I. Purpose

The intent of this written program is to define the rules regarding the use of respirators for personal protection at Montana Tech as stated in OSHA 29 CFR 1910.134. Strict adherence to the provisions contained in this program is necessary to prevent exposure of Montana Tech employees to potentially hazardous airborne contaminants.

II. Definitions

A. *Air purifying respirator* means a respirator which is designed to remove air contaminants (i.e. dust, fumes, mists, gases, vapors or aerosols) from the ambient air or air surrounding the respirator.

B. *Assigned protection factor* means the number assigned by NIOSH to indicate the capability of a respirator to afford a certain degree of protection in terms of fit and filter/cartridge penetration.

C. *Cartridge* means the element of a gas and vapor or particulate air-purifying respirator which contains the sorbent, filter and/or catalyst which removes specific contaminants from air drawn through it.

D. *Fit factor* means an estimate of the ratio of the average concentration of a challenge agent in a test chamber to the average concentration inside the respirator as worn with a high-efficiency filter.

E. *Maximum use concentration* (MUC) means the maximum concentration of an air contaminant in which a particular respirator can be used based on the respirator’s assigned protection factor.

F. *Negative pressure respirator* means a respirator in which the air pressure inside the face piece is positive during exhalation in relation to the outside air pressure, and negative during inhalation in relation to the outside air pressure.

G. *Positive pressure respirator* means an atmosphere-supplying respirator which is designed so that air pressure inside the face piece is positive in relation to the outside air pressure during inhalation and exhalation.

H. *Qualitative fit test* means an assessment of the adequacy of respirator fit by determining whether or not an individual wearing the respirator can detect the odor, taste, or irritation of a contaminant introduced into the vicinity of the wearer’s head.
I. **Quantitative fit test** means an assessment of the adequacy of respirator fit by numerically measuring concentrations of a challenge agent inside and outside the face piece. The ratio of the two measurements is an index of leakage of the seal between the respirator face piece and the wearer’s face.

III. **General**

A. The respective departments at Montana Tech shall provide respirators when deemed necessary to protect the health of the employee. Employee protection through the use of engineering controls, well designed work practices, the substitution of lower-toxicity materials, or some combination of these shall be emphasized before respirator usage.

B. Respirator use will be required only after the respective department and the Environmental, Health & Safety (EH&S) office has determined that no other control method is feasible. If an employee dons a respirator, the respective department is responsible for compliance with all components of the Respiratory Protection Program and will bear the associated costs.

C. EH&S is responsible for implementation, training, and record keeping for this program.

D. Training and fit testing for respirator use will be conducted annually or as necessary by the EH&S office.

E. All personnel required to wear a respirator will have to pass an initial medical evaluation prior to using a respirator. The EH&S office will coordinate the evaluations, with the respective departments covering the cost for the medical evaluation. Refer to Section VII on Medical Surveillance and Appendix A for the Medical evaluation form.

F. Employees shall comply with the requirements of the Respiratory Protection Program. Employees are responsible for proper use and maintenance of respirators in accordance with training received. Refer to Section VI on Training and Section VIII on Care and Maintenance of Respirators.

IV. **Selection of Respirators**

A. Respirators shall be selected following a hazard assessment conducted jointly by Environmental, Health and Safety and the respective department. See Appendix B for hazard assessment requirements.

B. Only NIOSH/MSHA approved respirators have been chosen for use in this program. EH&S and the respective department together will determine which respirator is appropriate for each situation.
C. Where elastomeric face piece respirators are to be used, Montana Tech shall provide a sufficient selection of respirators so that the respirator is acceptable to, and correctly fits, the user.

D. The concentration of any contaminant must not exceed the respirator’s Maximum Use Concentration (MUC). The MUC is calculated by multiplying the respirator’s Assigned Protection Factor (APF) by the OSHA Permissible Exposure Limit (PEL) for the contaminant in question. (MUC = APF x PEL). See Appendix C for assigned protection factors.

E. Air purifying high efficiency respirators and disposable dust/mist masks have the following limitations that must be taken into consideration when selecting a respirator:

1. Cannot be used in oxygen deficient areas (less than 19.5% oxygen by volume);
2. Cannot be used in immediately dangerous to life or health (IDLH) concentrations;
3. Cannot be used for protection against gases and vapors with poor warning properties unless equipped with an end-of-service life indicator;
4. Half-face respirators offer no eye protection and may require the use of safety goggles or a full face respirator.

F. Unless properly trained and fit tested, Montana Tech employees shall not don a supplied air respirator. When dangerous atmospheres are encountered in normal operations or in emergencies, the fire department or other appropriate personnel shall be called to respond.

