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Colorado School of Mines Respiratory Protection Program

1. Introduction

This document establishes the Colorado School of Mines (CSM) written compliance program for respiratory protection, as required by the Occupational Safety and Health Administration (OSHA) under Title 29 Code of Federal Regulations Part 1910.134. Appendix A of this Respiratory Protection Program contains a link to the Standard).

This Respiratory Protection Program addresses the use of respiratory protection as a method to protect CSM employees and students from exposures to airborne biological, chemical, and physical agents to safe levels below OSHA permissible exposure limits, as well as from oxygen deficient atmospheres (i.e.<19.5% O₂) and immediately dangerous to life and health (IDLH) conditions.

Whenever feasible, engineering controls and administrative work practice controls will be employed to maintain worker exposures below exposure limits and at a safe level. Respiratory protection shall only be required if these controls are not feasible or are not able to adequately reduce exposures to airborne contaminants.

The Environmental Health and Safety Department (EHS) shall administer all aspects of this Respiratory Protection Program.

2. Responsibilities

Various CSM departments and employees have responsibilities under this program, including:

a. Environmental Health & Safety Department

- Preparing, reviewing, and periodically revising this program;
- Providing and/or overseeing respirator fit-testing and training;
- Making information and training materials available to potentially affected employees;
- Monitoring and evaluating the need for respiratory protection in the workplace;
- Providing guidance to supervisors and employees in the selection of approved respirators;
- Maintaining records of exposure assessments, training, and respirator fit testing;
- Developing and implementing a medical surveillance program for respirator users;
- Ensuring that affected employees participate in medical surveillance program;
- Provide notifications to respirator users to schedule exams in accordance with the CSM Medical Surveillance Program;
- Reviewing medical surveillance records;
- Maintaining medical surveillance records;
- Supplying approved respirators to affected employees free-of-charge; and
- Requiring affected employees to wear respirators.

b. Supervisors

- Providing new employees with informal on-the-job training about potential respiratory hazards, personal protective equipment requirements, and the elements of this Program;
- Notifying CSM EHS about workplace conditions and potentially affected employees who are covered by this Program;
- Notifying potentially affected employees of the Medical Surveillance Program requirements; and
- Ensuring that affected employees receive respirator training and fit-testing prior to working with the respirator, and annually thereafter.

c. Affected Employees

- Observing the procedures and requirements outlined in this Program;
- Attending initial respirator training and annual training and fit testing thereafter;
- Scheduling and participating in medical surveillance program;
- Conducting positive and negative pressure check before each use;
- Inspecting respirators before and after each use;
- Cleaning, disinfecting and storing respirator for future use.
- Wearing approved respirators as required; and
- Notifying supervisors and EHS of changes in the workplace that could change exposures.

d. Vice President of Finance and Administration

- Providing financial resources to the EHS Department to adequately administer this plan for the CSM campus; and
- Administering disciplinary action for affected employees who willfully disregard the requirements of this plan.

3. Exposure Assessments

Potential exposures to hazardous materials and conditions at CSM are routinely evaluated through regular workplace inspections and upon employee or supervisor request. EHS takes all practical efforts to ensure that engineering or other controls are available and implemented to eliminate the need for respiratory protection. Nevertheless, certain situations and operations continue to require the use of respirators where exposures cannot be managed below the applicable permissible exposure limit. In addition, respirators may be required or desired because of the odor or irritation associated with chemical exposures, even though they may be well below all applicable exposure limits.

In the absence of an OSHA permissible exposure limit (PEL), commonly accepted guidelines such as the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) and the National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) will be referenced to evaluate potential airborne

exposures from a particular operation or occupational environment. Airborne concentrations of hazardous agents may be predicted on the basis of past experience, mathematical calculations, published results for similar work, or actual air sampling. Where air sampling is needed, measurements will be made with calibrated equipment operated by trained safety and health personnel. These personnel may be members of the School's EHS staff or contracted by EHS as an independent Industrial Hygienist. Monitoring will be repeated when changes occur which could render respiratory protective equipment inadequate, require more protective respiratory protection, or changes in job tasks will require new employees to be included in this Program.

4. Respirator Selection

Respirators are selected on the basis of workplace hazard assessments, as well as guidance from 29 CFR1910.134, the American National Standard *Practices for Respiratory Protection Z88.2-1992*, the NIOSH *Technical Guide to Industrial Respiratory Protection*, and the latest version of the NIOSH *Pocket Guide to Chemical Hazards*. Final selection of any respiratory protective device must be made in consultation with EHS staff members. Only respirators with a NIOSH approval may be used.

Respirators are selected on the basis of the anticipated health hazard(s), considering the following factors:

- Chemical, physical, or biological agent(s) present in the work environment;
- Physical state of contaminants (i.e., gas, vapor, dust, aerosol);
- OSHA PEL and immediately dangerous to life and health (IDLH) levels for the agent. In the absence of a PEL, other suitable exposure guidelines (ACGIH TLV or NIOSH REL) or known toxicity of the agent will be considered;
- Anticipated airborne concentration of agent(s) based upon either past experience, mathematical predictions, published results from similar operations, or actual airborne concentrations measured during air sampling activities. If the concentration cannot be predicted or if the contaminant(s) are unknown, respiratory protection must be upgraded to self-contained breathing apparatus (SCBA);
- Assigned protection factor for the respirator type;
- Potential for skin absorption or severe eye irritation;
- Potential for oxygen deficiency: and,
- Nature and duration of the activity requiring respiratory protection.

