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UNITED STATES MARINE CORPS
Marine Corps Base
Camp Lejeune, North Carolina 28542-5001

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BEMD
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From: Assistant Chief of Staff, Environmental Management Department
To: Assistant Chief of Staff, Logistics

Subj: REMOVAL OF DEFENSE REUTILIZATION AND MARKETING OFFICE SALVAGEABLE EQUIPMENT AND MATERIALS FROM LOT 203

Ref: (a) PhonCon btwn AC/S LOG and AC/S EMD on 15 Nov 89

Encl: (1) Site Safety Plan, Installation Restoration Program, Lot 203

1. The enclosure is provided as agreed during the reference.

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SITE SAFETY PLAN
INSTALLATION RESTORATION PROGRAM, LOT 203
MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

Introduction

This site safety plan has been developed by the Installation Restoration Program for activities to be conducted on Lot 203. The plan is intended to provide mandatory instructions for base personnel and to provide personnel with information concerning Lot 203. This document reflects best management practices.

Background

Lot 203 served as a waste disposal area in the 1940s. Subsequently, it was used for storage of scrap metal and other items, including DDT and PCB transformers. On January 4, 1989, two 55-gallon drums were unearthed while an employee was relocating metal bunkbeds. Additional drums were discovered while attempting to clear the area. One drum was clearly labeled DDT. DRMO-Memphis made the decision to close Lot 203 until sampling and analysis could prove that workers would not be exposed to a hazardous environment. Sampling events have occurred and have demonstrated no hazardous threat to health from surface soil releases.

On February 1, 1989, Facilities and Base Safety conducted a site survey of Lot 203. The purpose of this site survey was to identify using soil gas analysis, the presence of volatile organic compounds that could potentially affect personnel working at Lot 203. The Organic Vapor Analyzer (OVA-Foxboro Model 128) and soil auger were used. The OVA is designed primarily to quantitatively and qualitatively identify organic vapors at hazardous waste sites. Eleven test sites on Lot 203 were tested. The procedure which was followed included an initial measurement of vapors on the surface soil, prior to removing subsurface soil to a depth of approximately 18 inches using the hand auger. A measurement for the presence of organic vapors was made in each auger hole using the portable gas chromatograph in the survey made for organic vapor detection. The sensitivity of the equipment is from 0 to 1,000 ppm. All subsurface soil tests were negative with exception of Test 4 Site Area, near the "Demil Area." At Test 4 Site, where a soil stain was observed, an initial reading of >1000 ppm was indicated in subsurface soil. This test was followed up by a subsurface soil test approximately 10 feet north (20 ppm), and additional test holes located as close to the fence as possible (negative results) at approximately 20 feet to the north, east and south of the initial reading (all negative results). No evidence of organic vapors were found on the other test sites. This indicates there is no shallow soil contamination representing a threat to the health and safety of persons utilizing Lot 203.

ENCLOSURE 1

On November 15, 1989, Installation Restoration Manager and Base Safety personnel conducted a second site survey of Lot 203 using an AIM 815 Z. The AIM 815 Z is used by the Base Fire Department during emergency spill operations. The AIM 815 Z determines organic vapors and explosive gases and will produce individual readings for each gas. Test Site 4 from the February 1989 site survey was retested in several areas surrounding the original test site. All tests were negative for surface soils. The rest of the test sites all proved to be negative as well, including the DDT drum area. Based on these two sampling events, best management practices indicate normal operations of Lot 203 should continue. A full investigation of subsurface soils and groundwater will be started sometime later this year.

In addition to the OVA and AIM 815 Z, identifying volatile organic compounds, these instruments are a useful adjunct to professional judgment in selecting the level of protection to be worn by workers on site. There are four levels of protection described in EPA's Occupational Health and Safety Manual. According to this manual, protection levels range from Level A to Level D depending upon the presence and measured concentration of the chemical substance in the ambient atmosphere. Level A should be worn when the highest level of respiratory, skin and eye protection is needed. Level B should be worn when the highest level of respiratory protection is needed but a lesser level of skin protection. Level C should be worn when the criteria for using air-purifying respirators are met. Level D should be worn only as a work uniform and not on any site with respiratory or skin hazards. Attachment 1 fully defines the requirements for each level of protection.

Utilizing best judgment, specific findings of no ambient air contamination from surface soils and EPA guidance, EMD has determined that Lot 203 presents the minimal level of risk. Accordingly, Level D protection will be used by workers on Lot 203.

