

50Th Annual Southern Regional Mine Rescue Contest

JUDGE PACKET

Field Competition Day 2



May 3, 2023

New Iberia, Louisiana

Mine Information
New Iberia, LA
May 2 - 3, 2023

General

The Gator Mine is an underground Multi-level Category II-A room and pillar salt mine. The mine is owned and operated by Al Gator. The mine is located in Southern Louisiana and is active and operating at full capacity. The mine operates two 12-hour shifts per day, 6 days a week. Hours of operation are from 7 am to 7 pm on day shift and 7 pm to 7 am on nights. All production is on the 1200' level.

Mine Access

Mine access is provided by two 14-foot diameter steel-lined shafts. The two 14-foot shafts are known as the #1 Intake shaft and the #2 Exhaust shaft. Pillar sizes are 16 feet by 16 feet and working areas of the mine are 10 feet by 10 feet with back heights averaging 26 feet.

Explosives

All explosives are stored on the 1200' level in an approved storage facility. All shots are performed from surface with no employees underground per the 30 CFR.

Electricity

Electrical service to the mine is provided by Bayou Electric with the main disconnects located on surface. All face equipment in the mine is permissible. Power centers are located underground for mining equipment.

Gas

The mine is a gas category II-A (Subcategory II-A applies to Domal salt mines where an outburst reportable under 57.22004 (c) (1) has occurred. The mine generally experiences some nitrogen dioxide and carbon monoxide resulting from blasting and the operation of diesel equipment. The mine has a mine wide atmospheric monitoring system.

Communication

This is accomplished by two-way radios that are carried by mine personnel and battery mine phones strategically placed around the mine. The battery mine phones are not intrinsically safe.

Ground Control

Ground control is maintained with 6-foot mechanical bolts and timbers are located in the mine for secondary support.

Materials

All materials to work the problem are located underground or on the surface.

Mining Methods

Room and pillar method is accomplished by conventional mining techniques. Material is hoisted to surface, screened and loaded to be shipped to the northeast part of the country.

Mine Maps

The mine maps were last updated on February 1, 2023.

Mine Equipment

The mine currently utilizes under-cutters, face drills, haul trucks, loaders, bolters, battery operated scoops, and other smaller diesel-powered equipment for transportation.

Ventilation

The mine is ventilated by a non-reversible 350,000 cfm fan that is located on surface. The mine utilizes a blowing system; ventilation enters the mine via the #1 Intake shaft and exits the mine via the #2 Exhaust shaft. Three 6-foot ventilation shafts are located in the mine and are identified on the map.

Water

Water flows into the mine via seepage on the 1200' level and accumulates primarily in the eastern part of the mine. There are two sumps in the mine known as Sump A and Sump B with submersible pumps. An 8" suction line runs underground, and water is pumped to surface via the exhaust shaft.

Notification

All federal, state, and local officials have been notified.

Backup Teams

Two additional trained and fully equipped mine rescue teams are on site and are available for backup support.

