

<b>Environmental Standard Operating Procedure</b>	
<b>Battery Management and Storage</b>	
SF Director: Alicia Florez Signature:	Date:

**PURPOSE.**

The purpose of this Environmental Standard Operating Procedure (ESOP) is to provide environmental guidelines for the management and storage requirements for batteries aboard Marine Corps Logistics Base (MCLB) Barstow. This guidance applies to individuals working with the recharging, replacement, and disposal of communications, electronic, and lead acid batteries aboard MCLB Barstow.

**PROCEDURES.**

Batteries are specifically regulated under the Federal Resource Conservation and Recovery Act (RCRA) regulations 40 CFR part 273.2 and part 266.G. However, many batteries may exhibit one or more of the characteristics of hazardous waste, including ignitability, corrosivity, reactivity, and or toxicity and require management as Universal Waste under RCRA.

The following procedures apply:

1. General storage requirements for batteries in the shop.
  - a. All batteries must be stored in a cool, well-ventilated, dry storage area. If temperatures exceed 130 degrees Fahrenheit, dangerous vapors can be generated, and some batteries will generate flammable or reactive gas.
  - b. Batteries must be protected against being crushed, damaged, punctured, or short-circuited. If batteries are damaged in any way, they shall be turned in to the Hazardous Waste (HW) 90-Day Facility or prepared for pick-up as scheduled by the HW program manager.
  - c. Do not smoke, eat or drink in battery storage areas. Smoking can ignite the dangerous vapors.
  - d. Batteries shall be stored separate from all other hazardous materials (HM). Hazardous materials can interact with a venting battery and potentially cause an adverse reaction such as fire or explosion.
2. Communication Batteries Specific Management Practices.
  - a. All communication batteries will remain bagged & boxed until used.

- b. Lithium batteries shall be segregated from any other batteries. Due to the reactivity of lithium batteries, they shall be kept dry and stored away from water and high moisture sources.
- c. All personnel who are responsible for battery management must attend Hazardous Communication (HAZCOMM) training. Documentation of this training must be available for review during inspections.
- d. The terminals on all communication batteries will be covered by unit personnel with electrical/duct tape to preclude an electrical dead short prior to disposal/ turn-in to HW. The tape cannot cover any of the identifying markings on the battery.
- e. Battery charging shall be conducted on a non-flammable surface and only in areas designated for charging.
- f. Shelf/Service-Life Management. One of the most effective waste minimization programs is active life-cycle management of hazardous materials before they expire and become hazardous waste.
  - i. Communication batteries come from the manufacturer marked with either an expiration date or a manufacturer's test date. A Hazardous Material Management System (HMMS) shelf/service-life inspection label from HMMS shall be placed on the container. As long as a battery remains in their original container (Case, Box) only one HMMS label is required for that container. In the event the batteries are removed from their original container for individual storage or distribution, a new shelf/service life label will be requested for each battery. The original HMMS shelf/service-life label serial number will be turned in and used as justification for new individual labels.
  - ii. Quarterly inspections are conducted on all HM to determine adequate shelf/service-life. Areas, who identify batteries that will reach their manufacturer's test date or expiration date prior to the next quarterly inspection, shall contact their Environmental Compliance Coordinator (ECC) in order to schedule a turn-in or pick-up with the HW Manager.

### 3. Wet-Cell & Sealed Lead Acid Batteries – Specific Management Practices.

- a. Upon receipt by the end user, wet cell batteries shall be filled with the electrolyte that accompanies the kit. Any excess electrolyte shall be turned in to the Environmental Division at the next available curbside pick-up appointment.
- b. Refilling batteries with electrolyte are NOT AUTHORIZED.

- c. Batteries shall be stacked no higher than 2 tiers high for storage due to the potential damage to the batteries.
- d. Battery charging shall be conducted on a non-flammable surface and only in areas designated for charging.
- e. Cracked battery cases, batteries missing filler caps or other damaged areas which may result in a release of acid will be sealed with silicone or other appropriate sealant and placed into an appropriate container for transport. The battery shall not be comingled with other batteries and will be turned into HW as soon possible.

#### 4. Battery Turn-In Procedures.

- a. Spent wet-cell batteries will be scheduled for drop off or pick-up by the Environmental Division and staged on pallets. Batteries shall not be stacked more than two high on the pallet, separated by a layer of plywood or thick/heavy cardboard, and shall be banded to avoid the battery load shifting during transport.
- b. Communication batteries shall be placed in a Department of Transportation approved container for transport to HW. All battery types must be segregated for transport.
- c. Batteries shall not be placed into plastic bags prior to turn in.
- d. All wing nuts, bolts, terminal ends/connectors will be removed from the battery post by unit personnel prior to loading/transport.
- e. At no time will the Complete Discharge Device (CDD) be activated on lithium batteries.
- f. Damaged batteries will be segregated from other batteries and will be identified to HW staff as damaged during the unit's scheduled curbside pick-up appointment.
- g. Single-use alkaline batteries such as AAA, AA, C, D and 9-volt batteries produced by manufactures like Energizer and Duracell as well as less common and/or generic manufactures now fall below Federal and State hazardous waste standards. Regardless of these standards units requiring disposal of alkaline batteries will take them to the HW 90-Day Facility on their next available turn in day or drop-off.

