

2025 SE Regional Mine Rescue Contest

Judges' Instructions



Metal/Non-Metal - Day 1

Mine Information

Day 1

General

The TN Country Mine is an underground single-level room and pillar zinc mine located in SW Tennessee and has two active sections (3rd West and 1st North) operating at full capacity. The mine operates two 12-hour shifts per day, 7 days a week. Hours of operation are from 05:00 to 17:00 on day shift and 17:00 to 05:00 on night shift. Material is transported via rubber-tired diesel and battery haulage equipment.

Gas

The mine is a gas Category III per 30 CFR 57.22003(a)(3). The mine generally experiences low levels of methane during production and has experienced a couple of methane inundations in the past reaching explosive levels if fan malfunctions. There is also some nitrogen dioxide and carbon monoxide resulting from blasting and the operation of diesel equipment.

Maps

Mine maps have not been recently updated, but mine does not intersect any nearby workings or gas wells to our knowledge.

Ventilation

Mine is normally ventilated via 200,000 CFM exhausting main fan located on the surface with the #2 drifts in each section serving as intake airways. Mine also has air shafts in both sections. Fan is reversible, but we are having issues with switching rotation and cannot set to blowing mode at this time.

Mine Access

Mine is normally accessed via the intake #2 drift and transportation provided via mobile battery-powered equipment. Mine is walking height throughout.

Explosives

All explosives are stored on the surface 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 Pigeon Forge Electric with the main disconnects located on surface. Power centers and battery charging stations are located underground for pumps and mining equipment. All underground circuits are currently de-energized and locked/tagged.

Communication

Communication is accomplished by two-way radios carried by mine personnel. There are also Femco phones which are strategically placed in the mine.

Ground Control

Ground control is maintained with 8-foot mechanical bolts and posts are located in the mine for secondary support. Mine has experienced some wet areas and bad areas of rib/back.

Misc.

All local, state, and federal agencies have been notified and are on site and back up mine rescue teams are available. Guards are posted at all necessary areas.

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

Team Briefing

Day 1

Thank you for answering our call for help.

At approximately 05:00 this morning, our 2 dayshift crews entered the mine to begin their shift. 4 miners traveled to the 1st North production section. A call from the 1st North foreman was received by surface dispatch at 06:45 reporting they had water issues and a possible fire, and the crew was preparing to locate and extinguish it. Dispatch instructed the other crew working in the 3rd West section to evacuate the mine and made repeated calls to the affected crew with no response. Dispatch then contacted all necessary management, emergency personnel, and authorities which are now on site. Mine personnel entered the mine bare faced to search for the 1st North crew but were unable to advance the Fresh Air Base past crosscut 5 in the section due to the atmosphere and lack of mine rescue training.

Gas levels encountered were 5.1% CH₄, 0 ppm CO, 16.1% O₂, 0 ppm NO₂.

We need your mine rescue team to begin work from the established Fresh Air Base located at crosscut 5 of the 1st North section.

Power underground has been de-energized, and the exhausting mine fan is currently off. Fan can be started or stopped from the surface when requested but cannot be stalled. Fan is normally reversible, but we are having issues with switching rotation and cannot set to blowing mode at this time. We will inform your team when we are able to reverse it.

Please help us find our missing miners.

Team Instructions

Day 1

- Locate and rescue all live missing miners and transport them to FAB.
- Identify located miners to FAB by number:
John – Miner #1 James – Miner #3
Jerry – Miner #2 Jack – Miner #4
- Locate and extinguish all fires if safe to do so.
- Explore all accessible areas of section that can be done safely.
- Team will be relieved by backup team at 75 minutes.

Judges Instructions

Day 1

These 2 problems will evolve into a continuation and are focused on mine ventilation. Mine can be blown up if proper ventilation sequences are not met.

Date & Initials required at stoppings, faces, water over knee deep, impassable falls, barricades, fires out of control, and location of any live persons or bodies.

