

**Ohio Valley Tri-State Post # 6**  
**Day 1 Mine Rescue Contest**  
**June 14,2017**



## Statement

Thank you for responding to our call for help, this is the Trump Card Mine where we have a problem that needs your special talents. I will explain the situation as we know it to be now.

This is a new mine that went down to the coal seam from the surface using a slope then mined north off the slope bottom with 4 entries that are numbered from west to east with number one entry on the far west side of the mine. We mined north 2 cross cuts until we mined into the intersection with our air shaft which is located just off the # 4 entry in a side cut and the mine's blowing fan is located on top of this air shaft. Due to a dip in the coal seam water will accumulate at the shaft bottom quickly, and if the pump is not kept running there the water will roof in the intersection in front of the ventilation air shaft and will also roof at the bottom of the air shaft. This is what we believed happened and caused the problem that we have now.

Last night a three man set up crew arrived at the mine to find that the mine fan was not running and their efforts to re-start it failed. The men told the responsible person outside that they were going in the mine to see if the water was roofed at the shaft bottom and if the pump was off. The crew called out and reported that water was roofed in the intersection in front of the air shaft and backed up the grade toward the outby intersection about ankle deep there, they said they would check the pump and call out to energize it when they were ready. They never called back and never came back outside the responsible person made several efforts to reach them by radio, but no response came back. The mine foreman was called and he went underground only to find explosive gas and low oxygen readings at the slope bottom so he came out and called for help.

You are the first team ready to respond to our problem a back-up team is ready to serve you while you are underground. The command center is located on the surface and the switches that will turn on the fan and the pump are located there. Your team can request the power to be turned on the fan or pump when they are ready to turn them on. However once the fan or the pump are turned on we do not want them turned off.

The fan is in blowing mode and cannot be reversed, the maps that you will receive are current and show all openings to the mine and there are no known workings around us. All agencies are on hand and here to assist you. The mine is about 65 inches high, supported by resin bolts with problems with methane accumulations and poor roof.

Good luck

## **Instructions to the Team Problem**

**Explore all areas of the mine that be explored safely**

**Bring all survivors to the surface**

**The power to the fan and pump must be requested to be turned on by the team to the Superintendent at the Command Center**

**The power to the fan must be kept on once the fan has been turned on**

**The power to the pump must be kept on once started to prevent water from roofing again**

**We do not want the fan to be stopped, stalled or reversed once it is started it will only run in blowing mode**

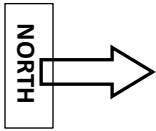
**You will have 75 minutes to work this problem and be given a 10-minute warning at 65 minutes**

**If a diagonal ventilation build is required to make it air tight secure the clips on each corner of the intendent corner to build on and the two curtains needed to make the diagonal must be clipped together in the middle, (show curtains and how clips work)**

**If the team uses a Command Center Attendant and the Visio map is not working, the Attendant will not be able to assist the Briefing Officer. Let the Superintendent know of the issue immediately so an effort can be made to correct the problem if it cannot be correct the CCA will close the computer and not assist the B/O in anyway.**

