to short circuit the air. I went up to 20 butt and knocked a hole in a stopping. The air was clear. I went back for the men after telling the men with me to go out. I got the men and started and fell down. T told the men to go on. I did not think I could make. The colored man said not while I am with you and dragged me to fresh air. We barricaded ourselves in one room with three brattices about three feet apart in the neck

of the room. I had some men outside watching the air. Robert Stevenson is the fireboss on my section. He was on 1 face section at the time of the explosion. Gas was found at the top of two left butt six or seven months ago. The pump in 4 left butt was at 13 room. This pump was moved some time ago on account of a squeeze. As far as I know this pump ran continuously. The air went up all 4 butts and came back 5 and 6 left. The haulageways were rock-dusted but not the trackless entries. There are no barriers in my section. I found smoke on 5 face at 11 left. It was dusty at the bottom. After they put the pipe in it was not so dusty."

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Testimony of Peter Quigley, Machine Repairman.

"I have seen blow torches around the shop and have seen them used. I work on the night shift. The mining machines are all of permissible type. I left the mine at 1 o'clock on the morning of the explosion. I have been at the pump on 4 left. They get the power for this pump off the trolley line. The pumps are all grounded to the rails."

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Testimony of Arthur Waterloo, Night Boss.

"I left the mines at midnight. I was looking after the machine men and supplies. No gas was reported the night before the explosion. The air went up 1, 2, 3 and 4 butts left, and returned to 8 left overcast. There is a pump in 4 butt. It was moved up on account of a squeeze. This pump ran continuously. There are 4 troughs to each rock-dust barrier. Gas was found at 25 right off 7 face on 2-8-29.

Mining machines are permissible. In the machine shop we have an emery wheel and a drill press. They use blow torches and acetylene burners. The machine shop is not dusty. The shop was rock-dusted. The bottom of the slope was rock-dusted as often as four times a week. We had a door on the haulageroad outby 4 left. Week prior to the explosion the bottom and Dabble Duck was rock-dusted. The man who rock-dusted was also the welder and was killed in the explosion. No one was assigned to examine 1, 2, 3 and 4 left butts that I know of. About two years ago the conveyor broke near the top and went to the bottom. This was the bottom strand. On February 8 they had gas on 25 right off 10 face. It was found that the entrance to the butt off 10 face contained this gas. This butt entry is 1000 feet long. Bitner told me he had examined these butts two weeks previous to this explosion before I had taken old rails out of there. I do not know whether weekly examinations were made of abandoned workings. I was in 24 butt and 25 butt off 10 face to take out iron before the gas was found. We just got 50 feet up the butt. I did not examine ahead of the men. The night shift goes to work about noon and at 4:30 p.m. The lights around the bottom of the slope were dimmed by dust. The lights are 50 and 100 watts."

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Testimony of <u>O. F. Taylor</u>, Superintendent.

"I have been superintendent since April, 1928. The big conveyor broke last September. The empty conveyor broke about 25 feet from the top. It did not kick up much dust. The bottom conveyor

does more damage to the structural work than the top. As near as I can tell the explosion occurred at 7:25 a.m. I came to work about 6:40 a.m. and talked with Mr. Riley the mine foreman and asked him how everything was. He said everything was clear. No gas reported. I do not recall when the last gas was reported in 2 left. I have never been up in 2 left butts although I was in 4 left last week. The 4 left pump did not run continuously. The pump ran at night. This pump was moved up on account of a squeeze. We employ underground 250 men and 30 on the surface. We have used two railroad cars of rock-dust and started on the third since the first of the year. To control the dust at the dump we had three sprays and also had a dust collector which consists of a 12 inch pipe running to the return airway. The end of this pipe is within 25 feet of the fan shaft. Since November the sprays have been disconnected. From the information I got I think the conveyor broke before the explosion. The conveyor is examined every night by mechanics. The breaks usually occur in the links. The conveyor when full holds 60 to 70 tons of coal. The Dabble Duck pump is operated at night. Two right pump is operated 24 hours a day. There were 258 persons in the mine at the time of the explosion; 213 came out alive; 45 were killed inside the mine, and one was killed outside. There are 21 widows. The escapeways from the mine are: 7th street shaft; old fan shaft, (no men came out this shaft); Valley Camp drift opening. There was no stairway in the fan shaft. There was ice in both shafts. There was no one taking care of the ice in the 7th street

shaft. There was no direction signs or markings in the passageways leading to the escapeways. There are no means taken to keep the passageways clear of water. We had 35 loaders and 18 day men working in Dabble Duck Section. On February 8 5 men in 14 left off 1 face. The officials and some workmen were moving gas in 24 right off 9 face on the night of February 8. Clarence Bitner was the assistant in this section. We fired him three weeks after this occurrence."

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Testimony of Paul Bougher, Repairman.

"I work on the day shift but I laid off the day of the explosion. I spent about half my time in the shop and the other half throughout the mine. We use a blow torch in the shop, but Idid not know of any job requiring a blow torch the morning of the explosion. There were canvas doors on the shop. We also had a big oil torch in the shop for heating large members. We use the blow torch six or eight times a day. I have helped to repair the conveyor two or three times. The lower part broke. It jammed against the bottom and pushed the top part up about 2 feet. I went down the slope every day. The aircourse to the left of the shop has 4 or 5 inches of fine dust in it. This entry was not cleaned or rock-dusted. The pump in 4 left was moved up six weeks ago. This pump ran continuously. Mr. Riley told me several times within the last two months to keep 4 left pump running. They always reported to the shop when 4 left pump or any other pump needed repairs. The pipe arrangement for checking dust at the dump

made some improvement over the sprays."

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Testimony of Charles Sozanska, Night Pumper.

"I look after the 4 left pump. This pump runs pretty nearly all the time. Sometimes it stops when there is no water. This pump was moved about six weeks ago. It got its power from the trolley line. I left the mine about 5 a.m. the morning of the explosion. Four left pump was running when I left. There was a switch at this pump. I did not see the day shift pumper when I came out. I did not know where this pump was pumping from. It discharged its water at the bottom of the shaft. There is a 4 inch pipe on the discharge and it was always half full of water. I left the pump at 5 a.m. on the morning of the explosion. I visited this pump three times a day. There is a danger board just inside the pump on 4 left. I have been on the pumps since before Christmas."

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Testimony of Edward L. Haas, Assistant Mine Foreman.

"I was on 21 rib off 23 right off 7 face when the explosion occurred. The men said to me there must have been a fire some place on account of the smoke. The smoke was in their place. I thought the fan had stopped and instructed them to set some posts and wait until they set their posts. These places were connected with the places on 22 butt. Mr. Jobes came by with a group of men and told me to get my men out the Valley Camp opening, that an explosion had

occurred. I notified all my men, and went back to 24 butt to three men and found they had gone. I got all my men out except the motorman and snapper. We got out after Jobes. I saw two lights outby and went out 300 feet on 15 butt 7 face, but could not locate any one. The smoke was there and I could not get any further. When we got to Valley Camp I asked if any of the men knew the way out; two men said they knew the way out, and they were placed in front. We had 61 men with us. We waded through water up to our waists about 500 feet. The haulageroads in my section were rock-dusted. The last gas reported was on the 21 rib fall in 23 butt off 7 face about a week before the explosion. The ventilation was sluggish in my section. Mr. Riley made it a practice to go around with me once a week. I examined the old workings once each week and made a report. Mr. Brim the fireboss on 24, 25 and 26 off 10 face left me to go to the above place February 8, 1929. I went with him and found a body of gas at the bottom of 24 butt. This gas would extend the distance of 25 rooms. This gas was moved on the night of February 8. They were using 4 and 5 sticks of explosives to shoot the coal. All crabreel motors were used for gathering coal. Brim was made fireboss. Mr. Riley intimated to me that he would rather see the fireboss' book clear.

