

2023 Loveland Day #1 TEAM BRIEFING

Thank, you for responding to our mine emergency. You are located at a fresh air base established at the mouth of 11 South development section. The drifts are numbered from left to right 1, 2 and 3. Fresh air is coming across the FAB from # 1 to # 3 then going out 3 drift. A command Center has been set up on the surface and is in constant communication with this FAB

We are a single-level longwall Trona Mine that operates at the 500-foot level. We produce ore 24 hours a day 365 days a year. We are classified as a class 3 mine in which noncombustible ore is extracted which liberates a concentration of methane that is explosive or can form an explosive mixture with air or have the potential to do so based on the history of the mine. We have water issues in places throughout our mine. If your team encounters roofed water you are not to advance through it if pumped down until our engineers determine the condition of the back. Most of the time our back is competent, but we have some faults in this area.

The mine is accessed by shafts and ventilated by one large main shaft fan on the surface and several smaller return or upcast shafts which provide additional exhaust ventilation where necessary. The main mine fan is equipped with an airtight automatic closing door which closes when the fan is off. None of the smaller upcast shafts have conveyances in them and they all contain automatic closing doors which are closed airtight as long as the fan is off. 11 South has one of these return shafts in # 1 drift. Our engineers have dropped a borehole camera through it and have determined it is safe. The fan on the shaft is off but can be started if necessary in the command center. Our pillar sizes are 15 feet by 15 feet with 10-foot entries, and crosscuts. We use no explosives. 11 South also has a power center which is supplied through a borehole cable and can be energized through a switch in the command center.

Last night seven miners entered the section to conduct routine maintenance work. At about 3:00am this morning a fire was reported by the crew working in the section. We have not had any communications with any of the miners since.

We have been taking atmospheric gas samples from our main shaft and all samples have been clear. We believe the fire is contained to this area. All federal and state agencies have been briefed on our current conditions and have approved us to send teams underground.

All the mine maps are current and up to date.

Our main mine fan is currently running but can be turned on and off, if necessary, from the command center. The main fan cannot be stalled or reversed. All the power to the mine has been locked out and is being guarded. If power is required, switches are available in the command center. There is currently 2 back up teams stationed and ready to assist if needed.

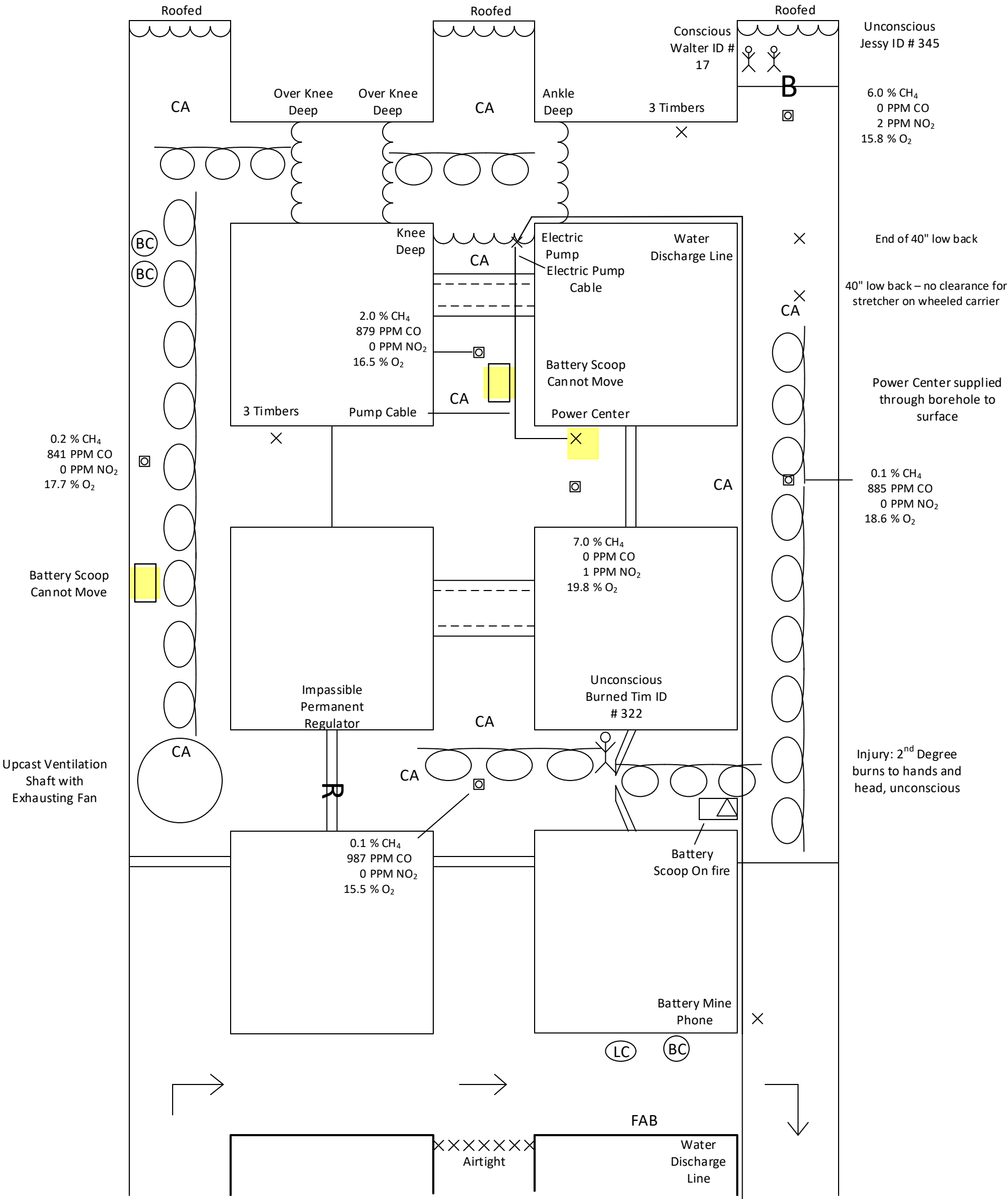
Objective:

