TOWN OF CLAYTON

Respiratory Protection Plan

TABLE OF CONTENTS

APPENDICES

LIST OF ACRONYMS & ABBREVIATIONS

CDC – Center for Disease Control and Prevention
CFR – Code of Federal Regulations
EPA – U.S. Environmental Protection Agency
HEPA – High Efficiency Particulate Air
HHS – U.S. Department of Health and Human Services
NIOSH – National Institute for Occupational Safety and Health
NYSDOH – New York State Department of Health
PEL – Permissible Exposure Limits
PLHCP – Physician or other Licensed Health Care Professional
PPE – Personal Protective Equipment
QLFT – Qualitative Fit Test
RPA – Respiratory Program Administrator

I. INTRODUCTION

Respiratory Protection Program

[redacted] has implemented this Program to ensure that medical personnel are [redacted] exposed to airborne biological hazards and that employees involved in construction / maintenance activities where lead containing materials are present are not exposed to airborne lead (dust) in excess of permissible exposure limits (PELs).

This program has been developed with specific respiratory protection scenarios common to employees in [redacted]. The program has been designed for maintenance / construction staff that may be required to wear respiratory protection (air purifying respirators) to control potential exposures associated with sanding, scraping, sawing or other dust generating tasks, when lead has been detected in the surface material **at any concentration.**

This program has been developed for respiratory protection during the following work activities.

The **Department Head** (for any department that requires employees to work in situations/conditions requiring respiratory protection) shall be identified as the Respiratory Program Administrator (RPA). The RPA shall be responsible for ensuring that the engineering controls and work practices outlined in this Respiratory Protection Program (RPP) are strictly enforced. While, Supervisors and line-managers will assist in the implementation of the Respiratory Protection Program requirements, the Department Head's responsibility as the RPA is non-transferrable.

The Department Head/RPA established for this Department shall be the following:

Department:

_____

Department Head / RPA:

_____

The Department H ead / RPA shall be r esponsible for the periodic evaluation of the program (annual review, at a minimum). The evaluation will be based on results of the air q uality monitoring program, medical evaluations, changing work environment(s), equipment changes, work requirements, employee responses, and regulatory changes. Respiratory equipment will be NIOSH certified only, and selection will be made by the Department Head/RPA based on identified and potential hazards, estimated exposures, and contamination information.

MANDATORY INFORMATION: For employees using respirators, when not required under PESH standards

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 to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set forth by PESH standards. If your employer 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 do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services (HHS) certifies respirators. 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 i s not designed to protect against. 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.
5. Check with your physician to ensure that you are medically fit to use respiratory protection.

II. RESPONSIBILITIES AND AUTHORITY

The following identifies some of the general responsibilities for various parties affected by this program.

Town Management (Town Board)

- Ensuring that Federal, State and Local laws, regulations, codes and ordinances are followed
- Developing the Respiratory Protection Program (RPP)
- Evaluating the effectiveness of the RPP
- Mandating annual review of RPP
- Establishing a procedure by which Human Resources (HR) will be able to maintain confidential medical records associated with RPP medical monitoring. Medical records must be maintained for an employee's duration of employment plus thirty (30) years.

Human Resources

- Maintaining annual fit test records for individuals required to wear a respirator in each employee's permanent personnel file. Department Heads/RPAs are responsible for providing this form to HR.
- Maintaining initial and annual medical evaluation/fitness forms (indicating that employee is medically fit to wear respirator) in employee's permanent file. Department Heads / RPAs shall be responsible for providing these forms to HR.
- Maintaining employee's medical records associated with RPP for the duration of employment plus thirty (30) years.

Department Head / RPA

The Department Head / RPA is responsible for administering the RPP. Duties of the Department Head / RPA include:

- Identifying work areas, processes, or tasks that require respiratory protection
- Arranging for medical evaluations for the program
- Providing medical evaluation form (indicating that employee is medically fit to wear respirator) from a licensed medical professional to Human Resources for incorporation into employees permanent file
- Providing fit test forms (indicating that employee has been properly fit tested to use a specific type of respirator) from a competent person (as defined by PESH) to Human Resources for incorporation into employees permanent file

- Arranging and coordinating a date & time for employee respirator fit testing by a competent person
- Maintaining copies of fit test records and medical/fitness evaluation results indicating employees "fitness" to wear respiratory protection for a period of at least three years at the employee's workplace
- Monitoring PESH standards for changes and revising policy, as necessary
- Monitoring CDC and NYSDOH recommendations and guidelines, as they relate to respiratory protection and ot her recommended infection control measures
- Selecting appropriate respiratory protection products (Involve users in selection whenever possible)
- Monitoring respirator usage by employees to ensure that respirators are used in accordance with this program, the training received, and manufacturer's instructions
- Coordinating medical evaluations with licensed healthcare professional
- Evaluating any feedback information or surveys
- Arranging for and/or conduct training and fit testing
- Ensuring that employees properly store and maintain respiratory protection equipment
- Conducting a periodic (at least annual) evaluation of the program and revising the program, as necessary (even if the only change is the brand of respirator used by the department)