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Testimony of <u>James McGuire</u>, Fireboss - 1 face.

"I was at 13 left off 1 face when I felt a stoppage of the air for a second. I was by myself. I thought it might be a fall

and proceeded to 15 butt off the face entry. While I was there two men came running from No.1 room and told me their place was full of smoke. I came back to No. 1 room to investigate and found their story correct. The room was full of thick black smoke. I took the two men down to G face. The air was good there. I told the two men to stay there while I investigated. I started out toward the slope and got within 500 feet of 1 face in 13 butt. I retreated back to the two men and proceeded up to A face and found everything clear - I returned to G face and came back to the two men. The motorman and snapper had arrived by that time. I asked them the condition of 3 and 4 face off 16 butt and they said it was all right. I sent them back to get the men and while they were gone I went up 15 and got 7 butt men. The air was bad in there. I felt as though I had all our men. Fireboss Stevenson had arrived and the men were going excited and wanted to go to the slope. I left the snapper in charge of the men and the fireboss and I went to A face and found everything all right. I came back and got our men. I found that Dave Jamison the snapper had left the party and started for the slope. I went after him and found him down, but I was too weak myself and could not move him. I got back on my hands and knees, feeling the effects of the gas. The snapper must have been in the gas 15 minutes. We had 42 men with us. We proceeded for A face and then to the Arnold shaft. We waded 3/4 of a mile in water from our waist to our armpits in depth. At the bottom of the shaft we had to creep over 20 feet of ice on a 45 degree angle to get up to the shaft. The haulageroads on my section were rock-dusted."

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Testimony of Peter Kearney, Assistant Mine Foreman.

"I was at home when the explosion occurred. I left the mine between 1 and 2 a.m. The water raises on Dabble Duck motor road when the pump is idle. Gas was reported in 10 left No. 9 gob about 1 month ago. Dabble Duck only worked at night. The haulage-roads were the only entries rock-dusted. There is only one complete rock-dust barrier in Dabble Duck Section."

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Testimony of James Spolnick, Loader.

"I work in 12 right aircourse off 11 face. We were on our way out, my brother and I. We got to within 80 feet of 7 face and I heard a rush of air and we got in a manhole. Dust and coal were flying through the entry. We were on 15 right off 7 face about 80 feet from 7 face. We saw the lights on the motor go out before the rush of air struck us. After the rush of air we tried to get out when the air started back. We were going to start for the bottom of the slope and go as far as 7 face past the telephone when we found Johnson the snapper laying on his stomach. We dragged him back to the manhole where we were when the wind struck us. We brought him to. There was smoke in the air where we found Johnson and we could not see him until we fell over him. My brother left for 10 face to tell the men. I tried to get Johnson to go with me. After I put his self-rescuer on him and brought him around he tried to persuade me togo toward the slope with him. When I would not because my brother told me to wait for him Johnson started toward the slope. (Johnson

was found overcome by afterdamp near the trip of cars). I did not see Jobes until I got to 11 face. I did not know of any escapeways. Jobes was going to barricade us before he remembered the Valley Camp openings. There was smoke on the entry where I found Johnson. We could not get our breath for a while when the rush of air was passing. I was never instructed where there were any escapeways. We dragged Johnson back from where we found him. I put his self-rescuer on him and he had made an effort to put it on but could not get it open when we found him. Ellsworth Peck was the motorman on this trip. I did not see him. We went out with Jobes and the other men."

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Testimony of John Bryson, Outside Foreman.

"There were electric lights in the pit below the dump. These were 50 watt, 250 volt,direct current. I think there were two lights. They were controlled from above. The switches in the pit were not in use. I do not know whether the sprays were in use on the morning of the explosion. They had been repaired since they froze up and had been put back in service. They were in service a week before the explosion. The length of the conveyor is 430 feet."

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Testimony of John A. Kearney, Firebose in 7 Face and Valley Camp.

"I found gas the last two weeks on a fall in 21 right off 7 face. I was in 22 right when the explosion occurred. I was with Haas bringing up the rear when taking the men out. We came out the old Valley Camp opening. The water was up to our belts. We met Hogan and he said he knew the way. We were delayed hunting for two

laborers. After we found them we got started out. We got all of the men out that were working on the section. I used to trap in Valley Camp. We found the old telephone line in Valley Camp and followed it outside. My section was rock-dusted on the 16th of the month. That is, the haulageroads. I did not know of any understanding about examining abandoned workings."

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Testimony of Mike Miskanis, Check No. 105, Loader in J Face.

"We did not hear anything at all until the fireboss came into my place the second time with another boss and said come out right away. We found smoke on 1 face. The fireboss and us did not know how to get out."

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Testimony of John Brim, Fireboss.

"On February 8 on my first run I found gas on 24 right off 10 face No. 1 room and also found gas at No. 7 room on 23 right. I fenced it off. This gas was moved that night.

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Statement by Charles Hemphill, Tipple Mechanic.

This man was interviewed at the Parnassus Hospital by the Commission. He was burned badly about the head and face, arms and legs. This man stated that he heard the emergency signal to stop the conveyor. (Taylor, the colored boy, pressed the button near the top of the tipple steps.) The tipple swayed at about the same time the signal was heard. This swaying of the tipple was thought to have been caused by the tension being released when the chain broke.

Hemphill stated that William Taylor, before his death, said that the conveyor broke before the explosion occurred. Hemphill said that he started to run to the controls in the tipple when he heard the signal and got about ten steps when the explosion occurred. Hemphill also stated that he saw two other tipple men start toward the controls and he felt sure we would find the controls in the "off" position. This fact was corroborated by testimony of James Arnold. The Commission found the controls in the "off" position.

- C O P Y -

Commonwealth of Pennsylvania.

Westmoreland County, ss.

