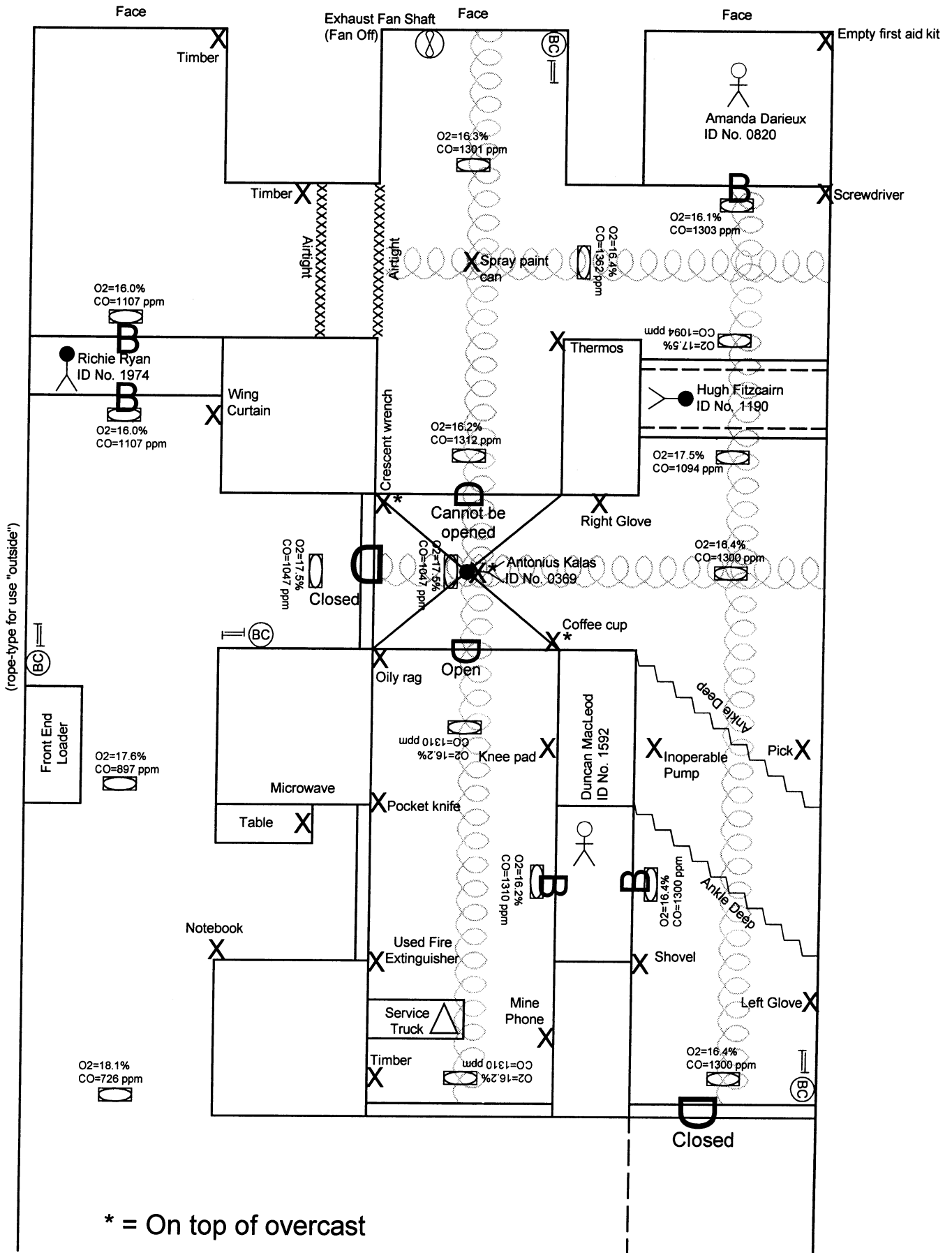
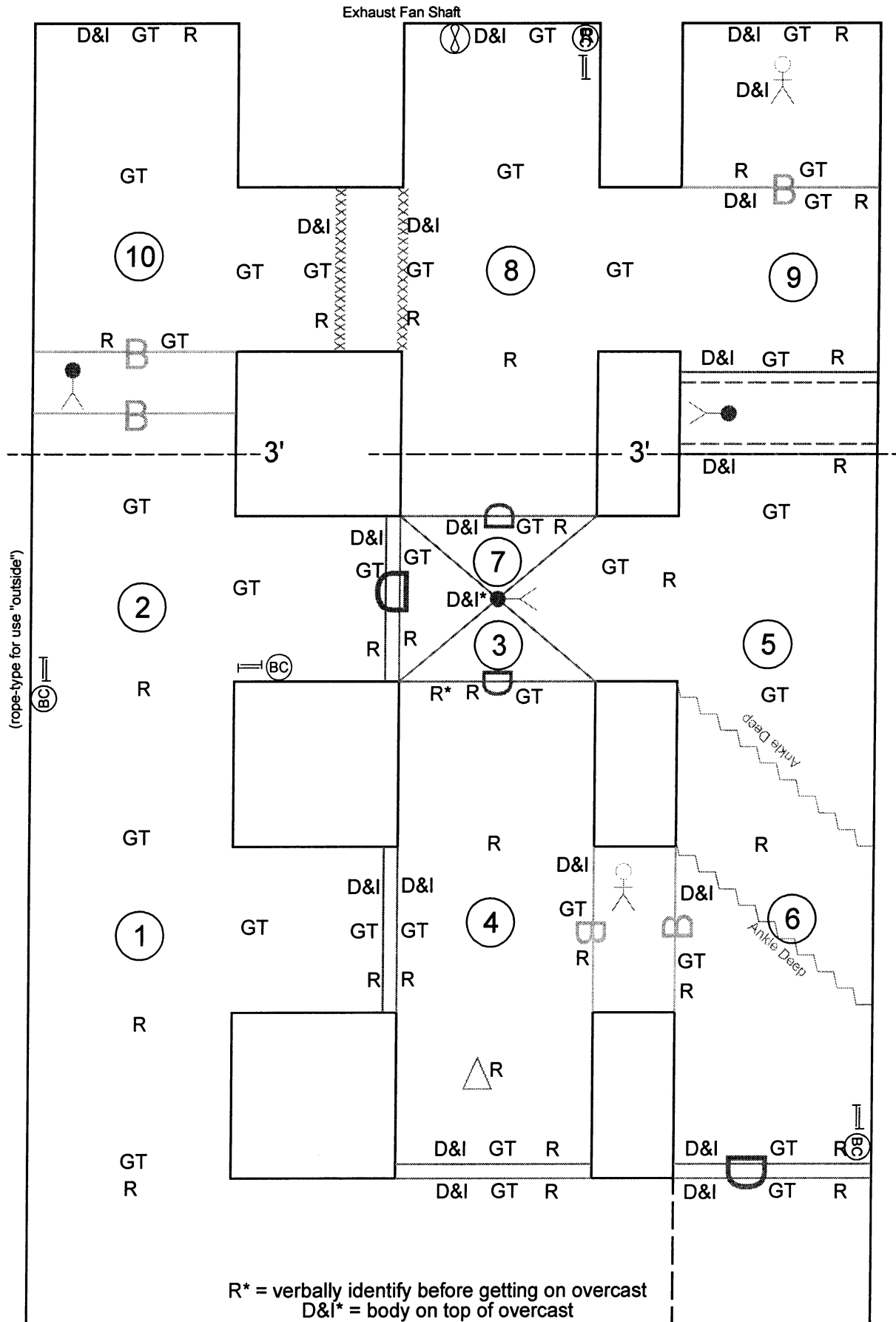