Gas tests required at stoppings, face areas, doors, regulators, barricades, and other areas with unknown conditions, intersections or turned off drifts.

Fresh Air Base Checks

#1 Entry – Team will encounter an airtight cave outby. Captain will check opening under apparatus. Clear air. Verbalize roof/back check.

#2 Entry – Team will encounter clear air at opening. Captain will check opening, unsafe right rib corner, and gas placards. Captain must notify fresh air base of placard with explosive mixture. Verbalize roof/back check.

#3 Entry – Team will encounter exhaust air shaft outby. Captain will check opening and temporary stopping. Verbalize roof/back check. D&I and gas test at stopping.

Team Stops 1-3

#1 Entry – Team will encounter explosive mixture/IDLH placard. Captain must notify fresh air base of explosive mixture on placard. Verbalize roof/back check. Barricade encountered. Person yells help and goes unconscious. D&I and gas test at barricade. Gas test in opening. Team has no means to recover person at this time.

#2 Entry – Team will travel across to next intersection and encounter gas placard, brattice cloth, and overcast wall. Door is open. Temporary stopping encountered across #2 to #3. Verbalize roof/back check. D&I and gas test at overcast and stopping. Gas tests in openings. Team can airlock across #2 to #3.

#3 Entry – Team will breach temporary stopping. Gas test required. Team will encounter battery scoop, battery mine phone, and line curtain. Captain will D&I and gas test backside of temporary stopping. Gas test at opening.

Team Stops 4-6

#3 Entry – Team will continue up #3 Entry and encounter gas placard and unsafe roof. Verbalize roof/back check. D&I and gas test. Gas test at opening.

#2 Entry – Team will travel across to next intersection and encounter overcast walls with doors open and battery hauler. Verbalize roof/back check. D&I and gas test. Gas test at openings. Clear air and brattice cloth encountered.

#1 Entry – Team will travel across to next intersection and encounter IDLH placard and caved area. Verbalize roof/back check. D&I and gas test. Gas test at opening.

Team Stops 7-9

#1 Entry – Team will travel up to next intersection. Team will encounter explosive mixture/IDLH placard. Captain must notify fresh air base of explosive mixture on placard. Verbalize roof/back check. Team will encounter 2 brattice cloths, gas placard, and water over knee deep. Verbalize roof/back check. Gas test at opening.

#2 Entry – Team will travel across to next intersection and encounter clear air, gas placard, and water roofed. D&I and gas test. Gas test at opening.

Team is now able to make 1st ventilation to clear barricade in #1 Entry.

Solutions

Team will erect stoppings for 1st ventilation (See Vent 1 Map). Battery mine phone will need to be relocated. Team will have to request starting of mine fan. Fan is exhausting ventilation for the 1st ventilation. Fan can be started and then stopped after installing line curtain. Team will then airlock into barricade. Verbalize roof/back check. D&I and gas test. Gas test at caved area. Person cannot be recovered due to unsafe roof.

Inform team at this time the fan has been repaired and is now reversible.

Team must now continue to top of #3 Entry to finish exploration.

Team will encounter explosive mixture/IDLH placard. Captain must notify fresh air base of explosive mixture on placard. Verbalize roof/back check. Team will encounter barricade, and unsafe roof. D&I and gas test at barricade and unsafe roof. Person in barricade yells help.

