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MAPP employees do not perform operations involving Respiratory Protection. Any subcontractor that must perform this type of job function shall have a written program and training compliant with regulatory guidelines. Any situation where a policy does not exist all employees shall comply with the following general policy:

1. **PURPOSE AND SCOPE**

1.1. MAPP employees and subcontractor employees shall be provided protection from occupational exposure where a potential hazard to dusts, fumes, mists, radionuclides, gases, vapors, biological airborne contaminants, or oxygen deficiency exists. Where feasible, exposure to contaminants at concentrations presenting a potential health hazard will be eliminated by engineering controls. When effective engineering controls are not feasible, respiratory equipment will be used to achieve this goal.

1.2. This policy provides a strategy to be followed when respiratory hazards are encountered. It is the intent of this work instruction to protect our worker's health and prevent the inhalation of harmful airborne substances or the hazards found in oxygen deficient atmospheres

2. **RESPONSIBILITIES**

2.1. Supervisors

Supervisors must address respiratory hazards in the Job Safety Analysis (JSA) to be completed for each work activity or work location. Supervisors shall assure that:

- Potential respiratory hazards are properly identified;
- Employees are medically qualified, fit tested, and trained;
- Employees have been issued and use the proper equipment; and
- The work environment is sampled and monitored, as appropriate**.**

2.2. Employees

Employees must collaborate with the supervisor in the development of the site-specific JSA to identify respiratory hazards and their controls.

Employees shall comply with requirements, which will be addressed in the site-specific Respiratory Protection Program training, that include:

- Proper equipment maintenance;
- Absence of gas-tight face-seal obstructions;
- Respirator user seal check, and
- Notification to supervision when work conditions change or otherwise present a potential health hazard

2.3. HSE Manager

The HSE Manager shall obtain from MAPP Project Manager, personnel and the customer appropriate chemical inventory and chemical process data, personal exposure and monitoring data, and medical surveillance data.

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The HSE Manager shall identify the hazards and necessary controls, which will be placed in the Respiratory Protection Program.

2.4. Program Administrator

The Program Administrator is responsible for the administration of the Respiratory Protection Program and evaluation of the Program's effectiveness.

2.5. Site HSE Supervisor

Since the Company operates multiple projects in various states and countries, the Program Administrator has designated Site HSE Supervisors to assist with administration of the Program and evaluation of the Program's effectiveness.

The Site HSE Supervisor shall ensure that deficiencies identified during Program evaluations are corrected as soon as possible.

3. DEFINITIONS

Administrative Controls	Methods of controlling employee exposures to contaminants by job rotation, work assignment, or time periods away from the contaminant.
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.
Atmosphere-supplying respirator	A respirator that supplies the user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self0contained breathing apparatus (SCBA) units.
Canister or cartridge	A container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.
Dust	Solid particles generated by handling, crushing, or grinding organic or inorganic material.
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.
End-of-service-life-indicator (ESLI)	A system that warns the respirator user of the approach of the end of the adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.
Engineering Controls	Methods of controlling employee exposures by modifying the source or reducing the quantity of contaminants released into the work environment.

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Escape-only respirator	A respirator intended to be used only for emergency exit
Filter or air purifying element	A component used in respirators to remove solid or liquid aerosols from the inspired air.
Filter 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.
Fume	Airborne solid particles from heating a solid material.
Gas	A state of matter in which the material has very low density and viscosity, can expand and contract in response to changes in temperature and pressure, easily diffuses into other gases, and that uniformly distributes throughout any container.
High efficiency particulate air (HEPA) filter	A filter that is at least 99.97% efficient in removing monodispersed particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100 and P100 filters.
Hood	A respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
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.
Mist	Suspended liquid droplets generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state such as splashing.
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%
PLHCP	A physician or other licensed health care professional.
Positive pressure respirator	A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

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Pressure-demand respirator	A supplied-air respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.
Qualitative fit test (QLFT)	A pass/fail 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.
Radionuclides	Atoms capable of spontaneously emitting radiation
Respiratory inlet covering	That portion of a respirator that forms the protective barrier between the user's respiratory tract and an air purifying device or breathing air source, or both. It may be a facepiece, helmet, hood suit, or mouthpiece respirator with nose clamp.
Self-contained breathing apparatus (SCBA)	A supplied-air respirator for which the breathing air source is designed to be carried by the user.
Supplied air respirator (SAR) or airline respirator	A supplied-air respirator for which the source of breathing air is not designed to be carried by the user.
Tight fitting facepiece	A respiratory inlet covering that forms a complete seal with the face.
User seal check	An action conducted by the respirator user to determine if the respirator is properly seated to the face.
Vapor	The gaseous form of a substance which is normally in the solid or liquid state.

