BMP
Best Management Practices
for
Miami-Dade Aviation Department
Operated Airports

MIAMI-DADE AVIATION DEPARTMENT

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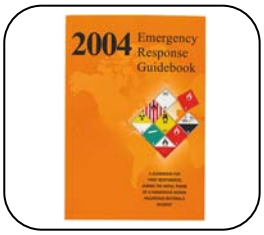
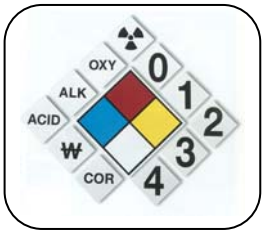
October 2007





“We do not inherit the earth from our ancestors, we borrow it from our children”
~ Native American Proverb

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Operated Airports

Prepared for:

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October, 2007

PREFACE

This Manual was specifically prepared to complement/supplement the current procedures and guidelines used by the Miami Dade Aviation Department (MDAD) Shops to help improve the environmental footprint of our operations throughout the County operated airports. MDAD Shops may employ this Manual to address non-compliance items identified during MDAD Internal Audits, which might not be specifically addressed by existing departmental Standard Operating Procedures (SOPs) and/or Operational Controls (OCs).

Some sections of the Manual refer to potential environmental impacts to our airports resulting from the activities of tenants, such as fixed based operators (FBOs), etc., and airports users, that are beyond the control of our shops. Consequently, we strongly recommend that MDAD Divisions dealing with those groups (Commercial Properties/Real Estate and General Aviation Airports management) take advantage of any pertinent sections that will ensure maintaining environmental compliance and striving for continual improvement in our system of airports.

Thank you for your commitment to protect the environment for future generations.

"We do not inherit the earth from our ancestors, we borrow it from our children"
Native American Proverb

NOTE: Please visit MDAD's website for additional information/documentation related to the environment: http://www.miami-airport.com/html/environmental.html

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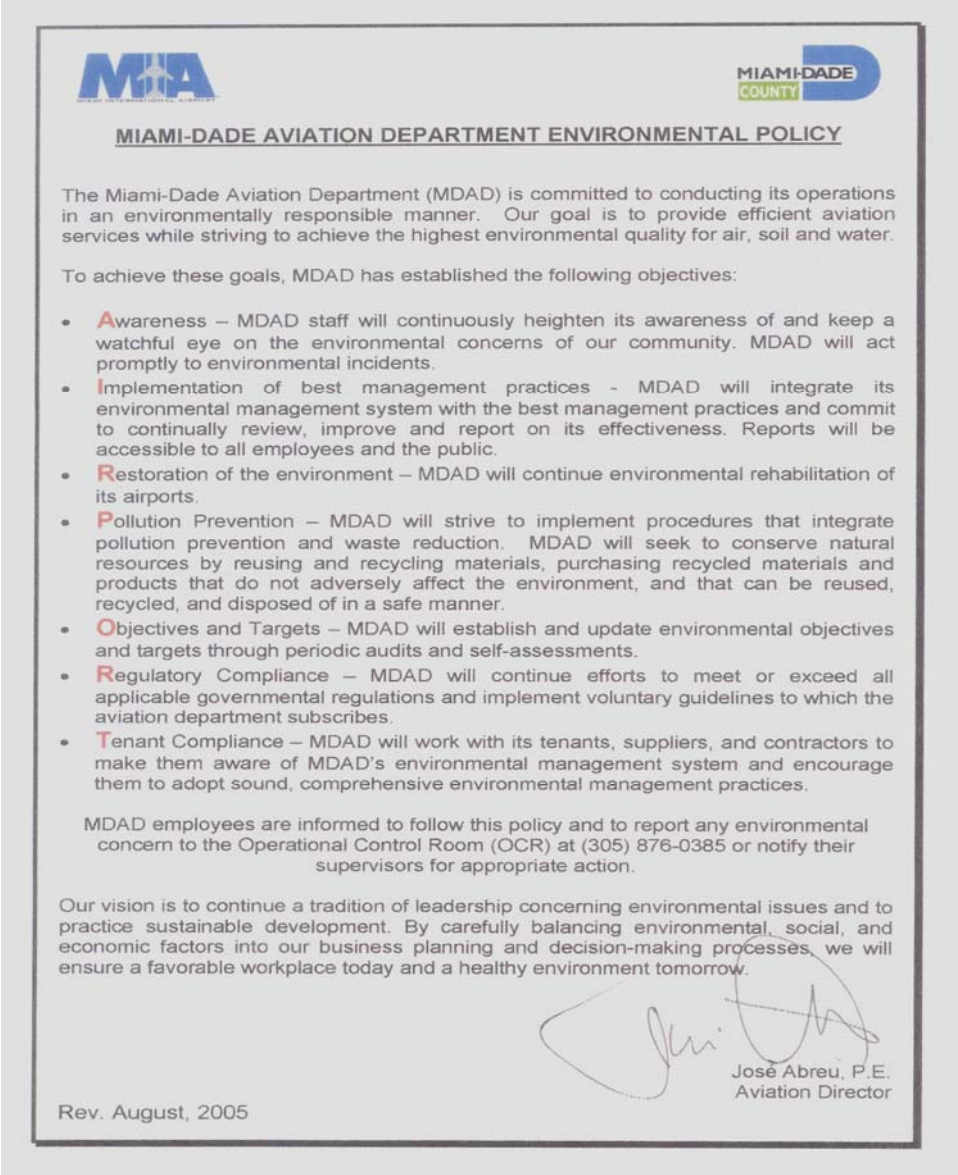
1.0 INTRODUCTION

This Best Management Practices (BMPs) Manual provides an overview of the proper handling and practices for hazardous materials/petroleum products and regulated wastes managed by the Miami-Dade Aviation Department (MDAD). This document is intended to familiarize MDAD personnel about BMPs and pollution prevention actions that can be implemented at the airports operational areas to further protect the environment and improve the efficiency of the MDAD operated airports pursuant to our Environmental Policy (**Figure 1** and **Appendix A**).



MIAMI-DADE AVIATION DEPARTMENT ENVIRONMENTAL POLICY

The Miami-Dade Aviation Department (MDAD) is committed to conducting its operations in an environmentally responsible manner. Our goal is to provide efficient aviation services while striving to achieve the highest environmental quality for air, soil and water.

To achieve these goals, MDAD has established the following objectives:

- Awareness – MDAD staff will continuously heighten its awareness of and keep a watchful eye on the environmental concerns of our community. MDAD will act promptly to environmental incidents.
- Implementation of best management practices - MDAD will integrate its environmental management system with the best management practices and commit to continually review, improve and report on its effectiveness. Reports will be accessible to all employees and the public.
- Restoration of the environment – MDAD will continue environmental rehabilitation of its airports.
- Pollution Prevention – MDAD will strive to implement procedures that integrate pollution prevention and waste reduction. MDAD will seek to conserve natural resources by reusing and recycling materials, purchasing recycled materials and products that do not adversely affect the environment, and that can be reused, recycled, and disposed of in a safe manner.
- Objectives and Targets – MDAD will establish and update environmental objectives and targets through periodic audits and self-assessments.
- Regulatory Compliance – MDAD will continue efforts to meet or exceed all applicable governmental regulations and implement voluntary guidelines to which the aviation department subscribes.
- Tenant Compliance – MDAD will work with its tenants, suppliers, and contractors to make them aware of MDAD's environmental management system and encourage them to adopt sound, comprehensive environmental management practices.

MDAD employees are informed to follow this policy and to report any environmental concern to the Operational Control Room (OCR) at (305) 876-0385 or notify their supervisors for appropriate action.

Our vision is to continue a tradition of leadership concerning environmental issues and to practice sustainable development. By carefully balancing environmental, social, and economic factors into our business planning and decision-making processes, we will ensure a favorable workplace today and a healthy environment tomorrow.

José Abreu, P.E.
Aviation Director

Rev. August, 2005

Figure 1. MDAD Environmental Policy

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2.0 POLLUTION OF THE ENVIRONMENT

Pollution of the environment can occur when hazardous materials such as pesticides, petroleum products, solvents or other chemicals are spilled, rinsewater from container or equipment cleaning is dumped on the ground or discharged into surface water, or improperly cleaned containers are stockpiled or disposed. Certain kinds of management practices, implemented at airports operational areas, can prevent the contamination of soil, surface water, and groundwater by the materials stored and handled at these sites. This document describes a number of Best Management Practices (BMPs) which can be implemented through proper design and operation of the airport facilities and equipment by MDAD, its tenants, its contractors and overall airports users. However, adherence to this document does not necessarily constitute full regulatory compliance. Applicable regulations and permit requirements must be reviewed carefully and adhered to. Refer to **Section 4.0** for further information about regulatory compliance.

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3.0 MDAD FACILITIES MAINTENANCE AND ENGINEERING DIVISION ORGANIZATION

MDAD operates the Miami International Airport (MIA) and four general aviation airports. MDAD is responsible for the operation and maintenance of airport terminals, parking garages, loading bridges and gates, roadways, tarmac, vehicle maintenance facilities, formerly leased lands/properties and water and sewer (only at MIA) at each of the county-operated airports. Airports currently operated and maintained by MDAD include:

- Miami International Airport
- Opa-Locka Airport
- Homestead General Airport
- Kendall-Tamiami Airport
- Miami-Dade/Collier Training and Transition Airport

The MDAD Facilities Maintenance and Engineering Division at MIA is organized into the following shops listed in **Table 1**.

Table 1 – MIA Organization Shops

<table>
<tr><td colspan="2">A/C Shop</td><td colspan="2">General Aviation Maintenance Shop</td><td colspan="2">Plumbing Shop</td></tr>
<tr><td colspan="2">Airfield Lighting Shop</td><td colspan="2">Administration/Ground/Landscape Projects and GA Airports Shop</td><td colspan="2">Roofing Shop</td></tr>
<tr><td colspan="2">Building Management Controls Shop</td><td colspan="2">Lift Station/Generator Shop</td><td rowspan="3">Technical Support Shop</td><td>Public Work</td></tr>
<tr><td colspan="2">Carpentry/Masonry Shop</td><td colspan="2">Lock Shop</td><td>Signage</td></tr>
<tr><td colspan="2">Passenger Loading Bridge/Conveyor Shop</td><td colspan="2">Mechanical Maintenance Shop</td><td>Graphic Design</td></tr>
<tr><td colspan="2">Electrical Shop</td><td colspan="2">Mobile Garage Shop</td><td colspan="2">Video Services Shop</td></tr>
<tr><td rowspan="4">Engineering Shop</td><td>Planning and Program Management</td><td rowspan="4">Terminal Maintenance Shop</td><td>Terminal A/C</td><td colspan="2">Waste Transfer Shop</td></tr>
<tr><td>Construction and Contracts</td><td>Terminal Paint</td><td colspan="2">West Cargo Shop</td></tr>
<tr><td>Interior Design</td><td>Terminal Projects</td><td colspan="2">Work Order Center</td></tr>
<tr><td>Engineering and Design</td><td>Re-lamp</td><td colspan="2"></td></tr>
<tr><td colspan="2">Fire Prevention (Fire Suppression)</td><td colspan="2">Paint/Stripping Shop</td><td colspan="2"></td></tr>
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4.0 GENERAL GUIDANCE

The BMPs presented in the following sections are intended to provide guidance concerning the conduct of work activities in a manner that is consistent with the requirements of laws and regulations applicable to MDAD operated airports. Hazardous materials/petroleum products and wastes are regulated by several federal, state and local government agencies. This BMP Manual identifies the general procedures for handling these materials in compliance with applicable regulations promulgated by the United States Environmental Protection Agency (EPA), Florida Department of Environmental Protection (FDEP), Florida Agriculture and Consumer Services (FDACS), United States Occupational Safety and Health Administration (OSHA), South Florida Water Management District (SFWMD) and the Miami-Dade County Department of Environmental Resources Management (DERM).

4.1 Information on Sound Environmental Practices

This section provides a brief summary of potential regulatory implications of routine activities conducted by the MDAD shops. A brief discussion of regulatory framework which establishes specific requirements is provided.

4.1.1 DERM Industrial Waste Permits

MIAMI-DADE COUNTY
Department of Environmental Resources Management

The DERM regulates and manages activities affecting our fragile environment (air, soil, water and natural resources). The DERM issues operating permits to facilities that use, generate, handle, dispose or store hazardous materials or hazardous waste as part of their normal operation. Shops at the county-airports that generate hazardous waste, automotive maintenance wastes, and some types of solid waste, may have an Industrial Waste (IW) permit issued by the DERM. The conditions of the permit document the activities that should be conducted to manage the waste in accordance with appropriate regulations. IW permits issued for MDAD operated airports are subject to specific and general conditions, some of the most important are listed below:

Permit Specific Conditions

- All wastes from facility operations shall be stored or disposed of in compliance with county, state and federal regulations.
- Facility shall have the ability to contain and collect any spill and properly dispose of contaminated materials. Accidental spills must be reported to the DERM within 24-hours at 305-372-6789. Refer to **Section 4.2** of this report of further information of spill reporting.
- Receipts from all industrial waste and/or wastewater disposal must be maintained at the business and be available for inspections by DERM personnel. Receipts shall contain clear information as to the name of the hauler, type of material transported, and quantity of material picked up. Records shall be kept for a period of three years.
- Hazardous waste (if allowed) shall not be stored longer than ninety (90) days, for generators, or one hundred eighty (180) days for small quantity generators. Containers must be clearly labeled, and must have the date of the first day of storage marked on the outside of the container.
- All above ground storage tanks (ASTs) and storage areas for hazardous materials and hazardous waste (if allowed) must have secondary containment. Design and construction must have DERM approval.
- If at any time pollution control facilities or procedures are found to be performing inadequately, MDAD must provide immediate improvements to the operating techniques and/or additional equipment in order to operate in compliance with applicable regulations. Additionally, any significant changes in facility operations, processes or inventory of materials must be reported to the DERM office in writing within 10 days.
- Industrial liquid waste discharges must meet the Miami-Dade County Standards.
- Rags used in cleaning processes and contaminated with hazardous materials (solvents, inks, oils and grease) must be recycled by an approved rag service or handled as hazardous waste unless proven otherwise by a hazardous waste profile (**Figure 2**).

Figure 2. Rag disposal into metal receptable equipped with a cover and properly labeled.

Permit General Conditions

- The applicant, by acceptance of this document, agrees to operate and maintain the subject operation so as to comply with the requirements of Chapter 24 of the Code of Miami-Dade County.
- If for any reason, the applicant does not comply with or will be unable to comply with any condition or limitation specified on this document the applicant shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance including exact dates and times; or if not reduce, eliminate, and prevent recurrence of the non-compliance. The applicant shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this document.
- As provided in Section 24-15 of the Code of Miami-Dade County, the prior written approval of the Department of Environmental Resources Management shall be obtained for any alteration to this facility.
- The issuance of the IW document does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. Nor does it relieve the applicant from liability for harm or injury to human health or welfare or property.
- IW document is required to be posted in a conspicuous location at the facility site during the entire period of operation. Refer to **Figure 3** and **Appendix B** for a sample of MDAD IW-5 permit.


MIAMI-DADE COUNTY

Environmental Resources Management

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INDUSTRIAL WASTE 5
ANNUAL OPERATING PERMIT

Figure 3. Sample of MDAD IW-5 permit issued by the DERM to airport facilities

- The IW document does not indicate a waiver of or approval of any other DERM permit that may be required for other aspects of the facility.
- Failure to comply with any condition of the IW document, or the requirements of Chapter 24, Code of Miami-Dade County may subject the applicant to the penalty provisions of said Chapter including civil penalties up to $25,000 per day per offense and/or criminal penalties of $500 per day or $200 per day for violations of Section 24-42.4, Sanitary Sewer Discharge Limitations and Pretreatment Standards and/or sixty (60) days in jail.

IW permits issued by the DERM for shops at the MIA facility are listed in **Table 2**.

Table 2 – DERM IW-5 Permits for MDAD shops at MIA.

No.	Location	Permit No
1	(UST) Building 863	IW5-002951-2007/2008
2	(AST Non Reg) Building 889	IW5-009594-2007/2008
3	Building 918	IW5-010032-2007/2008
4	CC G Gate 10	IW5-011518-2007/2008
5	(AST) Building 3099	IW5-011520-2007/2008
6	CC E Gate 21	IW5-011522-2007/2008
7	Building 3202	IW5-011524-2007/2008
8	CC D Gate 34	IW5-011525-2007/2008
9	CC G Gate 9	IW5—11526-2007/2008
10	(UST) Building 2201	IW5-011528-2007/2008
11	CC E Gate 2	IW5-011531-2007/2008
12	Building 3040	IW5-011535-2007/2008
13	Building 3038	IW5-012282-2007/2008
14	Building 721	IW5-014091-2007/2008
15	Building 3090	IW5-015876-2007/2008
16	CC E Gates 22-30	IW5-016622-2007/2008
17	CC G Gates11-15	IW5-016964-2007/2008
18	Building 702 Bays 2-4	IW5-017199-2007/2008

Note: CC= Concourse

4.1.2 Material Safety Data Sheets

Figure 4. MSDSs maintained at each airport facility that handles hazardous materials

Material Safety Data Sheets (MSDS) provide information about the chemical substances within a product, safe handling procedures, first aid measures and cleanup procedures to be taken when the product is accidentally spilled or released. Each facility that handles hazardous materials, chemicals and petroleum products should have available MSDS for each product/material in the shop. Refer to **Appendix C** for a sample of a MSDS.

MSDSs can be obtained from the chemical suppliers free of charge and are typically provided with the first shipment of a material. MSDS are located at the Right-to-Know Center provided at

each shop and filed in alphabetical order (**Figure 4**). MDAD Commodities Management will assist shop personnel in obtaining MSDSs that are in their master file at the Warehouse.

MDAD managers for each shop at operated airports will maintain copies of MSDSs for all hazardous chemicals in a location that is known and accessible to all employees (**Figure 5**). MSDSs must be readily accessible by employees during all hours of operation and in case of emergencies. MDAD personnel are encouraged to refer to the MSDS files for information on any materials in their work area.

Figure 5. MSDSs accessible to all MDAD employees

MSDSs prepared by chemical manufacturers, distributors, or importers must contain at least the following information:

- Identity of the material as used on the container label.
- If the material is a single substance, its chemical and common name(s).
- If the material is a mixture, the chemical composition including chemical and common names of all ingredients that present physical or health hazards. (Note: All hazardous chemicals present at 1% or greater and all carcinogens present at 0.1% or greater must be listed unless their identity is withheld as a trade secret.)
- Physical characteristics and important chemical properties (such as appearance and odor, vapor pressure, and solubility).
- Physical hazards including fire, explosion, and reactivity hazard information.
- Health hazard information (including signs and symptoms of overexposure and medical conditions that may be aggravated by exposure).
- Primary route(s) of entry.
- OSHA Permissible Exposure Limits (PELs), ACGIH Threshold Limit Values (TLVs), and any other recommended exposure limits.
- Information on the carcinogenic potential of any ingredient as listed in the NTP Annual Report on Carcinogens (latest edition), IARC Monographs (latest editions), or by OSHA.
- Generally applicable precautions for safe handling and use (including hygiene practices, protective measures, and procedures for clean-up of spills and leaks).
- Generally applicable measures to control exposures (such as engineering controls, work practices, and personal protective equipment).
- Emergency and first aid procedures.
- Waste disposal procedures.

- Name, address, and telephone number of the chemical manufacturer, distributor, or importer or other responsible party who can provide additional information on the hazardous chemicals and emergency procedures.

4.1.3 Environmental Compliance Audit

In the mid 1990's, the Civil Environmental Engineering Division (CEED) contracted an environmental consultant to conduct environmental compliance audits at each of the MDAD Shops in MIA whose operations could impact the environment, as a result of the storage, handling/use and eventual disposal of various chemicals, petroleum products, hazardous materials, universal wastes, etc. Pertinent reports were prepared for each of those Shops and some of those reports might still be in their respective files. Although they should be interesting reading from a historical perspective; the evolution of most of the environmental regulations have been significant in the past ten years.

Based on those audits' findings, the original version of this BMP Manual was prepared to provide operating guidelines for all MDAD Shops. As you may have noticed, this is the Third Revision of that BMP Manual, which incorporates not only the changing regulations, but the lessons learned as a result of the following activities:

- the implementation process of pertinent Environmental Management Systems in several of our divisions;
- the yearly Internal Audits for our operations conducted by outside consultants in preparation for the ISO 14000 surveillances/re-certifications;
- the findings and corrective actions resulting from the actual ISO 14000 Surveillances by our Certifying Registrar;
- especially, the findings and corrective actions resulting from our Internal EMS/Safety Compliance Audits, conducted by MDAD employees;
- and the most recent environmental compliance component, the Tenant Auditing Program conducted by outside environmental consultants to provide guidance and assistance to our tenant in order to help them achieve environmental compliance. This activity is handled as a Pollution Prevention (P2) service to help them improve their overall environmental management at MDAD airports.

Consequently, this BMP Manual should be used by MDAD Shops not only as a guideline but as a complement to achieve environmental compliance when addressing non-compliance items identified in the various audits. MDAD Tenants are encouraged to take advantage of the

information contained in this Manual to improve their environmental footprint in MDAD's operated airports.

4.1.4 Facility Wide Permits

IW permits issued by the DERM, permits issued by the FDEP, the EPA and the SFWMD governing storm water discharges, surface water discharges and air discharges are issued to MDAD for each county-operated airport, not to each shop. These permits are issued to ensure that discharges are reasonable and beneficial, are consistent with the public interest, and will not harm the environment.

The shop personnel should review this BMP manual to determine if their work activities may be regulated by a permit. The shops should contact CEED to discuss the work activities and obtain copies of any federal or state permits applicable to anticipated work.

4.1.5 Federal and State Regulations

Federal and State agencies review and issue permits and coordinate compliance monitoring and enforcement activities of hazardous waste generators, transporters and Treatment, Storage and Disposal (TSD) facilities with the regulatory district offices. In some cases, permits may reference specific sections of federal, state, or local regulations. Shop personnel should contact CEED to obtain copies of the regulations or guidance concerning acceptable work practices.

4.2 Spill Reporting

In the event of significant spills at MDAD facilities, several individuals and organizations should be contacted. The MDAD is responsible for ensuring that all required discharge notifications have been made. The Primary Emergency Contact List below provides all appropriate federal, state and local agencies that need to be contacted in the event of a spill (**Figure 6** and **Table 3**). MDAD Maintenance Emergency Contact List of all facility response coordinators are posted at prominent locations throughout the facility shops.

In the event of a spill of petroleum product, the following information will be collected and reported to the individuals and CEED named in **Table 3** and **Figure 6**:

- Facility shop address;
- Facility shop telephone number;
- Date and time of the oil discharge;
- Type of material discharged;
- Estimate of the total quantity of material discharged;
- Source of the discharged material;
- Description of affected media (i.e., storm drain, water, shoreline, etc);
- Cause of the material discharged;
- Damages and/or injuries resulting from the discharge;
- Actions taken to stop, remove or mitigate the effects of the discharge;
- Whether an evacuation may be needed; and
- Names of individuals and/or organizations that have been contacted.

Note: If the spill includes hydrocarbons (oils, petroleum products, etc.) which might reach navigable waters, you must check the **Spill Prevention Control and Countermeasures Plan (SPCC)** in your area to ensure compliance.
The FDEP requires facilities that store or transport petroleum products to report spills as follows:

- Loss of a regulated substance from a storage tank system exceeding 100 gallons on impervious surfaces, other than secondary containment (i.e., driveways, airport runways, etc) must be notified to the FDEP.
- Loss of a regulated substance exceeding 500 gallons inside a dike field area with secondary containment must also be notified to the FDEP.
- A spill or overfill event of a regulated substance to the soil or other pervious surface equal to or exceeding 25 gallons must be reported to the FDEP.
- Spill to storm water drains, swales or to surface waters which cause a sheen on the surface water must be reported to the FDEP.

The EPA requires reports of releases of hazardous materials and hazardous wastes to the environment. For a spill to be reportable, the following two requirements must be met:

- The amount of the material released must exceed the reportable quantity (RQ). The RQ varies for different materials. For some wastes generated at MDAD shops, the RQ is as little as one pound.
- The spill must be a release to the environment off the airport.

Table 3 – Emergency Contacts

Organization	Contact	Emergency Numbers
Miami-Dade Aviation Department	**OPERATIONS CONTROL CENTER**	**305-876-0385**
Miami-Dade Fire Rescue Department	MIA STATION	305-876-7070 (24 hours)
Miami-Dade Police Department	MIA STATION	305-876-7373 (24 hours)
Miami-Dade Aviation Department	CEED	305-876-7928 305-729-9374 (24 hours)
Miami-Dade Department of Environmental Resources Management (DERM)	AIRPORTS SECTION	305-372-6818 305-372-6955 (24 hours) Must state it is an airport emergency
Jackson Memorial Hospital	TRAUMA CENTER	305-585-1152
National Response Center		(800) 424-8802
Miami-Dade County LEPC	Local Emergency Planning Commission	911
United States Environmental Protection Agency (Region IV)	USEPA	(404) 562-9900 (800) 241-1754
State Emergency Response Commission	SERC	(800) 635-7179

MIA EMERGENCY TELEPHONE NUMBERS

MU 4.4.7.B Version 1.0 Revised 7-2007

INCIDENT TYPE	RESPONDER	CONTACT	TELEPHONE NUMBERS
	FIRE	MIA STATION	(305) 876-7070 (24-Hours)
	POLICE	MIA STATION	(305) 876-7373 (24-Hours)
	RESCUE	MIA STATION	(305) 876-7070 (24-Hours)
	MIA EMERGENCY	TERMINAL OCR	(305) 876-0385 (24-Hours)
	MIA RAMP CONTROL		(305) 876-7486 (24-Hours)
	MAINTENANCE EH&S	TED DAVIS – EMR Building 3030	(305) 876-0890 (After Hours) (305) 606-0099
	ENVIRONMENTAL ENGINEERING	Building 5A 1st FLOOR	(305) 876-7928
	DERM	POLLUTION CONTROL	(305) 372-6955 (24-Hours)
	MIAMI-DADE CRIME STOPPERS	MIAMI-DADE	(305) 471-8477 (24-Hours)

Figure 6. MIA Emergency Telephone Numbers

Generally, spills of solid materials or small volumes of liquids on soil or asphalt that are cleaned up promptly are not considered reportable releases. However, releases of gases to the atmosphere, spills of liquids or solid materials to storm water drains, industrial wastewater drains, and surface waters may have off-site impacts and are reportable releases. Likewise, larger releases of liquids or solid materials to soils, which can not be cleaned up promptly, may leach into groundwater. Because of the movement of groundwater, releases that migrate to the groundwater are potentially reportable releases.

