

### INTRODUCTION

This report is based on an investigation made pursuant to Section 103(a) of the Federal Mine Safety and Health Act of 1977, Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Joseph N. Cassaro, underground mine supervisor, age 46, Social Security Number 0947; George M. Martinez, stope miner, age 39, Social Security Number 9060; and Joseph Granillo, stope miner, age 26, Social Security Number 2689; were fatally injured between 5:30 and 6 p.m., May 10, 1982 in three separate incidents that involved a cave-in and fall-of-ground in the farm area of the 3440-2C stope.

The three were employees of Magma Copper Company, Superior Division for a combined total of 13 years. Cassaro's total known experience was 8-1/2 years, and was with this operation for about 3 years and a supervisor since December of 1979. Martinez's total known experience was 12 years and was with this operation for over 2 years as a stope miner. Granillo's total known experience was 8-1/2 years, all at this operation and was a stope miner for 2 years.

The Phoenix, Arizona Subdistrict Office of the Mine Safety and Health Administration was notified of the accident about 6:30 p.m., May 10, 1982, by Norbert Barajas, company safety engineer. An investigation was started the same day.

Information contained in this report was obtained from company officials, one victim's working partner, additional employees, and examination of the accident site.

An MSHA approved training plan was in effect and in compliance with Part 48 of 30 CFR. The victims had completed their last annual refresher training on November 3, 4, and 6, 1981.

### GENERAL INFORMATION

The Magma underground copper mine, owned and operated by Magma Copper Company, a subsidiary of Newmont Mining Corporation, was located about 9 miles east of Superior, Pinal County, Arizona, and south of U.S. Highway 60. Operating officials were: Frank Florez, general manager; Tim Acton, mine superintendent; Joe Vindiola, general mine foreman; Tony Johnson and Les Presmyk, assistant general foremen; and Norbert Barajas, safety engineer.

The mine was on a 36-hour schedule working four shifts, 7 days a week. A total of 978 employees worked at the underground mine on three 8-hour shifts a day and an additional 212 employees worked in the supporting shops and yards.

The mining method was primarily cut-and-fill stoping. Conventional drilling and blasting with pneumatically powered, rubber-tired CAVO LHD machines were used to handle the blasted materials. Conventional timbering was used throughout the mine for ground support. Rail haulage and vertical hoisting transported ore from the mine to surface processing facilities. Mined-out areas (stopes) were backfilled with hydraulic sandfill.

The last regular inspection of the Magma Mine, under Public Law 91-173 (83 STAT. 742) was conducted by two inspectors going to separate areas starting February 2 and ending March 9, 1982.

Participants in the accident investigation were:

Magma Copper Company

Frank Florez, general manager  
 William G. Wood, vice president and director of safety  
 Tim Acton, mine superintendent  
 Joe Vindiola, general mine foreman  
 Les Presmyk, assistant general mine foreman  
 Eddie Bartoglio, area mine foreman  
 Bob McDaniels, mine shift boss  
 Norbert Barajas, safety engineer  
 Walt Bartmess, safety  
 Luie DaRugna, foreman  
 Jess Almanza, level boss  
 George Gomez, miner and Granillo's partner (witness)  
 Andy Arroyos, miner (witness)  
 Paul Gonzales, miner (witness)  
 Henry Rodriguez, miner  
 Michael Ross, miner  
 Joe Brebiescas, miner  
 John Vera, miner  
 Jack Pruitt, miner

