

**UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION**

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

**Fatal Explosives Accident
June 13, 2003**

**# 1 Mine
Cody Mining Company, Inc.
McDowell, Floyd County, Kentucky
ID No. 15-17373**

Accident Investigators

**Anthony L. Burke
Coal Mine Safety & Health Inspector**

**Buford Conley
Coal Mine Safety & Health Inspector**

**Originating Office:
Mine Safety and Health Administration
District 6
100 Fae Ramsey Lane
Pikeville, Kentucky 41501
Franklin M. Strunk, District Manager**

Release Date: October 23, 2003

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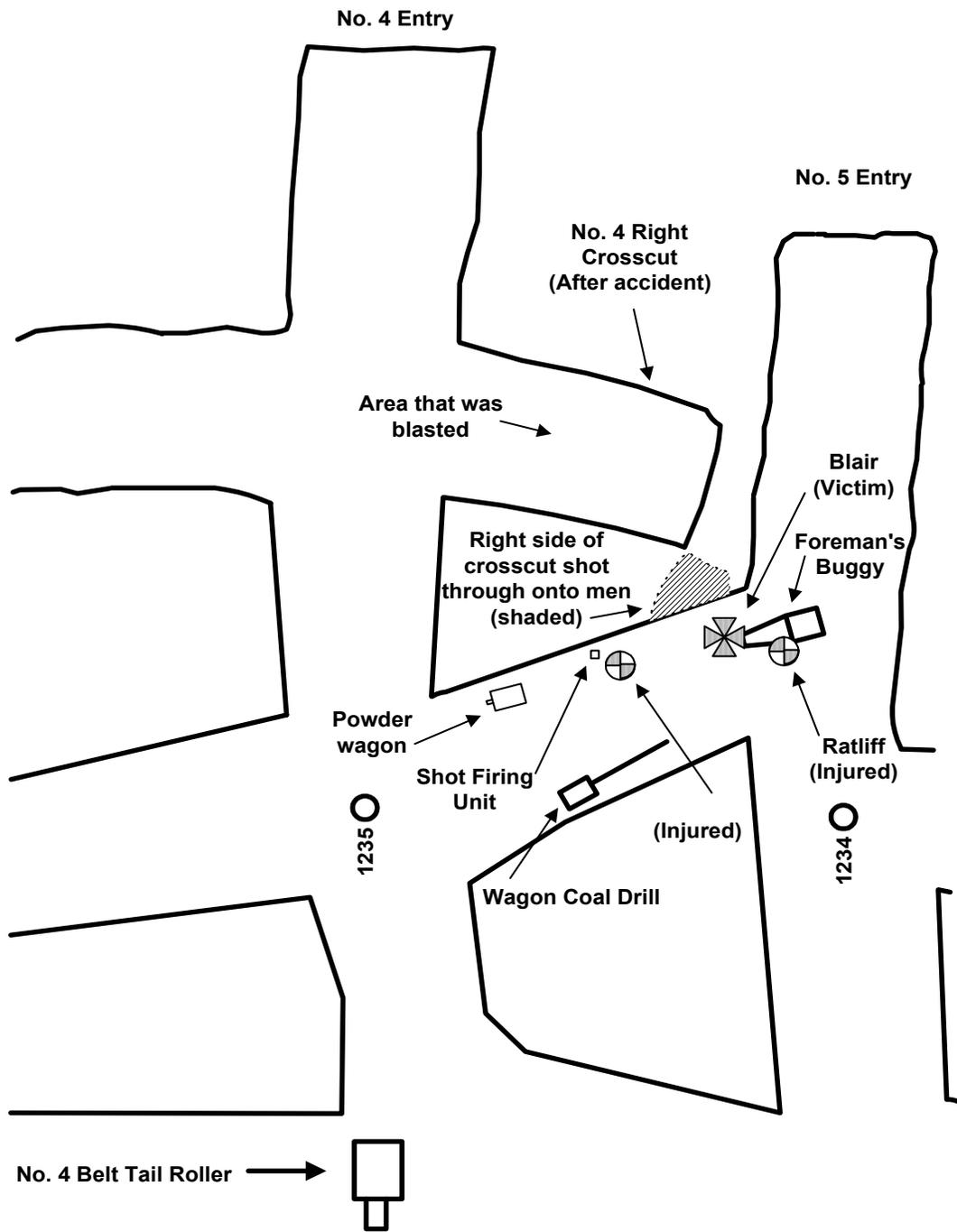
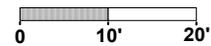