Only respirators that can provide protection in excess of the anticipated airborne concentration will be selected (i.e., the assigned protection factor *times* the permissible exposure limit must *exceed* the anticipated airborne concentration). The NIOSH Guide to Respirator Selection and the respirator/cartridge selection worksheet Contained in Appendix B of this Program shall be used as a guideline for selecting the most appropriate respiratory protection.

At CSM, negative pressure air purifying respirators and powered air purifying respirators (PAPRs) are typically sufficient for routine work operations requiring respiratory protection. Cartridge selection is made in accordance with the filtration capabilities; the appropriate cartridge or filter can be verified by EHS on a case by case basis. Cartridges for gases and

vapors must either have an end-of-service-life indicator (ESLI), or must be changed in accordance with the respirator cartridge change schedule described in Appendix C of this Respiratory Protection Program. Positive pressure-demand SCBA is used for emergency response, unknown or oxygen deficient atmospheres, when there is no appropriate filtering cartridge available, or in other high hazard situations. A list of approved respirators and their typical uses appears in Appendix D of this Program.

5. Restrictions

Respirators requiring a tight face seal for proper performance may not be worn if certain physical or health conditions prevent obtaining a tight seal. These may include: eyeglasses (with tight fitting full facepiece respirators); facial hair that interferes with the seal; punctured eardrum; articles of clothing that affect fit; other physical, health, or prosthetic conditions that interrupt or preclude an effective respirator fit.

Each of these conditions may be remedied as follows:

- Eyeglass Temple Pieces – Where a full-face negative pressure respirator must be worn, a spectacle kit that fits the respirator must be provided to the employee free-of-charge. The employee will then need to visit an optometrist during regular working hours to arrange for the lens to be fabricated to the required prescription. Although the practice is strongly discouraged, contact lenses may be worn provided the respirator is of full-face design.
- Facial Hair Impeding Effective Seal – Where an employee is required to wear a tight-fitting negative-pressure respirator, and facial hair impedes an effective facial seal, the hair must be removed before that respirator can be worn.
- Clothing – Clothing, jewelry, or other personal items worn that prevent making an effective facial seal must be removed so that the respirator can be properly worn.
- Other Issues – Other issues (e.g., prosthetics, handicaps, facial malformations) that could prevent the effective use of a respirator will be addressed on a case-by-case basis with the employee and the EHS office.

6. Equipment Acceptance Criteria

Respiratory protection devices, including cartridges for air purifying respirators, must be approved by NIOSH, and Grade D or better compressed air used in all supplied air respirator systems. The CSM EHS office works with the City of Golden Fire Department to refill SCBA bottles. A local dive shop may also be used to refill the SCBA bottles.

7. Fit Testing

Employees who are required to use a tight-fitting respirator facepiece for protection against airborne contaminants must be fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter. In addition to the fit test, the employee should conduct a respirator seal check prior to each use. User seal check procedures as mandated by OSHA are outlined in Appendix E of this Program.

Qualitative fit-testing verifies an assigned protection factor of 10 for the disposable N95 and N100 respirators. Qualitative fit-testing also verifies an assigned protection factor of 10 for ½ face respirators and an assigned protection factor of 50 for full face respirators. If a higher assigned protection factor is needed for full face air purifying respirator, a quantitative fit-test will be conducted. Qualitative fit-testing also verifies an assigned protection factor of 25 for hood style powered air purifying respirators (PAPR).

Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting PAPR shall be accomplished by performing qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

Qualitative fit testing of these respirators shall be accomplished by temporarily converting the facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying respirator or tight-fitting PAPR.

Hood style PAPRs do not require fit testing under OSHA in 29 CFR 1910.134. CSM EHS can conduct a fit check on the hood style PAPR if restrictions listed in Section 5 prohibit an employee from safely wearing a tight fitting air purifying respirator.

Quantitative fit-testing is performed as needed using equipment provided by an independent firm who specializes in quantitative fit testing. This fit testing is performed following the procedures mandated by OSHA in 29CFR1910.134 and available in Appendix A of this Respiratory Protection Program.

Fit testing is repeated annually and must also be repeated if the user's health/physical characteristics significantly change (e.g., surgery, accident, change or loss of dentures). The issue of a new respirator requires a fit test prior to use.

Records of fit testing are maintained by EHS in both paper and electronic files. See Appendix F of this Respiratory Protection Program for fit testing procedures and recordkeeping forms.

Qualitative fit testing is performed by EHS using irritant smoke, saccharin, bitrex, or isoamyl acetate ("banana oil").

8. Training

Employees and supervisors who are required to wear respirators during employment at CSM receive initial training in the proper use, care, and limitations of the selected respirator; details of this program; and on OSHA's requirements under 29 CFR1910.134. At a minimum, the following items are covered during the training session:

- The nature of the respiratory hazard (i.e., what specific chemical substances or microbiological species are present; what areas, operations, or conditions involve potentially hazardous exposures; and what effects may result, if respirators are not used).

- An explanation of why engineering controls are not immediately possible and a discussion of what efforts are being made to eliminate or minimize the need for respirators.
- An explanation of why the respirator type selected is correct for the application and what factors affect selection.
- A discussion and demonstration on how to use the respirator; i.e., how to inspect, put on and remove, check the seals, etc.
- Instruction on the proper techniques and importance of cleaning, disinfection, inspection, maintenance, and storage of the respirator.
- A discussion of the capabilities and limitations of respirators (i.e., in what environments or under what circumstances (such as oxygen deficiency) the respirator does not offer adequate protection) and any warning signs (odor, etc.) that may indicate the respirator is not functioning properly.
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
- The general requirements of OSHA’s respirator standard.

See Appendix G of this Program for an outline of the respirator training program.