4. PROCEDURE

4.1. Site-specific Respiratory Protection Program

A site-specific Respiratory Protection Program shall be developed for each site at which respiratory protection is used by employees of the Company.

Client respiratory protection programs may be adopted if determined by the Program Administrator to meet the requirements of this Program. In such cases, program documentation must be created to clearly identify the client's program as the Company's site-specific written Respiratory Protection Program.

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4.2. Program Administration

The MAPP Respiratory Protection Program Administrator is responsible for the administration of the Respiratory Protection Program and evaluation of the Program's effectiveness.

Site HSE Supervisors assist the Program Administrator with Program management and with routine observations to verify that Program components are effective.

4.3. Program Components

Respiratory Protection Program components include

4.3.1. Program administration,

4.3.2. Medical evaluations of employees required to use respirators,

4.3.3. Procedures for selecting respirators for use in the workplace,

4.3.4. Fit testing procedures for tight-fitting respirators,

4.3.5. Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations,

4.3.6. Procedures for proper use of respirators in routine and reasonable foreseeable emergency situations,

4.3.7. Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding and otherwise maintaining respirators,

4.3.8. Procedures for regularly evaluating the effectiveness of the Program.

4.3.9. Medical Evaluations, respirators, and training shall be provided by the employer with no additional cost to the employee.

4.4. Periodic Program Review

The written Site-specific Respiratory Protection Program shall be reviewed and updated at least annually or when there is a change in scope of work that potentially impacts worker exposure.

4.5. Program Effectiveness Evaluation

Program effectiveness observations should be documented through the use of Respiratory Protection Program Checklist, found in the Site-specific Respiratory Protection Program. Observation frequency shall be determined by the complexity of the site's Respiratory Protection Program.

The Site HSE Supervisor shall ensure that noted deficiencies are corrected as soon as possible.

5. MEDICAL EVALUATION

A medical evaluation will be completed to determine the worker's ability to use a respirator before the respirator wearer is fit tested or required to use the respirator in the workplace.

Based on the findings of the medical evaluation, a medical examination may also be required.

5.1. Medical Evaluation Procedures

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5.1.1. A physician or other licensed health care professional (PLHCP) performs all respirator user medical evaluations. Each respirator wearer shall complete the Medical Questionnaire for the Respirator Users (Appendix A), which is forwarded to a MAPP-designated physician for a written determination of the worker's ability to use the selected respirator, under the defined working conditions.

5.1.2. All respirator users will complete the Medical Questionnaire for Respirator Users, Appendix A.

5.1.3. If a pre-employment or annual physical is required and conducted, it may be used to meet the requirements of this section if it includes the same information as the Medical Questionnaire for Respirator Users, Appendix A.

5.1.4. The medical questionnaire and examinations are administered confidentially during the respirator wearer's normal work hours or at a time and place convenient to the worker. The medical questionnaire is also administered in a manner that ensures the respirator wearer understands its content.

5.1.5. The respirator wearer is also provided an opportunity to discuss the questionnaire and examination results with the PLHCP.

5.1.6. Any worker who refuses to be medically evaluated for respirator use will not be allowed to use a respirator.

5.2. Medical Examinations

A medical examination is provided for any worker who gives a positive response to any of Questions 1 through 8 in Section 2 of the Medical Questionnaire For Respirator Users, Appendix A, or whose initial medical examination demonstrates the need for a follow-up medical examination.

The medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make final determination on the respirator wearer's ability to use a respirator.

5.3 Supplemental Information for the PLHCP

5.3.1 Supplemental information concerning the specific type(s) of respirator to be used and the anticipated working conditions is provided

5.4 Medical Recommendation

5.4.1 Following the evaluation and/or examination, a written recommendation regarding the worker's ability to use the respirator must be provided by the PLHCP. The recommendation shall provide the following information:

- Any limitations on respirator use related to the medical condition of the worker or to the workplace conditions in which the respirator will be used, including whether or not the worker is medically able to use the respirator;
- The need, if any, for follow-up medical evaluations; and
- A statement that the PLHCP has provided the worker with a copy of the PLHCP's written recommendation.

5.4.2 For negative pressure respirator work, if the PLHCP finds a medical condition that may place the worker's health at increased risk, a powered air-purifying respirator (PAPR) can be provided if the PLHCP determines that the worker can use the PAPR.