The FDEP requires reports of spills of petroleum products. The loss of a regulated substance from a storage tank system exceeding 100 gallons on impervious surfaces, other than secondary containment (i.e., driveways, airport runways or other similar asphalt or concrete surfaces) must be notified to the county. The EPA requires reports of spills of hazardous materials and wastes. If the spill involves hydrocarbons (oils, petroleum products, etc.) which might reach navigable waters, you must check the **Spill Prevention Control and Countermeasures Plan (SPCC)** in your area to ensure compliance.

4.3 Discharges to Storm Water/Waste Water Drains, Swales and to Surface Waters

The EPA protects the air and water through the Clean Water Act (CWA) and the hazardous waste management through the Resource Conservation Recovery Act (RCRA). The CWA of 1972 is the principal federal statute protecting navigable waters and adjoining shorelines from pollution. Since its enactment, the CWA has formed the foundation for regulations detailing specific requirements for pollution prevention and response measures. A wide range of activities conducted at MDAD shops either routinely results in releases of wastes to the wastewater system or have the potential to affect the quality of water in the wastewater system, storm water drainage system, or surface waters adjacent to the airfields.

The standards prohibit discharging hazardous waste to a municipal treatment plant, flammable materials or materials that would generate toxic gases to the municipal treatment plant and discharge of toxic materials that could kill the bacteria in the municipal treatment plant.

A brief summary of the responsibilities of MDAD personnel with respect to discharges to storm water/waste water drains, swales and surface waters is presented below:

- Industrial wastes not identified on the IW permit must not be discharged to the wastewater treatment system. MDAD shops which do not have an IW permit must not discharge industrial wastes to the wastewater treatment system.
- In addition to discharge permits, dredging or excavation activities conducted along surface water canals and in wetland areas require joint permits from the FDEP, the U.S. Army Corps of Engineers and/or South Florida Water Management District. These permits often have very detailed requirements for handling soils/sediments, handling of elutriated water (drainage from sediment), restrictions on disturbing certain areas or plant species and mitigation of impacted wetlands. CEED is responsible for obtaining any required permit for projects which may impact surface water.
- Prior to conducting activities which could result in erosion of soil to surface waters, dewatering of construction areas, or excavation in either wetlands, storm water swales, ditches or canals, contact CEED to determine the need for and/or requirements of NPDES, Dredge and Fill, and other permits held by MDAD for the work.

4.4 Storage of Hazardous Materials and Wastes in Tanks

Hazardous waste storage tank requirements are dependent upon the RCRA classification of the facility (e.g., small quantity generator (SQG), large quantity generator (LQG) or treatment storage and disposal facility (TSD).

Storage of hazardous materials and wastes in tanks are required to meet basic requirements including:

- A hazardous waste may not be placed into a tank if it will cause the tank or its secondary containment system to rupture, leak, corrode, or fail.
- Special precautions are taken for ignitable, incompatible or reactive wastes.
- The tank is operated using appropriate controls and practices to prevent spills and overflows.
- Periodic inspections are conducted to detect spills, corrosion, leaks, and operator error.
- At closure, all hazardous waste and residues must be removed from the tank, peripheral equipment and foundation structure.
- If at any time, an MDAD shop plans to use a tank to hold a different material from what has previously been stored in the tank, the shop should contact CEED to obtain guidance concerning the suitability of the tank for the “new” material.
- Except for aboveground mineral acid storage tank systems and aboveground hazardous substance storage tank systems, the purpose of the FDEP Chapter 62-761, FAC, (Storage

Tank System) is to provide standards for underground storage tank systems having individual storage tank capacities greater than 110 gallons, and aboveground storage tank systems having individual storage tank capacities greater than 550 gallons.

- For mineral acid storage tank systems, the standards apply to aboveground storage tank systems with individual capacities greater than 110 gallons. For hazardous substance storage systems, the standards apply to aboveground hazardous substance storage systems with individual capacities greater than 110 gallons.

4.5 Processes that Generate Solid Waste

Once a hazardous waste has been identified as a hazardous waste, it is necessary to determine the composition of the waste (waste characterization) in order to select the appropriate method of disposal.

A summary of principal activities that are required by the various regulatory agencies is listed below:

- Once a hazardous waste stream has been characterized, it is important that other materials not be mixed with the hazardous waste.
- Properly MDAD trained personnel at the shop, pursuant to FDOT guidelines, should make sure to sign and date the transporters hazardous waste manifest before the waste is removed from the shop. A copy of the manifest should be retained at the shop (**Figure 7**). The original must be forwarded to CEED. Refer to **Appendix D** for a sample of Hazardous Waste Manifest.

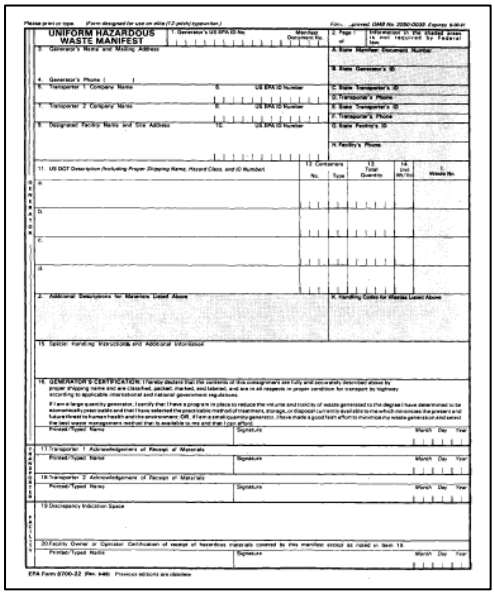

UNIFORM HAZARDOUS WASTE MANIFEST

Figure 7. Sample of hazardous waste manifest

- Provide copy of disposal manifest to CEED at Building 5A c/o Mr. Rod Buenconsejo. Phone (305) 876-0268 and Fax (305) 876-0239.
- Regulatory agencies determined that managing hazardous wastes such as used motor oil, antifreeze, fluorescent light bulbs and batteries under a special set of requirements would promote recycling of the wastes or would encourage citizens to manage the waste responsibly. Refer to **Section 5** of this manual for details of hazardous wastes management.

- MDAD shops that generate hazardous waste or selected special wastes are regulated by the DERM and by Federal and State of Florida agencies. Shop personnel should be familiar with the contents of the DERM IW permit applicable to their shop and the special wastes managed by the shop.
- If a shop generates an industrial waste that is not otherwise addressed in this manual, it is the responsibility of the shop supervisor or designee to contact CEED for guidance concerning how the waste should be handled, and whether a permit is required.

4.6 Airborne Contamination

The EPA, FDEP and the DERM regulate facilities and activities that affect ambient air quality. The United States Occupational Safety and Health Administration (OSHA) regulates air quality with respect to the inhalation of air contaminants by MDAD employees. The following list includes some of the activities which are or may be regulated by one or more of the regulatory agencies:

- Handling and management of refrigerants and the maintenance of air conditioning units.
- Sand blasting and other processes that generate airborne dusts.
- Paint striping by grinding, sanding or blasting, especially if the paint contains lead.
- Grinding, sanding, cutting or striping of building materials that contain asbestos.
- Spray painting, especially the use of a paint spray booth.
- Leaks and pressure venting from storage tanks.

4.7 Emergency preparedness and Right-to-Know Reporting

In 1983, OSHA established the Hazardous Communication Standards (29 CFR 1910.1200) also called the Employee Right-to-Know Law. This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legal requirements of a state, or political subdivision

Figure 8. Right-to-Know Center

requirements of a state, or political subdivision of a state, pertaining to this subject. If your shop changes suppliers for a hazardous material, elects to use a new hazardous material, or significantly increases the volumes of a hazardous material used, it is important that you notify CEED of these changes. Learn about MSDS at the Right-to-Know Center provided at each shop or warehouse and filed in alphabetical order or with a table of contents (**Figure 8**).

4.8 Use of Protective Clothing, Equipment and Respirators

Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in MDAD shops wherever it is necessary by reason of hazards of processes or environment, chemical hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact (**Figure 9**).

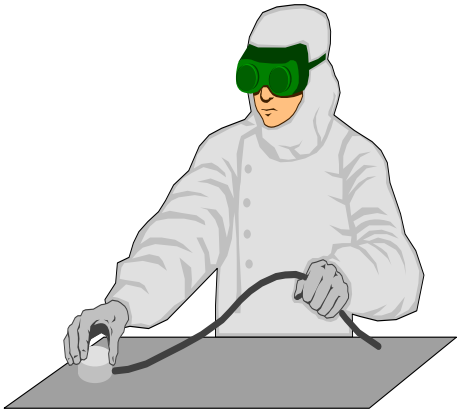


Figure 9. Personal Protective Equipment

Figure 10. Eyewash and Shower equipment

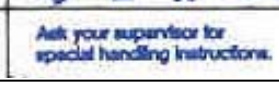
Routine review of protective clothing should be conducted to evaluate the suitability of the clothing for use with the hazardous materials in use and the physical condition of the protective clothing and equipment. Worn, damaged or unsuitable equipment should be replaced. Periodic inspection of emergency eyewash and testing of shower equipment should be conducted to assure adequate flow (**Figure 10**).

Refer to **Table 4** for a guide of proper personal protective equipment that should be used in MDAD shops whenever is necessary.

Respiratory Protection Standard

- MDAD shall establish and implement a written respiratory protection program with worksite-specific procedures. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. Refer to **Appendix E** for a copy of the respiratory protection program.
- Procedures for selecting respirators for use in the workplace.
- Medical evaluations of employees required to use respirators.
- Fit testing procedures for tight-fitting respirators.
- Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations.
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.
- Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators.
- Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations.
- Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance.
- Procedures for regularly evaluating the effectiveness of the program (monthly inspections).

Table 4. PROTECTIVE EQUIPMENT GUIDE

A		Safety glasses
B		Safety glasses and gloves
C		Safety glasses, gloves, and a chemical apron
D		Face shield, gloves, and a chemical apron
E		Safety glasses, gloves, and a dust respirator
F		Safety glasses, gloves, chemical apron and a dust respirator
G		Safety glasses, gloves, and a vapor respirator
H		Splash goggles, gloves, chemical apron, and a vapor respirator
I		Safety glasses, gloves, and a dust and vapor respirator
J		Splash goggles, gloves, chemical apron, and a dust and vapor respirator
K		Air line hood or mask, gloves, full chemical suit and boots
X		Ask your Supervisor

NOTE: Before using any respirator, consult your Supervisor for assistance

4.9 Training

MDAD personnel handling hazardous materials are required to have training to address the safe handling of hazardous materials they use on the job.

All MDAD personnel that as part of their daily duties or responsibilities: **prepare shipping of hazardous material containers, label hazardous material containers, transport hazardous material, accept hazardous material, and sign disposal manifests** are required to undergo Hazardous Material (HAZMAT) Employee Training


HAZMAT TRAINING CERTIFICATION

Rod Buenconsejo

NAME

02-17-06 TRAINING DATE

02-17-09 EXPIRATION DATE

I hereby certify that the above named person has been properly trained and tested in accordance with the general provisions of the regulations concerning transportation of hazardous materials as required by US DOT Code of Federal Regulations Title 49, Part 172.7000-704. Topics covered apply to hazardous materials recognition, labeling, preparation for transport, transportation regulatory compliance, emergency response, placarding, recordkeeping, safety and security awareness requirements.

Certified By:

Miami-Dade Aviation Department

Bureau Veritas – Rafael E. Silva - Instructor

Figure 11. Sample of HAZMAT-DOT Training Certificate

Certification every three (3) years in accordance with the general provisions of the regulations concerning transportation of hazardous materials as required by the U.S. Department of Transportation (DOT) CFR Title 49, Part 172.7000-704 (**Figure 11** and **Appendix E**). Topics covered in the training includes: hazardous material recognition, labeling, preparation for transport, transportation regulatory compliance, emergency response, placarding, recordkeeping, safety and security awareness requirements.

To effectively conduct the training and meet the requirements of the regulations all MDAD personnel handling hazardous materials must:

- Know which hazardous chemicals and toxic substances are found at their facility. Hazardous chemicals are chemicals and mixtures that may constitute any of the following hazards: flammable, ignitable, explosives, oxidizers, corrosive, toxic and radioactive materials.
- If an MSDS exists, assume the substance can be hazardous under certain circumstances.
- Follow a written hazard communication program.
- Maintain records of training performed to MDAD personnel. Training records shall include: purpose and objectives of the training, instructor name, student's name, training dates/times, topics discussed, copy of any hazardous or written materials, and test results (if any). Refer to **Appendix E** for a sample of MDAD training records.

4.10 Labeling Requirements

Every container of hazardous chemicals present in MDAD shops must be labeled. Containers of hazardous chemicals received without the appropriate label will be returned to the manufacturer, distributor, or importer unless the proper label can be supplied (**Figure 12**).

Figure 12. Sample of containers of hazardous chemicals properly labeled at MDAD Warehouse

Labels are intended to be an immediate warning and a reminder about more detailed chemical hazard information provided on MSDSs and presented in employee training sessions. Prior to handling or using any new chemical, MDAD employees are encouraged to read and become familiar with the information provided on the container label. All employees are also encouraged to consult MSDSs or ask their supervisor whenever they are unfamiliar with or concerned about any information or precautions specified on container labels. MDAD employees

will be instructed as part of their Hazard Communication training that they must never remove or deface label information of containers of hazardous chemicals.

All containers of hazardous chemicals must be labeled with the appropriate information. Chemical manufacturers, distributors, and importers are responsible for labeling original containers of their products prior to shipment to their customers. Labels on original containers must include at least the following information:

- Identity of the hazardous chemical(s).
- Appropriate hazard warning(s).
- Name and address of the manufacturer, importer, or other responsible party.
- Hazard warning information on labels may be conveyed in words, pictures, symbols, or any combination thereof. MDAD will accept containers of hazardous chemicals that are labeled according to any of the following systems:
    - **The Hazardous Materials Identification System (HMIS)** developed by the National Paint and Coatings Association (NPCA). Refer to **Section 4.10.1** for further information.
    - **The National Fire Protection Association (NFPA) 704 Diamond Label**. Refer to **Section 4.10.2** for further information.
    - **Department of Transportation (DOT) Placards**. Refer to **Section 4.10.3** for further information.
- Any other generally accepted hazard warning system for conveying hazard information as long as the label conveys specific physical and health hazards (including target organ effects).

Refer to EMS Job Instruction Module MDAD – Hazardous Waste Labeling Paint Shop & Internal Auditors, May 11, 2005 (**MDAD MU – OC – 13**) for further information about labeling requirements.

4.10.1 Hazardous Materials Identification System (HMIS) Labels

The HMIS label, like the NFPA 704 diamond label, provides hazardous chemical information using colors for the type of hazard and numbers for the degree of the hazard (with four (4) being the most hazardous and zero (0) being the least hazardous).

In addition, the HMIS system provides information on the type of personal protective equipment (PPE) that should be used when handling this material. In this category, a letter is used to indicate what combination of PPE should be used (**Figure 13**).

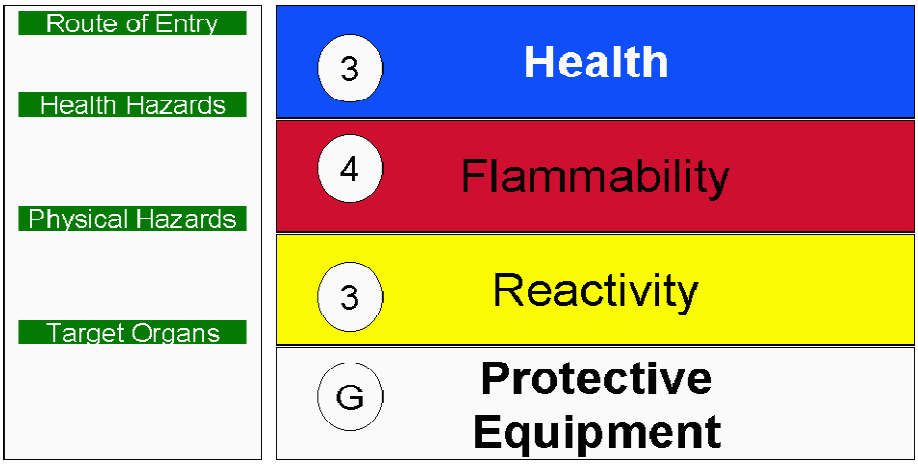


Figure 13. Sample of HMIS Label

Finally, the HMIS label also provides information regarding route(s) of entry, health hazards, physical hazards, and target organs. This information is found to the left side of the label. Refer to **Appendix F** for a copy of the HMIS hazard rating index and protective equipment guide.

4.10.2 National Fire Protection Association (NFPA) 704 Diamond Labels

The National Fire Protection Association (NFPA 704) system uses a diamond-shaped diagram of symbols and numbers to indicate the degree of hazard associated with a particular chemical or material (**Figure 14**). These diamond- shaped symbols are placed on containers of chemicals or materials to identify the degree of hazard associated with the chemical or material.

The diagram identifies three color-coded categories of hazard for each material:

- health hazard (blue sections)
- flammability (red sections)
- reactivity (yellow sections), and
- other hazard information (white section).

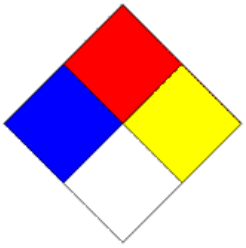


Figure 14. NFPA 704 Diamond Label

Each category is divided in five levels of hazard potential with zero (0) used to indicate no special hazards and four (4) for severe or extreme hazard potential. Refer to **Table 5** for a description of the four categories of the NFPA 704 Diamond.

Table 5 – NFPA 704 Diamond Categories

Health Hazard	
4	Very short exposure could cause death or serious residual injury even though prompt medical attention was given.
3	Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
2	Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
1	Exposure could cause irritation but only minor residual injury even if no treatment is given.
0	Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

Flammability	
4	Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
3	Liquids and solids that can be ignited under almost all ambient conditions.
2	Must be moderately heated or exposed to relatively high temperature before ignition can occur.
1	Must be preheated before ignition can occur.
0	Materials that will not burn.

Instability[1]	
4	Readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
3	Capable of detonation or explosive reaction, but requires a strong initiating source or must be heated under confinement before initiation, or reacts explosively with water.
2	Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.
1	Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.
0	Normally stable, even under fire exposure conditions, and are not reactive with water.

[1] Prior to 1996, this section was titled "Reactivity". The name was changed because many people did not understand the distinction between a "reactive hazard" and the "chemical reactivity" of the material. The numeric ratings and their meanings remain unchanged.

Special Hazards
This section is used to denote special hazards. There are only two NFPA 704 **approved** symbols: **OX** This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire. **W** Unusual reactivity with water. This indicates a potential hazard using water to fight a fire involving this material.

4.10.3 Department of Transportation (DOT) Placards

The DOT requires the use hazardous materials placards or labels when shipping hazardous materials cargo and dangerous goods in the United States. The hazardous material regulations set forth the procedures and criteria for determining the hazard class (class 1 through 8) and the proper shipping name for hazardous materials.

Hazard warning labels must conform to size and color specifications, be placed on the package near the marked proper shipping name and be clearly visible (**Figure 15**).

Hazard warning placards and identification numbers are displayed on the outside of motor vehicles, freight containers, and bulk packagings loaded with hazardous materials (**Figure 16**). They provide a readily visible warning that hazardous materials are present. The information they provide can be critical to emergency responders in mitigating the impacts of a hazardous materials incident or accident.

Refer to **Appendix F** for a copy of the DOT hazardous materials warning labels and placards.

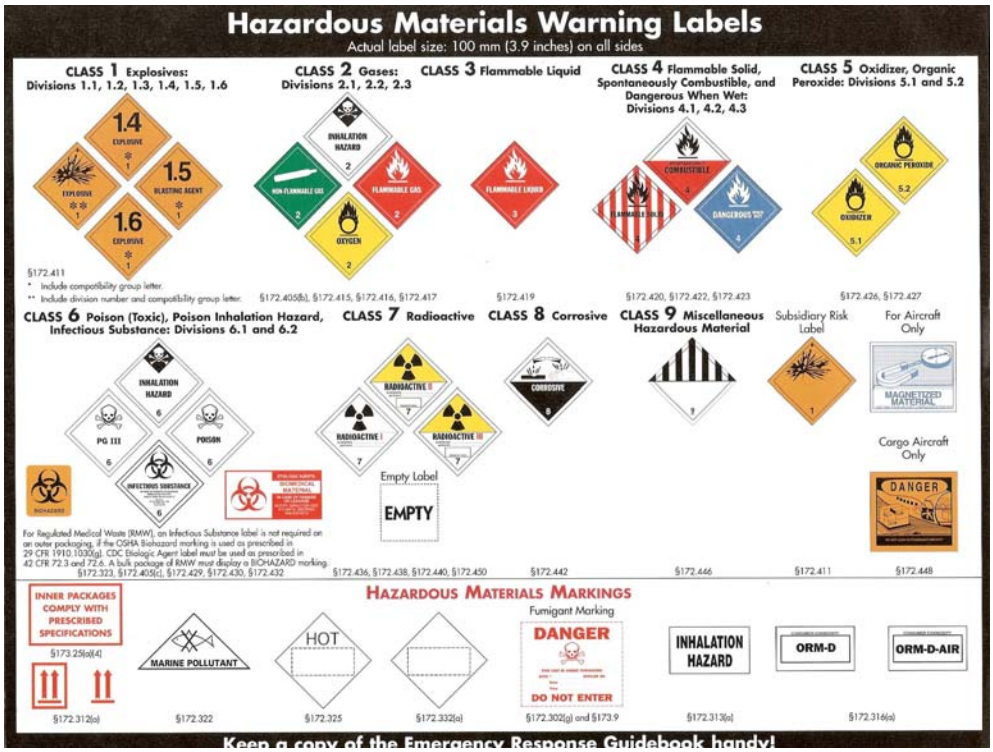


Figure 15. DOT Hazardous Materials Warning Labels

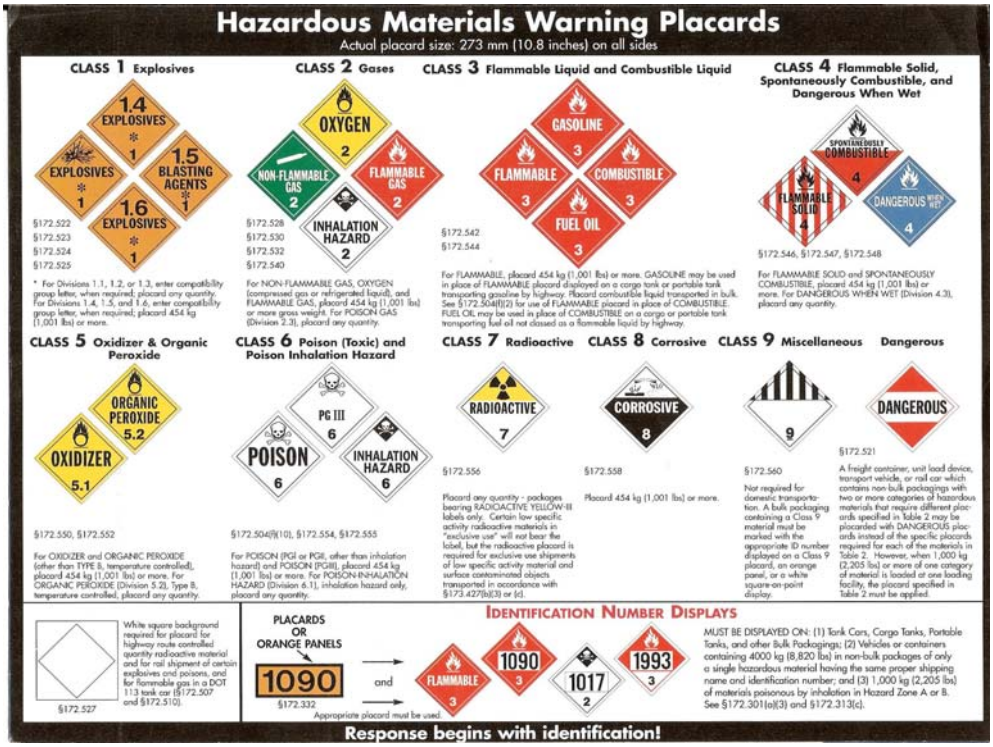


Figure 16. DOT Hazardous Materials Warning Placards

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5.0 BEST MANAGEMENT PRACTICES FOR HAZARDOUS MATERIALS AND WASTE STREAMS

5.1 ANTIFREEZE/COOLANT

Antifreeze/Coolant is a hazardous material and must be managed properly to protect public health and the environment. Most antifreeze/coolant is used as an engine coolant and consists of a water and ethylene glycol solution that is added to radiator water in motor vehicles and other equipment.

5.1.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of antifreeze/coolants. The following is the antifreeze/coolant used by MDAD:

-Ethylene Glycol

5.1.2 Environment

Ethylene glycol should never dumped in the environment. Antifreeze/Coolant picks up heavy metals such as lead during use in the engine. Therefore, ethylene glycol antifreezes/coolants should be returned to a recycling center to minimize harmful effects on our environment after use. Spills should be cleaned up immediately. Proper cooling system maintenance and good recycling practices can mitigate the harmful effects of antifreeze/coolant on our environment.

5.1.3 Health

Ethylene glycol is a clear, colorless liquid. Because ethylene glycol is toxic, it could have serious adverse health effects if taken internally, including respiratory and cardiac failure. Spilled antifreeze/coolant, either virgin material or used product, should be promptly cleaned up to minimize trip and fall hazards and contact with the material.

