CalEPA
California Environmental Protection Agency

CALIFORNIA CUPA FORUM

UNIFIED PROGRAM ADMINISTRATION AND ADVISORY GROUP (UPAAG)

HAZARDOUS MATERIALS BUSINESS PLAN (HMBP) STEERING COMMITTEE

HAZARDOUS MATERIALS BUSINESS PLAN (HMBP) TECHNICAL ADVISORY GROUP

BATTERY REPORTING GUIDANCE

FOR

UNIFIED PROGRAM AGENCIES

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INTRODUCTION

A battery work group was established within the Hazardous Materials Business Plan (HMBP) Technical Advisory Group (TAG) with members of UPAs from across the state to help address the issues associated with reporting batteries in the hazardous materials business plan. A review was conducted of many different types of batteries, the materials contained within them, associated hazards, and the technical challenges of reporting to provide the best practices for battery reporting outlined in this document.

Please consider the contents of this document as guidance and that it tries to cover most scenarios. However, battery technology is rapidly changing and may not fit in your exact situation. When faced with questions, one should consult with your management, HMBP TAG, and/or California Environmental Protection Agency for additional guidance and clarification.

I. BACKGROUND

Hazardous Materials Business Plan reporting for batteries presents a technical challenge because of the mixed chemical (ex. contains sulfuric acid and lead) and physical state (ex. both liquid, and solid) as well as the need to report them in a standardized way across the state. In addition to the technical challenges, another concern is the determination of any given battery as either a hazardous material, an article, or a consumer product as defined by laws and regulations for the hazardous materials business plan.

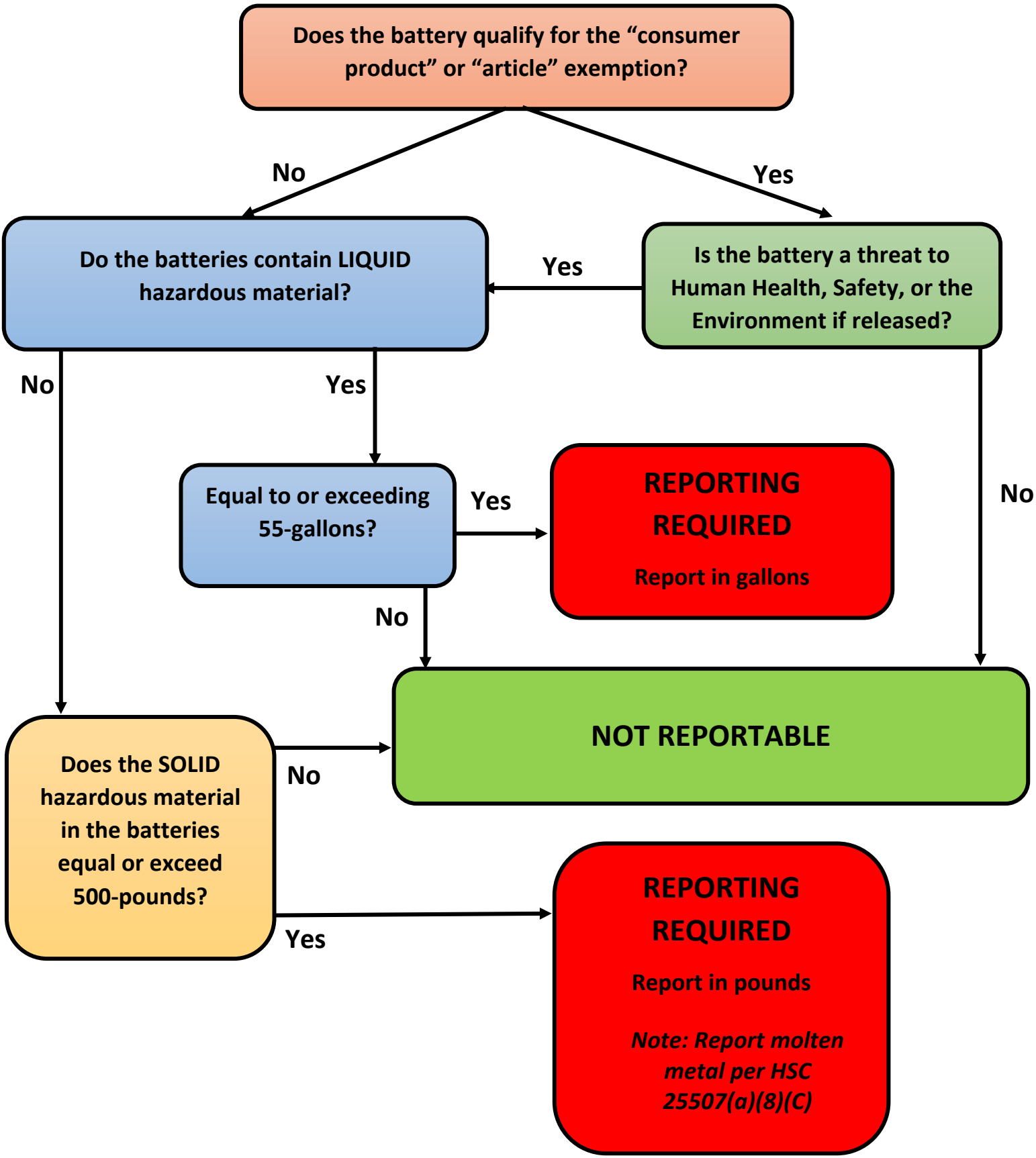
By their nature, batteries are made with a wide variety of materials including solid, liquid, or even molten materials. Although reportable mixtures of hazardous materials in different physical states can occur with some regularity, batteries represent a very frequent example of this reporting issue. Batteries use has continued or increase in many industries for power storage, management, electronic devices, and as a general utility. The battery industry continues to improve and change battery chemistry for residential, commercial, or grid-scale application. This results in significant variation, making it difficult to provide a simple answer as to how batteries should be properly reported on the HMBP.

Another issue is that the manufacturers often state that the battery is an “article” on the data sheet or safety data sheet (SDS). This identification presents a concern because materials determined to be “articles” may not be considered reportable hazardous materials according the California Health and Safety Code (HSC). In addition, consumer products may also be exempt from the definition of a hazardous material. The sections below will explain the exemptions and how to properly report a battery on the HMBP at this time. Section V provides a recommendation from the work group about how the TAG may resolve this concern.

II. REPORTING PROCEDURES

In order to provide concise guidance on how both a regulator and facility should evaluate batteries for proper reporting, this group has created a flow chart, below, which will walk the user through a step-by-step process. The first question determines if the battery is excluded from regulation as a hazardous material. The following questions resolve if the battery should be reported as a solid or liquid and the applicable threshold quantity. Each question on the flow chart is discussed in more detail in section C below. Information about how to calculate the quantity of material is in section B.