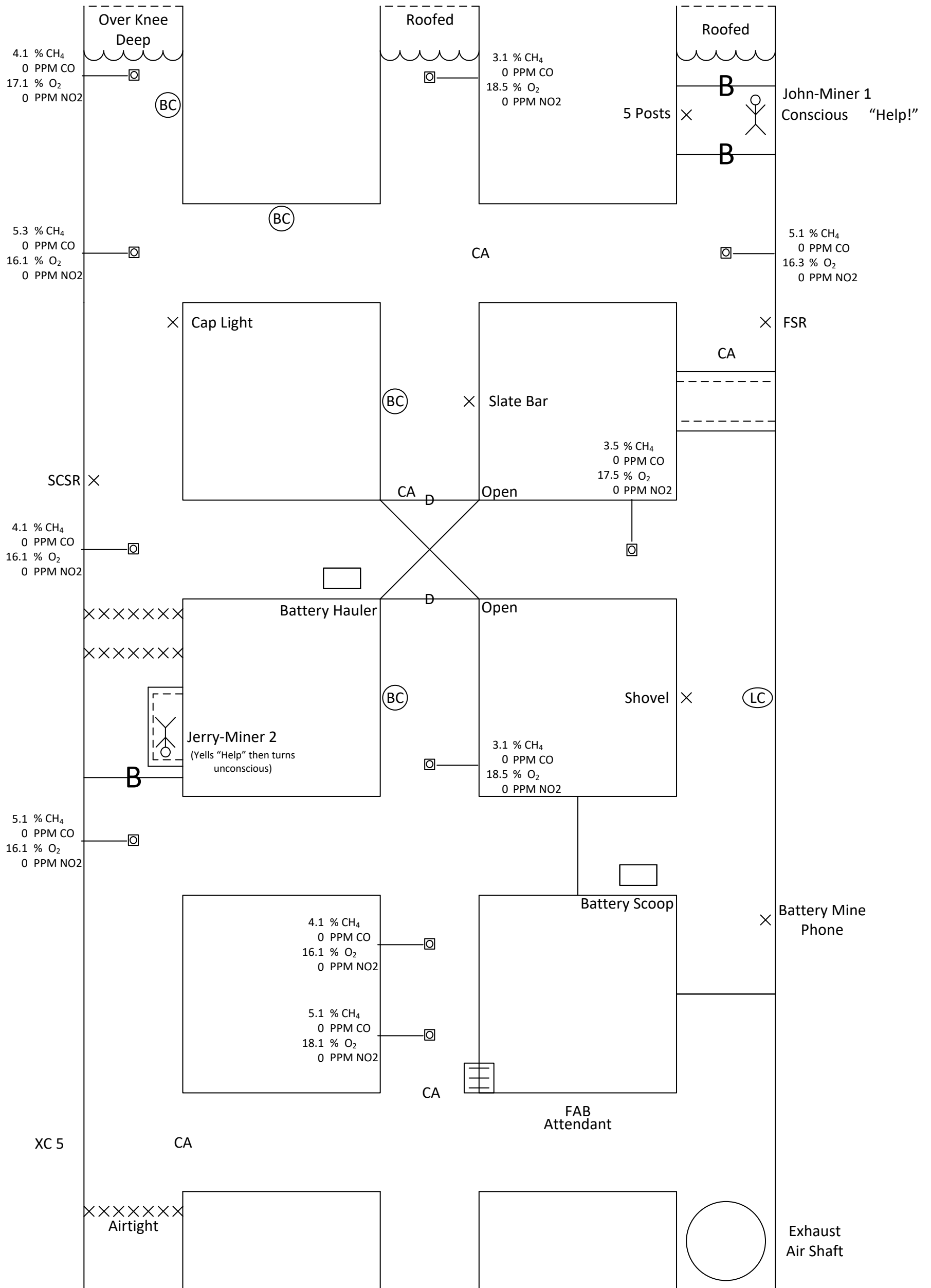
See Vent 2 Map. Team must request reversal of fan to blowing. Fan can be started and then stopped after installing line curtain. Team will then airlock into barricade. Verbalize roof/back check. D&I and gas tests. Person can walk out with no respiratory protection. 5 posts encountered.