Supervisors

Supervisors are responsible for ensuring that the following tasks are followed for employees that report to them:

- Ensuring that the RPP is implemented properly at all times
- Obtaining a copy of the respirator fit-test record, and medical fitness form for any individual required to wear a respirator
- Understanding the program requirements for their own protection and ensuring that the program requirements are understood
- Knowing the hazards in the areas in which they work
- Knowing the types of respirators that need to be used
- Ensuring staff use respirators, as required
- Ensuring that employees receive medical evaluations
- Ensuring employees receive annual training and fit testing
- Notifying the Department Head / RPA of any problems with respirator use or changes in work processes that would impact program
- Ensuring proper storage and maintenance of respirators by their staff

Employees

All employees are responsible for following the Town's RPP. In addition, Employee responsibilities include:

- Participating in all training, medical evaluations, and fit testing
- Wearing respirator, when indicated, or when work responsibilities require use of respiratory protection
- Properly maintaining, cleaning and disinfecting their respiratory protection equipment
- Inspecting respirator and performing seal check/fit checks before every use
- Report malfunctions or concerns to Supervisor or Department Head / RPA
- Reading and understanding the Town's RPP prior to performing work
- Performing work activities in strict accordance with the County's RPP

III. PREPARATION AND TRAINING

The Town will provide training to employees who are required to use respirators. The training will be comprehensive, understandable, **and recur annually** (and more frequently, if deemed necessary). The Town will also provide the basic information on respirators to employees who wear respirators when not required by this section or by the Town to do so. Employees that choose to use respiratory protection when not required must notify their Supervisor/Department Head so that a ppropriate information may be provided.

The Town of Clayton will ensure that employees are trained in the proper selection for situation and fit, use, storage, and cleaning of respiratory equipment, and can demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator.
- What the limitations and capabilities of the respirator are.
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
- How to inspect, put on, remove, use, and check the seals of the respirator.
- What the procedures are for maintenance and storage of the respirator.
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
- The general requirements of 29 CFR 1910.134 Respiratory Protection.

The training will be conducted in a manner that is understandable to the employee. The Town will provide the training prior to requiring the employee to use a respirator in the workplace.

Re-training will be done annually or when the following situations occur:

- Changes in the workplace or the type of respirator render previous training obsolete.
- Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding, knowledge, or skill.
- Any other situation arises in which retraining appears necessary to ensure safe respirator use.

Proper respiratory equipment, replacement elements, and any parts or equipment necessary for the functioning of the respiratory equipment shall be available to employees at no cost, provided that the respiratory equipment is required for the employee to effectively perform their respective job.

A medical examination for employees (required to use respiratory equipment) is required before use of the equipment. The examination will be provided at no cost to the employee. The information provided in the medical questionnaire (see **Appendix A)** is mandatory for employees required to use respiratory protection.

For work involving lead paint, periodic personal air monitoring will be performed to determine the proper respiratory equipment for the job being performed.

IV. IDENTIFYING WORK HAZARDS

The Town will identify and evaluate the respiratory hazard(s) in the workplace; this evaluation will include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. The identification and evaluation process shall take place prior to work activities being performed by Town employees.

The Town will help the employees elect an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed, the workplace where work will be performed, and user factors that affect respirator performance and reliability. The Town will provide respirators with a variety of respirator models and sizes, so that the respirator is acceptable to, and correctly fits, the user. The Town will only provide NIOSH-certified respirator. The respirator will be used in compliance with the conditions of its certification.

Infection Control Hazards

The respirators will be utilized by Employees as personal protective equipment, as part of an overall infection control plan which incorporates engineering and work practice controls.

Each respective Department shall follow the most current CDC and NYSDOH Guidance for appropriate infection control practices.

Routine infection control and isolation practices for typical work situations are well known and tend to remain constant over time. However, during an outbreak or a new virus type or pandemic flu, infection control guidance may change as the situation unfolds, based on available epidemiological data. In these situations, it will be the responsibility of the Department Head / RPA to keep current with CDC and NYSDOH recommendations. The program will be adjusted and employees will be kept informed as changes occur.

Construction / Maintenance – Lead in Dust Hazards

Respirators selected for construction / maintenance use will be used as part of an overall protection program that also incorporates engineering and administrative controls. The RPP is intended to minimize employee exposure to airborne hazards, such as lead.

The hazards associated with maintenance and construction activities that involve lead-based paint or lead containing materials will be identified through an investigative process. This involves sampling and analysis to determine the concentration of lead present in the material affected by construction / maintenance activities and exposure (air) monitoring to determine airborne lead concentrations expected in the work area.

V. RESPIRATOR SELECTION

Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) will be selected and used. In making the determination of which respirators to select, the Department Head / RPA will consider the type of settings and job activities the employees will perform, the capabilities and limitations of the respirator, and the duration of respirator use.

Respirators currently approved for use by this department are as follows (to be completed by the Department Head/RPA):

Work Task	**Manufacturer**	**Model**

Disposable Respirators for Infection Control Purposes

Respirators selected for infection control purposes, for use by medical staff, shall be disposable particulate respirators (minimum N95).