United Steelworkers of America, Local 938

Frank Maddox  
 Ruben Sanchez

Pinal County Sheriff's Department

Arizona State Mine Inspector's Office

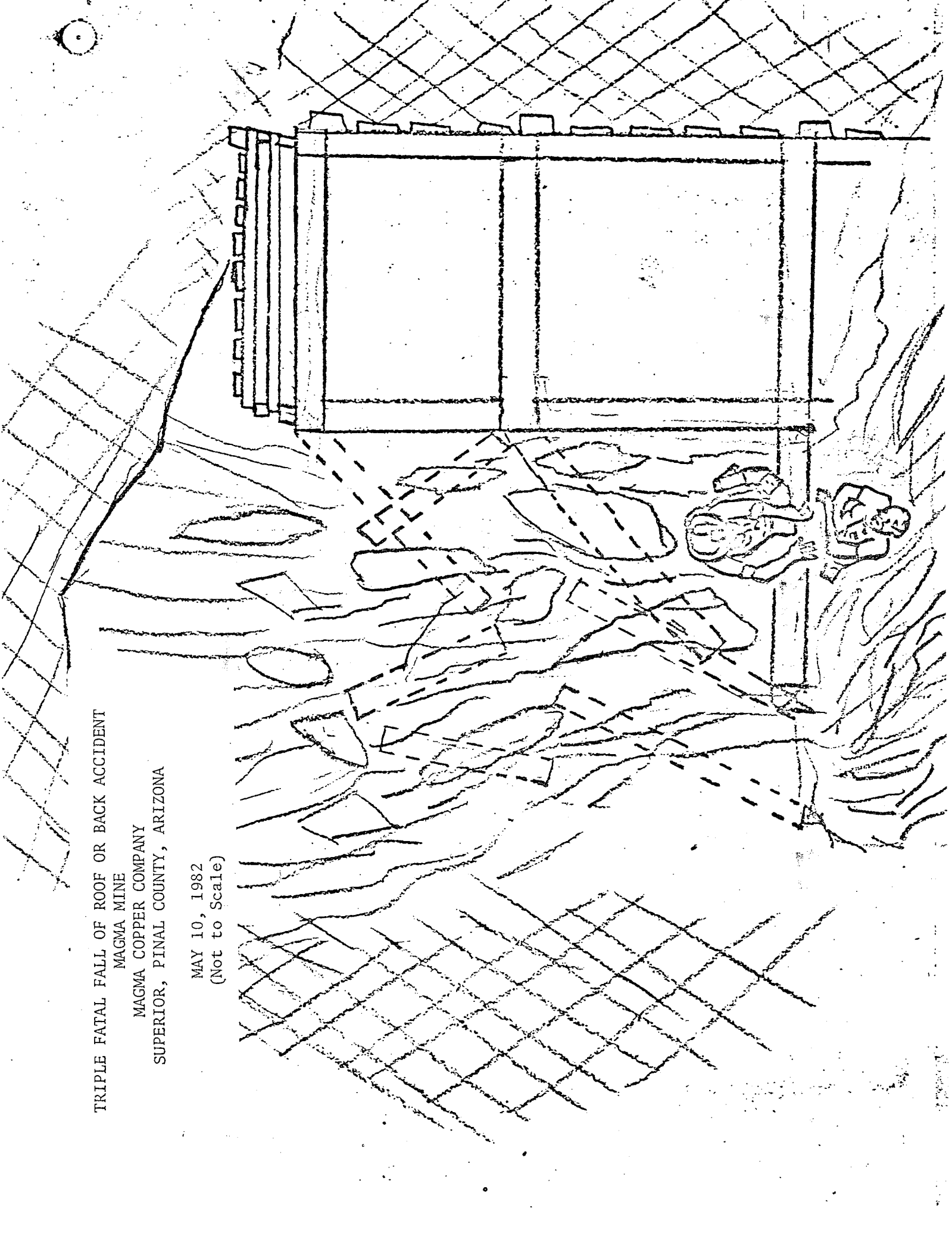
Frank Sepulveda, mine inspector  
 John Taylor, mine inspector

Mine Safety and Health Administration

Vernon R. Gomez, subdistrict manager  
 Harold Asheim, supervisory mine safety and health inspector