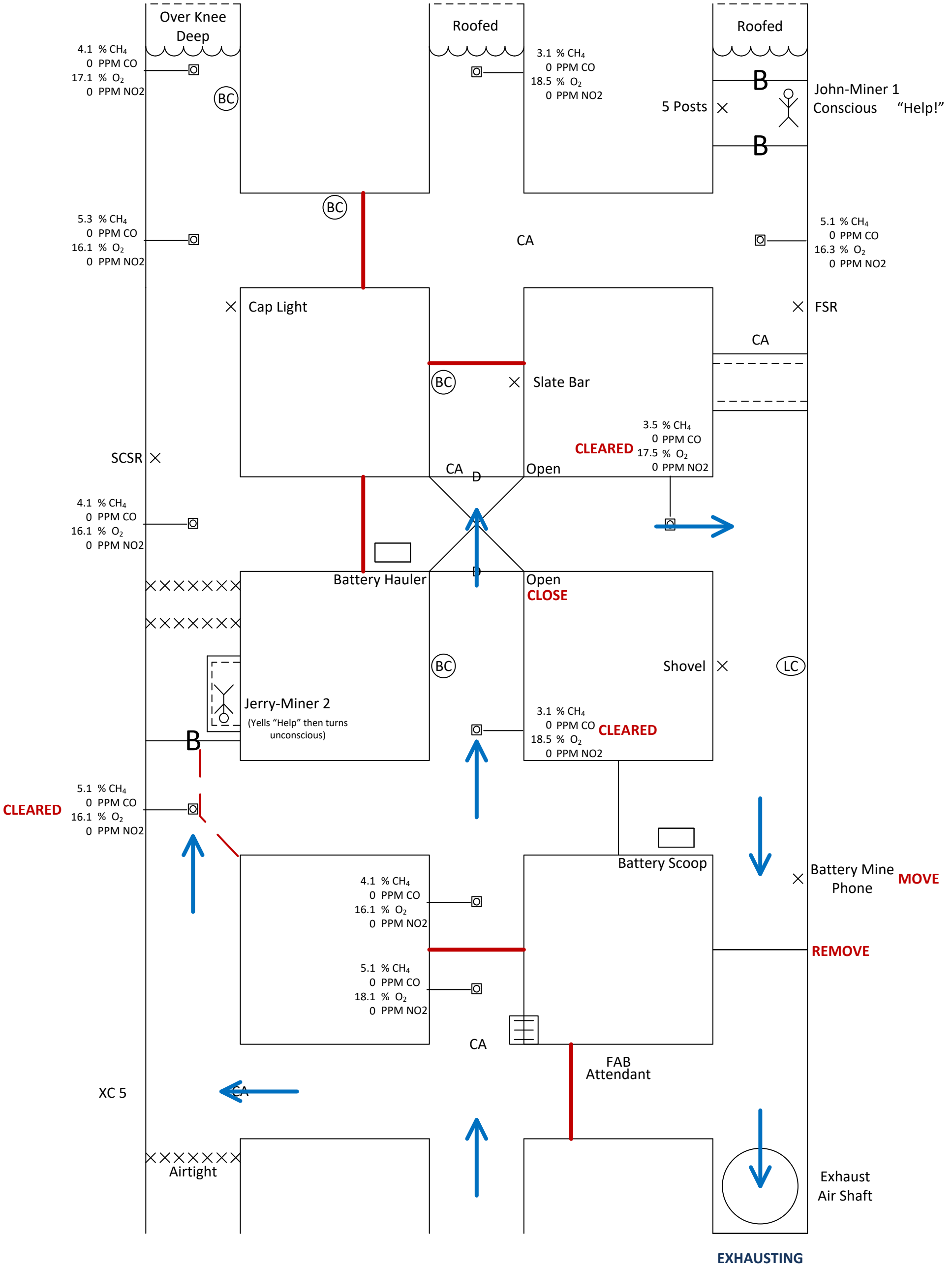
Team must set 2 posts to recover person in unsafe roof and place on stretcher. Verbalize roof/back check.