**From 2017 Mine Rescue Q & A's Q: What will be done to address Smart Watches in lock-up?**

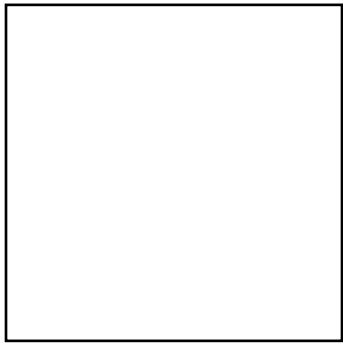
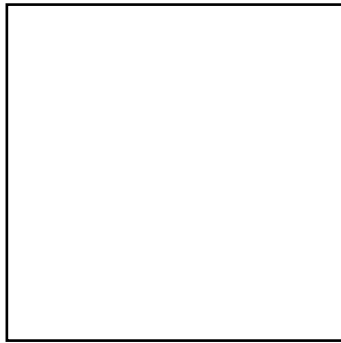
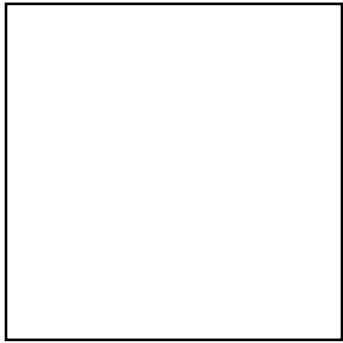
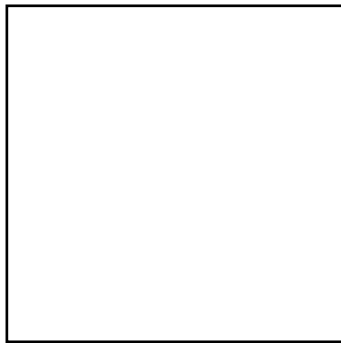
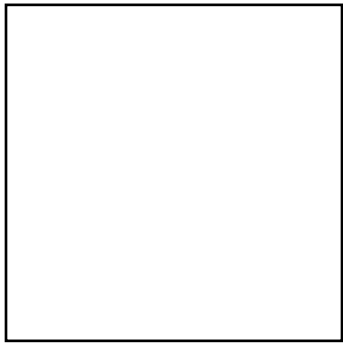
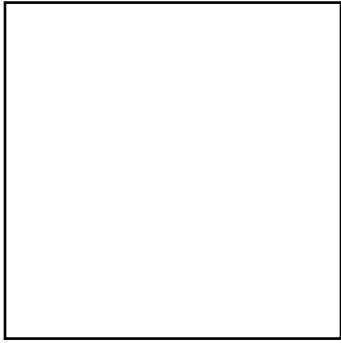
**A: Rule 8 of Rules Governing 2017 Mine Rescue Contests states that teams can be disqualified if they receive unauthorized information. Smart watches are communication devices and should not be brought into lock-up.**



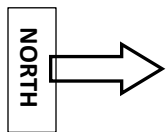
Command center for  
B/O and CCA  
Pump switch off/on X  
Fan Switch Off/On X

