

PIB P07-03 - BREATHABLE AIR QUESTIONS AND ANSWERS

These questions and answers are intended to provide guidance for coal operators in submitting their emergency response plans (ERPs) to MSHA. While the answers given may be appropriate in many mines, mine-specific conditions in some mines may make alternative arrangements appropriate to the circumstances in the mine. As discussed in PIB P07-03, any particular approval or denial of an ERP should take into consideration mine-specific conditions. In submitting ERPs, operators are advised to discuss the mine-specific conditions that would justify the operator's breathable air proposal.

1. How can outby miners, pumpers, examiners, etc., be provided with breathable air?

As with air provided to miners at the working section, breathable air should be provided to outby miners working in established work positions within an inflatable chamber, barricade, or other alternative that isolates miners from contaminated environments. Air may be provided through compressed air or oxygen canisters, chemical oxygen generator, a bore hole, or compressed air lines. To increase the chances that outby miners could reach breathable air supplies after an accident, District Managers generally will be looking for breathable air locations to be located not more than one hour travel distance from each other. This will help assure that miners would not need to travel more than 30 minutes in either direction to reach a refuge area. Pumpers and examiners who travel to remote areas of the mine present special circumstances that may require them to travel more than 30 minutes to reach breathable air supplies in the ventilation mains.

2. Can a mine operator construct a safe haven every 4 – 5 miles in the primary and secondary escapeways with two Ocenco 6.5 SCSRs per outby miner to get to the refuge area? This would mean that an outby miner would never be more than 2 – 2.5 miles from a refuge area and would have 2 SCSRs to start with, in addition to the outby caches in the required escapeways spaced at distances approved in the plan.

As a rule of thumb, refuge areas for breathable air could be located at every other cache of SCSRs (1 hour intervals).

3. Do we have to provide breathable air for both crews during shift change, including "hot seat" changes?

Yes.

4. Is breathable air required for MMUs less than 2,000 ft. from the portal? If so, at what location/distance should breathable air be available?

No.

5. Do shelters have to have an MSHA approval prior to implementation?

No. MSHA is not certifying shelters at this time, and will accept various options, including barricading supplies, to create airtight refuge areas. Among other options, MSHA is accepting state- approved refuge chambers to meet the breathable air provisions of the ERPs.

6. Can a hardened room, as allowed in the final rule for storing SCSRs in adjacent escapeways, meet the requirements of the breathable air location?

Yes. A hardened room, as discussed in the Emergency Mine Evacuation final rule, is a room built to seals standards located in a crosscut between adjacent escapeways.

7. When the PIB references “each miner,” does MSHA interpret this as all miners underground? Is it MSHA’s expectation that each section’s breathable air supply to be sufficient to cover all miners working in the mine at any one time?

The breathable air at any one location must be sufficient to maintain the miners who can reasonably be expected to use it. There must be enough breathable air for all miners working underground, including outby miners working near a section.

8. PPL P06-V-10 requires that ERPs contain provisions for barricading materials sufficient to construct an air-tight enclosure. The breathable air PIB says that ERPs should provide for breathable air within areas designed for barricading. Does this mean operators need two sets of barricades?

One set of barricading material should be stored within 2000 ft. of the section and stored with the breathable air. The purpose of the barricading materials is to create an enclosed environment in which miners can breathe.

9. Section II.B. of the breathable air PIB lists “buried or otherwise protected air lines . . . routed to locations . . .” as a method of providing breathable air. What does “otherwise protected” mean?

MSHA is looking for protection equivalent to burying pipes, such as trenching deep enough to be protected from any type of mine traffic or equipment damage. The method used also should be able to withstand an explosion.

10. What is the status of MSHA’s acceptance of the Drager SCBA system?

The Drager SCBA system has been accepted as a replacement for SCSRs.

- 11. At what point does the MINER Act's breathable air requirement discontinue? Is it at the conclusion of coal loading or does it include areas where sections are being set-up or torn down?**

There must be enough breathable air for all miners working underground, including outby personnel, regardless of the status of production.