INHALATION AND ABSORPTION: Ethylene glycol can enter your bloodstream if you breathe air containing mists or vapors from antifreeze/coolant containing this compound. This compound can also enter your bloodstream through your skin if you come in direct contact with them and do not wash them off.

5.1.4 Storage

- Collect and store used antifreeze/coolant in a sealed, labeled container, away from heat.
- Waste antifreeze/coolant should be collected and stored in 55-gallon drums or in tanks for future recycling; the material should be stored within secondary containment.

5.1.5 Handling

- Never store in a beverage container; original container is best.
- Clean up spills with absorbent; bag waste materials and discard in the trash. Flush soiled area with water.
- Do not mix with oil.
- Do not dispose down the drain or in storm drains.

5.1.6 Spill Response

- Care should be exercised to ensure the spill does not enter any storm drain system. Typically, rags, or absorbent materials are used to clean-up the spilled antifreeze/coolant. Rags used to address small spills can be containerized with other shop rags (oily rags).

5.1.7 Waste Profiles and Disposal Options

- Waste antifreeze/coolant must be collected and shipped to a recycler via a DERM approved hazardous waste hauler. Receipts and/or manifests for all waste generated must be kept at the CEED office for at least three years and made available for review by the DERM. Refer to **Figure 17** and **Appendix D** for a sample of a hazardous waste manifest.

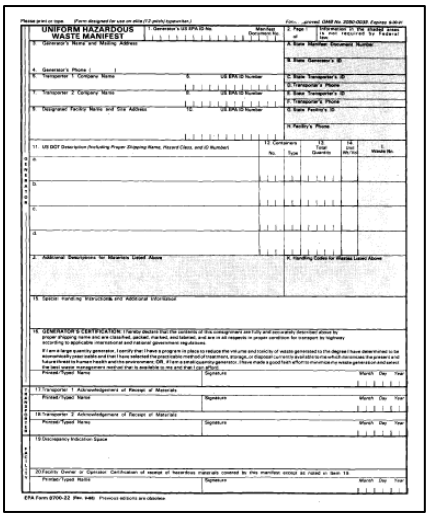

UNIFORM HAZARDOUS WASTE MANIFEST

Figure 17. Sample of hazardous waste manifest

5.2 ASBESTOS

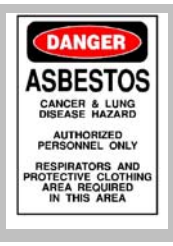
Although asbestos is hazardous, the risk of asbestos-related disease depends upon the exposure to airborne asbestos fibers. The EPA only requires asbestos removal in order to prevent significant public exposure to airborne asbestos fibers during building demolition or renovation activities. The EPA does recommend a proactive, in-place management program whenever asbestos-containing material (ACM) is discovered.

Various types of building materials throughout MDAD facilities contain more than 1% asbestos in any form. These materials are considered ACM. ACM handled and used by MDAD include: floor tile, floor tile mastic, window caulk, wallboard/joint compound, ceiling tile and pipe insulation.

5.2.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product component for detailed information concerning health effects of ACM and if there is any concern or suspicion that a construction material might be ACM, call the CEED to have the material checked for asbestos before disturbing it. The following is a list of types of asbestos that may be encountered in materials used by MDAD:

- Chrysotilel
- Amosite
- Crocidolite
- Tremolite
- Anthophyllite
- Actinolite



5.2.2 Environment

Asbestos fibers do not evaporate into air or dissolve in water. However, pieces of fibers can enter the air and water from the weathering of natural deposits and the wearing down of manufactured asbestos products. Fibers and fiber-containing particles may remain suspended in the air for a long time and be carried long distances by wind or water currents before settling. Asbestos fibers are not able to move through soil. They are generally not broken down to other compounds in the environment and will remain virtually unchanged over long periods.

5.2.3 Health

Significant exposure to any type of asbestos will increase the risk of lung cancer, mesothelioma and nonmalignant lung and pleural disorders, including asbestosis, pleural plaques, pleural thickening, and pleural effusions. Diseases from asbestos exposure take a long time to develop. Asbestos poses health risks only when fibers are present in the air that people breathe.

INHALATION: Prolonged inhalation of asbestos may result in: shortness of breath, difficulty in breathing, constant dry cough, constant pain in the chest, pulmonary hypertension and excess phlegm. Adequate ventilation must be maintained and respiratory protection should be worn.

5.2.4 Storage

- Labels shall be affixed to all products containing asbestos and to all containers containing such products, including waste containers.
- Asbestos must be adequately wetted so that fibers will not be released, and sealed in leak-tight, properly labeled containers. If bags are used, they should be thick plastic (6 mil) and double bagged.
- The same handling procedures are required for contaminated clothes and equipment.
- Container must then be labeled with an OSHA approved asbestos warning label: “DANGER, Contains Asbestos Fibers, Avoid Creating Dust, Cancer and Lung Disease Hazard” (**Figure 18**).

Figure 18. OSHA Asbestos warning label

5.2.5 Handling

- Do not dust, sweep or vacuum particles suspected of containing asbestos.
- If asbestos is in good condition, and fibers are not exposed, it does not need to be removed.
- Slightly damaged or loose asbestos can be re-wrapped rather than removed.
- Asbestos should be handled by a certified asbestos abatement contractor.

5.2.6 Waste Profiles and Disposal Options

Shop personnel that inadvertently disturb identified ACM or potential ACM should contact CEED at once. Outside contractors procured by MDAD for collection and disposal are responsible for characterization and proper disposal of the ACM. All asbestos materials must be disposed of in landfills permitted to receive asbestos.

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5.3 CLEANING COMPOUNDS

MDAD shops and facilities use a wide variety of chemical formulations for cleaning purposes. These materials used include both water-based cleaners and organic solvent-based cleaners.

5.3.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product component for detailed information concerning health effects of cleaning compounds. The following is a list of types of cleaning compounds used by MDAD:

-Acetone
-Ammonia
-Chlorine Bleach (Sodium Hypochlorite)
-Contact Cleaner
-Drain-O (Sodium Hydroxide)
-Floor Wax
-Hydrochloric Acid
-Isopropyl Alcohol (Rubbing Alcohol)
-Metal Polish
-Phenol
-Trichloroethane
-Wood Polish

5.3.2 Environment

Cleaners and waxes which are organic based may be flammable or combustible. The potential for fire is a significant hazard for these materials. Good housekeeping should be practiced to minimize trip and fall hazards. Spills of cleaning products should be cleaned up promptly to avoid contamination of surrounding soil and groundwater.

5.3.3 Health

INHALATION: Commercial cleaning agents can contain high concentrations of reactive chemicals. Mixing of cleaning agents can result in a release of toxic chemical vapors or result in adverse chemical reactions. Some cleaning agents are respiratory hazards.

PENETRATION AND ABSORPTION: Concentrated cleaning agents are often skin and eye irritants. Routine use of gloves to minimize skin contact and the use of eye protection is recommended.

5.3.4 Storage

The storage of cleaning products that are organic, solvent-based and are flammable or combustible requires MDAD personnel address several concerns, including:

- Container type
- Container labeling
- Proximity to ignition sources
- Use of flammable storage cabinets
- Bulk storage of materials on pallets and
- Fire Protection – Fire Extinguishers
- Water-based, incompatible products should not be stored together.

5.3.5 Handling

- Smoking is prohibited in storage areas.
- Activities including cutting, welding or use of open flames must be discontinued.
- Activities which produce sparks, including the use of electric motors, metal grinding or electrical repairs, should be discontinued.
- Other sources of heat, sparks or flame should be removed.

5.3.6 Spill Response

- Maintain ventilation when working with these products.
- Remove any potential sources of ignition. If sources cannot be removed, evaluate the need to evacuate the area and obtain fire protection support.
- Stabilize the source of the spill.
- Small spills (typically less than one gallon) should be wiped up promptly. Rags or absorbent used for cleanup should be stored in a labeled 55-gallon drum and disposed through a commercial facility.

- Leaking containers should be overpacked or the remaining product transferred to another container.
- Do not rinse a spill of cleaning products into a storm sewer drain or onto bare soil.
- Employees involved in decontamination procedures should wear protective clothing including, at a minimum, boots, eye protection and gloves.

Refer to EMS Job Instruction Module MDAD – Spill Cleanup. All Maintenance Shops, August 15, 2004 (**MDAD MU – OC – 8**) for further information about spill response of cleaning compounds.

5.3.7 Waste Profiles and Disposal Options

- Shop personnel are responsible for containerizing, labeling and storing the waste pending transportation and disposal.
- Following waste characterization, CEED may approve dilution of liquid solutions of acids and caustics with tap for water discharge to the municipal industrial wastewater system.
- Absorbent material and soil collected from spills of acids or caustics may be disposed as solid waste or as hazardous waste, pending a waste characterization by CEED.
- Similar to the liquid waste, if the absorbent material or soil is to be disposed as a hazardous waste, shop personnel are responsible for containerizing, labeling and storing the waste until transportation and disposal is arranged by CEED.
- Partially-full containers of cleaning solutions should be drained prior to disposal.
- Drainage from containers used to store organic solvents should be combined with virgin material of the same product or combined with waste generated from the same or similar product.
- Aerosol cans of cleaning materials may be disposed as solid waste, provided they are completely empty of both the cleaning material and propellant. However, MDAD personnel should use aerosol can puncturing units located in various MDAD shops.
- Liquid waste generated from the use of cleaning solutions that do not contain chemicals regulated as hazardous waste or that were not used to clean up hazardous waste may be disposed in the municipal industrial waste water system.
- Shop personnel should not dispose cleaning solutions into storm sewer drain nor into drainage canal nor surface waters.

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5.4 COMPRESSED GASES

MDAD shops use and store a wide variety of compressed gases for welding, fire suppressants, aircrafts tires, welding supplied air and refrigerants/coolants. These compressed gases, if not properly handled, can pose a hazard for people and the environment.

5.4.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product component for detailed information concerning health effects of compressed gases. Compressed gases generally fall into two categories: flammable and non-flammable gases. The following is a list of compressed gases used by MDAD:

-Acetylene
-Argon
-Nitrogen
-Oxygen
-Freons

5.4.2 Environment

Hazards associated with compressed gases include oxygen displacement, fires, explosions, and toxic gas exposures, as well as the physical hazards associated with high pressure systems. Special storage, use, and handling precautions are necessary in order to control these hazards.

5.4.3 Health

Contents under pressure present mechanical and projectile hazards and may explode in heat or fire (**Figure 19**).

Contents may be flammable or combustible and may form explosive mixtures in air. Contents may be asphyxiants, corrosive, flammable, poisonous, or pyrophoric.

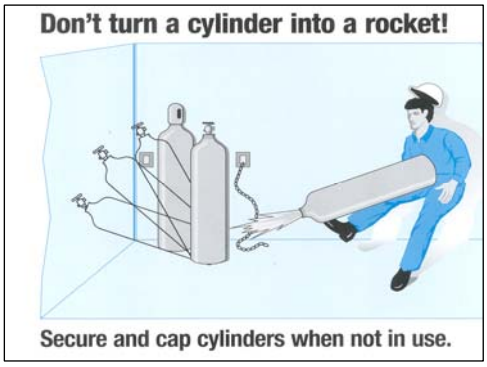

Figure 19. Maintain proper storage of compressed gases to prevent accidents

INHALATION: Uncontrolled gas leaks can become an inhalation hazard. Be aware that gases can accumulate and displace oxygen in a space that is not well ventilated. This is an asphyxiation hazard.

5.4.4 Storage

- Individual compressed gas containers shall be marked or labeled in accordance with DOT requirements or those of the applicable regulatory agency.
- The labels applied by the gas manufacturer to identify the liquefied or non-liquefied compressed gas cylinder contents shall not be altered or removed by the user.
- Compressed gas containers in use or in storage shall be secured to prevent them from falling or being knocked over by corralling them and securing them to a cart, framework, or fixed object by use of restraint (**Figure 20**).

Figure 20. Cylinders will be secured in carts or storage areas with a strap above its center of gravity

- When not in use all cylinders must be capped with a threaded-valve protection cap.
- Incompatible gases, as shown in **Table 6** below, should be stored at least 20-feet apart. Store cylinders at least 20-feet from other flammable or combustible liquids or solids in accordance with safety procedures of the National Fire Protection Association (NFPA) 55 Standard for the storage, use and handling of compressed gases.
- Cylinders should be secured in carts or storage areas with a strap above its center of gravity.
- Compressed gas containers whether full or partially full, shall not be exposed to temperatures exceeding 125°F or subambient (low) temperatures unless designed for use under such exposure.
- Compressed gas containers shall not be placed in areas where they are capable of being damaged by falling objects.
- Valve handles or operators for required shutoff valves shall not be removed or otherwise altered to prevent access.

Table 6 – Separation of Compressed Gases

With	Other gases	Oxidizers	Corrosive	Oxidizing	Flammable	Pyrophoric
Toxic or highly toxic	NR	20 ft	20 ft	20 ft	20 ft	20 ft
Pyrophoric	NR	20 ft	20 ft	20 ft	20 ft	___
Flammable	NR	20 ft	20 ft	20 ft	___	20 ft
Oxidizing	NR	20 ft	20 ft	___	20 ft	20 ft
Corrosive	NR	20 ft	___	20 ft	20 ft	20 ft
Other gases	___	NR	NR	NR	NR	20 ft
NR: No separation required						

5.4.5 Handling

- Compressed gas systems shall be designed for the intended use and shall be designed by persons competent in such design.
- Installation of bulk compressed gas systems shall be supervised by personnel knowledgeable in the application of the standards for their construction and use.
- When transporting by a hand truck, the cylinder must be strapped or chained above its center of gravity to the hand truck in an upright position.
- Do not transport cylinders in closed vehicles.
- Use compressed gases only when the cylinders are full and handle accordingly.
- Never mix gases in a cylinder. Explosion, contamination, corrosion and other hazards may result.
- All cylinder valves should have the safety cap in place for protection during transport.
- Facilities that perform AC repair must have equipment to recapture and/or recycle the refrigerant. This equipment must be EPA or UL listed and approved and be able to recover at least 80%-90% of the refrigerant. The refrigerant storage containers must be DOT or UL approved. For servicing low pressure equipment, the unit must be able to a pull a vacuum of at least 29 inches of mercury.

5.4.6 Spill Response

All cylinders storing compressed gases are generally assumed to be safe under normal operating conditions, as long as the temperature of the gas does not exceed approximately 125 °F. In the event of a spill of a compressed gas that is an irritant, oxidizer, asphyxiant, or has other

hazardous properties all personnel in the area should be alerted. Vacate the facility immediately and call security for assistance. Remain on the scene, but at a safe distance, to receive and provide information to safety personnel when they arrive. If shop personnel encounter a cylinder that is damaged or subjected to elevated temperature, the person(s) must leave the area immediately and call the MDAD fire department.

5.4.7 Waste Profiles and Disposal Options

- All empty, partially filled compressed gas cylinders, and those no longer in use should be returned to the supplier. If the supplier does not accept empty or partially filled cylinders, contact the CEED concerning disposal.
- Grouped into non-flammable and flammable categories and further grouped by their original content.
- Labeled with an empty sticker. The label identifying the cylinder's previous contents should remain on the cylinder.
- MDAD shop personnel should not dispose of full, partially empty or empty cylinders of compressed gases in a solid waste dumpster.

Refer to EMS Job Instruction Module MDAD – Compressed Gases/Aerosol Cans Handling, Use, Storage & Disposal. All Maintenance Shops, August 15, 2004 (**MDAD MU – OC – 6**) for further information about compressed gases handling, use, storage and disposal.

5.5 CONSTRUCTION MATERIALS

MDAD shops and facilities use a wide variety of construction materials. The use of these materials generates hazardous waste.

5.5.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of construction materials. The following is a list of construction materials used by MDAD:

-Glues
-Cleaners for PVC piping
-Cement
-Adhesives
-Asphalt (including blacktop and roof tar)

5.5.2 Environment

Construction materials can be flammable or combustible, use of the various glues, cleaners, adhesives and asphalt poses a potential fire hazards.

5.5.3 Health

SKIN AND EYE IRRITANTS: Some construction materials such as glues, adhesives and cleaners are irritating to skin and the eyes. Use gloves and eye protection when handling these materials.

INHALATION OF VAPORS: Prolonged inhalation of vapors of these materials may result in: dizziness, nausea, headaches, difficulty in breathing and unconsciousness (**Figure 21**).

Adequate ventilation should be maintained and respiratory protection may be appropriate.

Figure 21. Inhalation of vapor from construction materials may cause dizziness.

5.5.4 Storage

- Containers of construction materials in their original shipping packages shall be permitted to be stored either palletized or solid piled. Unpackaged containers shall be permitted to be stored on shelves or directly on the floor of the locker. In all cases, the storage arrangement shall provide unrestricted access to and egress from the locker.
- Placarding and warning signs for lockers shall be in accordance with applicable local, state and federal regulations (**Figure 22**). Refer to Appendix X for a copy of the DOT hazardous materials warning labels and placards.

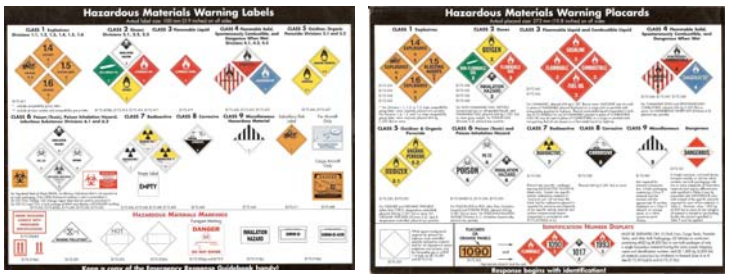

Figure 22. DOT Hazardous Materials Warning labels and placards

- Storage areas where dispensing is conducted shall be provided with either a gravity or a continuous mechanical exhaust ventilation system.
- Flammable and combustible materials should not be stored with strong oxidizers such as chloride gas, chlorine bleach, fertilizers (ammonium nitrate), cylinders of compressed oxygen gas or acids. Incompatible chemicals should be stored separately.
- Flammable and combustible materials should not be stored near ignition sources (open flames, sources of heat, sources of sparks or electrical currents).
- Areas near storm drains must be kept free of oil, grease and other contaminants.

5.5.5 Handling

- Containers shall be kept in closed containers when not actually in use.
- Materials shall not be used outside closed systems where there are open flames or other ignition sources.
- Personal protective equipment and respiratory protection should be worn when handling these materials (**Figure 23**).
- Use of these materials should be conducted in a well-ventilated area.

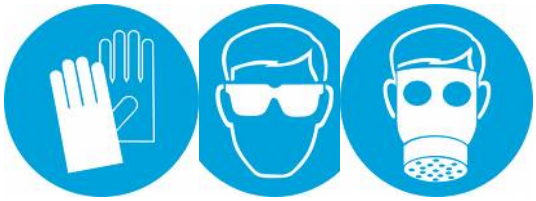

Figure 23. Personal Protective Equipment

5.5.6 Spill Response

Should spillage of any of the above-referenced flammable or combustible liquids occur, the following practices should be followed:

- Review the area around the spill. Remove any potential sources of ignition. If sources of ignition can not be removed, obtain additional fire support.
- Rags or absorbent materials should be used to stop the flow and absorb the material.
- If a spill occurs on bare soil, the visibly stained soil should be removed and clean soil used to backfill.

Should spills of the semi-solid glues, adhesives and asphalt occur, the following procedures should be followed:

- Spills of glues and adhesives may be allowed to harden and then scrapped away.
- Spills of asphalt can be cleaned up with ragas or shovels.

5.5.7 Waste Profiles and Disposal Options

Waste products generated by the use of these construction materials is typically limited to rags, soils and absorbent materials used to clean up spills and empty containers. Waste water from crack detection processes may be discharged to the sanitary sewer by treating it with an approved pretreatment system. Evaporation units are also available to reduce the amount of waste water. Evaporation units and pretreatment systems must be approved by the DERM prior to installation and use. Additionally, evaporation units require an air permit from the DERM. All sludge and/or waste filters generated from these processes must be profiled for determination of proper disposal.

Waste media (shells, sand or beads) generated from blasting activities must be profiled to determine the proper disposal method. Empty asphalt containers, including blacktop, roof tar and cement containers, can be disposed in an industrial or municipal solid waste landfill. Filled or partially filled containers of asphalt and cement should not be disposed in an incinerator, as gases can be released during burning.

Containers of glues, adhesives and cleaners should be drained and the solvent constituents allowed to volatize before they are disposed in a solid waste dumpster for ultimate disposal in

industrial or municipal solid waste landfills or incinerators. Shop personnel should not dispose of partially filled containers of liquid cleaners nor glues as solid waste.

5.6 FERTILIZERS

Fertilizers are materials added to soils and sometimes to foliage to supply nutrients for plant sustenance and growth. Fertilizers can be a significant source of water pollution.

5.6.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of fertilizers (**Figure 24**). The following is a list of types of fertilizers used by MDAD:

Primary: NITROGEN (N) supplied:	- Nitrate - Ammonia - Urea - Other organic nitrogen compound
Secondary: PHOSPHOROUS (P) supplied:	- Ammonium - Potassium - Organic Phosphorous
Minor: Potassium (K) supplied:	- Potassium Salt or complex

Figure 24. Maintain MSDSs readily available for reference at your facility

5.6.2 Environment

There are environmental concerns that need to be taken into consideration when using fertilizers. Elements such as nitrogen and phosphorus can get washed into our surface waters and cause algae blooms and excess plant growth. This excess growth in plant material can cause numerous problems, namely the reduction of oxygen which can lead to fish kills. Nitrogen leaching into our ground waters and drinking water supplies is a concern because excess nitrogen in drinking

water can contribute to the development of serious disease. Excesses of minor elements in the soil, such as copper and zinc, can cause problems in crop production. Ammonium nitrate represents a special case with respect to fertilizers. When in contact with organic materials, this compound is a serious fire and explosion potential.

5.6.3 Health

ABSORPTION: Some fertilizers are irritating to skin and the eyes. Use gloves and eye protection when handling these materials (**Figure 25**).

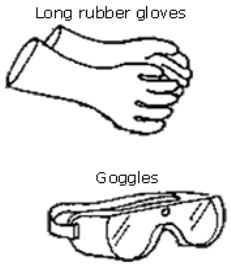

Figure 25. Use long rubber gloves and goggles when handling fertilizers

5.6.4 Storage

- Always store nitrogen based fertilizers separately from solvents, fuels, and pesticides since many fertilizers are oxidants and can accelerate a fire.
- Fertilizers should be stored on pallets in areas protected from rainfall and excessive moisture. Pallet storage should be consistent with the structural requirements of the building.
- Fertilizers should be stored away from acids, caustics, flammable/combustible materials and pesticides.

NFPA Storage of Ammonium Nitrate

- Only authorized personnel should be allowed access.
- Store filled bags and intermediate bulk containers in stable configurations.
- All points of entry to the storage area should be clearly labeled Ammonium Nitrate.
- The storage structure should not exceed one story, be adequately vented and free from water leaks.
- Maximum storage capacity is 60 tons without specific approval.
- Smoking and open flame is prohibited in storage areas.
- Fire hoses should be provided throughout the storage area.
- Ammonium nitrate should not be stored in the same area as organic materials, flammable or combustible materials, compressed gases, pesticides, acids or caustic materials.
- Containers that exceed a temperature of 130 °F should not be accepted for storage.
- Broken bags of ammonium nitrate should be overpacked promptly.
- Maximum dimensions of storage piles are 200 feet wide by 20 feet high by 50 feet long.

5.6.5 Handling

- Fertilizers sprays and dusts should not be applied on windy days.
- Application should be limited to areas where runoff to storm water drains, swales and surface waters will not occur.
- Manufacturer's directions should be carefully followed concerning application of water after fertilizer application.

Figure 26. Utility vehicles used for fertilizer application

5.6.6 Spill Response

- Spills of solid fertilizer can be addressed by collecting and storing the solid material in a plastic container.
- Any residual fertilizer can be cleaned up using an appropriate commercial absorbent or using sand/soil.
- Spill fertilizers near storm water drainages or surface waters should be cleaned up promptly and completely.

5.6.7 Waste Profiles and Disposal Options

Fertilizer waste is limited to appropriate absorbent material used to address spills of liquid fertilizers, empty containers and rinse water from empty containers. Disposal of absorbent materials and empty rinsed containers can be disposed in the dumpster as solid waste.

Refer to EMS Job Instruction Module MDAD – Handling & Storage of Fertilizer & Pesticides. Grounds Maintenance, Public Works, Landscape Projects and Warehouse, August 15, 2004 (**MDAD MU – OC – 9**) for further information about handling and storage of fertilizers.

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5.7 FLUORESCENT LAMPS AND MERCURY-CONTAINING DEVICES

Fluorescent lamps, including energy saving compact fluorescents, contain mercury. When a lamp breaks, it releases mercury into the air, which is toxic to the human nervous system and can poison wildlife. MDAD uses and stores a variety of term lamps that includes: fluorescent lamps, mercury lamps, metal halide lamps and high-pressure sodium lamps. Mercury including devices includes mercury switches, manometers, thermometers, and thermostats. Non-residential facilities are required by the State of Florida, through the FDEP (www.dep.state.fl.us/waste/) to recycle Mercury Containing Lamps (MCLs), including fluorescent lamps, and Mercury Containing Devices (MCDs), such as ballasts.

5.7.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of fluorescent lamps and mercury-containing devices. The following is a chemical product of fluorescent lamps and MCDs used by MDAD:

- Mercury

5.7.2 Environment

Fluorescent lamps and MCDs pose a serious environmental hazard. The mercury can leach out of landfills and poison both the soil and drinking water. They are also a health hazard workers can be exposed to dangerous mercury fumes and lead powder whenever fluorescent lights are broken.

5.7.3 Health

INHALATION, ABSORPTION AND INGESTION: Spilled liquid mercury is a health concern. The central nervous system is probably the most sensitive target organ for mercury vapor exposure. Mercury vapors can affect different areas of the brain, resulting in a variety of symptoms. Some symptoms from exposure to high levels of mercury vapor, or from long-term exposure to low levels, can include: memory loss, headache, sleeplessness, irritability and tremors.