Inquisition Indented and taken at Greensburg, Pa., in the County of Westmoreland aforesaid, on the 11th day of April A.D. 1929 before me, Dr. Jas. Harkins, Coroner of the county aforesaid, upon the view of the body of _____ then and there lying dead, upon the oaths and affirmations of F. P. Fogerty, Alex Hamilton, James McCartney, W. G. Huse, Geo. W. Hutchinson, and Robert Ramsey, good and lawful men of the county aforesaid, who being duly sworn and affirmed diligently to inquire and true presentment make on behalf of the said Commonwealth, when, where, how and after what manner the said deceased came to his death, and having heard the evidence, hereby certify and return, upon their oaths and affirmations aforesaid, that the said _____ of _____ aged ____ came to his death on the 21st day of March, 1929, at Kinloch Mines in said county, from

Burns and after-damp caused by a dust explosion in the Kinloch mines of the Valley Camp Coal Co., in Lower Burrell Twp., caused by breaking of a conveyor of faulty design in not having a safety appliance to prevent same from falling down the slope, and after hearing the evidence of witnesses submitted find no criminal responsibility on the part of the owners of the mine or any of its employees. Having heard the report of the Mine Inspectors having been appointed by the Secretary of the Mining Department of Pennsylvania, for the purpose of making a report to said Department of the cause of the explosion and such recommendations as in their judgment would be to the best interest if the future operation of the mine, fully endorse and recommend the enforcement of recommendation No. 1. in its entirety of said Inspector's report which is as follows:-That the use of the conveyor be discontinued as a means of transport until and unless it be provided with an automatic device or devices capable of preventing the conveyor or any part thereof from running away on a slope in the event of breakage of the conveyor, and that any device or devices installed to effectuate this recommendation shall be approved by the inspector of the district aided by such mechanical engineering advice as may be necessary.

In Witness Whereof, as well as the said Coroner, as the Jurors aforesaid, have to this Inquisition set their hands and seals. Dated the day and year at the place first above written.

JAMES HARKINS (SEAL)
Coroner

P. P. Fogerty Foreman	(SEAL)	James McCartney	(SEAL)
Alex Hamilton	(SEAL)	W. G. Muse	(SEAL)
Geo. W. Hutchinson	(SEAL)	Robert Ramsey	(SEAL)

Witness:

O. F. Taylor	Harold Raught	W. J. McGregor
John G. Bryson	James Hogan	Alex McCaugh
James Arnold	James McGuire	Robert Stevenson
J. M. Stitham	James Spolnock	Martin Flasher
H arvey Rearick	John L. Mulhamer	Louis Dustin
William Holscher	Ed. L. Haas	
Hunter L. Crooks	E. R. Jobes	

COMMISSION'S REPORT

Pittsburgh, Pa., April 4, 1929

Hon. Walter H. Glasgow,

Secretary of Mines,

Department of Mines,

Harrisburg, Pa.

Sir:-

We regret to formally report the occurrence of a mine explosion on March 21st, 1929, at about 7:25 o'clock a.m., in the Kinloch mine of the Valley Camp Coal Company, situated at Kinloch, Lower Burrel Township, Westmoreland County, Pennsylvania, in which 46 lives were lost and 4 persons were injured, all of the injuries having occurred on the surface and one of the deaths. Two hundred fifty-eight persons were underground at the moment of the explosion, 212 of which persons escaped on the day of the explosion and one on the following day.

The thick Freeport coal seam is being worked at the Kinloch mine and it is approached through a slope opening 280 feet in length, pitching at an angle of 30 degrees. The slope is of sufficient width to accommodate a conveyor system, a car track for the handling of mine refuse and mine supplies and a travelingway, the conveyor being carried along the west wall of the slope, the refuse and supply track in the center, with a travelingway along the east wall.

The coal is dumped into a bin at the foot of the slope, having a capacity of approximately 18 tons. The top of the bin is in the same plane as the trackage in the slope bottom. This bin was fitted up with an 8-inch pipe, which entered the bin near the top thereof and was carried into a receptacle known as a dust collector which, by reason of a lack of velocity, purged the air of a portion of its dust and thence passed through the side wall of the receptacle into the upcast air circuit through a 12-inch tube, the idea being that the depression created by the fan would compel the dust created at the dumping point to pass through the pipe and through the dust collector and to the return air circuit without passing into the air entering through the slope. We were advised that a sprinkling apparatus of the revolving type were so positioned over the bin that a constant stream of water was thrown upon the coal during dumping operations but we have no positive evidence that this sprinkling arrangement has been in operation since December, 1928. The coal from the bin is fed by a short conveyor to the top of a gravity chute from which point the coal gravitates into the main conveyor and is thence conveyed by the main conveyor to the head sprocket on the tipple at which point the conveyor is automatically relieved of its burden. The driving mechanism for the main conveyor is positioned in the tipple structure and the small conveyor mentioned above is driven from the tail sprocket of the main conveyor through the medium of a chain. The total length of the conveyor, including top and

bottom strand,is about 860 feet with a width of approximately 5 feet. The top strand has a carrying capacity of approximately 60 to 70 tons when loaded to capacity.

The mine is ventilated by a 4½-foot by 9-foot Sirocco fan operating on the exhaust principle, receiving its air from four openings, three of which openings are from two to four miles from the fan. At the time of the explosion the fan was exhausting from the mine approximately 241,500 cubic feet of air per minute at a speed of 190 revolutions per minute against a resistance of 10.4 pounds per square foot as indicated by the water gauge. One hundred sixty thousand four hundred cubic feet per minute of the total volume entered by the way of the slope, all of which air traveled over the main conveyor and much of it constantly flowed over the bin and dumping point at the foot of the slope. The slope had an average area of 153 square feet giving to the air a velocity of about 1050 feet per minute.

Kinloch mine was electrified, since pumps, locomotives, coal cutting machines, chain hauls and shop appliances were driven by electricity, and incandescent lights were positioned at strategic points, two of such lights being used in the compartment housing the bin into which the coal was dumped at the foot of the slope. The incandescent lights in this compartment were 60 watts and possibly 100 on a 250 volt direct circuit. There were also in proximity to the dumping point an electrically

driven pump and two electrically driven chain hauls with their starting and switching apparatus and necessary electric wiring. There were also not far from the dumping point energized trolley lines. The machine shop was close to the foot of the slope and in this shop was stationed an electric motor with necessary wiring, switching and starting devices. This unit was used for driving various shop appliances. The shop was supplied with an acetylene welding outfit, a heating unit of the oil burning type and two blow torches.

The mine is laid out on the ordinary room and pillar system, the main unfolding entries being driven on the four entry system with face entries driven in pairs at distances varying from 1200 feet to 1500 feet on the east and west side of the main unfolding entries. From these face entries productive entries are driven in pairs at intervals of 500 feet, and in these productive entries rooms are driven in both directions on 40 foot centers. The mine contains a very large area partly extracted and many local depressions partly filled with water which undoubtedly accounts in part for such a large number of workmen being out of range of the devastating force of the explosion.

At 7:25 o'clock a.m., as stated in former part of this report, the loaded strand of the main conveyor broke just a few feet below the head sprocket and began its descent into the slope, a portion of the conveyor lodging on the incline

above the slope portal and the remainder going to the bottom. Almost instantly a violent explosion occurred, setting the tipple on fire and destroying a good deal of the steel structural work joining the incline to the slope portal. The ventilating fan was rendered useless, because of the top being blown off the air drift connecting the fan with the air shaft and because of other damage done by the explosion to the masonry work housing the fan.

