2024 National Mine Rescue – Coal

Day 1 – Statement

Thank you for responding to our mine emergency at the Lexington Coal Company Mine. Last night, the 1st West Mains crew of 4 miners entered the section to finish a cut through in the #1 entry to intersect a new intake air shaft. We do not know if it was completed. We do know the mine experienced a seismic event from reports by the US Geological Survey, which also caused a power outage sometime during the shift. We have had no communication from the crew since. Our mine rescue teams were deployed underground and were unsuccessful at locating the missing miners but were able to set up a Fresh Air Base before encountering adverse roof conditions, high concentrations of methane, and water flooding. We need your team to begin exploration at this newly established Fresh Air Base.

Electrical power has been restored, but we continue to have issues. The exhausting main fan on the surface is currently in operation and guarded, but we cannot shut it down due to the possibility of not getting it started again. Due to this condition, it also can't be stalled or reversed.

The 1st West Mains section also has energized electrical circuits up to the Fresh Air Base - and just like the electrical issues with the fan, we cannot take the chance of cutting power and not being able to reset if it may be needed by your team. This is a 3-entry section, and entries are numbered from left to right – with #1 and #2 as intake aircourses, and #3 as the return aircourse. The entries are walking height, and roof is supported with resin-grouted bolts. Due to different floor elevations and uneven grades, there are some areas in the section that you may encounter very high water levels.

The mine has a history of bad roof conditions in addition to methane and water accumulation. A back up team is available but cannot assist your team. All federal, state, and emergency medical service personnel are onsite. Mine maps are not up to date.

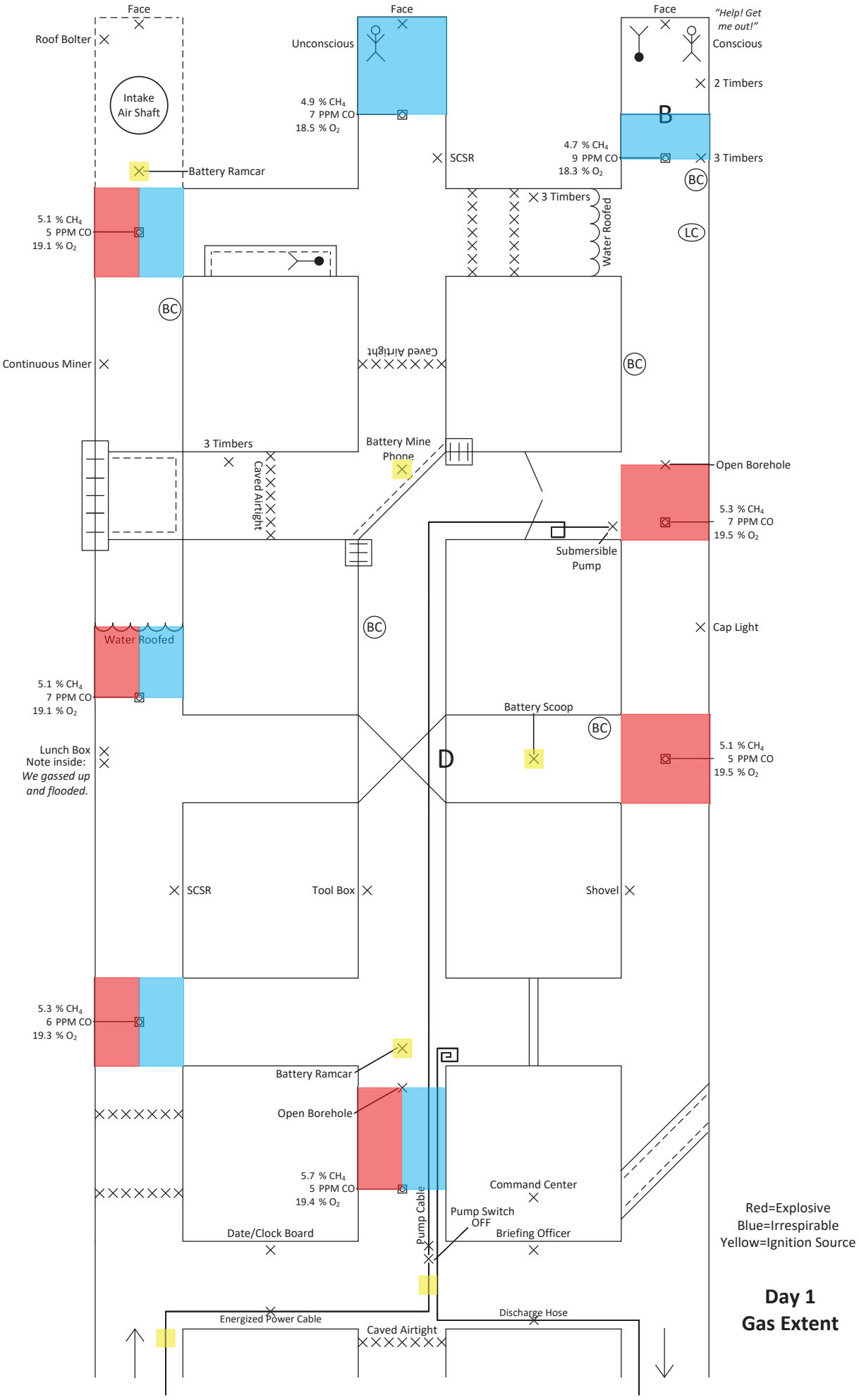
Thanks again for your assistance. Please get our miners out and be safe!