TEAM BRIEFING Day 2

New Iberia, LA

May 3, 2023

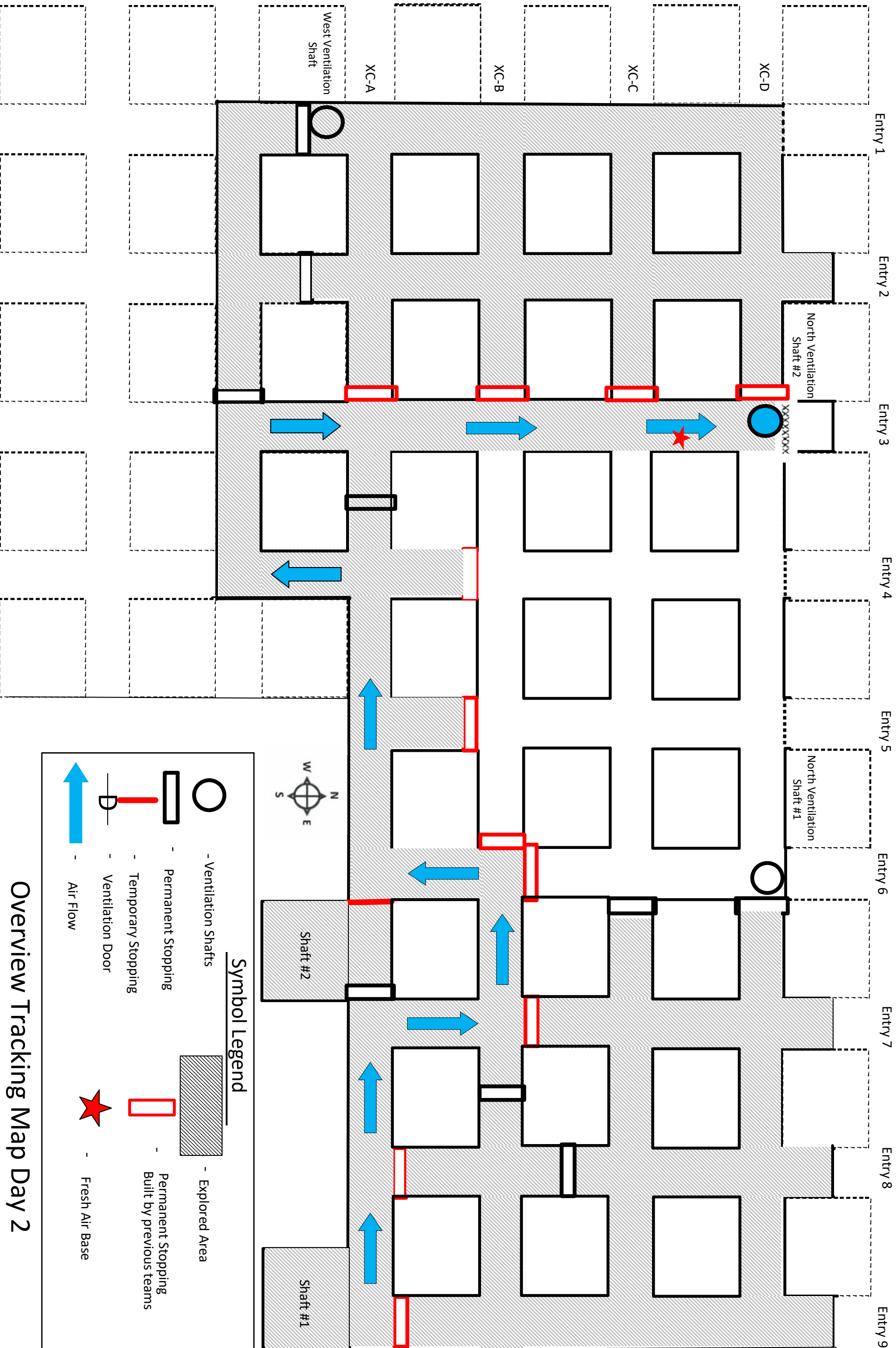
You have arrived back at the Gator Mine, the mine notified MSHA of a methane inundation this morning at approx. 2:00 a.m. Upon arrival to the mine MSHA was informed that a crew of 3 miners entered the mine to conduct a pre-shift examination. The mine operator has made several attempts to contact the crew with no success. The mine did not have any additional apparatuses to go in and explore, so they decide to call you back.

The atmospheric monitoring system has yet to be reestablished. The recently updated tracking map will show what has been accomplished by the previous team and where the new fresh air base has been relocated to.

It is now 6:30 a.m. and you will be the first team to enter the mine today. The mine fan is currently in the "OFF" position but can be turned "ON" at the team's request. The mine electrician is still working to repair the atmospheric monitoring system on surface, but we do not know how long that could take. If you are ready and willing, the service of your mine rescue team is needed. A back up team has just arrived and is ready to support you. Your objectives are listed below, and the mine manager will be available for any questions or requests. GOOD LUCK!

Field Problem Objectives:

- Explore all accessible areas of the mine.
- Extinguish or seal all fires.
- Locate all missing miners.
- Bring all survivors to the FAB.