All of the men who lost their lives were involved by the force or effect of the explosion from the moment of its occurrence except 7 who attempted, after having been otherwise directed, to make their escape by passageways leading to the slope. Workmen who were fortunate enough to be able to travel and act promptly after the explosion soon found their means of escape to the slope opening cut off by afterdamp and were compelled to find their way to openings to the surface through unmarked and unfrequented passageways, portions of which were partly filled with water. These openings were from two to four miles from the slope portal. It will thus be observed that a good deal of time and patience and good judgment, as well as courage, was required to consolidate the various groups of workers and bring them safely to the surface in orderly fashion, and it was not until about 2:00 o'clock in the afternoon that the last, save one, of those left alive after the explosion emerged from the mine, the exception being a man employed at the inner end of the pillars in No. 14 butt left on No. 1 face, who barrica-

himself in his working place and met the exploring crews on his way out of the mine on the day following the explosion.

Temporary repairs having been made to the ventilating fan structure and men and procedure organized for entry to the mine by way of the slope portal, and the last group of workmen having arrived at the surface, the ventilating fan was put in operation. In a few minutes after the fan was put in operation, trained men and official directors descended the slope and began exploration and recovery work which was continued incessantly until the mine was fully explored and all bodies recovered. The exploration work was advanced from the foot of the slope along No. 1 face, being a face running almost due north from the foot of the slope, and the workings on the east and west thereof were explored in orderly sequence. However, a preliminary exploration was advanced into the passageways leading into the "Dabble Duck" section (south and west of the slope bottom) and 7 bodies were recovered, which was believed at that time to be the total number of men engaged in that portion of the mine and it was not until the workings north of the slope were fully explored that a complete and detailed exploration was made of the "Dabble Duck" section and the passageways leading thereto. It should be understood, however, that a preliminary exploration had been made for fire and to secure other useful information a short time after the explosion occurred.

This exploration was made by three men from the Bureau of Mines accompanied by two oxygen breathing apparatus crews from adjoining mines. The extent of the exploration was in and around the bottom of the slope and entries leading to the fan shaft.

Recovery operations were considerably hampered by the finding of 5 fires, 3 of which were extinguished by direct methods, but the other two could not be reached because of smoke and other hampering conditions and circumstances, and were therefore sealed off which involved a considerable amount of time and labor and the usual hazards accompanying such undertaking.

Your Commission finds as follows:

1. That the conveyor was examined on the day of the explosion, and that this was a daily practice, but the practice did not appear to have been so sufficiently established that the management had knowledge of such a practice. However, the management was conversant with the fact that night men worked on the conveyor and examined it but this working and examination may have been contingent on the discovery of defects.

2. That the conveyor under full load broke near the head sprocket and very rapidly descended into the slope, a portion of the conveyor lodging on the incline above the slope portal. That the sudden impact of the conveyor at the foot of the slope threw into suspension a dense cloud of coal dust, there having been in all probability from 50 to 60 tons of coal carried to

the bottom of the slope by the runaway conveyor.

3. That an explosion followed almost immediately, which was extended to the surface and through a large area of the mine with considerable violence.

4. That from the evidence of eye witnesses to the breaking and initial descent of the conveyor, and from a car and other heavy objects which were thrown upon the lower strand of the conveyor, the explosion followed the landing and impact of the conveyor.

5. That the source of ignition was in the immediate neighborhood of the slope bottom and that the source was a flame discharged from some electric circuit carrying apparatus or device, but the most outstanding source of electric ignition appears to be lodged in the electric wiring and electric lights used to illuminate the bin compartment below the track level, because this was the first point the dust cloud came in contact with electric energy.

6. That the explosion was propagated by excessive accumulations of coal dust around the slope bottom, in the passageways and trackless entries leading to the active workings. This dust came from normal dumping operations at the bottom of the slope. It is quite probable from the complication of forces between the dumping point and No. 4 butt left that propagation was advanced by ignition of gas in this area and possibly by the same cause in idle areas on the east side of the

mine near the slope bottom. This augmenting of propagation appears to be supported by the fact that explosive gas was found in Nos. 3 and 4 butt left on the west side of the slope within recent months, bythe further fact that a squeeze was slowly but progressively approaching the entrance of No. 4 butt left on No. 1 face as evidenced by the heaving of the floor and other physical disorders in said No. 4 butt, and as a result of such heavings and disorders, conditions were developed unfavorable to thorough ventilation, and again no evidence has been found indicating that this area was examined once each week as the Statute requires. What is said above, with respect to weekly examinations, is also true of other open and non-producing areas on the east side of No. 1 face entry near the bottom of the slope. This augmentation of propagation is further supported by the fact that considerable quantities of methane were found in these workings during recovery operations on both sides of the slope in the workings referred to above.

7. That the force of the explosion, using the immediate bottom of the slope as a center, traveled north expanding where opportunity afforded to the east and west dying away in the neighborhood of a line running almost due east and west on the outby side of No. 15 butt on No. 7 face entry and that the dying away of the force was due to the combined effect of expansion, of accumulations of water in areas of depression, and to the rock-dusted tracked passageways. However, it should be understood

that the afterdamp was projected some considerable distance beyond the line marking the termination of force. The explosion force approached the section known as "Dabble Duck" over two routes, namely, entering by the track roadways running south from the bottom of the slope and by the way of 3 and 4 butts east on No. 1 face and thence by No. 5 face south of No. 3 butt east. These forces did not make contact and as a result the area or workings in which the men were employed were unimpaired except for the influence occasioned by afterdamp.

As a result of this disaster your Commission is of the opinion that the following recommendations are in order:

1. That the use of the conveyor be discontinued as a means of transport until and unless it be provided with an automatic device or devices capable of preventing the conveyor or any part thereof from running away on a slope in the event of breakage of the conveyor, and that any device or devices installed to effectuate this recommendation shall be approved by the inspector of the district aided by such mechanical engineering advice as may be necessary.

2. That all roadways, airways, and working places be thoroughly rock-dusted and so kept that the percentage of non-combustible to the mine dust shall be greater than 65 per cent and that such rock-dust treatment be maintained within 40 feet of the working faces.

3. That the wherewithal for supplying and maintaining a means of conducting water along the cutter bar of each mining machine be provided and that sufficient hose be supplied in each working place so that the face region may be kept watered and wet.

4. That all open and idle workings be ventilated insofar as this is consistent with mine practice and that such workings be examined by the mine foreman or his assistant or assistants once each week as required by the Statute and the results of such examinations made a matter of record in the book provided by the Commonwealth for that purpose.

5. That a determination be made as to whether or not the openings to the surface of this mine are in accordance with the intent and purpose of the Statute, because of the great distance by which they are separated.

6. That all passageways over which men are required to travel to the openings at the surface shall be well drained and otherwise kept safe and comfortable for travel and be supplied with sufficient direction signs for the guidance of those who may be compelled to travel to the openings.

Attached to this report is the map of the Kinloch mine upon which have been placed a number of important matters

which are intended to reinforce and clear up some of the statements made in the report.

Respectfully submitted,

(Signed) W. J. McGregor.
W. J. McGregor,
State Mine Inspector

(Signed) John F. Bell
John F. Bell,
State Mine Inspector

(Signed) Alexander McCaneh
Alexander McCaneh
State Mine Inspector

(Signed) J. J. Forbes
J. J. Forbes, Supervising Engineer,
U. S. Bureau of Mines.