Respirators for Control of Lead in Dust

The Town will provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA/PESH statutory and regulatory requirements, under routine situations.

This program is not designed for protection exposures to toxic vapors, gasses, and conditions that are immediately dangerous to life and health (IDLH). Town employees are prohibited from working in IDLH atmospheres and from performing activities that can result in the generation of toxic gasses or vapors such as:

- Welding or torch-cutting metals coated with paint that contains lead,
- Using high-temperature heat guns to remove paint that contains lead,
- Using chemical paint removers/strippers that contain hazardous volatile chemicals.

VI. MEDICAL EVALUATION

Employees will be provided 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. The Town may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator or when the employee is no longer in the employ of the Town.

The Town will identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire. It is strongly recommended that Department Heads / RPAs utilize an out side medical provider that specializes in industrial medicine to act as the PLHCP. An outside medical provider would be non-biased, would assure that employee's medical records were maintained confidentially, and would be able to provide required information to HR and Department Heads regarding the ability of an individual to perform their job duties.

While the County's Health Department may be able to act as the PLHCP and provide medical determinations, evaluations and examinations required under this Respiratory Protection Program that might be less costly to the Department, if a Department Head / RPA chooses to utilize the services of the County Health Department for these services, they must work through Human Resources to assure that records are maintained for the required period of time, and that the confidentiality of the employee's medical records is strictly maintained.

The medical evaluation will obtain the information requested by the questionnaire (**Appendix A**). All medical questionnaires and examinations are confidential, and handled during the employee's normal working hours. The medical questionnaire shall be administered so that the employee understands its content. All employees are provided an opportunity to discuss the questionnaire and examination results with their physician or other PLHCP.

Employee's medical records must be retained by the employer for at least the duration of employment plus thirty (30) years.

Medical Determination

In determining the employee's ability to use a respirator, the Department Head / RPA will:

- Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation will provide only the following information:
    - 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, including whether or not the employee is medically able to use the respirator.
    - The need, if any, for follow-up medical evaluations.
    - A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

If the PLHCP finds a medical condition that may place the employee's health at increased risk if a respirator is used, the employee will not be permitted to work in environments where a respirator is required.

Program Evaluation

Employees need to be medically cleared to wear respirators before commencing use. All respirators generally place a burden on the employee. Negative pressure respirators restrict breathing. Some respirators may cause claustrophobia. Self-contained breathing apparatuses are heavy. Each of these conditions may adversely affect the health of

some employees who wear respirators. That is why it is imperative that a physician or other licensed health care professional, operating within the scope of his/her practice, needs to medically evaluate employees to determine under what conditions they can **safely** wear respirators. This section requires the employer to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly. The Town will conduct evaluations of the workplace, as necessary, to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective in protecting Town workers.

The Town will regularly consult employees required to use respirators to assess the employees' views on this program's effectiveness and to identify any problems. Any problems that are identified will be assessed by the Town and modifications shall be made, as deemed necessary. Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance).
- Appropriate respirator selection for the hazards to which the employee is exposed.
- Proper respirator use under workplace conditions the employee encounters.
- Proper respirator maintenance.

Medical Evaluation

Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this section specifies the minimum requirements for medical evaluation that must be implemented to determine the employee's ability to use a respirator. Records of medical evaluations required by this section must be retained and made available in accordance with 29. CFR 1910.1020. The following is a synopsis of some of the requirements of the standard.

Each Department will develop cartridge/canister change schedules based on available data or information. Such information includes the exposure assessment and information based on breakthrough test data, mathematically based estimates, and/or reliable use recommendations from the Town's respirator and/or chemical suppliers.

Reliance on odor thresholds and other warning properties will not be permitted as the primary basis for determining the service life of respirator cartridges and canisters.

OSHA/PESH emphasizes that a conservative approach is recommended when evaluating service life testing data. Temperature, humidity, air flow through the filter, the work rate, and the presence of other potential interfering chemicals in the workplace all can have a serious effect on the service life of an air-purifying cartridge or canister.

Follow-up Medical Examination

The Town will ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of **Appendix A** or whose initial medical examination demonstrates the need for any follow-up medical examination. The follow-up medical examination will include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

Additional Medical Evaluations

At a minimum, the Town will provide additional medical evaluations that comply with the requirements of this section if:

- An employee reports medical signs or symptoms that are related to ability to use a respirator.
- A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be re-evaluated.
- Information from the -RPP, including observations made during fit testing and program evaluation, indicates a need for an employee re-evaluation.
- A change occurs in workplace conditions (e.g., physical work effort, protective clothing, and temperature) that may result in a substantial increase in the physiological burden placed on an employee.

VII. FIT TESTING

The Town requires that the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This fit test must be performed prior to the use of any respiratory equipment.

Fit testing is conducted to determine how well the seal of a respirator " fits" on an individual's face and that a good seal can be obtained. Respirators that do not seal properly, do not offer the protection for which the respirator was intended.