Figure 1 - Detail of Accident Scene



Fatal Blasting Accident
 Cody Mining Company, Inc.
 No. 1 Mine (15-17373)
 McDowell, Floyd County, Kentucky
 June 13, 2003

OVERVIEW

A 21-year-old Coal Drill Helper with two years total mining experience was fatally injured when the working face of a crosscut was blasted into the next outby crosscut. Two other miners were also injured in this accident, one of them seriously. The victim and his co-workers had retreated to the last open crosscut to set off the shot in the 32-inch high seam of coal when the accident occurred. The entries and crosscuts of the working section were driven off-centers, resulting in the No. 4 Right crosscut blasting into the outby crosscut. The cause of the accident was the failure to maintain proper sight lines and centers, the failure to conduct adequate preshift examinations, and excessive entry and crosscut widths.

GENERAL INFORMATION

Cody Mining Company, Inc., # 1 Mine (I.D. No. 15-17373), is located on Frazier's Creek, approximately 5 miles from State Route 122, near McDowell, in Floyd County, Kentucky.

Robert C. Ratliff, Sr. of Paintsville, Kentucky, is president and wholly owns Cody Mining Company, Inc. Shirley M. Ratliff is the secretary/treasurer, Robert C. Ratliff, Jr. is the superintendent, and Eugene Conley is the foreman.

The mine began production in the Lower Elkhorn coal seam, which averages 32 inches in height locally, on September 18, 1995, as Hood's Fork Mining, Inc., using the conventional method of mining and scoop haulage. Hood's Fork Mining, Inc., was temporarily abandoned on December 04, 1995. Cody Mining Company Inc., assumed operation of the mine on June 03, 1997, and began production on January 26, 1998.

At the time of the accident, approximately 150 tons of coal was being produced daily from one active section. Coal was broken from the working faces with explosives, utilizing solid blasting (drilling and shooting without the use of a cutting machine). Battery-powered scoops were used to load and haul coal from the working faces to the section loading point. Coal was then transported to the surface via a series of belt conveyors.

A total of twelve persons were employed at the mine, ten underground and two on the surface. The mine operated one production shift, five days per week. There had been no lost time accidents reported at this mine from the time Cody Mining Company, Inc. assumed control until June 13, 2003.

The last complete safety and health inspection of the mine by the Mine Safety and Health Administration was conducted from January 28, 2003, through March 07, 2003.

A safety and health inspection of the mine had been started on June 02, 2003, and was ongoing at the time of the accident.

DESCRIPTION OF THE ACCIDENT

At 7:00 a.m. on June 13, 2003, the day shift crew entered the mine under the supervision of Eugene Conley, Mine Foreman, and Robert C. Ratliff, Jr., Superintendent. The crew entered the mine and traveled approximately 2,800 feet underground to the 001-0 working section via Elkhorn battery-powered scoops and a four-wheeled battery-powered personnel carrier.

Upon arriving on the section, the crew started coal production activities. Robert C. Ratliff, Jr. and the victim, Paul E. Blair, Coal Drill Helper, started drilling operations in the No. 1 working face while scoops were used to begin loading coal out of the No. 6 Left face. Prior to the accident, the following additional working faces were also drilled for blasting: No. 2 Left Crosscut, No. 2 Entry, No. 2 Right Crosscut, No. 3 Entry, No. 4 Left Crosscut, No. 4 Entry, and No. 4 Right Crosscut.