(Signed) C. W. Grove
C. W. Grove, Mining Engineer,
U. S. Bureau of Mines.

(Signed) R. D. Currie
R. D. Currie, Associate Mining
Engineer, U. S. Bureau of Mines.

RESCUE WORK

The responsibility of rescuing the men who were left alive after the explosion in Kinloch mine fell on the shoulders of the officials who were alive and in their sections at the time. These were:

E. R. Jobes, Assistant Foreman,

James Hogan, Fire Boss,

Edward L. Haas, Assistant Foreman,

John A. Kearney, Fire Boss,

John J. Murhamer, Assistant Foreman,

James McGuire, Fire Boss,

Robert Stevenson, Fire Boss.

These men displayed unusual foresight and courage in gathering their men together from the widely scattered working faces and conducting them, in groups of from 16 to 135 men, to the openings of the old Valley Camp mine.

Most of the route traveled by these men was through old workings and much of it was through icy water waist deep, and in some cases up to the armpits.

Details of the rescue work is told in the evidence and testimony collected by the investigating committee which is attached. The routes traveled is also shown on the mine map attached.

These officials were directly responsible for saving the lives of all of the 212 men who came out of the mine on the day of the explosion.

MINE RESCUE TEAMS AND APPARATUS

TEAMS	COMPANY		APPARATUS GIBBS	MSACAA	GAS MASK
1	Union Collieries Co.	Renton, Pa.	5		
1	Inland Collieries Co.	Indianola, Pa.	5		
1	Ford Collieries Co.	Curtisville,Pa.	5		
1	Harwick Coal & Coke Co.	Harwick, Pa.		5	5
2	Elm Grove Mining Co.	Elm Grove, W.Va.		5	5
2	Republic Collieries Co.	Russellton,Pa.	5		
2	Keystone Coal & Coke Co.	Greensburg, Pa.	10		
1	Helvetia Coal Co.	Yatesboro, Pa.			6
1	Consumers Mining Co.	Harmarville, Pa.	5		
2	Bethlehem Mine Corp.	Johnstown and Ellsworth, Pa.	10		10
2	Pittsburgh Coal Co.	Pricedale, Pa.	10		5
2	Pittsburgh Terminal Coal	#8 and #15	10		
2	Penelec Coal Co.	Robindale, Pa.	6	5	4
1	Consolidation Coal Co.	Acosta, Pa.		5	
2	Consolidation Coal Co.	Fairmont, W. Va.		10	5
1	Allegheny Pgh. Coal Co.	Parnassus, Pa.	5		5
1	Monroe Coal Mining Co.	Revloc, Pa.	5		5
1	W. J. Rainey	Allison, Pa.			6
1	Mather Collieries Co.	Mather, Pa.	5		5
1	Vesta Coal Co.	California, Pa.	5		5
2	H. C. Frick Coal Co.	Mt. Pleasant, Pa.	10		5
1	New Eng. Fuel & Transp. Co.	Grant Town, W. Va.	5		
2	Hillman Coal & Coke Co.	Edna #2 & Isabelle,Pa	10		
	Bureau of Mines	Car #3, Pgh Station	10	6	10
1	Connellsville By-Products Co.	Morgantown, W.Va.			5
1	Hitchman Coal & Coke Co.	Benwood, W. Va.			
1	Glendale Gas Coal Co.	Moundsville, W. Va.			
1	Valley Camp Coal Co.	Soudan, Pa.		5	5
37			126	41	91

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Most of the route traveled by these men was through old workings and much of it was through icy water waist deep, and in some cases up to the armpits.

Details of the rescue work is told in the evidence and testimony collected by the investigating committee which is attached. The routes traveled is also shown on the mine map attached.

These officials were directly responsible for saving the lives of all of the 212 men who came out of the mine on the day of the explosion.

LIST OF MEN KILLED

NUMBER	NAME	AGE	MARRIED OR SINGLE
151	Mathew Ambrose	27 yrs.	Married
284	John Ambrose	31 "	"
675	Jesse Ando	30 "	"
343	Harry Bradstock	45 "	"
677	Alvin Boyce	33 "	"
630	Arnil Breeding	20 "	Single
655	Albert Brim	18 "	"
276	Joseph Bernardi	42 "	Married
688	Ben Coleman	43 "	"
676	James Davis	40 "	"
669	James Daugherty	27 "	"
617	George DeLouvieres	29 "	"
902	William H. Eash	40 "	"
308	Mike Eski	46 "	"
617	James Flynn	52 "	"
208	Alex Galiex	37 "	Single
344	Harry Hertzog	32 "	Married
815	Charles Hanlon	38 "	"
122	George Hunter	45 "	"
604	J. F. Jones	38 "	"
307	Dave Jamison	25 "	Single
632	James Johnson	28 "	Married
96-09	Peter Karatovich	35 "	"
814	Steve Lazure	38 "	"
696	Dan Mohurita	41 "	"
648	Joe Meyers	45 "	"
682	Peter Mallee	54 "	Single
623	J. T. Owens	24 "	"
645	William Oliver	33 "	Married
671	Charles Oliver	19 "	Single
639	James Poole	24 "	"
626	George Preskin, Jr.	27 "	Married
609	Ellsworth Peck	29 "	"
818	William Reynolds	46 "	"
601	Arnold Raffier	19 "	Single
803	John F. Riley	47 "	Widower
652	Barney Rodgers	27 "	Married
66	John Rowby	23 "	Single
635	Lloyd Smith	24 "	Married
820	Andy Sikora	19 "	Single
124-345	Wilbur Taylor	46 "	Married
778	William Taylor	17 "	Single
682	Robert Tyson	44 "	Married
650	Edward Williams	24 "	Married
673	John Warrick	31 "	Single
613	Andy Zino	33 "	Married

LIST OF MEN KILLED

NUMBER	NAME	AGE	MARRIED OR SINGLE
151	Mathew Ambrose	27 yrs.	Married
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630	Arnil Breeding	20 "	Single
655	Albert Brim	18 "	"
276	Joseph Barnardi	42 "	Married
698	Ben Coleman	43 "	"
676	James Davis	40 "	"
669	James Daugherty	27 "	"
817	George DeLouvieres	29 "	"
602	William H. Eash	40 "	"
306	Mike Eski	46 "	"
617	James Flynn	52 "	"
206	Alex Geliex	37 "	Single
344	Harry Hertzog	32 "	Married
815	Charles Hanlon	38 "	"
182	George Hunter	43 "	"
604	J. F. Jones	38 "	"
397	Dave Jamison	23 "	Single
632	James Johnson	28 "	Married
96-09	Peter Karatovich	35 "	"
814	Steve Lazure	38 "	"
696	Dan Mohurita	41 "	"
648	Joe Meyers	45 "	"
662	Peter Mallee	54 "	Single
623	J. T. Owens	24 "	"
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671	Charles Oliver	19 "	Single
629	James Poole	24 "	"
686	George Preskin, Jr.	27 "	Married
609	Ellsworth Peck	29 "	"
818	William Reynolds	46 "	"
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FINAL REPORT OF DUST EXPLOSION KINLOCH MINE, VALLEY CAMP COAL CO. PARNASSUS, WESTMORELAND CO., PA. MARCH 21, 1929

By

J. J. Forbes
Supervising Engineer

G. W. Grove
Mining Engineer

R. D. Currie
Associate Mining Engineer

DEPARTMENT OF COMMERCE
BUREAU OF MINES

I N D E X

FINAL REPORT OF DUST EXPLOSION
KINLOCH MINE, VALLEY CAMP COAL CO.
PARNASSUS, WESTMORELAND CO., PA.
MARCH 21, 1929

Introduction:

At about 7:20 a.m., March 21, 1929, an explosion occurred at the Kinloch Mine of the Valley Camp Coal Company, near New Kensington, Pa.