Short-term exposure to high levels can also cause: coughing, shortness of breath, chest pain, nausea, vomiting, diarrhea, fever, high blood pressure and skin rashes.

5.7.4 Storage

- Store lamps in box or case to prevent breakage. MDAD has established an area at the shop warehouses as the designated accumulation area for the storage of spent mercury-containing lamps and devices.
- Keep storage containers in a secure, dry area.
- Store your used mercury switches and bulbs no more than one year.
- Label containers containing fluorescent lamps: "Spent Mercury-containing lamps for recycling", "Waste Mercury Lamps" or "Used Mercury Lamps" and "Universal Waste" (**Figure 27**).

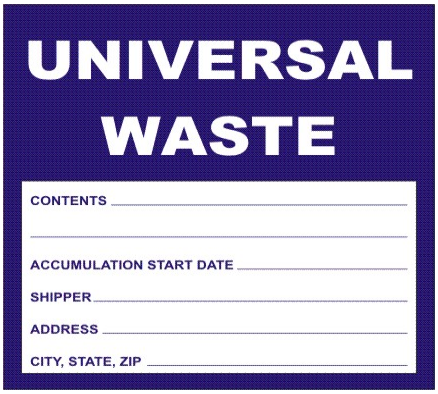

Figure 27. Label the waste of fluorescent lamps as "Universal Waste"

5.7.5 Handling

- Wear glasses when handling lamps.
- Shop personnel should be familiar with the requirement to recycle spent fluorescent lamps.
- Because of the presence of mercury in lamps and devices, broken lamps and devices should be promptly cleaned up.
- Personal protective equipment such as gloves and goggles should be worn when handling these materials.

5.7.6 Spill Response

In the event of breakage, shop personnel should cordon off the area until clean up is complete.

HOW SHOULD I HANDLE MERCURY?

You should remember two important things:

- Do not touch mercury and
- Do not throw mercury in the garbage.

To transport your lamps or mercury-containing products for recycling, double bag them using Zip-lock bags or contain them in a sealed plastic container. As a reminder, try to cushion the items to reduce the risk of spills.

IF YOU HAVE A MERCURY SPILL

- Keep people and pets away from the area.
- Use gloves, preferably rubber, to protect yourself.
- Do not use a vacuum or broom.
- Ventilate the area if possible.
- Scoop up the liquid with index cards and seal in a plastic bag or container.
- Contact the EMR and deliver the mercury to an approved collection site.
- Dispose of the gloves and the index cads with the mercury.
- Label the waste as “Universal Waste”.

5.7.7 Waste Profiles and Disposal Options

- MDAD may accumulate up to 5,000 kilograms of universal waste at any time for no more than 180 days from the accumulation start date.
- MDAD personnel are prohibited from diluting, treating or intentionally breaking its spent lamps or mercury-containing devices.
- Used fluorescent lamps and mercury-containing devices must be disposed by a recycler licensed by the State of Florida. Records of disposal shall be kept by MDAD for three years from the shipping date.
- If the lamps are spent or damaged, place in a container and mark or label it with the words “USED LAMPS” and deliver to warehouse at end of Building 3040.
- Warehouse personnel will arrange for shipment and disposal (recycling) on an as needed basis (**Note: used lamps can not be stored on site for more than a year**).

- Package lamps in disposal containers tightly without separators but do not package different lengths together.
- Place partially filled boxes on top of the designated pallet(s) but never tape spent lamps together. Keep lamp boxes dry not wet. Label or mark all boxes.
- Remove all packing materials before re-filling. Store disposal containers in pallets 42" by 48" and secure with stretch wrapping directly to the pallet.
- Contact MDAD CEED for disposal arrangements.

Refer to EMS Job Instruction Module MDAD – Electric Lamp Disposal. West Cargo, North Zone, South Zone, Middle Zone, Night Electric, Electric, Facilities Maintenance, Loading Bridge and Conveyor Shops, January 30, 2006 (**MDAD MU – OC – 3**) for further information about fluorescent lamps and mercury devices disposal.

5.8 FUELS AND PETROLEUM PRODUCTS AND WASTES (INCLUDING OIL RAGS)

Fuels and petroleum products become contaminated (typically with lead and benzene) when additives breakdown, or the oil picks up metals from engine wear, or from sloppiness during fluid changes. MDAD shops use a variety of hazardous petroleum products and generate a variety of waste materials.

5.8.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of fuel and petroleum products. The following is a list of fuels and petroleum products used by MDAD:

- Motor Oil
- Hydraulic Oils
- Lubricating Oil
- Spray Lubricants
- Greases
- Diesel Fuel
- Gasoline
- Propane Gas

NFPA 30 Flammable and Combustible Liquids Code

- Flammable liquid is any liquid that has a closed-cup flash point at or bellow 100°F.
- Combustible liquid is any liquid that has a closed-cup flash point at or above 100°F.
- Classification of flammable and combustible liquids is shown in **Table 7**. Refer to **Figure 28** for sample of hazardous materials warning placards for flammable and combustible liquids.

Figure 28. Hazardous Materials Warning Placards for flammable and combustible liquids

Table 7 – Classification of Flammable and Combustible Liquids

Liquid Type	Class	Flash Point	Boiling Point
Flammable Liquid	IA	below 73°F	below 100°F
Flammable Liquid	IB	below 73°F	at or above 100°F
Flammable Liquid	IC	at or above 73°F but below 100°F	
Combustible Liquid	II	at or above 100°F but below 140°F	
Combustible Liquid	IIIA	at or above 140°F but below 200°F	___
Combustible Liquid	IIIB	at or above 200°F	___
Note: Classification can be changed by contamination and the volatility of liquids is increased by heating.			

Classification of flammable and combustible liquids commonly used by MDAD personnel is listed below:

- Gasoline (Class IA)
- Motor Oil (Class IIIB)
- Hydraulic Oil (Class IIB)
- Spray Lubricants (Class IIIB)
- Greases (Class IIIB)
- Diesel Fuel (Class II)

5.8.2 Environment

Fuels and petroleum products can be flammable or combustible. For these materials, fire poses the greatest health and safety risk.

5.8.3 Health

Fuels and petroleum products pose hazards associated with inhalation of vapor or mist and skin contact.

INHALATION: If sprays are used to apply the oils, mists are produced which can be inhaled. Inhalation of petroleum vapors can cause: dizziness, nausea, headaches and loss of

consciousness. Respiratory protection and appropriate ventilation is necessary when transferring large volumes of light hydrocarbons or addressing spills.

ABSORPTION: Fuels and petroleum products are irritating to skin and the eyes. Use gloves and eye protection when handling these materials.

5.8.4 Storage

MDAD stores large volumes of gasoline, diesel fuel, propane gas and waste oil in tanks. The storage requirements differ depending on the method of storage and the flammability ranking of the materials.

NFPA 30 for Storage Tanks

- Tanks storing fuels and petroleum products should be separated by the distances given in **Table 8**. Contact CEED prior to removing empty tanks.
- Tanks should be labeled with its former contents and fire hazard.
- Propane gas (LP) tanks should have flammable labels.
- ASTs must have secondary containment to prevent uncontrolled releases. Inspection of secondary containment should be conducted and documented weekly.
- USTs must include external corrosion protection.

Table 8 – Minimum Tank Spacing

Fixed or Horizontal Tanks			
	Floating Roof Tanks	Class I or II Liquids	Class III Liquids
All tanks not over 150ft in diameter	1/6 sum of adjacent tank diameters	1/6 sum of adjacent tank diameters but not less than 3ft	1/6 sum of adjacent tank diameters but not less than 3ft
Tanks larger than 150ft in diameter:			
If remote impounding is provided	1/6 sum of adjacent tank diameters	1/4 sum of adjacent tank diameters	1/6 sum of adjacent tank diameters
If diking is provided	1/4 sum of adjacent tank diameters	1/3 sum of adjacent tank diameters	1/4 sum of adjacent tank diameters

- Placing storage tanks inside a building requires that the building meet construction specifications. Fire protection systems (sprinkler systems) and ventilation system must be in good working order to ensure safe operation of the storage tank. Shop personnel should contact CEED prior to moving any tank inside a building. Furthermore, shop personnel in buildings which contain tanks of petroleum products should be especially vigilant concerning the operation of ventilation systems.

NFPA 30 for Storage of Small Containers near the Point of Use

This section applies to the storage of liquids in drums or other containers that do not exceed 60 gallons. General storage recommendations for small containers of petroleum products are listed below:

- Small containers with fuels and oils should be stored in metal or polyethylene containers with a maximum capacity of five gallons. The maximum allowable size of a container or metal portable tank should not exceed that specified in **Table 9** below.
- Large containers of 30-gallon or 55-gallon drums should be stored on pallets in an upright position or horizontally on drum racks (**Figure 29**).
- Chemical storage areas must be on impervious surfaces with secondary containment or a bermed and covered area away from drainage structures.

Figure 29. 55-gallon drums containing used oil at MDAD shops

- Flammable and combustible petroleum products should not be stored near:
  - Oxidizers such as chlorine gas, chlorine bleach, ammonium nitrate, cylinders of compressed oxygen gas, muriatic acid or sulfuric acid.
  - Ignition sources (open flames, sources of sparks, or electrical currents) or sources of heat (stoves, heated pipes, sun, etc.)
  - Office spaces, except where maintenance is being performed.
  - In containers that exceed maximum container sizing requirements shown in **Table 9**.
- Storage of any liquids should not obstruct physical means of egress.

Table 9 – Maximum Allowable Sizes – Containers, Intermediate Bulk Containers and Portable Tanks

	Flammable Liquids				
Container Type	Class IA	Class IB	Class IC	Class II	Class III
Glass	1 pint	1 quart	1 gallon	1 gallon	5 gallons
Metal (other than DOT drums) or approved plastic	1 gallon	5 gallons	5 gallons	5 gallons	5 gallons
Safety cans	2 gallons	5 gallons	5 gallons	5 gallons	5 gallons
Metal drum (DOT specification)	60 gallons	60 gallons	60 gallons	60 gallons	60 gallons
Approved metal portable tanks and 1BCs	793 gallons	793 gallons	793 gallons	793 gallons	793 gallons
Rigid plastic 1BCs (UN 31H1 or 31H2) and composite 1BCs (UN 31HZ1)	Not permitted	Not permitted	Not permitted	793 gallons	793 gallons
Polyethylene DOT Specification 34, UN 1H1, or as authorized by DOT exemption	1 gallon	5 gallons*	5 gallons*	60 gallons	60 gallons
Fiber drum NMFC or UFC Type 2A; Type 3A, 3B-H, or 3B-L; or Type 4A	Not permitted	Not permitted	Not permitted	60 gallons	60 gallons
For Class 1B and 1C water-miscible liquids, the maximum allowable size of plastic container is 60 gallons, if stored and protected in accordance with NFPA 30.					

NFPA 30 Use of Flammable Storage Cabinets

- Not more than 120 gallon of Class I, Class II and Class IIIA liquids shall be stored in a storage cabinet.
- Storage cabinets must be vented pursuant to manufacturer's directions.
- Storage cabinets should be marked in conspicuous lettering: FLAMMABLE – KEEP FIRE AWAY (**Figure 30**).
- No more than three storage cabinets are allowed in a fire area.

Figure 30. Flammable cabinet.

NFPA 30 Bulk Storage of Containers

- Storage of any liquids shall not physically obstruct means of access/egress.
- Storage on racks should have a minimum of 4-feet wide aisle between adjacent rack sections and any adjacent storage of liquids. Main aisles should be a minimum of 8-feet wide.
- Storage of empty or idle combustible pallets inside an unprotected storage area should be limited to a maximum pile size of 2,500 ft^2 and to a maximum storage height of 6-feet. Pallet storage should be separated from liquid storage by aisles that are at least 8-feet wide.
- Containers in piles should be stacked to provide stability and to prevent excessive stress on container walls.
- Containers or portable tanks in unprotected liquid storage areas should not be stored closer than 36-inches to the nearest beam, chord, girder, or other roof member.
- Indoor unprotected liquid storage should comply with **Table 10**.

Table 10 – Indoor Unprotected Storage of Liquids in Containers, Portable Tanks, and Intermediate Bulk Containers

	Container Storage			Portable Tank/Metallic IBC Storage			Rigid Plastic and Composite IBCs		
Class	Max. Pile Height (ft)	Max. Quantity per pile (gal)	Max. Total Quantity (gal)*	Pile Max. Height (ft)	Max. Quantity per Pile (gal)	Max. Total Quantity (gal)*	Max. Pile Height (ft)	Max. Quantity per pile (gal)	Max. Total Quantity (gal)*
IA	5	660	660	___	NP	___	NP	NP	NP
IB	5	1,375	1,375	7	2,000	2,000	NP	NP	NP
IC	5	2,750	2,750	7	4,000	4,000	NP	NP	NP
II	10	4,125	8,250	7	5,500	11,000	7	4,125	8,250
IIIA	15	13,750	27,500	7	22,000	44,000	7	13,750	27,500
IIIB	15	13,750	55,000	7	22,000	88,000	7	13,750	55,000

*Applies only to cut-off rooms and attached buildings, not to liquid warehouses.

NP: Not permitted.

IBC: Intermediate Bulk Containers.

- Storage in inside rooms should meet the requirements listed in **Table 11** below.

Table 11 – Storage Limitations for Inside Rooms

Total Floor Area (ft^2)	Automatic Fire Protection Provided [a]	Total Allowable Quantity (gal/ft^2 of floor area)
≤ 150	No	2
	Yes	5
> 150 and ≤ 500	No	4[b]
	Yes	10

[a] The fire protection system should be automatic sprinklers, water spray, carbon dioxide, dry chemical, or other approved system.

[b] Total allowable quantities of Class IA and IB liquids should not exceed the quantities permitted in **Table 10**.

- Areas near storm drains must be kept free of oil, grease and other contaminants.

NFPA 30B for Spray Cans/Aerosol Containers

- In areas where flammable gases or flammable vapors might be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. Sources of ignition include: open flames, lighting, hot surfaces, smoking, stray currents and electricity among others.
- Storage areas for cases/cartons of aerosol products should be separated at least from other storage areas for other combustible or flammable materials.
- If applicable, further separate aerosols into acid and alkali storage within the low hazard storage area to keep potentially incompatible products from mixing.

Storage of Waste Petroleum Products

- The waste oil and waste fluid collection area must have a bermed, impervious surface and be under cover.
- Wastes must be stored in clearly marked containers that are in good condition.
- All wastes should be segregated.
- Wastes streams should not be mixed.
- Waste oil is generally stored in small storage tanks or in 55-gallon steel drums.

- Used oil filters must be drained of all free oil and then should be placed in a dedicated 55-gallon steel open top drum (**Figure 31**).
- Waste absorbent material containing spilled petroleum products should be stored in 55-gallon steel open top drum (**Figure 31**).
- Oily rags should be stored in drums or containers specified by the vendor who is contracted to clean the rags.
- Disposal of aerosol cans should be punctured at Mobile Garage, PLB/Conveyor Shop or West Cargo Shop before disposal to the local sanitary landfill. Aerosol cans should be drained of the remaining contents including propellant (**Figure 32**).

Figure 31. Storage of petroleum waste in 55-gallon drums

Figure 32. All aerosol cans must be punctured at Mobile Garage, PLB/Conveyor Shop or West Cargo Shop

- All containers used to store waste petroleum products should be kept closed when material is not being added to them.
- All containers used to store waste petroleum products should be labeled to identify the contents.
- Do not add waste-containing paint, mineral spirits, cleaning solutions, antifreeze or other waste materials to containers used to store waste petroleum products.
- Engines must be stored on impervious surfaces and under cover to avoid potential leaks from filters and fluid inside the engines.
- MDAD mechanic drains waste motor oil into designated waste oil transport container.

- MDAD mechanic swaps old filter for new filter in the parts room.
- All other shops must return used filters/strainers to automotive warehouse for disposal.

NFPA for Fire Protection

- Extinguishers used with flammable and/or combustible materials should be Class B or combination extinguishers, typically Class ABC.

- For shops handling flammable and combustible materials on a routine basis, Class B extinguishers should be available at 30-foot intervals.

- Fire extinguishers should be located in an area that is readily visible and is easily accessed.

- The location of fire extinguishers should be documented and the documentation should be provided to personnel and/or posted in a conspicuous location.

- The operating instructions on the name plate should be legible and visible: P-A-S-S for P-pull pin A-aim at base of fire, S-squeeze handle and S-sweep side to side (**Figure 33**).

Figure 33. Simple operating instructions to use a fire extinguisher (P-A-S-S)

- Seals and tamper indicators on the name plate should be legible and visible.
- If the seal has been broken, the fire extinguisher should be submitted to a reputable company for service.
- The fire extinguishers should be full. This status should be checked monthly by weighing the extinguisher or checking pressure gauge attached to the unit.
- Leaking, corroded or damaged extinguishers should be repaired or replaced.
- All fire extinguishers should be maintained by a certified individual at least annually.

- Periodically, extinguishers must undergo hydrostatic testing to verify the integrity of the pressurized cylinder.

- Records of monthly checks, annual maintenance, and hydrostatic testing should be maintained at the shop using the extinguishers (**Figure 34**). Refer to **Appendix G** for a copy of monthly fire extinguisher tag inspection record.

Figure 34. Monthly fire extinguisher tag inspection record

5.8.5 Handling

MDAD personnel should avoid mixing hazardous waste or other shop waste with used oil. Mixing may contaminate the used oil, making recycling more expensive and/or causing the entire mixture to be regulated as hazardous waste. The EPA's regulatory definition of used oil is as follow: Used oil is any oil that has been refined from crude oil or any synthetic oil that has been used and as a result of such use is contaminated by physical or chemical impurities. The following are general procedures that should be followed whenever fuels and petroleum products are used:

Figure 35. 55-gallon drums containing used oil at MDAD shops

- To prevent the mixing of used oil with other materials, always label all storage containers and tanks as "used oil" (**Figure 35**).
- Collect oil in a clean container with screw cap, such as the original container or clean, labeled plastic jug. Do not mix oil with any other liquids. Cap container to keep out dirt and water.
- Provide properly labeled containers which store petroleum products that are readily accessible and can be disposed of appropriately.
- All containers used to store petroleum products should provide secondary containment.
- Smoking is prohibited in areas where petroleum products are handled or stored.
- Other sources of heat, sparks or flames should be removed from the area of the transfer.
- Good housekeeping practices are our priority to minimize slips, trips and falls and to minimize inadvertent exposure to petroleum vapors or liquids.

- Used oil filters must be collected, crushed at the Mobile Garage Shop and disposed off by a permitted hauler or recycler (**Figure 36**). All fluids must be drained from filters prior to disposal. These filters cannot be disposed of in the trash/dumpster.
- Oily rags used in cleaning processes and contaminated with hazardous materials (solvents, inks, oil and grease) must be recycled by a licensed rag service or handled as a hazardous waste unless proven otherwise by a hazardous waste profile.

Figure 36. 55-gallon drums containing crushed oil filters at the Mobile Garage shop

- Parts washing may not be done over open ground. Parts washing must be done in parts washers. The parts can be rinsed or air dried over the parts cleaning container. Absolutely no fluid, not even rinse water, is to be disposed of to open ground, storm drains, septic tanks or any drainage structure. Dirty parts washing fluid may be recycled or disposed of properly as previously discussed above. A permitted part-washing contractor who brings new fluid and takes away the sludge and waste fluid is the preferred disposal method.
- MDAD personnel should wear the necessary personal protective equipment required to perform their duties and to avoid personal injuries (**Figure 37**).

Figure 37. Personal Protective equipment (PPE)

5.8.6 Spill Response

Small Spill

- Only properly trained MDAD employees shall clean up unknown spills.
- For known substance, follow label and MSDS directions.
- Safe cleanup of small spills of petroleum products requires personnel to evaluate the immediate hazards posed by the release and to take action as appropriate (**Figure 38**).

- Remove any potential sources of ignition. If sources of ignition can not be removed, evaluate the need to evacuate the area and obtain fire protection support.
- Small spill (less than one gallon) of petroleum products should be wiped up promptly.
- Absorbent material used for cleanup should be stored in a labeled 55-gallon drum and disposed through a commercial facility.
- Spill range of five to ten gallons should be stabilized with absorbent material, and, if necessary diked.
- If a spill occurs on bare soil, the visibly stained soil must be removed and clean soil used for backfill. All contaminated soil must be containerized, typically in DOT-approved 55-gallon drums. The soil should be assumed to be hazardous waste until evaluated. Stabilize the source of the spill. Overpack leaking drums or pails. Alternately, transfer the contents of the leaking container to another intact container (**Figure 38**).
- Employees involved in decontamination procedures should wear protective clothing, including, at a minimum, eye protection, boots and gloves. Additionally, coveralls, and/or boots covers should be used as necessary (**Figure 38**).
- Additional decontamination procedures can be performed by thoroughly washing and scrubbing the affected area with detergent and hot water.

All decontamination liquids should be containerized for future evaluation and disposal.

  - The containers should bear a label identifying decontamination fluid, type of spill and the accumulation date.

Figure 38. Drums and other hazardous waste containers should be handled using appropriate PPE

Large Spills

- Large spills such as failure of a tank or fill line should not be addressed by shop personnel, but instead should be referred to the Fire Department and reported to CEED.

5.8.7 Waste Profiles and Disposal Options

- Used oil can not be mixed with any type of hazardous waste.
- Used oil filters should also be properly opened, inspected, drained and crushed before disposal. Used oil filters must be recycled and cannot go to a solid waste landfill. Draining and crushing filters not only reduces storage and transport costs but protects the environment from oil contamination.

Figure 39. Disposal of oil rags in labeled containers

- Oily rags generated during maintenance operations, and oily rags used to clean up small spills of petroleum products, should be segregated and stored in separate labeled containers (**Figure 39**). Ideally, MDAD will recycle these rags by having them cleaned by a licensed commercial laundry facility (a facility with an appropriate waste water treatment permit).
- Used absorbent material should be segregated, labeled, and stored as if the absorbent material were hazardous waste pending the results of evaluation/testing. Used absorbent that is hazardous waste will be disposed by MDAD via an approved hazardous waste contractor. Used absorbent that is not hazardous waste can be disposed as solid waste in the dumpster.
- Small volumes of residual lubricants and oils can be combined with waste oil for disposal. When disposing of larger volumes, contact CEED for guidance. Empty drums which have been drained should be stored in a protected area pending shipment to a commercial drum reconditioning or recycling company. Empty containers with capacities of five gallons or less can be disposed in the solid waste dumpster.

Refer to EMS Job Instruction Module MDAD – Used Oil, Filters and Automotive Battery Disposal, August 15, 2004 (**MDAD MU – OC – 7**) for further information about fuel and petroleum products disposal.

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5.9 ORGANIC CLEANING SOLVENTS/DEGREASERS (INCLUDING SOLVENT-LADEN RAGS)

MDAD uses organic cleaning solvents and degreasers for washing parts. These materials are used by MDAD as cleaning to dissolve oil stains and dirt or grease.

5.9.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of organic cleaning solvents/degreasers. The following is a list of organic cleaning solvents/degreasers used by MDAD:

- Mineral spirits and Varsol
- Freon (liquid and spray can)
- Xylene
- Isopropyl Alcohol
- Kerosene
- Lacquer Thinner
- Liquid Wrench
- Paint Thinner
- Ramp Cleaner
- Safety-Kleen 140 Solvent

5.9.2 Environment

Organic Cleaning solvents compounds generally are flammable and combustible. Consequently, fire poses health and safety risks.

5.9.3 Health

INHALATION: Inhalation of petroleum vapors can cause dizziness, nausea, headaches and loss of consciousness. Adequate ventilation should be maintained when using Freon or other organic solvents cleaning materials. Respiratory protection may be necessary.

ABSORPTION: Organic Cleaning solvents compounds are irritating to the skin. Prolonged skin contact with petroleum products should be avoided. If prolonged skin contact is likely, gloves and protective clothing should be worn.

5.9.4 Storage

NFPA 30 for Drums, Dip Tanks, and Smaller Containers

Organic cleaning solvents are often used and/or stored by MDAD in a variety of containers including drums, dips tanks and smaller containers of five-gallon capacity or less. General storage recommendations for small containers of organic cleaning solvents are listed below:

Figure 40. Organic cleaning solvents stored in metal cabinets

- Small containers with organic cleaning solvents should be stored in metal or polyethylene containers (**Figure 40**).
- Five-gallon containers used to handle petroleum-based organic cleaning solvents other than the original product container should bear and approval from the DOT.
- Large containers of 30-gallon or 55-gallon drums should be stored on secondary containment pallets in an upright position or horizontally on drum racks. Indoor, unprotected storage of opened drums on racks should be limited to the volumes shown in **Table 10**.
- Drums and dip tanks must be kept covered when not in use.
- Flammable and combustible petroleum products should not be stored near:
    - Oxidizers such as chlorine gas, chlorine bleach, ammonium nitrate, cylinders of compressed oxygen gas, muriatic acid or sulfuric acid.
    - Ignition sources (open flames, sources of sparks, or electrical currents) or sources of heat (stoves, heated pipes, sun, etc.)
- Storage of any liquid should not physically obstruct means of access / egress.
- Areas near storm drains must be kept free of oil, grease and other contaminants.
- Do not deposit leftover product in the trash or down the drain.

NFPA 30 Use of Flammable Storage Cabinets

Flammable storage cabinets are recommended for use with small containers of organic cleaning solvents. When not in use, all containers less than 20 gallons capacity which contain flammable and combustible organic cleaning solvents should be stored in flammable material storage cabinets (**Figure 41** and **Figure 42**). Refer to **Section 5.8.4** for applicable limits.

Figure 41. Flammable material storage cabinets

NFPA 30 Bulk Storage of Containers

NFPA 30 addresses bulk storage of drums and pails of flammable and combustible materials including organic cleaning solvents. Refer to **Section 5.8.4** for general guidance for the use of pallets for storage.