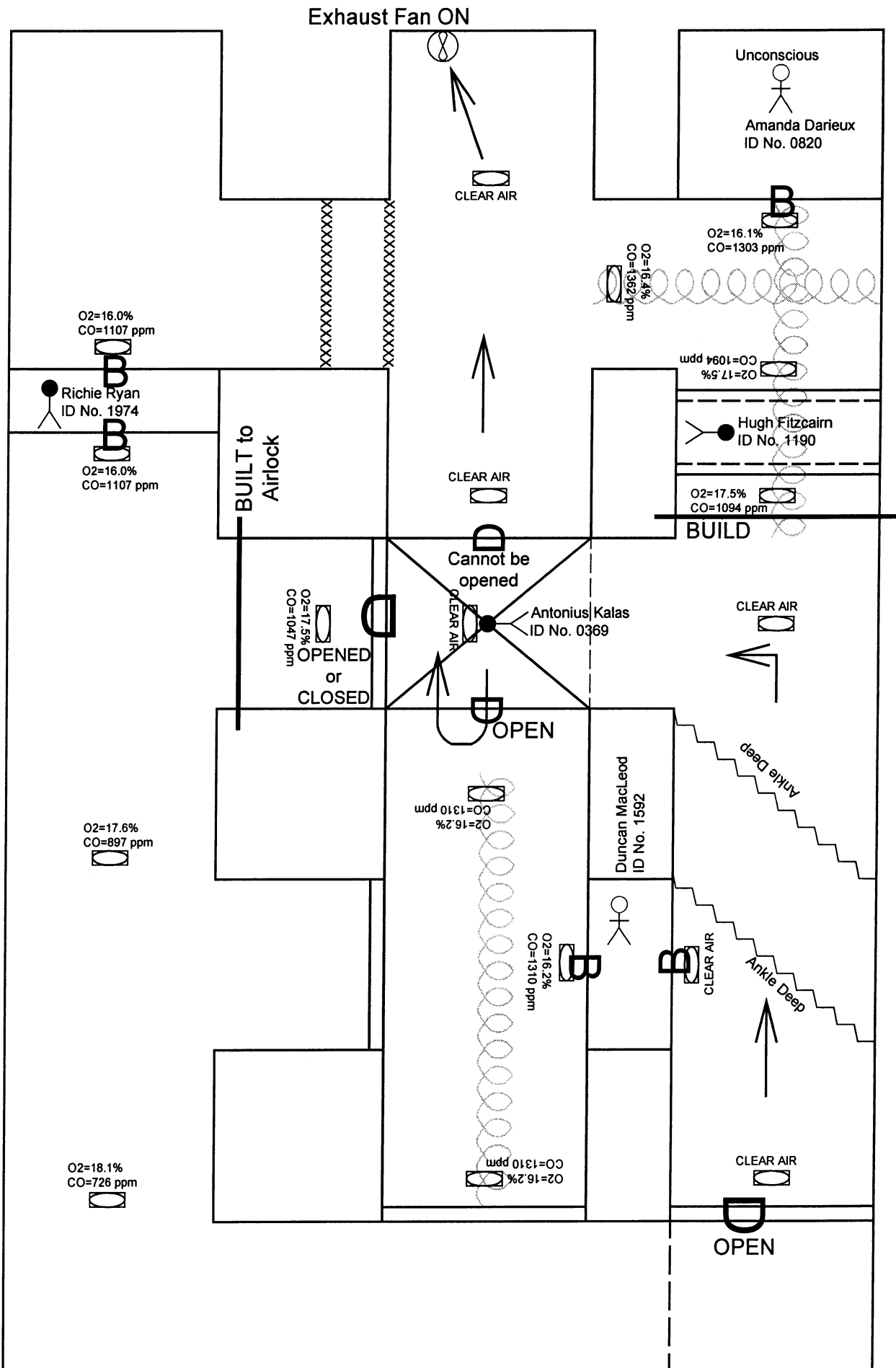
PROBLEM MAP



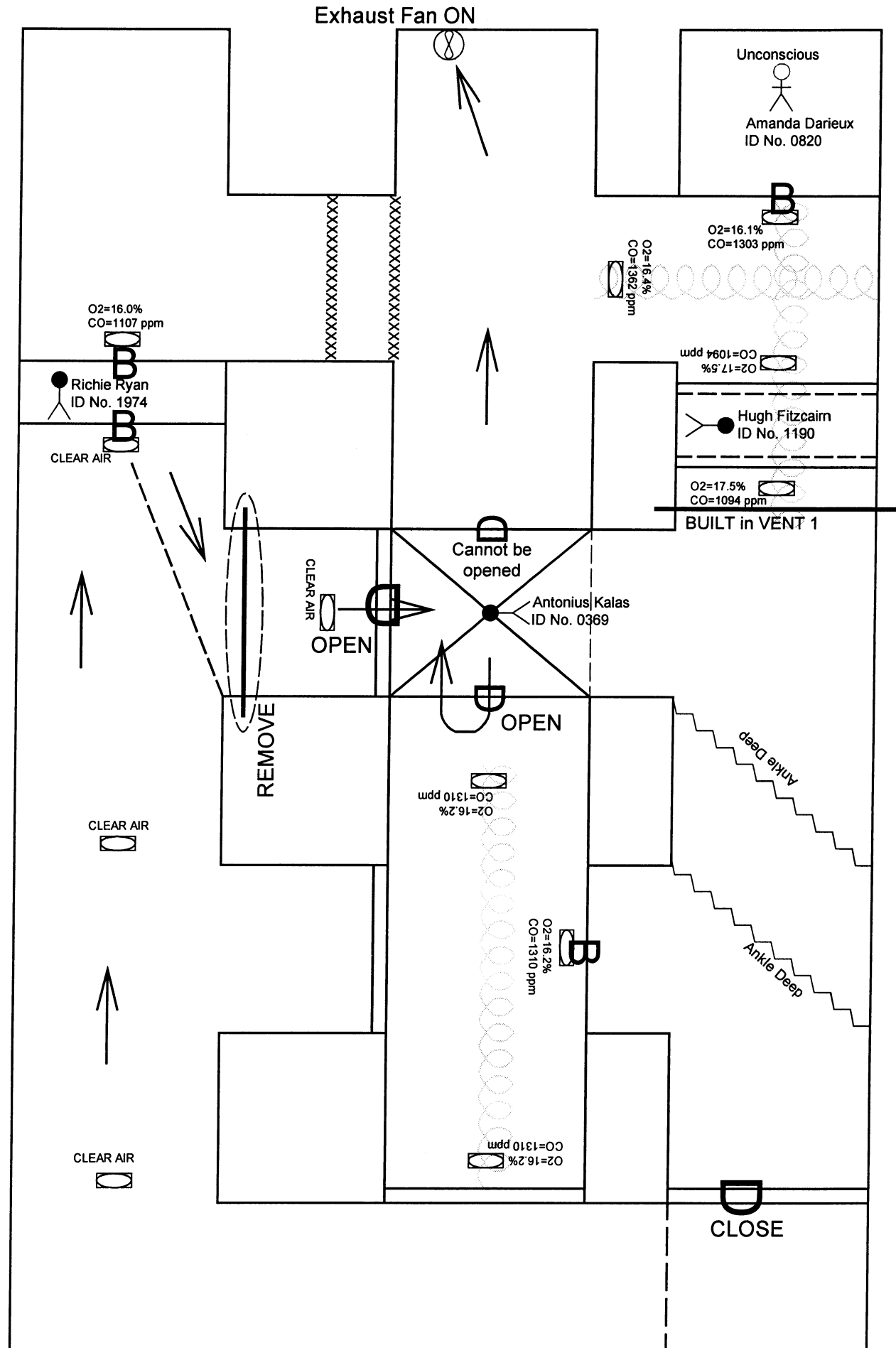
EXPLORATION MAP



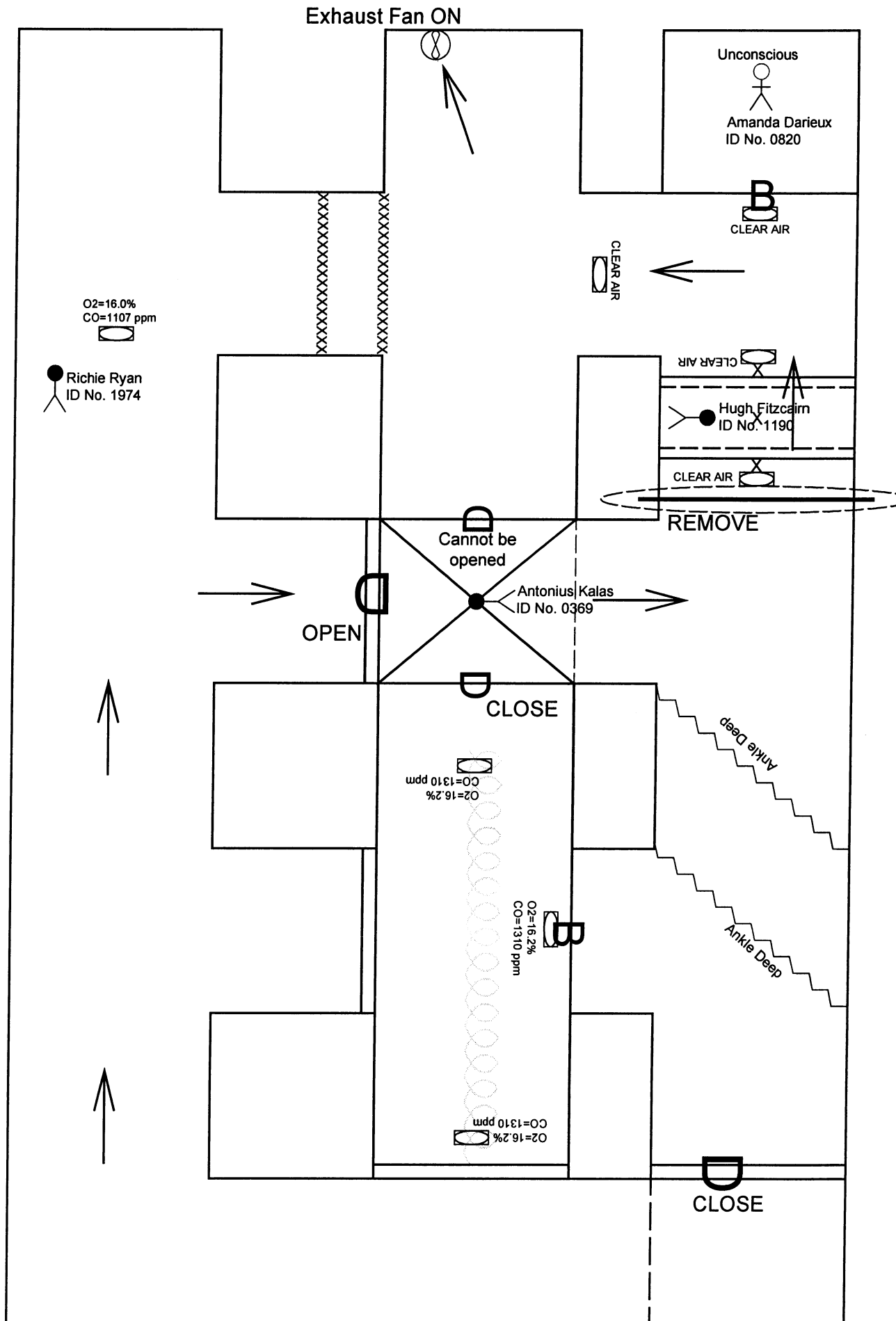
VENTILATION 1



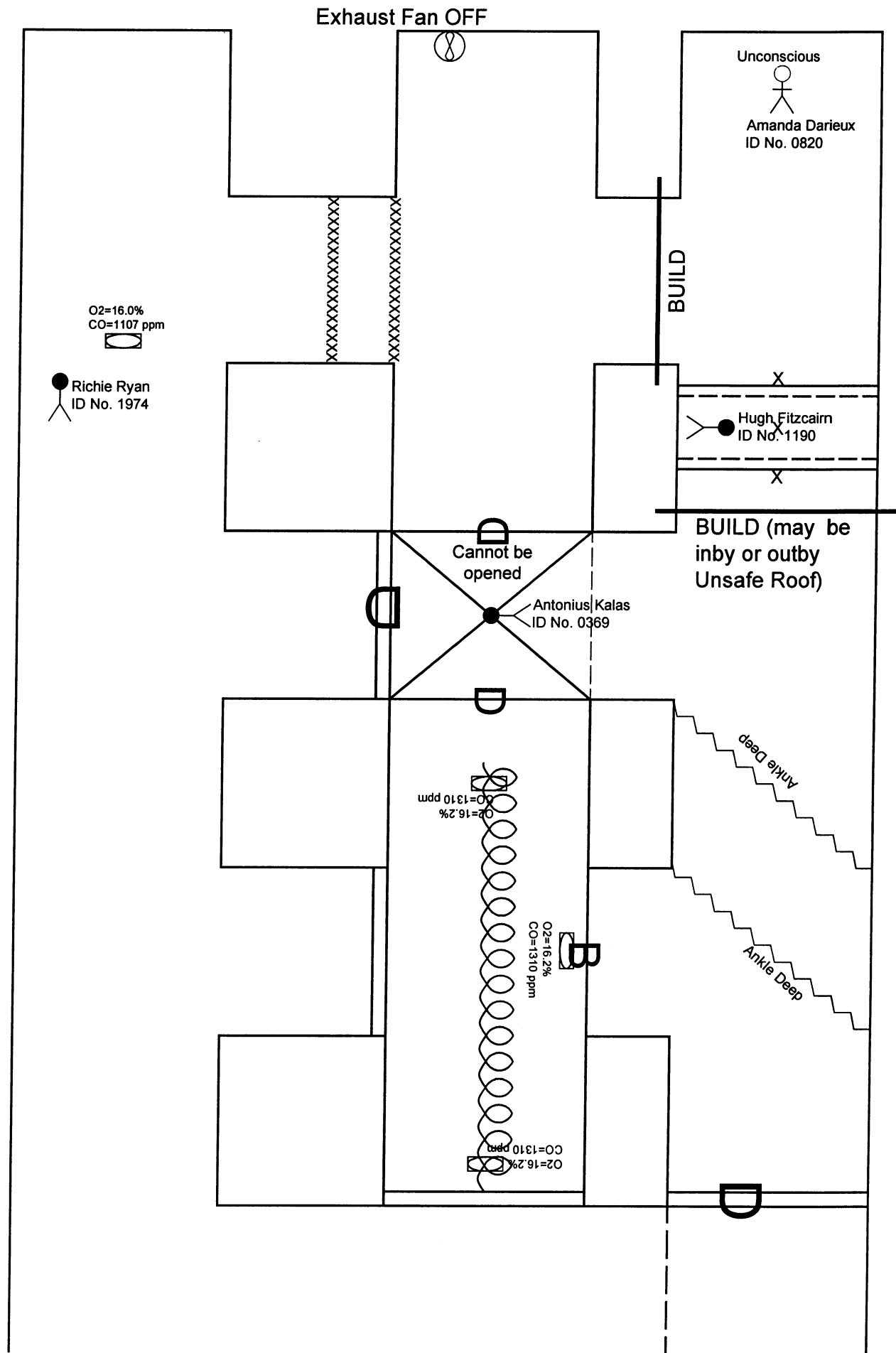
VENTILATION 2



VENTILATION 3



BREACHING DRIFT #3 BARRICADE



Briefing Statement

My name is _____ and I am the mine manager of the Highlander Mine.

You are standing at an established fresh air base on the surface of the Highlander Mine.

Six miners were performing general maintenance in the mine last night. At approximately 10:00 p.m., 2 miners came out of the mine and reported seeing flames and smoke. One of these miners immediately left mine property while the other went back in the mine to help. No one else has entered the mine since the miner went back in, and no one else has come out of the mine. We have not been able to communicate with anyone in the mine and don't know what has happened.