- Explore all accessible areas of the mine if it can be done safely
- Extinguish or seal any fires
- Locate all missing miners
- Bring all survivors to the surface
- Do not stall the main mine fan
- Water roofed areas must not be traveled through if you have means to pump.

Please be careful and good luck!!

PROBLEM MAP

Response: "Help"



2023 Loveland Day 1 Field Judge's Problem

FAB

Communication cable can be strung out prior to starting the clock, if the team has a CCA, the Visio mapping device will be up and running with the SD card/thumb drive in place during this time. Teams should have the option to ask for 3 paper maps if they request. No other work is allowed at this time by the team until the clock is started.

The captain will line up with team and introduce himself along with the team.

After instructions, and the statement has been given by the mine manager, the captain must start the clock, and write correct month, day, year, and draw position on the date board. At this time the blank maps will be given to the team.

A statement needs to be made to the judges about having non sparking tools due to the mine being gassy.

2023 MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Surface Discount Sheet Judge #1

Apparatus improperly assembled, each apparatus 10 x ____ = ____

2. Apparatus improperly adjusted to the wearer, each infraction 1 x ____ = ____

3. Apparatus part or parts worn or deteriorated so as to be dangerous to wearer, each person 8 x ____ = ____

4. Failure to follow prescribed procedures for going under oxygen, each person 3 x ____ = ____

5. Failure of team member to be clean shaven in the area that affects a good face-to-facepiece seal, each infraction 10 x ____ = ____

6. Failure of captain to examine each apparatus and have captains examined before entering the mine, each apparatus each infraction 2 x ____ = ____

7. Team member not wearing identification, protective clothing, including safety shoes, hard hat, permissible cap lamp, self-rescuer, each infraction 2 x ____ = ____

8. Failure of team captain to mark date and team position number on the check board at mine portal or fresh air base, or start timing device, each omission 4 x ____ = ____