Production continued normally until approximately 12:30 p.m., at which time three working faces in the No. 4 entry were ready to be blasted. Robert Delong, Shot Firer, detonated the No. 4 Right crosscut after receiving the "all clear" signal from Robert C. Ratliff, Jr., who had been performing duties as drill operator and superintendent. The shot broke through into the outby crosscut where Delong, Robert C. Ratliff, Jr., and Blair were located. Delong observed that Robert C. Ratliff, Jr. had been seriously injured, and crawled over to the No. 6 entry to obtain help from the roof bolting crew. After Delong informed Billy Adams, Roof Bolter Operator, of the accident, Adams crawled over to where Blair and Robert C. Ratliff, Jr. were located. Adams called to the others that Blair appeared to have been fatally injured and that Robert C. Ratliff, Jr. appeared to be seriously injured.

Larry Ratliff, Scoop Operator, arrived at the accident scene to assist Adams. Adams instructed Estill Lowe, Roof Bolter Helper, to telephone the surface and inform the outside man that a serious accident had occurred and that an ambulance was needed at the mine.

Adams and Larry Ratliff prepared to transport Robert C. Ratliff, Jr. via scoop to the surface. Adams rode to the surface in the scoop bucket with Robert C. Ratliff, Jr. Delong then spoke with Michael Adkins, Belt Man, and asked him to telephone the surface and call his father to let him know that Delong was also injured and may have to go to the hospital. Robert C. Ratliff, Sr. then instructed Conley to bring the remaining miners outside. The fatally injured victim remained underground at this time.

INVESTIGATION OF THE ACCIDENT

At approximately 1:00 p.m., Robert C. Ratliff, Sr. notified Scott Whitaker, Supervisory Coal Mine Safety and Health Inspector at MSHA's field office located in Martin, Kentucky. Robert C. Ratliff, Sr. also contacted the Kentucky Department of Mines and Minerals (KDMM) office in Martin, Kentucky.

Whitaker immediately dispatched Coal Mine Safety and Health Inspectors Tony Sturgill and Charles Moore to the mine. A section 103(k) Order was issued to ensure the safety of all persons until an investigation could be made to determine the extent of hazards contributing to the accident. Coal Mine Safety and Health Inspector Buford Conley was contacted at home at approximately 1:30 pm. He and Whitaker traveled together to the mine and went underground, accompanied by Tracy Stumbo, Wesley Gearheart, and Alan Howell from KDMM. MSHA and KDMM personnel recovered the victim's body and transported it to the surface, where Floyd County Coroner Roger Nelson examined the victim.

The investigation team examined the scene, took measurements, and informally interviewed employees who were at the mine at the time of the accident. Formal interviews were conducted on June 14th and 23rd, July 2nd, 10th, 23rd, and August 14th, 2003, at the KDMM office located in Martin, Kentucky. Six miners and one supervisor were interviewed during this session. The interviews were transcribed.

During the investigation, violations for conditions or practices that did not contribute to the accident were cited under a separate inspection event, and are not included in this report. The investigation team and personnel from MSHA's Educational Field Services Division also reviewed the operator's training records. Although several deficiencies were cited, none were contributory factors to the accident.

A quantity of an unknown substance was found in a clear plastic bag at the accident scene, and was sent by state investigators to the Kentucky State Police laboratory. The substance was identified by the laboratory as marijuana.

The investigation also revealed that the accident scene was altered, a violation of 30 CFR 50.12, when the non-permissible coal drill was moved from the accident site to an outby location, a distance of 150 to 180 feet.

DISCUSSION

Blasting and Mining Methods

The mine used the method of "shooting off the solid" (drilling and blasting without using a cutting machine to create a kerf) to break coal from the working faces. With this

method, coal remains confined in all directions from the loaded drill hole, except toward the working face. Typically, several blast holes are drilled into the free face on an angle. The loaded blast holes are then timed to detonate in a sequence so that other free faces are created during the blast, which allows the coal to be broken and cast out from the face. However, when loaded drill holes are detonated near an adjacent entry or crosscut, an additional free surface is available on the opposing side of the face for releasing energy from the shot.

Additional care must therefore be taken when approaching adjacent mine openings to ensure that the blast of a face is designed properly so that it does not shoot into an adjacent area or back side of the face where persons may be present.

Based upon witness statements taken under oath, it was determined that an excessive amount of explosive was used in the holes drilled for blasting. Using an excessive amount of explosive further increases the danger of shooting into an adjacent area.