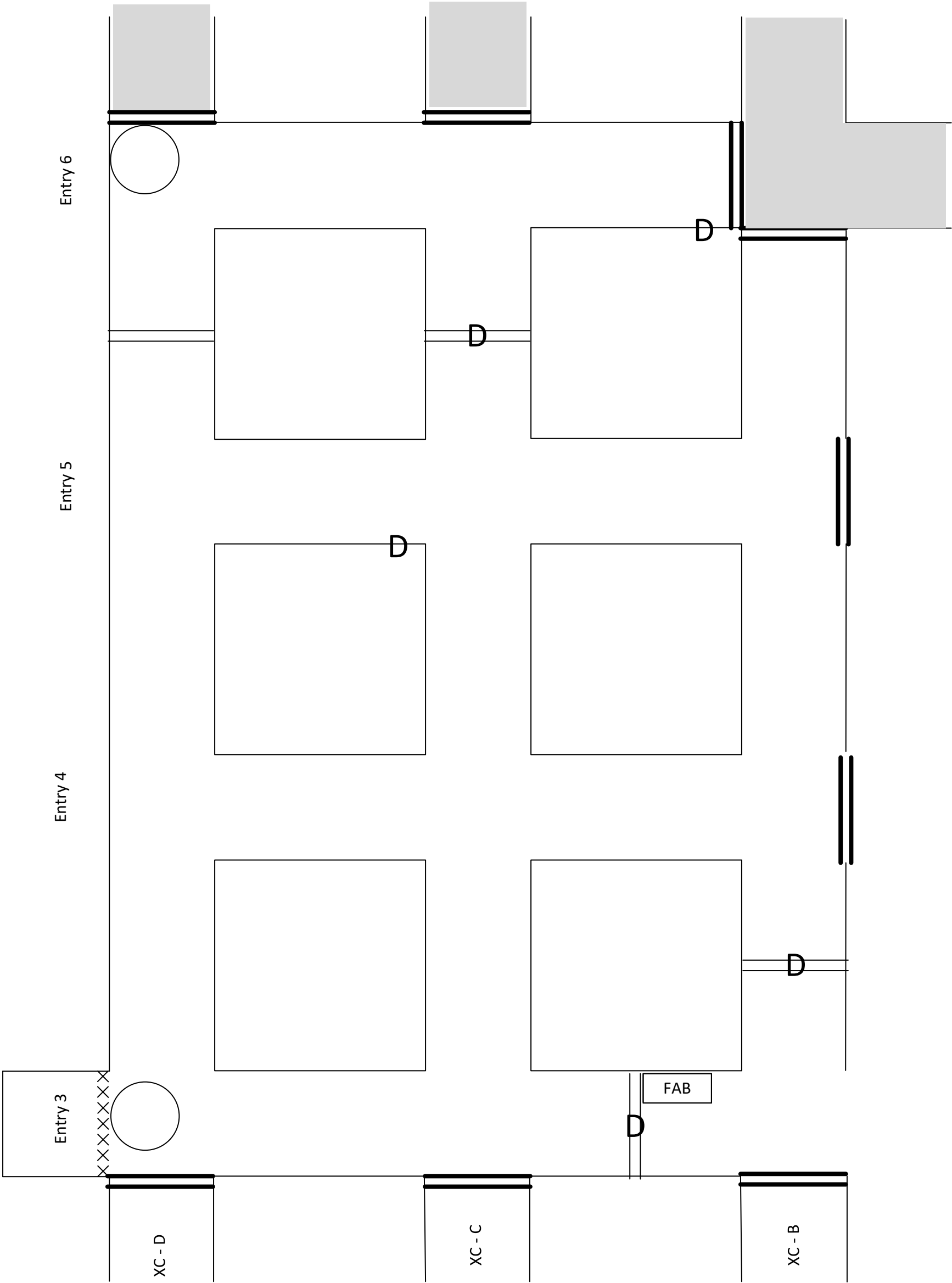


Overview Tracking Map Day 2

Team Map
Day 2

Team Name: _____

Team Draw # _____





Team Draw # _____

[illegible]

Gas Placard Key

CA = Clear Air

	= O ₂ – 16% CO – 0% CH ₄ – 3.2%
	= O ₂ – 16% CO – 0% CH ₄ – 7.2%



Southern Regional Mine Rescue Contest 2023

Day #2 Field Problem Solution

(See Solution Maps)

Fresh Air Base

The teams will arrive at the FAB and have introductions, the team will also be informed that they will be able to arrange their communication system and check functionality before they start the clock. Once the clock has been started the team will receive all of their maps and information.

Note: Throughout the field problem, while advancing and at the intersections the team will check for loose ground (loose roof or rib). Captain must verbally indicate he/she is checking the roof/back when constructing temporary stoppings.

Note: “Possible Infractions” are highlights of potential discounts at each team stop. These lists are not all inclusive, Judge’s may identify additional discounts during the working of the field problem.

Note: Entry Examination and Team Stop No.1 (See Solution Map 1)

Note: When the team arrives at the advanced fresh air base, the area map provided by the previous teams will have most of the items in the area already mapped.