5.4.3 If a worker is wearing a PAPR because of medical restrictions and if a subsequent medical evaluation finds that the worker is medically able to use a negative pressure respirator, then there is no longer a requirement to provide a PAPR.

5.5 Additional Medical evaluations and/or Examinations.

An additional medical evaluation and/or examination shall be conducted if:

- A worker reports medical signs or symptoms that are related to ability to use a respirator;
- A PLHCP, supervisor, Site HSE Supervisor, or the Respirator Program Administrator determines that a worker needs to be reevaluated;
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for worker reevaluation; or
- A change occurs in workplace conditions, e.g. physical work effort, protective clothing, temperature, that may result in a substantial increase in the physiological burden placed on a worker.
- All medical evaluations shall be retained by the employer for a minimum of 30 years and shall be made available to the employee within 15 days of receiving a written request for such records.

6. RESPIRATOR SELECTION

This section presents the types of respirators available on-site and the criteria and procedure to be used to determine respiratory protection needed for specific tasks**.**

6.1 Criteria for Respirator Selection

Respirator selection documentation will be completed by the Site HSE Supervisor and shall include information relative to respirator selection

For each type of task for which respirator protection is required, the questions or issues listed below shall be addressed, as applicable. Task examples include permit-required confined space entry, first line breaks, process valve maintenance activities, painting, cleaning or degreasing with solvents, etc. For routine tasks, where conditions or hazards do not change, a single respiratory hazard selection evaluation is generally sufficient. If hazards, work sequences, or conditions change, the respirator selection criteria must be re-evaluated.

- The task description and whether the task is routine or related to a non-routine task.
- Is exposure to hazardous material(s) anticipated throughout the duration of the work task or only due to an upset condition, such as failure of a control system or incomplete process system cleanout in preparation for maintenance?

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- Is there potential for exceeding the IDLH concentration of the hazardous material(s)? (See paragraph 3.2 for prohibitions related to IDLH work.)
- Identification of the major contaminant(s) associated with the work task.
- The occupational exposure limit for each major contaminant. Usually, this is the OSHA PEL, ACGIH TLV, NIOSH REL, or, when these are not available, the client or trade association exposure limit. Their limits are based on a full 8-hour shift time weighted average or short-term exposure limit (15 min.), or ceilings, or peaks above the acceptable ceiling concentration.
- Estimated exposure concentration aids in respirator selection and determination of the cartridge change schedule. The estimated concentration should be based on actual personal or area exposure monitoring data, exposure data from a similar operation, or an engineering estimate.
- For each listed respiratory protection task, the respirator manufacturer and model shall be listed.
- For particulate exposures, the particulate cartridge Types N, R, and P refer to standard performance designations established by NIOSH.
    - N refers to no oil exposure and 95%, 99%, or 100% (99.97%) filter efficiency.
    - R refers to some oil up to eight hours and 100% (99.97%) filter efficiency.
    - P cartridge types can be used with oil exposure with no time restriction and 100% (99.97%) filter efficiency. Individual manufacturers may have different designations. To aid in decision-making on the appropriate type of respirator, individual manufacturer literature will also be used
- For each task involving use of a cartridge respirator, a respirator cartridge change schedule shall be provided. Two options are available for those jobs involving vapor or gas exposures
    - The cartridge change-out schedule can be based on end-of-service-life indicator (ESLI) on the cartridge. There are ESLIs for mercury vapor cartridges and carbon monoxide, chlorine, ethylene oxide, and hydrogen sulfide canisters. There is also an OSHA contaminant-specific cartridge and canister change schedule for benzene, acrylonitrile, formaldehyde, methylenedianiline and 1,3 butadine. Refer to the contaminant specific regulation.
    - Or, manufacturers' change schedules may be used. If software calculations are used, a copy of the calculation printout must be attached to the Respirator Selection Worksheet, Form 3-1. The 3M cartridge change schedule is located at http://www.3m.com/occsafety/html/software.html The MSA cartridge life expectancy calculator is located at http://webapps.msanet.com/responseguide/ .

6.2 Immediately Dangerous to life or Health Atmospheres (IDLH)

6.2.1. Worker exposure to any of the following task conditions shall be avoided.

- Oxygen concentrations less than 19.5% or greater than 23.5%, or
- Atmospheres greater than 1% of the Lower Explosive Limit, or
- Atmospheres that are potentially Immediately Dangerous to Life or Health (IDLH), or
- Unprotected exposure to known human carcinogens, mutagens, or teratogens, or
- Unprotected exposure to known chemical sensitizers.