2024 National Mine Rescue – Coal

Day 1 Written Problem

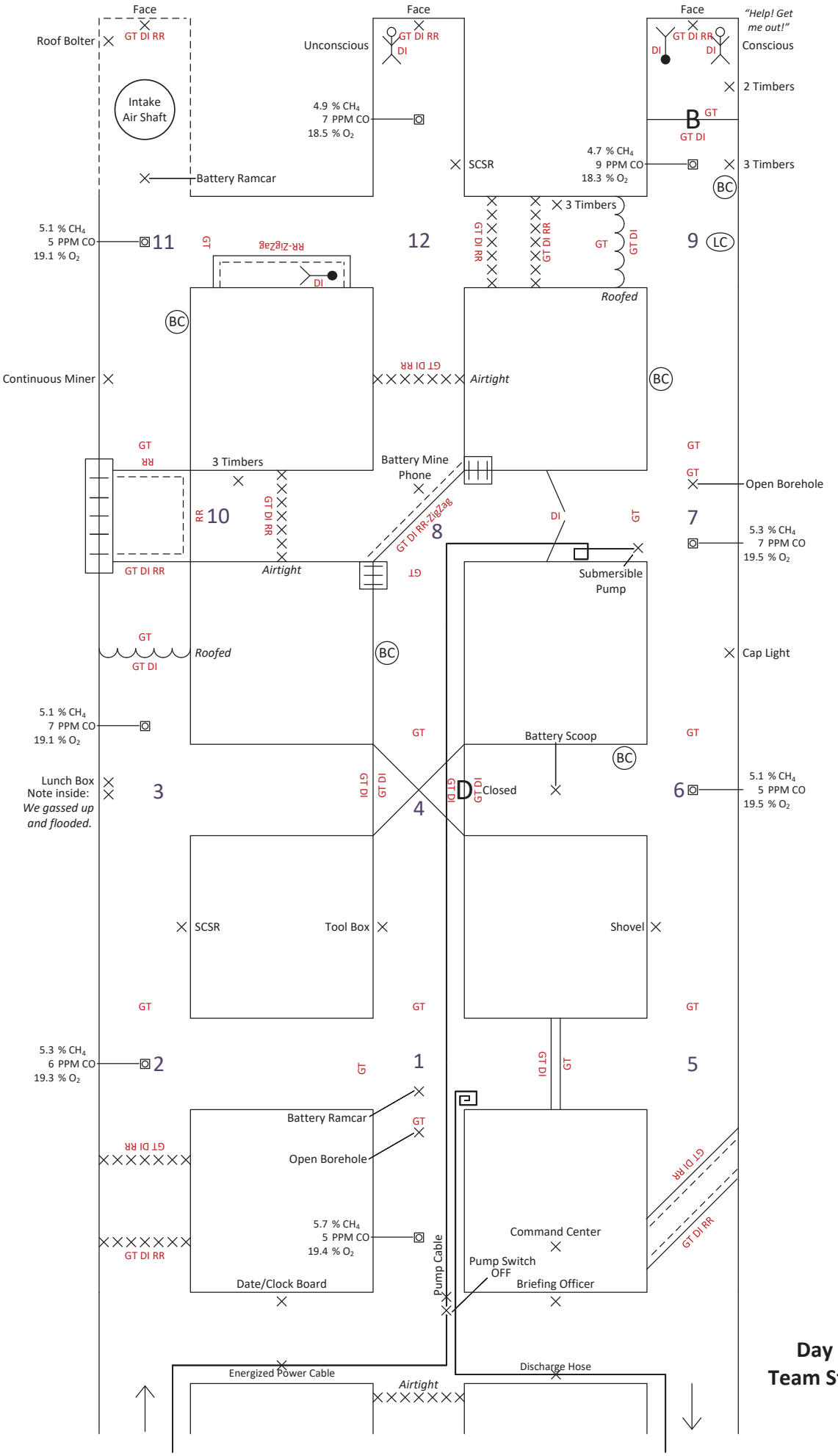
- Explore all areas in the 1st West Mains Section if it can be accomplished safely.
- Account for all missing persons and evacuate all survivors to the Fresh Air Base.
- The exhausting main fan is on and cannot be stopped, stalled, or reversed.
- Your back up team will relieve you in 75 minutes.

Day 1 Coal Field Problem



Red=Explosive
Blue=Irrespirable
Yellow=Ignition Source

Day 1
Gas Extent



Day 1
Team Stops

A video presentation will be given to the team prior to their arrival at the fresh air base, the presentation will state the following.

Thank you for responding to our mine emergency at the Lexington Coal Company Mine. Last night, the 1st West Mains crew of 4 miners entered the section to finish a cut through in the #1 entry to intersect a new intake air shaft. We do not know if it was completed. We do know the mine experienced a seismic event from reports by the US Geological Survey, which also caused a power outage sometime during the shift. We have had no communication from the crew since. Our mine rescue teams were deployed underground and were unsuccessful at locating the missing miners but were able to set up a Fresh Air Base before encountering adverse roof conditions, high concentrations of methane, and water flooding. We need your team to begin exploration at this newly established Fresh Air Base.
Electrical power has been restored, but we continue to have issues. The exhausting main fan on the surface is currently in operation and guarded, but we cannot shut it down due to the possibility of not getting it started again. Due to this condition, it also can't be stalled or reversed.
The 1st West Mains section also has energized electrical circuits up to the Fresh Air Base - and just like the electrical issues with the fan, we cannot take the chance of cutting power and not being able to reset if it may be needed by your team. This is a 3-entry section, and entries are numbered from left to right – with #1 and #2 as intake air courses, and #3 as the return air course. The entries are walking height, and roof is supported with resin-grouted bolts. Due to different floor elevations and uneven grades, there are some areas in the section that you may encounter very high-water levels.
The mine has a history of bad roof conditions in addition to methane and water accumulation. A back up team is available but cannot assist your team. All federal, state, and emergency medical service personnel are onsite. Mine maps are not up to date.
Thanks again for your assistance. Please get our miners out and be safe!

The person in charge of the fresh-air base will introduce himself or herself to the team captain immediately upon arrival of the team at the fresh-air base.

The team will have 4 minutes to position their equipment, lay out lifeline across the fresh-air base or distribute radios and have the SD card loaded in their computer and ready for use.

If the captain fails to start the clock at or before the 4 minutes has elapsed, the clock will be started for them, and the team will be discounted under Rule 49.

The blank maps and problem will be given to the team immediately after the captain or judge starts the timing device. The written instructions will state the following:
Explore all areas in the 1st West Mains Section if it can be accomplished safely. Account for all missing persons and evacuate all survivors to the Fresh Air Base. The exhausting main fan is on and cannot be stopped, stalled, or reversed. Your back up team will relieve you in 75 minutes.
Captain must legibly mark date, initials, and team number on check board after clock is started but before the entire team travels inby the fresh airbase. Rule 26.

The following equipment must be examined after the clock is started and before the entire team goes underground or inby the fresh-air base. The communication system and all gas detecting instruments used or taken inby the fresh-air base must be examined in the presence of a judge. (After examining, gas detecting instruments may be turned off during the working of the problem). Rule 14.

The team will now go under oxygen prior to checking the three openings inby fresh air base. Rule 9.

The captain will examine gauges, and apparatus and have his or her examined before going inby the fresh air base. Rule 6.

A proper apparatus examination will include a verbalization that the person performing the apparatus examination is checking the gauge, facepiece, hoses, and determine by sight or feel, that the protective cover is secure. If the gauge has a protective holder, the gauge must be put back into the holder after viewing. The team member making the check must obtain assurance from the person being checked that the person is all right. A verbal response from the person that he or she is all right will suffice. Rule 7.

All three openings will now be checked prior to the entire team traveling inby the fresh air base. Rule 24C.
Number 1 entry—gas test, D&I, and roof and rib test at the caved area.
Number 2 entry-gas test at the open borehole. The gas test required at the open borehole will stop the explosive mixture 5.7%Ch4 from extending into the intersection at stop 1 where a battery ram car will be located.
Number 3 entry-gas test, D&I, and roof and rib test at the diagonal unsafe roof.