Battery Reporting Flow Chart for HMBP



A. How to calculate aggregate solid or liquid hazardous material

Liquid - Aggregate quantity of electrolyte should be used to determine if the batteries have reached the reportable quantity threshold of 55 gallons. To calculate volume, use tables indicating gallons of electrolyte per battery cell from manufacturer/supplier and/or specification sheets. If electrolyte volume is unknown, multiply the fractional weight of electrolyte (from SDS) times the total battery weight (in pounds) and divide by the minimum specific gravity (from SDS) times 8.34 pounds per gallon;

Electrolyte volume= (X %/100)(Y pounds)/(Z Specific Gravity)(8.34 pounds/gallon)

Example: (40%/100)(40 pounds)/(1.285)(8.34 pounds/gallon)= 1.49 gallons

Solid - Total weight of solid hazardous materials in the battery, in pounds, should be used to determine if the batteries have reached the reportable quantity threshold of 500 pounds. Weight of hazardous material can be obtained from the manufacturer or supplier, specification sheets, or safety data sheets. If unknown, fractional weight of inert material can be subtracted from total battery weight to calculate aggregate quantity of hazardous material.

Molten Metals - Report total weight of combustible metal, or metal alloy that poses an explosive potential, when in molten form, at or above the reporting threshold of 500 pounds as required in HSC 25507(a)(8)(C).

Flow Chart Questions

Does the battery qualify for the "consumer product" or "article" exemption?

"Consumer product":
Consumer products are defined in the Health and Safety Code (HSC) 25501(j) and 29 CFR 1910.1200. They may be excluded from the list of hazardous materials in HSC 25507(n) paragraph 2 because they are excluded from the Hazard Communication Standard in 1910.1200(b)(6) as defined by section (ix).

The Health and Safety Code also considers consumer products to be exempt from reporting at retail establishments, but not at the facility that manufactures the product, the warehouse or the distribution center as specified in HSC 25507(b)(5). However, the definition must be applied properly. According to the Hazard Communication standard, the exemption can only apply if "the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended".

It is foreseeable that many batteries used for commercial and industrial purposes do not meet the definition of a consumer product. In addition, commercial and industrial uses do not seem to fit the definition referenced by the Hazard Communication standard and found in the Consumer Product Safety Act.

The definition states, "any article, or component part thereof, produced or distributed (i) for sale to a consumer for use in or around a permanent or temporary household or residence, a school, in recreation, or otherwise, or (ii) for the personal use, consumption or enjoyment of a consumer in or around a permanent or temporary household or residence, a school, in recreation, or otherwise"

Definitions:

HSC 25501(j) "Consumer product means a commodity used for personal, family, or household purposes, or is present in the same form, concentration, and quantity as a product prepackaged for distribution to and use by the general public".

1910.1200(b)(6)(ix) "Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended".

15 USC 2052(a)(5) Consumer Product safety Act "CONSUMER PRODUCT.--The term ''consumer product'' means any article, or component part thereof, produced or distributed (i) for sale to a consumer for use in or around a permanent or temporary household or residence, a school, in recreation, or otherwise, or (ii) for the personal use, consumption or enjoyment of a consumer in or around a permanent or temporary household or residence, a school, in recreation, or otherwise; but such term does not include—…"

Examples: Consumer type batteries may include the familiar sized AAAA to D batteries and button cells which may be formulated as alkaline, lithium ion, nickel metal hydride and could be single-use or rechargeable. These types of batteries typically power consumer type products such as calculators, clocks, flashlights, remotes, radios, toys, and other electronics used for typical consumer-type activities. Keep in mind that if any product is used with a greater frequency or duration than a consumer product or in a way not intended my the manufacturer, it may not quality as a consumer product.

"Article":
"Article" is not defined in the HSC, however, it is excluded from the definition of a hazardous material (HSC 25501(n)(2)) by the Hazard Communication standard in CFR 1910.1200(b)(6)(v). The key criteria in the definition of an "article" is that, "under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees" (1910.1200(c)). Some batteries have technical or safety data sheets that list them as an "article" and indicate they are exempt from regulation under the hazard communication regulations in 29 CFR 1910.1200. Depending on the type of physical or health hazards the use of a given battery presents, it may or may not be considered an article. The Occupational Health and Safety Administration has provided several interpretations of this, excluding some batteries from the definition of an article including lead-acid batteries and some lithium ion batteries. References to these interpretations can be found below.

1910.1200(c) Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

The "Enfonde letter of interpretation" on this issue, provided by the Occupational Safety and Health Administration in 2004 provides a succinct explanation of when a battery may be considered an article and how banks of sealed UPS batteries for backup power supply are not considered an article.

The 1997 letter of interpretation also provides some examples of why a lead-acid battery is not considered an article, explaining that under normal conditions of use and in foreseeable emergencies (not accidental fires) batteries have the potential to "leak, spill or break" and "have the potential to emit hydrogen gas, which may result in a fire".

In a 2015 letter response to Labelmaster, recorded on their website, the Occupational Health and Safety Administration stated, "lithium-ion batteries (or lithium battery-powered devices) on a whole, although sealed, have the potential to leak, spill, or break during normal conditions of use and foreseeable emergencies and expose employees to chemicals which can pose health (e.g., lithium cobalt, graphite) and/or physical (e.g., bums, fire) hazards, and therefore, cannot be considered an article"

Examples: Items containing batteries such as laptops, phones, and other devices which employee exposure does not occur. Batteries handled by maintenance employees and contractors may be excluded from the definition of an article. Batteries for backup power are typically not considered articles.

Does the battery pose a threat to human health, safety or the environment if released?
The intent of the Unified Program (UP) Hazardous Material Disclosure Program is to protect public and environmental health and safety from the releases or threatened releases of hazardous materials [HSC 25500(a)]. This is accomplished through the development of business plans that disclose basic information about a hazard posed by chemicals. The various battery types handled by businesses have inherit physical and chemical hazards (e.g. elevated operating temperatures, corrosive electrolytes, generation of flammable gases, thermal runaway etc.). On the basis of the hazards presented, a battery may still be subject to UP's hazardous materials disclosure requirements listed in HSC 25501(n)(3) which states that, the "unified program agency may adopt an ordinance that provides that, within the jurisdiction of the unified program agency, a material not listed in paragraph (2) is a hazardous material for purposes of this article if a handler… or if the governing body of the unified program agency has a reasonable basis for believing that the material would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment."

If the contents of the battery could pose a threat to human health, safety, or the environment if released, contact your unified program agency to verify that if the battery is required to be reported. If yes, proceed to questions 3.

Does the battery contain liquid hazardous material?

If the battery contains a liquid hazardous material, the flow chart instructs the user to report the battery as a liquid when the aggregate quantity of battery electrolyte on site is 55-gallons or greater. However, if a battery contains a negligible amount of liquid, for example less than 1%, it is recommended that the battery be reported as a solid when the aggregate quantity of solid hazardous materials is equal to or exceeds 500 pounds.