G. If a properly trained Montana Tech employee dons a supplied air respirator:

1. Breathing air quality shall meet the requirements of the specification for Grade D as described in Compressed Gas Association Commodity Specification G-7.1-1989.
2. In IDLH or oxygen-deficient areas, at least one additional person must be present as a standby. This person must have communication (visual, voice, or signal line) with workers at all times.
V. Availability of Respirators

A. Respirators shall be supplied by the respective departments at no cost to the employee. The department may decide whether to issue each employee his/her own respirator or to issue on an “as needed basis” with the respirators returned after the task is completed.

B. The department-designated EH&S contact is responsible for respiratory program oversight in their respective departments, and will ensure, through coordination/consultation with EH&S, that the appropriate respirators and cartridges are issued to employees.

VI. Training of Employees

A. Prior to fit-testing, each employee who will be issued a respirator will be trained by the EH&S office in the proper use and maintenance of the respirator. Training shall be administered annually or as necessary.

B. Employee training may be somewhat different for each respirator user depending on the hazard, but all training will include the following information:

1. The need for respiratory protection and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
2. An explanation of why engineering controls are not being applied or are not adequate, and what effort is being made to reduce or eliminate the need for respirators;
3. An explanation of why a particular type of respirator has been selected for a specific respiratory hazard;
4. An explanation of the operation, capabilities and limitations of the respirator selected;
5. The nature, extent, and effects of respiratory hazards in the workplace;
6. How to inspect and don the respirator and check the seals. This includes a requirement that a fit check shall be done each time the respirator is donned or adjusted (positive and negative pressure test);
7. How to maintain and store the respirator;
8. How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
9. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
10. The general requirements of the regulations.

VII. Fitting of Respirator
A. Proper fitting of respirators is essential if employees are to receive the protection for which this program is designed. Each employee required to wear a respirator will be fit-tested by EH&S. See Appendices D, E & F.

1. If a quantitative fit test is used, a fit factor that is at least 10 times greater than the assigned protection factor of a negative-pressure respirator shall be obtained before that respirator is assigned to an individual. (i.e., for a half-mask negative pressure respirator, a fit factor of 100 (APF 10 x 10) is required.
2. If a qualitative test is used, only validated protocols will be used. Refer to Appendix D, Respirator Fit-Testing Standard Practice, (from 29 CFR 1910.134, Appendix A) for protocol.
3. A respirator fit test will be carried out for each wearer prior to initial use and at least once every twelve months thereafter.
4. These tests shall be documented. See Appendix F for fit test record.
5. Fit test records shall be retained until the next fit test is administered.
6. Fit testing will be done while the employee is wearing any protective equipment, such as safety glasses, goggles, face shield, welding helmet, etc., that will be worn during work activities and could interfere with the fit.

B. In order to ensure a good face seal each time a respirator is worn, the following must be observed:

1. The respirator and straps must be in place and worn in the appropriate position. To adjust head bands, pull the free ends tight until a comfortable fit is obtained. All straps shall be secure. The respirator should not be over tightened so as to be uncomfortable on the face.
2. To adjust face piece properly, simply position chin firmly in cup and manually shift mask until the most comfortable position is located. Make final adjustments in the head band and do not break the nasal seal.
3. Facial hair must not interfere with the face seal, since proper fit cannot be assured. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, or long sideburns which cross the respirator sealing surface. Other conditions that may prevent adequate face-to-face piece seal include absence of one or both dentures, or temple bars on glasses (when wearing full face respirators).
4. Proper fit must be checked each time the respirator is worn. This is accomplished by performing a negative and positive fit check.
5. **Negative Pressure Check**
   a) Cover the cartridges/canister with the palms of your hands.
b) Inhale gently until the face piece collapses slightly, and hold the breath for 10 seconds. If the face piece remains slightly collapsed and no inward leakage is observed, the respirator is properly fitted.

6. Positive Pressure Check
   a) Cover the exhalation valve with your palm.
   b) Exhale gently until positive pressure builds in the face piece. Do not blow hard as this will cause leaks.
   c) If no outward leakage is noted, the respirator is fitted properly.

VIII. Care and Maintenance of Respirators

A. The employee is responsible for the cleanliness and maintenance of his/her own respirator, and will ensure that it is ready for use when needed.

B. All equipment must be inspected by the employee before and after each use. Emergency equipment (self-contained breathing apparatus for emergency use) must be inspected before and after each use or at least monthly. A record will be kept of all emergency equipment inspections with the results recorded. Refer to Appendix E for an inspection form for all respirators. Respirators will be inspected for the following:

   1. Tightness of connections
   2. Conditions of face piece
   3. Condition of head bands
   4. Condition of cartridges
   5. Condition of valves
   6. Pliability of rubber or elastomer parts
   7. Deterioration of rubber or elastomer parts

C. Any problems with the respirator should be reported to the employee’s immediate supervisor.

D. Routinely used respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition. Routinely used respirators issued to more than one employee shall be cleaned and disinfected after each use. Respirators maintained for emergency use shall be cleaned and disinfected after each use. To clean and disinfect, carry out the following procedures:

   1. Remove the air purifying elements (cartridges, filters) from the respirator. They should never be washed and disinfected.
   2. Immerse the respirator in a warm (110°F [43°C] maximum) aqueous solution with a mild detergent or cleaner recommended by manufacturer. The respirator face piece and parts may be scrubbed gently with a soft brush.
3. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
   a) A solution of approximately one milliliter of laundry bleach to one liter of water at 110°F; or
   b) A solution of approximately 0.8 milliliters of tincture of iodine (50 ppm iodine) to one liter of water at 110°F.
4. After washing, rinse thoroughly with warm water (110°F) and allow to air dry or dry with clean, lintless cloth.
5. After the respirator is completely dry, inspect for defects, attach the air purifying elements, and store in clean plastic bag.
6. Do not hang respirators on the wall; always store in plastic bag or container. The face piece and exhalation valve must be in a normal position to prevent abnormal set of elastomer parts. All respirators shall be stored in a manner that protects them from damage, dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals.
7. If any part of the respirator is unacceptable, replace that part or the entire respirator before use. Remember, wearing poorly maintained or malfunctioning respirators may be more dangerous than not wearing a respirator at all.

IX. Medical Evaluation

A. Using a respirator may place a physiological burden on employees. The burden will vary with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. The respective departments at Montana Tech shall provide for a medical evaluation to determine the employee’s ability to use a respirator before the employee is fit tested or required to use the respirator in the workplace. EH&S will assist the departments in providing for the required medical evaluations. Montana Tech may discontinue an employee’s medical evaluations when the employee is no longer required to use a respirator.

B. Montana Tech shall identify a licensed health care professional (LHCP) to perform medical evaluations using the medical questionnaire in Appendix A. If an employee gives a positive response to any question among questions 1 through 8 in Section 2, Part A, or whose initial medical evaluation demonstrates the need for a follow-up medical examination, the respective department at Montana Tech shall ensure that a follow-up medical examination is provided. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the LHCP deems necessary to make a final determination.

C. The EH&S Office of Montana Tech shall obtain a written recommendation from the LHCP regarding the employee’s ability to use the respirator. This will include any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which
the respirator will be used. It will also include the need, if any, for follow-up medical evaluations.

D. This medical evaluation will be provided before the employee is fit tested or dons a respirator. The respective departments at Montana Tech shall provide additional medical evaluations under the following conditions:
   1. An employee reports medical signs or symptoms that are related to ability to use a respirator;
   2. The LHCP, supervisor or respirator program administrator indicates that the employee needs to be reevaluated;
   3. Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or
   4. A change in workplace conditions that may result in a substantial increase in the physiological burden placed on an employee.

E. Records of all medical clearances for respirator use shall become a part of the employee’s respirator file kept in the Environmental, Health and Safety Office. These records are confidential, and will be maintained for at least 30 years after the employee’s termination in accordance with 29 CFR 1910.20(d)(1)(l). The medical questionnaire and the results of any medical exams will be maintained by the medical facility. If the medical facility performing the medical evaluations changes, the records shall be transferred to the new facility.

X. Record keeping

The following records must be maintained for the Respiratory Protection Program. The records will be kept in the EH&S Office; confidentiality will be maintained.

A. Completed medical clearance forms;
B. Employee Respirator Fit Testing Records;
C. Employee Training Records;
D. The specific types and models of respirators in use at the facility;
E. Records or reports evaluating the respiratory protection program;
F. SCBA Monthly Inspection Records, if appropriate;
G. Verification that the vendor of compressed air cylinders is supplying Grade “D” air or better.

XI. Respirator Program Evaluation
A. The Environmental, Health and Safety Office shall monitor the effectiveness of this program by annual surveillance and evaluation of work areas where respirators are being used. Refer to Appendix G for Surveillance Evaluation Form.

B. Appropriate changes to the Respiratory Protection Program will be made as necessary.

Questions concerning the Respiratory Protection Program should be directed to your supervisor and/or the Environmental, Health and Safety Office at 4463.
# APPENDICES

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<th>Description</th>
</tr>
</thead>
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<tr>
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<tr>
<td>Appendix F</td>
<td>Respirator Fit Testing Record</td>
</tr>
<tr>
<td>Appendix G</td>
<td>Respiratory Protection Program Evaluation Form</td>
</tr>
</tbody>
</table>
## Appendix A

**RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE**

**Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.**

To the employee: Can you read? (circle one) Yes No

**Your supervisor at Montana Tech must allow you to answer this questionnaire during normal working hours or at a time and place that is convenient to you. To maintain your confidentiality, your supervisor or other employees of Montana Tech must not look at or review your answers, and your supervisor must tell you how to deliver or send this questionnaire to the health care professional who will review it.**

### Part A. Section 1.

The following information must be provided by every employee who has been selected to use any type of respirator. Please print.