9. Voluntary Use

Under some circumstances, employees may wish to use respiratory protection equipment for their own comfort or sense of well being, even when there is no recognized hazard or overexposure. Respirator use in these circumstances would be considered “voluntary” and many elements of OSHA’s respiratory protection standard would not apply. For voluntary users, annual respirator fit testing is not required. However, EHS recommends initial fit testing and annual thereafter to help ensure proper fit. EHS also recommends completion of an initial training class on respiratory protection.

Voluntary users of filtering facepiece respirators (N95, N100) commonly referred to as dust masks are not required to participate in the medical surveillance program.

Voluntary users of all other respirators are required to complete the Medical Qualification Questionnaire to ensure that the respirator itself is not a hazard to the employee. See Appendix H of this Respiratory Protection Plan for the Medical Qualification Questionnaire.

Those employees who are not required to wear respirators but do so on a voluntary basis are provided with the required information from Appendix D from 29 CFR1910.134, and are invited to attend respiratory training. See Appendix I for a copy of the required information given to voluntary respirator wearers.

10. Equipment Inspection

Employees must inspect their respirator before and after each use, including face seals and shield (full face units), cartridge receptacles, straps, and inhalation and exhalation diaphragms. Components made of rubber, silicone, or another elastomer must be inspected for pliability and any signs of deterioration. If any parts are damaged, the unit must be immediately taken out of service and notification provided to EHS so that a suitable replacement or repair can be made. Respirators for emergency use and all SCBAs must also be inspected on a monthly basis (Appendix J). The most current inspection record is kept with the equipment. Blank inspection forms for the SCBAs are available in the EHS office.

11. Equipment Use

When donning a respirator, hair must be pulled back and away from the seal area, and negative and/or positive pressure seal checks conducted to evaluate the facial fit and unit integrity. If an airtight seal cannot be made by adjusting the tightening straps, then the respirator must be inspected for damage and either repaired or replaced.

When using a respirator, employees must immediately stop work and leave the area if they:

- Detect vapor or gas breakthrough, changes in breathing resistance, or leakage on the facepiece,
- Develop any signs or symptoms of over-exposure,
- Are alerted to end-of-service life indicator or low air alarm (for SCBA),
- Need to wash their face and respirator facepiece as necessary to prevent eye or skin irritation associated with respirator use, or
- Need to replace the respirator or the filter, cartridge, or canister elements.

In the event that a possible exposure may have occurred during respirator use, notify EHS and a supervisor for assistance and possible medical follow-up. Remove the respirator from service and inspect it for damage or other problems. If the cause cannot be identified and corrected, contact EHS to investigate the exposure and evaluate work procedures to prevent potential episodes in the future.

12. Additional Requirements for Use of Self-Contained Breathing Apparatus (SCBA)

To prevent tampering or inadvertent damage, SCBAs must be stored in clearly identified emergency equipment areas (or bags) under the direct control of the users. Compressed air cylinders must be kept fully charged and the equipment inspected on a monthly basis. The inspection includes checking tank pressure, assuring that components are present and in working condition, and evaluating proper function of regulators and warning devices.

In areas where a user could, upon respirator failure, be overcome by toxic materials or an oxygen-deficient atmosphere, at least one partner and two additional support or back-up persons must be present. Support personnel will be equipped with SCBAs and other emergency response equipment of equal or greater protection than that worn by the initial entrants. Prior to initial

entry into such a work area, EHS will conduct a pre-entry briefing to discuss the area, its potential hazards, and the actions to be taken in the event of an accident or emergency. Depending upon the work area, additional rescue equipment may be needed (e.g., safety harness and retrieval lines). Confined space entry is prohibited unless the requirements for CSM's Confined Space Entry Program have been met.

13. Equipment Maintenance and Storage

Respirators should be cleaned with detergent and water after each use, and then air dried before storing. See Appendix K for respirator cleaning procedures. Shared respirators must be disinfected with either isopropanol or an elastomer-safe disinfectant such as benzalkonium chloride pads. Store respirators in sealable plastic bags away from sources of potential contamination, and never stack them under heavy items that could deform the elastomer facepiece. Air purifying cartridges and canisters should be removed from the respirator after use and discarded. However, when used for only a short duration against relatively low concentrations of contaminants, cartridges may be sealed in an impermeable plastic bag and reused at a later date. Always store the cartridge separate from the respirator facepiece.

Cartridges can be reused until an end-of-service life indicator activates, the time period indicated in the cartridge change schedule has elapsed, breakthrough has occurred (i.e., odor detected), or resistance to breathing is detected, whichever comes first. When storing cartridges for reuse, a written record showing the date, contaminant(s), and duration of use must be written on the cartridges. See respirator cartridge change schedule in Appendix C of this Program.

Discard N-95 dust masks at the end of your shift, or after use.

Repairs to respirators may only be made by the manufacturer, authorized equipment service contractor, or by CSM staff trained in such repair. No adjustments or modifications can be made beyond the manufacturer's recommendations. SCBA air cylinders must be regularly tested and maintained by a manufacturer-approved service contractor. Routine cylinder air refilling is typically performed by the City of Golden Fire Department.

The entire respirator, including all parts, must be NIOSH or MSHA approved. The approval is for the entire unit, and any mixing of brands (i.e. North cartridges on an MSA respirator, or inhalation valves for a Survivair respirator on an AO respirator) voids the approval and is prohibited.

14. Medical Surveillance

Employees who are required to wear respiratory protection must be medically evaluated by a physician or licensed health-care professional (PLHCP). This evaluation is to determine the user's medical fitness to wear the type of respirator required under the anticipated job and workplace conditions. The medical evaluation must be conducted prior to issuance of respiratory protection.

