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World Trade Center Disaster
[insert lead agency title here]

FINAL DRAFT

DUST PROTECTION AND SUPPRESSION PLAN
FOR
POST DISASTER SEARCH/RESCUE, DEMOLITION, AND CLEANUP

September 25, 2001

DUST PROTECTION AND SUPPRESSION PLAN

1. INTRODUCTION

The World Trade Center disaster generated a tremendous amount of debris and dust in the "ground zero" area that may contain contaminants (e.g., asbestos). During search/rescue, demolition, and cleanup activities currently underway, the potential exists to contaminate search/rescue personnel and cleanup workers and spread contaminated materials into other areas. The purpose of this plan is to provide guidance and recommendations for protecting all personnel working in the "ground zero" area and minimizing the spread of dust during debris/dust removal, loading, and transport to disposal sites.

2. PERSONAL PROTECTION

Search/rescue, demolition, and cleanup personnel working on rubble piles at "ground zero" and in adjacent areas with large amounts of debris and dust (hereinafter termed "work areas") should follow the personal protective measures identified below.

2.1 While in the Work Area

Personnel in work areas should use the following personal protective measures to help protect themselves from potential dust hazards:

- Respiratory protection
  - Everyone who will perform work on/in, suspended above, or within 25 ft of the rubble pile must use a half-face re-usable respirator with combination P100 (or equivalent)/ organic vapor acid gas (OVAG) cartridges.
  - All others within the "green line" and not categorized above must use P100 (or equivalent) cartridges. In areas with odors, combination P100/organic vapor (OV) cartridges may be used.
  - Persons outside of the "green line" are encouraged to wear disposable N95 (or equivalent) dust masks if dusty or smoky conditions exist.
- Head covering (hard hat)
- Safety glasses (Z87) with side shields or mono-goggles
- Work gloves (with latex or nitrile glove liners if handling remains)
- Long pants, long sleeve work shirts, or coveralls
- Steel-toed work boots
- If available, disposable outer protective clothing when working on the rubble pile
- Exit the work area if any of the above personal protective measures are damaged or do not function properly and make necessary repairs before re-entering work area.
- Avoid eating in work area.

2.2 Leaving the Work Area:

When personnel leave the work area, they should do the following to prevent spreading dust outside the work area:

- Exit work area through designated routes.
- Clean or scrape off shoes, preferably with water.
- If wearing disposable outer protective clothing, dispose of clothing in designated container.
- Thoroughly dust off clothing. If available, use HEPA vacuum.
- Clean personal protective equipment (e.g., respirator, goggles).
- At end of shift, replace respirator cartridges.
- Wash face and hands with soapy water.

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2.3 Returning Home

When workers return "home" with clothing that has been soiled with dust, they should do the following to prevent bringing dust into their residence:

- Immediately remove clothing soiled with dust.
- Place dust soiled clothing in plastic bag(s) until washing. Do not shake dust from clothing.
- Launder dust soiled clothes twice and separate from other clothing.
- Run machine empty through one (1) complete cycle to rinse any debris that may have been deposited before washing next load.
- Dispose of plastic bag(s); do not reuse.
- Wash hands with soapy water.

3. DEBRIS/DUST REMOVAL AND LOADING

Search/rescue, demolition, and cleanup activities will require the removal of vast quantities of debris that could potentially spread dust within and outside the work area(s). The following dust suppression measures should be used to control the generation and spread of dust:

- Minimize handling of debris/dust by avoiding, where possible, multiple handling.
- Minimize the drop height of debris from equipment when dumping into haul trucks or onto ground surface.
- At locations in rubble piles where debris is separated by dropping, the rubble should be periodically wet down.
- Where practical, aerial mist sprayers could be used to help control dust when material is double handled or dumped (e.g., rest areas, areas where debris is sorted).
- In areas with thick dust accumulation (including streets and sidewalks), use a truck-mounted, high efficiency particulate air (HEPA) vacuum or, if not available, use standard large volume vacuum trucks.
- In areas where vacuum trucks are not used, lightly wet down areas prior to initiating debris/dust removal activities with shovels or other tools/equipment.
- Either wet down, or cover and secure debris/dust loads in haul trucks. Haul trucks should not be allowed to leave the work area unless these measures have been completed.
- Assign haul trucks designated routes to and from disposal site(s).
- Haul truck speed in work areas should not exceed 10 mph.
- Haul routes to disposal sites should be periodically wet down and/or cleaned with "street sweepers" to control dust.