Team will travel up number 2 to first team stop due to both 1 and 3 openings are blocked.

Team stop number 1.
The team will conduct a 50-foot check at this team stop. Rule 28.
Gas test & D&I at the permanent stopping.
Gas test in opening inby.
Gas test in crosscut.

The team will now advance through the open crosscut to team stop number 2. Rule 44D.
Gas test, D&I, roof, and rib test at caved area outby.
Gas test inby.

Team stop number 3.
The team will find a lunch box and note.

Gas test and D&I at wall of overcast.
Gas test and D&I at water roofed.
Note: The explosive mixture and low oxygen found outby the water roofed extends to the water roofed which would be an airtight separation. Rule 24E. This gas placard found outby the airtight water roofed can be cleared later by the use of a line curtain. Rule 48E.

Team stop number 4.
Gas test and D&I at both walls of the overcast.
Gas test inby.
Before breaking the two-break limit the team must take the brattice cloth they have found at this stop and use it to airlock through the permanent stopping found at team stop 1. Rule 44E
Roof & rib test must be conducted before building the temporary stopping. Rule 23.
The captain must mark the date and his or her initials at team-built stoppings, at each location where they are constructed, and after the building process has begun, but before the clock is stopped or the stopping is moved. Rule 27.
A gas test on back side by the captain after breaching the permanent stopping. Rule 24D.

Team stop number 5.
Gas test, D&I and roof test at the diagonal unsafe roof outby.
Gas test inby.

Team stop number 6.
Gas test and D&I at wall of overcast.
Gas test inby.

Team stop number 7.
Gas test at the open borehole in intersection.
Gas test inby.
Gas test in crosscut and D&I at temporary stopping not intact.

The team will now advance through the open crosscut to team stop number 8. Rule 44D.
Zig Zag roof test for the diagonal unsafe found in the intersection. Rule 23.
Gas Test and D&I at the diagonal unsafe roof.
A gas test outby. Rule 24B

Team stop number 9.
Note: All placards inby water roofed and inby the barricade will be face down.
Gas test and D&I at the water roofed in crosscut.
Gas test and D&I at the barricade.
Note: the conscious person behind the barricade will state when the team is at the barricade, "help get me out".
The team cannot breach the barricade due to having low oxygen immediately outby the barricade. Rule 35.
The team has now explored all accessible areas and must now find ways to pump water to continue to explore to find means to rescue the person they have contacted.

See vents 1 & 2, any explosive mixture being moved by the team in a vent change cannot be directed over an ignition source. Rule 31A. Any oxygen below 19.5% cannot be directed over the fresh air base. Rule 30H. If the team stalls the fan during any vent change. Rule 50.

After both vents are completed, the team having the three timbers must timber through the diagonal unsafe roof to reroute the pump cable up number 3. This is to get the cable out of the explosive mixture that still remains just inby the fresh air base in the number 2 opening before the team can energize cable and pump. Rule 31D.

The team may choose which water roofed they will pump first to continue to explore.
If the team elects the water roof at stop 9 first.

The team must build one airlock prior to pumping the water roofed at stop 9. Rule 42.
The team must place the pump into the water roofed and tie the discharge line to the pump. The briefing officer may start the pump for the team after the team has notified the briefing officer and requested it to be energized. Rule 19. A judge without undue delay will flip the water roofed placard over. The captain must conduct a gas test. Rule 24D.
The team will find three timbers and when they flip over the placard, they will find caved. Roof and rib test, Gas test, and D&I at the caved. The team must airlock back out of the area, due to the fan cannot be stopped, if not, air will be drawn down the intake shaft located in number 1 face, this will allow the explosive mixture to be moved that is located in the intersection at team stop 11, over the caved area. Rule 31C, also low oxygen would be moved through unexplored areas with three persons not accounted for. Rule 30F.

The team must build one airlock prior to pumping the water roofed at stop 3. Rule 42.
The team must place the pump into the water roofed and hook the discharge line to the pump. The briefing officer may start the pump for the team after the team has notified the briefing officer and requested it to be energized. Rule 19. A judge without undue delay will flip the water roofed placard over. The captain must conduct a gas test. Rule 24D.

After water is pumped, the team will find the unsafe roof starting on the imaginary line of the intersection with an unsafe rib. Roof and rib test, D&I and gas test at the unsafe roof. The captain will use the three timbers to timber around corner they found when pumping the water at stop 9. Roof test by the captain when last timber is set in crosscut in good roof. The team will find caved airtight in the crosscut and three timbers. Roof and rib test, D&I and gas test at the caved airtight. The captain will take the three timbers and timber around the corner of the unsafe roof in the intersection. When last timber is set on back side the captain will conduct a roof test. A gas test will be conducted for the opening inby.

Note: if the team pumps the water at stop 3 first, the team must airlock back out of the area, due to the fan cannot be stopped, if not, air will be drawn down the intake shaft located in number 1 face, this will allow the explosive mixture to be moved that is located in the intersection at team stop 11, over the unsafe roof. Rule 31C, also low oxygen would be moved through unexplored areas with three persons not accounted for. Rule 30F.

Team stop number 11.

Gas test in crosscut, and the captain must do a zig zag roof test due to elongated unsafe roof.
Gas test, D&I and roof face and rib test at the face.
Note: A placard stating BODY will be located in the elongated unsafe roof. Later when the team has made the area behind the barricade in the face of three and have taken the live person to the fresh air base, they will have two timbers that they must use before stopping the clock, to check the body in the elongated roof. Rule 32. The captain must D&I at the location of the body after timbering in. Rule 27.

Team stop number 12.

Roof and rib test, D&I and gas test at the caved area in crosscut.
Gas test and D&I at the water roofed outby.
The team must stop, and the captain examine, by touching with his or her hand, the missing person, prior to any team member passing the location of the missing person. Rule 32.
An initial assessment must be conducted on the unconscious live person. When assessing an unconscious live person, a team member must physically contact patient and verbalize the following assessments.
1 Ask patient if he or she is okay; asking if he or she is "alright."
2 Look for absence of breathing or gasping.
3 Check for presence of a carotid pulse (5-10 seconds).
4 Looking for life threatening injuries.
Rule 12.
The unconscious person should be secured to stretcher by at least two bandages or straps, one around trunk of body and one around legs, covered with blanket from the neck to and including the feet and placed so as not to crimp air hoses. The bandages or straps shall be fastened perpendicular to the patient's body. The patient's arms may or may not be secured, but the blanket must cover the patient to the neck. Rule 11.
The unconscious patient must be protected by an approved breathing apparatus or device with full face piece due to low oxygen that team found the person in 18.5%. Rule 30.
D&I at the location of the unconscious person & roof, face and rib test, gas test & D&I at the face of two. Take the person to the fresh air base.