The medical surveillance services are available to affected employees, at reasonable times and places during the employees normal work hours. Medical Surveillance is managed under the supervision of a (PLHCP), and in accordance with recommendations made by OSHA. All costs associated with medical evaluations related to the use of respiratory protection are paid by EHS.

EHS maintains the CSM Medical Surveillance Program. EHS maintains a contract with a licensed occupational medicine physician, clinic, or PLHCP to perform medical evaluations to support this Respiratory Protection Program.

Medical evaluations are provided for all employees who are required to wear a respirator at CSM. Required use includes protection from airborne respiratory hazards where engineering and or administrative controls cannot adequately protect employees.

Voluntary use, protection from nuisance dust and respirator use in non-hazardous environments equipped with adequate engineering controls is not defined as required use. Voluntary use of tight fitting respirators does require the user to complete the Medical Evaluation Questionnaire, review of the questionnaire by a PLHCP and completion of a Pulmonary Function Test.

The requirements of this respiratory protection program are included in the Medical Surveillance Program for employees who participate in cadmium research operations, are members of the campus spill team, work with hazardous waste, or are part of the asbestos team. This is not an additional requirement for these employees.

The following identifies the procedures for employees to participate in the medical surveillance program for respirator use.

1. Contact EHS to conduct a hazard analysis and exposure assessment to determine the need for respiratory protection.
2. Receive training covering respiratory protection and the elements of this Respiratory Protection Program.
3. Obtain a completed PLHCP Respirator Information Form from EHS. See Appendix L contained in this Respiratory Protection Program.
4. Complete a medical evaluation by scheduling an appointment with the PLHCP contracted by EHS. The evaluation consists of the following:
 - Review of the completed questionnaire contained in Appendix H of this Respiratory Protection Program by the PLHCP.
 - Completion of a Pulmonary Function Test administered by the PLHCP.
 - Upon PLHCP discretion, complete a respirator physical.
5. Following the medical evaluation, the PLHCP shall provide a written opinion within 30 days of the evaluation to the employee with a copy to EHS containing the following information:
 - Whether the PLHCP considers the individual medically able to wear respiratory protection under the conditions described;
 - Any limitations on respirator use related to the medical condition of individual, including a medical recommendation for the individual to use a PAPR instead of an APR; and

- The need, if any, for a follow-up evaluation that typically includes a respirator physical.
6. Additional medical evaluations are required when:
 - Individual reports medical signs or symptoms related to the ability to use a respirator.
 - The PLHCP recommends an employee for re-evaluation.
 - Information obtained during program evaluation or fit testing indicates a need for re-evaluation.
 - There are changes in workplace conditions (physical work effort, PPE, and temperature) that may result in substantial increase in physiological burden placed on employees.
 7. The employee is responsible for scheduling and attending the medical examination with the PLHCP.
 8. All examinations and questionnaires will remain confidential between the employee and the PLHCP. EHS will only retain the PLHCP written recommendations regarding each employee's ability to wear a respirator.

Confidential post-exposure medical evaluation and follow-up is made after documented or suspected over-exposures. Employees must notify their supervisors of such incidents and assist EHS in documenting all relevant conditions of the incident. This information will then be provided to the PLHCO to arrange for any required medical follow-up.

A written opinion from the healthcare professional will be obtained by EHS after the initial medical qualification examination as well as after any over-exposure incidents. Copies of this information will be provided to the affected employee.

15. Respirator Program Evaluation

Workplace evaluations will be conducted during normal area walkthroughs and during respirator training classes. The Respirator Program Administrator will continually evaluate the work areas to ensure that this program is being properly implemented and that it continues to be effective. Affected employees shall be regularly consulted about the effectiveness of the respirator program during walkthroughs and during annual respirator training.

This Respiratory Protection Program shall be updated as needed.

List of Appendices:

- A. OSHA's Respiratory Protection Standard (29 CFR Part 1910.134)**
- B. NIOSH Respirator Selection Decision Tree and Worksheet**
- C. Respirator Cartridge Change Schedule**
- D. Approved Respirator List and Typical Uses**
- E. User Seal Check**
- F. Respirator Fit Testing Exercises and Record Sheet**
- G. Respirator Training Program Outline**
- H. OSHA Medical Qualification Questionnaire**
- I. Voluntary Use of Dust Masks - Required Information**
- J. SCBA Inspection Record Sheet**
- K. Respirator Cleaning Procedures**
- L. PLHCP Respirator Information Form**