Site Safety Requirements

The following requirements are mandatory and will be followed:

a. Personnel protective equipment

- coveralls
- gloves
- boots/shoes, leather or chemical-resistant, steel-toe and shank
- safety glasses or goggles (optional)

b. Areas of non-entry have been clearly marked to prevent disturbance of subsurface soil. Areas outlined by yellow tape connected to posts will not be entered by any worker on Lot 203.

c. Excavation or disturbance of the subsurface soils will not be permitted unless authorized by the Installation Restoration Manager, in writing, prior to disturbance.

d. In order to insure that Level D protection continues to be appropriate, monthly monitoring of the ambient air will be conducted by Installation Restoration and Base Safety personnel.

e. If at any time safety personnel determine a higher level of protection for workers is appropriate, this will immediately be reported to Defense Reutilization and Marketing Office, Camp Lejeune, NC, 451-5613. Appropriate action will be taken based on any new information.

Any questions by workers should be referred to their supervisors. Supervisors should then contact Stephany Del Re, Installation Restoration Manager, at 451-5977 or 451-2471.

II. LEVELS OF PROTECTION

A. Level A Protection

1. Personnel protective equipment

- Supplied-air respirator approved by the Mine Safety and Health Administration (MSHA) and National Institute for Occupational Safety and Health (NIOSH).
  Respirators may be:

  -- pressure-demand, self-contained breathing apparatus (SCBA)

  or

  -- pressure-demand, airline respirator (with escape bottle for Immediately Dangerous to Life and Health (IDLH) or potential for IDLH atmosphere)

- Fully encapsulating chemical-resistant suit

- Coveralls*

- Long cotton underwear*

- Gloves (inner), chemical-resistant

- Boots, chemical-resistant, steel toe and shank. (Depending on suit construction, worn over or under suit boot)

- Hard hat* (under suit)

- Disposable gloves and boot covers* (Worn over fully encapsulating suit)

- Cooling unit*

- 2-Way radio communications* (inherently safe)

2. Criteria for selection

Meeting any of these criteria warrants use of Level A Protection:

- The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on:

  -- measured (or potential for) high concentration of

*Optional

Attachment 1

atmospheric vapors, gases, or particulates

or

-- site operations and work functions involves high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials highly toxic to the skin.

- Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible.

- Operations must be conducted in confined, poorly ventilated areas until the absence of substances requiring Level A protection is determined.

- Direct readings on field Flame Ionization Dectors (FID) or Photoionization Detectors (PID) and similar instruments indicate high levels of unidentified vapors and gases in the air. (See Appendixes I and II.)

3. Guidance on selection

a. Fully encapsulating suits are primarily designed to provide a gas or vapor tight barrier between the wearer and atmospheric contaminants. Therefore Level A is generally worn when high concentrations of airborne substances are known or thought to be present and these substances could severely effect the skin. Since Level A requires the use of a self-contained breathing apparatus, the eyes and respiratory system are also more protected.

Until air surveillance data are available to assist in the selection of the appropriate Level of Protection, the use of Level A may have to be based on indirect evidence of the potential for atmospheric contamination or other means of skin contact with severe skin affecting substances.

Conditions that may require Level A protection include:

- Confined spaces: Enclosed, confined, or poorly ventilated areas are conducive to build up of toxic vapors, gases, or particulates. (Explosive or oxygen-deficient atmospheres also are more probable in confined spaces.) Confined space entry does not automatically warrant wearing Level A protection, but should serve as a cue to carefully consider and to justify a lower Level of Protection.

- Suspected/known highly toxic substances: Various substances that are highly toxic especially through skin

absorption for example, fuming corrosives, cyanide compounds, concentrated pesticides, Department of Transportation Poison "A" materials, suspected carcinogens, and infectious substances may be known or suspected to be involved. Field instruments may not be available to detect or quantify air concentrations of these materials. Until these substances are identified and concentrations measured, maximum protection may be necessary.

- Visible emissions: Visible air emissions from leaking containers or railroad/vehicular tank cars, as well as smoke from chemical fires and others, indicate high potential for concentrations of substances that could be extreme respiratory or skin hazards.

- Job functions: Initial site entries are generally walk-throughs in which instruments and visual observations are used to make a preliminary evaluation of the hazards. In initial site entries, Level A should be worn when:

  -- there is a probability for exposure to high concentrations of vapors, gases, or particulates.

