Respiratory Protection Program

CITY OF BANGOR

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1. Purpose & Scope

The City of Bangor is committed to protecting employees from respiratory hazards that may be encountered in the work environment. Although it is the goal of the City to reduce or eliminate all respiratory hazards through engineering or administrative controls, we recognize that it may not always be feasible. In those particular cases, the City of Bangor has developed a Respiratory Protection Program in accordance with 29 CFR 1910.134 and the State of Maine Amendment for Public Sector 29 CFR 1910.134 (e)(7)(iv) to ensure our employees' are protected from respiratory hazards found in the workplace.

2. Definitions

Air-purifying Respirator: a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Assigned Protection Factor: the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.

Atmosphere-supply Respirator: a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

Demand Respirator: an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Emergency Situation: any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Employee Exposure: an exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-Service-Life Indicator: A system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Escape-only Respirator: a respirator intended to be used only for emergency exit.

Filtering Facepiece (dust mask): a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit Factor: a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit Test: The use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

High Efficiency Particulate Air (HEPA) Filter: a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Immediately Dangerous to Life or Health (IDLH): an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Maximum use Concentration (MUC): the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

Negative Pressure Respirator (tight fitting): a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Oxygen Deficient Atmosphere: an atmosphere with an oxygen content below 19.5% by volume.

Physician or other Licensed Health Care Professional (PLHCP): an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

Powered Air-purifying Respirator (PAPR): an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure Demand Respirator: a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Qualitative Fit Test (QLFT): a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative Fit Test (QNFT): an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Self-contained breathing apparatus (SCBA): an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Supplied-air Respirator (SAR) or Airline Respirator: an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

User Seal Check: an action conducted by the respirator user to determine if the respirator is properly seated to the face.

3. Program Administration and Responsibilities

3.1 Safety and Environmental Management (SEM)

- Will act as the program administrator for the City of Bangor;
- Develop, maintain, review and make available to all employees the City of Bangor Respiratory Protection Program;
- Assist departments in identifying and assessing respiratory hazards in the workplace;
- Provide guidance to departments for identifying and selecting engineering controls, administrative controls and/or respiratory protection to reduce or eliminate an employee's potential exposure;
- Maintain respiratory medical clearances, fit tests, exposure monitoring and training records for departments;
- Provide qualitative fit testing for employees included in the Respiratory Protection Program;
- Provide annual training to employees included in the Respiratory Protection Program; and
- Conduct periodic audits of the Respiratory Protection Program and City Departments to ensure regulatory compliance.

3.2 Supervisors

- Be familiar with the Respiratory Protection Program and ensure personnel comply with the requirements described in the program;
- Assist Safety and Environmental Management in the identification of work practices generating potential respiratory hazards;
- Work with Safety and Environmental Management to schedule exposure monitoring of respiratory hazards that could reach the permissible exposure limit;
- Consult with Safety and Environmental Management to determine the feasibility of appropriate engineering or administrative controls to reduce a potential respiratory hazard exposure;
- Prior to allowing an employee use respiratory protection and annually thereafter, ensure that employee been medically approved to wear a respirator, fit tested and properly trained to wear and maintain a specific respirator;
- Provide replacement cartridges for all employees included in the Respiratory Protection Program and ensure they are replaced according to the change-out schedule;

- Ensure employees are properly cleaning, maintaining, and storing their respirator as recommended by the manufacturer; and
- Ensure all employees that voluntarily use a respirator for activities that involve exposures to low-level, non-hazardous nuisance dust or other contaminants complete the Voluntary Use of a Respirator form. This form will be sent to SEM.

3.3 Employees Included in the Respiratory Protection Program

- Be familiar with the requirements of the Respiratory Protection Program;
- Assist the supervisor in identifying locations or operations to which they may produce a potentially hazardous respiratory contaminate;
- Attend and participate in annual respiratory protection training;
- Use only the respirator for which you have been assigned to use and fit tested for;
- Be clean-shaven prior to using a respirator. Facial hair must not affect the seal between the respirator face piece seal and skin or interfere with operation of inhalation and exhalation valves;
- Before each use, inspect the respirator and perform a user seal check;
- Properly clean, maintain and store your respirator in accordance with manufacturers' recommendations;
- Report to your supervisor any issues or defects that you experience with your assigned respirator;
- Report to your supervisor any change in medical status that may affect your ability to safely wear or use your respirator; and
- Replace respirator cartridges according to the change-out schedule.