9. No work will be done prior to starting the clock 4 (total) ____

10. Failure of team to "count off" before entering or leaving the mine 2 x ____ = ____

Underground Discount Sheet Judge #1

Discounts

1. Breathing external air while working the problem in by the fresh air base, each team member, each infraction 15 x = _____
2. Team not following proper procedure in case of apparatus failure, each infraction 10 x = _____
3. Failure of team to stop within 50 feet of the fresh air base or at the shaft station to perform personnel and apparatus checks, upon their first entry into the mine 4 (total) _____
4. Team member(s) not making apparatus check after removing apparatus to traverse restricted clearance or after apparatus has sustained damage from impact (each person, each incident) 4 x = _____
5. Apparatus examination exceeding 20-minute intervals 5 x = _____
6. Failure to use posted hoisting signals, each infraction 1 x = _____
7. Failure to close shaft station gate 5 x = _____
8. a. Failure of the captain to indicate to the team he/she has recognized bad ground. b. Failure of the captain to verbally indicate he/she is checking the back or roof: 1. at intersections, shaft stations, rooms, faces, and mine openings.
 2. at all points of farthest advance.
 3. before building or erecting any structure.
 4. upon passing through any barricade, stopping, bulkhead, air lock, door, check curtain, or similar barrier.
 5. at the location of fire or intense heat.
- c. Any team member performing work or moving into any part of an area during a team stop before the captain has visually checked the ground conditions in that part, each infraction 5 x = _____
9. Failure of the captain to mark the date and his/her initials at the point of farthest advance of the team in any direction such as at stoppings, faces of rooms and drifts, water over knee deep, impassable falls, barricades, fires out of control, and at the location of any live persons or bodies, each omission (maximum 10 discounts) 2 x = _____ (10 max.)
10. Captain or another team member doing anything to endanger himself/herself or other team members, 15 points each team member so endangered, each infraction, each occurrence 15 x = _____
11. Failure of team to explore or examine workings systematically and thoroughly, each infraction 25 x = _____
12. Teams must be checked immediately before entering smoke 5 x = _____
13. Failure to locate, seal, or extinguish fire, if possible, without undue delay 50 x = _____
14. Failure to notify the fresh air base when an air/gas mixture has reached its explosive range. 10 x = _____

15. Failure to bring live person to surface or fresh air base by the end of the problem, each omission 50 x =

16. Failure to locate bodies and/or live persons, each omission 50 x = _____

17. Transporting survivor in unexplored territory, leaving survivor unattended, and moving survivor in any direction except toward the fresh air base, each infraction 6 x = _____

18. The team performing an act that may result in the death or injury of survivor(s). Each infraction 50 x =

Surface Interpretation Judge #2

Discounts

1. Failure to make necessary gas tests where required, each gas, each omission 1 x = ____
2. Improper procedure when testing with gas detectors, each gas, each infraction 1 x = ____
3. Intentional causing of a test instrument to inflate faster than tests indicate that it should, each infraction 1 x = ____
4. Less than 5 members entering, working, or completing problem, each person 8 x = ____
5. Traveling at more than a normal walking speed - Team members running through problem (both feet have to be off the ground at same time. 8 (total)
6. Team member talking to an unauthorized person without permission of the judges or contest officials, each infraction 5 x = ____
7. Intentionally detaching/severing Lifeline while the team is advancing or retreating. 5 (total) ____
8. All team members must be connected or have hold of the team line when the team is traveling. When stopped, in air clear of smoke, at least one person must have hold of the team line. If tag lines are used between team members and the team line, they shall be no longer than 3 feet in length. 2 x = ____
9. Failure to erect temporary barricade, stopping or regulator, when necessary, each infraction 10 x = ____
10. Failure to erect temporary barricade, seal, or stopping reasonably airtight, each infraction 2 x = ____
11. Failure to make necessary ventilation changes or changing ventilation or electric power before the effects of such changes are known, each infraction 15 x = ____
12. Failure to properly secure survivor to stretcher; failure to cover survivor with blanket (unless first aid procedures indicate otherwise); or placing survivor on stretcher in such a way as to foul proper operation of apparatus, each omission 4 x = ____
13. Survivor care:
 - a. Failure to adequately examine and assess each person found in the mine for possible injury or illness, maximum for each survivor 4 x = ____
 - b. Failure to properly treat any injury or illness which is, or should have been, revealed by the examination, maximum for each survivor 4 x = ____
14. Failure to follow proper procedure when putting apparatus on survivor, each infraction 5 x = ____
15. Assistance given by supposedly unconscious person, each infraction 5 x = ____

Team Discount Summary Sheet

Team No.:

Company Name:

Team Name:

Judge #1 Surface:

Underground:

Judge #2 Surface:

Underground:

Written Test:

Map:

Working Time: Hours: Minutes: Seconds:

Total Discounts

Excluding average time:

Time Review Completed:

I certify that I have read and reviewed all discounts listed above:

Team Captain

Review Judge

Checking the openings

The number 1 is the intake drift, the number 3 is the exhaust drift, all 3 drifts need roof test RT and date and Initial DI. Team will count off and then proceed to check drift openings into the mine for team safety.

Drift 1 is blocked with a permanent stopping.