A non-permissible coal drill, equipped with a 12-foot auger, was being used to drill blast holes into the working faces. In this case, the 12-foot hole depth placed the explosive charge close to an adjacent mine opening, permitting the unplanned release of energy from the detonated explosives into the area occupied by Delong, Robert C. Ratliff, Jr., and Blair.

Mining Practices

Poor mining practices resulted in excessive widths of entries and crosscuts, undersized pillars, misaligned openings, accidental cut-throughs, and other violative conditions. These practices resulted in crosscut centers that were smaller than those specified in the approved roof control plan. Numerous crosscuts and entries had been mined as much as 25 degrees off their projected center lines. Observations on the working section and throughout the mine indicated that sightlines or other effective methods of directional control were not being used to maintain the projected direction of mining. This resulted in the two crosscuts involved in the accident being mined toward one another (refer to Figure 1). The No. 4 Right Crosscut working place was mined from 14 to 16 degrees to the right of its projected center line, while the last open crosscut was mined from 24 to 28 degrees to the left of its projected 90 degree angle off the No. 4 Entry. An additional factor that caused the No. 4 Right Crosscut working place to be mined off center was that it was blasted or "broken" continuously from the right side of the face during the mining cycle. This practice resulted in the crosscut being progressively mined to the right of center (in an outby direction) with each shot.

Wider mine openings also reduce adjacent pillar dimensions. Entry and crosscut widths exceeded the maximum of 20 feet permitted by the approved roof control plan at numerous locations on the working section, where widths of up to 25' were measured. Mining widths at the accident site were 21'6" in the No. 4 Right Crosscut

working place and 20 feet in the last open crosscut where Robert C. Ratliff, Jr., Blair, and Delong were located during the accident.

Mine Examinations

Preshift examinations are designed to identify, document, and facilitate correction of hazardous conditions. The mine's preshift examinations failed to identify obvious hazardous conditions, some of which had existed for extended periods of time. Although the preshift record books were completed, no certifications by date, time and initials, as required by 75.360(e), were found underground to demonstrate that any examination was performed. In addition, the records did not identify obvious hazardous conditions that contributed to the accident. Hazardous conditions are required to be recorded according to 75.360(f), including corrective actions. Obvious hazards included excessive widths of entries and crosscuts, undersized pillars, and misaligned openings – caused by a failure to use directional controls. Also, it would have been obvious to an examiner that persons were regularly working and traveling inby permanently supported roof.

The pre-blasting check, required by 75.1325, was similarly inadequate. Robert Delong, Robert C. Ratliff, Jr., and Paul E. Blair, were located in the last open crosscut between survey stations 1234 and 1235 when the No. 4 Right crosscut was blasted. Interview statements by Delong indicated that, after observing a scoop leaving the section loading point, Robert C. Ratliff, Jr., gave the "all clear" signal to Delong to blast the No. 4 Right Crosscut.

At approximately 12:30 p.m., when the No. 4 Right Crosscut was blasted, the shot broke through into the outby crosscut where Robert Delong, Robert C. Ratliff, Jr., and Paul E. Blair were located. Blair was fatally injured, Robert C. Ratliff, Jr. received serious injuries, and Delong received minor injuries.

Training

Although several deficiencies were found in the training records for this mine, they were cited as part of a separate inspection event because they were determined not to be contributing factors to the accident.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following causal factors were identified:

Causal Factor: A sightline or other method of directional control to maintain the projected direction of mining was not being used.

Corrective Action: Mine management should ensure that a sightline or other methods of directional control is utilized in all entries, rooms, and crosscuts to maintain proper centers and direction of mining.

Causal Factor: Adequate preshift examinations were not being conducted.

Corrective Action: The person conducting the preshift examination should ensure that all areas of the mine where miners work or travel are examined. Any hazardous conditions found should be properly recorded in the record book along with the action taken, or the area should be posted with a conspicuous danger sign to prevent access until the condition has been corrected. The person conducting the preshift examination should certify by initials, date and time that the examination was made.

Causal Factor: Persons were not removed to an area free from the hazards associated with blasting activities.