NFPA 30 for Spray Cans/Aerosol Containers

MDAD shops use spray cans of both Freon and petroleum-based cleaners. The aerosol products are usually packaged in individual labeled canisters. Canisters that are in routine use can be stored at the work area. Small numbers of canisters which are not actively used should be stored in flammable material storage cabinets (**Figure 41** and **Figure 42**). Storage of cases or cartons of aerosol containers should be consistent with the requirements of NFPA 30B as noted in **Section 5.8.4**.

Figure 42. Flammable material storage cabinets used to keep canisters

Storage of organic cleaning solvent wastes should be addressed as follows:

- Solvent-laden rags and oily rags may be stored in the same container prior to being sent for recycling.
- If solvent laden rags can not be recycled, the rags should be considered a hazardous waste.
- Two types of storage are allowed for hazardous wastes stored in containers. These types of storage are satellite accumulation

Figure 43. Warning Label for Satellite storage hazardous waste

and storage pending transportation/disposal, also referred to as a 180-day storage area (**Figure 43**).

- Satellite accumulation containers must be located near the location where the shop personnel empty or clean out containers holding used solvents.
- Satellite accumulation drums must be under constant control of an operator.
- Satellite accumulation drums must be kept closed unless in use, the drums must be labeled to identify contents.
- After the satellite accumulation drum is full, MDAD shop personnel have three calendar days to move the drum to an approved 180-day storage area to await transportation and disposal and label the drum with the date it enters the area.
- 180-day storage area should be provided with secondary containment for all drums.
- Accumulation areas should be protected from rainfall, and a procedure established to discharge rain water which collects within secondary containment area.
- Drums of organic solvent waste within the 180-day hazardous waste storage area should be DOT approved steel drums in good condition, suitable for transportation. Drums should be closed at all times.
- Storage areas must have adequate communications equipment, emergency response equipment and aisle space to deal with foreseeable emergencies and to allow for safe inspection and handling of the wastes.

NFPA 34 Fire Protection

General guidance concerning the selection, availability, operation and maintenance of manual fire extinguishers is discussed in **Section 5.8.4**. This general guidance applies to storage and handling of organic cleaning solvents. Additional guidance concerning fire protection in areas where dip tanks are used is presented below:

NFPA 34 Fire Protection Dip Tanks

- Automatic sprinkler system should be available in the fire area where the dip tank is used.
- Dip tanks should be closed when not in use, and either automatic closure or special fire protection systems for the dip tanks is recommended.
- Fire extinguishers specific to the dip tanks should be available.
- Training in the hazards of using organic cleaning solvents in dip tanks is required for personnel performing these activities.

5.9.5 Handling

- Activities including cutting, welding or other open flames must be discontinued.
- Smoking is prohibited in areas where organic cleaning solvents / degreasers are handled.
- Activities which produce sparks, including the use of electric motors, metal grinding or electrical repairs should be discontinued in the area of the transfer.
- Other sources of heat, sparks or flame should be removed from the area of the transfer.
- Good housekeeping is our priority to minimize slips, trips and falls and to minimize inadvertent exposure to organic cleaning solvent vapors or liquids.

NFPA 34 Guidance regarding the Use of Dip Tanks

- Dip tanks should not be located in an area used for the storage of other combustible or flammable materials.
- Dip tanks should not be located in areas which are below surrounding grade.
- Good housekeeping is especially important to prevent the buildup of combustible materials in the vicinity of the dip tanks.
- Carefully control potential ignition sources around dip tanks, including the use of non-sparking materials, limiting the use of electrical equipment and sources of heat or open flame.
- Assure adequate ventilation, especially in areas where cleaned parts are allowed to air dry.

5.9.6 Spill Response

- Maintain ventilation when working with these products.
- Remove any potential sources of ignition. If sources cannot be removed, evaluate the need to evacuate the area and obtain fire protection support.
- Stabilize the source of the spill.
- Small spills (typically less than one gallon) should be wiped up promptly. Rags or absorbent used for cleanup should be stored in a labeled 55-gallon drum and disposed through a commercial facility.
- Leaking containers should be overpacked or the remaining product transferred to another container.
- Do not rinse a spill of cleaning products into a storm sewer drain or onto bare soil.
- If a spill occurs on bare soil, the visibly stained soil must be removed and clean soil used for backfill. All contaminated soil must be containerized, typically in a DOT-approved 55-gallon drum.

- If it is necessary to remove or clean organic cleaning solvents from concrete floors or areas with finished floor, the bulk of the spilled material should be cleaned up as described above.
- Additional decontamination procedures can be performed by thoroughly washing and scrubbing the affected area with detergent and hot water.
- Employees involved in decontamination procedures should wear protective clothing including, at a minimum, boots, eye protection and gloves.

5.9.7 Waste Profiles and Disposal Options

Organic cleaning solvents and degreasers is typically disposed in two ways:

- Solvent rags are shipped to a licensed commercial laundry facility for cleaning (recycling). Shop personnel should store the solvent laden rags in a drum or container acceptable to the licensed commercial laundry facility and coordinate pick up of the dirty rags for transport to the laundry facility. In the event that a laundry service is unavailable, shop personnel must manage the rags as hazardous waste transporter to a licensed hazardous waste disposal facility.
- Receipts and/or manifests for all waste generated must be kept at the CEED office for at least three years and made available for review by the DERM.
- Containers used to stored organic cleaning solvents can either be recycled or discarded. The container should be completely empty of its contents.
- All aerosol spray cans must be punctured at Mobile Garage, PLB/Conveyor Shop or West Cargo Shop before metal recycling or disposal to the local sanitary landfill. The aerosol cans should be emptied of all solvent and all propellant (**Figure 44**).
- Wear appropriate eye safety goggles (**Figure 44**).
- Insert spray can in receptacle.
- Secure can in receptacle with retainer clamp.
- Push down on puncture lever.
- Discard punctured aerosol spray can into solid waste container prior to final disposal (**Figure 45**).

Figure 44. All aerosol cans must be punctured at Mobile Garage, PLB/Conveyor Shop or West Cargo Shop

Figure 45. Disposal of punctured aerosol spray cans

Refer to EMS Job Instruction Module MDAD – Compressed Gases/Aerosol Cans Handling, Use, Storage & Disposal. All Maintenance Shops, August 15, 2004 (**MDAD MU – OC – 6**) for further information about aerosol cans disposal.

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5.10 PAINTING AND RELATED PRODUCTS

MDAD shops and facilities use a wide variety of paints, stains, thinners, lacquers and paint strippers/removers which are hazardous waste.

5.10.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of paints and related products. The following is a list of chemical components present in paints and related products used by MDAD:

-Acetone
-Acids
-Acrylics
-Alkalis
-Chlorinated Hydrocarbons
-Mineral spirits
-Esters
-Petroleum Hydrocarbons
-Alcohols
-Turpentine
-Ethylene glycol
-Metals

5.10.2 Environment

Solvent-based mixtures of paint and related products containing organic compounds can be flammable or combustible. For these materials, fire poses the greatest health and safety risk.

5.10.3 Health

Paint products and associated materials pose hazards associated with inhalation of vapor or mists (sprays) and skin contact. The chemical hazards presented by paints and solvents are due to the heavy metal content, presence of organic vapors and drying effect on the skin.

ABSORPTION: Solvent-based paint and paint strippers are irritating to the eyes. Use eye protection when handling liquid paints and associated products.

INHALATION: Prolonged inhalation of vapors or mists may result in: dizziness, nausea, headaches, difficulty in breathing and unconsciousness. Adequate ventilation should be maintained and respiratory protection may be appropriate.

5.10.4 Storage

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed and use self-closing funnels when adding waste.
- All containers should be labeled with their contents.
- Containers should be kept covered when not in use.
- Wastes must be compatible with the container. For example, use HDPE plastics containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (acids and bases), in the same container.

Paints and related products used by MDAD shops are provided in a variety of containers including small drums, pails and aerosol cans.

NFPA 30 for Solvent-based Paints and Associated Products

- These materials should be stored in metal or polyethylene containers.
- Large containers of 30-gallon or 55-gallon drums should be stored on pallets in an upright position or horizontally on drum racks. Indoor, unprotected storage of opened drums on racks should be limited to the volumes shown in **Table 10**.
- Containers must be kept covered when not in use.
- Storage of any liquids should not obstruct physical means of egress.
- Areas near storm drains must be kept free of oil, grease and other contaminants.
- Do not put leftover product in the trash or down the drain.
- Maintain adequate aisle space between container rows to allow inspection for leaks and damage. Aisle ways should be cleared of debris and stacked materials should not exceed safe heights.
- Store ignitable reactive wastes at least 50 feet from property boundaries. Incompatible chemicals should be stored separately.

- Store containers of incompatible wastes in separate areas.
- Be aware of allowable time limits of storage.

NFPA 30 for Latex-based Paint and Associated Products

- Good housekeeping practices should be followed such that storage areas have adequate aisle space for access of personnel.
- Aisle should be clear of debris and stacked materials should not exceed safe heights, as defined on the cartons or cases used to ship materials.
- Latex-based paints should not be stored with incompatible materials, including chlorine gas, chlorine bleach, fertilizers, and cylinders of compressed oxygen or acids.

NFPA 30 Use of Flammable Storage Cabinets

Flammable storage cabinets are recommended for use with small containers of solvent-based paint formulations, especially lacquers, strippers and thinners. When not in use, all containers less than 20 gallons capacity which contain flammable and combustible paint and related products should be stored in flammable material storage cabinets. Refer to **Section 5.8.4** for applicable limits.

NFPA 30 Bulk Storage of Containers

NFPA 30 addresses bulk storage of drums and pails of flammable and combustible materials including solvent-based paints and associated products. Refer to **Section 5.8.4** for general guidance for the use of pallets for storage.

NFPA 30 for Spray Cans/Aerosol Containers

MDAD shops use spray cans of various types of paints/chemicals. The aerosol products are usually packaged in individual labeled canisters. Canisters that are in routine use can be stored at the work area. Small numbers of canisters which are not actively used should be stored in flammable material storage cabinets. Storage of cases or cartons of aerosol containers should be consistent with the requirements of NFPA 30B as noted in **Section 5.8.4**.

Storage of solvent-based paint wastes should be addressed as follows:

- Used paint rags should be segregated from oily rags by storing them in a separate closed container.
- If the used rags cannot be laundered, the rags should be considered hazardous waste.
- Solvents may be recycled by a recycling unit or distilled and recycled using a solvent recovery unit.
- Recycling and distillation units must be approved by the DERM prior to implementation and use.
- Solvent-based paint wastes may be ignitable hazardous wastes such as mineral spirits, thinners, lacquers and strippers.
- Waste solvent-based paint and associated products should be segregated by type and stored in 55-gallon steel drums.
- Two types of storage are allowed for hazardous wastes stored in containers. These types of storage are satellite accumulation and storage pending transportation/disposal, also referred to as a 180-day storage area.
- Satellite accumulation containers must be located near the location where the shop personnel empty or clean out containers holding used solvents.
- Satellite accumulation drums must be under constant control of an operator.
- Satellite accumulation drums must be kept closed unless in use, the drums must be labeled to identify contents (**Figure 46**).
- After the satellite accumulation drum is full, MDAD shop personnel have three calendar days to move the drum to an approved 180-day storage area to await transportation and disposal and label the drum with the date it enters the area.
- 180-day storage area should be provided with secondary containment for all drums.

Figure 46. Satellite drums properly labeled to identify contents

- Accumulation areas should be protected from rainfall, and a procedure established to discharge rain water which collects within secondary containment area.
- Drums of solvent-based paint and associated products waste within the 180-day hazardous waste storage area should be DOT approved steel drums in good condition, suitable for transportation. Drums should be closed at all times.

- Storage areas must have adequate communications equipment, emergency response equipment and aisle space to deal with foreseeable emergencies and to allow for safe inspection and handling of the wastes.

NFPA 33 Fire Protection

General guidance concerning the selection, availability, operation and maintenance of manual fire extinguishers is discussed in **Section 5.8.4**. This general guidance applies to storage and handling of solvent-based paint and associated products. Additional guidance concerning fire protection in areas where dip tanks are used is presented below:

NFPA 33 Fire Protection for Spray application of Solvent-based Paints and Coatings

- Maintenance of sprinkler systems and ventilation system should be conducted routinely by trained personnel. The potential failure of electrical components, resulting in heat or sparks, is of special concern.
- Employees should be trained to familiarize them with equipment operation and maintenance, as well as emergency procedures.

5.10.5 Handling

- Activities including cutting, welding or other open flames must be discontinued.
- Smoking is prohibited in areas where painting and related products are handled.
- Activities which produce sparks, including the use of electric motors, metal grinding or electrical repairs should be discontinued in the area of the transfer.
- Other sources of heat, sparks or flame should be removed from the area of the transfer.
- Good housekeeping should be a priority to minimize slips, trips and falls and to minimize inadvertent exposure to solvent-based paint vapors or liquids.
- Gloves and eye protection should be worn if prolonged or frequent skin contact is expected, such as transferring materials between containers.
- Solvents and other industrial fluids shall not be discharged into sanitary sewers, storm drains, soakage pits, and surface waters or onto the ground surface.
- If waste solvent is recycled by the facility generating the waste, the still bottoms from the reclaiming operation must be collected and handled as hazardous waste, unless proven

otherwise by chemical profiling. If the waste solvent is recycled by a permitted solvent recycler, receipts must be obtained from the recycler and maintained at the facility.

NFPA 33 for Spray Application of Solvent-based Paints, Coatings and associated products

- Open flames, spark-producing equipment or processes, and equipment whose exposed surfaces exceed the auto-ignition temperature of the material being sprayed should not be located in the spray area or in surrounding areas.
- Static charges can build-up on airless spray equipment. Airless spray guns and any conductive object being sprayed should be electrically grounded prior to beginning working.
- "No Smoking or Open Flames" sign in large letters on contrasting color background shall be conspicuously posted at all spray area and paint storage rooms (**Figure 47**).
- Good housekeeping is especially important to prevent the build up of overspray, which is combustible or may spontaneously ignite.

Figure 47. Warning signs located in paint storage rooms

- Rags used in the cleaning operations should be removed from the area after each use or each shift and stored in containers.
- An adequate supply of clean make-up air should be provided to compensate for the air exhausted from spray operations.
- Employees clothing contaminated with sprayed material shall not be left on the premises overnight unless kept in metal lockers.
- Spray application of oxidizers such as hydrogen peroxide, chlorine bleach, or other oxidants should not be conducted in the same area used to apply paints and coatings.
- It is necessary to thoroughly clean the equipment and remove all traces of incompatible substances.
- The use of paints, coating or strippers containing chlorinated solvents in spray equipment containing aluminum parts should be avoided.

Application of Latex-based Paints, Coatings and associated products

- Applications should be conducted in well ventilated areas.
- Frequent recurring contact with the skin should be avoided.
- Good housekeeping should be a priority to minimize slips, trips and falls.
- Spills of paint should be cleaned promptly to minimize trips and falls.
- Spent spray booth filters may be disposed with regular trash only if tests prove the filters are non-hazardous.

5.10.6 Spill Response

Safe clean up of small spills of paints and related products require personnel to evaluate the immediate hazards posed by the release and to take appropriate action.

Spilled latex-based paints and coatings can be contained with absorbent materials and/or rags. Typically, the used rags and absorbent contaminated with paint which does not contain any of the metals can be disposed in a solid waste dumpster.

Small spills of solvent-based paints, coating and associated products can be cleaned up using the following procedures:

- Observe the area around the spill and remove any potential sources of ignition. If sources of ignition can not be removed, evaluate the need to evacuate the area and obtain fire protection support.
- Assure that sufficient ventilation is present and note the odor of solvent vapors. If shop personnel become dizzy or light headed, back away from the spill area and obtain support to address the spill.
- Stabilize the source of the spill. Overpack leaking drums or pails. Alternately, transfer the contents of the leaking container to another intact container.
- Small spills (typically less than 1 gallon) of solvent-based paints, coatings, associated products or waste should be wiped promptly. Absorbent material used for cleanup should be stored in a labeled 55-gallon drum and disposed through a licensed commercial facility.
- Spill in the range of five to ten gallons should be stabilized with absorbent material and, if necessary, diked. All sand and absorbent diking material should be swept and placed in a DOT-approved, 55-gallon drum.

- If a spill occurs on bare soil, the visibly stained soil must be removed and clean soil used for backfill. All contaminated soil must be containerized, typically in DOT-approved 55-gallon drums. The soil should be assumed to be hazardous waste until evaluated.
- Employees involved in decontamination procedures should wear protective clothing, including, at a minimum, eye protection, boots and gloves. Additionally, coveralls, and/or boots covers can be used as necessary.
- Additional decontamination procedures can be performed by thoroughly washing and scrubbing the affected area with detergent and hot water.
- All decontamination liquids should be containerized for future evaluation and disposal.
- The containers should bear a label identifying decontamination fluid, type of spill and the accumulation date.

5.10.7 Waste Profiles and Disposal Options

- Solvents and other industrial fluids shall not be discharged into sanitary sewers, septic tanks, storm drains, soakage pits, surface waters or onto the ground surface. These fluids must be collected and disposed of properly. Any industrial waste discharged into sanitary sewers must meet sanitary sewer standards.
- All solvent and paint containers must be empty and completely dry before disposal. Aerosol cans must be punctured before disposal to the local sanitary landfill.
- Paint thinners, solvents, spent solvents and solvent mixtures are hazardous wastes and must be properly disposed of by a permitted hazardous waste transporter; or the solvents can be recycled by a permitted recycler or distiller and recycled using a solvent recovery unit at your facility.
- If the waste solvent is recycled by the facility generating the waste, the still-bottoms from the reclaiming operation must be collected and handled as hazardous waste, unless proven otherwise.
- If the waste solvent is recycled by a permitted solvent recycler, receipts must be obtained from the recycler and copies kept at your facility.
- In all cases when a hazardous waste is produced, a permitted hazardous waste transporter must be used to transport the waste to a federally approved hazardous waste disposal or treatment facility. Hazardous waste manifests must be kept at your facility, available for review. The facility generating the hazardous waste is required to obtain an Environmental Protection Agency identification number unless classified as a conditionally exempt generator by contacting:

Bureau of Solid & Hazardous Waste
Florida Dept. of Environmental Protection
Division of Waste Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
(850) 245-8707

- Rags used during cleaning processes which become contaminated with hazardous materials such as solvents, paints, etc. are considered hazardous waste and may be handled by an approved rag service or an approved hazardous waste transporter. Used rags must not be disposed of in the trash/dumpster unless a hazardous waste profile indicates otherwise and approval is granted by the DERM.
- Receipts of all waste and/or wastewater disposal must be maintained on site, available for inspection. Hazardous waste manifest must be kept for any hazardous waste disposal. Receipts/manifests must be kept for a period of three (3) years. Refer to **Figure 48** and **Appendix D** for a sample of Hazardous Waste Manifest.
- Special attention should be paid to storm drain locations. Storm drains are designated to help alleviate rainwater. These drains are not connected to the sanitary sewer system, but rather discharge to the ground, groundwater and surface waters. Therefore, no discharges are to go to these storm drains, other than rainwater. Areas should be kept free of oil and grease and other contaminants into these drains.

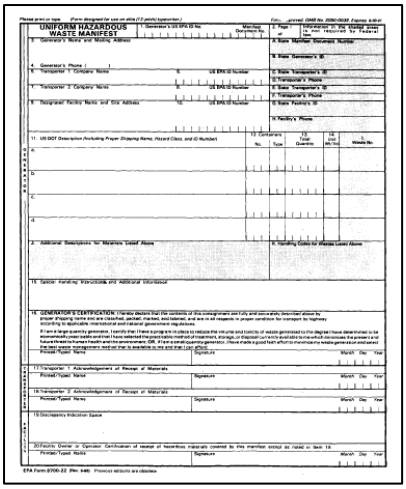
UNIFORM HAZARDOUS WASTE MANIFEST

Figure 48. Sample of hazardous waste manifest

Refer to EMS Job Instruction Module MDAD – Hazardous Waste Labeling Paint Shop & Internal Auditors, May 11, 2005 (**MDAD MU – OC – 13**) for further information about painting and related products labeling and refer to EMS Job Instruction Module MIA – Chemicals and Chemical Waste Handling & Disposal. All Maintenance Shops, July 12, 2006 (**MDAD MU – OC – 1**) for further information about painting and related products handling and disposal.

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5.11 PESTICIDES

MDAD shops and facilities use a wide variety of pesticides for preventing, destroying, repelling or mitigating any pest, or intended for use as plant regulator, defoliant or desiccant. These materials used include solvent base, water base and solid base pesticides.

5.11.1 Material Safety Data Sheets

Pesticides may be classified as insecticides, herbicides, antimicrobial pesticides, rodenticides, biopesticides, disinfectants/sanitizers or other similar substances.

Because pesticides are regulated under the Federal Pest Control Products Act, they are partially exempted from maintained MSDSs when these products are purchased from a supplier or distributor. However, MDAD is still required to educate all workers who use or are potentially exposed to pesticides. In addition, a workplace label must be applied if the product is decanted into another container (**Figure 49**).

Figure 49. Read labels of products before handling

A list of United Nations (UN) Prior Informed Consent (PIC) pesticides, banned pesticides, severely restricted pesticides and severely hazardous pesticide formulations is presented in **Table 12**, below.

Table 12 – Severely restricted pesticides and severely hazardous pesticides formulations

Pesticide	UN PIC List	Banned	Severely Restricted
Aldrin	Yes	Yes	
Arsenic trioxide			Yes
Asbestos all forms (interim)	Yes	Yes	
Benzene hexachloride [BHC]	Yes	Yes	
Binepacryl (ibterim)		Yes	
2,3,4,5-Bis(2-butylene)tetrahydro-2-furaldehyde [Repelent-11]		Yes	
Bromoxynil butyrate		Yes	
Cadmium compounds		Yes	
Calcium arsenate		Yes	
Captafol	Yes	Yes	
Carbofuran (granular only)			Yes
Carbon tetrachloride		Yes	
Chloranil		Yes	
Chlordane	Yes	Yes	
Chlordecone (kepone)		Yes	
Chlordimeform	Yes	Yes	
Chlorobenzilate	Yes	Yes	
Chloromethoxypropylmercuric acetate [CPMA]		Yes	
Copper arsenate		Yes	
Daminozide/alar			Yes
DBCP		Yes	
DDT	Yes	Yes	
Dieldrin	Yes	Yes	
Dinoseb and salts	Yes	Yes	
Di(phenylmercury)dodecenylsuccinate [PMDS]		Yes	
DNOC Interim	Yes	Yes	
1,2-dibromoethane (ethylene dobromide – EDM)	Yes	Yes	
Ethylene dichloride (EDC) Interim		Yes	
Ethylene oxide (ETO) (Interim) agricultural uses only			Yes
Endrin		Yes	
EPN		Yes	
Ethyl hexyleneglycol [6-12]		Yes	
Fluoroacetamide	Yes	Yes	
Heptachlor	Yes		Yes
Hexachlorobenzene	Yes	Yes	

Lead arsenate		Yes	
Leptophos		Yes	
Lindane	Yes		Yes
Mercury Compounds (mercurous chloride and mercuric chloride)	Yes	Yes	
Methamidophos	Yes		
Methyl Parathion	Yes		
Mevinphos		Yes	
Mirex		Yes	
Monocrotophos	Yes	Yes	
Nitrofen (TOK)		Yes	
OMPA 9octamethylpyrophospohoramide)		Yes	
Parathion (ethyl)	Yes		
Pentachlorophenol	Yes		Yes
Phenylmercury Acetate [PMA]		Yes	
Phenylmercuric Oleate [PMO]		Yes	
Phosphamidon	Yes		
Potassium 2,4,5-trichlorophenate [2,3,5-TCP]		Yes	
Pyriminil [Vacor]		Yes	
Safrole		Yes	
Silvex		Yes	
Sodium Arsenate			Yes
Sodium Arsenite		Yes	
TDE		Yes	
Terpene Polychlorinates [Strobane]		Yes	
Thallium Sulfate		Yes	
Toxaphene (Chlorinated Camphene) (Interim)	Yes	Yes	
Tributyltin Compounds			Yes
2,4,5-Trichlorophenoxyacetic Acid [2,4,5-t]	Yes	Yes	
Vynil Chloride		Yes	

5.11.2 Environment

Pesticides, in the form of powders, granules, vapors, aerosols and liquids, can enter the body in three ways. Someone can be poisoned and not be aware that the pesticide has entered his or her body. Pesticides and pesticide formulations may also be flammable.

5.11.3 Health

INHALATION: When applying fumigants, inhalation can be the main route of entry. Inhalation exposure is usually minimized through the use of a chemical cartridge respirator. Change the cartridge whenever vapors are detected by smell or taste, whenever breathing is restricted or as frequently as the manufacturer recommends.

ABSORPTION: This is the most common route of entry. Studies show that 95% of a person's exposure to a pesticide occurs in this way. Different parts of the body have different degrees of absorption. Most absorption occurs through the hands and forearm during the handling, mixing and loading operations.

Clothing is your main defense against dermal exposure to pesticides. Because pesticides can be absorbed through the skin in all areas of the body it makes sense to cover the body as much as possible. The most common reasons for this exposure is not wearing appropriate protective clothing (**Figure 50**).

Figure 50. Protective Personal Equipment (PPE)

If exposure does occur, the best treatment after removing any contaminated clothing is often to drench the affected area of the body with fresh water.

Since the eyes make up a very small portion of the total area of the body, the amount of pesticide entering the body this way would be very small and toxicologically of minor concern. However, to avoid the possibility of permanent vision impairment and possibly blindness direct chemical contact must be avoided.

Exposure most often occurs by the pesticide being accidentally splashed or sprayed into the eyes. Such exposure can be avoided by wearing appropriate goggles. The pesticide label instructions advise the use of goggles when handling high or moderate risk pesticides.

INGESTION: Oral intake can occur through eating, drinking and smoking with pesticide contaminated hands. In this case good personal hygiene is your best protection. Always wash your hands with soap and water before such activities. Poisonings have also occurred when pesticides have been removed from their original containers and stored in liquor, soft drink or food bottles. Keep pesticides in their original containers.