TRIPLE FATAL FALL OF ROOF OR BACK ACCIDENT  
MAGMA MINE  
MAGMA COPPER COMPANY  
SUPERIOR, PINAL COUNTY, ARIZONA

MAY 10, 1982  
(Not to Scale)



Juaquin G. Sepulveda, mine safety and health inspector  
Benito Orozco, mine safety and health inspector  
Clarence Ellis, mine safety and health inspector (special investigator)

#### PHYSICAL FACTORS INVOLVED

The mining method used in the 17 north panel 3440-2C stope where the accident occurred was underhand stoping with sandfill in the back and on the right side. A wedge of ore about 8 feet thick on the left side was to be mined with sandfill beyond the wedge of ore.

The 17 north panel was 13 sets long and had been completed and the stope crews were in the process of mining the wedge of ore. This process was called farming.

The normal stope set timbers used were two 10- by 10-inch by 10-foot posts, one 10- by 10-inch by 10-foot cap about 22 feet in height, placed on 5-foot centers and tied to the existing sandfill stope timbers.

The panel was 28 feet in height, 6 feet more than normal and required an additional set above the normal sets referred to as a pony set.

The first farm area was blasted on or about May 1, 1982, and the mining cycle (blasting, mucking & timbering) was completed within 2 days of the initial blast. A second blast was made in the farm area on May 4, 1982 and mucking & timbering had not been completed by May 10, 1982, when the accident occurred.

A sandfill line on the 3400 level had become loose at a connection causing a spill of sand and water to run down into the muck tramway of the 3440-2C stope preventing the rubber-tired mucker from operating. A decision was then made to pump the water and install muck floors over the spill. This delayed the stope crews from extracting the broken ore and completing the timbers in the farm area.

The cave-in washed out the sets 7, 8 & 9 and the roof peeled to a width of about 30 feet and was cone shaped approximately 12 to 15 feet from the top of the existing 17 N panel and the farm area. The 10, 11, and 12 sets were still in place after the accident.

#### DESCRIPTION OF THE ACCIDENT

On the day of the accident, George M. Martinez, miner (victim); Joseph C. Granillo, miner (victim); Joseph N. Cassaro, supervisor (victim); reported for work on their regular afternoon shift, 4 p.m. to 12 midnight.

Reportedly, a safety meeting was held, and conducted by Cassaro (victim), on the 3400 level with numerous employees which included the other two victims.

After the meeting George A. Gomez and Granillo (victim) proceeded to their working place, 3440-2C stope. They instructed the timber rustlers to stay near the stope's timber slide at the level, while Granillo and

Gomez checked on what timbers they were going to need. After returning with their timber order, Gomez and Granillo sat down near the stope's entrance, drank a soft drink, smoked a cigarette and discussed the timbering process. They were to finish timbering by standing two posts under the middle set and blocking and lagging the west and face sides. (See Sketch #1)

At about 5:30 p.m., Gomez and Granillo went back into the stope and stood on the farm pony set floor. Seeing some loose ground, Granillo asked Gomez for a bar. As Gomez handed Granillo the bar, the first fall-of-ground occurred. Gomez jumped back into the 6th pony set of the panel, getting away from the cave-in.

Gomez stated the ground or timber gave no warning whatsoever. When the dust had cleared, Gomez saw that the farm pony set, the 7th, 8th and 9th sets of the 17 N panel (see sketch #2) were washed out. He saw Granillo trapped up to his waist and was not able to pull him out. He immediately ran for help to the adjacent 3440-5C stope, some 200 feet away. Andy Arroyos (witness) miner; Paul Gonzales (witness) miner; Martinez and Cassaro (victims) responded to Gomez's call.

Arriving at the accident site, the five men began trying to rescue Granillo. Cassaro ordered Gonzales up the level (3400) to summon help and get a basket. At this time, Arroyos asked Martinez to help him remove a steel beam that was next to Granillo. When doing so, a second fall-of-ground occurred hitting Martinez and knocking Arroyos to one side. (See Sketch #3) Gomez and Arroyos picked up Martinez and laid him in the middle of the first farm set, which was still standing. Gomez then left to assist Gonzales.