- 12. My company's present ERP plan requires barricading materials to be kept closer to the section than the 2000 feet distance for the breathable air. These requirements need to be reconciled. As we read it the implementation of both the barricading and the breathable air requirements are part of the ERPs and not an MSHA regulation. It seems that if we set up a breathable air supply with a stopping system as drawn in the policy memo we should not need inflatable shelters etc. Is this correct?**

Barricading materials or inflatable shelters (anything that allows miners to isolate themselves from contaminated environments) should be provided within 2000 ft. of sections and the breathable air would be stored in the same location.

- 13. Can those mines in states that require a 48-hour supply of air and a rescue chamber (i.e., WV) have two stored breathable air designs? One 48-hour supply in a rescue chamber to meet the state chamber requirement and one additional 48 hour supply on a skid in a stopping off area to comply with MSHA?**

If a mine chooses to provide a 96-hour supply of breathable air, the air generally should be stored in one location, along with the barricading materials or rescue chamber (anything that provides an air-tight enclosure for miners).

- 14. Will the agency consider a 30-day extension for submitting breathable air portions of the ERPs?**

No. The MINER Act required operators to submit ERPs within 60 days of the date of enactment on June 15, 2006 and mine operators were given until March 12, 2007 to submit the breathable air component of their Emergency Response Plan. Given that statutory requirement, no extension is justified.

- 15. If mining in a seam where seams are located above and below that have been mined out, are boreholes a reasonable and prudent method of providing breathable air? What would be needed to ensure the integrity of a borehole going through abandoned workings and allowing possible contaminated or even explosive atmospheres to enter into the mine in attempting to provide this air?**

The agency recognizes there are circumstances that may preclude this option from being used. In cases where an operator does choose this option as the means to provide breathable air the agency would expect the operator to prevent contaminated or explosive atmospheres from entering the mine (e.g., by casing or grouting the hole).

16. What does Section I. (2) (b) of the PIB mean where it discusses the capacity to transport a drill rig to a pre-surveyed drill hole? Can you have an arrangement with a driller in advance? Does the road have to be constructed? What about eminent domain issues? What if you are mining under a State Park with no surface rights at all and little likelihood of getting the rights?

The agency understands some challenges may arise in considering the use of a borehole at any given mine. Operators proposing to provide 48 hours of breathable air with prior arrangements to drill a borehole should be able to demonstrate that the hole can be drilled (providing miners with fresh air) within 48 hours. This may necessitate pre-construction of a road and/or reaching an agreement with the surface owner. These matters will be considered by the District Manager when the ERP is reviewed.

17. Do inflatable stoppings have to be provided at various locations throughout the mine or just for sections?

Any material that creates an airtight refuge area for miners may be used as an area within which miners are provided breathable air. As mentioned in PPL P06-V-10, materials for each working section should consist of two inflatable stoppings or other quick deployable units, or inflatable shelters or equivalent, within 6 months of these items becoming commercially available.

18. What are the parameters of burying a compressed air line for compliance? Is it 4 inches or more? What entry should the air line be installed in? How should lines be designed to keep water buildup from becoming a problem? If using this system with a full breathing mask, how would one eat and intake liquids during the 96 hours of sustained confinement?

MSHA is allowing operators flexibility to determine what methods will best protect the compressed air line in a particular mine. The method selected should be capable of withstanding an explosion. As mentioned in the breathable air PIB, MSHA is looking for operators to submit breathable air options that involve providing breathable air within areas designated for barricading (or other alternatives that will isolate the miners from contaminated environments). Full breathing masks normally would not be needed in these airtight areas.

19. Why does the quality of air referenced in the PIB have to match the quality of air in the active working place? Why can't it be sufficient to provide and sustain life? Life can be easily sustained at 16.5% and therefore the formula used to calculate the number of cylinders is incorrect. Is this a reasonable approach?