When work in these environments seems to be absolutely necessary, the Project Manager shall appeal to the appropriate Senior Operations Manager and Senior HSE Manager for written approval to proceed and specific safe work procedures.

6.2.2. For tasks for which there is the potential for IDLH atmospheres, the respirator must be a full facepiece supplied-air respirator in positive pressure mode and 5-minute (minimum) escape cylinder.

Examples of jobs that have the *potential* to become IDLH:

- Breaking into flare lines,
- Initial opening of all H2S or CO equipment vessels and lines,
- Confined space entry work where inert gas, e.g., nitrogen purge, may be present, or
- Working in certain process or sanitary sewers.

In *potential* IDLH atmospheres, ongoing air monitoring shall be conducted to verify contaminant concentrations and to detect changes.

6.2.3 For work in atmospheres with the potential for IDLH conditions, trained rescue standby person(s) located outside the potential IDLH area are posted and equipped with an SCBA or supplied-air respirator on separate supply. This includes work in confined spaces that require supplied-air respiratory protection.

6.2.4 Standby persons will be equipped with:

- Continuous-flow or pressure-demand SCBAs or continuous flow or pressure-demand, supplied air respirator with a 5 minute (minimum) escape air cylinder and
- Appropriate retrieval equipment (harnesses, wristlets, anklets) for removing an employee, who enters the hazardous atmosphere.

6.2.5 Retrieval equipment must be used unless it would increase the overall risk of rescue. Situations may exist in which retrieval lines would pose an entanglement problem, especially if airlines and/or electrical cords are present.

Verify that visual or signal line communication is maintained between personnel in the *potential* IDLH atmosphere and personnel located outside the *potential* IDLH atmosphere.

7. FIT TESTING REQUIREMENTS

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Respirator fit testing is performed in accordance with the fit test protocols and procedures described below.

7.1 General Fit Test Protocols

7.1.1 The Respiratory Protection Program Administrator will designate qualified persons to conduct qualitative and/or quantitative fit tests.

7.1.2 The following fit testing requirements will be met:

- Each respirator wearer will be fit-tested on each specific (model, size) respirator worn prior to initial use and annually thereafter
- Spectacles (glasses), goggles, faceshields, or welding helmets will be worn in a manner that does not interfere with the facepiece seal of the respirator
- Contact lenses (soft and gas permeable only) may be worn with a full-facepiece respirator. However, some clients have policies which prohibit their use on their sites
- Respirator wearers shall be clean-shaven. Facial hair shall not interfere with the sealing surface of the facepiece and the face or interfere with valve function.
- User seal checks are performed each time the respirator is donned.

Fit tests shall be documented and retained until the next fit test is administered

Fit test Form 4-1, Qualitative respirator Fit-Test Record, and Form 4-2, Quantitative respirator Fit-Test Record, may be used to document the fit test.

7.1.3 The respirator wearer shall be allowed to pick the most acceptable respirator for a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits the user.

7.1.4 Prior to the selection process, the respirator wearer shall be shown how to don a respirator, how it should be positioned on the face, how to set strap tension, and how to determine and acceptable fit.

A mirror will be available to assist the respirator wearer in evaluating the fit and positioning of the respirator. This instruction does not constitute the respirator wearer's formal training on respirator use, because it is only a review.

7.1.5 Respirator wearers shall be informed that they are being asked to select the respirator that provides the most acceptable fit

7.1.6 The respirator wearer shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit. The more acceptable facepieces are noted in case the one selected proves unacceptable.

7.1.7 The most comfortable facepiece is donned and worn at least five minutes to assess comfort. If the respirator wearer is not familiar with using a particular respirator, then he/she shall be directed to don the facepiece several times and to adjust the straps each time to become adept at setting proper tension on the

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straps.

7.1.8 Assessment of comfort shall include a review of the following points with the respirator wearer:

- Position of the respirator on the nose
- Room for eye protection
- Room to talk
- Position of respirator on face and cheeks

7.1.9 The following criteria shall be used to help determine 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 respirator to slip
- Self-observation in mirror to evaluate fit and respirator position

7.1.10 The respirator wearer shall conduct negative and positive pressure user seal checks each time the respirator is donned.

Before conducting the negative and positive pressure user seal checks, the respirator wearer shall be told to seat the respirator 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 respirator wearer fails the user seal check.

7.1.11 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 or obstruction which interferes with a satisfactory fit shall be altered or removed.