  -- substances are known or suspected of being extremely toxic directly to the skin or by being absorbed.

Subsequent entries are to conduct the many activities needed to reduce the environmental impact of the incident. Levels of Protection for later operations are based not only on data obtained from the initial and subsequent environmental monitoring, but also on the probability of contamination and ease of decontamination.

Examples of situations where Level A has been worn are:

- Excavating of soil to sample buried drums suspected of containing high concentrations of dioxin.

- Entering a cloud of chlorine to repair a valve broken in a railroad accident.

- Handling and moving drums known to contain oleum.

- Responding to accidents involving cyanide, arsenic, and undiluted pesticides.

b. The fully encapsulating suit provides the highest degree of protection to skin, eyes, and respiratory system if the suit material resists chemicals during the time the suit is worn. While Level A provides maximum protection, all suit material may be rapidly permeated and degraded by certain chemicals

from extremely high air concentrations, splashes, or immersion of boots or gloves in concentrated liquids or sludges. These limitations should be recognized when specifying the type of fully encapsulating suit. Whenever possible, the suit material should be matched with the substance it is used to protect against.

B. Level B Protection

1. Personnel protective equipment

- Supplied-air respirator (MSHA/NIOSH approved). Respirators may be:

  -- pressure-demand, self-contained breathing apparatus

  or

  -- pressure-demand, airline respirator (with escape bottle for IDLH or potential for IDLH atmosphere)

- Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one or two-piece chemical-splash suit; disposable chemical-resistant, one-piece suits)

- Long cotton underwear*

- Coveralls*

- Gloves (outer), chemical-resistant

- Gloves (inner), chemical-resistant

- Boots (outer), chemical-resistant, steel toe and shank

- Boot covers (outer), chemical-resistant (disposable)*

- Hard hat (face shield)*

- 2-Way radio communications* (inherently safe)

2. Criteria for selection

Meeting any one of these criteria warrants use of Level B protection:

- The type and atmospheric concentration of toxic substances has been identified and requires a high level of respiratory protection, but less skin protection than Level A. These would be atmospheres:

*Optional

-- with concentrations Immediately Dangerous to Life Health, but substance or concentration in the air does not represent a severe skin hazard

or

-- that do not meet the selection criteria permitting use of air-purifying respirators.

- The atmosphere contains less than 19.5% oxygen.

- It is highly unlikely that the work being done will gener high concentrations of vapors, gases or particulates, splashes of material that will affect the skin of person wearing Level B protection.

- Atmospheric concentrations of unidentified vapors or ga are indicated by direct readings on instruments such as the FID or PID or similar instruments, but vapors a gases are not suspected of containing high levels of chemicals toxic to skin. (See Appendixes I and II.)

3. Guidance on selection

a. Level B does not afford the maximum skin (and eye) pr tection as does a fully encapsulating suit since t chemical-resistant clothing is not considered gas, vapo or particulate tight. However, a good quality, hooded chemical-resistant, one-piece garment, with taped wris ankles, and hood does provides a reasonable degree protection against splashes and to lower concentrations air. At most abandoned hazardous waste sites, ambie atmospheric gas or vapor levels have not approached conce trations sufficiently high to warrant Level A protectio In all but a few circumstances (where highly toxic mate ials are suspected) Level B should provide the protectio needed for initial entry. Subsequent operations at a sit require a reevaluation of Level B protection based on th probability of being splashed by chemicals, their effec on the skin, the presence of hard-to-detect air contam- inants, or the generation of highly toxic gases, vapors or particulates, due to the work being done.

b. The chemical-resistant clothing required in Level B i available in a wide variety of styles, materials, construc- tion detail, and permeability. One or two-piece garment are available with or without hoods. Disposal suits wit a variety of fabrics and design characteristics are als available. Taping joints between the gloves, boots an suit, and between hood and respirator reduces the pos- siblity for splash and vapor or gas penetration. Thes

factors and other selection criteria all affect the degree of protection afforded. Therefore, a specialist should select the most effective chemical-resistant clothing based on the known or anticipated hazards and job function.

Level B equipment does provides a high level of protection to the respiratory tract. Generally, if a self-contained breathing apparatus is required for respiratory protection, selecting chemical-resistant clothing (Level B) rather than a fully encapsulating suit (Level A) is based on needing less protection against known or anticipated substances affecting the skin. Level B skin protection is selected by:

- Comparing the concentrations of known or identified substances in air with skin toxicity data.