Now its time to ventilate the barricade, see vents 3 and 4.

After vents are completed, the team must airlock to enter the barricade. The captain must do a gas test on backside of the breached barricade.
D&I at the body.
The team must stop, and the captain examine, by touching with his or her hand, the missing person, prior to any team member passing the location of the missing person. Rule 32.
An initial assessment must be conducted on the **live** person. The assessment should commence once the captain has physically contacted the person. Any of the five working team members may be utilized to conduct the assessment. However, the team member starting the assessment of the live person will continue and complete the assessment.

When assessing a conscious live person, a team member must physically contact the patient and verbalize the following assessments.
1 Ask if he or she is okay; asking person if he or she is "alright" will suffice.
2 Looking for life threatening injuries. Rule 12.
D&I at location of person.
Roof, face and rib test, D&I and gas test at the face of three.
Take person to fresh air base, now they have the two timbers to check the body located in the elongated unsafe roof.

If the team does not complete the problem within the 75-minute time limit: Rule 3 on the A card.
1. Stop the team, allow no more work.
2. Discount team for everything not mapped, written instructions not followed, and any rules related to patients or missing persons.
3. Discount team additional.
a. 15 points if problem was not completed, or
b. 5 points if exploration was completed and team is traveling out of the mine, or.
c. 30 points if the captain stops the clock and doesn't try to finish the problem because time is running out.

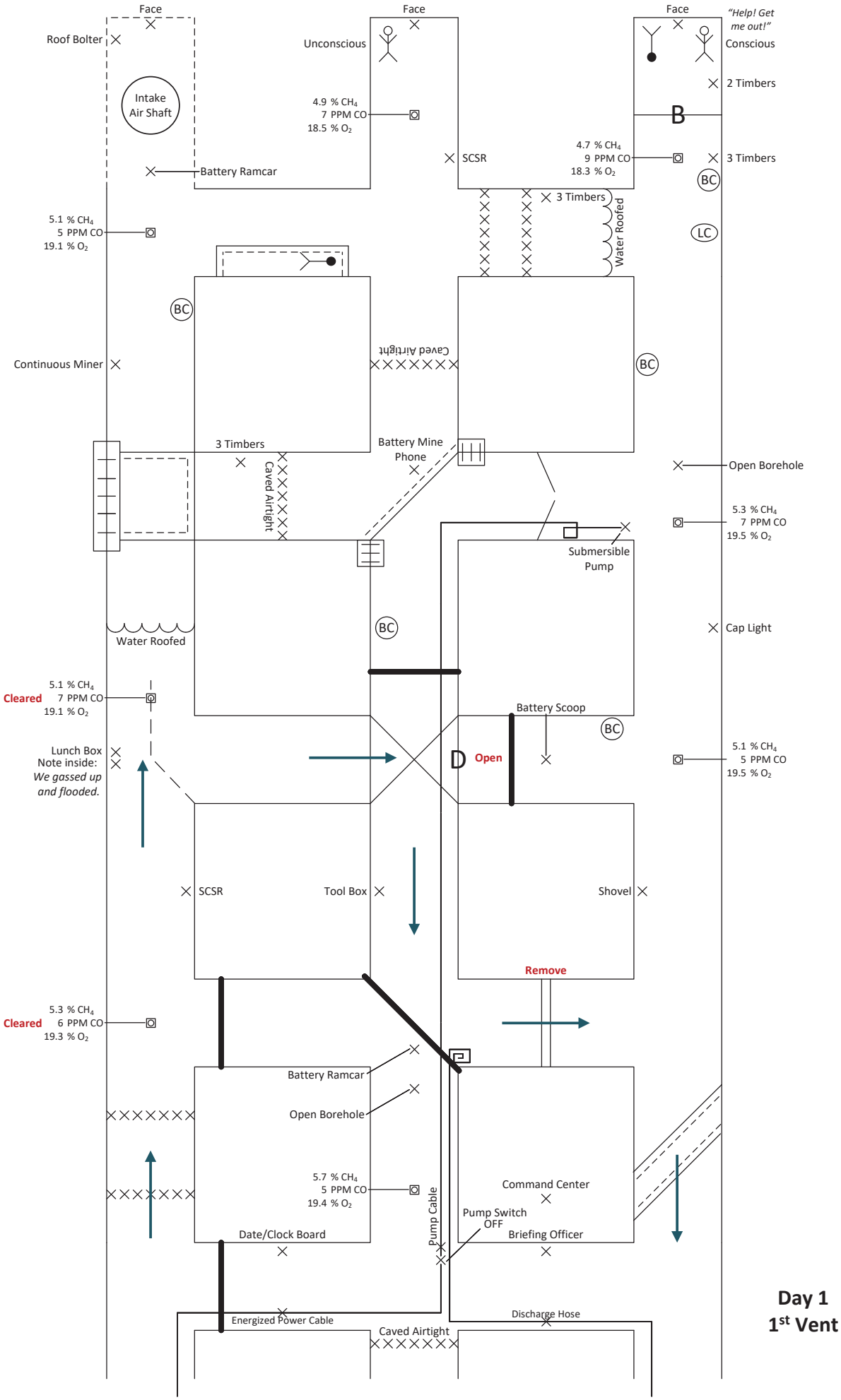
If the team stalls the fan. Rule 50. Team failed to follow written instructions.

The maps given to the team will not be labeled, and the team will be responsible for labeling the Team map and Briefing Officer Map. Failure to identify will result in a 2-point discount per map on the A card. At the end of the problem and clock has been stopped, the field judges shall check to see that the maps are identified before the team leaves the field and if not, mark the maps so that the map judges can correctly judge the maps. The team will still be discounted for not identifying the maps.