Arroyos helped Martinez into a comfortable position. Seeing the ground was moving over and around the existing farm set, he decided to move Martinez, who was still alive and talking, into the panel's 11th middle set. Arroyos stated that, when the events were happening, Cassaro was digging, trying to uncover Granillo. Arroyos also stated that after assisting Martinez, he told Granillo to grab hold around his neck and Arroyos, putting his arms around Granillo's upper body, tried to pull him out, but to no avail. Seeing that Granillo's legs were pinned between timbers and muck, he decided to run back to his stope for a tugger, to pull the timbers from around Granillo.

Help had been summoned and a basket had been lowered down the stope's timber slide and manway. Gomez then returned to the accident site carrying the basket. He stated that he saw Cassaro and told him he had the basket when the third fall-of-ground occurred, completely covering Granillo and Cassaro. As the dust cleared, he yelled for anyone and Martinez was the only one that responded to his call.

More help arrived, and with the roof still caving, three miners, Henry Rodriguez, Ray Curtis, and Andy Arroyos, crawled over the muck pile and were able to load Martinez onto the basket. Martinez was taken to Number 9 mine shaft where he was pronounced dead.

Rescue and recovery continued around-the-clock. Granillo's body was recovered at 1 a.m. and Cassaro's body was recovered at 5 a.m., on May 12, 1982.

#### CAUSE OF ACCIDENT

The accident was caused by the failure of the temporary ground support. A contributing factor was the length of time between the time the work place was blasted and the time permanent ground support was started.

#### CITATION ISSUED

The following citation was issued during the investigation:

Citation No. 383668 104(a) issued May 26, 1982 at 0800 hours

Part and Section: 57.3-20

On May 10, 1982, the company had experienced 3 fatalities in 3 separate sequences in the 3440-2C farm area. Two miners were in the process of barring down some loose ground from the 6 ft. pony set in the farm when a fall-of-ground occurred trapping one of the miners. The second farm line had been blasted on May 4th and the timbering of the middle and bottom sets had not been completed by May 10, 1982, when the accident occurred. The timbering had been delayed because of conditions in the stope's muck tramway. A sandfill line had become loose at a connection on the above level (3400) causing the Cavo-mucking machine unable to continue the mucking and dumping of the broken material (ore) from the farm line into the 4CC ore pass. Circumstances of this condition inadvertently directed the stope crews to work in correcting the tramway problem leaving the incompleteness of the timbers of the farm line. Supervisors should have known the condition insofar as the length of time the line was left open and in consistent with the nature of the ground and the mining method used at this mine.

Citation No. 383668 was terminated May 26, 1982 at 1045 hours. The 3440-2C stope has been backfilled.

#### RECOMMENDATIONS

Compliance with the following recommendations may prevent similar accidents or reduce their severity.

Raise elevations to an acceptable height in stopes that are now being farmed and timber farm areas immediately. Acceptable, meaning not to farm any areas that are higher than the two standard sets.

## ACKNOWLEDGMENT

The courtesy and cooperation of company and union personnel during this investigation are appreciated.