Current regulations require that 19.5 percent oxygen be maintained in the environment. Studies have shown that some individuals may experience adverse physiological effects at 18 percent oxygen levels.

- 20. Page 2 of the PIB attachment shows a skid with the bottles lying on their sides. The regulations require the compressed gas bottles be secured in an upright position when stored. Will the oxygen bottles be required to be stored upright or can they be laid on their sides to meet this requirement?**

30 C.F.R. § 75.1106-3 requires gas cylinders to be stored securely and, “where the height of the coalbed permits, in an upright position, preferably in specially designated racks, or otherwise secured against being accidentally tipped over.” For purposes of storing compressed gas cylinders to meet the breathable air requirement, MSHA will be looking to see that operators are storing these cylinders securely in a rack or by other means so that they will not roll or tip. MSHA will consider options that involve side storage so long as the cylinders are secure and protected from damage. If stored on transportable skids the agency would envision cylinder storage in a rack to protect them from movement during transport.

- 21. Oxygen rates: It is our understanding that carbon dioxide is generated at the rate of 1.08 cubic feet per hour per person and oxygen is consumed at a rate of 1.32 cubic feet per hour per person. (See page 1 of the PIB’s “Methods for Providing Breathable Air” attachment.) Which rate would we use to calculate if using oxygen bottles?**

1.32 is the correct rate for calculating the amount of oxygen needed, and 1.08 is the rate used in calculating the carbon dioxide scrubbing capacity needed.

- 22. On page 8 of that same attachment, it appears that we would need 750 cubic feet per hour per person of compressed air. This would mean we would need over 3,000 bottles stored. Are we looking at this correctly and would this be practical?**

The example on page 8 assumes that there is no separate method of carbon dioxide scrubbing capability (such as lithium hydroxide curtains) and that the compressed air is being pumped in at sufficient rates to create an air current that removes carbon dioxide through a vent. As mentioned on page 2 of this attachment, a K size compressed air cylinder contains approximately 282 cubic feet of air that contains 19.5% oxygen, or about 55 cubic feet of oxygen per cylinder. As mentioned on page 1, a person consumes 1.32 cubic feet of oxygen per hour per person. If carbon dioxide scrubbers are used in conjunction with compressed air cylinders, one cylinder may provide about 40 hours of breathable air for one person. In any event, it is true that more compressed air cylinders would be needed than oxygen cylinders to provide the same amount of oxygen. Compressed air cylinders may be better used to initially purge an air-tight area of contaminants, followed by oxygen cylinders to provide the oxygen miners need to breathe.

- 23. If oxygen is used will MSHA be requiring that CO₂ scrubbers be used and if so, what criteria will be required for CO₂ scrubbing systems? Will the ERP require CO₂ calculations as part of this breathable air requirement?**

Oxygen cylinder systems providing breathable air must have CO₂ scrubbing capability. Individuals produce CO₂ at a rate of 1.08 cubic feet per hour.

24. The PIB attachment talks about a safe haven. This could be a small area where CO₂ could build up fast or it could be a section that was barricaded off with entries several hundred feet in depth. Would the requirements be the same for both situations and is MSHA stating that the company must build a safe haven and keep the affected area small?

Breathable air must be provided inside a refuge area that is airtight so that the environment inside may be controlled and isolated from outside contamination. Whatever area is designated, the system utilized must be capable of providing enough oxygen and purging CO₂ out of the affected area.

25. If oxygen is used will we be required to provide medical grade oxygen in lieu of oxygen used for cutting and welding?

No. The quality of oxygen to be used as specified in PIB 07-03 attachment "Methods of Providing Breathable Air" states non-USP with greater than 99% O₂.

Welding oxygen cylinders which are greater than 99% oxygen will suffice.

26. If crews change out at a point more than 2,000' outby the working section, and do not enter the section split of air at the same time, is the requirement then for one crew or two, or does it include outby miners also?