Corrective Action: All persons should leave the blasting area and each immediately adjacent working place where a hazard would be created by the blast, to an area that is around at least one corner from the blasting area and a qualified person should ascertain that all persons are a safe distance from the blasting area.

Causal Factor: Numerous entries and crosscuts had been mined from 20'6" to 25' wide.

Corrective Action: Entries and crosscuts should be driven in accordance with the approved roof control plan. Additional roof support should be installed where widths exceed the parameters specified in the approved roof control plan.

CONCLUSION

The fatal accident was the result of poor mining practices, inadequate or lacking mine examinations, use of a coal drill with a 12-foot drill auger, and improper blasting procedures. No sightline or directional controls were used. Hazardous conditions were not recorded and there was no indication found underground (date, time, and initials) that required examinations had been conducted. Persons were not removed from areas subject to blasting hazards. Contributing to the accident was a management system and philosophy which permitted miners to work under unsupported roof; permitted

development, without correction, of excessive widths of entries and crosscuts; and caused alteration of the accident scene.

ENFORCEMENT ACTIONS

1. 103(k) Order No. 7397812 was issued to ensure the safety of any person in the mine until an examination or investigation is made to determine that the mine is safe.
2. 104(d)(1) Citation No. 7402741 was issued to Cody Mining Company, Inc. because a sightline or other method of directional control to maintain the projected direction of mining was not being used on the 001-0 working section. The third cut being mined from the No. 4 Right crosscut had been prepared for blasting and, when the explosives were detonated, the right corner of the No. 4 Right crosscut shot into the last open connecting crosscut between survey stations 1234 and 1235. The failure to maintain proper sightlines or other method of directional control was a contributing factor to an accident on June 13, 2003, that resulted in fatal injuries to the Coal Drill Helper, serious injuries to the Coal Drill Operator, and injuries to the Shot Firer. Evidence indicates this was a mine-wide practice in that numerous crosscuts throughout the mine were driven as much as 25 degrees off center, a violation of 30CFR, 75.203(b).
3. 104(d)(1) Order No. 7402742 was issued to Cody Mining Company, Inc. for failure to conduct adequate preshift examinations on the 001-0 working section as required, in that several obvious hazardous conditions existed that contributed to an explosives accident on June 13, 2003.

Those hazards included crosscuts being mined off the projected centers due to a failure to use a sightline or other means of directional control on the 001-0 working section, and entry and crosscut widths in excess of that specified in the approved roof control plan. There were no hazardous conditions recorded in the preshift book for June 13, 2003, a violation of 30 CFR, 75.360(b). No dates, times or initials were found at any location in the mine, which indicates that, as a practice, preshift examinations were either inadequate or omitted altogether.

Failure to conduct adequate preshift examinations was a contributing factor to an explosives accident on June 13, 2003, that resulted in fatal injuries to the Coal Drill Helper, serious injuries to the Coal Drill Operator, and injuries to the Shot Firer.

4. 104(d)(1) Order No. 7402743 was issued to Cody Mining Company, Inc. for failure to ascertain that all persons had been removed to a safe location prior to blasting, a violation of 30 CFR, 75.1325(c). The Shot-Firer, Coal Drill Operator, and Coal Drill Helper were at the last open crosscut between survey stations

1234 and 1235 when the face of the No. 4 Right crosscut was blasted. When the explosives were detonated, the right corner of the No. 4 Right crosscut shot into the last open connecting crosscut where the miners were located.

This practice was a contributing factor to an explosives accident on June 13, 2003, that resulted in fatal injuries to the Coal Drill Helper, serious injuries to the Coal Drill Operator, and injuries to the Shot Firer.

5. 104(d)(1) Order No. 7402744 was issued to Cody Mining Company, Inc. because numerous entries and crosscuts on the 001-0 working section had been mined from 20'6" to 25' wide, a violation of 30 CFR, 75.203(e)(1). No additional roof support had been installed in these wide areas. The approved roof control plan requires that entries and crosscuts be driven no more than 20' in width.