7.1.12 If the respirator wearer exhibits difficulty in breathing during the tests, he or she shall be referred to a physician or other licensed health care professional (PLHCP) for a medical re-evaluation to determine whether he or she can wear a respirator while performing his or her duties.

7.1.13 If the respirator wearer finds the fit of the respirator unacceptable, the respirator wearer shall be given the opportunity to select a different respirator and to be retested.

7.1.14 A tight fitting PAPR can be fit tested by not turning the fan motor on

7.1.15 Exercise Regimen

Prior to the commencement of the fit test, the respirator wearer shall be given a description of the fit test and the respirator wearer's responsibilities during the test procedure.

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The description of the process shall include a description of the test exercises that the respirator wearer will be performing.

The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

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

7.1.16 Test Exercises

The following test exercises are performed for all fit testing methods prescribed in this procedure, except for the Control Negative Pressure (CNP) method. A separate fit testing exercise regimen is contained in the CNP protocol. The respirator wearer shall perform exercises in the test environment in the following manner:

- Normal Breathing

In a normal standing position, without talking, the respirator wearer shall breathe normally.

- Deep Breathing

In a normal standing position, the respirator wearer shall breathe slowly and deeply, taking caution so as not to hyperventilate.

- Turning Head Side to Side

Standing in place, respirator wearer shall slowly turn his or her head from side to side between the extreme positions on each side.

- Moving Head Up and Down

Standing in place, the respirator wearer shall slowly move his or her head up and down.

The respirator wearer shall be instructed to inhale in the up position (i.e. when looking toward the ceiling).

- Talking

The respirator wearer shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The respirator wearer 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."

- Grimace

The respirator wearer shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT.)

- Bending Over

The respirator wearers shall bend at the waist as if they were to touch their toes. Jogging in place shall be substituted for this exercise in those test environments, such as shroud type QLFT units, which do not permit bending over at the waist.

- Normal Breathing

In a normal standing position, without talking, the respirator wearer shall breathe normally.

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

The respirator wearer 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.

7.2 Qualitative Fit test Requirements

7.2.1 Negative-pressure air purifying respirators that will be worn in concentrations that are equal to or less than 10 times the PEL may be fit tested using qualitative fit test requirements. (QLFT).

7.2.2 The person administering the QLFT will be able to prepare test solutions, calibrate equipment, and perform tests properly; recognize invalid tests; and ensure that test equipment is in proper working order.

7.2.3 The QLFT equipment is to be kept clean and well maintained so as to operate within the parameters for which it was designed.

7.3 Quantitative fit test requirements

7.3.1 The following quantitative fit test (QNFT) methods are 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 the 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.

7.3.2 QNFT Procedure

- The person administering the QNFT will be 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.
- The QNFT equipment must be kept clean, maintained, and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.
- Once a respirator has been modified or altered with a fit test probe, the facepiece will only be used for fit testing. When the facepiece is returned to the original NIOSH tested-and-certified configuration, the facepiece may be returned to service.

8 PROPER RESPIRATOR USE

8.1 General Requirements

8.1.1 All respirators, filters, cartridges, and components used at this site shall be certified by NIOSH (a US certification) and shall be worn in accordance with all manufacturers' instructions

8.1.2 Respirators shall be used only for the purpose intended and shall not be modified in any way.

8.1.3 Tight-fitting facepiece respirators are not to be worn by workers who have any condition that interferes with the face-to-facepiece seal or valve function (such as facial hair).

8.1.4 If a worker wears corrective glasses or goggles or other personal protective equipment, the Site HSE Supervisor shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

8.1.5 For all tight-fitting respirators, a user seal check is conducted each time the respirator is donned. Tight-fitting respirators that cannot be seal-checked are not acceptable for use.

8.1.6 Site management shall ensure appropriate surveillance of work area conditions and degree of worker exposure or stress. When there is a change in work area conditions or degree of worker exposure or stress that may affect respirator effectiveness, the Site HSE Supervisor shall reevaluate the continued effectiveness of the respirator.

8.1.7 The worker's Supervisor will ensure that workers can leave the area

- To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use;
- If they detect vapor or gas breakthrough, changes in breathing resistance or leakage of the facepiece; or
- To replace the respirator or the filter, cartridge, or canister elements, when vapor or gas breakthrough is detected, changes in breathing resistance occur,

or when there is leakage of the facepiece. The respirator will be replaced or repaired before allowing the worker to return to the work area.