XC-B (entry) check reveals:

The team will travel to XC-B in entry 3. The team will conduct the necessary gas tests. The team will identify a “Clear Air” placard if they stretch north the team will also identify a “Permanent Stopping with door” and the door will be closed.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to “DI”.

XC-C (entry) check reveals:

The team will travel to the XC-C in entry 3. The team will conduct necessary gas tests. A placard at the entrance will indicate “Clear Air.”. the team will also identify a “Gator Utility Vehicle (parked & running)”. The team may decide to secure the wheels and shut off the engine at this time.

Possible Infractions: Failure to take necessary gas tests.

XC-D (entry) check reveals:

The team will travel to XC-D in entry 3. The team will conduct the necessary gas tests. The team will identify “Clear Air”, “North Ventilation Shaft”, “Caved (Airtight)”, and a “Permanent Stopping”. The team will DI and continue exploration.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to “DI”.

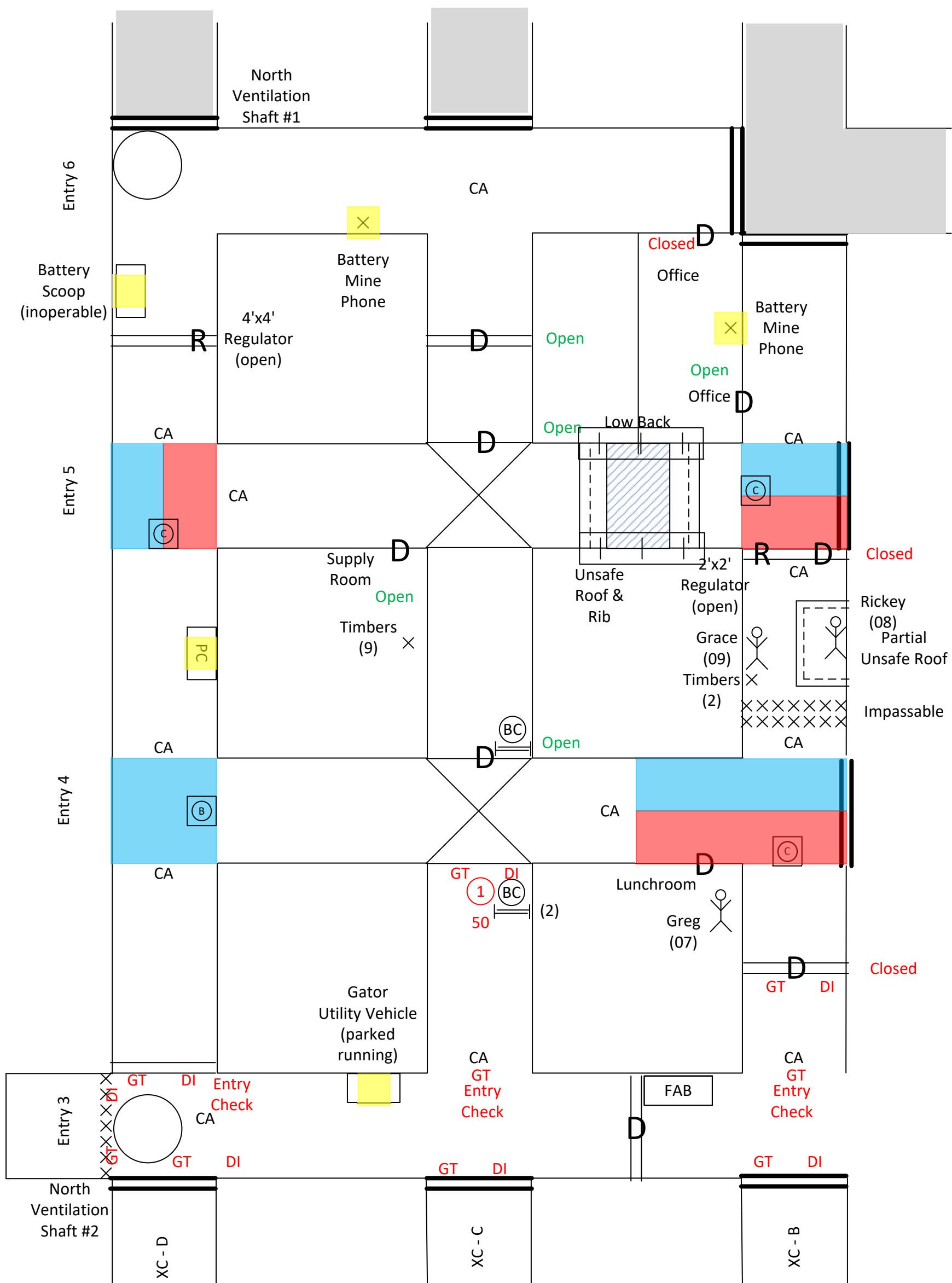
Team Stop #1

The team will return to XC-D and begin exploration until they reach the intersection of Entry 4. The team will identify “Brattice Cloth and Brattice Frames” and “Overcast” stopping. The team will also likely conduct their 50’ check in this area. The team will conduct the necessary gas test and DI.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to “DI” at the point of farthest advance of the team. Failure to conduct a 50’ check.