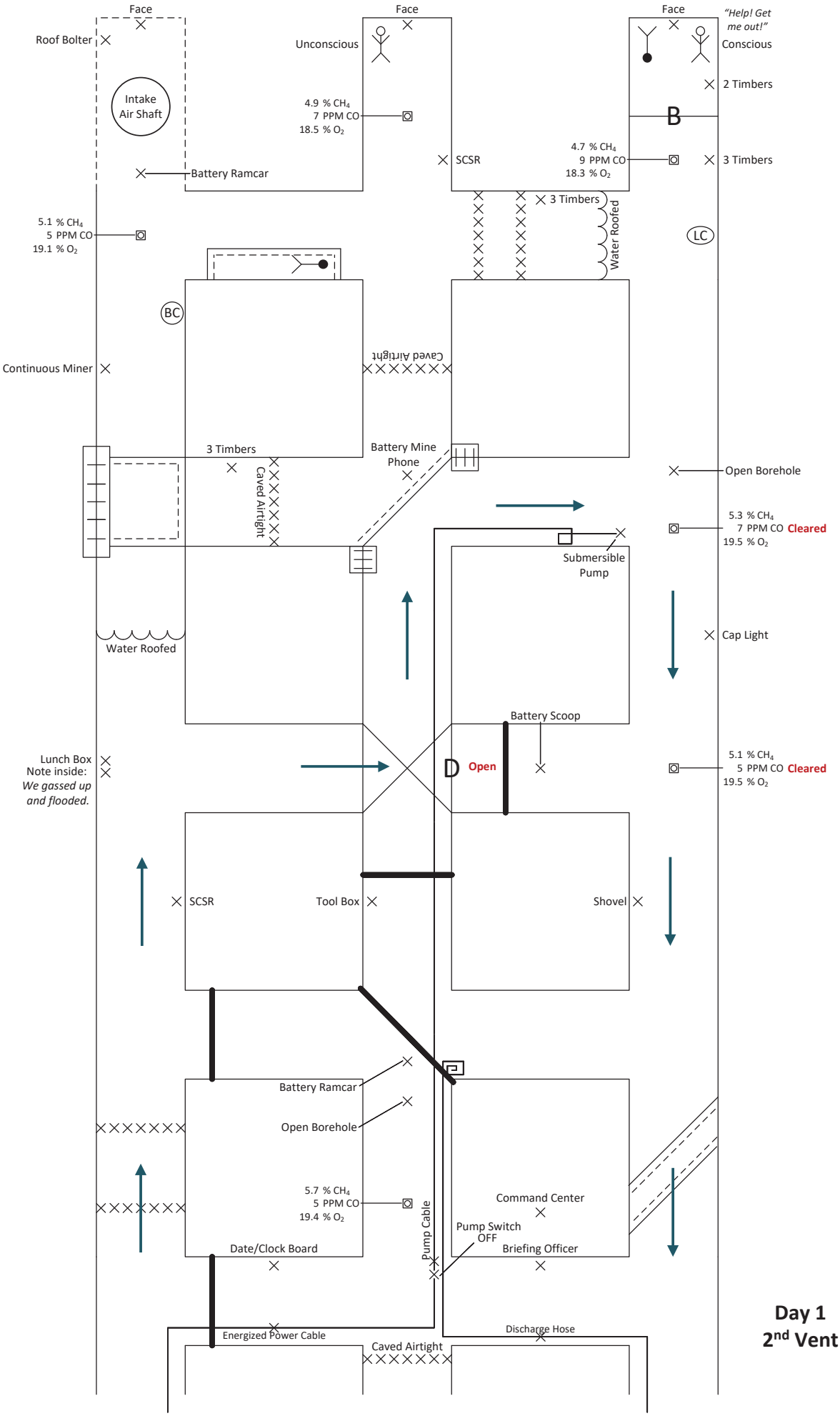
The time judge will record the working time at end of problem. The judges will gather all maps, and SD card and place back in packet at end of problem.

A judge will walk the field with a team member marking the final map.
Showing all vent controls still intact, if pump is on or off, if door on overcast is open or closed, and show all timbers that were set by the team.

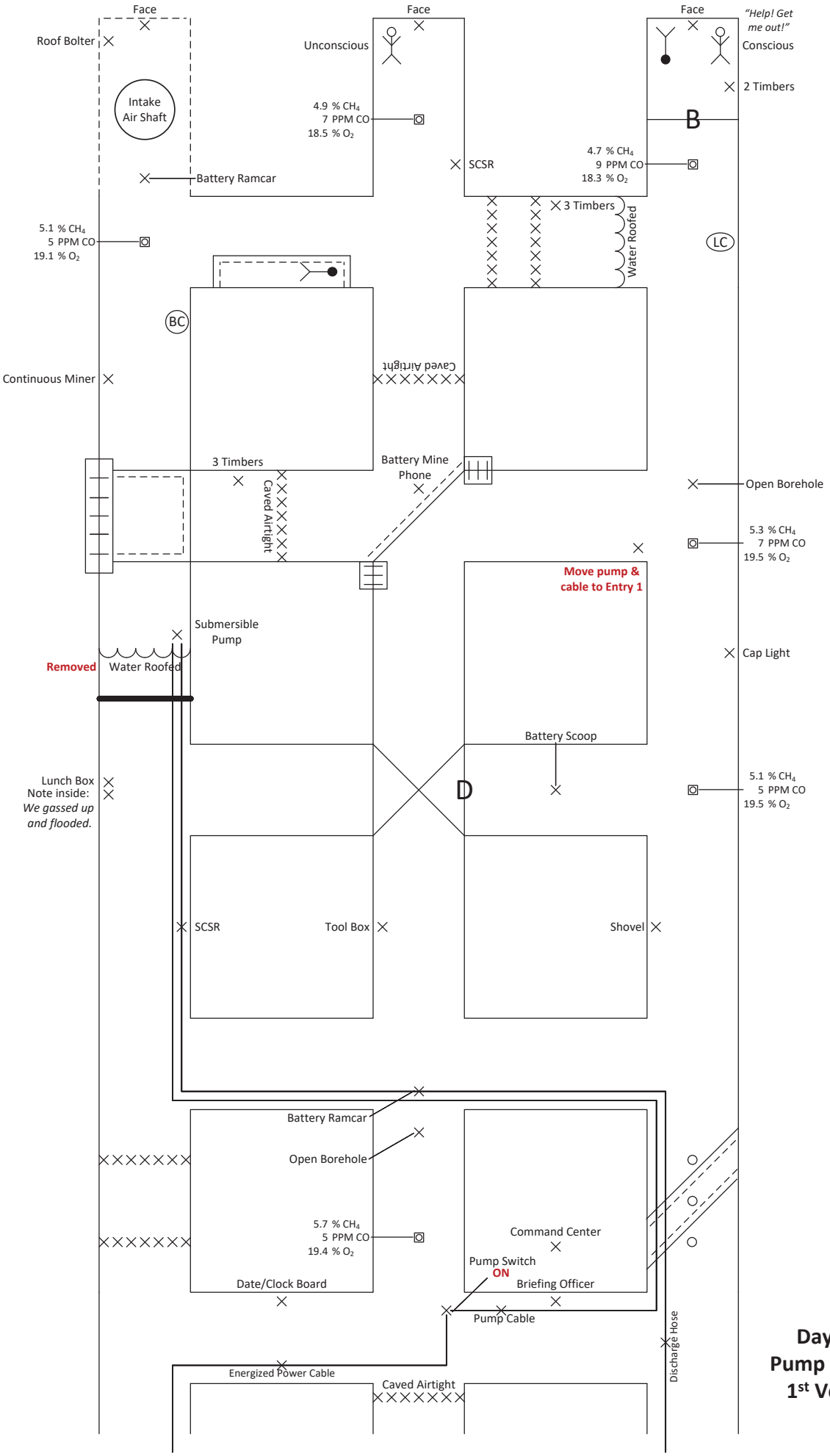
Thanks.