Employees required to wear a respirator shall be fit-tested using qualitative fit testing methods. The Town will ensure that an employee using a tight-fitting, face-piece respirator is fit tested prior to initial use of the respirator, whenever a different respirator face-piece (size, style, model, or make) is used, and at least annually thereafter.

The Town will establish a record of the qualitative fit tests administered to employees including:

- The name or identification of the employee tested
- Type of fit test performed
- Specific make, model, style, and size of respirator tested
- Date of test
- The pass/fail results for QLFT *(Qualitative Fit Test)*

Employees shall be fit-tested with a respirator of the exact make, model, style and size, as that of the respirator that will be used by the employee. Based on the results of the fit- test, it may be determined that the employee needs a different style or size of tight-fitting face piece. These employees shall be given a reasonable opportunity to select a different face piece, and be re-tested. Employees shall not be permitted to work in situations requiring a respirator, without first passing a qualitative fit-test.

Fit testing will be conducted at least annually AND:

Prior to being allowed to wear any respirator or:

- If the model of respirator available for use changes,
- If the employee adds or loses body weight by 10% or more, or
- If the employee has any changes in facial structure or scarring.

Records of fit testing shall be maintained by the Department Head / RPA for at least (3) three years, and will be maintained by Human Resources in the Employee's permanent record.

Fit tests will be administered by competent, qualified person trained in fit testing methods. Qualitative fit testing will be conducted in a manner consistent with the fit testing protocols presented in Appendix A to § 1910.134 **(See Appendix B).** The fit test record form is included as **Appendix C.**

Face-Piece Seal Protection

The Town will not permit respirators with tight-fitting face-pieces to be worn by employees who have:

- Facial hair that comes between the sealing surface of the face-piece and the face or that interferes with valve function.
- Any condition that interferes with the face to face-piece seal or valve function.
- If an employee wears corrective glasses or goggles or other personal protective equipment, the employer will ensure that such equipment is worn in a manner that does not interfere with the seal of the face-piece to the face of the user or provides respirators equipped with prescription lenses incorporated into the respirator.
- For all tight-fitting respirators, the employer will ensure that employees perform a user seal check each time they put on the respirator using the procedures presented in **Appendix D**.

VIII. PROPER RESPIRATOR USE

Employees will use their respirators under the conditions specified by this program and in accordance with the t aining they receive on the use of the selected model(s). In addition, the respirator shall not be used in a manner for which it is not certified by NIOSH or by its manufacturer.

All em ployees s hall c onduct us er s eal c hecks / fit ch ecks, according t o m anufacturer recommendations, each and every time they wear a respirator.

Employees, who wear respirators, cannot have facial hair that comes between the sealing surface of the facepiece and the face, or that interferes with the respirator functions.

All em ployees shall leave a potentially contaminated work area, if the respirator is causing physical symptoms or the respirator no longer offers adequate protection (for example – strap breaks, becomes saturated with fluid, etc.).

IX. CLEANING AND DISINFECTION

Disposable Particulate Respirators

A disposable particulate respirator cannot be cleaned or disinfected. There is no specific time limit for how long an N95 respirator can be used.

If the medical condition requires only airborne isolation precautions (e.g., TB):

- Discard t he respirator i f soiled, i f breathing becomes labored, or if structural integrity of the respirator is compromised.
- Discard the respirator at the end of the work shift.

If the condition also requires contact and or droplet precautions:

- The respirator must be discarded after a single use. All PPE should be removed and disposed of in a receptacle prior to or upon exiting a patient room and hand hygiene performed immediately.
- However, in times of shortage, consideration can be g iven to extend the use or reuse, if special t aining is provided. The decision will be made by the Department Head / RPA based on the available supply and current epidemiological data and will be communicated clearly to the staff.

Non-Disposable Respirators

The Town will provide each respirator user with a respirator that is clean, sanitary, and in g ood working order. The Town will provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees. The employees will be responsible for cleaning and disinfecting the respirator that is assigned to them, in

accordance w ith the procedures in this section, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness. The respirators will be cleaned and disinfected at the following intervals:

- Respirators issued for the exclusive use of an employee will be cleaned and disinfected, as often as necessary, to be maintained in a sanitary condition.
- Respirators used i n fit t esting and training w ill be cleaned and disinfected after each use.

Procedures for Cleaning Respirators

Non-disposable respirators will be cleaned in accordance w ith Appendix B -2 to § 1910.134 (see **Appendix E**). In summary:

- Remove filters, cartridges, or canisters. Disassemble face-pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- Wash c omponents i n warm water with a mild det ergent or w ith a c leaner recommended by t he m anufacturer. A s tiff bristle (not w ire) br ush m ay be used to facilitate the removal of dirt.
- Rinse components thoroughly in c lean, warm, preferably running water. Drain.
- When t he c eaner used does not contain a disinfecting ag ent, respirator components should be immersed for two minutes in a commercially available respirator disinfectant.
- Rinse components thoroughly in clean, warm, preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face-pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- Components should be hand-dried with a clean lint-free cloth or air-dried.
- Reassemble face-piece, replacing filters, cartridges, and canisters where necessary.