Entry Examinations and
Team Stop No. 1
Solution Map 1

Team Name: _____
Team Draw # _____



Gas Placard Key

CA = Clear Air

B

= O₂ – 16%
CO – 0%
CH₄ – 3.2%

C

= O₂ – 16%
CO – 0%
CH₄ – 7.2%



Note: Team Stop Nos. 2 – 4 (See Solution Map 2)

Team Stop #2

The team will utilize the building materials to create an airlock and continue exploration north in XC-B until they reach entry 4. The team will conduct the necessary gas test and identify a “C” gas placard (see map for concentrations) This will indicate an explosive air/gas mixture and the team will need notify the FAB. The team also identifies “Permanent Stopping”, “Caved” impassable, “Clear Air” separation, and “Lunchroom Door”. knocking on the door the team will make verbal contact with a missing miner inside. The miner will relay the following information. “Get me out of here, I’m not injured, this room is completely enclosed, and the air in here is ok”. Due to the gas concentrations in front of the door the team will need to ventilate the area first to enter the room. The team does not have all of the necessary materials to execute the ventilation change at this time and will be permitted to continue exploration.

Possible Infraction: Failure to take necessary gas tests, Failure of the captain to “DI”, failure to check roof/rib while advancing through the door/building stopping, Failure to notify the FAB of an air/gas mixture that’s reached its explosive rang, and if not stated at the beginning of the problem that the team has non-sparking tools, they will need to return to the FAB and request them.

Team Stop #3

The team will continue exploration west in entry 4 until they reach the intersection of XC-C. The team will conduct the necessary gas test. At the intersection the team will identify “Overcast”, “Overcast Stopping on the south, and “Overcast Stopping with door open” on the north. Stretching north the team will examine up to the second “Overcast Stopping” The team will DI.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to “DI”.

Team Stop #4

The team will continue west in entry 4 until they reach the intersection of XC-D. The team will conduct the necessary gas tests. They will identify a “B” gas placard, and the “Clear Air” separation. Stretching south the team will identify “Brattice Cloth and Brattice frames” and examine up to the backside of the “Permanent Stopping. The team will have the means to execute the first ventilation change to enter the Lunchroom and rescue the missing miner.



Possible Infraction: Failure to take necessary gas tests, and Failure of the captain to “DI”.

Team Draw # _____

[illegible]

Gas Placard Key

CA = Clear Air

	= O ₂ – 16% CO – 0% CH ₄ – 3.2%
	= O ₂ – 16% CO – 0% CH ₄ – 7.2%



Note: Ventilation Change #1 and Team Stop No. 5 (See Solution Map 3)

Note: The team will have the means and have explored enough to isolate a path to execute ventilation change #1 and rescue a missing miner.

Ventilation Change #1

The team will request a ventilation change, once granted the following steps will be required to clear the area in front of the door.

- Relocate Gator UTV (see map) to remove the ignition source.
- Build Temporary Stopping in XC-B between entry 4 & 5. (in front of caved impassable)
- Build Temporary Stopping in XC-C between entry 4 & 5. (Between overcasts)
- Build Temporary Stopping in entry 4 between XC-C & XC-D
- Close door in Entry 3 next to FAB (to course air north in XC-B)
- Turn the fan to the “ON” position.

Note: Ventilation path is indicated by blue arrows on the map and will clear gases along this path.

Note: Upon reentry into areas cleared of smoke and toxic or dangerous gasses, teams shall make gas tests rib to rib at all openings along the route they travel.