#### 5. Spill Reporting and Response Requirements.

- a. In the event that a wet cell/lead acid battery is damaged to the point of leaking, or the unit suspects a lithium battery is off-gassing, unit personnel must immediately call 760-577-6666/911.
- b. Any releases or spills that occur in and around the area of responsibility must be reported immediately to the Base Fire and Emergency Services Division (FESD) by dialing 760-577-6666/ 911. A Spill Report Release Form must be completed and forwarded to the area's Environmental Compliance Coordinator (ECC). A copy of the completed Spill Report must also be maintained in the unit ECC Binder. Forms can be obtained by area's ECC or by contacting the Environmental Division.
- c. Units must stock appropriate amounts of spill containment and control equipment onsite for use in the event of a spill.
- d. Signs are to be posted in the vicinity of the used oil, off spec fuel, used antifreeze, hazardous material, or pollution abatement facilities that will indicate the following information:

IN CASE OF AN OIL OR HAZARDOUS MATERIALS SPILL  
CALL FIRE AND EMERGENCY SERVICES DIVISION AT 911  
NOTIFY YOUR COMMANDER/SUPERVISOR IMMEDIATELY

The sign must have yellow background and black lettering. Information to purchase the signs can be acquired from the cognizant ECC.

## REFERENCES:

- a. MCO P5090.2A – Environmental Compliance and Protection Manual
- b. MCIEAST-MCB CAMLEJO 5090.9 Hazardous Material/Waste Management
- c. ESOP Hazardous Material Management Program

## TRAINING:

Unit personnel shall be trained on all the provisions of this SOP. All training must be requested through unit ECC or Environmental Compliance Branch.

Unit commanders shall ensure that personnel who perform operations such as vehicle maintenance, fueling, or washing are properly trained in the operation and maintenance of pollution abatement facilities. Personnel shall be trained on the environmental impact of oil and HM spills, and prevention of such incidents.

All affected personnel must be trained in this Standard Operating Procedure and the following:

- a. Intro to Hazardous Waste Training
- b. RCRA Training
- c. EM 104 – ECC Training Class

## DEFINITIONS:

Most battery types come in several different shapes and sizes, including A, AA, AAA, C, D, 6V, 9V, coin, or button shaped, and battery packs (a series of battery cells connected together and usually encased in plastic). Some batteries are hazardous to the environment and pose health and safety risks to those using them. The following is a list of battery types and their hazards:

Alkaline. The most widely used battery type; these batteries contain an electrolyte which is made up of either potassium hydroxide or sodium hydroxide. Both of these electrolytes are strong alkalis. If this electrolyte contacts skin or eyes, it will cause severe chemical burns. These batteries are non-rechargeable.

Zinc. These batteries are non-recyclable. They do contain ammonium chloride and zinc chloride which is used as an electrolyte. Both of these electrolytes are considered corrosive.

Lead-Acid. These large batteries are very corrosive and must be stored separate of all other hazardous materials. The battery contains aqueous electrolyte, which is used as an electrolyte. The electrolyte content of these batteries is between 28 and 51 percent by weight.

Lithium. Lithium batteries include lithium-manganese dioxide, lithium- sulfur dioxide, and lithium thionyl chloride. Lithium-sulfur dioxide batteries contain pressurized sulfur dioxide gas and lithium-thionyl chloride batteries contain liquid thionyl chloride, which vaporizes readily upon exposure to air, both of which are highly toxic and reactive.

Magnesium. These batteries contain an electrolyte that is made up of magnesium bromide or magnesium perchlorate. These chemicals can emit highly toxic fumes when heated. If batteries show signs of leakage, proper eye and skin protection is recommended during handling.

Mercury. These batteries contain an electrolyte of either aqueous potassium hydroxide or sodium hydroxide. The core of the battery is made up of 20-50 percent mercury or mercuric oxide by weight. The electrolyte can cause the same adverse effects as alkaline batteries listed above.

Nickel Cadmium. Also known as Ni-Cads, contain an electrolyte that is made up of an aqueous solution of potassium hydroxide. The battery cells typically contain 13-15 percent nickel by weight. The electrolyte solution is caustic solution and is capable of causing the same serious chemical burns as alkaline batteries.

Silver- Zinc. These batteries contain an electrolyte that is made from an aqueous solution of lithium chloride or zinc chloride and zinc sulfate. The electrolyte is a mild acid (20 to 30 percent by weight) and can cause serious chemical burns to the skin and eyes.

Nickel-Metal Hydride. These batteries are usually rechargeable.

Wet-Cell. This type of battery usually contains some sort of acid or caustic to use as an electrolyte. A wet-cell battery requires the user to “top off” the battery to gain its charge back. Some types of wet-cell batteries are non-refillable, and if heated or cracked will leak their respective electrolytes. The dangers of these can burns or severe skin irritation. These electrolytes can be either strong caustic or strong acids, depending on the battery type and manufacturer.

Gel-Cell Batteries. Gel-cell batteries use a gel that replaces the standard acid that typically is found in lead acid or wet-cell batteries. The batteries are still turned in to EMD with a one for one exchange policy.

Motorola Radio Batteries. Handled the same as Ni-Cads.