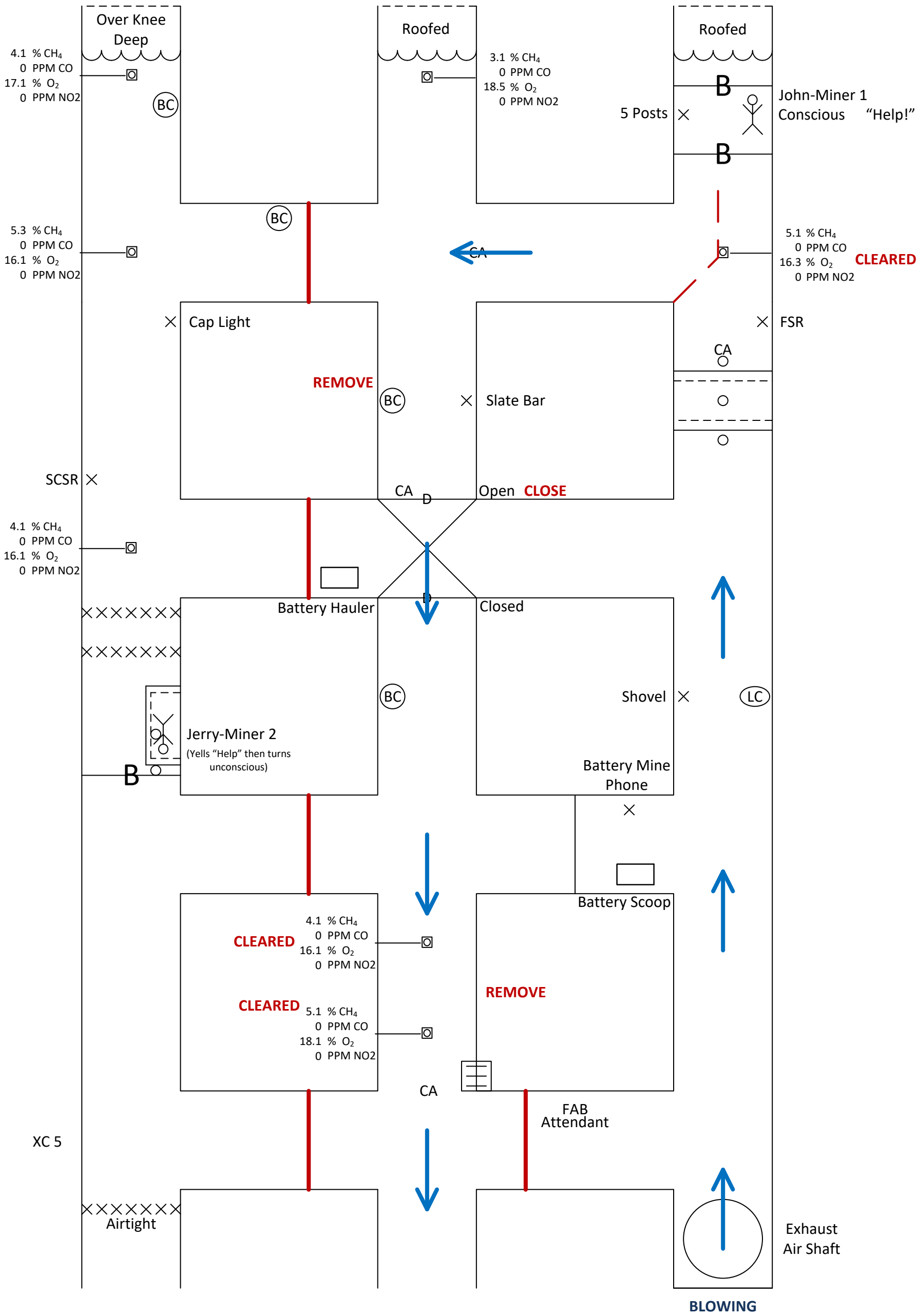
Team must set 3 posts across unsafe roof to complete exploration. Verbalize roof/back check.

Team must airlock into inner barricade in top of #3 Entry. D&I and gas test at barricade and water roofed.

End of problem Day 1.







Vent 2
Team must set supports
after breaching barricade
to reach Miner 2 and
complete exploration in 3
entry.

XC 5