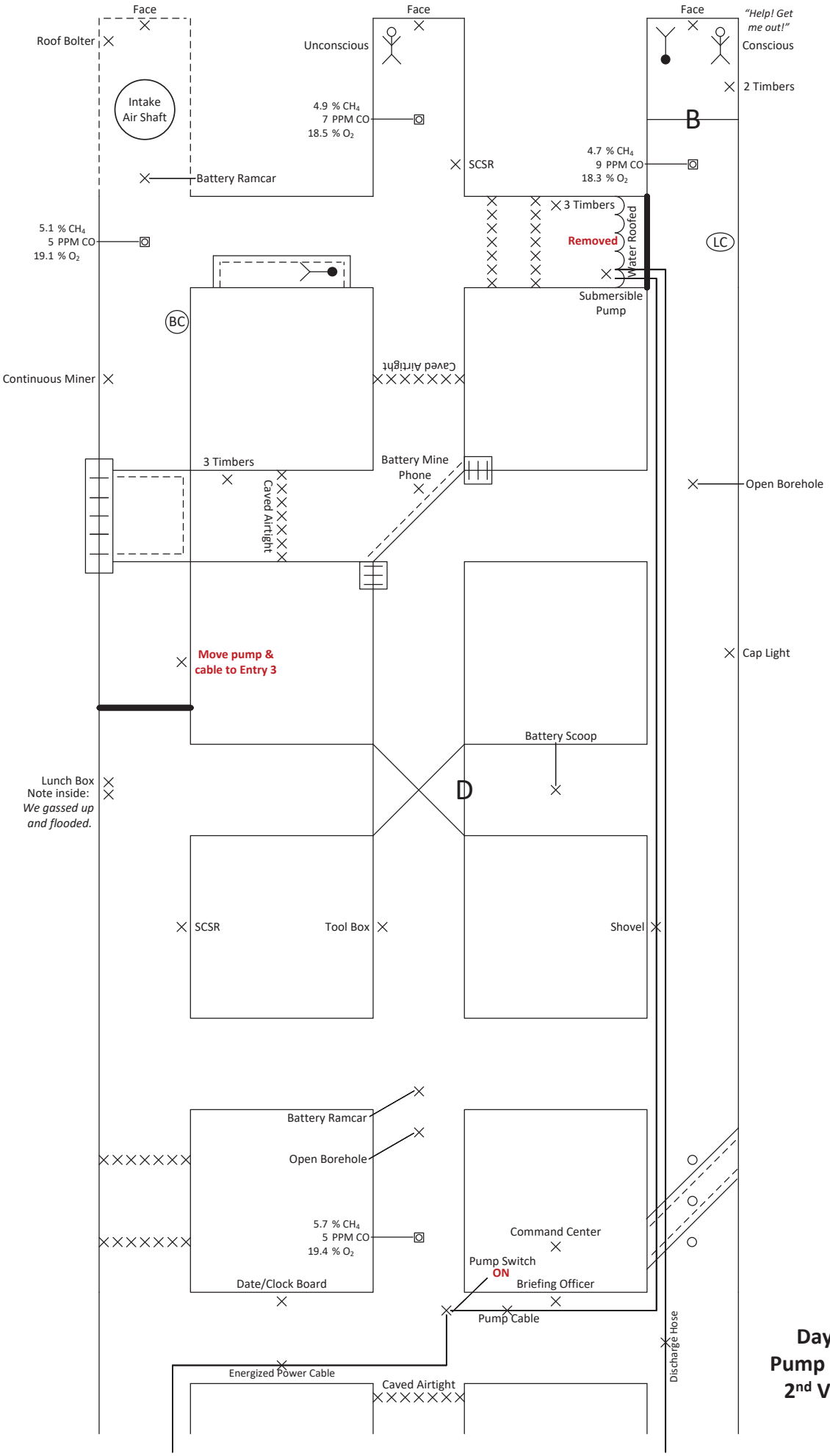
Day 1
1st Vent



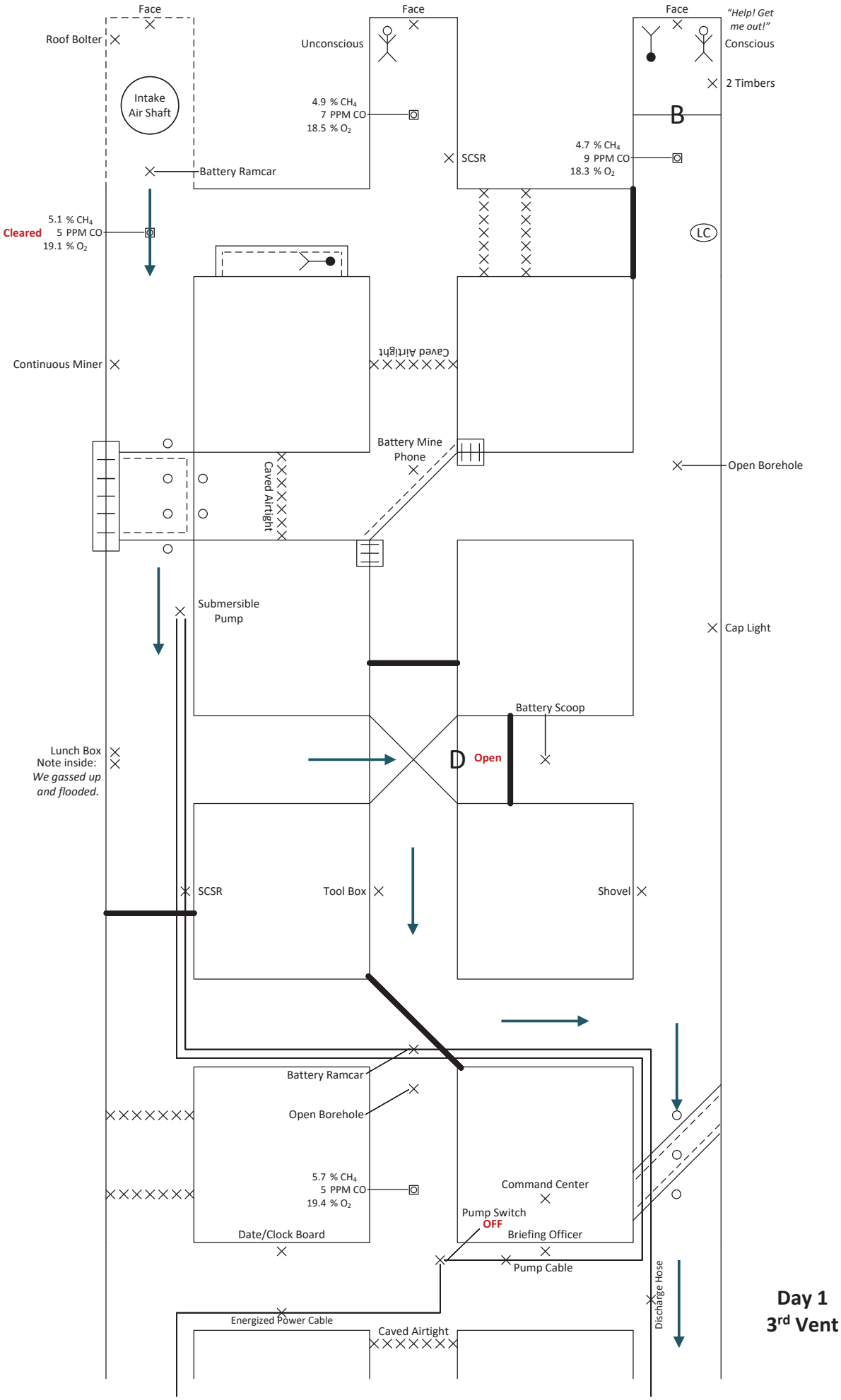
Day 1
2nd Vent

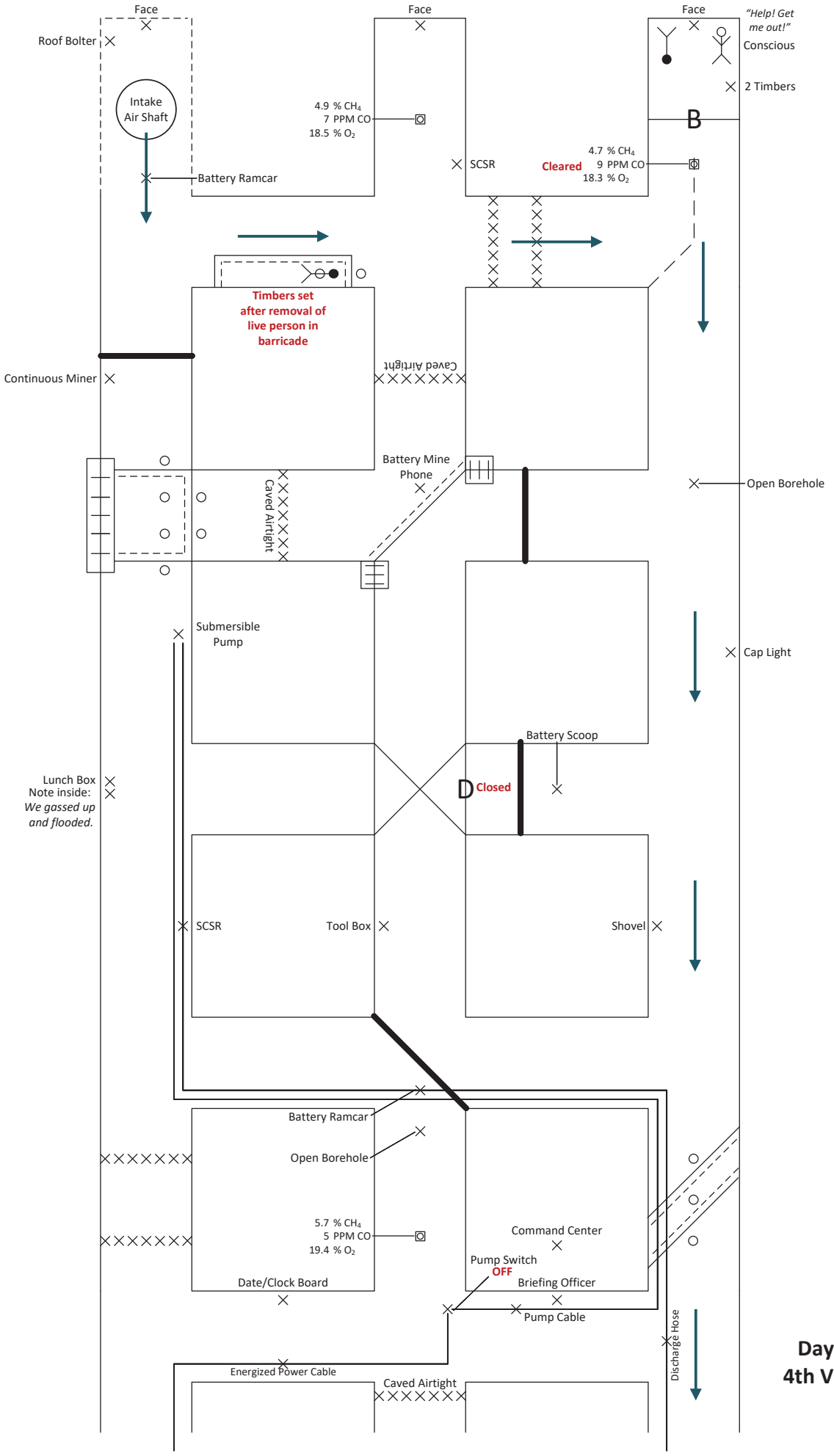


Day 1
Pump after
1st Vent

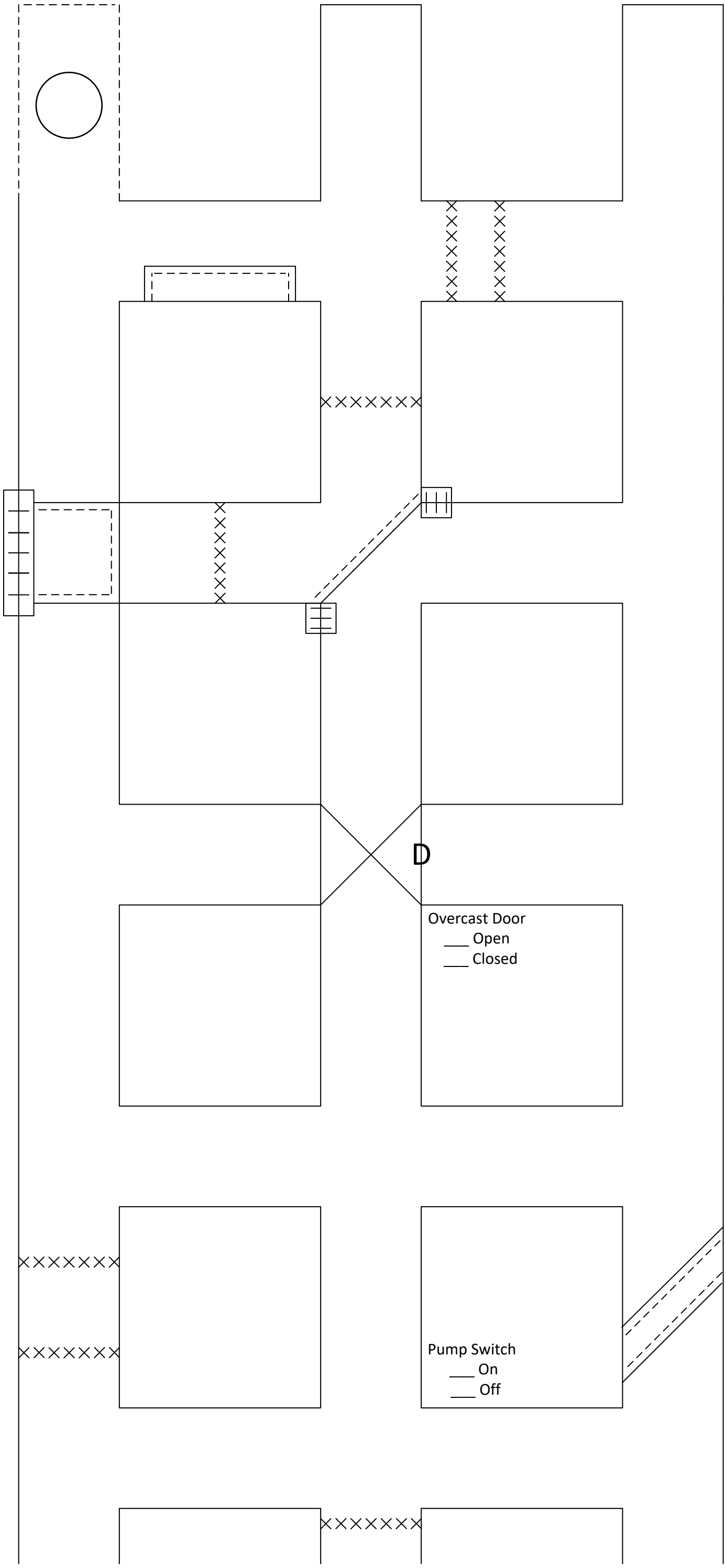


Day 1
Pump after
2nd Vent


Face
Roof Bolter
Intake Air Shaft
Battery Ramcar
5.1 % CH4
Cleared 5 PPM CO
19.1 % O2