If only one crew is at the working section (or within 2000 feet of it) at any given time, breathable air should be provided for that crew at a location within 2000 feet of the working section. In addition, since breathable air also should be provided for outby miners, air sufficient for all the outby miners that may be in one location during shift changes should be provided in those outby locations as described previously. The mine operator needs to provide enough breathable air for all miners who may be trapped after an accident.

27. Will the oxygen components from the Chem-Bio shelter be acceptable for use with barricading material without the chamber itself since the chamber is not approved?

For purposes of the MINER Act's breathable air requirement, MSHA is accepting all refuge chambers that the states have accepted. Oxygen can be provided in a number of ways. District Managers will be looking to see whether an operator's proposed method will work to provide breathable air inside an air-tight refuge area.

28. Will operators be required to use inflatable stoppings that are commercially available, or can they use other approved stoppings for barricading?

Any material that creates an airtight refuge area for miners may be used as an area within which miners are provided breathable air. As mentioned in PPL P06-V-10, materials for

each working section should consist of two inflatable stoppings or other quick deployable units, or shelters, within six months of these items becoming commercially available.

29. The PIB illustrations of examples show what appears to be block stoppings for the refuge areas. Will any approved stopping suffice? Concrete blocks, Omega, Kennedy Steel, etc.?

Any stopping that provides an airtight seal may be used in meeting the MINER Act's breathable air requirement. However, "hardened rooms," which are located in crosscuts between adjacent escapeways and used to store SCSRs (as explained in the Emergency Mine Evacuation final rule) must be built to MSHA's seals standards so that an explosion will not damage the SCSRs.

30. If the third option under the PIB's Quantity of Breathable Air is used (the 96hour option), does anything have to be pre-constructed or just available within 2,000' of the working section?

The refuge area within which the air will be provided does not have to be preconstructed under Option 3. However, materials should be readily available so that, in the event of an accident, miners may quickly construct and access a refuge area while wearing their SCSRs.

31. Several manufacturers have oxygen generating systems, oxygen manifolds and similar systems with CO₂ curtains, soda lime systems etc. with or without shelters. Will any of these be approved by the deadline or is an approval necessary if the system is used without the shelters?

The Agency will not grant a time extension for plan submissions. Any oxygen delivery method not affected by permissibility requirements would be acceptable.

32. Is MSHA coordinating with State agencies concerning approval of rescue chambers and the amount of breathable air needed?

MSHA has been looking at state requirements and has had discussions with state representatives. However, MSHA is statutorily required to enforce the MINER Act. In any situation in which state and federal requirements may diverge, MSHA will enforce the federal requirement.

33. Is MSHA going to recognize inflatable chambers?

Yes.

34. Will MSHA approve of using 96-hour chambers when they are commercially available?

MSHA will accept a number of options, including state-approved 96-hour rescue chambers, to meet the breathable air provision.

35. If the state approves a chamber, will MSHA also approve it?

MSHA currently will accept any state-approved chamber as the designated area within which breathable air is provided. The quantity of breathable air MSHA would approve will depend upon mine conditions and an operator's advance arrangements for emergencies.

36. If a plan is submitted stating that we will provide a 96-hour refuge chamber when commercially available, will it be approved?

District Managers will be looking for a proposal that currently protects miners. Assuming such a chamber were to be available in a short time frame, MSHA believes that such a proposal would be consistent with the MINER Act requirements.

37. Could a hilltop mine provide an entry to the surface every 2000 feet to meet the breathable air requirement?

Depending upon the ventilation scheme of the mine and the proximity of the openings to the active areas of the mine, this scenario may be an effective way to provide breathable air.

38. If a plan is submitted to supply breathable air through boreholes, do we have 60 days to drill bore holes after approval?

Yes. Operators have 60 days to implement the plan, which would include boreholes, fan installation, etc.

39. For the post-accident breathable air, could we use SCSRs?

No. SCSRs are not intended or suitable for long-term use and therefore cannot be utilized to meet the breathable air requirement.