5.11.4 Storage

NFPA 43D Pesticides

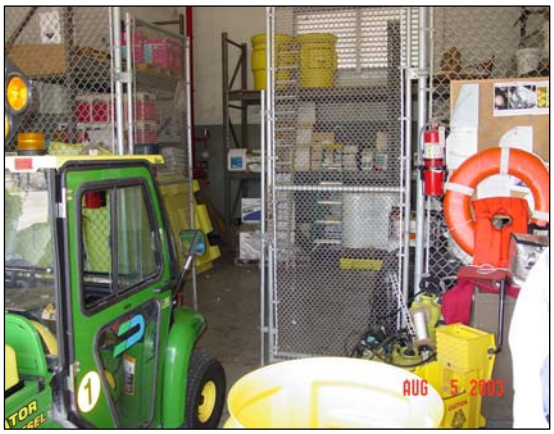

Figure 51. MDAD Pesticides Storage Areas

- Typical storage container types include 1-gallon, 2-gallon, 5-gallon drums, glass bottles, bags, cartons, and plastic jugs, depending on the chemical nature of the particular pesticide or fertilizer.
- Pesticides should be adequately separated from other materials in storage. Pesticides should be stored so as to prevent contact with moisture. Specific storage requirements are provided on pesticide container labels.
- Design and build pesticide storage structures to keep pesticides secure and isolated from the surrounding environment (**Figure 51**). Store pesticides in a roofed concrete or metal structure with a lockable door.
- Store pesticides in their original containers. Do not put pesticides in containers that might cause children or others to mistake them for food or drink.
- Keep the containers securely closed and inspect them regularly for splits, tears, breaks, or leaks.
- Arrange pesticides containers so that labels are clearly visible and make sure labels are legible. All pesticide containers should be labeled (**Figure 52**).
- Pesticides should be stored in dry, well ventilated areas not associated with offices, laundry, shower and/or locker rooms.
- Signs should be posted indicating no smoking, eating or drinking. A “Danger, Poison, Pesticide Storage” sign should be posted at the entrance(s) to the storage areas.

Figure 52. Pesticides containers with labels

NFPA 30 Flammable or Combustible Formulations

- Large containers of 30- or 55-gallon drums should be stored on pallets in an upright position or horizontally on drum racks. Indoor, unprotected storage of opened drums on racks should be limited to the volumes shown in **Table 10**.
- Flammable and combustible petroleum products should not be stored near:
    - Oxidizers such as chlorine gas, chlorine bleach, ammonium nitrate, cylinders of compressed oxygen gas, muriatic acid or sulfuric acid.
- Storage of small numbers of aerosol cans in the immediate work area is appropriate. When not in use, aerosol cans should be stored in flammable storage cabinets.
- Basic guidance concerning the selection, availability, operation and maintenance of manual fire extinguishers, provided in NFPA 10, is summarized in **Section 5.8.4**.

Fumigants Stored as Compressed Gases

- Compressed gas fumigants should be stored away from heat.
- Gas cylinders should be tightly closed and provided with a safety cap when not in use, wheter empty or full.
- Gas cylinders should be separated by type and from other compresses gases.
- Avoid dropping, bumping, dragging or sliding gas cylinders.

Building Construction and Signs

Storage locations for pesticides should be constructed in a way to avoid contaminating streams, ponds, groundwater and pasture land from runoff of fire-fighting operations.

Pesticides storage buildings, storage rooms, or storage areas should be identified by prominent and legible signs posted to provide notice of the presence of pesticides.

Identification signs should be of durable material and display the word Pesticides in ultra-bold, uncondensed, roman capitals at least two inches high, black printing on white background (**Figure 53**).

Figure 53. Warning signs located in pesticides storage areas

Each pile, bin, bay, rack or other grouping of pesticide

containers, enough containers should have labels visible to allow identification from ordinary avenues of approach.

5.11.5 Handling

- **Avoid buying more product than you need, as it is likely to become a waste at a later date.**
- Do not put pesticides in the trash or pour down the drain.
- Adequate personal protective equipment should be worn such as rubber gloves, goggles and respirators when handling pesticides (**Figure 54**).
- Do not use or give away banned pesticides or pesticides that are no longer registered for use.

Figure 54. Adequate PPE should be worn when handling pesticides

5.11.6 Spill Response

- Cleanup spill as soon as possible. The sooner you can contain, absorb, and dispose of a spill, the less chance there is that it will cause harm.
- Control actively spilling or leaking materials by setting the container upright, plugging leak(s), or shutting the valve.
- Contain the spilled material using barriers and absorbent material.
- Collect spilled material, absorbents, and leaking containers and place them in a secure and properly labeled container;
- Store the containers of spilled material until they can be applied as a pesticide or appropriately disposed.

5.11.7 Waste Profiles and Disposal Options

Unusable pesticides are generally classified as hazardous wastes. Shop personnel should provide the MSDSs for any unusable pesticides to CEED to assist in arranging transportation and disposal. In recent years, FDEP has provided disposal services of pesticides, for modical fees, on a yearly basis. Be on the alert to take advantage of such opportunities. Shop personnel should not dispose unusable pesticides on the ground, in the storm water drains, on surface water nor in the dumpster with the solid waste.

- Cleanup residues such as absorbent materials, soil and decontamination fluids generated from pesticide spills may be hazardous waste. With support from shop personnel, CEED will evaluate and arrange for testing of the pesticide waste. If the cleanup residues are a hazardous waste or a waste restricted from disposal in the county by DERM, CEED will coordinate shipping and disposal via a licensed transporter to an approved disposal facility. Receipts and/or manifests for all waste generated must be kept at the CEED office for at least three years and made available for review by the DERM.
- Empty containers which have been decontaminated can be disposed as solid waste. Empty containers which have not been decontaminated must be disposed by incineration or at a landfill approved to handle pesticides.
- In recent years, FDEP has provided disposal services, for modical fees, on a yearly basis. Be on the alert to take advantage of such opportunities.

Refer to EMS Job Instruction Module MDAD – Handling & Storage of Fertilizer & Pesticides. Grounds Maintenance, Public Works, Landscape Projects and Warehouse, August 15, 2004 (**MDAD MU – OC – 9**) for further information about handling and storage of pesticides.

5.12 TIRES

Waste tire means a tire that has been removed from a motor vehicle and has not been retreaded or regrooved. Waste tire includes used tires and processed tires.

5.12.1 Environment

Tire debris contains significant quantities of zinc (Zn) which may be released by tire rubber. Avoid storing unused tires in open areas to prevent environmental toxicity of the leachates that can be derived from tire derived particles.

5.12.2 Health

Tires present serious health and solid waste disposal problems:

- As potential health risks, used tire stockpiles can be havens in which pests reside and mosquitoes breed, they are a potential fire hazard, and they can contaminate surface water run-off.

5.12.3 Storage

- Avoid storing any tires close to combustible or flammable materials.
- MDAD shops that remove tires from motor vehicles as part of their ordinary operations may store no more than 1,500 used tires without a permit.
- Tires must be stored in a manner that will prevent the accumulation of wastes (**Figure 55**).
- Tires stored outdoors must be covered to prevent accumulation of rain water.

Figure 55. Adequate storage of tires

5.12.4 Handling

- MDAD personnel should wear the necessary personal protective equipment to avoid personal injuries.

5.12.5 Waste Profiles and Disposal Options

- The State of Florida requires that anyone who is moving more than 25 waste tires on Florida roadways must be registered with the Florida Department of Environmental Protection as a waste tire collector. MDAD has several trucks registered to transport waste tires to disposal facilities. However, in instances that MDAD shops have to use contractors for the transportation, disposal or processing of waste tires, they should obtain copy of the contractor's state registration. Copies of these documents should be kept on file at the facility.

5.13 USED BATTERIES

Batteries contain materials that can damage the environment and pose a safety hazard if handled improperly. Types of batteries generated from MDAD operations are NiCad (rechargeable type batteries), lithium (watch/calculator or button type batteries) and alkaline (flashlight type batteries). Lead acid batteries, which are typically used to start internal combustion engines, are treated separately from other types of batteries.

5.13.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of used batteries. The following is a list of chemical components present in batteries used by MDAD:

- Nickel
- Cadmium
- Lithium
- Lead
- Copper

5.13.2 Environment

Batteries may produce the following potential hazards:

- Pollute the lakes and streams as the metals vaporize into the air when burned.
- Contribute to heavy metals that potentially may leach from solid waste landfills.
- Expose the environment and water to lead and acid.
- Contain strong corrosive acids.

5.13.3 Health

Batteries contain chemicals that have the potential to be hazardous to your health. The batteries contain lead, a highly toxic metal, and sulfuric acid, a corrosive electrolyte solution. Contact with

the sulfuric acid solution may lead to irritation or burns to the skin, or irritation to the mucous membranes of the eyes or the upper respiratory system.

INHALATION, ABSORPTION AND INGESTION: Symptoms of low-level lead exposure include: fatigue, impaired central nervous system functions, and impaired learning. Severe lead poisoning can result in: coma, convulsions, irreversible mental retardation, seizures, and even death. Safety glasses should be worn for protection when working with batteries.

5.13.4 Storage

Used batteries require some care to ensure proper and safe storage.

- Batteries require cool, well ventilated, dry storage areas.
- Temperatures should not exceed 130 degrees Fahrenheit.
- Protect batteries against being damaged, crushed, punctured, or short-circuited.
- Do not smoke or eat in battery storage areas.
- Store batteries separately from other hazardous materials.
- Each shop should provide a drum or container with a cover in which to store used batteries.
- Container should be constructed of plastic, not metal.
- The container should be labeled “Used Batteries” (**Figure 56**).
- The container must have an accumulation start date log sheet.
- Batteries must be stored on a concrete or other impervious surface and under cover until shipment.

Figure 56. Used batteries container

5.13.5 Handling

- Lead acid batteries should be handled without draining the electrolyte.
- Use personal protective equipment as necessary to avoid eye and skin contact with acids from the batteries.

5.13.6 Waste Profiles and Disposal Options

- MDAD is not responsible for characterizing waste lead acid batteries. To avoid generation and disposal of hazardous waste, MDAD shops are required to accumulate lead acid batteries and submit them for recycling.
- With respect to other batteries, MDAD may recycle and/or dispose them as solid waste. CEED will coordinate shipping and disposal via a licensed transporter to an approved disposal facility. Receipts and/or manifests for all waste generated must be kept at the CEED office for at least three years and made available for review by the DERM.
- Dispose of spent batteries in designated PVC plastic containers labeled "Used Batteries" with the DOT Class 8 secondary label. Do not dispose of any batteries in the trash. Document accumulation start date for every collection cycle on log attached to disposal container.
- When plastic used batteries containers are full, arrange for removal to the Waste Transfer Facility (**Figure 57**).
- Upon arrival, place the used batteries inside the corresponding 55-gallon color coded barrels, to insure their proper disposal. The corresponding color coded barrels are for the following: **yellow**: alkaline batteries (i.e. aaa, aa, c, d, 6v lantern, 9v); **red**: nickel cadmium / nicad (radio battery); **green**: lead acid / gel cell / rechargeable (ie. exit light, emergency light, fire panels, cordless batteries) and **black**: lithium (**Figure 58**).

Figure 57. MDAD International Waste Handling Facility

Figure 58. MDAD Used batteries 55-gallon color coded barrels

- Label the drums with the Universal Waste label and write in the accumulation start date.
- Collect and remove offsite boxes, buckets, bags or any container used to deliver your used batteries.
- When the barrels are ¾ full, the vendor will be notified to have the barrels picked up. CEED will also be notified.
- The International Waste Transfer Station will only be accepting batteries for disposal at its facility Monday thru Friday between the hours of 7:00 am and 3:00 pm.

- Please feel free to call ahead of time at **-7354** or contact **Transfer 1** on the radio before coming out.

Refer to EMS Job Instruction Module MDAD – General Battery Disposal. Standard Operating Procedures Commodities Management Unit, August 7, 2007 (**MDAD MU – OC – 5**) for further information about used batteries disposal.

5.14 WATER TREATMENT CHEMICALS

MDAD treats water for use in its boilers, chillers and cooling towers. The bulk of the chemicals used in these systems is provided and maintained by a vendor under contract to MDAD. However, chemicals are stored at MDAD's facilities, where MDAD personnel may have contact with them.

5.14.1 Material Safety Data Sheets

Shop personnel should consult the MSDS for each product for detailed information concerning health effects of water treatment chemicals. The following is a list of chemicals used by MDAD:

-Acids
-Caustics
-Biocides
-Testing reagents

5.14.2 Environment

Improper handling of water treatment chemical can pose harm to the environment. Maintain boilers, chillers and cooling towers fill to prevent water from dripping or sloshing from the fill and onto the ground. All the water passing through the fill should go into the basin. Select feasible chemical treatment choosing less harmful chemicals or alternative chemicals which have a lower potential for impact on the environment.

5.14.3 Health

Many acids, caustics, biocides and testing reagents are corrosive to the skin and are severe skin and eye irritants.

PENETRATION, ABSORPTION AND INHALATION: Hand and Eye protection should be routinely worn when handling these materials.

Some water treatment chemicals generate vapors during storage or as a result of chemical reactions if they are spilled onto concrete or metallic surfaces. Inhalation of chemical vapors should be avoided. These vapors can cause respirator distress.

5.14.4 Storage

- Acids, caustics and biocides are generally stored in 30-gallon to 55-gallon drums.
- Drums should be closed, except when material is being removed or if the drum is directly connected to the process.
- Drums, whether in use or in bulk storage areas, should be placed on pallets to allow detection of leaks.
- Acids, caustics and biocides should be stored in separate areas. Exceptions for materials that have similar chemical composition are appropriate on a case by case basis.
- Testing reagents should be stored inside, out of direct sunlight, and in a cool location.
- Containers of testing reagents should be tightly closed during storage.

5.14.5 Handling

- For concentrated acids and caustics, use of a chemically resistant apron and splash shield may be appropriate.
- Adequate ventilation should be provided when working with these products.

5.14.6 Spill Response

- Ventilate the area.
- Leaking containers should be overpacked or the remaining product transferred to another container.
- If necessary, contain the spill with absorbent material. Neutralization agents such as soda ash or baking soda can be used to neutralize the spill.
- Clean the bulk of the spill with rags, absorbent material or, if on a hard surface, a mop and bucket. Containerize any liquid collected in a pail with a top or a drum. Label the container. Spills of acids, caustics materials and biocides should be stored in plastic containers, not steel drums.
- The remainder of the spill on floors or other hard surfaces can be rinsed with water, using a mop and bucket, or can be rinsed into a floor drain connected to the industrial sewer system.

- Do not rinse a spill of cleaning products into a storm sewer drain or onto bare soil.
- If the spill occurs on bare soil, the visibly stained soils should be removed and replaced with clean soil.
- Place any used absorbent material or contaminated soil in a drum. Label the container to identify the contents.
- Liquids and solids generated from spills of different products should be segregated unless CEED has been consulted and has approved combining the materials.

5.14.7 Waste Profiles and Disposal Options

- Shop personnel are responsible for containerizing, labeling and storing the waste pending transportation and disposal.
- Storage containers for acid and caustic wastes should be plastic drums rather than steel drums.
- Absorbent material and soil collected from a spill of acid or caustics may be disposed as solid waste or as hazardous waste, pending waste characterization conducted by CEED.
- Receipts and/or manifests for all waste generated must be kept at the CEED office for at least three years and made available for review by the DERM. Refer to **Appendix D** for a sample of a hazardous waste manifest.
- Most test tank water, boil out tank sludge and associated wash and rinse waters may be hazardous waste due to high metals concentrations.
- Test tank water and rinse waters must be treated, recycled or collected.
- The remaining sludge may have to be disposed as hazardous. A recycling system may be used to filter the test tank water to be reused as clean test tank water. The filter may have to be disposed as hazardous.
- If the test tank water is neither recycled nor treated, it must be collected and tested to determine proper disposal.
- If it meets sewer standards, it may be disposed via sanitary sewer.
- If the test tank water is hazardous, it must be disposed by a DERM-approved transporter.
- The boil out tank sludge must be properly handled as hazardous waste.
- Alternatively, acid, caustic and biocide drums may be triple rinsed, and the rinse waters may be treated in the industrial water treatment system.

Refer to EMS Job Instruction Module MIA – Chemicals and Chemical Waste Handling & Disposal. All Maintenance Shops, July 12, 2006 (**MDAD MU – OC – 1**) for further information about water treatment chemicals handling and disposal.

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6.0 OTHER WASTES

Many of the airport operations generate debris or article alien from vehicles or systems which would potentially cause damage. If these materials are not handled and disposed of properly, they can become a hazard to aircraft, ramp/passengers and buildings.

6.1 Foreign Object Debris (FOD)

Foreign object debris (FOD) at airports includes any object found in an inappropriate location that as a result of being in that location can damage equipment or injure airplane or airport personnel. The resulting damage is estimated to cost the aerospace industry $4 billion a year. Airports, airlines, and airport tenants can reduce this cost by taking steps to prevent airport FOD.

FOD includes a wide range of material, including loose hardware, plastic, pavement fragments, catering supplies, safety wires, building materials, rocks, sand, baggage pieces, and even wildlife (**Figure 59**). FOD is found at terminal gates, cargo aprons, taxiways, runways, and run-up pads. It causes damage through direct contact with airplanes, such as by cutting airplane tires or being ingested into engines, or as a result of being thrown by jet blast and damaging airplanes or injuring people.

Figure 59. Foreign Objects Debris (FOD)

Foreign Object Debris (FOD) Containers

FOD containers are strategically placed in FOD sensitive areas. FOD containers are very useful tools in preventing foreign objects from migrating into aviation products. It is MDAD employees and tenants' responsibility to utilize FOD containers for any trash or foreign material in a FOD sensitive area.

Please use the FOD receptacle only to keep the Airport Operation Area (AOA) free of object and other debris that could impact people safety and working environment, pursuant to Miami-Dade County Code 25.2.17.1, MIA Standards Manual (4/2000) and Federal Aviation Administration (FAA) advisory circulars 150/5380-5B, Debris Hazards at Civil Airport, & 150/5370-2C, Operational Safety on Airports During Construction. Refer to **Figure 60, Figure 61** and **Appendix H** for a copy of the FOD labels placed in FOD containers.

Do not discard in the receptacle trash, liquid and/or solid wastes from your offices, shops and/or break areas. Prior to entering the AOA, please dispose of any meals/drinks leftovers, batteries, documents/papers, used oil, etc., in the appropriate containers located in your respective working areas. Refer to **Section 5.15.2** for other items that are not allowed in any dumpster and/or FOD container.

Visit the following website for more information www.miami-airport.com.

Figure 60. Foreign Objects Debris (FOD) label

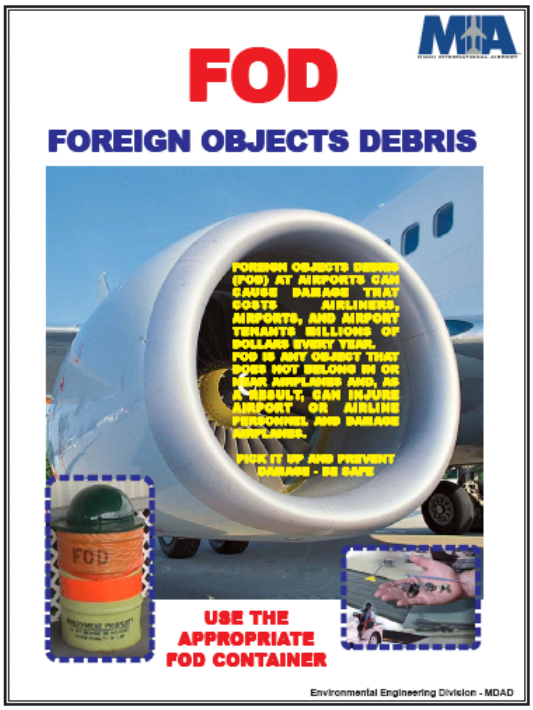

Figure 61. Foreign Objects Debris (FOD) flyer

6.2 Dumpsters

The following items are not allowed in any dumpster and/or FOD container:

- Absorbent Pads/Materials
- Aerosol/Spray cans, unless completely empty (punctured or spent)
- Asbestos containing materials (ACM)
- Batteries (vehicular, flashlights, beepers, etc)
- Compressed Gases Cylinders
- Fluorescent Lamps and other mercury containing devices
- Liquid/fluid wastes
- Paint containers (unless contents have solidified in the container)
- Pesticides and similar chemicals
- Petroleum products and/or empty drums/containers over five (5) gallons capacity
- Tires
- Used oil filters
- Used rags with gasoline, solvents, degreasers and/or other hazardous chemicals
- Reusable Wooden Pallets

Refer to **Figure 62** and **Appendix H** for a copy of the MIA FOD flyer of items not allowed in dumpster and/or FOD container.

Figure 62. MIA FOD flyer of items not allowed in dumpster and/or FOD container

6.3 Sumped Fuel

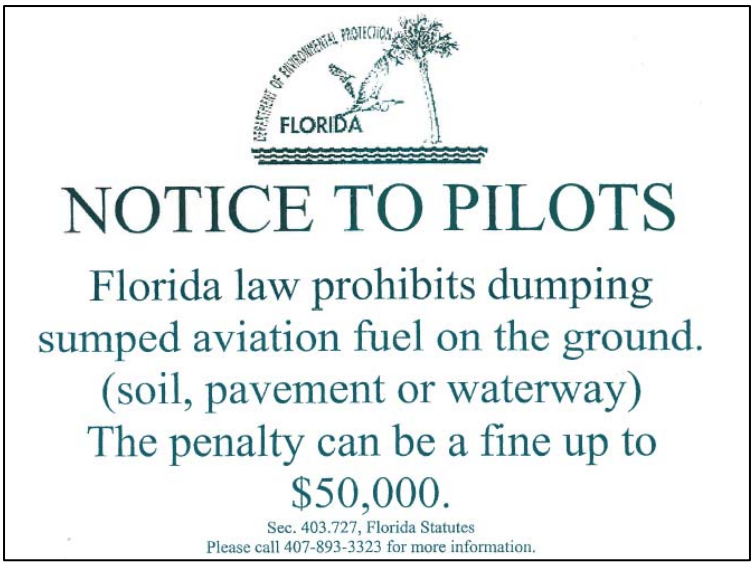

Figure 63. FDEP Notice to Pilots

Waste aircraft fuel is a hazardous waste, most obviously for being flammable. A previous procedure for disposal of sumped fuel was to throw it onto the tarmac, expecting the fuel to evaporate. This illegal practice causes air pollution as well as possible runoff issues contaminating the soil. Wise hazardous waste practices not only are good choices for health and safety, but also protect our environment by producing the least amount of air and ground water pollution as possible.

The FDEP prohibits dumping sumped aviation fuel on the ground (soil, pavement or waterway). The penalty can be a fine up to $50,000, pursuant Section 403.727, Florida Statutes. Refer to **Figure 63** and **Appendix H** for a copy of the notice to pilots.

Several options and devices are available to assist with the testing and proper disposal of preflight fuel. One such option is the Gasoline Analysis Test Separator (GATS) jar. With this device, Embry-Riddle Aeronautical University has developed new procedures. These procedures allow the return of the clean fuel back to the aircraft tank, and contaminated fuel to be dumped into a disposal unit located on the ramp. In accordance with the normal procedures of pilot's operating handbook, it required to always "Sump the tanks" prior to flight. **Fuel testing, or "sumping", is a necessary safety measure and in no way should it be circumvented or eliminated from the preflight inspection.**

Listed below are the procedures that Embry-Riddle Aeronautical University developed and uses with this type of fuel tester. Refer to **Appendix H** for a copy of Embry-Riddle Aeronautical University brochure. For more information please contact: Janine.Kraemer@floridadep.net or haunj@erau.edu.

- Draw, examine, and retain all fuel samples in the normal course of the preflight inspection, observing color for proper octane.
- Check for water and other Contaminants trapped on the tester screen and inside the jar.
- If fuel is clean and free of contaminants, wipe separator screen on jar clean and pour fuel through screen back into tank.
- If water and/or contaminants are present continue to sump until fuel is clean. Pour fuel and contaminant into the waste fuel container.

Once all the fuel tanks have been sampled, check the screen for foreign matter and allow the residual AVGAS to evaporate. If fuel or other liquids are left in the openings, consult an aircraft maintenance technician.

Table 13 lists other wastes that could be generated by a Fixed Base Operator (FBO) or aircraft maintenance facility.

Table 13 – Possible wastes that could be generated by an aircraft maintenance facility

Used Oil	Used oil filters
Parts washer fluid	Batteries and battery acid
Nonempty aerosol cans	Used shop towels
Stripped paint residue	Hydraulic fluid
Expired oxygen generators	Turbine wash residue
Alodine Waste (brushes, wipes, swabs)	Expired chemicals

7.0 LIST OF ACRONYMS

ACM: Asbestos Containing Material

BMP: Best Management Practices

CEED: Civil Environmental Engineering Division

CWA: Clean Water Act

DERM: Miami-Dade County Department of Environmental Resources Management

DOT: Department of Transportation

EMR: Environmental Management Representative

EPA: Environmental Protection Agency

FBO: Fixed Base Operator

FDACS: Florida Department of Agriculture and Consumer Services

FDEP: Florida Department of Environmental Protection

HMIS: Hazardous Materials Identification System

HWRS: Hazardous Waste Regulation Section

IBC: Intermediate Bulk Container

ISO: International Standards Organizations

MCLs: Mercury Containing Lamps

MCDs: Mercury Containing Devices

MDAD: Miami-Dade Aviation Department

MIA: Miami International Airport

MSDS: Material Safety Data Sheets

NFPA: National Fire Protection Association

NPCA: National Paint and Coatings Association

OSHA: United States Occupational Safety and Health Administration

PIC: Prior Informed Consent

RCRA: Resource Conservation Recovery Act

SFWMD: South Florida Water Management District

SPCC: Spill Prevention Control and Countermeasure Plan

TSD: Treatment, Storage and Disposal

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8.0 REFERENCES

NFPA 10	Portable Fire Extinguishers, 2002 Edition
NFPA 30	Flammable and Combustible Liquids Code, 2000 Edition
NFPA 30B	Manufacture and Storage of Aerosol Products, 2007 Edition
NFPA 33	Standard for Spray Application Using Flammable or Combustible Materials, 2000 Edition
NFPA 34	Dipping and Coating Processes Using Flammable or Combustible Liquids, 2000 Edition
NFPA 55	Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks, 2005 Edition
DERM	Best Management Practices for Mechanical Repair Facilities May 25, 2005
	Best Management Practices for Paint and Body Shops, May 25, 2005
	Best Management Practices, May 25, 2005
	Best Management Practices for Aircraft Maintenance/Repair Facilities and Machine Shops
	Industrial Waste 5 Annual Operating Permit
FDEP	Chapter 62-710 Used Oil Management
	Chapter 62-761 Underground Storage Tank System
	Chapter 62-762 Aboveground Storage Tank System
	Florida's Handbook for Small Quantity Generators of Hazardous Waste, December 2006
	Hazardous Waste Curriculum for Aviation Maintenance, 2003 - Second Edition

Maintenance Division EMS Job Instruction Module MDAD – Chemicals and Chemical Waste Handling & Disposal. All Maintenance Shops, July 12, 2006 (MDAD MU – OC – 1).