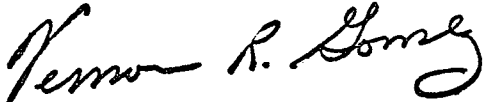
/s/ J. G. Sepulveda

J. G. Sepulveda  
Mine Safety and Health Inspector

/s/ Benito Orozco

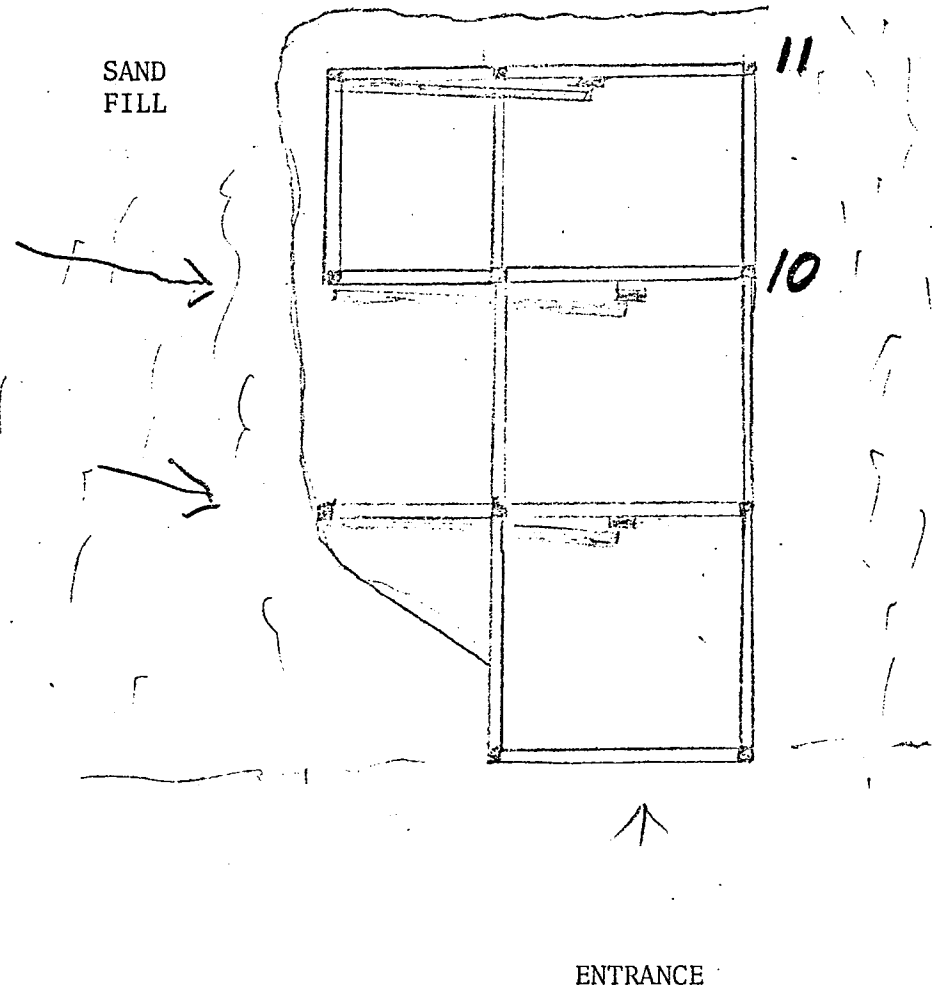
Benito Orozco  
Mine Safety and Health Inspector

APPROVED:



Vernon R. Gomez  
Subdistrict Manager

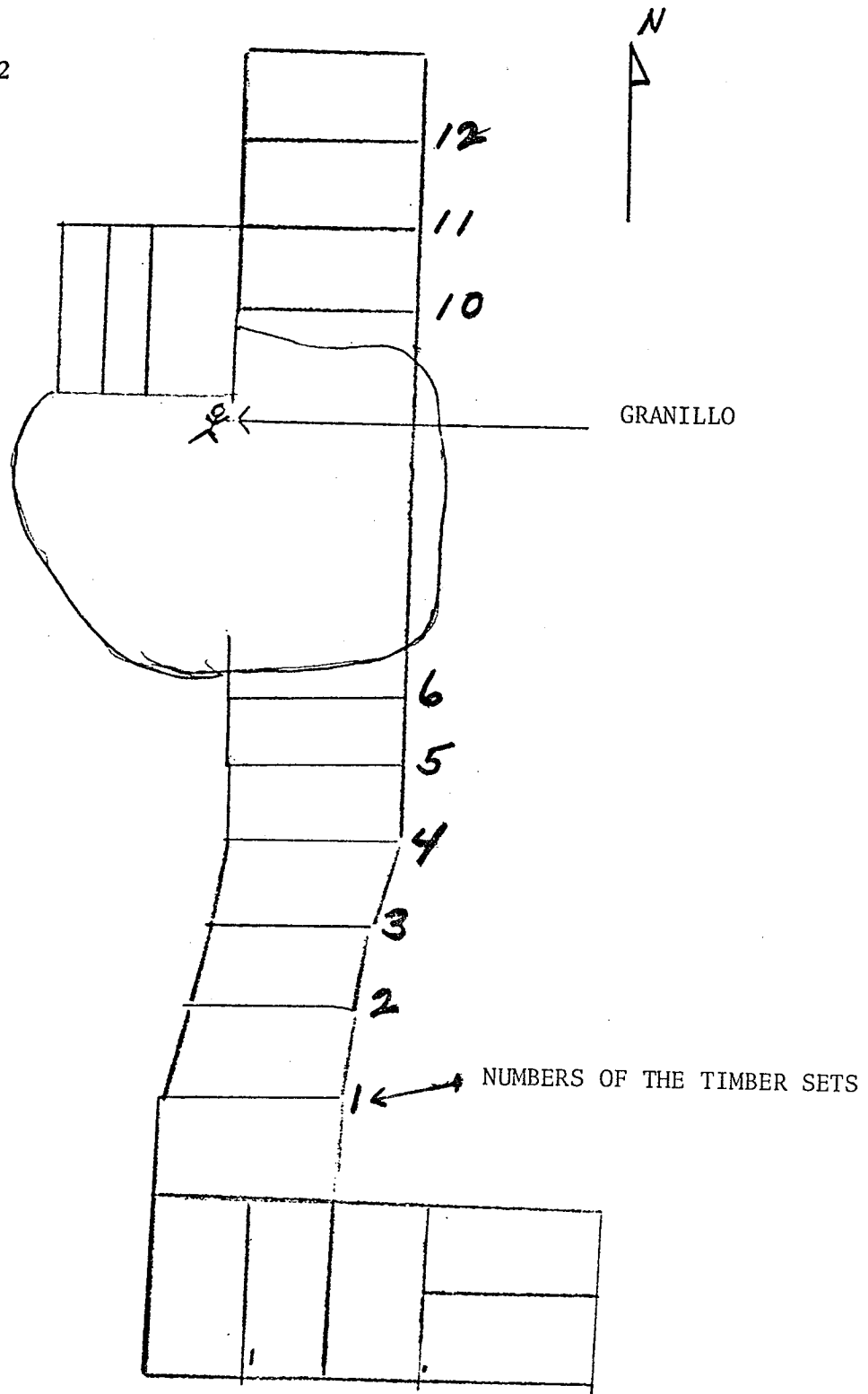
SKETCH # 1



NOT TO SCALE

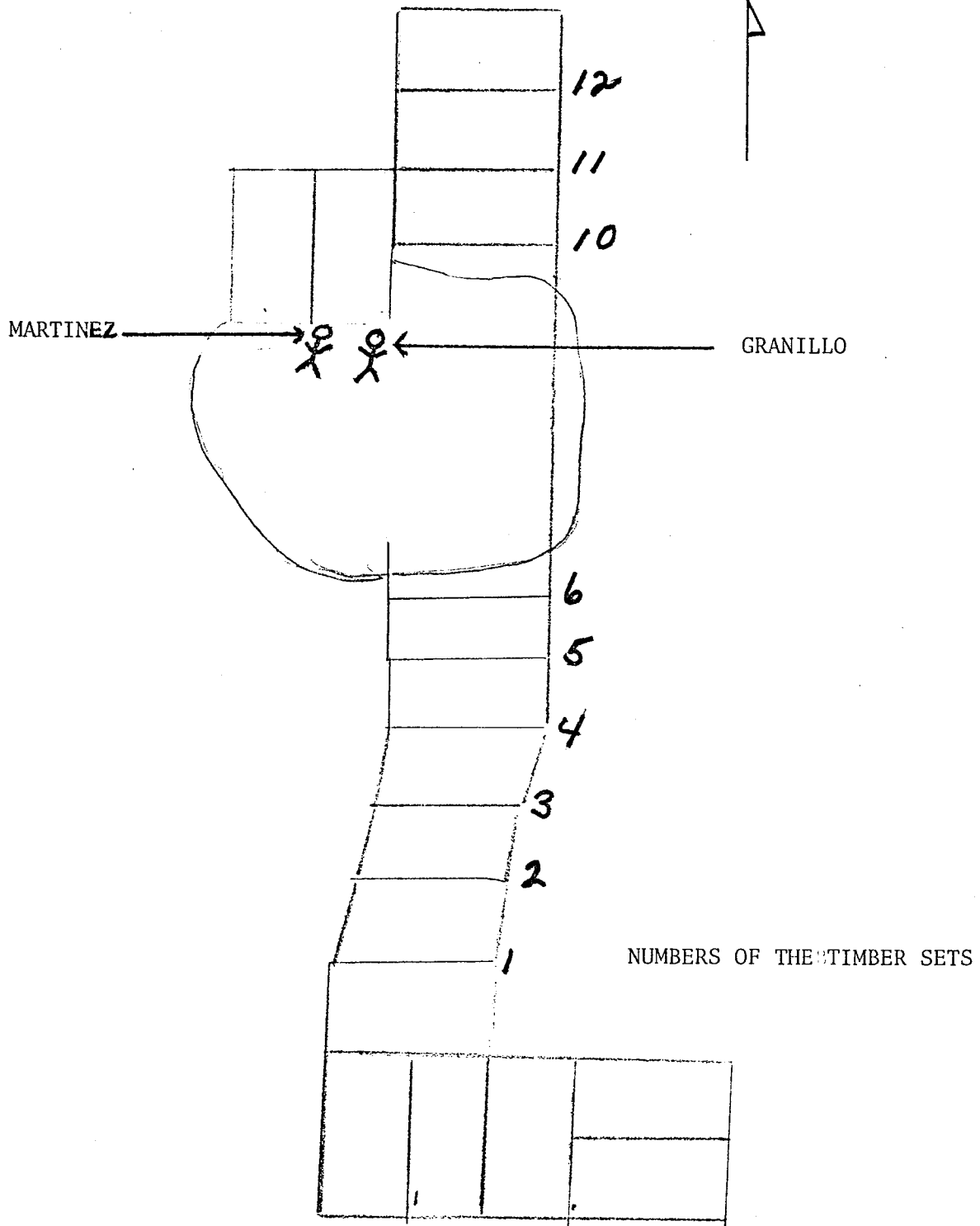


SKETCH # 2



NOT TO SCALE

ENTRANCE



NOT TO SCALE

ENTRANCE

This operation is exempt from the enforcement of training regulations

MSHA Training Programs Completed

Name: J. N. Cassaro

Date of Hire 7/30/79

Date Training Plan Approved 3/12/79

Required Training (Victim)	Date Training Received	<input type="checkbox"/>	Required Training (victim)	Date Training Received
<input type="checkbox"/> New Miner (U.G.)	_____	<input type="checkbox"/>	Hazard Training (U.G.)	_____
<input type="checkbox"/> New Miner (Sur.)	_____	<input type="checkbox"/>	Hazard Training (Sur.)	_____
<input type="checkbox"/> Newly Employed Experienced (U.G.)	7/30/79			
<input type="checkbox"/> Newly Employed Experienced (Sur.)	_____			
<input type="checkbox"/> Annual Refresher (U.G.)	11/6/81			
<input type="checkbox"/> Annual Refresher (Sur.)	_____			