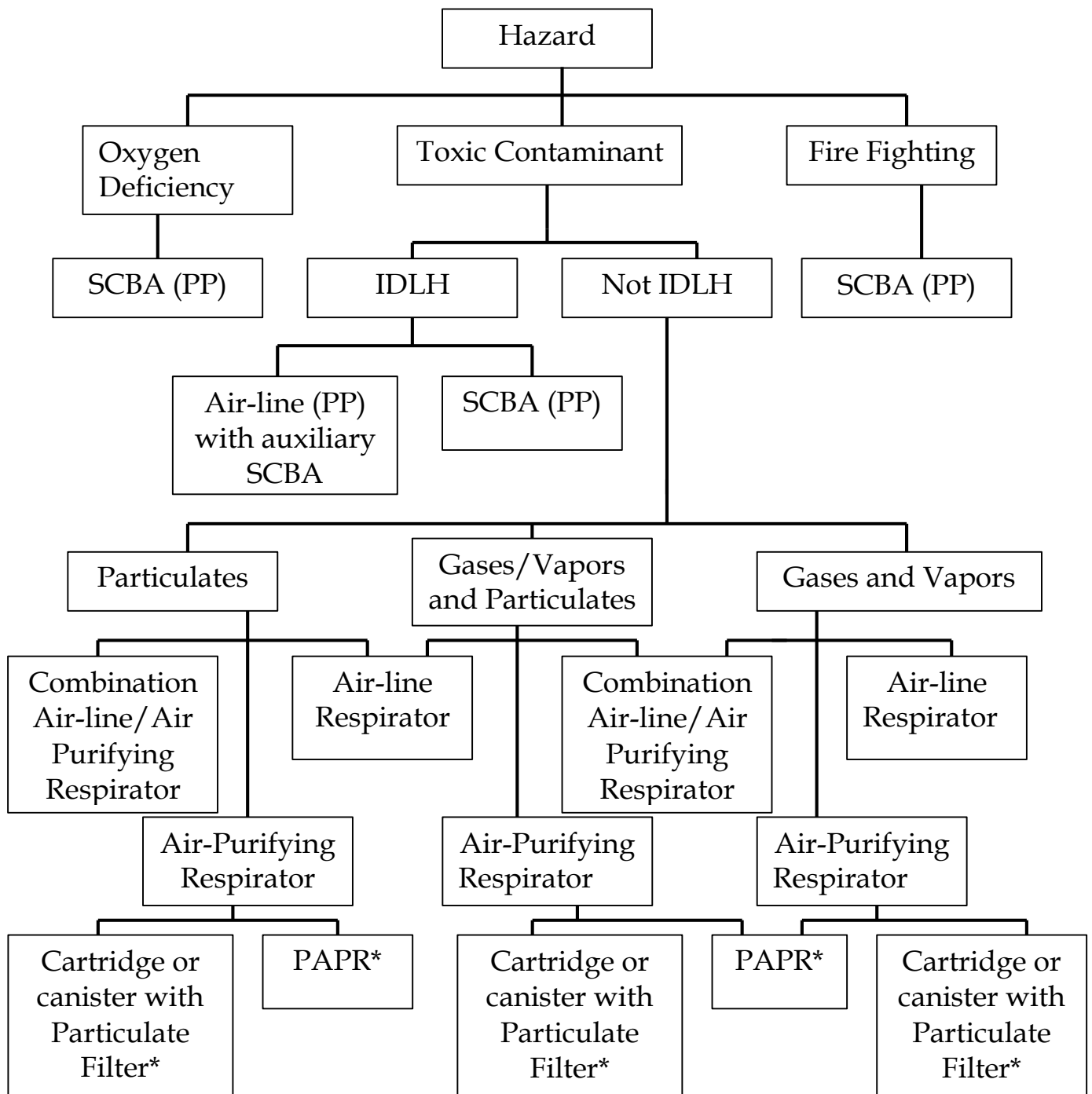
Appendix A
OSHA's Respiratory Protection Standard
(29 CFR Part 1910.134)

<http://www.osha.gov/>

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12716&p_table=standards

Appendix B

NIOSH GUIDE TO RESPIRATOR SELECTION
DECISION TREE



*See Appendix C – RESPIRATOR AND CARTRIDGE SELECTION GUIDE

SCBA – Self-Contained Breathing Apparatus. IDLH – Immediately Dangerous to Life and Health.

PP – Positive Pressure. Includes pressure demand units, does not include demand units.

PAPR – Powered Air-Purifying Respirator.

RESPIRATOR SELECTION WORKSHEET

Job Title/Employee(s) Affected:

Operation/Environment:

Airborne Contaminant(s):

Source of Contaminant(s):

Other Hazard(s) Present:

Control(s):

Anticipated Airborne Contaminant Level (AACL):

Basis: Exposure Monitoring

Calculations: (attach or show on reverse)

Other:

Acceptable Respirator Option(s):

Respirator Type	Required Conditions of Use			PEL	APF	PEL x APF
	O2 deficiency (<19.5% O2)	AACL > IDLH	Emergency, unknown, or non-quantifiable AACL			
SCBA						
PAPR						
Full Face APR						
Half Face APR						
Disposable Nuisance Dust Mask						
Other						

Is $PEL \times APF > AACL$? If Yes, respirator meets basic selection criteria

RESPIRATOR AND CARTRIDGE SELECTION GUIDE

Air Purifying Respirators Canister Color Codes

Atmospheric contaminants to be protected against	Color Assignment
Acid gases (Chlorine, Hydrogen Chloride, Sulfur Dioxide, Hydrogen Fluoride, Chlorine Dioxide) and Formaldehyde Cartridge	White
Organic vapors – Chemicals with poor warning properties where the odor threshold exceeds the PEL, select SCBA	Black
Ammonia and Methylamine Cartridge	Green
Acid gases & organic vapors - Chemicals with poor warning properties where the odor threshold exceeds the PEL, select SCBA	Yellow
Particulates	Purple (magenta)
Radioactive materials, excepting tritium & noble gases	Purple (magenta)
Mercury Vapor and Chlorine Cartridge with End-of-Service-Life-Indicator (ESLI) for Mercury Vapor	Olive
Multi-Purpose Cartridge - Organic Vapor, Ammonia, Methylamine, Formaldehyde and Acid Gas (Chlorine, Hydrogen Chloride, Sulfur Dioxide, Hydrogen Sulfide [escape], Hydrogen Fluoride, Chlorine Dioxide)	Olive

Choosing the correct respiratory protection equipment involves several steps:

- a) Determination of the hazard;
- b) Choosing equipment that is certified for the hazard; and
- c) Assuring the device is performing as it is intended.