Team Stop #5

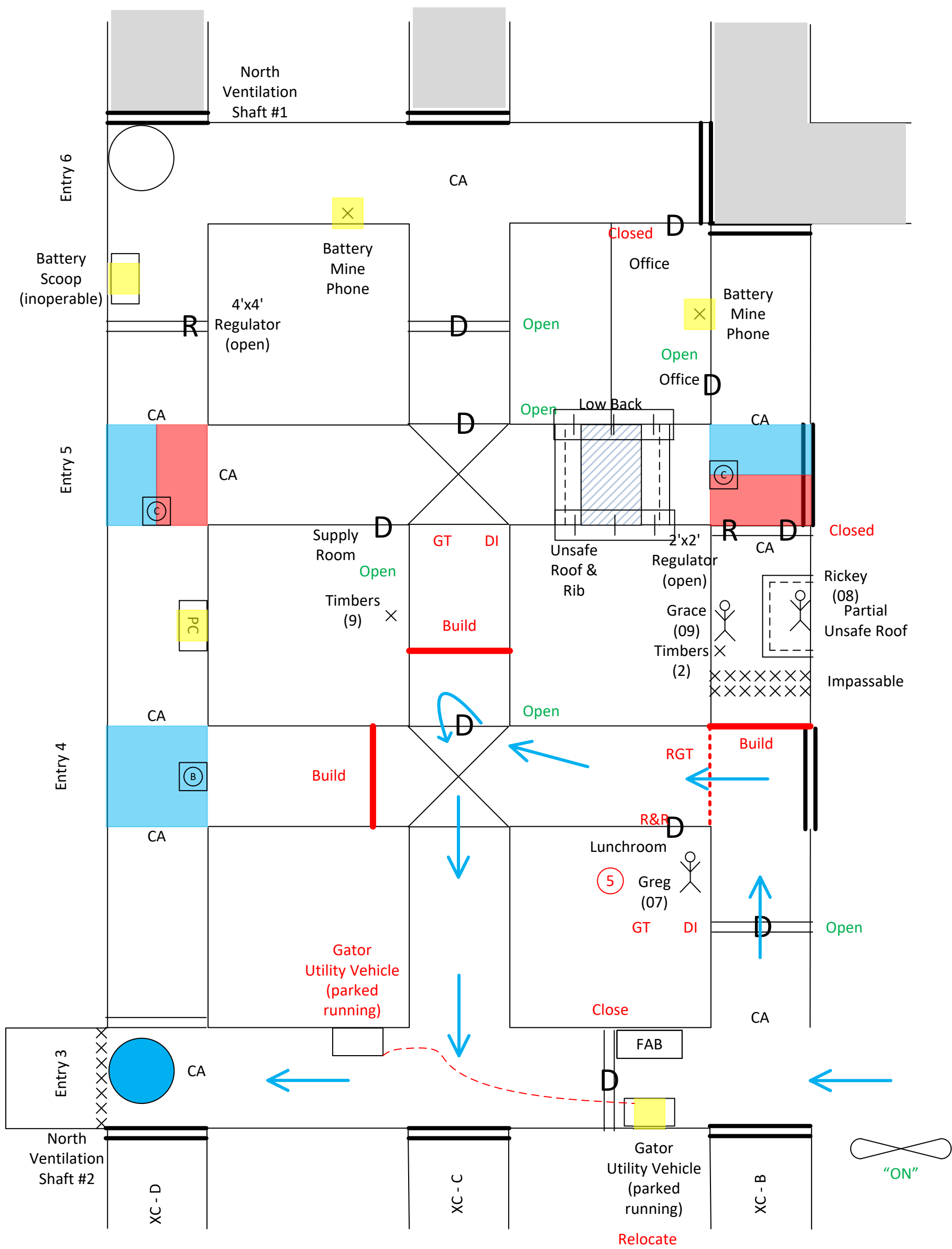
The team will know the conditions inside of the lunchroom and can enter the area. The team will identify “Greg (07)” Greg is not injured and can walk out with the team.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to “DI”.

Team Name: _____

Team Draw # _____

Solution Map 3
Ventilation Change 1
Team Stop No. 5



Gas Placard Key

CA = Clear Air

B

= O₂ - 16%
CO - 0%
CH₄ - 3.2%

C

= O₂ - 16%
CO - 0%
CH₄ - 7.2%



Note: Team Stop Nos. 6 – 8 (See Solution Map 4)

Team Stop #6

The team will continue exploration north in XC-D until they reach the intersection of entry 5. While advancing the team will identify a “Power Center”. At the intersection the team will conduct the necessary gas tests. The team will identify a “C” gas placard and the “Clear Air” separation. Stretching north the team will identify “Permanent Stopping with 4’ x 4’ Regulator (open)”.