The Highlander Mine is a Category VI mine with no history of liberating any explosive gases. There are some areas of bad roof and we occasionally have water issues.

I will provide you with a mine map that was updated yesterday. There are 3 drift openings into the mine from the surface and 1 exhaust fan shaft. Drift #3 is being mined toward some old abandoned workings but I do not know if these workings were inadvertently intersected or not.

The exhaust fan is currently off and I can have it turned on and off as you need. The exhaust fan shaft has been examined at the surface and explosive gases were not found. Guards have been posted on the surface at the fan.

There is no power to the underground portion of the mine at this time.

The local, state, and federal agencies were notified and are on site.

All materials necessary to complete the problem can be found in the mine.

You will be the first team to enter the mine since the incident was reported. I need you to explore and map all safely accessible areas, to account for all missing miners and call out their names and ID numbers to the surface when found, and to bring all survivors to the surface. A back-up team has assembled on-site and will replace you in 90 minutes.

Good Luck!

Mine Rescue Problem

You have 90 minutes to:

1. Explore and map all areas of the mine that are safely accessible
2. Account for all missing miners and call out their names and ID numbers to the surface when found
3. Bring all survivors to the surface

Captain's Briefing

Building Materials

Inside the simulated mine, including any "extensions" in place "outside" the simulated mine, builds must be made with brattice cloth and frames comprised of pogo sticks and curtain. If builds are needed anywhere else then the rope/ribbon type with hooks must be used.