X. STORAGE INSPECTION AND MAINTENANCE

Disposable Respirators

Employees will inspect the respirator immediately prior to use. Inspection will include:

- Examine the disposable respirator to determine if it has structural integrity. Discard the respirator if there are nicks, abrasions, cuts or creases in seal area, and/or if the filter material is physically damaged or soiled.
- Check the respirator straps to be sure they are not cut or otherwise damaged.

- Make sure the metal nose clip is in place and functions properly (if applicable).

Respirators will be stored in a clean, dry area away f rom direct sunlight and extreme heat. The Department Head/RPA will periodically inspect a representative sample of respirators in storage to ensure they are in usable condition.

Non-Disposable Respirators

All respirators used in routine situations will be inspected before each use and during cleaning.

Respirator inspections include the following:

- A check of respirator function, tightness of connections, and the condition of the various par ts i ncluding, but n ot l imited to, the face-piece, h ead s traps, v alves, connecting tube, and cartridges, canisters or filters.
- A check of elastomeric parts for pliability and signs of deterioration.

Respirators shall be stored as follows:

- All respirators will be stored to protect them from damage, contamination, dust, sunlight, extreme t emperatures, excessive moisture, and damaging chemicals, and they will be packed or stored to prevent deformation of the face-piece and exhalation valve;
- In addition to the other requirements of this section, emergency respirators will be:
    - Kept accessible to the work area.
    - Stored in compartments or in covers that are clearly marked
    - Stored in accordance with any applicable manufacturer instructions.

Repairs

The Town will ensure that respirators that fail an inspection or are otherwise found to be de fective ar e r emoved f rom s ervice, and ar e discarded or r epaired or adj usted i n accordance with the following procedures:

- Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and will use only the respirator manufacturer's NIOSH-approved parts designed for the respirator.
- Repairs will be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed.
- Reducing and admission valves, regulators, and alarms will be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

Discarding Respirators

Respirators that fail an inspection or are otherwise not fit for use and cannot be repaired must be discarded. The Department Head / RPA will make the determination regarding whether a respirator can be repaired, or must be discarded.

XI. EVALUATING / UPDATING THE PROGRAM

The Department Head / RPA will complete an annual evaluation of the RPP. During the annual review, the Department Head / RPA will evaluate any feedback information or surveys, review any new hazards or changes in CDC, NYSDOH, EPA or OSHA/PESH recommendations that would affect respirator use. The Department Head / RPA will make recommendations and implement any changes needed in the RPP.

XII. DOCUMENTATION AND RECORD KEEPING

A written copy of this program can be found in the following location:

A copy of the RPP can be obtained from the Department Head / RPA identified in Section I.

Copies of fit test records, training records, and medical/fitness forms will be maintained by the Department Head / RPA for a period of at least 3 years. Copies of these records will be provided to Human Resources, who will maintain the documents as part of each employee's permanent personnel file.

Employee's medical records are confidential and must be maintained for a period of at least the duration of employment plus thirty (30) years.

The Town will establish and retain written information regarding medical evaluations, fit testing, and the RPP. This information will facilitate employee involvement in the RPP, assist the Town in auditing the adequacy of the program, and provide a record for compliance determinations by PESH.

XIII. ADDTIIONAL INFORMATION AND RESOURCES

The following documents are helpful references:

- 29 CFR 1910.134, Respiratory Protection, and Appendices.
- 42 CFR 84, Approval of Respiratory Protective Devices.
- ANSI Z88.2, Respiratory Protection.
- NIOSH Guide to Industrial Respiratory Protection.
- NIOSH Guide to the Selection and Use of Particulate Respirators.

Appendix A

Appendix A - Sample Medical Questionnaire - taken from:
Sec. 1910.134 - Appendix C: OSHA Respirator Medical Evaluation Questionnaire

Instructions: Please complete this form BEFORE your Respirator Fit Test and return to:
{fill in the blanks}

If you wish to speak to the health care professional who will review this questionnaire, contact: *{fill in the blank}*

Can you read? (circle one): Yes No

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)

Your name: _____ Date ___/_____/_____
Your age (to nearest year):_____ Sex (circle one): Male/Female
Your height: _____ ft. _____ in. Your weight: _____lbs.
Your job title: _____
Phone number at work: _____ Best time to call: _____
Have you worn a respirator (circle one): Yes/No
If "yes," what type(s)? :_____

Part A. Section 2. (Mandatory) Questions 1 through 9 must be answered by every employee selected to use a respirator. Please check "YES" or "NO" for each question.