Possible Infraction: Failure to take necessary gas tests and Failure of the captain to “DI”.

Team Stop #7

The team will continue exploration east in entry 5 until they reach the intersection of XC-C. While advancing the team will identify “Supply Room Door (open)”, entering the room the team will identify “Timbers (9)”. The team will take the timbers with them. At the intersection the team will conduct the necessary gas tests. North the team will identify “Overcast Stopping (door open)”, stretching the team will identify “Permanent Stopping with door (open)” and south “Overcast Stopping”.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to “DI”.

Team Stop #8

The team will continue exploration east in entry 5 until they reach the intersection of XC-B. While advancing the team will identify “Unsafe Roof”, “Unsafe Rib”, and “Low Back”. The team will have enough timbers to use dual support across the length of the unsafe area. At the intersection the team will conduct the necessary gas tests. The team will identify a “C” gas placard, “Permanent Stopping”, and “Permanent Stopping with a door (closed) and 4’x4’ Regulator (open)”. Knocking on the door the team will make verbal contact with a missing miner inside. The miner will relay the following information. “Get me out of here, I’m not injured, and the air in here is clear”. The team will need to clear the door to enter. Stretching north the team will identify a “Office Door (open)” and examine up to the “Permanent Stopping”. The team will then enter the office and identify that the room extends to another door that is closed. The team will also identify a “Battery Mine Phone”.

Possible Infractions: Failure to take necessary gas tests, Team member exposed underneath unsafe roof/rib, Failure of the captain to “DI”, team endangerment if support are not correct, failure to check roof/rib when traveling through the door.

Team Stop #9

The team will return to entry 5 and XC-C, continue exploration north until they reach entry 6. At the intersection the team will conduct the necessary gas tests. The team will identify “Clear Air” and “permanent Stopping”. Stretching east the team will identify “Office Door (closed)” and “Permanent Stopping”. The team know the conditions behind the door and can open an access the office to tie in.

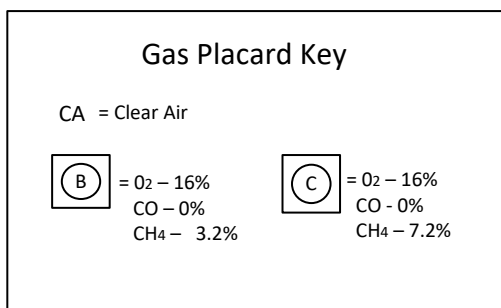
Possible Infractions: Failure to take necessary gas tests and Failure of the captain to “DI”.

Team Stop #10

The team will explore west in entry 6 until they reach the intersection of XC-D. while advancing the team will identify “Battery Mine Phone”. At the intersection the team will conduct the necessary gas tests. The team will identify “North Ventilation Shaft #1” and a “Permanent Stopping”. Stretching south the team will identify “Battery Scoop (inoperable)” and the backside of the “Permanent Stopping with 4’x4’ regulator (open)”.

Possible Infractions: Failure of the captain to “DI”, and Captain or team member accessing under the open shaft.

Team Draw # _____

[illegible]

Note: Ventilation Change #2 and Team Stop No. 11 (See Solution Map 5)

The team has explored all accessible areas of the mine and now has the means to execute ventilation change #2 and rescue the final two missing miners.

Ventilation Change #2

The team will request a ventilation change, once granted the following steps will be required to clear the area in front of the door.

- Relocate Battery Mine Phones (see map) to isolate ignition source.
- Open both Office Door's
- (optional) Close Regulator in Entry 5 & XC-C. (Door where missing miners are located)
- Close second Overcast Door and permanent Stopping Door in XC-C between entry 5&6
- Close regulator in XC-D between entry 5&6
- Close first Overcast Door
- Maintain Temporary Stopping in entry 4 & XC-B (in front of caved impassable)
- Maintain door closed next to FAB
- Turn the fan to the "ON" position.

Note: Ventilation path is indicated by blue arrows on the map and will clear gases along this path.