- Determining the presence of substances that are destructive to or readily absorbed through the skin by liquid splashes, unexpected high levels of gases, vapor, or particulates, or other means of direct contact.

- Assessing the effect of the substance (at its measured air concentrations or potential for splashing) on the small areas left unprotected by chemical-resistant clothing. A hooded garment taped to the mask, and boots and gloves taped to the suit further reduces area of exposure.

c. For initial site entry and reconnaissance at an open site, approaching whenever possible from upwind, Level B protection (with good quality, hooded, chemical-resistant clothing) should protect response personnel, providing the conditions described in selecting Level A are known or judged to be absent.

C. Level C Protection

1. Personnel protective equipment

- Air-purifying respirator, full-face, canister-equipped (MSHA/NIOSH approved)

- Chemical-resistant clothing (coveralls; hooded, one-piece or two-piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls)

- Coveralls*

- Long cotton underwear*

- Gloves (outer), chemical-resistant

- Gloves (inner), chemical-resistant*
- Boots (outer), chemical-resistant, steel toe and shank
- Boot covers (outer), chemical-resistant (disposable)*
- Hard hat (face shield*)
- Escape mask*
- 2-Way radio communications* (inherently safe)

2. Criteria for selection

Meeting all of these criteria permits use of Level C protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV) and the concentration is within the service limit of the canister.
- Atmospheric contaminant concentrations do not exceed IDLH levels.
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are a few ppms above background on instruments such as the FID or PID. (See Appendices I and II.)

3. Guidance on selection

a. Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions permit wearing air-purifying respirators.

The air-purifying device must be a full-face respirator (MSHA/NIOSH approved) equipped with a canister suspended from the chin or on a harness. Canisters must be able to

*Optional

remove the substances encountered. Quarter-or half-masks or cheekcartridge, full-face masks should be used only with the approval of a qualified individual.

In addition, a full-face, air-purifying mask can be used only if:

- Substance has adequate warning properties.
- Individual passes a qualitative fit-test for the mask.
- Appropriate cartridge/canister is used, and its service limit concentration is not exceeded.

b. An air surveillance program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be thoroughly monitored when personnel are wearing air-purifying respirators. Periodic surveillance using direct-reading instruments and air sampling is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

c. Level C protection with a full-face, air-purifying respirator should be worn routinely in an atmosphere only after the type of air contaminant is identified, concentrations measured and the criteria for wearing air-purifying respirator met. To permit flexibility in precribing a Level of Protection at certain environmental incidents, a specialist could consider using air-purifying respirators in unidentified vapor/gas concentrations of a few parts per million above background as indicated by a needle deflection on the FID or PID. However a needle deflection of a few parts per million above background should not be the sole criterion for selecting Level C. Since the individual components may never be completely identified, a decision on continuous wearing of Level C must be made after assessing all safety considerations, including:

- The presence of (or potential for) organic or inorganic vapors/gases against which a canister is ineffective or has a short service life.
- The known (or suspected) presence in air of substances with low TLVs or IDLH levels.
- The presence of particulates in air.
- The errors associated with both the instruments and monitoring procedures used.

*Optional

- The presence of (or potential for) substances in air which do not elicit a response on the instrument used.

- The potential for higher concentrations in the ambient atmosphere or in the air adjacent to specific site operations.

d. The continuous use of air-purifying respirators (Level C) must be based on the identification of the substances contributing to the total vapor or gas concentration and the application of published criteria for the routine use of air-purifying devices. Unidentified ambient concentrations of organic vapors or gases in air approaching or exceeding a few ppm above background require, as a minimum, Level B protection.

D. Level D Protection

1. Personnel protective equipment

- Coveralls

- Gloves*

- Boots/shoes, leather or chemical-resistant, steel toe and shank

- Safety glasses or chemical splash goggles*

- Hard hat (face shield)*

2. Criteria for selection

Meeting any of these criteria allows use of Level D protection:

- No contaminants are present.

- Work functions preclude splashes, immersion, or potential for unexpected inhalation of any chemicals.

Level D protection is primarily a work uniform. It can be worn only in areas where there is no possibility of contact with contamination.

III. PROTECTION IN UNKNOWN ENVIRONMENTS

In all incident response, selecting the appropriate personnel protection equipment is one of the first steps in reducing health effects from toxic substances. Until the toxics hazards at an environmental incident can be identified and personnel safety measures