The instruction to report the aggregate quantity of batteries as a liquid is based on the reporting requirements for lead-acid batteries found in CCR Title 27 § 15186.1 instead of the mixture reporting instructions from HSC 25507(a)(1)(A). The 2011 guidance document for lead-acid battery reporting stated the basis for this determination is, "The quantity of electrolyte, which is the component of the battery which presents the primary immediate hazard to emergency responders, should be used to determine if the batteries have exceeded the reporting threshold". This is also found to be true for other types of battery electrolyte.
If the physical state of materials contained within the battery is unclear (e.g. some electrolytes are in gel form), definitions to help distinguish between a solid and liquid can be found in the

California Fire Code Ch. 2 and they are provided here for reference. **Solid** – a material that has a melting point and decomposes or sublimes at a temperature greater than 68°F (20°C). **Liquid** – a material having a melting point that is equal to or less than 68°F (20°C) and a boiling point which is greater than 68°F (20°C) at 14.7 pounds per square inch absolute (psia)(101 kPa). Where not otherwise identified, the term "liquid" includes both flammable and combustible liquid. If a battery contains molten metal, HSC defines specific reporting in 25507(a)(8)(C) and states that reporting is required for a, "combustible metal, or metal alloy, that poses an explosive potential, when in molten form, in a quantity at any one time during the reporting year that is equal to, or greater than, 500 pounds". This definition was not intended for use with batteries, however it may be used if applicable. A few examples of these metals are lithium, sodium, and potassium.

Does the solid hazardous material in the battery exceed 500 pounds?
If the battery is composed of solid hazardous material the battery is to be reported as a solid with the reporting threshold of 500 lbs in aggregate on site.

Additional Reporting Requirements:
Discarded batteries are typically universal or hazardous waste. Once deemed a waste, if stored on site at 55 gallons or 500 pounds, they are reportable. See the citations listed for more details: 25501(n)(2)(E), HSC 25117(a), HSC 25141, and CCR Title 22 66261.1-66261.126.

Inventory Page Guidance

Liquid Example: Chemical Inventory Page for Nickel Metal Hydride batteries

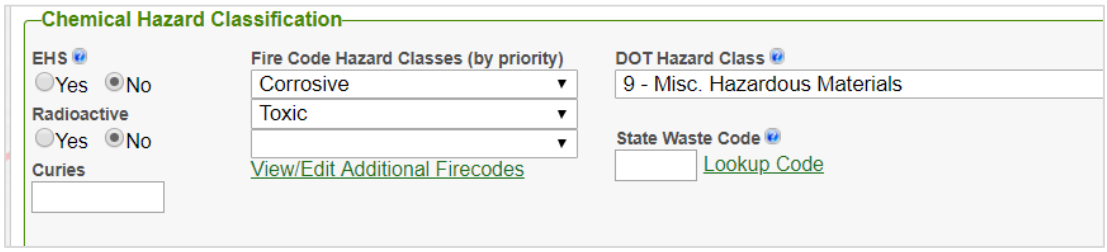
The following inventory sheet was created as a guidance document and will not be representative of all Nickel Metal Hydride (NiMH) or all liquid batteries. Always consult the SDS for your specific product to ensure chemical components and hazards are correct. Refer to the flow chart to determine if your batteries are reportable. The following example is for large NiMH battery cells. Smaller consumer NiMH batteries may be reported as solids and/or have different chemical components. An asterisk (*) below indicates a required field in CERS. Please note that more information than the minimum required fields is typically required. Always fill out the inventory pages as completely as possible.

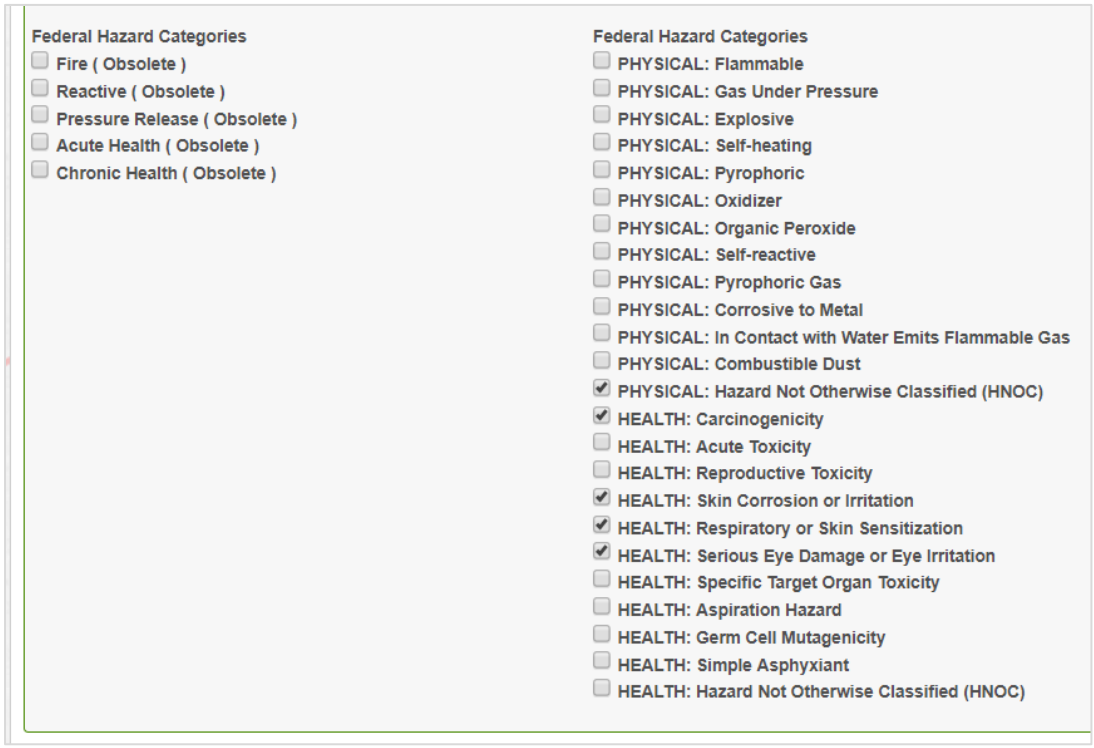
Chemical Identification and Physical Properties Required Fields:

Chemical Name, Common Name*, Physical State*, Hazardous Material Type, Trade Secret. Note: For the Physical state, if battery contains liquid electrolyte at or above the threshold quantity, check “liquid” and report the amounts in gallons.

Chemical Hazard Classification Required Fields:

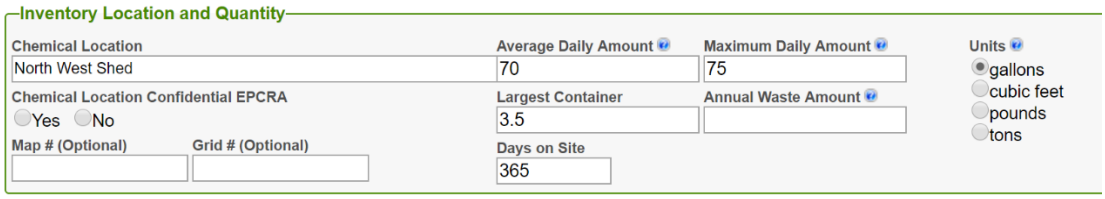
EHS (Extremely Hazardous Substance)*, Radioactive, Fire Code Hazard Class (If available), DOT Hazard Class (If available), 24 Federal Hazard Categories. Note: Ensure 5 (Obsolete) Federal Hazard Categories on the left are unchecked if they are visible to you.