<table>
<thead>
<tr>
<th>1. Name:</th>
<th>2. Today’s date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Age (to nearest year):</td>
<td>4. Sex: (circle one) Male Female</td>
</tr>
<tr>
<td>5. Height: ft. in.</td>
<td>6. Weight:</td>
</tr>
<tr>
<td>7. Job title:</td>
<td>8. Phone number where you can be reached by the health care professional who reviews this questionnaire:</td>
</tr>
<tr>
<td>9. Best time to reach you:</td>
<td>10. Has your employer told you how to contact the health care professional who will review this questionnaire? (circle one) yes no</td>
</tr>
<tr>
<td>11. Check the type of respirator you will use (you can check more than one category):</td>
<td>12. Have you worn a respirator? (circle one) yes no</td>
</tr>
<tr>
<td>___Disposable respirator (filter-mask, non-cartridge type)</td>
<td>13. If yes, what type(s)?</td>
</tr>
<tr>
<td>___Half- or full-face air purifying</td>
<td></td>
</tr>
<tr>
<td>___Powered air purifying, SCBA, supplied air</td>
<td></td>
</tr>
</tbody>
</table>

## Part A. Section 2.

**Questions 1-9 below must be answered by every employee who has been selected to use any type of respirator. Please circle “yes” or “no.” If you answer yes to any of these questions, use the space at the end of the questionnaire to explain.**

| 1. Do you currently smoke tobacco or have you smoked tobacco in the last month? | Yes | No |
| 2. Have you ever had any of the following conditions? | |
| a) Seizures (fits) | Yes | No |
| b) Diabetes | Yes | No |
| c) Allergic reactions that interfere with your breathing | Yes | No |
| d) Claustrophobia | Yes | No |
| e) Trouble smelling odors | | |

---

11
3. Have you ever had any of the following pulmonary or lung problems:
   a) Asbestosis………………………………………………………………… Yes No
       .
   b) Asthma…………………………………………………………………… Yes No
   c) Chronic bronchitis……………………………………………………… Yes No
   d) Emphysema……………………………………………………………… Yes No
       .
   e) Pneumonia……………………………………………………………….. Yes No
       .
   f) Tuberculosis……………………………………………………………… Yes No
       .
   g) Silicosis…………………………………………………………………… Yes No
   h) Pneumothorax (collapsed lung)………………………………………… Yes No
   i) Lung cancer……………………………………………………………… Yes No
   j) Broken ribs……………………………………………………………… Yes No
   k) Any chest injuries or surgeries……………………………………….. Yes No
   l) Any other lung problem that you’ve been told about……………… Yes No

4. Do you currently have any of the following symptoms of pulmonary or lung illness?
   a) Shortness of breath………………………………………………………… Yes No
   b) Shortness of breath when walking fast on level ground or walking up a slight hill or incline Yes No
   c) Shortness of breath when walking with other people at an ordinary pace on level ground Yes No
   d) Have to stop for breath when walking at your own pace on level ground Yes No
   e) Shortness of breath when washing or dressing yourself……………… Yes No
   f) Shortness of breath that interferes with your job…………………… Yes No
   g) Coughing that produces phlegm (thick sputum)……………………… Yes No
   h) Coughing that wakes you early in the morning…………………….. Yes No
   i) Coughing that occurs mostly when you are lying down……………… Yes No
   j) Coughing up blood in the last month………………………………… Yes No
   k) Wheezing………………………………………………………………… Yes No
   l) Wheezing that interferes with your job……………………………….. Yes No
   m) Chest pain when you breathe deeply……………………………….. Yes No
   n) Any other symptoms that you think may be related to lung problems…….. Yes No
5. Have you ever had any of the following cardiovascular or heart problems?
   a) Heart attack……………………………………………………………….. Yes
   b) Stroke……………………………………………………………………… No
   c) Angina…………………………………………………………………….. Yes
   d) Heart failure……………………………………………………………… Yes
   e) Swelling in your legs or feet (not caused by walking)……………… Yes
   f) Heart arrhythmia (irregular heart beat)……………………………….. Yes
   g) High blood pressure………………………………………………………. Yes
   h) Any other heart problem that you’ve been told about……………….. Yes

6. Have you ever had any of the following cardiovascular or heart symptoms?
   a) Frequent pain or tightness in your chest……………………………… Yes
   b) Pain or tightness in your chest during physical activity……………… Yes
   c) Pain or tightness in your chest that interferes with your job………… Yes
   d) In the past two years, have you noticed your heart skipping or missing a beat
      Yes
   e) Heartburn or indigestion that is not related to eating……………….. Yes
   f) Any other symptoms that you think may be related to heart or circulation problems
      Yes

7. Do you currently take medication for any of the following problems?
   a) Breathing or lung problems……………………………………………… Yes
   b) Heart trouble……………………………………………………………… Yes
   c) Blood pressure…………………………………………………………….. Yes
   d) Seizures…………………………………………………………………… Yes