Proper selection of respirators must be made according to the OSHA requirements set forth in 29 CFR 1910.134 (d). All respiratory protective devices must be certified by NIOSH for the contaminant or situation to which employees may be exposed. The respirator shall be used in compliance with the conditions of the NIOSH certification. In addition, there are substance-specific OSHA standards that require additional criteria for respirator selection (for example, 29 CFR 1910.1001 (g) Asbestos). All such requirements of each applicable OSHA standard must be observed.

Chemical and physical properties of the contaminant, as well as the toxicity and concentration of the hazardous material and the amount of oxygen present must be considered in selecting the proper respirator. The nature and extent of the hazard, the work rate, the area to be covered, mobility, length of exposure time, work requirements and conditions, as well as the limitations and characteristics of available respirators, also are selection factors that must be considered.

Appendix C

RESPIRATOR CARTRIDGE CHANGE SCHEDULE

A change schedule is the part of the written respirator program which says how often cartridges should be replaced and what information was relied upon to make this judgment. A cartridge's useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends upon many factors, including environmental conditions, breathing rate, cartridge filtering capacity, and the amount of contaminants in the air. It is suggested that employers apply a safety factor to the service life estimate to assure that the change schedule is a conservative estimate.

The following change schedule is determined based on OSHA standards, manufacturer's recommendations, and the ACGIH "rule of thumb".

CONTAMINANT NAME	CHANGE SCHEDULE										
Acrylonitrile	End of shift.										
Ammonia	Maximum 8 hours total (up to 125 ppm)										
Benzene	Discard after use.										
Butadiene	every 1, 2, 3, or 4 hours based on the following: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="text-align: center;">Concentration</th> <th style="text-align: center;">Replacement Schedule</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><=5 ppm</td> <td style="text-align: center;">Every 4 hours</td> </tr> <tr> <td style="text-align: center;"><=10 ppm</td> <td style="text-align: center;">Every 3 hours</td> </tr> <tr> <td style="text-align: center;"><=25 ppm</td> <td style="text-align: center;">Every 2 hours</td> </tr> <tr> <td style="text-align: center;"><=50 ppm</td> <td style="text-align: center;">Every 1 hour</td> </tr> </tbody> </table> Discard after use.	Concentration	Replacement Schedule	<=5 ppm	Every 4 hours	<=10 ppm	Every 3 hours	<=25 ppm	Every 2 hours	<=50 ppm	Every 1 hour
Concentration	Replacement Schedule										
<=5 ppm	Every 4 hours										
<=10 ppm	Every 3 hours										
<=25 ppm	Every 2 hours										
<=50 ppm	Every 1 hour										
Formaldehyde	Following 3 hours of use or at the completion of work activities, whichever occurs first.										
HCl, SO ₂ , Chlorine	One shift only										
Methylene Chloride	No approved respirator cartridges - must use supplied air										
Nitric Acid	No approved respirator cartridges - must use supplied air										
Organic Vapors	8 hours use total (up to 200 ppm)										
Vinyl chloride	Single use only										

All North Safety Products, Inc., respirator cartridges for organic vapors and acid gases not listed above should be changed out using the North Safety Products, Inc. Cartridge Service Life Estimation web page available at:

http://www.northsafety.com/TriggerWorkflow.aspx?WorkflowModuleGUID=a3c3bf34-f500-45aa-a73f-13a246669a21&Alias=NSUS&SB_ContentItemGuid=e985936e-23c2-4a6a-ba14-8dc17277a43f&ReuseToken=True&CDTID=1e233702-0176-4244-8ff3-376802314de1

Please contact EHS for assistance using this cartridge Service Life Estimation web page.

Please contact EHS to calculate the end of service life for other manufacturer's respirator cartridges.

HEPA filters should be changed out if any of the following conditions occur.

- Restricted breathing:
- Visibly dirty;
- Wet
- Potentially compromised.

Filtering dust masks should be discarded following use or earlier if visibly dirty, contaminated, or if the mask restricts breathing.

Appendix D

APPROVED RESPIRATOR LIST AND TYPICAL USES

Type	Style	Intended Use(s) ¹	Respirator Description
Air Supplying	Self-contained breathing apparatus (SCBA)	Emergency conditions with unknowns, high concentrations of toxic materials, potential oxygen deficient environments, back-up rescue/assistance teams. Normal operations when respiratory protection is required/desired and no approved air purifying cartridge/filter is available.	Positive pressure-demand self contained breathing apparatus with minimum 30 min. air supply cylinder, low air alarm
Air Purifying		Nuisance particulates where concentration is anticipated to be below any applicable action limits	Disposable nuisance dust/particulate Mask. NIOSH approved (N,R,P) 95, 99, and 100, filtering facepieces.
Air Purifying	½ Face, disposable (2-strap, NIOSH approved)	Potential exposure to infectious aerosols in clinical/healthcare settings	NIOSH approved (N,R,P) 95, 99, and 100, filtering facepieces
Air Purifying	½ Mask, Reusable	Asbestos, other toxic dusts/aerosols/mists/fumes, organic vapors, acid gases/mists, etc.	NIOSH/MSHA approved, form-fitting polymer face piece with appropriate filters and/or cartridges
Air-Purifying	Full-Face Reusable	Asbestos, other toxic dusts/aerosols/mists/fumes, organic vapors, formaldehyde, acid gases/mists, etc., lachrymators.	NIOSH/MSHA approved, form-fitting polymer facepiece mask with appropriate filters and/or cartridges or large capacity single canister.
Air Purifying	Powered Air Purifying Respirators (PAPR)	Asbestos, other toxic dusts/aerosols/mists/fumes, organic vapors, formaldehyde, acid gases/mists, etc.,	NIOSH approved, positive pressure with fully charged battery and minimum flow of 6 cubic feet per minute with filters or cartridges.