Drift 2 is blocked with a permanent stopping.

Drift 3 is blocked with a temporary stopping.

Team Stop #1 – in drift 3 at XC A

Airlock required to be built to access XC A. XC A drift #3 50-foot check will need to be conducted (may be conducted any time entire team in inby openings). Captain will break all the openings in the 3-way intersection. DI, GT, and RT are needed at all these locations, DI and RT are verbally stated by the captain though out the problem. Team in smoke. Team Check required prior to team entering smoke. Captain needs to verbally recognize the scoop fire to his team, and it must be extinguished.

Team Stop #2 – in drift 2 at XC A

XC A drift #2. The team has located Tim, burn victim, unconscious. 2nd degree burns to hands and head. Team must treat and load on stretcher and take to FAB. On return to Stop 2, all the openings need to be broke by the captain and followed up with RT, GT, and a DI. Team should find impassible regulator in XC A and unsafe roof in 2 Drift. will need to retreat to XC A. Team must advance in drift 3 to XC B.

Team Stop #3 – in drift 3 at XC B

Team still in smoke. GT need to be conducted at all these openings prior to advancing, along with verbal acknowledgement of checking the back RT. permanent stopping in XC B towards 2 drift. Team must advance in 3 drift.

Team Stop #4 – in drift 3 at XC C

Teams find low back and the stretcher must be removed from a wheeled carried due to low clearance, if equipped, to reach XC C AND any subsequent travel through this area. GT's, DI's, and RT's need to be conducted at all these openings prior to advancing from this team stop. Explosive, and irrespirable gas is found in front of a barricade which has a response of "help" Teams must call the explosive out to the FAB. Teams cannot ventilate yet due to lack of material and should travel across XC C to drift 2. A water discharge line is observed heading towards 2 drift.

Team Stop #5 – in drift 2 at XC C

Team located 3 timbers. Smoke and now water in intersection. All opening will be examined by the captain and then proper RT, DI and gas test GT will be done. Team will find roofed water inby intersection in #2 drift, unsafe roof outby in drift 2 and water over knee deep towards drift 1 in XC C. An electric pump is found in drift 2 outby the intersection with the pump cable trailing into drift 2.

Not enough materials available or information known to change ventilation to breach barricade yet.

Team has option to set timbers in unsafe roof in 2 drift either outby XC B or outby XC C

Team Stop #6 – in drift 2 at XC B

After setting timbers through either unsafe roof area Captain will break all the openings RT, DI, and GT's will be conducted behind him. Team finds explosive gas in XC towards drift 3 and the power center, an ignition source (battery scoop) and a temporary stopping in XC B towards drift 1. Team have means to airlock through XC B to drift 1.

Team Stop #7 in drift 1 at XC B

Team finds more smoke, TC required, and finds 3 timbers in XC B, an ignition source outby XC B in drift 1 and low O2 in intersection. GT, DI, and RT are needed at these openings. Teams can advance out drift 1.

Team Stop # 8 - in drift # 1 at XC A

Still in smoke. Team finds bottom of upcast ventilation shaft and inby side of permanent stopping and 1 drift side of impassible regulator. Teams can retreat back to XC B and advance inby.

Team Stop # 9 – in drift 1 at XC C

Team passes two BC and frames. finds water roofed inby intersection and water over knee deep in XC C towards 2 drift.

Team now has enough information to vent gasses to be able to energize power center and water pump, then ventilate barricade and breach but must set additional timbers through the other unsafe roof in drift 2.

After pumping water, team must advance to water over knee deep in XC C and explore in order to ventilate through.

Both ventilation solutions utilize the upcast vent shaft fan exclusively. Each fan control in the command center can be started and stopped by flipping the placard. The main mine fan can be turned off to avoid stalling it by a switch in the command center. See the first ventilation solution for proper placement of temporary stoppings. Teams can go to any of their previous explored team stops. After the team requests a ventilation change and all gasses have been cleared from PC, it can be energized to pump water.

See ventilation solution 2 to vent the explosive gas from in front of barricade safely. An airlock is required to enter the barricade. Two missing miners found, one unconscious, and can be removed to the FAB, however one needs to be on a stretcher, which must be removed from a wheeled carrier when retreating through the low back in 3 drift. Proper gas checks must be conduct along their route of travel from rib to rib.

Once the team reaches the surface and has turned over their patient the team will need to count off, stop the clock, and turn in their maps, and SD card/ thumb drive if using a CCA.