4. Hazard Assessment and Respirator Selection

A work environment where the respiratory hazards cannot be controlled by the preferred use of engineering or administrative controls may require employees to use respiratory protection to reduce or eliminate the employee's potential exposure. A respiratory hazard assessment is required for jobs in which employees may be exposed to breathing air contaminated with harmful levels of dusts, fumes, sprays, mists, fogs, smokes, vapors, or gases in order to ensure selection of appropriate respiratory equipment.

Before respiratory protection is selected, the supervisor will request assistance from Safety and Environmental Management to identify and evaluate the operation, process or work area where the respiratory hazard may be present. These evaluations are based on the identification of the contaminants, the estimated airborne concentration of the contaminants, the toxicity of the contaminants, the warning properties of the contaminant, and the oxygen content of the atmosphere.

For each potential respiratory hazard, a NIOSH approved respirator will be selected by SEM that will be appropriate for the hazard involved. These respirator selections will include consultation with the applicable employee(s) and will be based on, but not limited to, the following factors:

- The nature of the hazardous operation or process;
- The type of respiratory hazard (including physical properties, physiological effects on the body, concentration of toxic material, and established IDLH concentration for the material);
- The warning properties of the respiratory hazard;
- The oxygen levels in the work area;
- The period of time for which respiratory protection must be provided and the potential stresses associated with the work activities during usage;
- The physical characteristics and limitations of the various types of respirators;
- Respirator assigned protection factors (APFs), maximum use concentrations (MUCs) and an individual's fit test results; and
- All applicable laws, regulations, and safety reference materials relating to the potential hazard.

5. Respirator Use

All respirators used at the City of Bangor will be certified by the National Institute for Occupational Safety and Health (NIOSH). Only clean, sanitized and inspected respirators will be used by employees, after a successful positive and negative user seal check has been performed. The employee is required to notify the supervisor is an issue is found with the respirator upon inspection or performing the user seal checks. If the employee detects a contaminant break-through, a change in breathing resistance, or leakage of the face piece while using the respirator, the employee must immediately leave the area and report the issue to his or her supervisor. Only air-purifying and powered air purifying respirators (PAPR) will be used in atmospheres that are not oxygen-deficient or in atmospheres that do not exceed the protection factors listed below:

NOISH Respirator and Assigned Protection Factor

Filtering Face Piece / Dust Mask (N95 or N99)	10x PEL
Half-Mask, Air-Purifying Respirator	10x PEL
Full Face, Air-Purifying Respirator	50x PEL

PAPR with loose fitting hood / helmet	25x PEL
PAPR with half-mask face piece	50x PEL
PAPR with full-face piece or NIOSH certified hood / helmet	1000x PEL

6. Respirators for IDLH Atmosphere

Immediately Dangerous to Life or Health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible health effects, or would impair an individual's ability to escape from a dangerous atmosphere. If potentially hazardous contaminants cannot be determined, if the exposure level cannot be identified or reasonably estimated, or if no exposure limit or guidance is available, the atmosphere should be considered IDLH and respirator choice should be made accordingly. Safety and Environmental Management may be able to demonstrate, through information on the processes and reasonable assumptions about potential maximum concentrations that IDLH concentrations would not occur. In this case, respiratory protection selection will be based on this estimated exposure. All oxygen-deficient atmospheres (less than 19.5% O_2 by volume) are considered IDLH.

The City of Bangor employees do not engage in activities that would require them to use respiratory protection in an IDLH atmosphere, with the exception of the Bangor Airport's permit-required confined space entry rescue team and the Bangor Fire Department. The City of Bangor Fire Department maintains its own Respiratory Protection Program.

The Bangor Airport's permit-required confined space entry rescue team uses a full-face, supplied air respirator for rescue operations that could potentially contain a hazardous atmosphere. The breathing air is supplied by a cylinder that is maintained and filled by a third party vendor. The supplied air system will meet the following requirements:

- Meet the requirements for Grade D breathing air;
- Compressed oxygen is not used in respirators that have previously used compressed air;
- Oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution;
- Breathing air couplings are incompatible with outlets for other gas systems;
- Breathing gas containers are marked with appropriate NIOSH certifications;
- Cylinders are tested and maintained according to DOT 49 CFR Part 173 & 178;
- A certificate of analysis for breathing air has been obtained from the supplier; and
- Moisture content in the cylinder does not exceed a dew point of -50^{o}F at 1 atmosphere pressure.