Questions		**YES**	**NO**
1. Do you currently smoke tobacco, or have you smoked tobacco in the last month?			
2. Have you ever had any of the following conditions?		**YES**	**NO**
a.	Seizures (fits)		
b.	Diabetes (sugar disease)		
c.	Allergic reactions that interfere with your breathing		
d.	Claustrophobia (fear of closed-in places)		
e.	Trouble smelling odors		
3. Have you ever had any of the following pulmonary or lung problems?		**YES**	**NO**
a.	Asbestosis		
b.	Asthma		
c.	Chronic bronchitis		
d.	Emphysema		
e.	Pneumonia		
f.	Tuberculosis		
g.	Silicosis		
h.	Pneumothorax (collapsed lung)		
i	Lung cancer		
j.	Broken ribs		
k.	Any chest injuries or surgeries		
l.	Any other lung problem that you've been told about		

4. Do you currently have any of the following symptoms of pulmonary or lung illness:		YES	NO
a.	Shortness of breath		
b.	Shortness of breath when walking fast on level ground or walking up a slight hill or incline		
c.	Shortness of breath when walking with other people at an ordinary pace on level ground		
d.	Have to stop for breath when walking at your own pace on level ground		
e.	Shortness of breath when washing or dressing yourself		
f.	Shortness of breath that interferes with your job		
g.	Coughing that produces phlegm (thick sputum)		
h.	Coughing that wakes you early in the morning		
i.	Coughing that occurs mostly when you are lying down		
j.	Coughing up blood in the last month		
k.	Wheezing		
l.	Wheezing that interferes with your job		
m.	Chest pain when you breathe deeply		
n.	Any other symptoms that you think may be related to lung problems		
5. Have you ever had any of the following cardiovascular or heart problems?		YES	NO
a.	Heart attack		
b.	Stroke		
c.	Angina		
d.	Heart failure		
e.	Swelling in your legs or feet (not caused by walking)		
f.	Heart arrhythmia (heart beating irregularly)		
g.	High blood pressure		
h.	Any other heart problem that you've been told about		
6. Have you ever had any of the following cardiovascular or heart symptoms?		YES	NO
a.	Frequent pain or tightness in your chest		
b.	Pain or tightness in your chest during physical activity		
c.	Pain or tightness in your chest that interferes with your job		
d.	In the past two years, have you noticed your heart skipping or missing a beat?		
e.	Heartburn or indigestion that is not related to eating		
f.	Any other symptoms that you think may be related to heart or circulation problems		
7. Do you currently take medication for any of the following problems?		YES	NO
a.	Breathing or lung problems		
b.	Heart trouble		
c.	Blood pressure		
d.	Seizures (fits)		
8. Have you ever used a respirator? IF NO, go to question 9. If you HAVE used a respirator, have you ever had any of the following problems?		YES	NO
a.	Eye irritation:		
b.	Skin allergies or rashes		
c.	Anxiety:		
d.	General weakness or fatigue?		
e.	Any other problem that interferes with your use of a respirator		
9. Would you like to talk to a health care professional about your answers to this questionnaire?			

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.

Questions		YES	NO
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?		YES	NO
a.	Wear contact lenses?		
b.	Wear glasses?		
c.	Color blind?		
d.	Any other eye or vision problems?		
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?		
b.	Wear a hearing aid?		
c.	Any other hearing or ear problems?		
14. Have you ***ever had*** a back injury		YES	NO
15. Do you ***currently*** have any of the following musculoskeletal problems?		YES	NO
a.	Weakness in any of your arms, hands, legs, or feet		
b.	Back pain		
c.	Difficulty fully moving your arms and legs		
d.	Pain or stiffness when you lean forward or backward at the waist		
e.	Difficulty fully moving your head up or down		
f.	Difficulty fully moving your head side to side		
g.	Difficulty bending at your knees		
h.	Difficulty squatting to the ground		
i.	Climbing a flight of stairs or a ladder carrying more than 25 lbs		
j.	Any other muscle or skeletal problem that interferes with using a respirator		

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.

Questions		YES	NO
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:		YES	NO
a.	Asbestos		
b.	Silica (e.g., in sandblasting):		

c.	Tungsten/cobalt (e.g., grinding or welding this material):		
d.	Beryllium		
e.	Aluminum		
f.	Coal(for example, mining):		
g.	Iron		
h.	Tin		
i.	Dusty environments:		
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?		**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)?		**YES**	**NO**
a.	HEPA Filters?		
b.	Canisters (for example, gas masks)?		
c.	Cartridges?		
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 work shift hrs. mins.			
Examples of light work 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*** (200-500 kcal per hour)	**YES**	**NO**
If "yes," how long does this period last during the average work shift hrs. mins.			
Examples of light work 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 surface about 2 mph or down a 5-degree grade about 3 mph; or ***pushing*** a wheelbarrow with 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 work 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 are using your respirator		**YES**	**NO**
If "yes,' describe this protective clothing and equipment:			
14. Will you be working under hot conditions (temperatures 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 are using your respirator.			
17. Describe any special or hazardous conditions you might encounter when you are using your respirator (for example, confined space, life-threatening gasses):			
18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator			
Name of first toxic substance:			
Estimated maximum exposure level per shift:			
Duration of exposure per shift:			
Name of second toxic substance:			
Estimated maximum exposure level per shift:			
Duration of exposure per shift:			
Name of third toxic substance:			
Estimated maximum exposure level per shift:			
Duration of exposure per shift:			
The name of any other toxic substances that you will be exposed to while using your respirator:			
19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well being of others (for example, rescue, security):			