Appendix E

RESPIRATOR USER SEAL CHECK

Persons using tight-fitting respirators must perform a user seal check to ensure an adequate seal is achieved each time the respirator is used. Both the positive and negative pressure checks listed in this Appendix or the respirator manufacturer's recommended user seal check method must be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

A. Positive pressure check

Close off the exhalation valve and exhale gently into the facepiece. The fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air through the seal. For some respirator brands, this method of leak testing requires the wearer to remove the exhalation valve cover before closing off the exhalation valve. Carefully replace the valve after the test.

B. Negative pressure check

Close off the inlet opening of the canister or cartridge by covering with the palm of the hands or by replacing the filter seal(s). Inhale gently so that the facepiece collapses slightly and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the respirator to face seal is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

Appendix F

Qualitative Respirator Fit Test and Recordkeeping Procedures

The fit test shall be performed in the following manner using a fit test challenge agent such as isoamyl acetate, saccharin, or bitrex.

1. Normal Breathing – In a standing position, without talking or moving the head, the fit test subject shall breathe normally.
2. Deep Breathing – In a standing position and without moving the head, the fit test subject shall breathe slowly and deeply.
3. Move Head – Standing in place, the fit test subject shall turn his/her head from side to side. The test subject shall be instructed to hold several positions and breathe deeply. Afterwards, the test subject shall be instructed to move his/her head slowly upwards towards the ceiling and downwards towards the floor. The fit test subject shall be instructed to hold several positions and breathe deeply. Afterwards, the test subject shall be instructed to move his/her head in a circular motion. The fit test subject shall be instructed to hold several positions and breathe deeply.
4. Talking – In a standing position, the fit test subject shall talk out loud and engage in conversation with the fit test supervisor. The fit test subject may also recite The Rainbow Passage.

The Rainbow Passage - When the sunlight strikes raindrops in the air, they act as a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

5. Leaning – In a standing position, the fit test subject shall bend at the waist in order to touch his/her toes. If a fit test booth is used, an easy jog in place may substitute the leaning exercise.
6. Normal Breathing – In a standing position, without talking or moving the head, the fit test subject shall breathe normally.
7. Test Agent Sensitivity – At the completion of a successful fit test, the fit test subject must remove the respirator and confirm if he/she can smell or taste the fit test challenge agent. If the fit test subject cannot smell or taste the fit test agent, the fit test is not valid and must be repeated using a different test agent.

The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated. If the wearer smells the fit test challenge agent, or experiences irritation, the fit is not valid and another size or style mask must be obtained, or the unit adjusted until a successful fit test is achieved.

Appendix G

Respirator Training Outline

Respirator Training Program Outline

1. Introduction
2. Engineering Controls versus PPE
3. Routes of Exposure
4. OSHA's Respirator Standard 29 CFR 1910.134
5. Supplied Air Respirators (SARs) versus Air Purifying Respirators (APRs)
6. Air Purifying Respirators – Use, Limitations, Cartridge/filter Selection, Protection Factors
7. Cartridge/filter selection
8. Cartridge change out schedule: Appendix C of Respirator Program
9. Maintenance and Cleaning
10. Inspection of Respirator
11. Storage
12. Medical Surveillance
13. Seal checks
14. Fit-testing conducted

Appendix H

OSHA Respirator Medical Evaluation Questionnaire

Colorado School of Mines – Environmental Health and Safety Department

1500 Illinois Street

Golden, Colorado 80401

303-273-3316

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

You must be allowed to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A.

Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____

2. Your name: _____

Mailing Address: _____

3. Your age (to nearest year): _____

4. Sex (circle one): Male/Female

5. Your height: _____ ft. _____ in.

6. Your weight: _____ lbs.

7. Your job title: _____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):

a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).

b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No

If "yes," what

type(s): _____

Part A.

Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

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: Yes/No

b. Diabetes (sugar disease): Yes/No

c. Allergic reactions that interfere with your breathing: Yes/No

d. Claustrophobia (fear of closed-in places): Yes/No

e. Trouble smelling odors: Yes/No

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/No
- b. Stroke: Yes/No
- c. Angina: Yes/No
- d. Heart failure: Yes/No
- e. Swelling in your legs or feet (not caused by walking): Yes/No
- f. Heart arrhythmia (heart beating irregularly): Yes/No
- g. High blood pressure: Yes/No
- h. Any other heart problem that you've been told about: Yes/No

6. Have you *ever had* any of the following cardiovascular or heart symptoms?

- a. Frequent pain or tightness in your chest: Yes/No
- b. Pain or tightness in your chest during physical activity: Yes/No
- c. Pain or tightness in your chest that interferes with your job: Yes/No
- d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
- e. Heartburn or indigestion that is not related to eating: Yes/No
- d. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you *currently* take medication for any of the following problems?

- a. Breathing or lung problems: Yes/No
- b. Heart trouble: Yes/No
- c. Blood pressure: Yes/No
- d. Seizures (fits): Yes/No

8. If you've used a respirator, have you *ever had* any of the following problems? (If you've never used a respirator, check the following and go to question 9:)

- a. Eye irritation: Yes/No

b. Skin allergies or rashes: Yes/No

c. Anxiety: Yes/No

d. General weakness or fatigue: Yes/No

e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

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.