7. Medical Evaluation

Using a respirator may place a physiological burden on an employee, which may vary with the type of respirator, task being performed, workplace conditions and the medical status of the employee. A medical evaluation is required for all employees who are assigned to wear a respirator. For each medical evaluation, the City of Bangor is required to provide the following information to the City's occupational healthcare provider.

- Type and approximate weight of the respirator to be used by the employee;
- Duration and frequency of respirator use (including those used for rescue or escape);
- The expected physical work effort;
- Additional protective clothing and equipment to be worn;
- Temperature and humidity extremes that may be encountered; and
- A copy of the employer's Respiratory Protection Program and applicable standards.

The employee will confidentially complete a Respiratory Medical Evaluation Questionnaire and submits it directly to the City of Bangor Occupation Medical Provider. A physician or other licensed health care provider (PLHCP) will review the completed questionnaire and determine if additional examinations or tests are required. Once the PLCHP medically clears the employee to wear a respirator, the occupational health care provider will send written confirmation to Safety and Environmental Management. SEM will notify the supervisor that the employee has been medically cleared to wear a respirator and that they are ready to be fit tested and trained.

Periodic medical evaluation will be administered according to the following schedule:

Age of Worker	Medical Evaluation & Approval
Up through 35 yrs.	At least every 5 yrs.
36 – 40 yrs.	At least every 2 yrs.
40 and Older	At least annually

8. Training

The City of Bangor will provide initial and annual training to all employees that are included in the Respiratory Protection Program. Training will be documented and include the employee's name, his or her signature or initials, name of the trainer and date of the training. This

information will be available for review upon request. The training will cover the following topics:

- How and why a particular respirator and respirator cartridge was selected and its limitations;
- Why the respirator is necessary and how improper fit, usage or maintenance can compromise the protective effect of the respirator;
- To identify the contaminant(s) or situations where their respirator will provide protection;
- To use other controls (i.e. local exhaust ventilation, safe work practices, etc.) in conjunction with respirator use to help reduce exposure to hazardous substances in the workplace;
- How to put on (donning), wear, and take off (doffing) their respirator;
- How to properly perform a respirator seal check;
- How to properly clean, inspect, maintain and store their respirator in accordance with manufacturer recommendations;
- When to change the face-piece, cartridges, or filters based upon hours of use, contaminant concentration, work rate, end-of-service-life indicator, or when breathing through the respirator (filtering face-piece or filters) becomes difficult;
- To inform their supervisor if they develop any health or technical problems that affect their ability to use a respirator; and
- How to recognize an emergency situation, immediately exit the area and to notify their supervisor.

Training will be conducted annually or when the following situations occur:

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

9. Respirator Fit Testing

After confirmation of medical clearance from the City's occupational healthcare provider and completing the annual training requirement, the employee must be fit tested with the same make, model, style and size of respirator that will be used in the workplace. A proper fit test helps the employee select the best fitting respirator for his or her facial characteristics and is required on an annual basis. Safety and Environmental Management will provide a qualitative respirator fit test in accordance with Appendix A of 29 CFR 1910.134. If a quantitative fit test is required, arrangements can be made with the Bangor Fire Department. An additional fit test may be required whenever any of the following conditions occur:

- Significant weight change (20 pound or more);

- Significant facial scaring in the area of the facepiece seal;
- Significant dental changes;
- Reconstructive or cosmetic surgery; or
- Other conditions that may interfere with the facepiece seal.

Safety and Environmental Management will not conduct a fit test for an employee who has facial hair that will affect the seal between the respirator face piece seal and skin or interfere with operation of inhalation and exhalation valves.