8. If you’ve used a respirator, have you ever had any of the following problems?  (If you’ve never used a respirator, go the question 9.)
   a) Eye irritation……………………………………………………………… Yes
   b) Skin allergies or rashes…………………………………………………… Yes
   c) Anxiety…………………………………………………………………….. Yes
   d) General weakness or fatigue……………………………………………… Yes
   e) Any other problems that interferes with your use of a respirator……. Yes

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire?
   Yes
Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Have you ever lost vision in either eye (temporarily or permanently)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Do you currently have any of the following vision problems?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Wear contact lenses</td>
<td></td>
<td></td>
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<tr>
<td>b) Wear glasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Color blind</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Any other eye or vision problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Have you ever had an injury to your ears, including a broken ear drum?</td>
<td></td>
<td></td>
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<tr>
<td>13. Do you currently have any of the following hearing problems?</td>
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<td></td>
</tr>
<tr>
<td>a) Difficulty hearing</td>
<td></td>
<td></td>
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<tr>
<td>b) Wear a hearing aid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Any other hearing or ear problems</td>
<td></td>
<td></td>
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<tr>
<td>14. Have you ever had a back injury?</td>
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<td></td>
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<tr>
<td>15. Do you currently have any of the following musculoskeletal problems?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Weakness in any of your arms, hands, legs, or feet</td>
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<td></td>
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<tr>
<td>b) Back pain</td>
<td></td>
<td></td>
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<tr>
<td>c) Difficulty fully moving your arms and legs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Pain or stiffness when you lean forward or backward at the waist</td>
<td></td>
<td></td>
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<tr>
<td>e) Difficulty fully moving your head up or down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Difficulty fully moving your head side to side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Difficulty bending at your knees</td>
<td></td>
<td></td>
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<tr>
<td>h) Difficulty squatting to the ground</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Climbing a flight of stairs or a ladder carrying more than 25 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j) Any other muscle or skeletal problem that interferes with using a respirator</td>
<td></td>
<td></td>
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</tbody>
</table>

Part B. **Must be completed by all employees. If you answer yes to any of these questions, use the space at the end of the questionnaire to explain.**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen? If &quot;yes,&quot; do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals? If &quot;yes&quot; name the chemicals if you know them:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Have you ever worked with any of the materials or under any of the conditions listed below?
   a) Asbestos…………………………………………………………………….. Yes  No
   b) Silica (e.g., in sandblasting)………………………………………………. Yes  No
   c) Tungsten/cobalt (e.g. grinding or welding this material)……………….. Yes  No
   d) Beryllium……………………………………………………………………. Yes  No
   e) Aluminum…………………………………………………………………… Yes  No
   f) Coal…………………………………………………………………………. Yes  No
   g) Iron………………………………………………………………………….. Yes  No
   h) Tin……………………………………………………………………………. Yes  No
   i) Dusty environments………………………………………………………… Yes  No
   j) Any other hazardous exposures. If “yes” describe these exposures:…….

4. List any second jobs or side businesses you have:

5. List your previous occupations:

6. List your current and previous hobbies:

7. Have you been in the military services?
   If “yes” were you exposed to biological or chemical agents (either in training or combat)?
   Yes  No

8. Have you ever worked on a HAZMAT team?
   Yes  No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier, are you taking any other medicines for any reason, including over-the-counter medications?
   If “yes” name the medications if you know them:
   Yes  No

10. Will you be using any of the following items with your respirator?
    a) HEPA filters………………………………………………………………….. Yes  No
    b) Canisters (for example, gas masks)………………………………………. Yes  No
    c) Cartridges…………………………………………………………………….. Yes  No

11. How often are you expected to use the respirator(s)? Circle yes or no for all answers that apply to you.
    a) Escape only (no rescue)…………………………………………………… Yes  No
    b) Emergency rescue only……………………………………………………. Yes  No
    c) Less than 5 hours per week……………………………………………… Yes  No
    d) Less than 2 hours per week……………………………………………… Yes  No
    e) 2 to 4 hours per day………………………………………………………… Yes  No
    f) Over 4 hours per day………………………………………………………… Yes  No
12. During the period you are using the respirator, is your work effort:
   a) Light (example: sitting while writing or performing light assembly work, or standing while operating a drill press)
      If “yes” how long during average shift? ______hrs._______mins.
      Yes  No
   b) Moderate (example: sitting while nailing, standing while drilling, nailing walking on level surface, pushing wheelbarrow with heavy load (100 lbs.)
      If “yes” how long during average shift? ______hrs._______mins.
      Yes  No
   c) Heavy (example: lifting a heavy load (50 lbs) from floor to waist or shoulder, shoveling, walking up 8-degree grade, climbing stairs with heavy load.
      If “yes” how long during average shift? ______hrs._______mins
      Yes  No

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you’re using your respirator?
    If “yes” describe protective equipment or clothing:
    Yes  No