Date Board  
& Clock X

X  
Top of Slope



8 ft. dia. Air  
Shaft



De-energized power center

Command center for B/O and CCA  
Pump switch off/on  
Fan Switch Off/On

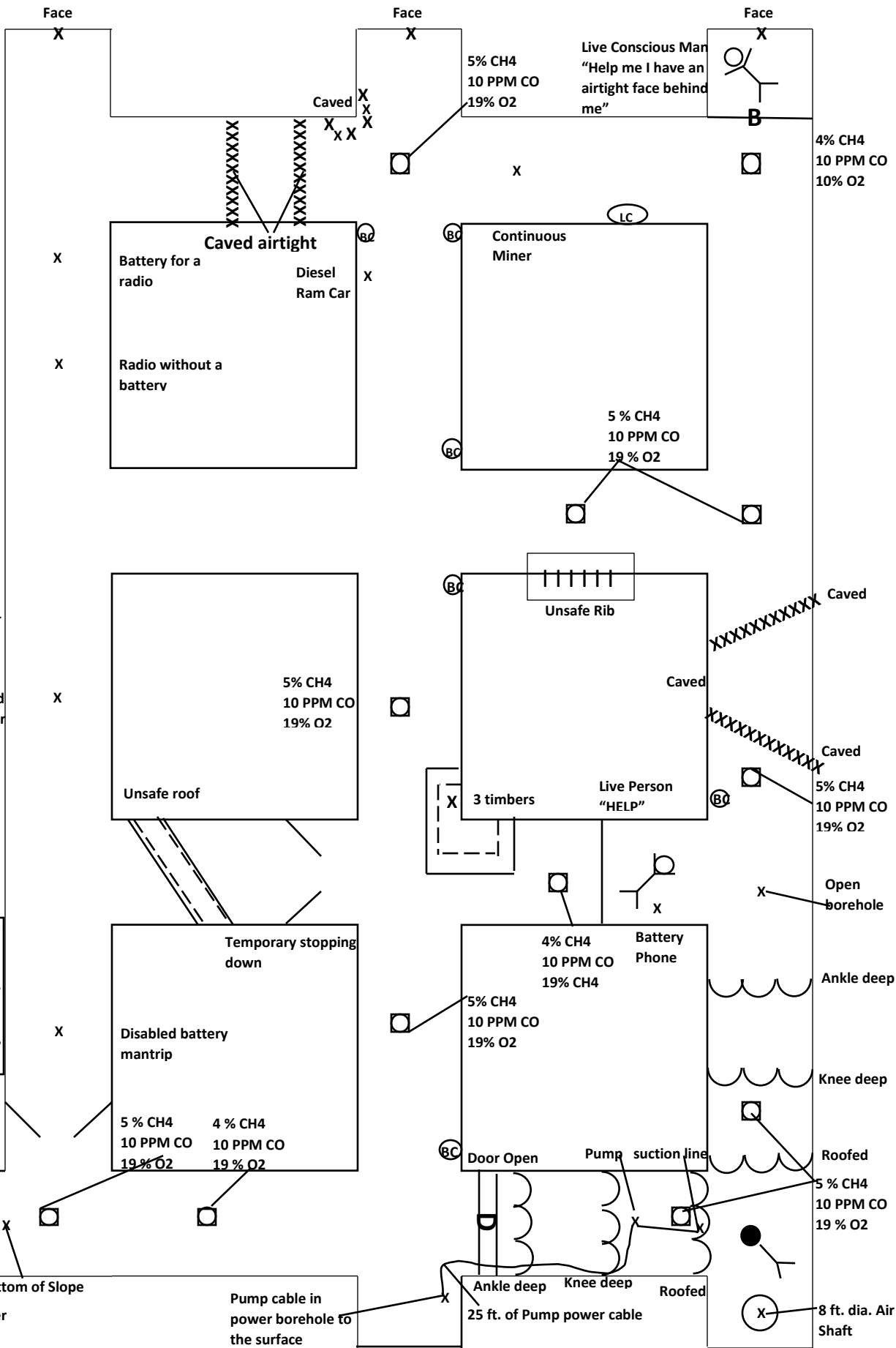
Date Board & Clock

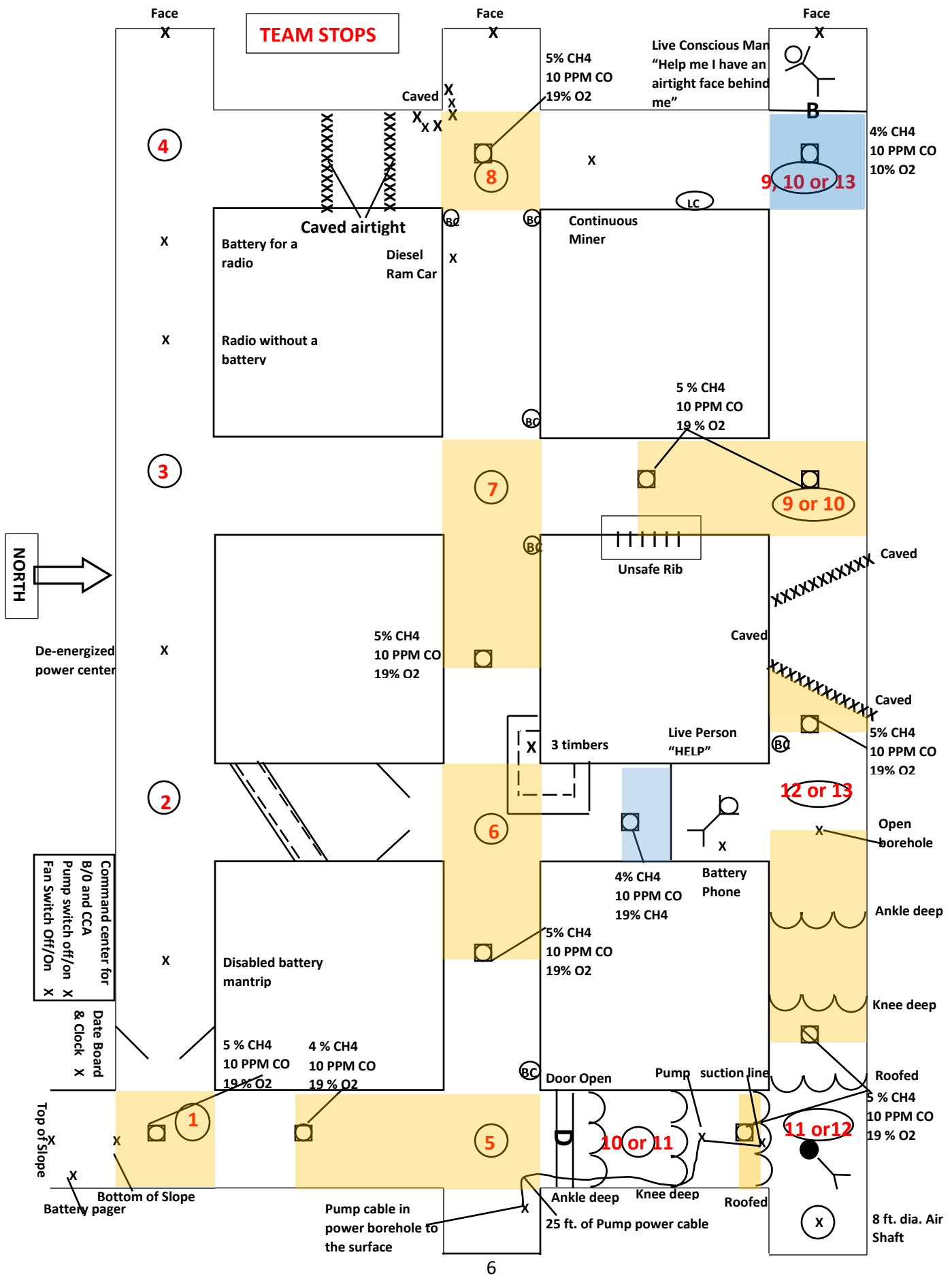
Top of Slope

Bottom of Slope

Battery pager

Pump cable in power borehole to the surface





**TEAM STOPS**

Live Conscious Man  
 "Help me I have an  
 airtight face behind  
 me"

**Caved airtight**

Continuous Miner

Unsafe Rib

Live Person  
 "HELP"