10. Respirator Inspections

Respirators must be inspected prior to each use, during the cleaning process, and in the event that chemical breakthrough occurs while using the respirator, in which case the inspection must occur outside the contaminated work area. Many respirator manufacturers' will include guidance on proper inspection of their products. The inspection must include the following:

- Inspection of the respirator for defects;
- Ensuring that the respirator is pliable and free of cracks, tears, holes, shape distortion, or other observed deterioration of the construction material;
- Ensuring that filters and cartridge mounts are free from damage;
- Ensuring respirator cartridges are replaced in accordance with the cartridge change-out schedule;
- Ensuring that the respirator has no parts missing or damaged gaskets;
- Ensuring that the respirator is free from damaged or improperly installed valves; and,
- Ensuring that the respirator is free from broken or worn head straps (straps that exhibit loss of elasticity, cuts, tears, or broken buckles / clips).

Filtering face-piece respirators (i.e. dust masks) that are damaged, or contaminated on the interior surface, must not be used. They must be discarded, and a new filtering face-piece obtained.

11. User Seal Checks

User seal checks must be performed each time the employee puts on a tight fitting respirator. Both steps must be passed for a successful seal check. Employees must pass a seal check prior to using their respirator for protection against workplace contaminants. Air should neither leak in or out of the mask during the seal check, nor should air leak out of a respirator except through the exhaust valve during use. If a leak occurs or the respirator fails, it is not to be used until it

has been replaced, repaired, or re-fitted to the user. Seal checks are performed while wearing the respirator and include two steps:

- Positive - Cover the exhalation valve with the palm of either hand while *gently* exhaling. If air does not leak through the face to face-piece seal of the respirator, then you have passed the positive pressure check.
- Negative - Cover the attached cartridges with the palms of your hands while *gently* inhaling. If air does not leak through the face to face-piece seal of the respirator, then you have passed the negative pressure check.

User Seal Check

12. Maintenance and Storage Requirements:

Respirators are issued exclusively to each employee and must be cleaned and disinfected as often as necessary to maintain the respirator in a sanitary condition. A mild soap solution and warm water should be used to clean the elastomeric portions of a respirator as directed by the manufacturer. The respirator should be dried with a cloth, then placed in a clean location to air-dry. Once the respirator is dry it should be placed in the designated respirator bag, separate from the cartridges.

Note: Prolonged presence of sand, dirt, dust, or visible microbial growth can damage a respirator.

Users must store respirators in a clean, sanitary area away from sunlight, excessive moisture, chemicals, extreme temperatures, and dust. Separate the cartridges from the respirator and place

within a container (or equally effective manner) in a way that protects the face seal from being deformed. Store the cartridges in a similar manner. Respirators are not to be stored by hanging them from their straps, this will weaken the straps potentially cause a poor fit to the user's face.

13. Voluntary Use:

Under some circumstances, employees may wish to use respiratory protection for their own comfort or sense of well-being, even when there is no recognized hazard or overexposure. Respirator use in these circumstances would be considered "voluntary" and many elements of OSHA's respiratory protection standard would not apply. For voluntary users, annual respirator fit testing is not required, but SEM can provide this service to help ensure proper size selection. Voluntary users of filtering face piece respirators (N95, N99) are also not required to undergo medical clearances. However, voluntary users of all other respirators are required to provide SEM a medical clearance from a physician or other licensed health care provider (PLHCP).

Employees that voluntarily chose to wear a respirator must complete the following:

- Obtain a medical clearance from a physician or other licensed health care provider (PLHCP) within the past year. Unless the employee is using a filtering facepiece respirator;
- Read and sign the Voluntary Use of a Respirator Form;
- Read and follow the manufacturer's recommendations for proper respirator use;
- Agree to use the respirator in situations where there is no recognized hazard or overexposure; and
- Properly use, maintain, store and clean the respirator.

14. Recordkeeping:

The City of Bangor will maintain the following Respiratory Protection records:

- Medical clearance records from the Occupational Healthcare Provider – will be kept by Safety and Environmental Management for the duration of employment plus 30 years;
- Respiratory Protection training records – will be kept by Safety and Environmental Management for the duration of employment;
- Fit Test records - will be kept by Safety and Environmental Management until the next fit test is administered; and

- Voluntary Use of a Respirator form – will be kept by Safety and Environmental Management for the duration of employment.

15. Program Review

Safety and Environmental Management will conduct a periodic review of the Respiratory Protection Program, including the training program to assess compliance with 29 CFR 1910.134. Periodic field audits will be conducted of departments that have employees included in the respiratory protection program to ensure compliance at the departmental level.