14. Will you be working under hot conditions (>77°F)?
    Yes  No

15. Will you be working under humid conditions?
    Yes  No

16. Describe the work you’ll be doing while you’re using your respirator:

17. Describe any special or hazardous conditions you might encounter when you’re using your respirator, for example, confined spaces, life-threatening gases:

18. Provide the following information, if you know it, for each toxic substances you’ll be exposed to when you’re using your respirator:

   Name of toxic substance 1:
   Estimated exposure level per shift:
   Duration of exposure per shift:

   Name of toxic substance 2:
   Estimated exposure level per shift:
   Duration of exposure per shift:

19. Describe any special responsibilities you’ll have while using your respirator that may affect the safety and well-being of others (for example, rescue, security):

Please use the following space to make comments for any “yes” answers that need further explaining. Refer to the Section, Part and question number.
APPENDIX B
Hazard Assessment

As required by 29 CFR 1910.134, the following must be included in a hazard assessment to determine the appropriate respiratory protection.

1. The nature of the hazard;
2. The physical and chemical properties of the air contaminant;
3. The adverse health effects of the respiratory hazard;
4. The relevant hazardous exposure level;
5. The results of workplace sampling of airborne concentrations of contaminants;
6. The nature of the work operation or process;
7. The period of time respiratory protection will be worn by employees during the work shift;
8. The work activities of the employees and the potential stress of these work conditions on employees wearing the respirators;
9. Fit test results;
10. Warning properties of the hazardous chemical;
11. The physical characteristics, functional capabilities, and limitations of the various types of respirators.
HAZARD ASSESSMENT FOR RESPIRATOR USE

Employee: _______________________________________________________
Department: _______________________________________________________

1. What hazard is present that would require the use of a respirator?

2. What are the physical and chemical properties of the air contaminant?
   a) Appearance/state (i.e., liquid, solid, color, etc.)
   b) Odor threshold
   c) Flash point
   d) Explosion limits (upper and lower)
   e) Vapor pressure
   f) Specific gravity
   g) Vapor density

3. What are the warning properties of this contaminant? (eye irritation, smell, etc.)

4. What are the potential health effects from exposure to the contaminant?
   a) Acute
   b) Chronic
   c) Target organs

5. What are the exposure limits for this contaminant?
   OSHA PEL ________________ TLV ________________

6. Results of sampling or air monitoring done for this contaminant:

7. What is the nature of the process or operation that requires the use of a respirator?

8. How long will the employee be required to wear the respirator during the work shift?

9. What type of work activities will the employee be engaged in while wearing the respirator?

10. What are the potential stressors from these work activities, i.e., heat stress, cold stress, etc.

11. Has the employee been fit tested? ___yes ___no

12. What type(s) of respirator is the employee allowed to wear based on the fit testing?

13. Based on the above information, what type(s) of respirator can this employee wear to protect himself from the identified hazard?
APPENDIX C
Assigned Protection Factors

<table>
<thead>
<tr>
<th>Type of Respirator</th>
<th>Half mask includes disposable half mask, 1/4 mask, &amp; half masks with elastomeric face pieces</th>
<th>Fullfacepiece</th>
<th>Helmet/hood</th>
<th>Loose-fitting face piece</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air purifying (APR)</td>
<td>10</td>
<td>100</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Powered air purifying</td>
<td>50</td>
<td>1000(^1)</td>
<td>1000(^1)</td>
<td>25</td>
</tr>
<tr>
<td>Atmosphere supplying</td>
<td>10</td>
<td>100</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SCBA (demand)(^2)</td>
<td>10</td>
<td>100</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Air line (demand)</td>
<td>10</td>
<td>100</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Air line Pressure demand</td>
<td>50</td>
<td>1000</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Continuous flow</td>
<td>50</td>
<td>1000</td>
<td>1000</td>
<td>25</td>
</tr>
<tr>
<td>SCBA Pressure demand</td>
<td>---</td>
<td>10,000(^3)</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

1. Protection factors listed are for high-efficiency filters and sorbents (cartridges and canisters). With dust filters, an assigned protection factor of 100 is to be used due to the limitations of the filter.
2. Demand SCBA shall not be used for emergency situations such as fire fighting.
3. Although positive-pressure respirators are currently regarded as providing the highest level of respiratory protection, a limited number of recent simulated workplace studies concluded that all users may not achieve protection factors of 10,000. Based on this limited data, a definitive assigned protection factor should not be listed for positive-pressure SCBAs. For emergency planning purposes where hazardous concentrations can be estimated, an assigned protection factor of no higher than 10,000 should be used.

NOTE: Assigned protection factors are not applicable for escape respirators. For combination respirators, e.g., airline respirators equipped with an air-purifying filter, the mode of operation in use will dictate the assigned protection factor to be applied.
APPENDIX D
Respirator Fit-Testing Procedures

Montana Tech
Standard Practice

Respirator Fit-Testing
Date: April 1998

Page: 1 of 2

1.0 PURPOSE
To define the requirements for qualitative fit-testing for Montana Tech employees required to wear a respirator.