The team can only carry 2 sets of building material at once. If present, the rope/ribbon type counts as 1 set of building materials.

Smoke

If smoke is in the simulated mine portion of the problem, it will be visible and placards are not used. Any visible smoke should be mapped accordingly.

If smoke is in the simulated mine portion, teams will need to keep up with where the smoke has been cleared during any ventilation changes because there will be no smoke placards to move or turn over. Following a ventilation change, any smoke that may be present in the ventilation path will be considered immediately cleared even if some smoke may still be visible.

Any smoke, if used, inside a barricade will not be part of the problem and should not be mapped.

Overcast

Any overcast that may be present can be crossed under and over.

Pillar Sizes

The pillars in this problem are smaller than normal. Please work the problem as if they are standard 20'x20' pillars.

Body/Person Placards

Each miner's identification will be on the back side of any Body or Person placard.

If you see a Body placard – assume injuries were obviously fatal and there is no need for assessment. ID will be on back of Body placard. BSI precautions must be used to touch a Body placard as if it is a person.

Maps

At the start you will be given 2 mylar maps. One is labeled **TEAM MAP** and the other is labeled **B.O. MAP**. The **TEAM MAP** is for using in the mine and the **B.O. MAP** is for the Briefing Officer at the FAB. Please make sure you give the maps to the right people. Please make sure you put your team working order number in the space provided at the top (**Team No. _____**) as well.

2017 Tennessee Region Mine Rescue Contest

Solution Steps

There are usually multiple ways to solve most mine rescue contest problems. This problem is no exception. Below are the steps for one way to solve this problem.

BEFORE EXPLORATION

Team Arrival

The team may string out their communication cable but no other work can be done until the clock is started (*Judge 1 – Surface Rule 9*). The team will line up and captain will introduce the team and remark, “We are here to offer our help. I have a fully equipped, properly trained, and physically fit mine rescue team and we are ready to do anything you may require in the rescue and recovery work at your mine.”

Briefing

The Mine Manager will indicate that they do need the team’s assistance and will read the “**Briefing Statement**” furnished in the team packet.

Starting the Clock

After the Mine Manager reads the “**Briefing Statement**”, the captain will start the clock and date the board (month, day, year, and team position number) (*Judge 1 – Surface Rule 8*).

Team Handouts

After the clock has been started the Mine Manager will hand the team a copy of the “**Mine Rescue Problem**”, the “**Briefing Statement**” two 11”x17” blank maps, and one 8.5”x11” inch blank map. These items are furnished in the team packet. The map for the Briefing Officer is marked B.O. The team map is marked TEAM.

Judges’ Maps

The team packet also includes blank maps for the judges to use for tracking team stops, gas tests, D&Is, roof tests, and ventilation.

Equipment Checks

Equipment checks are supposed to be conducted prior to the team reporting to the field and are not required to be made again. However, deficiencies with the team’s equipment identified by judges during the working of the problem should be discounted appropriately. (*See Judge 1 – Surface Rules 1, 2, 3, 4, 5, 6, and 7*). The team members will don their apparatuses and go under oxygen

Gas Box Testing Station

The team will find a gas box testing station at the fresh air base. A team member must use the team's multi-gas instruments to determine the gas concentrations in the unknown mixture. The team must provide its own calibration cap to report: oxygen (O₂), methane (CH₄), carbon monoxide (CO), and nitrogen dioxide (NO₂) concentrations.

- O₂ must be reported within $\pm 0.5\%$ of the actual value to be correct (*Judge 2 – Underground Rule 4(a)*).
- CH₄ must be reported within $\pm 0.2\%$ of the actual value to be correct (*Judge 2 – Underground Rule 4(b)*). An instrument with a catalytic sensor must be used to be within tolerance.
- CO must be reported within $\pm 10.0\%$ of the actual value to be correct (*Judge 2 – Underground Rule 4(c)*).
- NO₂ must be reported within ± 3 ppm of the actual value to be correct (*Judge 2 – Underground Rule 4(d)*).

EXPLORATION

Fresh Air Base

The captain will find a “Permanent Stopping” blocking advance in drift #2. The captain will find a “Permanent Stopping With Door” with the door in the closed position blocking advance in drift #3 (materials for airlocking in have not been found at this time).

The captain will date and initial (D&I) (*Judge 1 – Underground Rule 9*), perform gas tests (GT) (*Judge 2 – Underground Rule 1*), and verbally indicate he/she is checking the back or roof (R) (*Judge 1 – Underground Rule 8(b)(2)*) at the stoppings at drifts #2 and #3.

The team must “count off” before entering the mine for the first time at drift #1 (*Judge 1 – Surface Rule 10*). Hand or audible counting off is acceptable.

Team Stop #1

Upon entering the mine at drift #1, the captain will GT (*Judge 2 – Underground Rule 1*) and will find a gas placard (O₂=18.1% and CO=726 ppm).

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

Apparatus checks will be made at Team Stop #1 (*Judge 1 – Underground Rule 3*).

The captain will break the plane of the intersection to the east and make a gas test (*Judge 2 – Underground Rule 1*).

The team will advance through the crosscut to the east. The captain will find a notebook, a table, and a microwave in the crosscut. A “Permanent Stopping” blocks advance to drift #2 and the captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the stopping. The team will return to the intersection.

The captain will break the plane of the intersection to the north, make a gas test (*Judge 2 – Underground Rule 1*) and will find a gas placard (O₂=17.6%, CO= 897 ppm). A front-end loader is located along the west rib. Inby the loader is brattice cloth and frames (this is rope to be used outside the enclosed portion only!)

Team Stop #2

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

The captain will break the plane of the intersection to the east and make a gas test (*Judge 2 – Underground Rule 1*).

The captain will break the plane of the intersection to the north and make a gas test (*Judge 2 – Underground Rule 1*). No team member can advance more than 3 feet north of the intersection at this time (*Judge 1 – Underground Rule 11*).

NOTE: The barricade in drift #1, the gas placard, and the wing curtain are more than 3 feet inby the intersection and are not “visible” at this time.

The team will advance through the crosscut to the east. The captain will find a gas placard (O₂=17.5%, CO=1047 ppm), brattice cloth and frames, and a “Permanent Stopping with Door” with the door in the closed position. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the permanent stopping.