The wide entries and crosscuts, in conjunction with mining off centers, reduced the size of the coal pillars and was a contributing factor to an explosives accident on June 13, 2003, that resulted in fatal injuries to the Coal Drill Helper, serious injuries to the Coal Drill Operator, and injuries to the Shot Firer. This practice demonstrates aggravated conduct on the part of the mine operator.

6. 104(d)(1) Order No. 7402745 was issued to Cody Mining Company, Inc. because the operator was not complying with the approved roof control plan, a violation of 30 CFR, 75.220(a)(1). Crosscuts in all 8 entries of the 001-0 working section (from spad No. 1115 in the No. 1 entry inby for 5 crosscuts to the faces) were driven on centers ranging from 30 feet to 40 feet. The roof control plan, approved July 07, 1998, specifies minimum crosscut centers from 60 feet to 80 feet.

The reduced crosscut centers reduced the size of the coal pillars and was a contributing factor to an explosives accident on June 13, 2003, that resulted in fatal injuries to the coal drill helper, serious injuries to the coal drill operator and injuries to the shot firer.

7. 104(d)(1) Order No. 7402746 was issued to Cody Mining Company, Inc., based on taped and transcribed interviews taken under oath during the investigation of a fatal blasting accident. It was determined that more than 3 pounds of explosive was loaded into holes drilled into the faces of the No. 3 entry, No. 4 entry, No. 4 left crosscut, and No. 4 right crosscut on the 001-0 working section, a violation of 30 CFR, 75.1319.

The detonation of an excessive amount of explosive in the aforementioned faces was a contributing factor to an explosives accident on June 13, 2003, that resulted in fatal injuries to the coal drill helper, serious injuries to the coal drill operator and injuries to the shot firer.

8. 104(a) Citation No. 7402747 was issued to Cody Mining Company, Inc. because evidence indicated that, prior to MSHA's investigation of a fatal blasting accident on June 13, 2003, the accident scene was altered when a non-permissible drill involved in the accident was moved from the accident scene to another location outby the 001-0 working section, a violation of 30 CFR, 50.12.

The Click's wagon drill, which was equipped with a twelve-foot drill auger, had been moved from the accident scene outby approximately 150 to 180 feet to the crosscut between the No. 3 and No. 4 entries, adjacent to survey station No. 1226. The injured miners were in the last open crosscut of the 001-0 working section, between survey stations 1234 and 1235. Evidence, in the form of blood spatters covering the frame of the drill, indicates that the drill was in the last open crosscut when the accident occurred. The investigation revealed that the 10-5 SO cable, which supplied 220VAC power to the Click's drill, had been freshly cut on both ends.

An explosives accident at this mine on June 13, 2003, resulted in fatal injuries to the Coal Drill Helper, serious injuries to the Coal Drill Operator, and injuries to the Shot Firer.

APPROVED BY:

Franklin M. Strunk
District Manager

APPENDIX A

List of Persons Participating in the Investigation

Cody Mining Company, Inc.

Cody Mining Company, Inc. personnel did not participate in this investigation.

Kentucky Department of Mines and Minerals

Wesley Gearheart	.....	Electrical Inspector
Allen Howell	.....	Electrical Inspector
Earl Dean Martin	.....	Inspector
Freddie Moore	.....	Inspector
Tony Opegard	.....	Chief Counsel
Tracy Stumbo	.....	Chief Investigator

Mine Safety and Health Administration

Anthony Burke	.....	Coal Mine Safety & Health Inspector
Buford Conley	.....	Coal Mine Safety & Health Inspector
Anne Knauff	.....	Attorney, U.S. Department of Labor , SOL
Gerald McMasters	.....	Conference & Litigation Representative
Franklin M. Strunk	.....	District Manager
Tony Sturgill	.....	Coal Mine Safety & Health Inspector
Arlie A. Webb	.....	District 6 Accident Investigation Coordinator
Scott Whitaker	.....	Supervisory Coal Mine Safety & Health Inspector

APPENDIX B

List of Persons Interviewed

Cody Mining Company, Inc.