Face
Unconscious
4.9 % CH4
7 PPM CO
18.5 % O2
SCSR
Face
"Help! Get me out!"
Conscious
2 Timbers
B
4.7 % CH4
9 PPM CO
18.3 % O2
LC
Continuous Miner
Caved Airtight
Battery Mine Phone
Caved Airtight
Open Borehole
Submersible Pump
Cap Light
Battery Scoop
Lunch Box
Note inside:
We gassed up and flooded.
D Open
SCSR
Tool Box
Shovel
Battery Ramcar
Open Borehole
5.7 % CH4
5 PPM CO
19.4 % O2
Command Center
Pump Switch
OFF
Date/Clock Board
Briefing Officer
Pump Cable
Discharge Hose
Energized Power Cable
Caved Airtight
Day 1
3rd Vent



Day 1
4th Vent



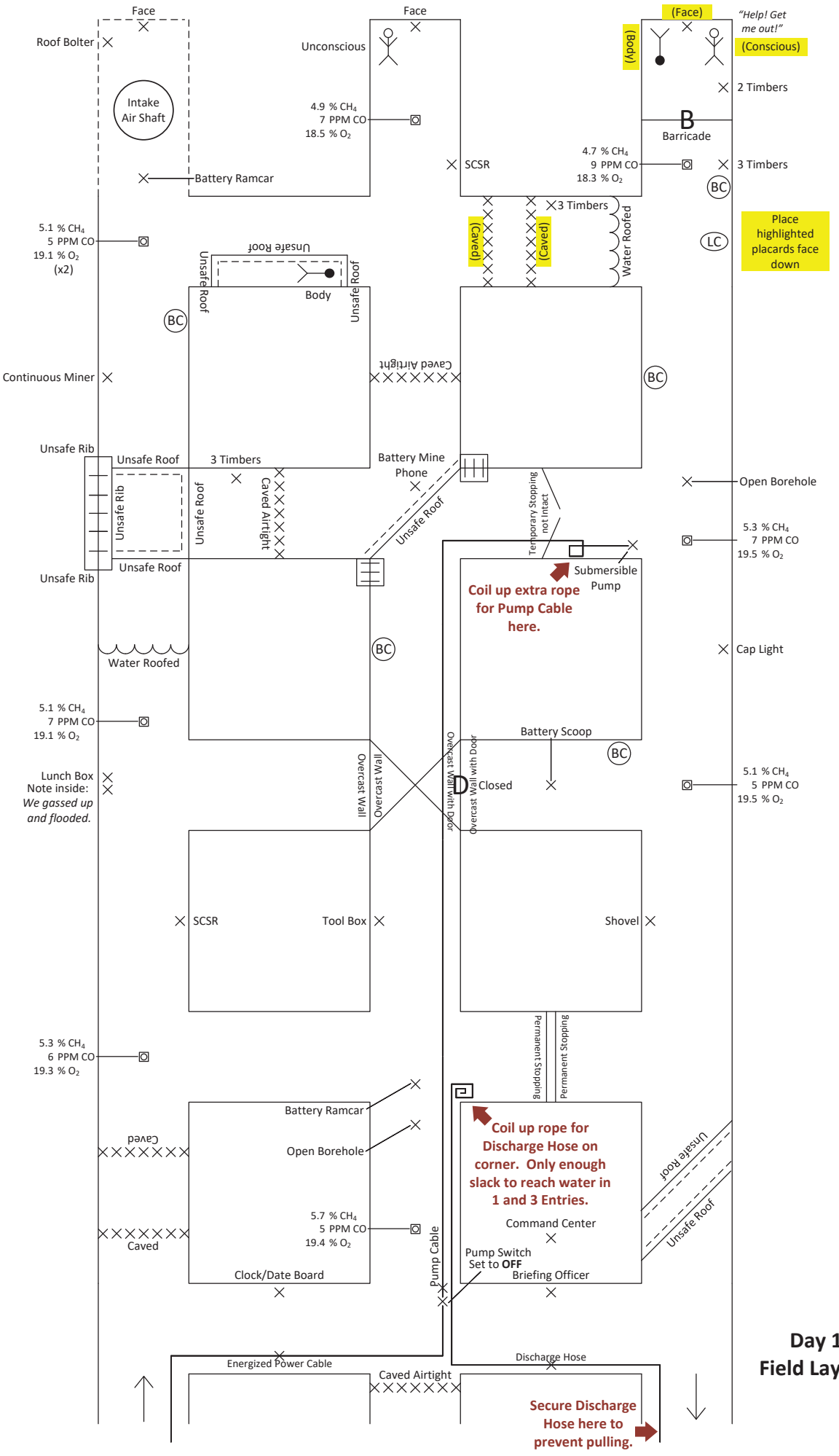
Judge Initial

_____

Captain Initial

_____

Day 1
Final Vent



Day 1
Field Layout