8.1.8 Prior to use, the following items are visually inspected, as appropriate:

- Tightness of connections
- Condition of facepiece
- Head straps
- Valves and connecting tube
- Cartridge/Canisters
- Elastic parts (for pliability)
- Respirator function
- Disposable-Type/Single-Use Respirators (Non-IDLH)

8.1.9 Limitations

This respirator provides protection against low levels of certain dusts and/or fumes, but does not supply oxygen, and shall not be used in an oxygen deficient atmosphere. Do not use in any atmosphere that is immediately dangerous to life or health. These NIOSH approved respirators will not be used where airborne concentrations of dust and/or fumes equal or exceed 10 times the Permissible Exposure Limit (PEL).

8.1.10 Procedures For Using The Respirator

- Inspect the respirator before use to verify that all parts are present and in good working order.
- Follow the manufacturer's instructions when donning and adjusting the respirator straps. Some disposable single use respirators utilize elastic straps and adjustable buckles.

If detection of vapor inside the facepiece (by smell or otherwise) or difficult breathing is experienced, workers are trained to leave the area immediately, report the condition to their supervisor, and provide the respirator to the Site HSE Supervisor for inspection.

8.2 Chemical Cartridge Respirator/Air-Purifying Respirator (Non-IDLH)

8.2.1 These respirators provide protection against low levels of certain gases and vapors. Respirator canisters or cartridges shall be specifically selected for concentrations of gases and/or vapors that may be encountered.

8.2.2 This respirator does not supply oxygen and shall not be used in an oxygen deficient atmosphere. These respirators cannot be used in any atmosphere that is immediately dangerous to life or health. Workers are trained to leave the area immediately if an odor is detected inside the respirator.

8.2.3 Air purifying respirators (APRs) shall not be used for rescue or emergency work.

8.2.4 Procedures for Using the Respirator

- Respirators are inspected before each use to assure that all parts are present and in good working order.
- Workers will then don the respirator and adjust it to obtain a snug but comfortable fit.

- Workers then perform a user seal check.

8.2.5 Cartridges are replaced in accordance with cartridge change schedule stated in the Respirator Selection Worksheet, Form 3-1. If workers can smell or otherwise detect vapors inside the facepiece, or if difficulty breathing is experienced, the cartridges will be changed.

8.3 Particulate Filter Respirator (Non-IDLH)

8.3.1 Limitations

Particulate Filter Respirators provide protection against low levels of certain dusts and/or fumes. This respirator does not supply oxygen and shall not be used in an oxygen deficient atmosphere. These respirators cannot be used in any atmosphere that is immediately dangerous to life or health.

8.3.2 Procedures For Using the Respirator

- The respirator is inspected by the worker before each use to assure that all parts are present and in good working order.
- Workers will then don the respirator and adjust it to obtain a snug but comfortable fit.
- Workers will then perform a user seal check.

8.4 Airline Respirator

8.4.1 Limitations

An airline respirator shall not be used in any atmosphere that is immediately dangerous to life or health, including an oxygen deficient atmosphere, unless equipped with a self-contained escape (5, 15, or 30 minute) air cylinder.

8.4.2 Procedures For Using Airline Respirators

- Workers shall inspect all equipment before each use to assure all parts are present and in good working order.
- If using an escape air cylinder, user will ensure that air supply is of sufficient capacity (5, 15, or 30 minute) to permit safe escape from work area.
- The worker will then follow the manufacturer's instruction to select correct length of airline hose.
- Connect hose to regulator and air supply (The maximum air pressure at the point of attachment of hose to air supply is determined by manufacturer's instructions.)
- The worker will then don the respirator and adjust to obtain a snug but comfortable fit and perform a user seal check.
- Next the worker shall connect the respirator to the regulator and adjust the airflow in the facepiece.

In case of respirator malfunction, workers are trained to leave the area immediately and report the condition to their supervisor.

8.4.3 Procedures For Using Airline Respirators With Compressors

- If using a compressor, the worker and their supervisor, or the Site HSE

Supervisor, will verify that the compressor's air intake is in an uncontaminated area. Air-purifying filters and/or sorbents shall be used if necessary to assure Grade D quality air. (Refer to section below related to Breathing Air Quality.)

- Record on a tag, which will be maintained at the compressor, the most recent filter change date and the signature of the person authorized to perform the filter change.
- If the compressor is oil-lubricated, it shall be equipped with high temperature and carbon monoxide alarms that are both audible and visual.
- For compressors that are not oil=lubricated, ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.
- In-line air purifying sorbent filters with water and oil traps shall be installed between the compressor and user(s).

8.5 Self-Contained Breathing Apparatus (SCBA)

8.5.1 SCBAs are provided primarily for use in emergency response when spills, leaks, or other circumstances present respiratory hazards.