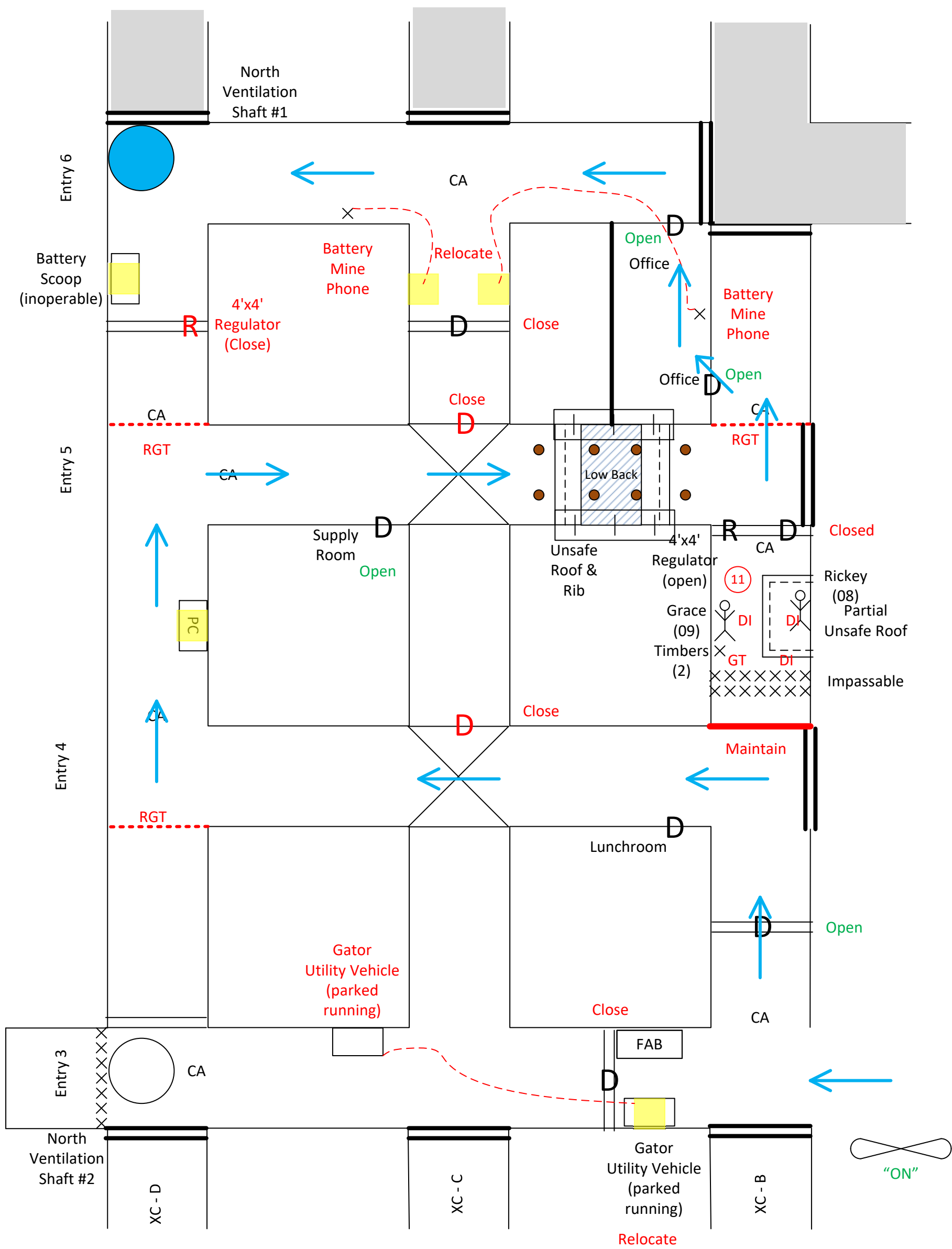
Note: Upon reentry into areas cleared of smoke and toxic or dangerous gasses, teams shall make gas tests rib to rib at all openings along the route they travel. (see map for possible areas RGT)

Team Stop #11

The team knows the conditions inside the door and can enter. The team will "Clear Air", "Partial Unsafe Roof" and make visual contact with a miner underneath, "Grace (09)", "Timbers (2)", and "Caved (impassable)". Grace will not be injured and can walk out with the team. The team will utilize a minimum of 2 timbers to access the miner. Assessing the miner, they identify "Rickey (08)" rickey is unconscious. The team will need to use an emergency move to pull the miner out from underneath the area and prepare the miner for transport. The team will bring the miners to the FAB, transfer care, report their findings, turn in all maps and stop the clock. THE END!

Solution Map 5
Ventilation Change 2
Team Stop No. 11

Team Name: _____
Team Draw # _____



Gas Placard Key

CA = Clear Air

(B)	= O ₂ - 16% CO - 0% CH ₄ - 3.2%	(C)	= O ₂ - 16% CO - 0% CH ₄ - 7.2%
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