2.0 DEFINITIONS
2.1 Approved Respirator: A respirator that has been tested and found to meet minimum performance standards set by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH).

2.2 Chamber: Nonventilated enclosed area (hood available in S&E 211) placed over the employee’s head to perform the fit testing.

2.3 Clean Shaven: No facial hair is allowed between the face and the sealing surface of the respirator or facial hair that interferes with the valve of the respirator.

2.4 Negative-pressure test: A test of the seal of a respirator facepiece to a subject’s face that is performed both prior to the fit-test and prior to use of the respirator in the working environment. To perform the negative-pressure test, the subject should cover the filter cartridges with his/her hands or with plastic film and inhale. The mask should collapse against the subject’s face and remain collapsed for 10 seconds.

2.5 Positive-pressure test: A test of the seal of a respirator facepiece to a subject’s face that is performed both prior to the fit-test and prior to the use of the respirator in the working environment. To perform a positive-pressure test, the subject should cover the exhalation valve and exhale; a slight pressure buildup should be felt inside the mask with no evidence of outward leakage.

3.0 PRACTICE
3.1 General
a. Respirators shall be provided when such equipment is necessary to protect the health of the employee.

b. Employees will be fit-tested for respirators annually within 30 days of medical approval or if facial features change.

3.2 Sampling equipment
a. Approved negative pressure respirator
b. Organic vapor cartridges (for isoamyl test)
c. HEPA cartridges (for irritant smoke test)
d. Isopropyl alcohol
e. Isoamyl acetate (IAA)
f. Irritant smoke tube
g. Chamber

3.3 Procedure
a. Medical approval
For each employee required to wear a respirator for more than five hours during any work week, Montana Tech shall obtain a written opinion from a licensed physician which states whether the employee has any detected medical condition which would place the employee’s health at increased risk of material impairment from respirator use, and any recommended limitations when using a respirator.

b. Respirator Fitting
(1) The individual and/or the department, with input from EH&S if requested, will select the most comfortable and appropriate respirator. Personal assessment includes:
(a) chin properly placed
(b) position of mask on nose
(c) strap tension
(d) fit across nose bridge
(e) room for safety glasses
(f) distance from nose to chin
(g) room to talk  
(h) tendency to slip  
(i) cheeks filled out  
(j) self-observation in mirror  
(k) adequate time for assessment

(2) The employee shall perform positive and negative pressure fit checks.

(3) Each respirator used for the fitting and fit-testing shall be equipped with organic vapor cartridges for isoamyl acetate test and HEPA cartridges for the irritant smoke test. The employee shall wear the respirator and cartridges for 10 minutes before entering the chamber.

(4) When using isoamyl acetate, the ampul shall be broken and placed in the chamber for two minutes prior to beginning test exercise.

(5) When using irritant smoke, break both ends of the tube, and attach the tube to the bulb. Advise the employee that the smoke can be irritating to the eyes, and instruct the employee to keep his eyes closed during the test. Begin stream of smoke inside chamber, moving around the perimeter of the mask.

(6) The following exercises shall be sequentially performed for both isoamyl and irritant smoke:
   - Breathing normal
   - Breathing deep and regular
   - Turning head side-to-side
   - Nodding head up and down
   - Talking aloud (Read Rainbow Passage)
   - Jog in place
   - Touch toes
   - Breath normal again

(7) If at any time during the test the employee detects the banana-like odor of IAA, the employee shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(8) If a person cannot be fitted with the half-mask respirator, recheck the fit or try a different size, or if necessary, include a full facepiece model in the selection process.

(9) Persons who have successfully passed this fit test may be assigned the use of the tested respirator in atmospheres with up to 10 times the PEL of airborne contaminants.

(10) A respirator permit card will be provided to the workers, and the employee shall sign and present the card when requesting a respirator. The card will indicate the manufacturer, size, and date of the last fit-test.
APPENDIX E
Respirator Inspection Record

Name: ________________________________________
Shop:  ________________________________________

Respirator Type: __dust mask  __ half mask  __1/4 mask  __full-face mask  __SCBA

Use the following guidelines for your inspection. Inspect for:

1. **Disposable respirator**: Holes in filter, straps for elasticity and deterioration, metal nose clip
2. **Face piece (for all types)**: Excessive dirt, cracks, tears, holes, distortion
3. **Face piece (for full face)**: Cracked, scratched or loose-fitting lenses
4. **Head strap**: Breaks or tears, loss of elasticity, broken or malfunctioning buckles or attachments, excessively worn serrations on the head harness
5. **Inhalation and exhalation valves**: Detergent residue, dust particles or dirt on valve or valve seat, cracks, tears, or distortion in valve material or valve seat, missing or defective valve cover
6. **Filter elements**: Proper filter for the hazard, missing or worn gaskets, worn threads, cracks or dents in filter housing, deterioration of gas mask canister harness, service life indicator on applicable models.
7. **Hood, helmet, blouse or full suit**: Rips or torn seams, headgear suspension, cracks or breaks in face shield
8. **Air supply system**: Breathing air quality, breaks or kinks in air supply hoses and end fitting attachments, tightness of connections, proper setting of regulators and valves, correct operation of air-purifying elements, proper operation of carbon monoxide alarms or high-temperature alarms.