Disabled battery  
 mantrip

Battery  
 Phone

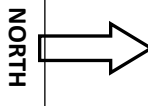
Door Open

Pump suction line

Pump cable in  
 power borehole to  
 the surface

25 ft. of Pump power cable

8 ft. dia. Air  
 Shaft



Command center for  
 B/O and CCA  
 Pump switch off/on  
 Fan Switch Off/On

Date Board  
 & Clock

Top of Slope

Bottom of Slope  
 Battery pager

De-energized  
 power center

4

3

2

1

8

7

6

5

6

9 10 or 13

9 or 10

12 or 13

10 or 11

11 or 12

4% CH4  
 10 PPM CO  
 10% O2

Caved

Caved

5% CH4  
 10 PPM CO  
 19% O2

Open  
 borehole

Ankle deep

Knee deep

Roofed  
 5% CH4  
 10 PPM CO  
 19% O2

5% CH4  
 10 PPM CO  
 19% O2

5% CH4  
 10 PPM CO  
 19% O2

5% CH4  
 10 PPM CO  
 19% O2

5% CH4  
 10 PPM CO  
 19% O2

4% CH4  
 10 PPM CO  
 19% O2

4% CH4  
 10 PPM CO  
 19% CH4

5% CH4  
 10 PPM CO  
 19% O2

Caved

X

X

X

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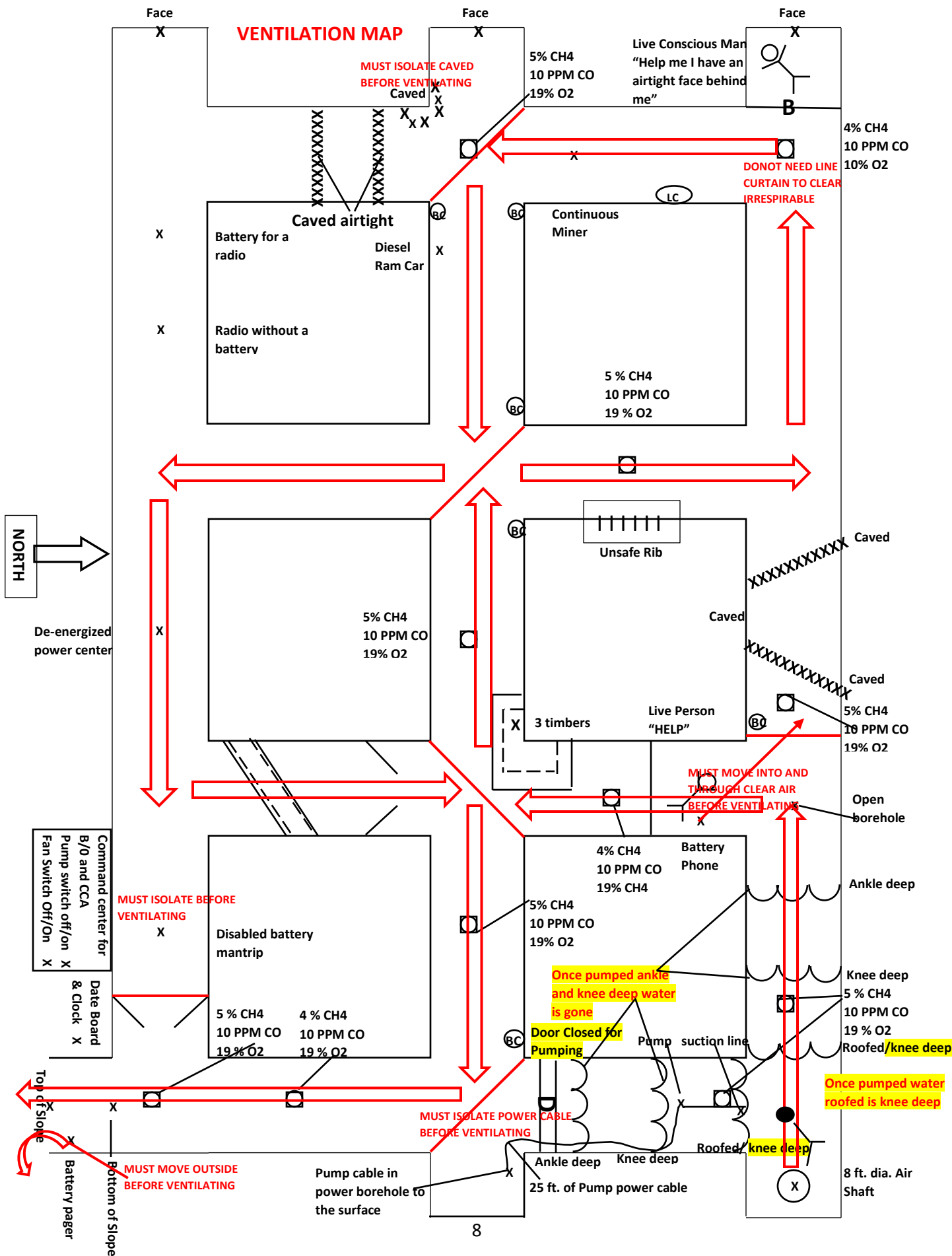
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# VENTILATION MAP



**MUST ISOLATE CAVED BEFORE VENTILATING**

5% CH4  
10 PPM CO  
19% O2

Live Conscious Man  
"Help me I have an airtight face behind me"

