DEPARTMENT OF HEALTH & HUMAN SERVICES

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MEMORANDUM FOR NIH ENVIRONMENTAL REMEDIATION CONTRACTORS

FROM: CAPT Derek A. Newcomer
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SUBJECT: Use of portable high effectiveness air filtration devices during remediation projects at NIH-owned, Maryland-located facilities

The Division of Occupational Health and Safety (DOHS) is implementing policy affecting devices incorporating high efficiency particulate air (HEPA) filters for capturing particulate matter (PM) during environmental remediation activities. This type of engineering control is known as a negative air machine, air scrubber, air filtration unit, and portable high-efficiency air filtration (PHEAF) device.

Several publications are available that assess the performance of HEPA filters used in stationary sources, e.g. biological safety cabinets. These studies demonstrated that once installed, the HEPA filter may not perform as specified due to manufacturer defects, damage incurred during shipping and handling, or improper installation of the HEPA filter into the housing mount. For these reasons, end-users of stationary HEPA systems conduct testing to demonstrate integrity of the installed filter. Since the type of HEPA filter used in stationary sources is similar to those used in PHEAF devices, the circumstances that cause damage to the HEPA filter are shared between stationary and portable units.

Furthermore, environmental remediation and indoor renovation projects are often short in duration, which means these portable devices are frequently transported between project locations. Consequently, the PHEAF device may be mishandled or dropped causing damage to the equipment and/or filter. Sometimes the damage may not be visibly evident to the user, such as a HEPA filter dislodged from its filter mount.

In harmony with measures that promote a safe work environment, the DOHS is implementing policy to inspect and test each PHEAF device used during abatement or remediation of hazardous materials within the building envelope.

The performance test will determine the PHEAF device's percent capture effectiveness measured by aerosol photometer and/or laser particle counter. The test protocol is adopted from *NSF International Standard/American National Standard 49: Biosafety Cabinetry: Design, Construction, Performance, and Field Certification.*

Effective 1 May 2019, PHEAF devices *used within NIH-owned facilities* located within Maryland must be visually inspected and judged to be in good-repair. Inspection of each PHEAF device will be performed by an industrial hygienist representing the interest of the NIH. Units

will be visually assessed for each project. Further inspection of the PHEAF device will be made whenever the unit is relocated during the course of the project. A copy of the *draft* inspection checklist is attached for reference. The visual inspection is intended to identify apparent damage to the PHEAF cabinet or filter.

Effective 1 June 2019, a PHEAF device will be considered unacceptable for use if the following concerns are identified during inspection:

- The date the HEPA filter was replaced is unknown. Owners of PHEAF devices must ensure replacement of HEPA filters in accordance with the manufacturer's recommendation. A trained technician must be responsible for filter replacement. The operator of the PHEAF device must label or otherwise identify, e.g. date and operational hours, when the HEPA filter was last replaced.
- Damage to the PHEAF device's cabinet can cause the HEPA filter to become misaligned in the filter mount frame. Damage which appears to distort the squareness of the cabinet or otherwise prevent proper seating of the HEPA filter is unacceptable.
- Damage to the HEPA media, corrugated aluminum separators, or housing can affect the efficacy of the filter. Damaged HEPA filters must be replaced before use of the PHEAF device.
- The HEPA filter's retaining brackets must be securely tightened. Loose brackets can allow a gap between the filter gasket and filter mount.
- A dirty pre-filter or ring filter is not acceptable. Clean filters must be installed before each project.

Responsibilities of the Operator:

Conduct inspection of the PHEAF device and verify that inspection, testing and maintenance as prescribed by the manufacturer is completed as scheduled.

1. Inspection, testing and maintenance, e.g. replacement of the pre-filter and ring filter, is completed by a competent individual. This activity is documented in writing.
2. Institute measures to ensure that the PHEAF device is exhausted outside of the building envelop unless circumstances prevent such arrangement. Exceptions to this rule will be considered only when the industrial hygienist's professional judgement indicates a low risk to occupants.
3. The PHEAF device shall not be connected to the building exhaust duct via a temporary flexible duct. If exhausted within the building envelope, an additional PHEAF device shall be operated in sequence (i.e., piggyback serial configuration).
4. When requested the operator of the PHEAF device must present an operating procedure indicating preventative maintenance, technician training, criteria to determine filter change out, and methods employed to prevent cross-contamination while replacing the contaminated filter.

From May through June 2019, PHEAF devices will be randomly tested to assess their effectiveness to capture PM. This period affords remediation contractors the opportunity to witness the test and qualify the performance of their PHEAF device inventory. Units that grossly

underperform will be consider for use albeit the unit must be exhausted outside the building envelope. **PHEAF devices associated with projects scheduled after 1 July 2019 must demonstrate a minimum capture effectiveness of at least 99.0%.**

Note: NIH does not have the resources to simultaneously test multiple PHEAF devices. For projects beginning after 1 July 2019, the operator of the PHEAF device(s) must contact the NIH industrial hygienist (msarathchandra@gciusa.biz) to determine availability of test personnel prior to selecting your project start date. In the event multiple projects are scheduled for the same date, priority will be given on a first come, first serve basis.

In summary, the proposed PHEAF device policy will be implemented as follows:

Effective Date	**Activity**
16 April	Notice of policy on the use and testing of PHEAF devices for projects performed in NIH-owned facilities located in Maryland.
1 May	PHEAF devices used for projects involving hazardous materials will be visually inspected. Inspection findings will be provided to contractor.
1 June	PHEAF devices used for projects involving hazardous materials must pass visual inspection. *Deficiencies* must be corrected before permitted use.
1 May – 30 June	Random performance testing of PHEAF devices to assess capture effectiveness. Units failing the performance test may be consider for use; however, the unit must be exhausted outside of the building envelop or operated in sequence with another PHEAF device.
1 July	PHEAF devices passing visual inspection must demonstrate minimum capture effectiveness of 99%. Units which fail the performance test will be prohibited from use. When requested the operator of the PHEAF device must present an operating procedure indicating preventative maintenance, technician training, criteria to determine filter change out, and methods employed to prevent cross-contamination while replacing the contaminated filter.

An orientation session will be held on May 13th and May 14th from 1:00 pm – 2:30 pm to address questions from affected parties. You can register to attend either session by email (jose.romero2@nih.gov).

A Frequently Asked Questions factsheet is enclosed to address anticipated concerns and questions. Questions not address in the factsheet can be emailed to jose.romero2@nih.gov.