Appendix B

Appendix A to § 1910.134: Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures -- General Requirements

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

(a) Position of the mask on the nose

(b) Room for eye protection

(c) Room to talk

(d) Position of mask on face and cheeks

7. The following criteria shall be used to help determine the adequacy of the respirator fit:

(a) Chin properly placed;

(b) Adequate strap tension, not overly tightened;

(c) Fit across nose bridge;

(d) Respirator of proper size to span distance from nose to chin;

(e) Tendency of respirator to slip;

(f) Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 of this section or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. 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, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

14. Test Exercises.

(a) Employers must perform the following test exercises for all fit testing methods prescribed in this appendix, except for the CNP quantitative fit testing protocol and the CNP REDON quantitative fit testing protocol. For these two protocols, employers must ensure that the test subjects (***i.e.***, employees) perform the exercise procedure specified in Part I.C.4(b) of this appendix for the CNP quantitative fit testing protocol, or the exercise procedure described in Part I.C.5(b) of this appendix for the CNP REDON quantitative fit-testing protocol. For the remaining fit testing methods, employers must ensure that employees perform the test exercises in the appropriate test environment in the following manner:

(1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

(3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like 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 reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

(7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test

environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

(8) Normal breathing. Same as exercise (1).

(b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. 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.

B. Qualitative Fit Test (QLFT) Protocols

1. General

(a) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

(a) Odor Threshold Screening

Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

(1) Three 1 liter glass jars with metal lids are required.

(2) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.

(3) The isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.

(4) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

(5) The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(6) A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.

(7) The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

(8) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(9) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(10) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(11) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(b) Isoamyl Acetate Fit Test

(1) The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.

(2) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.

(3) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(4) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(5) Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

(6) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

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

(8) If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(9) If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.

(10) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

3. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.

Note to paragraph 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Saccharin solution aerosol fit test procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure described in 3. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.

(11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

(12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

4. Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste Threshold Screening.

The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure shall have a \3/4\ inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.

(7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Bitrex Solution Aerosol Fit Test Procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure as that described in 4. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.

(6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.

(11) If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. Irritant Smoke (Stannic Chloride) Protocol

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

(a) General Requirements and Precautions

(1) The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

(2) Only stannic chloride smoke tubes shall be used for this protocol.

(3) No form of test enclosure or hood for the test subject shall be used.

(4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

(5) The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

(b) Sensitivity Screening Check

The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

(1) The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

(2) The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

(3) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

(c) Irritant Smoke Fit Test Procedure

(1) The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).

(2) The test subject shall be instructed to keep his/her eyes closed.

(3) The test operator shall direct the stream of irritant smoke from the smoke tube toward the faceseal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the

smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.

(4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

(5) The exercises identified in section I.A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

(6) If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

(7) Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

(8) If a response is produced during this second sensitivity check, then the fit test is passed.

C. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General

(a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

(a) Apparatus.

(1) Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.

(2) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(3) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.

(4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.

(6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.

(7) The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.

(8) The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.

(9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.

(10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.

(12) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

(13) The limitations of instrument detection shall be taken into account when determining the fit factor.

(14) Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

(b) Procedural Requirements.

(1) When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.

(2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.

(3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.

(4) Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.

(5) A stable test agent concentration shall be obtained prior to the actual start of testing.

(6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.

(7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.

(8) Calculation of fit factors.

(i) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.

(ii) The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.

(iii) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(A) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(B) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(C) Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

(D) The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

$$\text{Overall Fit Factor} = \frac{\text{Number of exercises}}{1/ff_1 + 1/ff_2 + 1/ff_3 + 1/ff_4 + 1/ff_5 + 1/ff_6 + 1/ff_7 + 1/ff_8}$$

Where ff_1, ff_2, ff_3, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol.

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount ^{TM}) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Portacount Fit Test Requirements.

(1) Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.

(2) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.

(3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

(4) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instructions for operating the Portacount and proceed with the test.

(6) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(7) After the test exercises, 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.

(b) Portacount Test Instrument.

(1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

(2) Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.

(3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

4. Controlled negative pressure (CNP) quantitative fit testing protocol.

The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Occupational Health Dynamics of Birmingham, Alabama also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during

the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) CNP Fit Test Requirements.

(1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.

(2) The CNP system defaults selected for test pressure shall be set at -- 15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.

(**Note:** CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)

(3) The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.

(4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.

(5) The employer must train the test subject to hold his or her breath for at least 10 seconds.

(6) The test subject must don the test respirator without any assistance from the test administrator who is conducting the CNP fit test. The respirator must not be adjusted once the fit-test exercises begin. Any adjustment voids the test, and the test subject must repeat the fit test.

(7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.

(b) CNP Test Exercises.

(1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.

(3) Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his or her breath for 10 seconds during test measurement.

(4) Moving head up and down. Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(6) Grimace. The test subject shall grimace by smiling or frowning for 15 seconds.

(7) Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(8) Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, 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 a respirator shall be tried.

(c) CNP Test Instrument.