8.5.2 Grade D breathing air quality cylinders shall be stored and maintained in a fully charged state and shall be recharged if the pressure falls to 90% of the manufacturer's recommended pressure level

8.5.3 Limitations

Air Supply is generally rated for 30 minutes.

Heavy exertion and excitement will increase the breathing rate and deplete the air supply sooner. Workers are trained to leave the area when the alarm indicates low air supply.

8.5.4 Procedures For Using The Equipment

- Workers shall inspect the unit before each use and ensure a sufficient air supply (at or above 90%) and that the regulator and low pressure warning devices function properly.
- The user will then open the cylinder air supply valve.
- Next, don unit so cylinder is on the user's back with the valve pointing down and engage and tighten the harness.
- Then the worker will don the respirator and adjust to obtain a snug but comfortable fit and perform a user seal check.
- The worker will then connect the facepiece hose to the regulator.

Workers are trained to use the bypass only in the event of regulator failure and to leave area immediately whenever the low-pressure alarm sounds.

8.5.5 Care and maintenance of SCBAs is performed by a qualified person.

8.5.6 Bottles are refilled only with breathing air that meets the specifications for Grade D Breathing Air in Compressed Gas Association Commodity Specification G-7.1-1989. Grade D has an oxygen content of 19.5-23.5%, condensed

hydrocarbon of 5mg/m^3 or less, carbon monoxide of 10 ppm or less, carbon dioxide of 1,000 ppm or less, and lack of noticeable odor.

8.5.7 SCBA emergency use respirators are kept accessible to the work area and stored n compartments or in covers that are clearly marked as containing emergency respirators.

8.5.8 All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use.

8.5.9 Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

8.5.10 For respirators maintained for emergency use, the Site HSE Supervisor or Supervisor will assure the presence of a tag or label containing the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.

This information is provided on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent inspection.

8.6 Breathing Air Quality

8.6.1 Air supply shall be free of harmful quantities of contaminants, and shall meet specification for Grade D Breathing Air as described in the Compressed Gas Association publication G-7 1988, Compressed Air for Human Respiration.

8.6.2 Compressed oxygen shall not be used in supplied-air respirators or in open circuit self-contained breathing apparatus.

8.6.3 Breathing air may be supplied to respirators from cylinders or air compressors. Cylinders must have a dated label or sticker affixed to them indicating "Certified Breathing Air" or equivalent.

8.6.4 Workers are instructed to stop work immediately if they experience in difficulty breathing, smell any unusual odors, or experience an ill feeling such as a headache or upset stomach, etc. and report the situation to their Supervisor.

8.7 User Seal Checks

8.7.1 Negative-Pressure Seal Check Procedure

- Close inlet openings of the respirator, canister(s), cartridge(s), or filter(s) by covering with palm of hands, by replacing the inlet seal on the canister(s), or by squeezing a breathing tube or blocking its inlet so as not to allow the passage of air.
- Inhale gently and hold breath for ten seconds.
- Verify that a satisfactory fit has been achieved by assuring that the facepiece collapses slightly and no inward leakage of air into facepiece is detected.

If inward leakage is detected the respirator wearer will reposition the facepiece and/or

straps and repeat this sequence until a satisfactory fit check is obtained.

8.7.2 Positive-Pressure Seal Check Procedure

- Close exhalation valve or breathing tube or both.
- Exhale gently.
- Verify that a satisfactory fit has been achieved by assuring that a slight buildup of positive pressure is generated inside the facepiece without detection of outward leakage between the sealing surface and the face.

If outward leakage is detected, the respirator wearer will reposition the facepiece and/or straps and repeat this sequence until a satisfactory seal check is obtained.

9 TRAINING

Training is provided to all workers who are required to use respirators prior to requiring them to use the respirator in the workplace.

9.1 Training Content

The training is comprehensive, understandable, and conducted on an annual basis or more often, if necessary

At a minimum, the training includes the following topics:

- The nature of the hazard(s), including physical properties, odor characteristics, physiological effects on the body, and known concentration levels of toxic material or airborne radioactive level;
- How improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- The physical characteristics, functional capabilities, and limitations of various types of respirators;
- How to use the respirator in emergency situations;
- How to inspect, don, doff, use, and check the seal of the respirator;
- Procedures for maintenance and storage of the respirator; and
- How to recognize the medical signs and symptoms that may limit or prevent the effective use of respirators.

9.2 Training Documentation

Training documentation is maintained for all workers who are assigned work that requires the use of a respirator. (Form 6-1 may be used to document the training.)