4% CH4  
10 PPM CO  
10% O2

**DONOT NEED LINE CURTAIN TO CLEAR IRRESPIRABLE**

**Caved airtight**  
Battery for a radio  
Diesel Ram Car

Continuous Miner  
5% CH4  
10 PPM CO  
19% O2

5% CH4  
10 PPM CO  
19% O2

Unsafe Rib  
Caved  
3 timbers  
Live Person "HELP"  
5% CH4  
10 PPM CO  
19% O2

5% CH4  
10 PPM CO  
19% O2

**MUST MOVE INTO AND THROUGH CLEAR AIR BEFORE VENTILATING**

**MUST ISOLATE BEFORE VENTILATING**

5% CH4 10 PPM CO 19% O2  
4% CH4 10 PPM CO 19% O2

4% CH4 10 PPM CO 19% CH4  
5% CH4 10 PPM CO 19% O2

5% CH4  
10 PPM CO  
19% O2

Once pumped ankle and knee deep water is gone

Door Closed for Pumping

Once pumped water roofed is knee deep

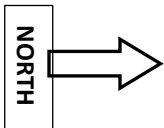
**MUST ISOLATE POWER CABLE BEFORE VENTILATING**

**MUST MOVE OUTSIDE BEFORE VENTILATING**

Pump cable in power borehole to the surface

Ankle deep  
Knee deep  
25 ft. of Pump power cable

8 ft. dia. Air Shaft



Command center for B/O and CCA  
Pump switch off/on  
Fan Switch Off/On  
Date Board & Clock

Top of Slope  
Bottom of Slope  
Battery pager

## Key Points

### Team Information from the Statement ;

The statement the team receives in lock up tells them that there are three missing miners, the maps are up to date, there is a blowing fan located on top of the 8 foot diameter air shaft located just off to the side of # 4 entry, the bottom of the shaft area is located at the lowest point in the mine by 6 feet, the pump that is at that shaft area is off, and that the area at the bottom of the air shaft is roofed with water. The team is also told that when they are at the bottom of the slope they will be in the # 4 entry. That the entries are numbered from west to east, and there are 4 entries that drove two cross cuts North.

Team stop # 1 is at the bottom of the slope in # 4 entry the team finds an explosive air gas mixture in the intersection. West in the cross cut toward # 3 entry they encounter a battery mantrip and north inby in # 4 entry they encounter an irrespirable air gas mixture. **Judges please note that the team under Rule 44 D must tie across through the opening, (cross-cut) before advancing inby so unless blocked they must tie to # 3, # 2, and # 1 entries in A-line before advancing inby to B-line.**

Team stop # 2 in A-line in # 3 entry in the cross-cut toward # 2 entry they find a de-energized power center, in the entry going north, (inby) they are blocked by unsafe roof.

Team stop # 3 will be in # 2 entry of A-line where in the cross-cut toward # 1 entry where they will a battery for a radio and in the entry toward B-line in # 2 entry there is nothing.

Team stop # 4 will be in # 1 entry of A-line where the team will find a face going west and a caved airtight heading north inby in # 1 entry.

Team stop # 5 will be in B-line of # 4 entry this is the only contaminated entry and the adjacent entry in # 3 entry is blocked by unsafe roof. Here the team finds a side cut on the east side of the intersection with a power bore to the surface in it and a pump cable. In the cross-cut toward # 3 entry of B-line the team finds a brattice build and an explosive air gas mixture. In the intersection part of a pump

cable is in it and it runs inby in # 4 entry through a permanent stopping that has an open door in it. Heading north, (inby) in # 4 entry the team finds ankle deep then knee deep water, then a pump with a suction line on it. Next they find an explosive air gas mixture then water roofed with the suction line extending into the water roofed. This blocks the team from advancing inby not only due to the water roofed, but if they pump the water roofed they still cannot advance inby due to the open cross-cut toward # 3 entry under Rule 44 D. This requires the team to tie over to # 3 entry first.