10. Have you *ever lost* vision in either eye (temporarily or permanently): Yes/No

11. Do you *currently* have any of the following vision problems?

a. Wear contact lenses: Yes/No

b. Wear glasses: Yes/No

c. Color blind: Yes/No

d. Any other eye or vision problem: Yes/No

12. Have you *ever had* an injury to your ears, including a broken ear drum: Yes/No

13. Do you *currently* have any of the following hearing problems?

a. Difficulty hearing: Yes/No

b. Wear a hearing aid: Yes/No

c. Any other hearing or ear problem: Yes/No

14. Have you *ever had* a back injury: Yes/No

15. Do you *currently* have any of the following musculoskeletal problems?

a. Weakness in any of your arms, hands, legs, or feet: Yes/No

b. Back pain: Yes/No

- c. Difficulty fully moving your arms and legs: Yes/No
- d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
- e. Difficulty fully moving your head up or down: Yes/No
- f. Difficulty fully moving your head side to side: Yes/No
- g. Difficulty bending at your knees: Yes/No
- h. Difficulty squatting to the ground: Yes/No
- i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
- j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

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: Yes/No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

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: Yes/No

If "yes," name the chemicals if you know them: _____

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 (for example, mining): Yes/No

g. Iron: Yes/No

h. Tin: Yes/No

i. Dusty environments: Yes/No

j. Any other hazardous exposures: Yes/No

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? Yes/No

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 in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes," name the medications if you know them: _____

10. Will you be using any of the following items with your respirator(s)?

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 day*: 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(s), is your work effort:

- a. *Light* (less than 200 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of a light work effort are *sitting* while writing, typing, drafting, or performing light assembly work; or *standing* while operating a drill press (1-3 lbs.) or controlling machines.

- b. *Moderate* (200 to 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of moderate work effort are *sitting* while nailing or filing; *driving* a truck or bus in urban traffic; *standing* while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; *walking* on a level surface about 2 mph or down a 5-degree grade about 3 mph; or *pushing* a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

- c. *Heavy* (above 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of heavy work are *lifting* a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; *shoveling*; *standing* while bricklaying or chipping castings; *walking* up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If "yes," describe this protective clothing and/or equipment: _____

14. Will you be working under hot conditions (temperature exceeding 77 deg. 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(s):

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

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the second toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the third toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

The name of any other toxic substances that you'll be exposed to while using your respirator:

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

Appendix I

VOLUNTARY USE OF DUST MASKS – REQUIRED INFORMATION

ALL VOLUNTARY USERS OF RESPIRATORS (INCLUDING DUST MASKS)

Information for Employees Using Respirators When Not Required Under the Standard
(Appendix D to Sec. 1910.134)

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If CSM provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified by NIOSH for use to protect against the contaminant of concern. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator. Keep it in a clean place, and discard or clean it when it becomes visibly dirty or you suspect it might be contaminated.

This information is provided to all voluntary users of respirators including N95 and P100 dust masks.

Appendix J

SCBA MONTHLY INSPECTION RECORD

Scott SCBA Tank Serial Number: _____

Scott Regulator Serial Number: _____

Scott Pressure Reducer Serial Number: _____

Inspection Date													
Inspector Initials													
FACEPIECE ASSEMBLY – Inspect for damage, cracks, wear, and missing parts. Ensure facepiece was disinfected.													
Head Harness, Nose Cup, Lens Exhalation Valve													
Supply Air Hose, Regulator/Facepiece Connection													
HARNES/BACKPACK ASSEMBLY – Inspect for worn or frayed straps, broken buckles, and damage to the frame.													
Harness Straps and Buckles													
Backpack Frame													
CHECK REGULATOR AND ALARM – Open valve, ensure alarm sounds, and ensure the cylinder is more than ¾ full.													
Low-Pressure Alarm													
Cylinder Pressure													
Purge Valve Closed (Full Counterclockwise)													
Regulator Facepiece is Clean and Protected During Storage													
CYLINDER INSPECTION – Hand tighten pressure reducer coupling to cylinder. Make sure cylinder valve is closed.													
Pressure Reducer Coupling is Hand Tightened to the Cylinder													
Close Cylinder Valve for Storage (Full Counterclockwise)													
THE CYLINDER REQUIRES A HYDROSTATIC RETEST WITHIN 5 YEARS OF THE DATE STAMPED ON THE CYLINDER. THE CYLINDER IS NOT AUTHORIZED FOR USE AFTER 15 YEARS OF THE DATE OF MANUFACTURER.													

Appendix K

PROCEDURES FOR CLEANING RESPIRATORS

A. Remove filters, cartridges, or canisters. Disassemble facepiece by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 °C [110 °F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm, preferably running water. Drain.

D. Disinfection Techniques

1. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

a. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of warm water; or,

b. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of warm water; or,

c. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

2. Rinse components thoroughly in clean, warm, preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepiece may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

E. Components should be hand-dried with a clean lint-free cloth or air-dried.

F. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

G. Test the respirator to ensure that all components work properly prior to using.

Appendix L

PLHCP Respirator Information Form

Employee Name: _____

Employee Address: _____

Employee Phone Number: _____

Employee's Department: _____

Respirator Type: _____

Respirator Weight: _____

Duration and frequency of use: _____

Expected physical work effort (heavy/moderate/light): _____

Additional protective clothing and equipment to be worn:

Temperature and humidity extremes anticipated? _____

Attached (if not checked, it is assumed the PLHCP has the document):

A copy of this Respiratory Protection Program

29 CFR 1910.134

Other _____

This form must be signed by an Environmental Health and Safety Department Representative.

The Representatives signature certifies the following:

- EHS has conducted a hazard/exposure assessment and determined a respirator should be issued to the employee.
- Engineering controls are not feasible to control occupational exposures.
- The employee has received training covering respiratory protection and the elements of this Respiratory Protection Program.

Signature EHS Department Representative

Date

EHS Department Representative Printed Name