40. Where are barricades supposed to be constructed -- in the primary or secondary escapeway?

Refuge areas within which breathable air is required could be located in any number of areas such as in crosscuts off the primary or secondary escapeways. Factors to consider in locating these areas may involve ease of travel to the area, time to travel to the area, and physical factors that may make erecting a stopping or other barrier more or less feasible.

41. Can an operator pre-construct a stopping-type barricade with access for miners to enter, or do we have to wait to construct these refuge areas until after an accident?

Refuge areas may be constructed in advance, so long as they are located appropriately (generally within 2000 feet of the working section and at 1-hour intervals in escapeways).

42. Are multi-gas detectors that detect carbon dioxide required? Could you have more than one detector to monitor the different gases?

Although carbon dioxide detectors are not required currently, MSHA encourages their use. The Emergency Mine Evacuation final rule published on December 8, 2006, requires operators to provide multi-gas detectors that can measure methane, oxygen and carbon monoxide to each group of underground miners and to each person who works alone.

43. If an operator has ordered 96-hour inflatable chambers and they will not be available to use 60 days after the plan is approved, do you still have to supply oxygen or compressed air, etc., until they are delivered?

MSHA will consider phase-in with a valid purchase order.

44. We were first told that outby miners will not be required to wear or carry two SCSRs. Now, a new interpretation says that outby miners must have two SCSRs available. Can this be clarified?

Under existing regulations, one SCSR must be worn or carried by every miner underground. If wearing or carrying an SCSR would be hazardous, the SCSR must be located within 25 feet. If a 10-minute SCSR is worn, a one-hour SCSR must be located in accordance with an approved plan. Under the new Emergency Mine Evacuation final rule (see 30 C.F.R. § 75.1714-4), a second one-hour SCSR for each miner must be provided at fixed underground work locations. Outby and/or traveling miners with no fixed work location must have a second one-hour SCSR on their vehicles, or if they are on foot, within a 30-minute distance. In addition to these SCSRs, more SCSRs must be stored in each required escapeway at 30-minute intervals.

45. Will shelters or barricading material within which breathable air will be provided be needed in outby areas throughout the mine? We thought that the required SCSR caches would provide post-accident breathable air for outby miners.

SCSRs are to assist miners in escaping from the mine. They are not designed for barricading situations in which miners may need air for sustained periods of time. For this reason, District Managers are looking for operators to submit plans that include provision of breathable air within secure areas within a reasonable distance from any location miners are present. In determining distances, District Managers will consider mine-specific conditions.

46. What will be the requirements concerning positive pressure on boreholes for breathable air?

A fan or equivalent method should be used to force fresh air into the hole with enough positive pressure to overcome total mine pressure in order to deliver sufficient quantities of breathable air.

47. Would you describe compressed air best practices?

Compressed air intakes should be installed and maintained to ensure that only clean, uncontaminated air enters the compressors. Mines should ensure compressors have the capacity to deliver the required volume of air at the point(s) of expected usage.

48. Would there be a requirement that ventilation to/in a “hardened room” be continuous, or could the room be ventilated after an event occurs?

In a hardened room situation, a borehole will have been constructed already. An arrangement in which fresh air would be quickly established in less than one hour would be acceptable.

49. Can a mine operator utilize portable blowing fan units for ventilation of boreholes into a safe haven?

- a. Then the units could be stored in a centralized location out of the weather.**
- b. The units could also be examined/inspected by the same people on a frequent basis (to be determined and in the mine plan).**
- c. The units would be much better maintained and ready for emergency.**

Pre-constructed boreholes into refuge areas must be used in such a way that fresh air is established very quickly, as miners need fresh air before their SCSRs deplete. While it may be possible for the proposal described above to work, it must be established that all borehole fans in by a fire or explosion will be in operation in less than one hour. The District Manager will consider the unique mine conditions and the proposals that provide equivalent protection.

50. What type of seals must be used to construct a hardened room?

a. You are not sealing off an abandoned area. No monitoring.

b. Would a 75.335(a)(1) seal suffice?