Team stop # 6 will be in # 3 entry of B-line where the team encounters a wraparound area of unsafe roof on the inby corner toward # 2 entry this will require the entire intersection to have a roof & rib test made in it before the team leaves the area. In the entry outby the team finds a stopping down then the inby side of a diagonal unsafe roof. In the cross-cut west toward # 2 entry the team passes by three timbers in the unsafe roof and then finds an explosive air gas mixture. In the # 3 entry going toward C-line the team will need to have the person behind the wall yell, "HELP" as soon as the captain breaks the imaginary line of the intersection. The first thing they find is an irrespirable air gas mixture then a stopping with the person yelling from behind it. Under Rule 35 second paragraph if verbal contact is made with a patient and there is an irrespirable in front of the airtight separation it must be removed before breaching the airtight separation. This means to treat the stopping like a barricade with an irrespirable in front of it. At this time, they cannot ventilate and they have an open cross-cut toward # 2 entry so they must continue to explore.

Team stop # 7 will be in B-line in # 2 entry the explosive gas mixture from the cross cut will extend into this intersection from the # 3 entry side. In the cross cut toward # 1 entry there are 3 brattice builds in the entry going inby toward C-line there is an explosive air gas mixture that extends toward C-line and an area of unsafe rib.

Team stop # 8 will be in B-line of # 1 entry in the intersection there is an explosive air gas mixture, and on the outby corner of the intersection there is a wraparound of a caved area which will require the entire intersection to have a

roof and rib test made by the captain before the team leaves that intersection. The team encounters a face just pass the intersection heading west and outby in the # 1 entry the team finds the inby side of the caved airtight. Then inby in # 1 entry the team will find a line curtain. The team now has a choice to either travel inby up # 1 entry which is the entry adjacent to the contaminate or they can go back and travel inby up # 2 entry which is the contaminated entry.

Team stop 9 or 10 can be in C-line of # 1 entry here the team finds an irrespirable in the entire intersection and a barricade on the imaginary line of the intersection for the side-cut to the west. **Note to Judges please have the patient yell to the team, "Help me I have an airtight face behind me" as soon as the captain enters the intersection.** At this time there is no way to ventilate the barricade so the team must continue to explore through the cross-cut in C-line to #2 entry.

Team stop 9 or 10 can be in the C-line in # 2 entry here the team the team finds a caved area in the cross-cut toward # 3 entry in C-line. If this is Team stop #10 the team now has to return to Team stop # 5 and pump the water. If this is team stop # 9 the team has a choice to explore through the cross-cut in C-line to # 1 entry or return to Team stop # 5 location and pump the water. The reason that they can do this instead of going through the cross cut toward # 1 is because they are not passing the opening they are retreating and not going inby it.

Team stop # 10 or # 11 should be pumping the water this requires the team to use an equivalent airtight separation for the one removed under Rule 42 paragraph 5. This can be achieved by closing the door in the permanent stopping behind them. Some teams may also be build one in the cross-cut in C-line at the caved between #2 and # 3 entries and may also bring in an extra build before closing the door. **The team must under Rule 42 airlock before pumping water roofed.** Since the pump is not in the explosive mixture and the suction line extends into the water roofed the team must by written instructions request the pump be turned on outside, (Superintendents please let the field judges know that the pump has been turned on). **Judges please turn over all water placards in the intersection and the cross-cut as well as the entry as soon as the pump is turned on. Remember the pump must stay on once it has been turned on so if the team**

turns it off let the judge on the field know that it is off. If a team does not follow the instructions field judges, please turn the roofed water placard back over to roofed from knee deep. Once the team turns the pump back on turn the water roofed placard back to knee deep.

Team stop # 11 or # 12 will be in C-line of # 4 entry once the water has been pumped the team may then proceed into that intersection. There they will find a body in the intersection that requires the captain to stop before passing it by any team member and under Rule 32 touch by hand the body and under Rule 27 date and initial that body. In the side cut to the east of the intersection there is a 8 ft. diameter air shaft, in the cross-cut toward # 3 entry all the water placards should be turned over or removed there is an explosive air gas mixture that extends through the cross-cut toward the next intersection.