Task Training Specify Type:	
<u>Haulage Motor</u>	<u>Barring Down</u>
<u>Aux. Cage</u>	<u>Drilling</u>
<u>Cage &amp; Skip</u>	<u>Trackless Mucker</u>
<u>Ventilation</u>	<u>Blasting Procedure</u>
<u>Sandfill</u>	<u>Timbering Procedure</u>

Section III

Company Training Program Completed:

Training	OJT/Formal	Instructor	Date Completed
<u>Supervisor Training for Haulage, Ventilation</u>		<u>J. Vindiola</u>	<u>4/2/82</u>
<u>Firefighting and Emergency Evacuation</u>		<u>O.T. Gronlund</u>	<u>8/2/82</u>
<u>Stope Miner</u>			

Section IV

Did victim have training specifically related to the task being performed at the time of the accident?  Yes  No When? 2/13/80

By Whom? D. Garroutte How Training was Given? Classroom

Section V

Recommend training plan evaluation by Education and Training Office? 3/18/82  Yes  No

This operation is exempt from the enforcement of training regulations

MSHA Training Programs Completed

Name: G. M. Martinez

Date of Hire 1/28/80

Date Training Plan Approved

Required Training (Victim)

Date Training Received

Required Training (victim)

Date Training Received

New Miner (U.G.)

\_\_\_\_\_

Hazard Training (U.G.)

\_\_\_\_\_

New Miner (Sur.)

\_\_\_\_\_

Hazard Training (Sur.)

\_\_\_\_\_

Newly Employed Experienced (U.G.)

2/1/80

Newly Employed Experienced (Sur.)

\_\_\_\_\_

Annual Refresher (U.G.)

11/4/81

Annual Refresher (Sur.)

\_\_\_\_\_

Task Training Specify Type:

Battery Motor  
Switching & Re-railing  
Loading & Dumping  
Material Handling  
Basic Hand Tools

Tugger Operation  
Slusher Operation  
Travelways  
Barring Down  
Drilling

Section III

Company Training Program Completed:

Training

OJT/Formal

Instructor

Date Completed

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Stope Miner  
\_\_\_\_\_  
\_\_\_\_\_

D.E. Wright  
\_\_\_\_\_  
\_\_\_\_\_

2/6/80  
\_\_\_\_\_  
\_\_\_\_\_

Section IV

Did victim have training specifically related to the task being performed at the time of the accident?  Yes  No When? 2/6/80

By Whom? D.E. Wright How Training was Given? Classroom/O.J.T.

Section V

Recommend training plan evaluation by Education and Training Office?  No

3/18/82

This operation is exempt from the enforcement of training regulations

MSHA Training Programs Completed

Name: J. C. Granillo

Date of Hire 12/6/77

Date Training Plan Approved 3/12/79

Required Training (Victim)

Date Training Received

Required Training (victim)

Date Training Received

New Miner (U.G.)

Hazard Training (U.G.)

New Miner (Sur.)

Hazard Training (Sur.)

Newly Employed Experienced (U.G.)

Newly Employed Experienced (Sur.)

Annual Refresher (U.G.) 11/3/81

Annual Refresher (Sur.)

Task Training Specify Type:

Track Installation  
Drill Jumbo  
Rock Bolting  
Barring Down  
Timbering

Material Handling  
Blasting Procedure  
Trackless Mucker  
Ground Control

Section III

Company Training Program Completed:

Training	OJT/Formal	Instructor	Date Completed
	Mine Training	T.S. Jehu	7/2/78
	Motor Operator	T.S. Jehu	4/4/78

Section IV

Did victim have training specifically related to the task being performed at the time of the accident?  Yes  No When? 8/16/79

By Whom? Dave Garroutte How Training was Given? Classroom/O.J.T.

Section V

Recommend training plan evaluation by Education and Training Office?  Yes  No 3/18/82