The “hardened rooms” mentioned in the December 8, 2006 final Mine Emergency Evacuation rule at 30 C.F.R. § 75.1714-4(d)(1) can be used as for breathable air, but were first proposed as SCSR storage locations in crosscuts between adjacent escapeways. As required in the Emergency Mine Evacuation rule, these rooms must be built using MSHA seals requirements (currently 50 psi), in order to prevent damage to the stored SCSR units.

51. If pressurized air lines are used to comply with the MINER Act’s breathable air requirement, what steps will MSHA take to assure that these lines are installed and maintained safely?

a. Can a mine operator put a borehole down with an air compressor (compressed air) at the top of the borehole (or centrally located) and run air lines from the borehole to pipe the compressed air into various sections of the mine?

Yes, provided that all portions of the compressed air lines leading from the borehole are adequately protected against explosions and other damage hazards.

b. Can the compressed air line be run along the mine floor or what is required to protect the line?

Compressed air lines should be buried or otherwise protected such that they would withstand an explosion and not be damaged by mine equipment or other mine activity.

52. Can a mine operator locate the compressed air outside unit in a central location out of the weather and bring it to the borehole in the event of a mine emergency?

This may be possible. More details are needed to determine the time this approach is likely to take and whether other sources of breathable air may be needed to cover any gaps. (Also see answer to question 49.)

53. Is the reference in the PIB to “within 2,000 feet of the working section” set in stone?

a. Property and local issues?

b. Company would like to do a safe haven with borehole at mouth of 5000’ – 7000’ panels and breathable air within 2000’ of section tail piece but may not be able to use the property right at the mouth of the section. Can there be some flexibility in the distances? How much? How far?

MSHA believes that breathable air located farther than 2,000 feet from the working section may be unavailable to miners trapped at the face. For this reason, MSHA would not approve proposals of more than 2,000 feet from the working section.

54. If we use oxygen-generating devices that stay within the shelter, do they have to be permissible?

Yes. Devices with electrical components must be permissible or intrinsically safe.

55. What happens if we elect to use a manufacturer’s product then MSHA evaluates the product finding that it does not meet the requirements?

Any product the operator uses to meet the ERP expectations would have to be approved in the ERP. MSHA will accept refuge chambers that have been approved to meet certain state requirements of the breathable air provision.

56. Is it a good idea to store a large amount of oxygen underground?

Any oxygen that is stored underground should be done taking the appropriate precautions for safe use and storage. The breathable air PIB attaches a Hazard Awareness sheet to assist operators in understanding and managing the risks of oxygen storage and handling.

57. Sufficient breathable air is required to be maintained underground for all individuals that are underground at any one time, including during shift change when miners are changing out at the face. An emergency situation could occur at anytime, as with Sago, while miners are enroute to the section. Where is it suggested that the required hours of oxygen per miner be maintained for the miners enroute to or from their work area? Some miners travel several miles from the portal to the section.

Working crews should have their breathable air stored within 2,000 feet of the working section. Breathable air for working section miners does not need to be stored enroute to their work locations.

58. Where can we find out what commercial refuge alternatives devices are available that would be approvable?

This information will be placed on MSHA's web site by the Technical Support group as it becomes available.

59. One operator has a unique escapeway plan that utilizes dual intake airways for the section primary and alternate paths from active sections. Both escapeways are accessible by driving for most if not all the distance. The active longwall panel and when connected, the set-up location for the next longwall panel are provided intake airways from two opposite directions. This condition should be considered in review of the breathable air requirement. If one of the escapeways is not travelable because of an incident, the other would be intact. Therefore, those individuals on the sections would not be trapped as described in PIB 07-03. How should this be considered in reviewing the plan?

MSHA believes that the intent of the MINER Act is that all operator ERPs contain some provision for breathable air for trapped miners. However, as the PIB explains, unique mine conditions and the emergency preparedness of the operator may affect a miner's risk of entrapment as well as the risk that such an entrapment will be lengthy. District Managers should consider unique mine conditions and proposals that provide equivalent protection.