EMS Job Instruction Module MDAD – Conveyor, Mechanical, A/C & Loading Bridge Shops MIA. Disposal of Speed Reducers and Gear Motors, July 15, 2004 (MDAD MU – OC – 2).

EMS Job Instruction Module MDAD – Electric Lamp Disposal. West Cargo, North Zone, South Zone, Middle Zone, Night Electric, Electric, Facilities Maintenance, Loading Bridge and Conveyor Shops, January 30, 2006 (MDAD MU – OC – 3).

EMS Job Instruction Module MDAD – Ballast Disposal. West Cargo, North Zone, South Zone, Middle Zone, Night Electric, Electric, Facilities Maintenance, Loading Bridge and Conveyor Shops, May 15, 2004 (MDAD MU – OC – 4).

EMS Job Instruction Module MDAD – General Battery Disposal. Standard Operating Procedures Commodities Management Unit, August 7, 2007 (MDAD MU – OC – 5).

EMS Job Instruction Module MDAD – Compressed Gases/Aerosol Cans Handling, Use, Storage & Disposal. All Maintenance Shops, August 15, 2004 (MDAD MU – OC – 6).

EMS Job Instruction Module MDAD – Used Oil, Filters and Automotive Battery Disposal, August 15, 2004 (MDAD MU – OC – 7).

EMS Job Instruction Module MDAD – Spill Cleanup. All Maintenance Shops, August 15, 2004 (MDAD MU – OC – 8).

EMS Job Instruction Module MDAD – Handling & Storage of Fertilizer & Pesticides. Grounds Maintenance, Public Works, Landscape Projects and Warehouse, August 15, 2004 (MDAD MU – OC – 9).

EMS Job Instruction Module MDAD – Scrubber & Sweeper Cleanup. Public Works – Sweepers & Scrubber Shops, January 27, 2004 (MDAD MU – OC – 10).

EMS Job Instruction Module MDAD – Cardboard Recycling. Standard Operating Procedures. All Maintenance Shops, January 12, 2005 (MDAD MU – OC – 11).

EMS Job Instruction Module MDAD – Toner Recycling. Standard Operating Procedures. All Maintenance Shops, April 22, 2005 (MDAD MU – OC – 12).

EMS Job Instruction Module MDAD – Hazardous Waste Labeling Paint Shop & Internal Auditors, May 11, 2005 (MDAD MU – OC – 13).

ISO 14001 Certification MDAD, Miami International Airport Maintenance Division, August 28, 2007.

Kenneth Barbalace. US DOT Hazardous Materials Transportation Placards. EnvironmentalChemistry.com. 1995 - 2008. Accessed on-line: 3/19/2008, http://EnvironmentalChemistry.com/yogi/hazmat/placards/.

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APPENDIX A

MIAMI-DADE AVIATION DEPARTMENT ENVIRONMENTAL POLICY

The Miami-Dade Aviation Department (MDAD) is committed to conducting its operations in an environmentally responsible manner. Our goal is to provide efficient aviation services while striving to achieve the highest environmental quality for air, soil and water.

To achieve these goals, MDAD has established the following objectives:

- **A**wareness – MDAD staff will continuously heighten its awareness of and keep a watchful eye on the environmental concerns of our community. MDAD will act promptly to environmental incidents.
- **I**mplementation of best management practices - MDAD will integrate its environmental management system with the best management practices and commit to continually review, improve and report on its effectiveness. Reports will be accessible to all employees and the public.
- **R**estoration of the environment – MDAD will continue environmental rehabilitation of its airports.
- **P**ollution Prevention – MDAD will strive to implement procedures that integrate pollution prevention and waste reduction. MDAD will seek to conserve natural resources by reusing and recycling materials, purchasing recycled materials and products that do not adversely affect the environment, and that can be reused, recycled, and disposed of in a safe manner.
- **O**bjectives and Targets – MDAD will establish and update environmental objectives and targets through periodic audits and self-assessments.
- **R**egulatory Compliance – MDAD will continue efforts to meet or exceed all applicable governmental regulations and implement voluntary guidelines to which the aviation department subscribes.
- **T**enant Compliance – MDAD will work with its tenants, suppliers, and contractors to make them aware of MDAD's environmental management system and encourage them to adopt sound, comprehensive environmental management practices.

MDAD employees are informed to follow this policy and to report any environmental concern to the Operational Control Room (OCR) at (305) 876-0385 or notify their supervisors for appropriate action.

Our vision is to continue a tradition of leadership concerning environmental issues and to practice sustainable development. By carefully balancing environmental, social, and economic factors into our business planning and decision-making processes, we will ensure a favorable workplace today and a healthy environment tomorrow.

José Abreu, P.E.
Aviation Director

Rev. August, 2005

APPENDIX B

2006041208492633

Environmental Resources Management
Industrial Facilities Section
33 SW 2nd Avenue • 6th Floor
Miami, Florida 33130-1540
T 305-372-6600 F 305-372-6545

miamidade.gov

PERMIT NO: IW5-016909-2006/2007 (REG)-JBSO
AMERIJET INTERNATIONAL, INC.
Building [716A] (MIA-WEST)
MIAMI, FL 33178-

PERMITTEE:
Mr. John Nash
AMERIJET INTERNATIONAL, INC. ATTN; RISK MANAGEMENT
2800 S. ANDREWS AVE
FT. LAUDERDALE, FL 33316-

INDUSTRIAL WASTE 5
ANNUAL OPERATING PERMIT

DESCRIPTION OF FACILITY/EQUIPMENT

This document, issued under the provisions of Chapter 24, Miami-Dade County (Dade County Environmental Protection Ordinance), shall be valid from May 01, 2006 through April 30, 2007. The above named permittee, is hereby authorized to operate the pollution control facility at the above location which consists of the following:

Aircraft maintenance shop without metal plating facilities generating oil, solvent, and acid wastes; served by sanitary sewer.

This facility is subject to conditions listed below and in the following pages (if any) of this permit.

SPECIFIC CONDITIONS

1. All wastes from facility operation shall be stored or disposed of in compliance with county, state and federal regulations.

2. Facility shall have the ability to contain and collect any spill and properly dispose of contaminated materials. Accidental spills must be reported to this department within 24 hours at (305)372-6789.

3. When allowed, waste oil, transmission fluids, brake fluids, solvents, sludge's, chemicals, or other industrial wastes must be collected and placed in a secure location. These materials shall be disposed of in an approved manner by Miami-Dade County permitted haulers only.

4. Receipts from all industrial waste and/or wastewater disposal must be maintained at the business and be available for inspection by DERM personnel. Receipts shall contain clear information as to the name of the hauler, type of material transported, and quantity of material picked up. Records shall be kept for a period of three years.

5. Hazardous wastes (if allowed) shall not be stored longer than ninety (90) days, for GENERATORS, or one hundred eighty (180) days for SMALL QUANTITY GENERATORS, containers must be clearly labeled, and must have the date of the first day of storage marked on the outside of the container.

6. Receipts from all hazardous waste disposal (manifests), with data on volume, name of hauler and final destination, shall be maintained on file in order at the facility and be made available to this Department's representatives upon request. Records shall be kept for a period of three years.

7. All above ground tanks and storage areas for hazardous materials and hazardous waste (if allowed) must have secondary containment. Design and construction must have departmental approval.

Miami-Dade County
Department of Environmental Resources Management

File Number: 22237

Carlos Espinosa, P.E., Acting Director

APPENDIX C

Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Issue Date: 2006-06

Unleaded Petrol
AUT5000

Section 1 - Chemical Product and Company Identification 61

Material Name: Unleaded Petrol **CAS Number:** 8006-61-9
Chemical Formula: Mixture of hydrocarbons
EINECS Number: 232-349-1
ACX Number: X1003056-5
Synonyms: AUTOMOTIVE GASOLINE, LEAD-FREE; GASOLINE; MOTOR FUEL; MOTOR SPIRITS; NATURAL GASOLINE; PETROL; UNLEADED PETROL
General Use: Lead free motor fuel for internal combustion engines, 2-stroke and 4-stroke.

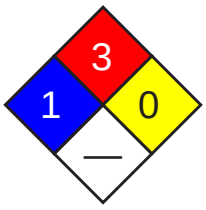
Section 2 - Composition / Information on Ingredients

Name	CAS	%
gasoline	8006-61-9	>90
benzene	71-43-2	5 max.

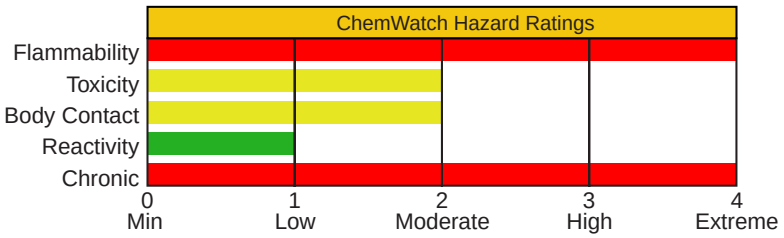
OSHA PEL **NIOSH REL**

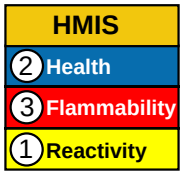
ACGIH TLV
TWA: 300 ppm, 890 mg/m^3;
STEL: 500 ppm, 1480 mg/m^3.

Section 3 - Hazards Identification



Fire Diamond





ANSI Signal Word

Danger!


Flammable

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Clear liquid; distinctive odor. Irritating to eyes/skin/respiratory tract. Other Acute Effects: dizziness, drunkenness, unconsciousness. Chronic Effects: dermatitis. Possible cancer hazard. Flammable.

Potential Health Effects

Target Organs: skin, eye, respiratory system, central nervous system (CNS)
Primary Entry Routes: inhalation, ingestion, skin contact

Acute Effects

Inhalation: The vapor is discomforting to the upper respiratory tract and may be harmful if exposure is prolonged. Inhalation hazard is increased at higher temperatures. Acute effects from inhalation of high concentrations of vapor are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterized by headache and dizziness, increased reaction time, fatigue and loss of coordination. If exposure to highly concentrated solvent atmosphere is prolonged this may lead to narcosis, unconsciousness, even coma and possible death. WARNING: Intentional misuse by concentrating/inhaling contents may be lethal. High inhaled concentrations of mixed hydrocarbons may produce narcosis characterized by nausea, vomiting and lightheadedness. Inhalation of aerosols may produce severe pulmonary edema, pneumonitis and pulmonary hemorrhage. Inhalation of petroleum hydrocarbons consisting substantially of low molecular weight species may produce irritation of mucous membranes, incoordination, giddiness, nausea, vertigo, confusion, headache, appetite loss, drowziness, tremors and anesthetic stupor. Massive exposures may produce central nervous system depression with sudden collapse and deep coma; fatalities have been recorded. Irritation of the brain and/or apneic anoxia may produce convulsions. Although recovery following overexposure is generally complete, cerebral micro- hemorrhage of focal post-inflammatory scarring may produce eleptiform seizures some months after the exposure. Pulmonary episodes may include chemical pneumonitis with edema and hemorrhage. The lighter hydrocarbons may produce kidney and neurotoxic effects. Liquid paraffins may produce anesthesia and depressant actions leading to weakness, dizziness, slow and shallow respiration, unconsciousness, convulsions and death. C_{5-7} paraffins may also produce polyneuropathy. Aromatic hydrocarbons accumulate in lipid-rich tissues (typically the brain, spinal cord and peripheral nerves) and may produce functional impairment manifested by nonspecific symptoms such as nausea, weakness, fatigue, vertigo; severe exposures may produce inebriation or unconsciousness. Many of the petroleum hydrocarbons are cardiac sensitizers and may cause ventricular fibrillations.

Eye: The liquid may produce eye discomfort and is capable of causing temporary impairment of vision and/or transient eye inflammation, ulceration. The vapor is discomforting to the eyes. Petroleum hydrocarbons may produce pain after direct contact with the eyes. Slight, but transient, disturbances of the corneal epithelium may also result. The aromatic fraction may produce irritation and lachrymation. The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Skin: The material is moderately discomforting to the skin if exposure is prolonged. The material contains a component that may be absorbed through the skin and may cause drying of the skin, which may lead to dermatitis from repeated exposures over long periods. Toxic effects may result from skin absorption. Open cuts, abraded or irritated skin should not be exposed to this material. The material may accentuate any pre-existing dermatitis condition.

Ingestion: Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis. Ingestion of petroleum hydrocarbons may produce irritation of the pharynx, esophagus, stomach and small intestine with edema and mucosal ulceration. Resulting symptoms include a burning sensation in the mouth and throat. Large amounts may produce narcosis with nausea and vomiting, weakness or dizziness, slow and shallow respiration, swelling of the abdomen, unconsciousness and convulsions. Myocardial injury may produce arrhythmias, ventricular fibrillation and electrocardiographic changes. Central nervous system depression may also occur. Light aromatic hydrocarbons produce a warm, sharp, tingling sensation on contact with taste buds and may anesthetize the tongue. Aspiration into the lungs may produce coughing, gagging, and a chemical pneumonitis with pulmonary edema and hemorrhage.

Carcinogenicity: NTP - Not listed; IARC - Group 2B, Possibly carcinogenic to humans; OSHA - Not listed; NIOSH - Listed as carcinogen; ACGIH - Class A3, Animal carcinogen; EPA - Not listed; MAK - Not listed.

Chronic Effects: Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. Prolonged or continuous skin contact with the liquid may cause defatting with drying, cracking, irritation and dermatitis following. Chronic poisoning may occur from vapor inhalation or skin absorption. The most significant toxic effect is insidious and irreversible injury to the blood-forming tissue by benzene. Leukemia may develop. Chronic exposure may cause headache, fatigue, loss of appetite and lassitude with incipient blood effects including anemia and blood changes. Gasoline "sniffing" has caused severe nerve damage. Repeated or prolonged exposure to mixed hydrocarbons may produce narcosis with dizziness, weakness, irritability, concentration and/or memory loss, tremor in the fingers and tongue, vertigo, olfactory disorders, constriction of visual field, paresthesias of the extremities, weight loss and anemia and degenerative changes in the liver and kidney. Chronic exposure by petroleum workers to the lighter hydrocarbons has been associated with visual disturbances, damage to the central nervous system, peripheral neuropathies (including numbness and paresthesias), psychological and neurophysiological deficits, bone marrow toxicities (including hypoplasia, possibly due to benzene) and hepatic and renal involvement. Chronic dermal exposure to petroleum hydrocarbons may result in defatting which produces localized dermatoses. Surface cracking and erosion may also increase susceptibility to infection by microorganisms.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air. Lay patient down. Keep warm and rested.
If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital, or doctor.

See DOT ERG

Eye Contact: Immediately hold the eyes open and wash continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids. Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: Immediately remove all contaminated clothing, including footwear (after rinsing with water). Wash affected areas thoroughly with water (and soap if available). Seek medical attention in event of irritation.

Ingestion: Contact a Poison Control Center. If swallowed, do NOT induce vomiting. Give a glass of water.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: For acute or short term repeated exposures to petroleum distillates or related hydrocarbons:

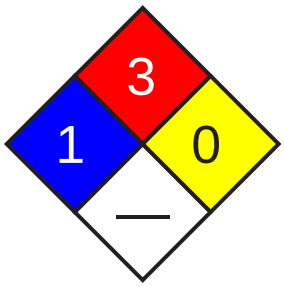
1. Primary threat to life from pure petroleum distillate ingestion and/or inhalation is respiratory failure.
2. Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO_2 <50 mm Hg or pCO_2 >50 mm Hg) should be intubated.
3. Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
4. A chest x-ray should be taken immediately after stabilization of breathing and circulation to document aspiration and detect the presence of pneumothorax.
5. Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitization to catecholamines.
Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
6. Lavage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients.

Section 5 - Fire-Fighting Measures

Flash Point: -43 °C
Autoignition Temperature: 280 °C
LEL: 1.4% v/v
UEL: 7.6% v/v

See DOT ERG

Extinguishing Media: Foam. Dry chemical powder.
Bromochlorodifluoromethane (BCF) (where regulations permit). Carbon dioxide.



Fire Diamond

General Fire Hazards/Hazardous Combustion Products: Liquid and vapor are highly flammable. Severe fire hazard when exposed to heat, flame and/or oxidizers. Vapor forms an explosive mixture with air. Severe explosion hazard, in the form of vapor, when exposed to flame or spark. Vapor may travel a considerable distance to source of ignition. Heating may cause expansion/decomposition with violent rupture of containers. On combustion, may emit toxic fumes of carbon monoxide (CO).

Fire Incompatibility: Avoid contamination with oxidizing agents, i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc., as ignition may result.

Fire-Fighting Instructions: Alert fire department and tell them location and nature of hazard. May be violently or explosively reactive. Wear breathing apparatus plus protective gloves. Prevent, by any means available, spillage from entering drains or water ways. If safe, switch off electrical equipment until vapour fire hazard removed. Use water delivered as a fine spray to control fire and cool adjacent area. Avoid spraying water onto liquid pools. Do not approach containers suspected to be hot. Cool fire exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire.

Section 6 - Accidental Release Measures

Small Spills: Remove all ignition sources. Clean up all spills immediately. Avoid breathing vapors and contact with skin and eyes. Control personal contact by using protective equipment. Contain and absorb small quantities with vermiculite or other absorbent material. Wipe up. Collect residues in a flammable waste container.

See DOT ERG

Large Spills: Clear area of personnel and move upwind. Alert fire department and tell them location and nature of hazard. May be violently or explosively reactive. Wear breathing apparatus plus protective gloves. Prevent, by any means available, spillage from entering drains or water ways. No smoking, naked lights or ignition sources. Increase ventilation. Stop leak if safe to do so.
Water spray or fog may be used to disperse/absorb vapor. Contain spill with sand, earth or vermiculite. Use only

spark-free shovels and explosion proof equipment. Collect recoverable product into labeled containers for recycling. Absorb remaining product with sand, earth or vermiculite. Collect solid residues and seal in labelled drums for disposal. Wash area and prevent runoff into drains.
If contamination of drains or waterways occurs, advise emergency services.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid generating and breathing mist. Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. DO NOT enter confined spaces until atmosphere has been checked. Avoid smoking, bare lights, heat or ignition sources. When handling, DO NOT eat, drink or smoke. Vapor may ignite on pumping or pouring due to static electricity. DO NOT use plastic buckets. Ground and secure metal containers when dispensing or pouring product. Use spark-free tools when handling. Avoid contact with incompatible materials. Keep containers securely sealed. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Use good occupational work practices. Observe manufacturer's storing and handling recommendations. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

Recommended Storage Methods: Metal can, metal drum. Packing as recommended by manufacturer. Check all containers are clearly labeled and free from leaks.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: CARE: Use of a quantity of this material in confined space or poorly ventilated area, where rapid build-up of concentrated atmosphere may occur, could require increased ventilation and/or protective gear. Use in a well-ventilated area. If inhalation risk of overexposure exists, wear a NIOSH approved organic-vapor respirator. Correct respirator fit is essential to obtain adequate protection. In confined spaces where there is inadequate ventilation, wear full-face air supplied breathing apparatus. Provide adequate ventilation in warehouse or closed storage areas.

Personal Protective Clothing/Equipment:

Eyes: Safety glasses with side shields; or as required, chemical goggles.
Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Barrier cream with polyethylene gloves or PVC gloves. Safety footwear. Do NOT use this product to clean the skin.

Respiratory Protection:

Exposure Range >300 to 1000 ppm: Air Purifying, Negative Pressure, Half Mask
Exposure Range >1000 to 15,000 ppm: Air Purifying, Negative Pressure, Full Face
Exposure Range >15,000 to 300,000 ppm: Supplied Air, Constant Flow/Pressure Demand, Full Face
Exposure Range >300,000 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face
Cartridge Color: black

Other: Overalls. Ensure that there is ready access to eye wash unit. Ensure there is ready access to an emergency shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Purple, highly flammable, volatile liquid with characteristic sharp odor. Floats on water. Consists of a complex mixture of hydrocarbons with small amounts of residual benzene from the refining operations.

Physical State: Liquid
Odor Threshold: 0.005 ppm
Vapor Pressure (kPa): 53.33 at 20 °C
Vapor Density (Air=1): > 2
Formula Weight: Not applicable.
Specific Gravity (H_2O=1, at 4 °C): 0.72-0.735 at 15 °C
Evaporation Rate: Fast
pH: Not applicable
pH (1% Solution): Not applicable.
Boiling Point: 38.89 °C (102 °F)
Freezing/Melting Point: Not available
Volatile Component (% Vol): 100
Decomposition Temperature (°C): Not available.
Water Solubility: Insoluble

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Presence of incompatible materials. Product is considered stable. Hazardous polymerization will not occur.

Storage Incompatibilities: Avoid storage with oxidizers.

Section 11 - Toxicological Information

Toxicity
Oral (rat) LD_{50}: 18800 mg/kg

Irritation
Skin (rabbit): 500 mg/24h mild

Section 12 - Ecological Information

Environmental Fate: No data found.
Ecotoxicity: No data found.
Biochemical Oxygen Demand (BOD): 8%, 5 days

Section 13 - Disposal Considerations

Disposal: Consult manufacturer for recycling options and recycle where possible. Follow all applicable federal, state, and local laws. Incinerate residue at an approved site. Recycle containers where possible, or dispose of in an authorized landfil.
BEWARE: Empty solvent, paint, lacquer and flammable liquid drums present a severe explosion hazard if cut by flame torch or welded. Even when thoroughly cleaned or reconditioned, the drum seams may retain sufficient solvent to generate an explosive atmosphere in the drum.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Shipping Name and Description: Gasoline
ID: UN1203
Hazard Class: 3 - Flammable and combustible liquid
Packing Group: II - Medium Danger
Symbols:
Label Codes: 3 - Flammable Liquid
Special Provisions: 139, B33, B101, T8
Packaging: **Exceptions:** 150 **Non-bulk:** 202 **Bulk:** 242
Quantity Limitations: **Passenger aircraft/rail:** 5 L **Cargo aircraft only:** 60 L
Vessel Stowage: **Location:** E **Other:**

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Not listed
SARA 40 CFR 372.65: Not listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Group, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

APPENDIX D

Please print or type. *(Form designed for use on elite (12-pitch) typewriter.)* *Form approved. OMB No. 2050-0039. Expires 9-30-91*

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address

4. Generator's Phone ( )

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name | 6. US EPA ID Number

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address | 10. US EPA ID Number

G. State Facility's ID

H. Facility's Phone

GENERATOR

11. US DOT Description *(Including Proper Shipping Name, Hazard Class, and ID Number)*	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.					
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name | Signature | Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name | Signature | Month Day Year

APPENDIX E

8-2: Employee using respiratory protection in a confined space

A. Respiratory protection practices are established here and at Section 11, of this manual to ensure that adequate respiratory protection is afforded to individuals whose work practices will expose them to hazards that feasibly cannot be eliminated by administrative or engineering controls.

B. Respiratory hazards shall be assessed through monitoring practices to evaluate and protect employees from exceeding the permissible exposure levels of contaminants listed in 29 CFR 1910.1000 (Z Tables)

C. Respiratory hazards shall be controlled through engineering or administrative means, when feasible, to keep personnel from depending on personal protective equipment. Engineering or administrative controls that may be used are:

1. Local or general ventilation to remove potential hazard.
2. Source enclosure to contain the potential hazard.
3. Restriction of personnel access to high exposure environments.

D. Selection of proper respiratory protection equipment for hazards based on oxygen deficiencies or levels of toxic contaminants shall be in accordance with the respiratory protection procedures at Section 11 of this manual.

E. All personnel required to use respiratory protective equipment should receive training covering respiratory hazards, respiratory selection, respiratory capabilities and limitations and the proper use of respirators.

F. All personnel required to use respiratory protective equipment should receive and pass a quantitative fit test.

G. Respiratory protective equipment shall be inspected, maintained, and repaired.

H. Personnel required to use respiratory protective equipment shall be certified through a medical surveillance as being physically able to perform work under the stress of respirator use.

I. Employees whose work requires or may require, as per job classification, the use of respiratory protective equipment, must successfully complete an annual respiratory fit test.

J. Employees entering into any environment requiring respiratory protection must obtain a facial seal before entry can be made.

HAZMAT TRAINING CERTIFICATION

MIAMI INTERNATIONAL AIRPORT

Rod Buenconsejo

NAME

02-17-06	02-17-09
TRAINING DATE	EXPIRATION DATE

I hereby certify that the above named person has been properly trained and tested in accordance with the general provisions of the regulations concerning transportation of hazardous materials as required by US DOT Code of Federal Regulations Title 49, Part 172.7000-704. Topics covered apply to hazardous materials recognition, labeling, preparation for transport, transportation regulatory compliance, emergency response, placarding, recordkeeping, safety and security awareness requirements.