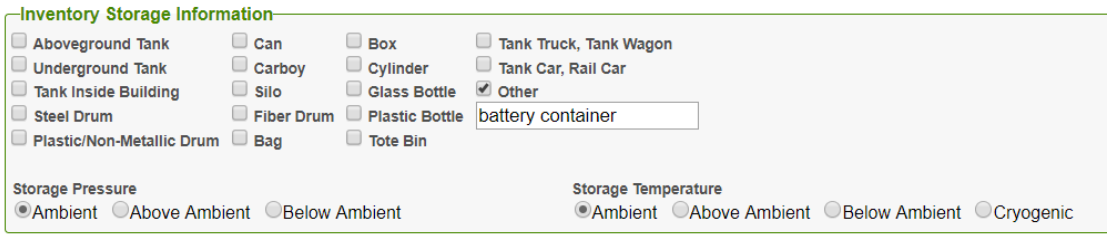
Inventory Location and Quantity Required Fields:

Chemical Location, Average Daily Amount, Maximum Daily Amount*, Largest Container, Days on Site, Units*. Note: Amounts are an example and will be different for each location. Maximum daily amount should be the total of all containers on site added together ie: 21 batteries that are each contain 3.5 gallons + 1 battery that contains 1.5 gallons = 75 gallons. Average daily amount is the average daily amount stored on site, not the average daily amount used.

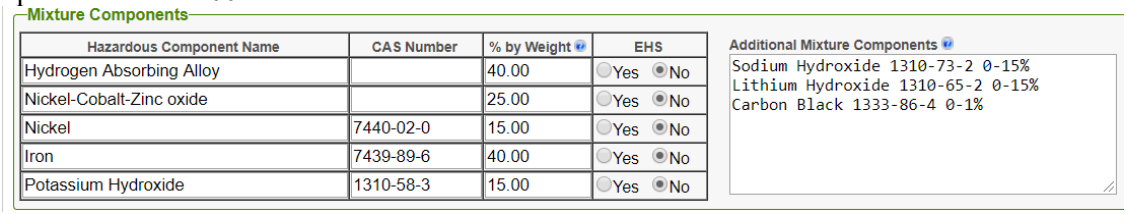


All amounts should be calculated and reported in gallons as indicated in section II A.

Inventory Storage Information Required Fields:
Inventory Storage Information*, Storage Pressure, Storage Temperature

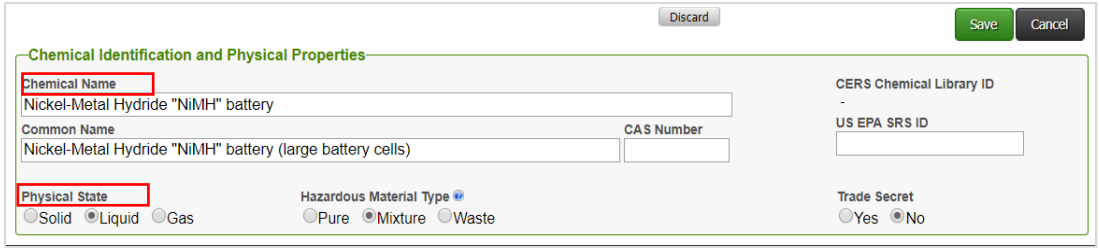


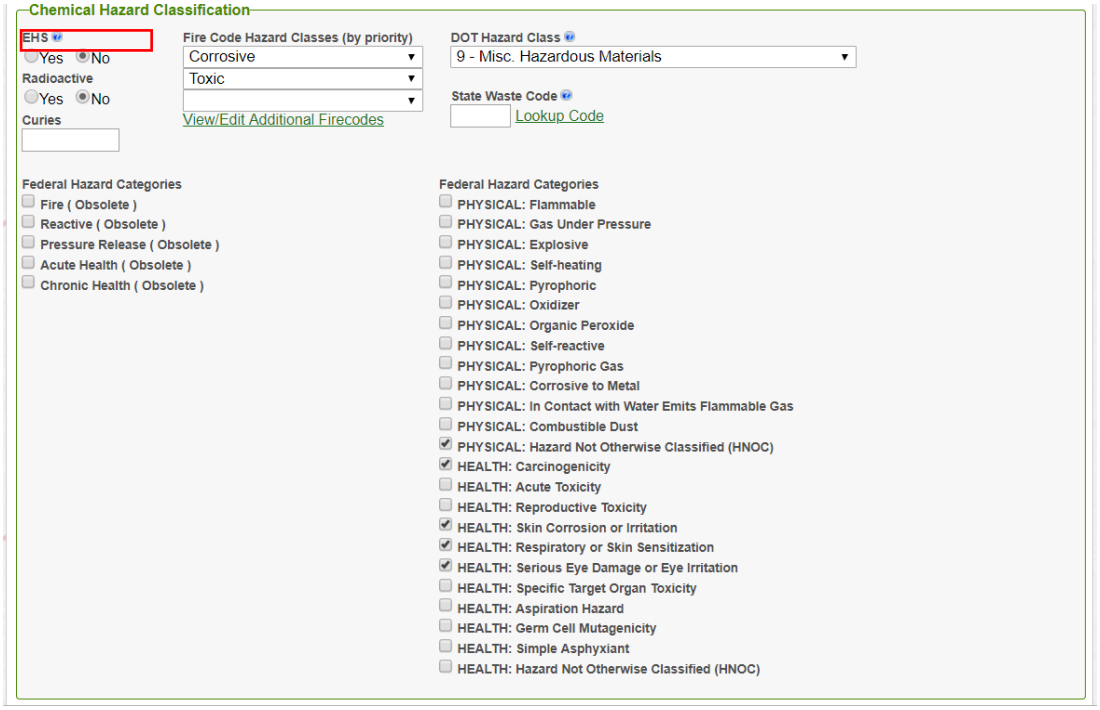
Mixture Components:
Hazardous Component Name, CAS Number (If available), % by Weight, EHS, Additional Mixture Components (If necessary). Note: Refer to Safety Data Sheet Section 3 for this information. % by weight should be reported as the highest percent listed if a range is shown. It is acceptable for the weight to add up to more than 100%.

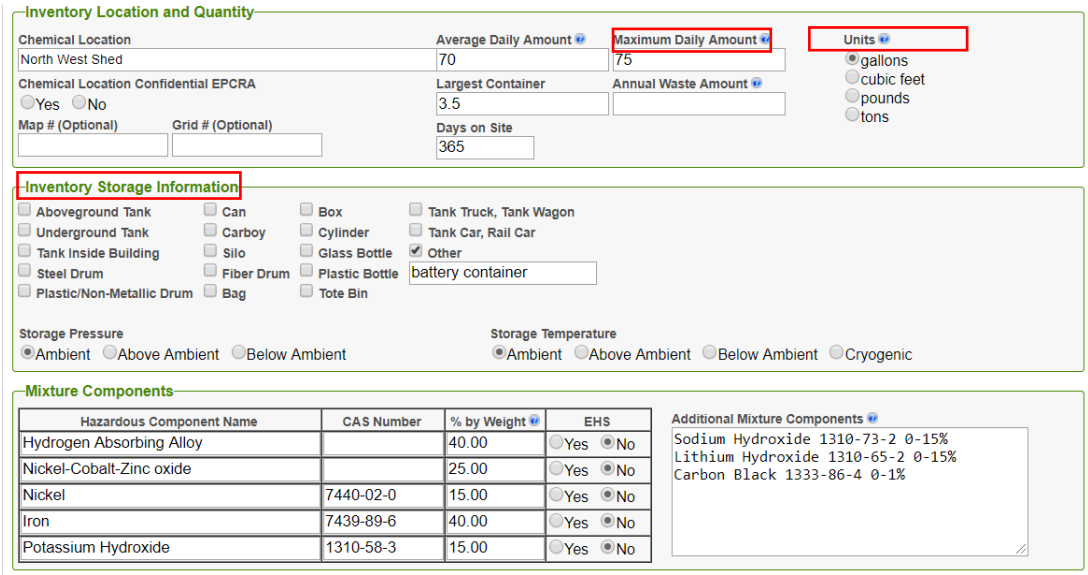


(Full inventory page on next page)