There were 258 men in the mine at the time of the explosion; 45 of these were killed, 212 escaped on the day of the explosion, and one on the following day. There were also one man killed and four burned on the tipple.

The explosion was caused by the breaking, and rapid descending of the five-foot apron conveyor which conveyed the coal from the dump at the foot of the 430 foot incline to the tipple up about a 30° pitch.

The explosion travelled through about half of the mine, terminating just outby ~~of~~ 15 Butt.

The mine was partly rock dusted; none of the air courses or trackless entries were rock-dusted.

The Bureau of Mines received word of the explosion about an hour after it occurred. Car 3 was notified at about the same time. The truck from the Pittsburgh Station, with Forbes, McCaa, Grove, Burdelsky, Webb, Howarth and Craighead arrived at the mine about 9:30 a.m. Car 3 left Russelton, Pa.

about 9 a.m. and arrived at Kinloch about 10:30 a.m., with McLellan, Muir and Quenon. Currie left the car at Russelton at 9 a.m. and drove to Kinloch, arriving about 9:30 am.

Bureau of Mines men participating in the rescue and recovery operations were:

D. Harrington	R. D. Currie	J. M. Webb
J. J. Forbes	Harry Howarth	G. N. McLellan
G. S. McCaa	E. J. Craighead	N. L. Muir
G. W. Grove	H. R. Burdelsky	E. E. Quenon

Following the rescue and recovery work separate investigations were made by

G. S. Rice) Office of Chief Mining Engineer,
H. P. Greenwald) of the Experimental Section
Mine

C. F. Christopher) of the Metallurgical Section
G. R. Fitterer)

J. J. Forbes)
G. W. Grove) Safety Division
R. D. Currie)

Location:

Kinloch mine is located in Lower Burrell Township, Westmoreland County, Pennsylvania, about three miles south west of New Kensington and twelve miles north east of Pittsburgh.

Employees:

The mine normally employs about 350 men, 260 of whom work inside the mine on the day shift. There were 256 men in the mine the morning of March 21. The average daily production

is about 2000 tons.

Openings:

Kinloch mine is opened by a slope about 300 feet long on a 30° pitch. This slope is used as a manway and intake airway. It also accommodates a supply track and five foot apron type conveyor. A vertical shaft about 150 feet deep is used as the upcast air shaft. This mine is also cut into the old Valley Camp mine which has three openings - a drift and two shafts. These three openings are also used as intake airways.

Coal Bed:

The coal bed worked in this mine is the Thick Freeport, which averages about 7 feet thick, with a bony coal parting about a foot thick near the center of the bed.

The analyses of the coal from two nearby mines are as follows:

Bureau of Mines	Lab. No. A-49876	Lab. No. A-51309
Moisture	2.0	2.3
Volatile Matter	34.8	35.5
Fixed Carbon	56.0	54.6
Ash	7.2	7.6
Sulphur	1.5	1.6
B.t.u's	13830	13810

Collected by R; D. Currie. Analyzed by H.M.Cooper

Roof:

The roof throughout most of the mine is a sandy shale although in many parts it is sand rock. The roof is very regular throughout the mine.

Mining System:

The mine is laid out on the ordinary room and pillar system. The main entries are driven north on a four entry system.

Face entries are turned to the east and west off these in pairs at intervals varying between 1200 and 1500 feet. From these face entries producing entries are driven in pairs at intervals of 500 feet with rooms turned off both entries on 40-foot centers. The mine contains large areas of abandoned workings in which the pillars are standing.

The coal which is undercut with approved type mining machines is blasted with permissible explosives.

The mine is partly timbered throughout, but very little timber is required in entries.

Ventilation:

The mine is ventilated by a 9 x 4-1/2 foot Sirocco fan, operating on the exhaust principle. There are four intake openings; one of them is a slope, another a drift and two of them shafts. There is only one upcast shaft. At the time of this explosion the fan was circulating approximately 241,500 cubic feet of air per minute at a speed of 190 r.p.m. against a water gauge of 2 inches. The Kinloch slope was the main intake, and 160,400 cubic feet of air were entering it per minute. All of this air

travelled over or along the conveyor and much of it travelled over the Phillip's dump located at the foot of the slope. The slope has an average area of 153 square feet, giving the air passing through it a velocity of about 1050 feet per minute.

The mine is rated as gassy by the Pennsylvania Department of Mines, and has been found so, as shown by air samples collected in the two fire areas which are sealed at this time. Ventilation has not been put into its normal condition since the explosion on account of the two large fire areas, and therefore, no air samples have been collected from the various sections of the mine. However, many samples have been collected and analyzed from these fire areas, and a report of these will be found in the appendix.

Haulage:

All hauling is done by trolley and cable reel types of locomotives operating on 275 volt direct current.

Track gauge is 42 inches, and the rails used are 60 lb. per yard on main entries, 40 and 30 pound per yard on producing entries, and 20 pound per yard in rooms.

Clearance is maintained on the side opposite the trolley lines while shelter holes are provided at 45 foot interwals.

All trolley lines are located on intake airways.

Conveyor:

The conveyor that carries the coal from the Phillip's cross-over dump to the tipple is 430 feet long from head sprocket to tail sprocket. It is 5 feet wide and on a 30 degree pitch.

The conveyor is of the apron type. Coal is carried on the top strand. The conveyor when fully loaded holds about 60 tons of coal.

Dump:

The dump which is located at the foot of the slope is of the cross-over type. There is a bin under the dump with a capacity of about 8 tons. This bin is equipped with a dust collector consisting of an 8 inch pipe, a settling chamber and a 12 inch discharge pipe.

There was also a small sprinkler located over the dump.

Lighting:

Electric lights on 275 volt direct current lines were located at the foot of the slope, in the dumping pit, along the bottom and in the motor barn.

Edison electric cap lamps are used by all underground employees.

Approved, magnetically locked flame safety lamps are used by all officials for inspecting and testing.

Machinery Underground:

None of the machinery underground was of the approved

type except the mining machines. There were in operation at the time of the explosion, open type locomotives, pumps and chain haul motors; the latter located at the foot of the slope.

Explosives:

The explosive used in this mine is Permissible Union FLF detonated with No. 6 electric detonators and single shot blasting units.

Drainage:

There are many local swamps throughout the mine in which water collects, and there are some sections of the mine which are quite wet underfoot; however, the mine is generally dry and dusty throughout. Water is carried by ditches and small pumps to central points and conveyed to the surface by central pumping stations.