Certified By:

Miami-Dade Aviation Department

BUREAU VERITAS

Bureau Veritas – Rafael E. Silva - Instructor

Miami-Dade Aviation Department
Maintenance Training Report

MIAMI INTERNATIONAL AIRPORT

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rev 08/02/06

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Pruning For Hurricanes

Loc	S S #	Last Name	First Name	Shop	Discription of Training	Date of Training	Refresher Training Due
06	0587	Arocha	Jesus	Grounds Tree Trimmer	Pruning For Hurricanes	05/30/02	
33	0746	Diaz	Jose	Grounds Supervisor	Pruning For Hurricanes	05/30/02	
21	7731	Pinto	Bienvenido	Grounds Sprayer	Pruning For Hurricanes	05/30/02	
	5613	Steward	Robert	Landscape Supervisor	Pruning For Hurricanes	05/30/02	
21	7866	Villeta	Moises	Public Works	Pruning For Hurricanes	05/30/02	

Miami-Dade Aviation Department
Maintenance Training Report

DOT Hazmat Manifest Training

4/15/2008 9:40

Loc	S S #	Last Name	First Name	Shop	Discription of Training	Date of Training	Refresher Training Due
29	5203	Anson	Derrick	Fire Tech	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
10	5949	Arencibia	Humberto	Paint	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
		Avendaro	Tulio	Warehouse	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
35	2028	Birdwell	Robert	Waste Transfer	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
41	8051	Castro	Omar	Paint	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
09	0816	Contreras	Juan	Mobile	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
29	7037	Davis	Earl	Fire Tech	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
10	9262	Dupree	Glen	Paint	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
24	0765	Grady	William	Mechanical	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
24	5899	Johnekins	Johnny	Mechanical	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
		Johnson	Randy	Warehouse	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
		Powell	Jacqueline	Environment Eng.	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
31	1813	Vaz	Stanley	Supervisor	DOT Hazmat ManifestTraining	02/17/06	February 17, 2009
06	2638	Pittman	Calvin	Waste Transfer	DOT Hazmat ManifestTraining	02/09/07	February 17, 2009
		McGee	Gloric	Procurement	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
24	0765	Grady	William	Mechanical	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
44	1588	Davis	Ted	Safety & Training	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
03	9705	Bedell	Michael	Landscape Archetech	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
53	6771	Garcia	Ysnard	Supervisor Opa-Locka	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
02	1478	Ellis	Brenda	Administration	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
06		Herbert	Fred	Waste Transfer	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
54	9426	Poulos	Terri	Opa-Locka	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
		Jaffe	Richard	Superintendent AC	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
21	7866	Villeta	Moises	Public Works	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
20	6937	DeCeaser	James	Supervisor	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
18	4495	Gibb	Eric	Air Condition	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
21	7731	Pinto	Bienvenido	Public Works	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
		Buenconsejo	Rod	Environment Eng.	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
		Mitchell	Jerald	Allied Aviation	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010
		Santiago	Cruz	Allied Aviation	DOT Hazmat ManifestTraining	02/09/07	February 9, 2010

APPENDIX F

HAZARD RATING INDEX

Health Hazard

4 – Extreme: Highly Toxic - May be fatal on short term exposure. Special protective equipment required.

3 – Serious: Toxic - Avoid inhalation or skin contact.

2 – Moderate: Moderately Toxic - May be harmful if inhaled or absorbed.

1 – Slight: Slightly Toxic - May cause slight irritation.

0 – Minimal: All chemicals have some degree of toxicity.

Flammability Hazard

4 – Extreme: Extremely flammable gas or liquid, Flash Point below 73°F.

3 – Serious: Flammable - Flash Point 73°F to 100°F.

2 – Moderate: Combustible - Requires moderate heating to ignite. Flash Point 100°F to 200°F.

1 – Slight: Slightly Combustible - Requires strong heating to ignite.

0 – Minimal: Will not burn under normal conditions.

Reactivity Hazard

4 – Extreme: Explosive at room temperature.

3 – Serious: May explode if shocked, heated under confinement or mixed with water.

2 – Moderate: Unstable, may react with water.

1 – Slight: May react if heated or mixed with water.

0 – Minimal: Normally stable, does not react with water.

HAZARDOUS MATERIAL IDENTIFICATION GUIDE

PROTECTIVE EQUIPMENT GUIDE

A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
X	Ask your supervisor for special handling instructions.

- HEALTH
- FLAMMABILITY
- REACTIVITY
- PROTECTIVE EQUIPMENT

LAB SAFETY SUPPLY

DIVISION OF SCIENCE RELATED MATERIALS, INC.
P.O. BOX 1368
JANESVILLE, WI 53547-1368 Reorder No.8002

U.S. Department of Transportation
Research and Special Programs Administration

DOT CHART 12

Hazardous Materials Marking, Labeling & Placarding Guide

Refer to 49 CFR, Part 172:

Marking - Subpart D

Labeling - Subpart E

Placarding - Subpart F

Emergency Response - Subpart G

NOTE: This document is for general guidance only and must not be used to determine compliance with 49 CFR, Parts 100-185.

Hazardous Materials Warning Labels

Actual label size: 100 mm (3.9 inches) on all sides

CLASS 1 Explosives: Divisions 1.1, 1.2, 1.3, 1.4, 1.5, 1.6

§172.411

* Include compatibility group letter.

** Include division number and compatibility group letter.

CLASS 2 Gases: Divisions 2.1, 2.2, 2.3

§172.405(b), §172.415, §172.416, §172.417

CLASS 3 Flammable Liquid

§172.419

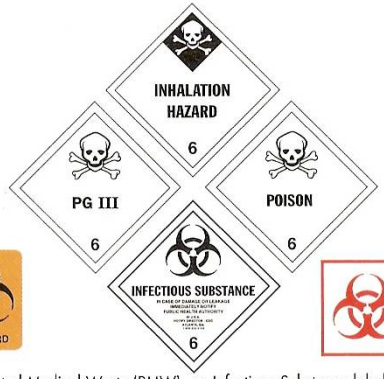
CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet: Divisions 4.1, 4.2, 4.3

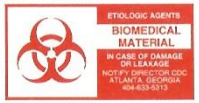
§172.420, §172.422, §172.423

CLASS 5 Oxidizer, Organic Peroxide: Divisions 5.1 and 5.2

§172.426, §172.427

CLASS 6 Poison (Toxic), Poison Inhalation Hazard, Infectious Substance: Divisions 6.1 and 6.2





For Regulated Medical Waste (RMW), an Infectious Substance label is not required on an outer packaging, if the OSHA Biohazard marking is used as prescribed in 29 CFR 1910.1030(g). CDC Etiologic Agent label must be used as prescribed in 42 CFR 72.3 and 72.6. A bulk package of RMW must display a BIOHAZARD marking.

§172.323, §172.405(c), §172.429, §172.430, §172.432

CLASS 7 Radioactive

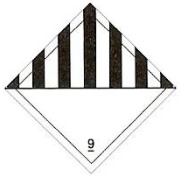
Empty Label

§172.436, §172.438, §172.440, §172.450

CLASS 8 Corrosive

§172.442

CLASS 9 Miscellaneous Hazardous Material

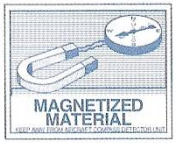


§172.446

Subsidiary Risk Label

§172.411

For Aircraft Only



Cargo Aircraft Only

§172.448

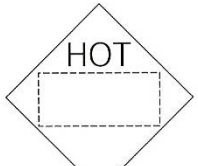
HAZARDOUS MATERIALS MARKINGS

INNER PACKAGES COMPLY WITH PRESCRIBED SPECIFICATIONS

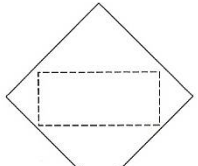
§173.25(a)(4)

§172.312(a)

§172.322



§172.325

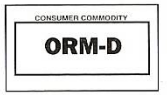


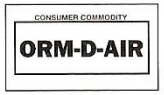
§172.332(a)

Fumigant Marking

§172.302(g) and §173.9

§172.313(a)





§172.316(a)

Keep a copy of the Emergency Response Guidebook handy!

Hazardous Materials Warning Placards

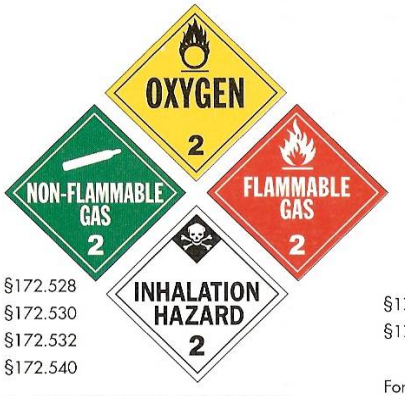
Actual placard size: 273 mm (10.8 inches) on all sides

CLASS 1 Explosives

§172.522
§172.523
§172.524
§172.525

* For Divisions 1.1, 1.2, or 1.3, enter compatibility group letter, when required; placard any quantity. For Divisions 1.4, 1.5, and 1.6, enter compatibility group letter, when required; placard 454 kg (1,001 lbs) or more.

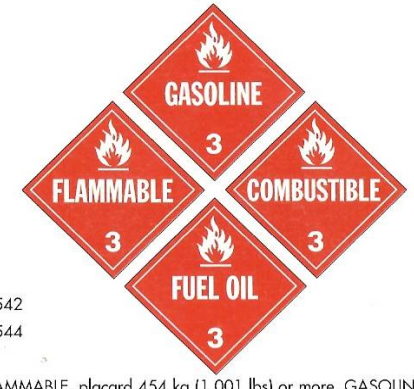
CLASS 2 Gases



§172.528
§172.530
§172.532
§172.540

For NON-FLAMMABLE GAS, OXYGEN (compressed gas or refrigerated liquid), and FLAMMABLE GAS, placard 454 kg (1,001 lbs) or more gross weight. For POISON GAS (Division 2.3), placard any quantity.

CLASS 3 Flammable Liquid and Combustible Liquid



§172.542
§172.544

For FLAMMABLE, placard 454 kg (1,001 lbs) or more. GASOLINE may be used in place of FLAMMABLE placard displayed on a cargo tank or portable tank transporting gasoline by highway. Placard combustible liquid transported in bulk. See §172.504(f)(2) for use of FLAMMABLE placard in place of COMBUSTIBLE. FUEL OIL may be used in place of COMBUSTIBLE on a cargo or portable tank transporting fuel oil not classed as a flammable liquid by highway.

CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet

§172.546, §172.547, §172.548

For FLAMMABLE SOLID and SPONTANEOUSLY COMBUSTIBLE, placard 454 kg (1,001 lbs) or more. For DANGEROUS WHEN WET (Division 4.3), placard any quantity.

CLASS 5 Oxidizer & Organic Peroxide

§172.550, §172.552

For OXIDIZER and ORGANIC PEROXIDE (other than TYPE B, temperature controlled), placard 454 kg (1,001 lbs) or more. For ORGANIC PEROXIDE (Division 5.2), Type B, temperature controlled, placard any quantity.

CLASS 6 Poison (Toxic) and Poison Inhalation Hazard

§172.504(f)(10), §172.554, §172.555

For POISON (PGI or PGII, other than inhalation hazard) and POISON (PGIII), placard 454 kg (1,001 lbs) or more. For POISON-INHALATION HAZARD (Division 6.1), inhalation hazard only, placard any quantity.

CLASS 7 Radioactive

§172.556

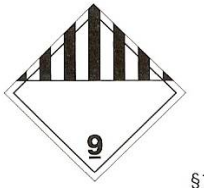
Placard any quantity - packages bearing RADIOACTIVE YELLOW-III labels only. Certain low specific activity radioactive materials in "exclusive use" will not bear the label, but the radioactive placard is required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with §173.427(b)(3) or (c).

CLASS 8 Corrosive

§172.558

Placard 454 kg (1,001 lbs) or more.

CLASS 9 Miscellaneous



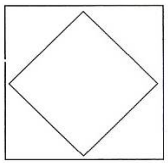
§172.560

Not required for domestic transportation. A bulk packaging containing a Class 9 material must be marked with the appropriate ID number displayed on a Class 9 placard, an orange panel, or a white square-on-point display.

Dangerous

§172.521

A freight container, unit load device, transport vehicle, or rail car which contains non-bulk packagings with two or more categories of hazardous materials that require different placards specified in Table 2 may be placarded with DANGEROUS placards instead of the specific placards required for each of the materials in Table 2. However, when 1,000 kg (2,205 lbs) or more of one category of material is loaded at one loading facility, the placard specified in Table 2 must be applied.



§172.527

White square background required for placard for highway route controlled quantity radioactive material and for rail shipment of certain explosives and poisons, and for flammable gas in a DOT 113 tank car (§172.507 and §172.510).

PLACARDS OR ORANGE PANELS

§172.332

and

Appropriate placard must be used.

IDENTIFICATION NUMBER DISPLAYS

MUST BE DISPLAYED ON: (1) Tank Cars, Cargo Tanks, Portable Tanks, and other Bulk Packagings; (2) Vehicles or containers containing 4000 kg (8,820 lbs) in non-bulk packages of only a single hazardous material having the same proper shipping name and identification number; and (3) 1,000 kg (2,205 lbs) of materials poisonous by inhalation in Hazard Zone A or B. See §172.301(a)(3) and §172.313(c).

Response begins with identification!

General Guidelines on Use of Warning Labels and Placards

LABELS

See 49 CFR, Part 172, Subpart E, for complete labeling regulations.

- The Hazardous Materials Table [§172.101, Col. 6] identifies the proper label(s) for the hazardous material listed.
- Any person who offers a hazardous material for transportation MUST label the package, if required [§172.400(a)].
- Labels may be affixed to packages when not required by regulations, provided each label represents a hazard of the material contained in the package [§172.401].
- The appropriate hazard class or division number must be displayed in the lower corner of a primary and subsidiary hazard label [§172.402(b)].
- For classes 1,2,3,4,5,6, and 8, text indicating a hazard (e.g., "CORROSIVE") is NOT required on a label. The label must otherwise conform to Subpart E of Part 172 [§172.405].
- Labels must be printed on or affixed to the surface of the package near the proper shipping name marking [§172.406(a)].
- When primary and subsidiary labels are required, they must be displayed next to each other [§172.406(c)].
- For a package containing a Division 6.1, Packing Group III material, the POISON label specified in §172.430 may be modified to display the text PG III instead of POISON or TOXIC. Also see §172.313(d).
- The class number must be displayed on a subsidiary label. For Transition 2005, see §172.402(b).

PLACARDS

See 49 CFR, Part 172, Subpart F, for complete placarding regulations.

- Each person who offers for transportation or transports any hazardous material subject to the Hazardous Materials Regulations must comply with all applicable requirements of Subpart F [§172.500].
- Placards may be displayed for a hazardous material, even when not required, if the placarding otherwise conforms to the requirements of Subpart F of Part 172 [§172.502(c)].
- For other than Class 7 or the DANGEROUS placard, text indicating a hazard (e.g., "FLAMMABLE") is not required. Text may be omitted from the OXYGEN placard only if the specific ID number is displayed on the placard [§172.519(b)(3)].
- For a placard corresponding to the primary or subsidiary hazard class of a material, the hazard class or division number must be displayed in the lower corner of the placard. For Transition 2005, see §172.519(b)(4).
- Any transport vehicle, freight container, or rail car containing any quantity of material listed in Table 1 must be placarded [§172.504].
- When the gross weight of all hazardous materials in non-bulk packages covered in Table 2 is less than 454 kg (1,001 lbs), no placard is required on a transport vehicle or freight container [§172.504(c)].
- Notes: See §172.504(f)(10) for placarding Division 6.1, PG-III materials.
- Placarded loads require registration with USDOT. See §107.601 for registration regulations.

Inhalation Hazard Materials

§172.540

§172.555

§172.313

Materials which meet the inhalation toxicity criteria have additional "communication standards" prescribed by the HMR. The words "Poison-Inhalation Hazard" must be entered on the shipping paper, as required by §172.203(m)(2). Packagings must be marked "Inhalation Hazard" or, alternatively, when the words "Inhalation Hazard" appear on the label or placard, the "Inhalation Hazard" marking is not required on the package. Transport vehicles, freight containers, portable tanks and unit load devices that contain a poisonous material subject to the "Poison-Inhalation Hazard" shipping description, must be placarded with a POISON INHALATION HAZARD or POISON GAS placard, as appropriate. This shall be in addition to any other placard required for that material [§172.504].

Placarding Tables

[§172.504(e)]

Table 1 (Placard any quantity)

Hazard class or division	Placard name
1.1	EXPLOSIVES 1.1
1.2	EXPLOSIVES 1.2
1.3	EXPLOSIVES 1.3
2.3	POISON GAS
4.3	DANGEROUS WHEN WET
5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
6.1 (Inhalation Hazard, Zone A or B)	POISON INHALATION HAZARD
7 (Radioactive Yellow III label only)	RADIOACTIVE

Table 2 (Placard 1,001 lbs or more)

Hazard class or division	Placard name
1.4	EXPLOSIVES 1.4
1.5	EXPLOSIVES 1.5
1.6	EXPLOSIVES 1.6
2.1	FLAMMABLE GAS
2.2	NON-FLAMMABLE GAS
3	FLAMMABLE
Combustible Liquid	COMBUSTIBLE
4.1	FLAMMABLE SOLID
4.2	SPONTANEOUSLY COMBUSTIBLE
5.1	OXIDIZER
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
6.1 (Other than inhalation hazard, Zone A or B)	POISON
6.2	(None)
8	CORROSIVE
9	CLASS 9 [§172.504(f)(9)]
ORM-D	(None)

For complete details, refer to one or more of the following:

- Code of Federal Regulations, Title 49, Transportation, Parts 100-185. [All modes]
- International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air. [Air]
- International Maritime Dangerous Goods (IMDG) Code. [Water]
- Transportation of Dangerous Goods Regulations of Transport Canada. [Rail and Highway]

U.S. Department of Transportation
Research and Special Programs Administration

Copies of this Chart may be obtained by contacting:

J. J. Keller & Associates, Inc.

Call Toll-Free: **1-800-327-6868**

Web site: **www.jjkeller.com**

40-F 1143
(4-04)

DHM50-0019-0104

APPENDIX G

(Model No.)

(Mfr.)

OWNER'S I.D. Number (if used) _____

REMARKS _____

Fusible Links Temperature Sensing Element Data

Yr Mfg _____ Date Installed _____

MONTHLY INSPECTION RECORD

DATE	BY	DATE	BY
11/5/07	[illegible]		
12/26/07	[illegible]		

PRINTED IN U.S.A.

DO NOT REMOVE

SERIAL NUMBER OF EXTINGUISHER: SN 096918

SERVICED BY: AALLEN

PERMIT NO.: 72434400072006

ABC	AFFF	ANTI-FREEZE	CARTRIDGE	CO_2	DRY CHEM.	FOAM
LOADED STREAM	METAL POWDER	PUMP	PRESSURE	PURPLE K		
SUPER-K	WATER	WET AGENT	1211	1301	SYSTEM	

MIAMI-DADE AVIATION DEPT.
(305) 869-4180

2004 | 2005 | 2006 | 2007

JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC.

6 EXPIRES IN 6 MONTHS/12 MONTHS FROM DATE PUNCHED

NEW | MAINTENANCE | RECHARGED

APPENDIX H

FOD

FOREIGN OBJECTS DEBRIS

PLEASE USE THIS FOD RECEPTACLE ONLY TO KEEP THE AOA FREE OF OBJECTS AND OTHER DEBRIS THAT COULD IMPACT YOUR SAFETY AND WORKING ENVIRONMENT, PURSUANT TO MDC-COUNTY CODE 25.2.17.1, MIA STANDARDS MANUAL (4/2000) AND FAA ADVISORY CIRCULARS 150/5380-5B, Debris Hazards at Civil Airport, & 150/5370-2C, Operational Safety on Airports During Construction.

DO NOT DISCARD IN THIS RECEPTACLE TRASH, LIQUID AND/OR SOLID WASTES FROM YOUR OFFICES, SHOPS AND/OR BREAK AREAS. PRIOR TO ENTERING THE AOA, PLEASE DISPOSE OF ANY Meals/ Drinks Leftovers, Batteries, Documents/Papers, Used Oil, Etc., IN THE APPROPRIATE CONTAINERS LOCATED IN YOUR RESPECTIVE WORKING AREAS.

THANK YOU FOR KEEPING MIA CLEAN & SAFE

MIAMI INTERNATIONAL AIRPORT

FOD

FOREIGN OBJECTS DEBRIS

FOREIGN OBJECTS DEBRIS (FOD) AT AIRPORTS CAN CAUSE DAMAGE THAT COSTS AIRLINERS, AIRPORTS, AND AIRPORT TENANTS MILLIONS OF DOLLARS EVERY YEAR.
FOD IS ANY OBJECT THAT DOES NOT BELONG IN OR NEAR AIRPLANES AND, AS A RESULT, CAN INJURE AIRPORT OR AIRLINE PERSONNEL AND DAMAGE AIRPLANES.

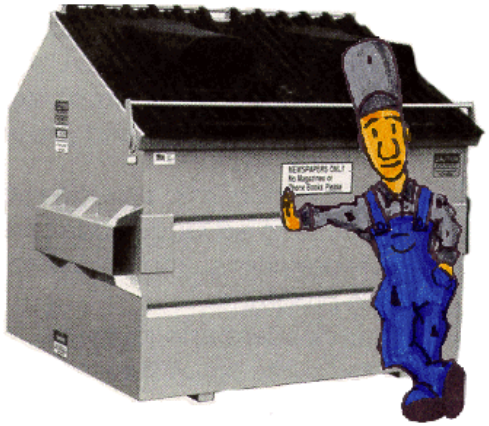
PICK IT UP AND PREVENT DAMAGE - BE SAFE

USE THE APPROPRIATE FOD CONTAINER

Environmental Engineering Division - MDAD

MIAMI INTERNATIONAL AIRPORT

The following items are NOT ALLOWED in any dumpster and/or FOD container



- Absorbent Pads/Materials
- Aerosol/Spray cans, unless completely empty (punctured or spent)
- Asbestos containing materials (ACM)
- Batteries (vehicular, flashlights, beepers, etc)
- Compressed Gases Cylinders
- Fluorescent Lamps and other mercury containing devices
- Liquid/fluid wastes
- Paint containers (unless contents have solidified in the container)
- Pesticides and similar chemicals
- Petroleum products and/or empty drums/containers over five (5) gallons capacity
- Tires
- Used oil filters
- Used rags with gasoline, solvents, degreasers and/or other hazardous chemicals
- Reusable Wooden Pallets

IT IS UP TO YOU TO STOP THE ILLEGAL USE OF DUMPSTERS AND F.O.D. CONTAINERS AT MIA

NOTICE TO PILOTS

Florida law prohibits dumping sumped aviation fuel on the ground. (soil, pavement or waterway) The penalty can be a fine up to $50,000.

Sec. 403.727, Florida Statutes

Please call 407-893-3323 for more information.

Several other types of filtering devices are available on the market and can be purchased through aviation supply companies. Another option is to use your current fuel testing cup but dispose of the fuel in an appropriate waste fuel container.

The following are possible other wastes that could be generated by an FBO or aircraft maintenance facility:

- Used oil
- Parts washer fluid
- Nonempty aerosol cans
- Stripped paint residue
- Expired oxygen generators
- Alodine Waste (brushes, wipes, swabs)
- Used oil filters
- Batteries and battery acid
- Used shop towels
- Hydraulic fluid
- Turbine wash residue
- Expired chemicals

For more information please contact:

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Studies indicate that over 3 million gallons of AVGAS are poured on aircraft parking ramps every year from sampling fuel during preflight inspections. As a pilot, fixed based operator, or aviation maintenance technician, you are required by law to dispose of your "sumped" fuel properly. The information contained in this pamphlet will assist you in proper procedures for disposal of sumped fuel.

This document was published to help educate the public on hazardous waste management issues. The suggested options will help individuals operate in an environmentally appropriate manner. Business owners are responsible for obtaining complete information about applicable regulations. Misinterpretations by the reader or omissions by the Florida Department of Environmental Protection or Embry-Riddle Aeronautical University do not relieve any person from any requirement of federal regulations or Florida law.

A hazardous waste is defined as being corrosive, toxic, flammable, and containing toxic amounts of lead. Waste aircraft fuel meets the definition of a hazardous waste, most obviously for being flammable.A previous procedure for disposal of sumped fuel was to throw it onto the tarmac, expecting the fuel to evaporate. This illegal practice causes air pollution as well as possible runoff issues contaminating the soil. Wise hazardous waste practices not only are good choices for health and safety, but also protect our environment by producing the least amount of air and ground water pollution as possible.

Several options and devices are available to assist with the testing and proper disposal of preflight fuel. One such option is the GATS (gasoline analysis test separator) jar. With this device, Embry-Riddle Aeronautical University has developed new procedures. These procedures allow the return of the clean fuel back to the aircraft tank, and contaminated fuel to be dumped into a disposal unit located on the ramp. By using new fuel testers you are not only protecting our environment and comply with the law, you're saving money by returning clean fuel to your aircraft tank.

In accordance with the normal procedures of your pilot's operating handbook, always "sump your tanks" prior to flight. Fuel testing, or "sumping", is a necessary safety measure, and in no way should it be circumvented or eliminated from the preflight inspection

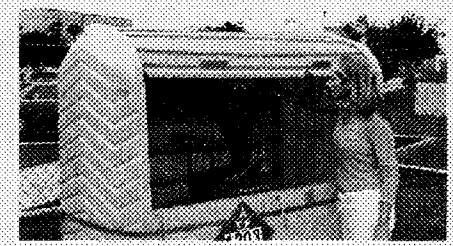
Listed below are the procedures that Embry-Riddle Aeronautical University developed and uses with this type of fuel tester:

1. Draw, examine, and retain all fuel samples in the normal course of the preflight inspection, observing color for proper octane.

2. Check for water and other Contaminants trapped on the tester screen and inside the jar.

3. If fuel is clean and free of contaminants, wipe separator screen on jar clean and pour fuel through screen back into tank.

4. If water and/or contaminants are present continue to sump until fuel is clean. Pour fuel and contaminants into the waste fuel container.



Once all the fuel tanks have been sampled, check the screen for foreign matter and allow the residual AVGAS to evaporate. If fuel or other liquids are left in the screen openings, consult an aircraft maintenance technician.

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