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4. WASH DOWN AND DECONTAMINATION STATIONS

At a minimum, all haul trucks leaving the work area should be washed as described in Section 4.2 below. If agency sampling (e.g., ambient air or bulk sample) results from areas within or in close proximity to the work area exceed the prescribed "action level" for asbestos, the measures described in Section 4.3 below should be implemented to minimize the spread of dust into adjacent residential/commercial areas and along haul routes.

4.1 Siting Considerations

The siting criteria for wash/decontamination stations listed below should be followed to enhance protection of personnel within work areas and the general public, and to prevent spreading dust outside the work areas:

- Locate along designated routes to disposal site(s) and in close proximity to work areas.
- Avoid locating in public traffic areas and pedestrian zones. If this is not possible, construct barriers to keep out unauthorized personnel.
- Keep away from overhead utilities.
- Select a site with sufficient space to construct a contained wash area with an adjacent area for stockpiling saturated sediment/debris.
- Locate near a clean water source (e.g., fire hydrant) or where a water tank can be placed.
- Locate near an acceptable wash water disposal receptor (e.g., sanitary sewer, not a storm water drain or outfall).

4.2 Wash Area Actions

To prevent/minimize the spread of dust outside work areas, the following actions should be performed at wash areas:

- Wash the truck's sides, tailgate, tires, and undercarriage.
- Verify haul truck loads are wet down or covered and the cover is securely attached. Haul trucks should not be allowed to leave wash/decontamination stations unless these measures have been completed.
- Properly manage wash water and sediment/debris resulting from wash area activities.

4.3 Operation and Maintenance of Decontamination Wash Stations

If agency prescribed "action levels" are exceeded, decontamination wash stations should be operated and maintained to ensure haul trucks are affectively decontaminated and resulting wash water and sediment/debris contained. The following measures are provided as examples of options available for managing contained wash water and sediment/debris:

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- If possible, pump accumulated wash water from wash containment area into a settling tank(s) with baffle(s) to promote separation of oils, sediment/debris, and water.
  - As needed for reuse or discharge, pump water from discharge side of settling tank through a five (5) micron, in-line, filter.
  - If possible, use electric pumps.
  - If generators or gas pumps are used, they should be placed in secondary containment with oil absorbent material and fire extinguisher readily available.
  - Removal of sediment from tank can be accomplished with the use of sludge vacuum pump (e.g., vacuum truck).
- If a settling tank is not used, accumulated wash water should be pumped through a non-woven filter bag that is place in a contained area adjacent to the wash/decontamination station.
  - Filtered water should then be checked for hydrocarbon contamination (e.g., sheen or odor). If fuel/oil contamination is identified, oil absorbent material/boom should be used to remove contamination and these materials disposed of properly.
  - As needed for reuse or discharge, pump water through a five (5) micron, in-line, filter.
  - Filter bag should be taken to disposal site once sediment capacity has been reached.
- If wash water is not filtered, it should only be discharged into a sanitary sewer or water tankers for transport to an approved disposal site.
- If possible, debris/sediment from wash/decontamination station should be stockpiled in an adjacent contained area to allow saturated sediment/debris to drain prior to being loaded into haul trucks and transported to disposal site(s). If draining of saturated sediment/debris is not possible, trucks transporting saturated material should have dump bed liners to contain liquids during transport to disposal site(s).

4.4 Personal Protective Measures

Personnel involved in wash/decontamination station activities will be responsible for removing accumulated dust from vehicles leaving the work area and ensuring loads are properly wet down or covered. Consequently, they will be exposed to dust, wet conditions, and debris/sediments and should use the following measures to help protect themselves against possible hazards:

- Head covering
- Approved dust mask
- Face shield
- Rubber gloves
- Water repellent outer clothing
- Rubber boots

When returning home, wash/decontamination station workers should follow the recommended protection measures described above in Section 2.3, Returning Home.

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