Rock Dust:

Rock-dusting has been done to some extent in this mine. Practically all of the haulage roads have been rock-dusted, but no rock-dusting has been done in trackless entries, rooms, or abandoned sections of the mine.

A rock dust sampling and testing outfit is kept at the mine, and samples were collected and analyzed at regular intervals by the safety inspector.

A copy of the analyses of samples collected just prior to the explosion will be found in the appendix. These samples were collected and analyzed by Mr. Wm. Nash on March 4, 5, 6, 7, 8, 9, 1929.

Dust samples were collected in the mine during this investigation, complete analyses of which will be found in the appendix. A tabulation of the analyses is as follows:

ANALYSES OF DUST SAMPLES, KINLOCH MINE
COLLECTED MARCH 24 - 26, 1929 by C.N.McLELLAN
ANALYZED BY H. M. COOPER

Lab. No:	Location	Moisture:	Combustible:	Ash :	
A-50470:	In dump at bottom of slope	6.7	72.3	21.0	Road
A-50473:	Machine Shop	2.6	71.1	26.3	Road
A-50474:	Machine Shop	3.1	73.1	23.8	Rib & Roof
A-50478:	D.D. Inby explosive zone	3.4	25.8	70.8	Road
A-50479:	D.D. Inby explosive zone	4.0	35.6	60.4	Rib & Roof
A-50475:	D.D. Haulway between Manway & 1st L:	4.4	46.0	49.6	Road
A-50476:	D.D.Haulway between Manway &1st L:	4.7	63.1	32.2	Rib & Roof
A-50469:	D.D.Parallel below Manway	2.2	50.1	47.7	Road
A-50471:	D.D.Parallel below Manway	3.8	72.4	23.8	Rib & Roof
A-50472:	D.D.Haulage below Manway	3.4	56.1	40.5	Road
A-50497:	D.D.Haulage below Manway	2.8	64.7	32.5	Rib & Roof
A-50477:	D.D.Inby explosion zone on 1 F at 1 Left	13.9	71.7	14.4	Road
A-50481:	#3 Face between 1 Left & Bottom	4.3	71.4	24.3	Rib & Roof
A-50480:	3 Face between 1 Left & Bottom	5.7	70.8	23.5	Road
A-50482:	2 Face between 1 Left & Bottom	2.2	38.9	58.9	Road
A-50483:	2 Face between 1 Left & Bottom	3.2	61.2	35.6	Rib & Roof
A-50485:	1 Face between 8 & 9 Butts	1.6	44.7	53.7	Road
A-50486:	1 Face between 8 & 9 Butts	4.1	66.3	26.9	Rib & Roof
A-50487:	2 Face between 8 & 9 Butts	2.0	50.7	47.3	Road
A-50488:	2 Face between 8 & 9 Butts	5.4	68.0	26.6	Rib & Roof
A-50489:	3 Right - 11 Room	3.5	78.9	17.6	Road
A-50490:	3 Right - 11 Room	5.8	79.0	15.2	Rib & Roof
A-50494:	1 Face between 1 Left & Slope Bottom:	3.3	68.7	28.0	Rib & Roof
A-50484:	1 Face between 1 L & Slope Btm.	4.0	58.4	37.6	Road
A-50591:	1 Face 200 ft.inby 13 Right	8.5	49.3	42.2	Rib & Roof
A-50592:	1 Face 200 ft.inby 13 Right	3.2	31.8	65.0	Road
A-50491:	4 Right 11 Room	2.6	68.8	28.6	Road
A-50492:	4 Right 11 Room	4.0	81.2	14.8	Rib & Roof
A-50493:	6 Right 11 Room	7.7	69.1	23.2	Road
A-50494:	6 Right 11 Room	19.1	64.9	16.0	Rib & Roof
A-50495:	5 Right 11 Room	34.0	53.1	12.9	Rib & Roof
A-50496:	5 Right 11 Room	6.2	67.7	26.1	Road
A-50587:	8 Face between 14 & 15 butts	14.0	62.3	23.7	Road
A-50586:	8 Face between 14 & 15 butts	21.8	54.8	23.4	Rib & Roof
A-50593:	2 Face 200' inby 13 Right	17.0	49.6	33.4	Rib & Roof
A-50588:	2 Face 200' inby 13 Right	5.5	41.5	53.0	Road
A-50589:	7 Face between 14 & 15 Butts	11.1	37.1	51.8	Rib & Roof
A-50590:	7 Face between 14 & 15 Butts	6.4	24.8	68.8	Road

It will be noted in these analyses that only three of the samples run less than 35% combustible or over 65% non-combustible, which are the limits recommended by the Bureau of Mines.

Conditions Prior to Explosion:

On the morning of the explosion the mine had started operations in a normal manner. The fan chart showed normal water gauge; the fire bosses reports showed no accumulations of explosive gas in the mine; and the conveyor had been in operation about 20 minutes.

Previous Explosions, this Mine:

A gas and dust explosion occurred at this mine at 9:30 p.m. February 20, 1928, in which 10 men were killed in Kinloch mine and two suffocated in the Boyd mine, which "holes" into the Valley Camp No. 1 Mine, directly connected to the Kinloch mine. This explosion originated at 17 NE off 11 Face opposite No. 16 room. The explosion was started when a cutting machine cable "dip" ignited an accumulation of explosive gas.

Property Damage:

The explosion on March 21, 1929, originated in the dump at the foot of the Kinloch Slope, and travelled up the slope where it completely destroyed the conveyor supports, and destroyed part of the tipple structure by force and fire. The explosion also travelled inby where it destroyed, or more or less damaged, stoppings, overcasts, doors, mine cars, locomotives, rock duster, machine shop , and power lines within the explosion area which extended

to a line running east and west just outby ~~of~~ 15 Butt. The force of the explosion damaged the fan housing to such an extent that it required about five hours to make temporary repairs to get the fan ready to operate.

Several fires were located and extinguished in 3 Butt Right and two fire areas were sealed. The fire area on the left side of the mine is quite extensive. It was found advisable to flood this area on the left in addition to sealing.

The accompanying mine map shows the locations of the bodies and the routes traveled by the men who escaped. It also shows the extent of forces and the sealed fire areas.

Rescue and Recovery Operations:

Calls were made for assistance to surrounding mines, the Bureau of Mines and the Mine Safety Appliances Company.

Within an hour after the explosion teams were arriving at the mine with full equipment of rescue apparatus, and by 2:30 p.m., approximately 30 rescue teams with apparatus had reported at the mine.

Rescue work was impeded at first on account of the damage to the fan and the report that men were escaping from the back openings in the Valley Camp Mine.

Men and cars were dispatched to Valley Camp shaft, 7th Street shaft and Valley Camp drift to render assistance

to those who came out that way. (See appendix for details).

By two o'clock in the afternoon 212 men had made their way out the Valley Camp openings; the fan had been repaired temporarily, and an exploration trip had been made to the foot of the Kinloch Slope. This exploration trip was made by Bureau of Mines engineers and two rescue teams from adjacent mines.