Full Inventory with Required Fields Highlighted – NiMH Liquid





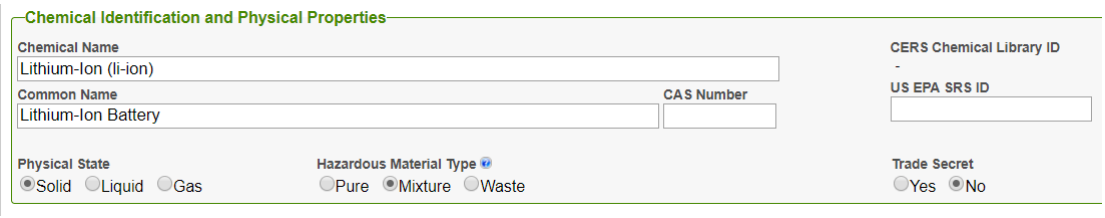


A. Solid Example: Chemical Inventory Page for Lithium Ion (Li-ion) batteries

The following inventory sheet was created as a guidance document and will not be representative of all Lithium Ion (Li-ion) or all solid batteries. Always consult the SDS for your specific product to ensure chemical components and hazards are correct. Refer to the flow chart to determine if your batteries are reportable. An asterisk (*) below indicates a required field in CERS. Please note that your CUPA may require more than the minimum required fields. Always fill out the inventory pages as completely as possible.

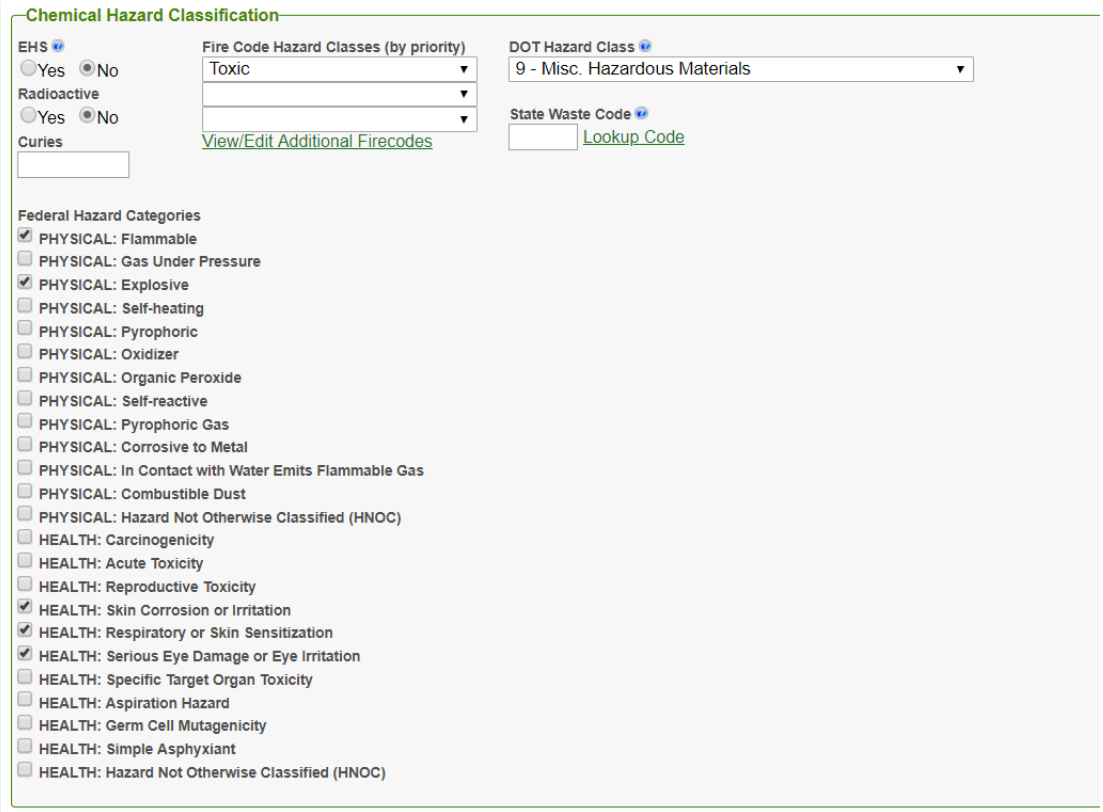
Chemical Identification and Physical Properties Required Fields:

Chemical Name, Common Name*, Physical State*, Hazardous Material Type, Trade Secret. Note: For the Physical state, if battery does not contain liquid electrolyte, check “solid” and report the amounts in pounds.



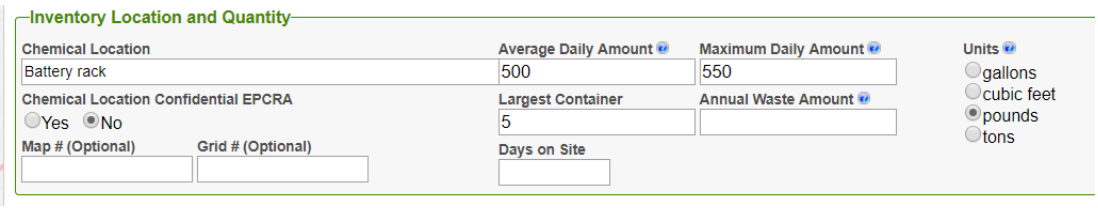
Chemical Hazard Classification Required Fields:

EHS*, Radioactive, Fire Code Hazard Class (If available), DOT Hazard Class (If available), 24 Federal Hazard Categories. Note: Ensure 5 (Obsolete) Federal Hazard Categories on the left are unchecked if they are visible to you.