Using the brattice cloth and frames found in the crosscut, the team will construct a temporary stopping across the crosscut to form an airlock before opening the permanent stopping door (*Judge 2 – Underground Rule 10*). The captain will verbally indicate checking the back or roof before erecting the temporary stopping (*Judge 1 – Underground Rule 8(b)(3)*).

After constructing the airlock, the captain will open the door and will see smoke. All team members must be connected or have hold of the lifeline when entering the smoke (*Judge 2 – Underground Rule 9*). Before entering smoke, a personnel check must be made to assure all members are OK (*Judge 1 – Underground Rule 12*).

Team Stop #3 (under the overcast)

Before passing through the door, the captain must verbally indicate he/she is checking the back/roof (*Judge 1 – Underground Rule 8(b)(4)*). Upon entering drift #2 through the door, the captain will make a gas test (*Judge 2 – Underground Rule 1*).

All team members must remain connected or have hold of the lifeline (*Judge 2 – Underground Rule 9*).

To the north, the captain will find that the inby overcast door cannot be opened. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at this wall.

To the east, the captain will break the plane of the intersection crosscut and make a gas test (*Judge 2 – Underground Rule 1*).

To the south, the captain will find an open overcast door. The captain will pass through the open door and check the back or roof (*Judge 1 – Underground Rule 8(b)(4)*) and will make a gas test (*Judge 2 – Underground Rule 1*). The captain will find a gas placard (O₂=16.2%, CO=1310 ppm).

The team will find an oily rag along the west rib near the overcast, a knee pad along the east rib, and a pocket knife on the west pillar corner on the south end of the pillar while advancing to Team Stop #4.

NOTE: The overcast is traversable. The scenario above assumes the team will not cross the overcast at this time. If the team elects to cross the overcast at this time, no member can travel more than 3 feet north of the overcast (*Judge 1 – Underground Rule 11*). See Team Stop #7 for details regarding objects and actions related to crossing the overcast if the team crosses at this point.

Team Stop #4

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

All team members must remain connected or have hold of the lifeline (*Judge 2 – Underground Rule 9*).

A “Permanent Stopping” blocks advance to the west and the captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the stopping.

The team will find a used fire extinguisher on the pillar corner to the southwest. To the east, the captain will find a gas placard (O₂=16.2%, CO=1310 ppm) in front of the barricade. A conscious person behind the barricade to the east will yell, “HELP, HELP, GET ME OUT! I’M IN AN AIRTIGHT AREA BETWEEN 2 BARRICADES!” when the captain checks the barricade. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the barricade. The person cannot be rescued because the barricade must be ventilated and it is not possible at this time. Any attempt to rescue the survivor without ventilating the barricade may result in the death or injury of the survivor (*Judge 1 – Underground Rule #18*).

To the south, the captain will find a “Service Truck” on fire. A fire extinguisher must be used to put the fire out without undue delay (*Judge 1 – Underground Rule 13*). The captain will check the back or roof at the fire location (*Judge 1 – Underground Rule 8(b)(5)*). **NOTE:** *The smoke machines need to be turned off as soon as the fire is extinguished.*

The team will find a mine phone east of the fire location and a timber south of the “Service Truck”. A “Permanent Stopping” prevents additional advance south in drift #2. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the

stopping. The captain will find a gas placard (O₂=16.2%, CO=1310 ppm) at the stopping.

Retreat: The team will retreat back through the door in the overcast to Team Stop #3 location and then advance toward Team Stop #5.

Team Stop #5

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

All team members must remain connected or have hold of the lifeline (*Judge 2 – Underground Rule 9*).

The captain will find a gas placard (O₂=16.4%, CO=1300 ppm) in the center of the intersection.

The captain will break the plane of the intersection to the north and make a gas test (*Judge 2 – Underground Rule 1*) and will find a gas placard (O₂=17.5%, CO=1094 ppm).

If the captain travels 3 feet to the north, he/she will find “Unsafe Roof” and will indicate to the team he/she has recognized bad ground. The captain will D&I (*Judge 1 – Underground Rule 9*) and R (*Judge 1 – Underground Rule 8(b)(2)*) at the unsafe roof. The team may see a “Person” under the unsafe roof.

JUDGES & MINE MANAGER – The team will have found only 1 timber at this time. If the team asks about the availability of roof supporting materials, tell them that **“All materials for working the problem are located in the mine.”**

The captain will break the plane of the intersection to the south and make a gas test (*Judge 2 – Underground Rule 1*). The team will advance south toward Team Stop #6 and will find a pick along the east rib, an inoperable pump along the west rib, and “Ankle Deep” water.

Team Stop #6

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

All team members must remain connected or have hold of the lifeline (*Judge 2 – Underground Rule 9*).

To the west, the captain will find a gas placard (O₂=16.4%, CO=1300 ppm) in front of a barricade. A conscious person behind the barricade will yell, “HELP, HELP, GET ME OUT! I’M IN AN AIRTIGHT AREA BETWEEN 2 BARRICADES!” when the captain checks the barricade. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the barricade. The person cannot be rescued because the barricade must be ventilated and it is not possible at this time. Any attempt to rescue the survivor without ventilating the barricade may result in the death or injury of the survivor (*Judge 1 – Underground Rule 18*).

Advancing to the south, a shovel is located along the west rib and a left glove is located along the east rib. The captain will find a gas placard (O₂=16.4%, CO=1300 ppm) at the “Permanent Stopping with Door” (with door closed) and will find brattice cloth and frames. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the stopping.

The materials and means for ventilating the barricade are now available. However, the team does not know the effect a ventilation change will have on the rest of the mine at this time so additional exploration is necessary (*Judge 2 – Underground Rule 12*).

Retreat: The team will retreat back to the Team Stop #3 location under the overcast and through the open door in the south overcast wall. The overcast is traversable and must be crossed to continue exploration.

Team Stop #7 (on top of overcast)

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

All team members must remain connected or have hold of the lifeline (*Judge 2 – Underground Rule 9*).

A coffee cup is located on top of the overcast in the southeast corner.

The captain will find a “Body” (Antonius Kalas, ID No. 0369) on top of the overcast (*Judge 1 – Underground Rule 16*). The captain will D&I the body (*Judge 1 – Underground Rule 9*). The miner’s name and ID number will be called out to the surface.