60. An operator proposes to meet the MINER Act's breathable air requirements not by importing breathable air *per se*, but through a plan to install a series of ventilation stoppings that could be opened to divert air and could be closed behind miners forced back toward the face to "close off" contaminated areas. Could a plan such as this be approved?

This approach is a creative one, but it depends, for the most part, on how fast retreating miners can move and assumes the ventilation controls would be intact after an explosion. MSHA would not approve this approach.

61. Will the Kennedy rescue chambers or other chambers be approved by MSHA and if so, when?

For purposes of meeting the MINER Act's breathable air requirements, MSHA will accept refuge alternatives states have approved, although the quantity of air needed within those refuge areas may differ.

62. Why must a plan for breathable air be submitted by March 12, 2007, when MSHA doesn't have the rescue chambers approved yet?

There are presently methods available to comply with the breathable air requirements.

- 63. Option 1 of PIB No. P07-03 requires a hardened room (a room enclosed with approved 50 psi seals) with fresh air from the surface. Options 2, 3, and 4 would allow devices made of wood, nylon, and plastic sheets or plastic inflatable devices to enclose a refuge area. These seem to be contradictory. Please explain.**

As explained in the Emergency Mine Evacuation final rule, hardened rooms are rooms located in crosscuts between adjacent escapeways used to store SCSRs. These rooms must be built to MSHA seals standards in order to prevent damage to the stored SCSR units. These rooms would be pre-constructed, and can be used as breathable air refuge areas.

- 64. Will one regulator be sufficient for all oxygen tanks inside the barricade?**

This would be dependent upon the number of tanks used, the type of cascading system, etc.

- 65. When two MMUs are less than 2000 feet apart, can one barricade capable of supplying air for all miners in both working sections be acceptable?**

Yes.

- 66. How many hand held multi-gas detectors should be inside a barricade?
Battery life for these instruments usually last 8 to 12 hours.**

Refuge areas should have at least one multi-gas detector.

- 67. Can these instruments be turned on and off to save battery power?**

Yes.

- 68. If a mine has 5 employees working outby the section and provides breathable air/materials at an outby location for these persons, do they have to be included in the number when calculating air for the working section?**

If breathable air is provided for the outby personnel, they would not be included in the working section calculations.

- 69. Oxygen flow rates must be calculated by the number of persons inside the barricade. Will there be a chart to determine how and what is needed?**

The breathable air PIB's "Methods for Providing Breathable Air" appendix discusses how to calculate the amount of oxygen needed. According to this appendix, each miner needs 1.32 cubic feet of oxygen per hour.

70. Will State and Federal employees occasionally present in a mine be included in the number to determine the necessary breathable air?

No.

71. If no pre-determined location for the barricade is established and only breathable air material/supplies (stored on sled) are maintained, should the plan address a closer distance than 2000 ft from the section?

Generally the barricade location should be planned in advance and the sled should be stored at that location so all miners will know where to go and what to do if barricading becomes necessary. Mine operators can keep the breathable air closer than 2000 feet.

72. Will the locations be subject for approval or can they be shown on the wall map?

The locations should be identified in the ERP and also shown on the 75.1200 map.

73. Does the 2000' distance apply strictly outby, or can miners go in an inby direction, as long as breathable air is located within 2000 feet?

If escape is impossible, miners should proceed to the nearest refuge area. On longwall panels, refuge areas may be inby the longwall face.

74. Please clarify what MSHA means by the phrase "or equivalent CO₂ scrubbing agent" used in the PIB Attachment.

MSHA is aware of the following methods to scrub CO₂: lithium hydroxide curtains, soda lime curtains, and soda lime used in cartridge form in systems that utilize an air mover to create air flow through the soda lime chemical bed. All these methods, when designed, properly installed and sized to remove CO₂ at the rate of 1.08 cubic feet per hour per person, are considered acceptable for removal of CO₂ from the breathable atmosphere.