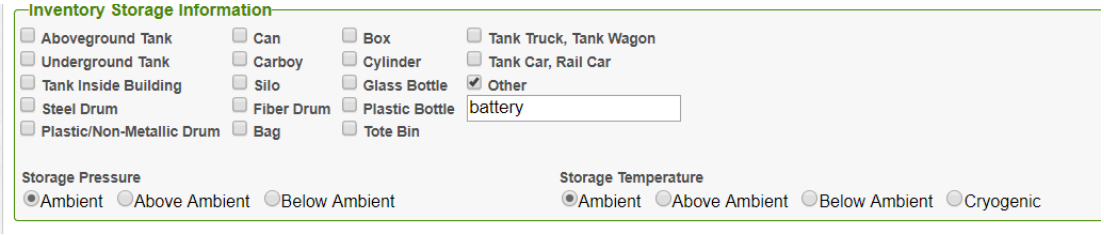
Inventory Location and Quantity Required Fields:

Chemical Location, Average Daily Amount, Maximum Daily Amount*, Largest Container, Days on Site, Units*. Note: Amounts are an example and will be different for each location. Maximum daily amount should be the total of all containers on site added together (ex. 110 batteries that contain 5 lbs of hazardous materials each = 550 pounds). Average daily amount is the average daily amount stored on site, not the average daily amount used.



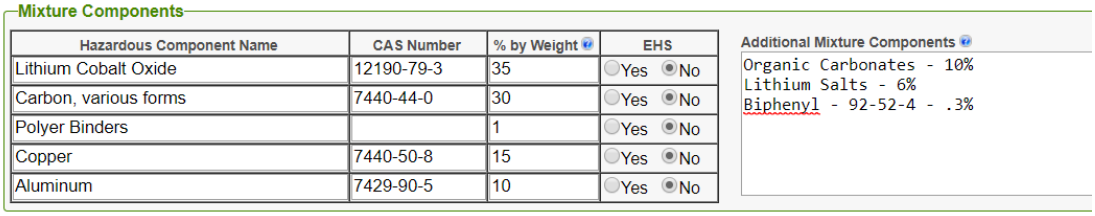
Inventory Storage Information Required Fields:

Inventory Storage Information*, Storage Pressure, Storage Temperature



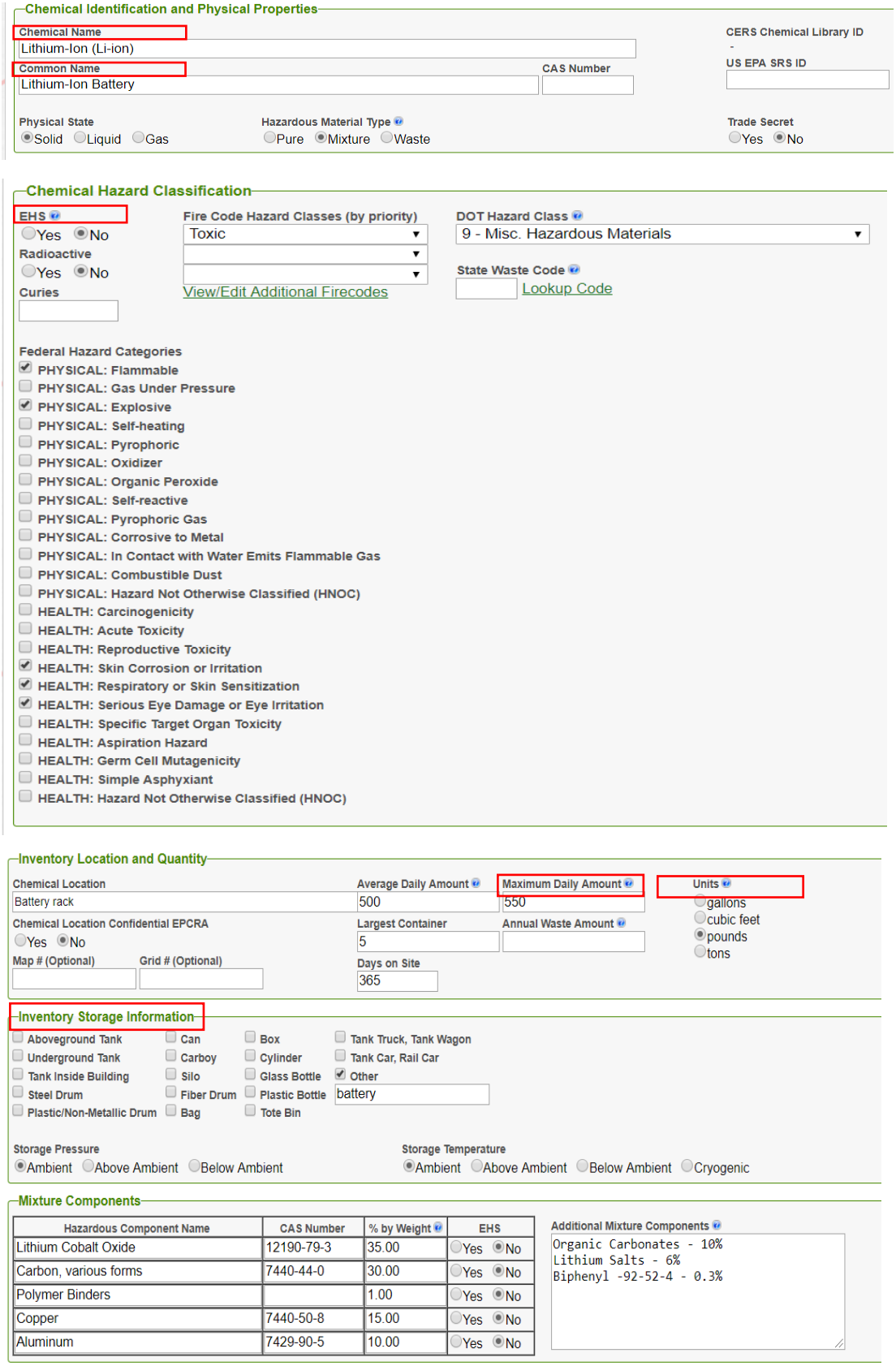
Mixture Components:

Hazardous Component Name, CAS Number (If Available), % by Weight, EHS, Additional Mixture Components (If necessary). Note: Refer to Safety Data Sheet Section 3 for this information. The percent by weight should be reported as the highest percent listed if a range is shown. It is acceptable for the weight to add up to more than 100%.



Full Inventory with Required Fields Highlighted - Li-Ion Solid
(Next page)

Full Inventory with Required Fields Highlighted - Li-Ion Solid



Chemical Identification and Physical Properties

Chemical Name: Lithium-Ion (Li-ion)
Common Name: Lithium-Ion Battery
CAS Number:
CERS Chemical Library ID: -
US EPA SRS ID:
Physical State: (•) Solid ( ) Liquid ( ) Gas
Hazardous Material Type: ( ) Pure (•) Mixture ( ) Waste
Trade Secret: ( ) Yes (•) No

Chemical Hazard Classification

EHS: ( ) Yes (•) No
Radioactive: ( ) Yes (•) No
Curies:
Fire Code Hazard Classes (by priority): Toxic
View/Edit Additional Firecodes
DOT Hazard Class: 9 - Misc. Hazardous Materials
State Waste Code: Lookup Code