A crescent wrench is located on top of the overcast in the northwest corner.

The team will advance toward Team Stop #8 and the captain will find a gas placard (O₂=16.2%, CO=1312 ppm) just north of the overcast. A thermos is located along the east rib near the next intersection.

Team Stop #8

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

All team members must remain connected or have hold of the lifeline (*Judge 2 – Underground Rule 9*).

The captain will find a can of spray paint in the center of the intersection.

The captain will find “Caved Airtight” to the west and will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the caved airtight.

The captain will break the plane of the intersection to the east and make a gas test (*Judge 2 – Underground Rule 1*) and find a gas placard (O₂=16.4%, CO=1362 ppm).

To the north, the captain will break the plane of the intersection and make a gas test (*Judge 2 – Underground Rule 1*) and find a gas placard (O₂=16.3%, CO=1301 ppm), a brattice cloth and frames, the face, and an exhausting fan shaft. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(1)*) at the face.

The team will advance toward Team Stop #9.

Team Stop #9

The captain will verbally indicate he/she is checking the back or roof at the intersection before physically entering the area (*Judge 1 – Underground Rule 8(b)(1)*).

All team members must remain connected or have hold of the lifeline (*Judge 2 – Underground Rule 9*).

The captain will break the plane into the crosscut and make a gas test (*Judge 2 – Underground Rule 1*).

To the south, the captain will break the plane of the intersection and make a gas test (*Judge 2 – Underground Rule 1*) and find a gas placard (O₂=17.5%, CO=1094 ppm). The captain will find “Unsafe Roof” and will indicate to the team he/she has recognized bad ground. The captain will D&I (*Judge 1 – Underground Rule 9*) and R (*Judge 1 – Underground Rule 8(b)(2)*) at the unsafe roof. The team may see a “Person” under the unsafe roof.

JUDGES & MINE MANAGER – The team will have found only 1 timber at this time. If the team asks about the availability of roof supporting materials, tell them that **“All materials for working the problem are located in the mine.”**

To the north, the captain will find a gas placard (O₂=16.1%, CO=1303 ppm) and a barricade.

A screwdriver is located outside the southeast corner of the barricade.

There will be no response from inside the barricade when it is checked. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the barricade.

Though there are unexplored areas under the “Unsafe Roof” and on the outside of the enclosed portion of the mine, ventilation changes necessary to rescue the survivor found between Team Stop #4 and Team Stop #6 should now be made.

VENTILATION 1 (see map labeled VENTILATION 1)

The team will discuss the planned ventilation change with the FAB and Mine Manager.

Step 1: Build a temporary stopping immediately inby or outby the unsafe roof in drift #3 to prevent an irrespirable atmosphere from traveling over a potentially live person and ventilating through an unexplored area. Before erecting the temporary stopping, the captain will check the roof (*Judge 1 – Underground Rule 8(b)(3)*). This stopping may have already been erected during exploration.

Step 2: Open the door in the permanent stopping located at the mouth of drift #3.

Step 3: Call out for an air change and to start the exhausting fan.

Fresh air will pull through the door past the barricade, west through the 2nd crosscut, through the south overcast wall door, and back over the overcast to the fan. Six (6) gas placards should be turned over along this path to clear the areas indicated on the **VENTILATION 1** map.

Since it may take a while for the fan to actually clear the visible smoke along this path, for purposes of this contest the areas ventilated will be considered free of smoke.

RESCUE 1

Since the air in front of the barricade is clear of contaminants and the team knows that the barricaded area is airtight, the team can open the barricade on the drift #3 side without making an airlock.

Before breaching the barricade, the captain will make a gas test outside the barricade to ensure the air is clear. The barricade can be opened. Before passing through the barricade, the captain will verbally indicate he/she is checking the back/roof (*Judge 1 – Underground Rule 8(b)(4)*). The captain will perform a gas test (*Judge 2 – Underground Rule 1*) and will D&I (*Judge 1 – Underground Rule 9*) where the survivor (Duncan MacLeod, ID No. 1592) is located. The miner's name and ID number will be called out to the surface.

Note: There may be visible smoke inside the barricade but this is not part of the problem and should be ignored.

The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the remaining barricade structure.

The survivor will be taken to the FAB through the open door at the mouth of drift #3.

CONTINUED EXPLORATION

The team entered the enclosed portion of the problem from drift #1 through the door in the permanent stopping. The team can re-enter the mine through drift #1 but it is likely they will re-enter through the door at the mouth of drift #3 and exit to drift #1 through the door in the permanent stopping.

MINE MANAGER – Be aware of fan stall, which will occur if the fan is running and both entrances into the enclosed portion of the mine are closed. Turn the fan off if this happens. Do not restart until at least one entrance is open (and without an airlock stopping to block airflow) and the team asks to restart the fan.

JUDGES – Be aware of fan stall, which will occur if the fan is running and both entrances into the enclosed portion of the mine are closed. **DO NOT TELL THE TEAM WHEN IT OCCURS** – let them figure out why their ventilation will not work. If they try to ventilate while fan is in stall, they will have to correct the condition and ask for the fan to be restarted before they can ventilate.

To save time, it is expected that the team will have the fan turned off before re-entering the mine and will close the door at the mouth of drift #3 behind them. The team would then exit into drift #1 through the door in the permanent stopping. The team knows there is now no ventilation in the mine and may remove the temporary stopping used to airlock into the enclosed area and may leave the permanent stopping door open.

The team will resume exploration at Team Stop #2 location in drift #1 and advance toward Team Stop #10.

Drift #1 - Team Stop #2 Location

Exploration to 3 feet inby this intersection was completed at Team Stop #2.

The team will advance toward Team Stop #10.

The captain will find a gas placard (O₂=16.0%, CO=1107 ppm) in front of a barricade and a wing curtain. A "Body" (Richie Ryan, ID No. 1974) is behind the barricade so there will be no reply when the captain checks it.

The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the barricade.

Ventilation of the barricade in drift #1 is now possible.

VENTILATION 2 (see map labeled VENTILATION 2)

The team will discuss the planned ventilation change with the FAB and Mine Manager.

Step 1: Remove the airlock stopping in the crosscut if it is still up.

Step 2: Open the permanent stopping door in crosscut if it is closed.

Step 3: Open the door in the south overcast wall if it is closed.