Michael Adkins	.....	Head Drive Man, Beltman
Billy Adams	.....	Roof Bolter Operator
Jack Collins, Jr.	.....	Head Drive Man
Eugene Conley	.....	Foreman and Scoop Operator
Estill Lowe	.....	Roof Bolter Operator
Larry Ratliff	.....	Scoop Operator
Robert C. Ratliff, Sr.	.....	Mine Operator/ Owner
Ronald Ratliff	Outside Man, Electrician

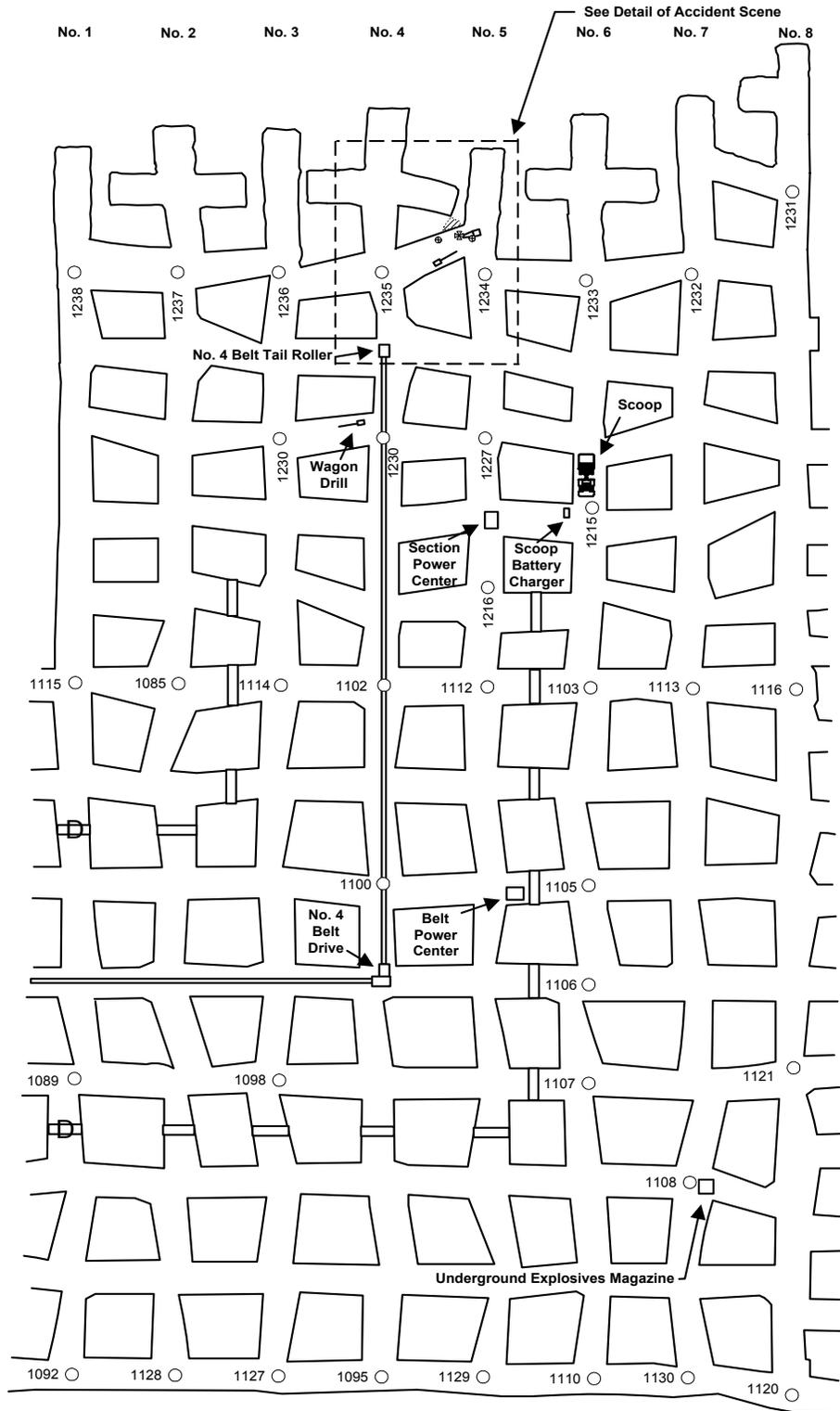


Figure 2 - Sketch of 001-0 Section

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