The exploration trip to the slope bottom revealed that the stoppings were blown out at the foot of the slope; considerable wreckage blocked the passageways leading back into the mine; and four bodies were seen, one of these about half way up the slope.

The fan was started about 2:30 p.m., and a systematic exploration of the entire mine was started, oxygen breathing apparatus and gas masks being used to a considerable extent for making explorations ahead of travelling air.

The mine was completely explored and recovered by Saturday evening, and all bodies were removed to the surface except that of a boy who worked in the dumping pit and whose body could not be definitely located on account of the wreckage in the pit. This body was recovered from the sump near the foot of the slope, Thursday, one week after the explosion.

Fires:

Saturday morning smoke was found on the left side in the entries near the foot of the slope. The fires could not be located on account of water accumulations and squeezed conditions

This area was sealed with temporary stoppings, and the air passing these seals was taken across the temporary overcast at 4 left. This area was later sealed with masonry stoppings, and the area increased to include the entire set of entries between 1 and 12 left, between 1 Face and the boundary line on the east side of the mine. It was also decided to flood this area because the grades indicated that an effective water seal could be made by flooding.

Sunday evening, following the explosion, fire was discovered in No. 71 room, 3 Butt right. This fire was extinguished by direct attack but it was soon discovered that additional fires that could not be reached were burning in "61 Section" which is a section of rooms to the south and west of 61 room 3 Butt. It was decided to seal this area to control the fires.

The samples of gases taken from behind the fire seals and analyzed at the Bureau of Mines Experimental Station in Pittsburgh have shown no carbon monoxide since June 21st; thus showing that the fires ~~were out~~ probably had been extinguished.

The seals were left intact, however, and sampling continued until August 5th. The samples in the meantime showed no carbon monoxide and very low oxygen content.

This period of waiting allowed ample time for the heated coals and strata to cool so that the chances of the fire starting again when air was admitted were remote.

The seals on the fire area on the left side of the mine were opened and the section ventilated on August 5th under the direction of the State Inspection force and G. W. Grove of the Bureau of Mines. The exact location of the fire could not be determined on account of large accumulations of water; however, the approximate location was determined as being at No. 23 or 24 room on 1 and 2 left. There is a large fall at this point and the cannel coal roof shows evidence of high temperature.

The fire area on the right side of the mine is still under seal and considerable pumping will be necessary before it can be opened. The seals on this side can only be reached by men wearing hip boots.

These fires are a good example of where the unsealing was governed by laboratory analyses of air samples and unsealing delayed until the analyses indicated that the fire was out and time allowed for cooling of the area.

Extent of Flame and Violence:

From all the evidence at hand the force of the explosion died out just before reaching 15 Butt entry, on a line running east and west.

Had the force and flame gone a few hundred feet beyond this line it is doubtful that any of the 213 men who came out would have survived, as this was the beginning of the active workings.

The force traveled only a short distance toward the "Dabble Duck" section and the men who were killed in this section were all killed by afterdamp which they walked into following the explosion.

That the explosion died out as it did was undoubtedly due to three factors; namely, rock-dusted haulage roads; numerous local swamps and wet sections; and large open territories which allowed room for expansion.

That rock-dust played an important part in cooling the flames is evidenced by the lack of coke except in the immediate vicinity of the slope bottom.

State Inspectors' Conclusions:

A commission consisting of three State Mine Inspectors and three Bureau of Mines engineers made an investigation and report to the Secretary of Mines of Pennsylvania. A copy of this report will be found in the appendix. This commission found in part as follows:

1. "That the conveyor under full load broke near the head sprocket, and very rapidly descended into the slope; That the sudden impact of the conveyor at the foot of the slope threw into suspension a dense cloud of coal dust."

2. "That an explosion followed almost immediately, which was extended to the surface and throughout a large area of the mine with considerable violence."

3. "That from the evidence the explosion followed the landing and impact of the conveyor."

4. "That the source of ignition was flame, discharged from some electric circuit carrying apparatus or device."

5. "That the explosion was propagated by excessive accumulations of coal dust around the slope bottom, in the passageways and trackless entries leading to the active workings.

"It is quite probable that propagation was advanced by ignition of gas. This augmenting of propagation appears to be supported by the fact that explosive gas was found in 3 and 4 Butt left."

6. "That the force of the explosion, using the immediate bottom of the slope as a center, traveled north, expanding where opportunity afforded to the east and west, and dying away in the neighborhood of a line running almost due east and west on the outby side of 15 Butt, and that the dying away of the forces was due to the combined effect of expansion, of accumulations of water in areas of depression and to the rock-dusted passageways. The afterdamp was projected some considerable distance beyond the

line marking the termination of forces."

Summary:

It is the opinion of the writers

1. That this explosion was caused by the ignition of coal dust following the breaking and descent of the conveyor.

2. That the source of ignition was probably an arc from the electric light lines in the dumping pit, although numerous other possible sources of ignition by electricity were in proximity to the slope bottom.

3. That the explosion was propagated by the accumulations of coal dust in the slope, around the bottom, in all trackless entries and in abandoned workings around the bottom of the slope.

4. That the mine was not thoroughly rock dusted.

5. That no means of watering or spraying was used at the working faces or ~~along the haulage roads~~ for spraying pit cars.

6. That no means were provided on the conveyor to prevent its descent in case of a break.

Recommendations:

In the interest of greater safety and to prevent explosions in the future, the following recommendations are made: It is the opinion of the writers that they can be adopted without undue expenditure, or extensive deviation from the present mining system:

1. That the conveyor, if its use is continued, should be equipped with a device, or devices, that will prevent the de-

scent of the conveyor or any part of it into the slope in case of breakage.

2. That the ventilating current be arranged so that the air passing over the dump shall be conducted directly to the outside.

3. That the mine be thoroughly rock-dusted in every part to within 40 feet of every working place. This is to include all haulage ways, air ways and trackless entries, headings, sections, panels, pillars and rooms, whether working or idle.

4. That high pressure water lines be conducted throughout the mine and each working place be equipped with sufficient hose and connections, so that water can be used on the cutter-bar of all mining machines while cutting coal, and so that the coal and region within 40 feet of the face can be kept in a wet and watered condition at all times.

5. That high pressure sprays be located at all gathering partings and over the dump to prevent accumulations of dust from moving cars and from the dumping operation. It is recognized that some of these sprays cannot be operated in cold weather.

6. That open flames, blow torches, acetylene burners, and welding outfits should be restricted to pure intake air.

7. That a reliable and accurate check-in and out system be established and maintained.

8. That all escapeways and passageways through which men are required to travel shall be maintained in safe travelling condition, and shall be suitably marked.

9. That all abandoned sections of the mine be effectively sealed with strong fire-proof seals.

10. That only approved, permissible type, electrical equipment be used in this mine.

Acknowledgements:

The writers wish to express their appreciation to the officials of the Valley Camp Coal Company for the assistance given in making this investigation.

Respectfully submitted,

J. H. Forbes
Supervising Engineer

G. V. Grove
Mining Engineer

P. D. Currie
Associate Mining Engineer

Approved:

R. Harrington

APPENDIX