Re-training is administered annually and when the following situations occur:

- Changes in the workplace or the type of respirator render previous training obsolete;
- Inadequacies in the respirator wearer's knowledge or use of the respirator indicate that the worker has not retained the requisite understanding or skill; or
- Situations arise in which retraining appears necessary to ensure safe respirator use.

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SECTION 31

Respiratory Protection

10 RESPIRATOR MAINTENANCE

10.1 Cleaning & Sanitization

10.1.1 Respirators will be cleaned and sanitized before being issued. Commercial wipes may also be used by the wearer to clean his/her respirator between uses during the work shift.

10.1.2 Cleaning, disinfecting, and storage of respirators shall be performed as follows:

- Remove filters, cartridges, or canisters. Disassemble facepiece by removing speaking diaphragms, demand- and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- Wash components in warm (43° C [110° F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- Rinse components thoroughly in clean, warm (43° C [110° F] maximum), preferably running water. Drain.
- When cleaner used does not contain a disinfecting agent, respirator components will be immersed for two minutes in one of the following:
  - Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43° C (110° F);
  - 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° C (110° F).; or
  - Other commercially available cleansers of equivalent disinfectant quality when used as directed, as recommended or approved by the respirator manufacturer.
- Rinse components thoroughly in clean, warm (43° C [110° 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.
- Components are hand-dried with a clean lint-free cloth or air-dried.
- Test the respirator to verify that all components work properly.

10.1.3 Chemical cartridges and mechanical filters shall be discarded and replaced as defined in section 3.0 of this Program.

10.2 Inspection & Storing

10.2.1 All respirators must be inspected by the wearer prior to each use.

10.2.2 Storage shall be in a convenient, clean, and sanitary location. At minimum respirators shall be stored in a protective bag.

10.2.3 Self-contained breathing apparatus (SCBAs) shall be inspected monthly and after

each use by a qualified person. The wearer shall self-inspect the SCBA prior to each use. SCBA inspections shall include checking cylinder pressure and units shall be brought to the rated pressure. Units shall be recharged after each use.

10.2.4 Airline respirators shall receive a functional check before and after each use.

10.2.5 Replacement of parts shall be made only with those specifically designed for the respiratory device used. All maintenance and repair shall be performed only by appropriately trained persons and shall be documented.

For some respiratory equipment's maintenance and repairs, e.g. SCNAs, escape units, the manufacturer will provide training certification for the person doing the maintenance or repairs.

10.3 Defective equipment shall be immediately removed from service and repaired prior to use. Repairs shall be made only by an appropriately trained, designated qualified person, and only with the manufacturer's approved replacement parts.

Defective equipment not repaired immediately shall be tagged:

Danger--- Do Not Use---Defective

Specific defect(s) will be listed on the tag.

Users may self-perform repairs only if they have been appropriately trained and approved parts are available. Reducing and admission valves, regulators, and alarms for air-supplied respirators shall only be repaired by the manufacturer or a certified technician trained by the manufacturer.

11 RESPIRATOR PROGRAM EVALUATION

The effectiveness of this site-specific Respiratory Protection Program will be evaluated with routine observations and formal Program evaluations.

11.1 Routine Observations

The Site HSE Supervisor shall be responsible for conducting routine observations related to the effective selection, use maintenance, storage and other aspects of this Program. Observations shall be noted through the use of Safety Observation Reports (SORs) or equivalent documented routine safety inspections. Noted deficiencies shall be corrected as soon as possible.

11.2 Program Evaluations

Formal Program evaluations shall be conducted on a periodic basis. Regular program effectiveness should be documented through the use of the Respiratory Protection Program Checklist, Appendix C. Safety Observation Reports (SORs) and Safety Evaluation Reports (SERs) can also be used to document Program Effectiveness.

The Site HSE Supervisor shall ensure that noted deficiencies are corrected as soon as possible.

11.3 Content of Program Evaluations

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SECTION 31

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Program evaluations shall conform to the following:

- Program administration
- Medical evaluations of employees required to use respirators,
- Procedures for selecting respirators for use in the workplace,
- Training of respirator wearers in the respiratory hazards to which they are potentially exposed during routine and emergency situations,
- Initial and annual fit testing for tight-fitting respirators,
- Procedures for proper use of respirators in routine and reasonable foreseeable emergency situations,
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and maintaining respirators,
- Procedures to verify adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators,
- Procedures for regularly evaluating the effectiveness of the program,
- Voluntary use procedures, and
- Other applicable observations.