Federal Hazard Categories
- [x] PHYSICAL: Flammable
- [ ] PHYSICAL: Gas Under Pressure
- [x] PHYSICAL: Explosive
- [ ] PHYSICAL: Self-heating
- [ ] PHYSICAL: Pyrophoric
- [ ] PHYSICAL: Oxidizer
- [ ] PHYSICAL: Organic Peroxide
- [ ] PHYSICAL: Self-reactive
- [ ] PHYSICAL: Pyrophoric Gas
- [ ] PHYSICAL: Corrosive to Metal
- [ ] PHYSICAL: In Contact with Water Emits Flammable Gas
- [ ] PHYSICAL: Combustible Dust
- [ ] PHYSICAL: Hazard Not Otherwise Classified (HNOC)
- [ ] HEALTH: Carcinogenicity
- [ ] HEALTH: Acute Toxicity
- [ ] HEALTH: Reproductive Toxicity
- [x] HEALTH: Skin Corrosion or Irritation
- [x] HEALTH: Respiratory or Skin Sensitization
- [x] HEALTH: Serious Eye Damage or Eye Irritation
- [ ] HEALTH: Specific Target Organ Toxicity
- [ ] HEALTH: Aspiration Hazard
- [ ] HEALTH: Germ Cell Mutagenicity
- [ ] HEALTH: Simple Asphyxiant
- [ ] HEALTH: Hazard Not Otherwise Classified (HNOC)

Inventory Location and Quantity

Chemical Location: Battery rack
Average Daily Amount: 500
Maximum Daily Amount: 550
Units: ( ) gallons ( ) cubic feet (•) pounds ( ) tons
Chemical Location Confidential EPCRA: ( ) Yes (•) No
Largest Container: 5
Annual Waste Amount:
Map # (Optional):
Grid # (Optional):
Days on Site: 365

Inventory Storage Information

- [ ] Aboveground Tank
- [ ] Underground Tank
- [ ] Tank Inside Building
- [ ] Steel Drum
- [ ] Plastic/Non-Metallic Drum
- [ ] Can
- [ ] Carboy
- [ ] Silo
- [ ] Fiber Drum
- [ ] Bag
- [ ] Box
- [ ] Cylinder
- [ ] Glass Bottle
- [ ] Plastic Bottle
- [ ] Tote Bin
- [ ] Tank Truck, Tank Wagon
- [ ] Tank Car, Rail Car
- [x] Other: battery

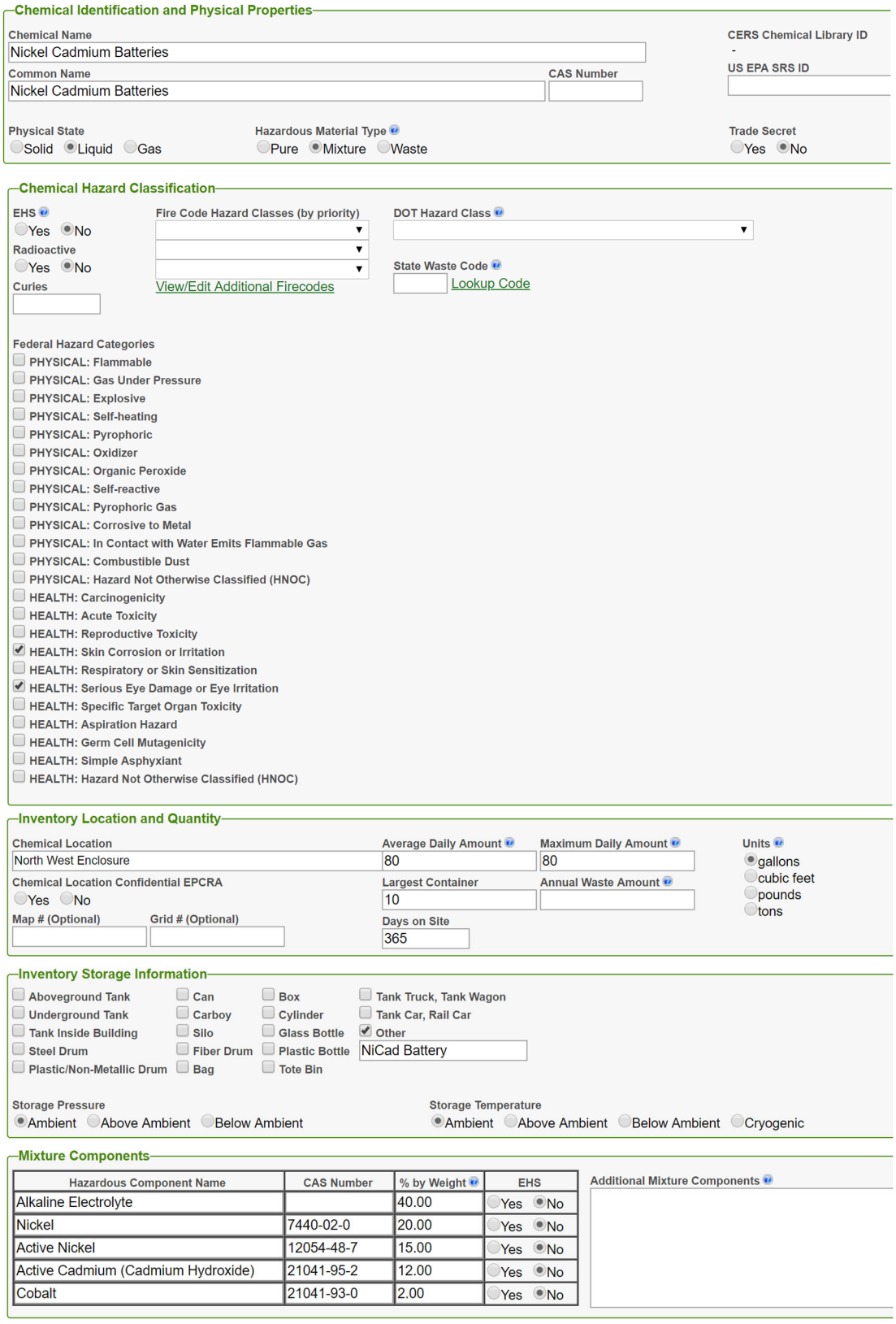
Storage Pressure: (•) Ambient ( ) Above Ambient ( ) Below Ambient
Storage Temperature: (•) Ambient ( ) Above Ambient ( ) Below Ambient ( ) Cryogenic

Mixture Components

Hazardous Component Name	CAS Number	% by Weight	EHS
Lithium Cobalt Oxide	12190-79-3	35.00	( ) Yes (•) No
Carbon, various forms	7440-44-0	30.00	( ) Yes (•) No
Polymer Binders		1.00	( ) Yes (•) No
Copper	7440-50-8	15.00	( ) Yes (•) No
Aluminum	7429-90-5	10.00	( ) Yes (•) No

Additional Mixture Components:
Organic Carbonates - 10%
Lithium Salts - 6%
Biphenyl -92-52-4 - 0.3%

B. Sample Chemical Inventory Page for Nickel Cadmium Batteries



Chemical Identification and Physical Properties

Chemical Name: Nickel Cadmium Batteries
Common Name: Nickel Cadmium Batteries
CAS Number:
CERS Chemical Library ID: -
US EPA SRS ID:
Physical State: Solid / Liquid / Gas
Hazardous Material Type: Pure / Mixture / Waste
Trade Secret: Yes / No

Chemical Hazard Classification

EHS: Yes / No
Radioactive: Yes / No
Curies:
Fire Code Hazard Classes (by priority):
View/Edit Additional Firecodes
DOT Hazard Class:
State Waste Code: Lookup Code