Team stop # 12 or 13 will be in C-line in # 3 entry there the team finds an open borehole which requires a gas test and means that since the results of that test show no gas mixture in by the explosive mixture is in only half of the intersection, (see the extent of gas map in this packet). In the cross cut toward # 2 entry in C-line the team finds a brattice build and an explosive air gas mixture then a caved area. In the outby entry they find a battery phone then a live person a date and initial at the patient and touch by the captain's hand before any team member passes the patient, an assessment must be made of the patient by a team member before the team leaves the area and the patient must be attended by a team member who is within 10 ft. (Rule 37). of that patient, then the team finds a stopping. The team will not need to ventilate to remove this patient they will need to properly protect him by donning a SCSR or Carevent on him because they will take him through irrespirable air on the way out. They might while they are preparing the patient to be taken out also move the battery phone from the entry into the cross-cut toward the caved. Judges observe the team to make sure that they do not pass the battery phone into the side of the intersection that has explosive air gas mixture in it and also not too far into the cross cut where the other explosive air gas mixture is located, please concur on this if a captain or team member does this. The patient can be taken out through the outby stopping in # 3 entry or back around and straight out # 4 entry since these areas have been

explored. Please note that if the team does not put protection on the patient the patient will be moved through multiple irrespirable mixtures.

Exploration is now complete except for behind the barricade in # 1 entry so ventilation must be established, (see the ventilation map). There are two battery ignition sources that will need re-located one in the slope that needs move outside, one in the entry where the live person was found, it will need move in the cross-cut in by the corner of the intersection in C-line of # 3 entry but not into the explosive mixtures that are located there. Please note that if the team moves the battery phone in # 3 entry out by into the entry below B-line they will move it through explosive air gas mixture which was found in direction of travel in the B-line cross-cut. If they move into the cross-cut between # 3 and # 4 in C-line they move it into explosive air gas mixture also. There are several areas that must be isolated from air movement that are also shown on the ventilation map and depending on their locations multiple explosive air gas mixtures can be passed through or over them. To correctly build the teams were instructed by written instructions that all diagonal builds in intersections will require two builds with the clips secured on each corner of the intersection they are extending to and clipped together in the middle, sagging does not mean it is not airtight as long as they are proper clipped. The ventilation designs require ten build of which 8 builds are for two curtain diagonals, there are two temporary stoppings down, a permanent stopping with a door in it, a temporary stopping intact, and 6 brattice builds for a total of 10 builds in the problem.

Please note that once the ventilation is set up the team by written instruction must request that the fan be turned on. Superintendent please let the field judges know when the fan is on. Once on it cannot be turned off and it is in blowing mode only.

Once the fan is on and the ventilation is properly set the gas placards in the ventilation course can be turned over to indicate that they have been cleared, (there should be 9 gas placards). However once that the team passes the cleared gas placards as they retreat outside. They still will need retested those areas where there was a gas under Rule 24. The barricade in # 1 entry will not require

the use of a line curtain to sweep the irrespirable away since it is located on the imaginary line of the intersection. Since the patient inside the barricade said he had an airtight face behind him no airlock is required to go in and get that patient under Rule 42 paragraph 3. The captain must make a gas test when breaching the barricade and date and initial the patient and touch him by hand, an assessment must be made of the patient by a team member before the team leaves the area and he must be attended by a team member who is within 10 ft. of that patient. The face will require a roof, face and rib test along with a gas test and the captain's date and initials. Once this is complete the team may remove the patient from the mine.

Please note that on the retreat out with the last patient from behind the barricade in # 1 entry the team will need to disrupt ventilation in order to get to the surface. If they choose they can use the barricade from # 1 entry to airlock out, but they can also just take down the temporary stopping between # 4 and # 3 entry in A-line or the diagonal in # 2 entry of B-line. This will not stop the fan and it will not move any gases that have not been cleared.