THE END!!

The diagram illustrates a mine layout with various rooms and equipment. The layout is divided into 'Roofed' and 'Unroofed' sections. Key areas include:

- Over Knee Deep:** Two rooms at the top, each with 'RT DI GT' labels.
- Knee Deep:** A central room containing an 'Electric Pump', 'Water Discharge Line', 'Battery Scoop', and 'Power Center'. It also has 'RT DI GT' labels.
- Electric Pump:** A room with 'Electric Pump Cable' and 'Battery Scoop Cannot Move'.
- Water Discharge Line:** A room with 'Water Discharge Line' and 'Power Center'.
- Battery Scoop:** A room with 'Battery Scoop Cannot Move' and 'Power Center'.
- Impassible Permanent Regulator:** A room on the left side.
- Unconscious Burned Tim ID # 322:** A room on the right side.
- Unconscious Jessie ID # 345:** A room at the top right.
- Walter ID # 17:** A room at the top right.
- Gas Concentrations:**
 - 2.0 % CH₄, 879 PPM CO, 0 PPM NO₂, 16.5 % O₂
 - 7.0 % CH₄, 0 PPM CO, 1 PPM NO₂, 19.8 % O₂
 - 0.1 % CH₄, 987 PPM CO, 0 PPM NO₂, 15.5 % O₂
 - 0.1 % CH₄, 885 PPM CO, 0 PPM NO₂, 18.6 % O₂
 - 6.0 % CH₄, 0 PPM CO, 2 PPM NO₂, 15.8 % O₂
- Personnel:**
 - Unconscious Burned Tim ID # 322 (stick figure)
 - Unconscious Jessie ID # 345 (stick figure)
 - Walter ID # 17 (stick figure)
- Equipment:**
 - Electric Pump
 - Water Discharge Line
 - Battery Scoop
 - Power Center
 - Impassible Permanent Regulator
 - Battery Mine Phone
- Labels:**
 - RT DI GT (Red Tag, Danger, Inert Gas Tag)
 - DI (Danger Inert)
 - TC (Team Check)
 - BC (Battery Check)
 - LC (Low Concentration)
 - CA (Clearance Area)
 - Over Knee Deep
 - Knee Deep
 - Unconscious
 - Burned Tim
 - Unconscious Jessie
 - Walter
 - Electric Pump
 - Water Discharge Line
 - Battery Scoop
 - Power Center
 - Impassible Permanent Regulator
 - Battery Mine Phone
 - Airtight
 - FAB
- Legend:** TC = team check prior to entering smoke

The diagram illustrates a complex mine environment with various rooms and equipment. Key features include:

- Roofed Areas:** Indicated at the top of the layout.
- CA (Clearance Area):** Marked throughout the layout, indicating areas requiring clearance.
- BC (Belt Conveyor):** Located on the left side of the layout.
- FAB (Fan Assembly Building):** Located at the bottom center of the layout.
- LC (Lift Cage):** Located near the bottom right of the layout.
- Gas Concentrations:**
 - Top Left: 2.0 % CH₄, 879 PPM CO, 0 PPM NO₂, 16.5 % O₂
 - Top Right: 6.0 % CH₄, 0 PPM CO, 2 PPM NO₂, 15.8 % O₂
 - Middle Right: 7.0 % CH₄, 0 PPM CO, 1 PPM NO₂, 19.8 % O₂
 - Bottom Left: 0.1 % CH₄, 987 PPM CO, 0 PPM NO₂, 15.5 % O₂
 - Bottom Right: 0.1 % CH₄, 885 PPM CO, 0 PPM NO₂, 18.6 % O₂
- Equipment and Structures:**
 - Electric Pump, Water Discharge Line, Battery Scoop, Power Center, Impassible Permanent Regulator, Battery Mine Phone, and Unconscious Burned Tim ID # 322.
 - Timbers (3 Timbers) are present in several areas.
 - Over Knee Deep and Ankle Deep areas are marked near the top.
- Personnel:**
 - Conscious Walter ID # 17 is located near the top right.
 - Unconscious Burned Tim ID # 322 is located near the bottom right.
- Actions and Status:**
 - Red dashed arrows indicate movement paths.
 - Red solid lines indicate barriers or specific actions: Build, Rebuild, Remove, and Cleared.
 - A yellow box highlights a specific area near the Power Center.

VENT 2

Response: "Help"