<table>
<thead>
<tr>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place ✓ if okay</td>
</tr>
</tbody>
</table>

| Face piece |
| Inhalation valve assembly |
| Exhalation valve assembly |
| Headbands |
| Cartridge holder |
| Filter |
| Harness assembly |
| Hose assembly |
| Speaking diaphragm |
| Gaskets |
| Connections |
| Rubber/elastomer parts |

Notes any defects found, the date, and actions taken:
### Respirator Fit Testing Record

<table>
<thead>
<tr>
<th>Name:</th>
<th>Shop:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Next test due:</td>
</tr>
<tr>
<td>Respirator Model:</td>
<td></td>
</tr>
<tr>
<td>Size:</td>
<td></td>
</tr>
<tr>
<td>Manufacturer:</td>
<td></td>
</tr>
<tr>
<td>Tested by:</td>
<td></td>
</tr>
<tr>
<td>Test(s) used:</td>
<td></td>
</tr>
</tbody>
</table>

**Does the employee require use of other PPE, such as safety glasses, goggles, etc. when wearing a respirator?**

- yes
- no

**If yes, what PPE?**

- |

**Was it worn during testing?**

- yes
- no

<table>
<thead>
<tr>
<th>Test</th>
<th>if passed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive pressure fit</td>
<td></td>
</tr>
<tr>
<td>Negative pressure fit</td>
<td></td>
</tr>
<tr>
<td>Breathing normal</td>
<td></td>
</tr>
<tr>
<td>Breathing deeply</td>
<td></td>
</tr>
<tr>
<td>Turning head side to side slowly</td>
<td></td>
</tr>
<tr>
<td>Nodding head up and down slowly</td>
<td></td>
</tr>
<tr>
<td>Reading Rainbow Passage</td>
<td></td>
</tr>
<tr>
<td>Grimace</td>
<td></td>
</tr>
<tr>
<td>Touch toes/Jog in place</td>
<td></td>
</tr>
<tr>
<td>Breathing normal again</td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

__________________________  _______________________
Employee signature                      Date

__________________________  _______________________
Tester signature                      Date
APPENDIX G
Program Evaluation Form

MONTANA TECH
RESPIRATORY PROTECTION PROGRAM
ANNUAL EVALUATION

Evaluator: _____________________  Location: ___________________________
Date: _________________________

This evaluation is to be conducted annually by the Environmental, Health and Safety Coordinator. Two important aspects of the respiratory program are the periodic surveillance of work areas requiring respirators and an evaluation of the overall effectiveness of the respiratory protection program.

1. Are work area conditions and employee exposures properly surveyed?  yes  no
2. Are respirators selected on the basis of hazards to which the employee is exposed?  yes  no
3. Are selections made by individuals knowledgeable of selection procedures?  yes  no
4. Are only NIOSH/MSHA approved respirators purchased and used?  yes  no
5. Have medical evaluations been performed on the users?  yes  no
6. Where practical, have respirators been issued to the users for their exclusive use?  yes  no
7. Are users given the opportunity to try on several respirators to determine whether the respirator they will be wearing is the best fitting one?  yes  no
8. Is fit testing done at appropriate intervals?  yes  no
9. Are those users who require corrective lenses properly fitted?  yes  no
10. Are users prohibited from wearing contact lenses when using respirators?  yes  no
11. Are respirators cleaned and disinfected after each use when different people use the same device, or as frequently as necessary for devices issued to individual users?  yes  no
12. Are respirators inspected before and after each use and during cleaning?  yes  no
13. Are individual records kept of respirator inspections?  yes  no
14. Are qualified individual/users instructed in inspection techniques?  yes  no
15. Is respiratory protective equipment designated for “emergency use” inspected monthly, in addition to after each use?  yes  no
16. Is a record kept of the inspection of “emergency use” respiratory protective equipment?  yes  no
17. Are respirators stored so as to protect them from dust, sunlight, heat, excessive or moisture, or damaging chemicals?  yes  no
18. Are generic replacement parts used instead of the manufacturer’s?  yes  no
19. Are repairs made by knowledgeable individuals?  yes  no
20. Are SCBA repairs made only by certified personnel?  yes  no
21. Are respirator users trained annually to use their respirator properly?  yes  no
22. Are respirator users trained in the selection of respirators?  yes  no