(1) The test instrument must have an effective audio-warning device, or a visual-warning device in the form of a screen tracing, that indicates when the test subject fails to hold his or her breath during the test. The test must be terminated and restarted from the beginning when the test subject fails to hold his or her breath during the test. The test subject then may be refitted and retested.

(2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.

5. Controlled negative pressure (CNP) REDON quantitative fit testing protocol.

(a) When administering this protocol to test subjects, employers must comply with the requirements specified in paragraphs (a) and (c) of Part I.C.4 of this appendix ("Controlled negative pressure (CNP) quantitative fit testing protocol"), as well as use the test exercises described below in paragraph (b) of this protocol instead of the test exercises specified in paragraph (b) of Part I.C.4 of this appendix.

(b) Employers must ensure that each test subject being fit tested using this protocol follows the exercise and measurement procedures, including the order of administration, described below in Table A-1 of this appendix.

Table A-1. -- CNP REDON Quantitative Fit Testing Protocol

Exercises[1]	Exercise procedure	Measurement procedure
Facing Forward	Stand and breathe normally, without talking, for 30 seconds.	Face forward, while holding breath for 10 seconds.
Bending Over	Bend at the waist, as if going to touch his or her toes, for 30 seconds.	Face parallel to the floor, while holding breath for 10 seconds
Head Shaking	For about three seconds, shake head back and forth vigorously several times while shouting.	Face forward, while holding breath for 10 seconds.
REDON 1	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask.	Face forward, while holding breath for 10 seconds.
REDON 2	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask again.	Face forward, while holding breath for 10 seconds.

[1] Exercises are listed in the order in which they are to be administered.

(c) After completing the test exercises, the test administrator must question each test subject regarding the comfort of the respirator. When a test subject states that the respirator is unacceptable, the employer must ensure that the test administrator repeats

the protocol using another respirator model.

(d) Employers must determine the overall fit factor for each test subject by calculating the harmonic mean of the fit testing exercises as follows:

$$\text{Overall Fit Factor} = \frac{N}{[1/FF_1 + 1/FF_2 + \ldots\ 1/FF_N]}$$

Where:
N = The number of exercises;
FF1 = The fit factor for the first exercise;
FF2 = The fit factor for the second exercise; and
FFN = The fit factor for the nth exercise.

Part II. New Fit Test Protocols

A. Any person may submit to OSHA an application for approval of a new fit test protocol. If the application meets the following criteria, OSHA will initiate a rulemaking proceeding under section 6(b)(7) of the OSH Act to determine whether to list the new protocol as an approved protocol in this Appendix A.

B. The application must include a detailed description of the proposed new fit test protocol. This application must be supported by either:

1. A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the National Institute for Standards and Technology) stating that the laboratory has tested the protocol and had found it to be accurate and reliable; or

2. An article that has been published in a peer-reviewed industrial hygiene journal describing the protocol and explaining how test data support the protocol's accuracy and reliability.

C. If OSHA determines that additional information is required before the Agency commences a rulemaking proceeding under this section, OSHA will so notify the applicant and afford the applicant the opportunity to submit the supplemental information. Initiation of a rulemaking proceeding will be deferred until OSHA has received and evaluated the supplemental information.

[63 FR 20098, April 23, 1998; 69 FR 46993, August 4, 2004]

Appendix C

Appendix C: Respirator Training and Fit-Testing Record for Qualitative Fit Test

Section 1 – To be Completed by Employee

Employee Name	Title	Date

Training

I have received and understood training on each of the subjects checked below:

	Check
• Review of written Respiratory Protection Program	
• Description of the activities and circumstances for which respirator use is required	
• Importance of proper fit and the consequences of improper fit	
• Importance of proper use, storage and inspection	
• Limitations of this type of respirator	
• Appropriate action if respirator becomes damaged, a leak is detected or breathing becomes difficult	
• Review of manufacturer instruction sheet on proper donning, performing user seal check, and removing respirator	
• How to store respirator and when to discard or reuse	

Use

Describe anticipated job assignments for which respiratory protection will be required:

_____

_____

_____

Employee's Name **Signature** **Date**

Section 2 – To be completed by Fit-Tester

Check One: [ ] Initial fit-test [ ] Annual re-test **Test Solution:** [ ] Saccharin [ ] Bitrex

[ ] Unable to complete test – list reason _____

[ ] Failed fit-test-list type of respirator(s) tested

Manufacturer	Model Type	Size

[ ] Successfully completed fit test – list type of respirator(s) tested

Manufacturer	Model Type	Size

Fit Tester's Name **Signature** **Date**

Appendix D

Appendix B-1 to § 1910.134: User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall 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 face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. *Negative pressure check.* Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) 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 tightness of the respirator 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.

[63 FR 1152, Jan. 8, 1998]

Appendix E

Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

A. Remove filters, cartridges, or canisters. Disassemble facepieces 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 deg. C [110 deg. 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 (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

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

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

2. 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 water at 43 deg. C (110 deg. F); or,

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

E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

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

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

H. Test the respirator to ensure that all components work properly.

[63 FR 1152, Jan. 8, 1998]