Step 4: Call out for an air change and to start the exhausting fan.

Step 5: Ventilate the front of the barricade by using the wing curtain found at the barricade.

Fresh air will pull up drift #1, around the wing curtain to clear the barricade, through the open permanent stopping door, through the south overcast wall door, and back over the overcast to the fan. Four (4) gas placards should be turned over along this path to clear the areas indicated on the **VENTILATION 2** map.

The captain may call for the fan to be turned off.

BREACHING THE BARRICADE IN DRIFT #1

The conditions behind the barricade are not known so a temporary stopping, using the rope-type brattice cloth and frames, must be constructed before breaching the barricade (*Judge 2 – Underground Rule 10*). The captain will check the roof before constructing the temporary stopping (*Judge 1 – Underground Rule 8(b)(3)*).

The team will open the barricade. Before passing through the barricade, the captain will verbally indicate he/she is checking the back/roof (*Judge 1 – Underground Rule 8(b)(4)*). The captain will perform a gas test (*Judge 2 – Underground Rule 1*) and will D&I (*Judge 1 – Underground Rule 9*) where the body (Richie Ryan, ID No. 1974) is located. The miner's name and ID number will be called out to the surface.

The captain will find another barricade. With the airlock still installed, this barricade will be breached. Before passing through the barricade, the captain will verbally indicate he/she is checking the back/roof (*Judge 1 – Underground Rule 8(b)(4)*). The captain will perform a gas test (*Judge 2 – Underground Rule 1*). This location is at the plane of the intersection so the roof check also satisfies *Judge 1 – Underground Rule 8(b)(1)*. An additional gas test for breaking the plane is not needed.

The team will continue to advance toward Team Stop #10.

CONTINUED EXPLORATION

Team Stop #10

The captain will find a gas placard (O₂=16.0%, CO=1107 ppm) in the intersection just in by the barricade.

The captain will break the plane of the intersection to the east and make a gas test (*Judge 2 – Underground Rule 1*).

The team will advance through the crosscut to the east. The captain will find a timber on the north rib and "Caved Airtight" in the crosscut. The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(2)*) at the caved area. The team will return to the intersection.

The captain will break the plane of the intersection to the north and make a gas test (*Judge 2 – Underground Rule 1*) and advance to the face.

The captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(1)*) at the face. A timber is located in the northeast corner of the face.

NOTE: The team now has 3 timbers and can timber the unsafe roof in drift #3.

Retreat: The team will retreat outby toward the Team Stop #2 location and can remove the airlock stopping used to breach the barricade. The

team will proceed east through the permanent stopping door in the crosscut and leave the door open. The team can close the door in the south overcast wall as they pass it or leave it open to make a short circuit until ready for the next ventilation. *NOTE: If the fan is still running it will stall if they close the south overcast wall door because there is no path for air to reach the fan if the door is closed at the mouth of drift #3.* The team will retreat to the Team Stop #5 intersection.

Drift #3 - Team Stop #5 Location

The team will be in smoke when they break the north plane. All team members must be connected or have hold of the lifeline when entering the smoke (*Judge 2 – Underground Rule 9*). Before entering smoke, a personnel check must be made to assure all members are OK (*Judge 1 – Underground Rule 12*).

The team will remove the temporary stopping across drift #3 at the unsafe roof (assuming either the fan is off or the door in the south overcast wall is still open). The captain will set timbers through the unsafe roof and will find a “Person” (a mannequin; Hugh Fitzcain, ID No. 1190) under the unsafe roof and must take body substance isolation (BSI) precautions before physically contacting the mannequin (*Judge 1 – Underground Rule 10(a)(5)*). An assessment of the person for possible injury or illness must be made (*Judge 2 – Underground Rule 14(a)*).

JUDGES: Hand the “This person is dead” card with identification on back to the captain when he completes the primary assessment.

The captain will D&I (*Judge 1 – Underground Rule 9*) where the body (Hugh Fitzcain, ID No. 1190) is located. The miner’s name and ID number will be called out to the surface.

Ventilation of the barricade in drift #3 is now possible.

VENTILATION 3 (see map labeled VENTILATION 3)

The team will discuss the planned ventilation change with the FAB and Mine Manager.

Step 1: Open the permanent stopping door (between Team Stops #2 and #3) if it is closed.

Step 2: Close the door in the south overcast wall if it is open.

Step 3: Call out for an air change and to start the exhausting fan.

If the fan was never turned off and the team left the permanent stopping door and south overcast wall door open, then all they need to do to make the air change is close the south overcast wall door.

Fresh air will pull up drift #1, through the open permanent stopping door and under the overcast to drift #3, northward, across the front of the barricade, and on to the fan. Four (4) gas placards should be turned over along this path to clear the areas indicated on the **VENTILATION 3** map.

Smoke is now cleared out of the mine, even if some is visible, except for the area south of the overcast in drift #2. Team members do not have to be attached to the lifeline unless they travel in drift #2 south of the overcast.

The captain may call for the fan to be turned off.

BREACHING THE BARRICADE IN DRIFT #3

The conditions behind the barricade are not known so the team must airlock in. Temporary stoppings must be erected across drift #3 and across the crosscut between drift #2 and drift #3 (see map labeled **BREACHING DRIFT #3 BARRICADE**) (*Judge 2 – Underground Rule 10*). The captain will check the roof before constructing each temporary stopping (*Judge 1 – Underground Rule 8(b)(3)*).

The captain will breach the barricade and verbally indicate he/she is checking the back/roof before passing through (*Judge 1 – Underground Rule 8(b)(4)*). The captain will perform a gas test (*Judge 2 – Underground Rule 1*) and will D&I (*Judge 1 – Underground Rule 9*) where the person (Amanda Darioux, ID No. 0820) is located. The miner's name and ID number will be called out to the surface. *Note: There may be visible smoke inside the barricade but this is not part of the problem and should be ignored.*

While at this location, the captain will D&I (*Judge 1 – Underground Rule 9*), GT (*Judge 2 – Underground Rule 1*), and R (*Judge 1 – Underground Rule 8(b)(1)*) at the face.

An empty first-aid kit is located in the northeast corner of the face.

RESCUE 2

The team will retreat through drift #3 to the FAB with the survivor. The team does not have to airlock out of the mine.

At this time all persons have been located, identified, and rescued as necessary.