Federal Hazard Categories
- PHYSICAL: Flammable
- PHYSICAL: Gas Under Pressure
- PHYSICAL: Explosive
- PHYSICAL: Self-heating
- PHYSICAL: Pyrophoric
- PHYSICAL: Oxidizer
- PHYSICAL: Organic Peroxide
- PHYSICAL: Self-reactive
- PHYSICAL: Pyrophoric Gas
- PHYSICAL: Corrosive to Metal
- PHYSICAL: In Contact with Water Emits Flammable Gas
- PHYSICAL: Combustible Dust
- PHYSICAL: Hazard Not Otherwise Classified (HNOC)
- HEALTH: Carcinogenicity
- HEALTH: Acute Toxicity
- HEALTH: Reproductive Toxicity
- [x] HEALTH: Skin Corrosion or Irritation
- HEALTH: Respiratory or Skin Sensitization
- [x] HEALTH: Serious Eye Damage or Eye Irritation
- HEALTH: Specific Target Organ Toxicity
- HEALTH: Aspiration Hazard
- HEALTH: Germ Cell Mutagenicity
- HEALTH: Simple Asphyxiant
- HEALTH: Hazard Not Otherwise Classified (HNOC)

Inventory Location and Quantity

Chemical Location: North West Enclosure
Chemical Location Confidential EPCRA: Yes / No
Map # (Optional):
Grid # (Optional):
Average Daily Amount: 80
Maximum Daily Amount: 80
Largest Container: 10
Annual Waste Amount:
Days on Site: 365
Units: gallons / cubic feet / pounds / tons

Inventory Storage Information

- Aboveground Tank
- Underground Tank
- Tank Inside Building
- Steel Drum
- Plastic/Non-Metallic Drum
- Can
- Carboy
- Silo
- Fiber Drum
- Bag
- Box
- Cylinder
- Glass Bottle
- Plastic Bottle
- Tote Bin
- Tank Truck, Tank Wagon
- Tank Car, Rail Car
- [x] Other: NiCad Battery

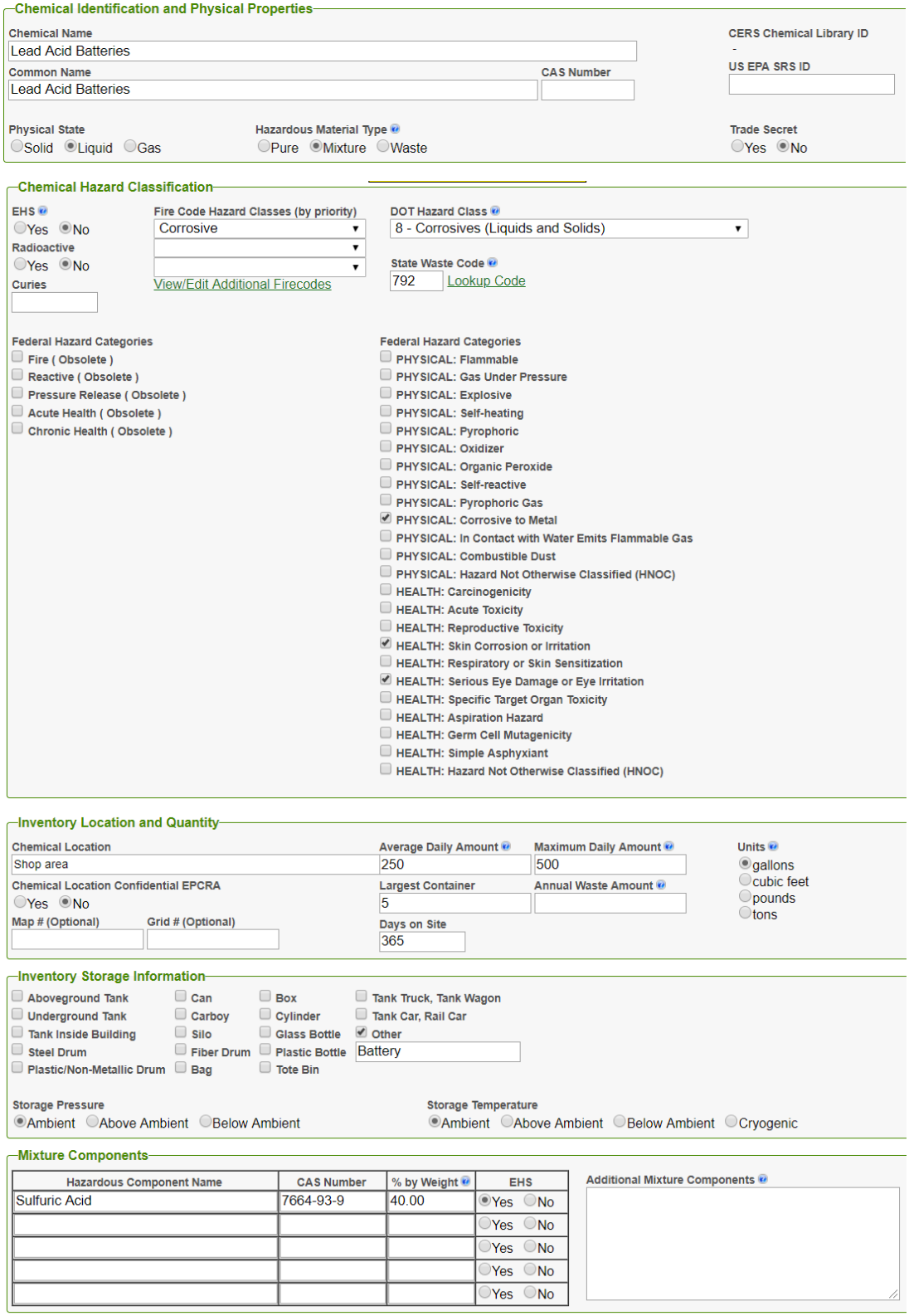
Storage Pressure: Ambient / Above Ambient / Below Ambient
Storage Temperature: Ambient / Above Ambient / Below Ambient / Cryogenic

Mixture Components

Hazardous Component Name	CAS Number	% by Weight	EHS
Alkaline Electrolyte		40.00	Yes / No
Nickel	7440-02-0	20.00	Yes / No
Active Nickel	12054-48-7	15.00	Yes / No
Active Cadmium (Cadmium Hydroxide)	21041-95-2	12.00	Yes / No
Cobalt	21041-93-0	2.00	Yes / No

Additional Mixture Components:

C. Sample Chemical Inventory for Lead Acid Batteries



Chemical Identification and Physical Properties

Chemical Name: Lead Acid Batteries
Common Name: Lead Acid Batteries
CAS Number:
CERS Chemical Library ID: -
US EPA SRS ID:
Physical State: ○ Solid ◉ Liquid ○ Gas
Hazardous Material Type: ○ Pure ◉ Mixture ○ Waste
Trade Secret: ○ Yes ◉ No

Chemical Hazard Classification

EHS: ○ Yes ◉ No
Radioactive: ○ Yes ◉ No
Curies:
Fire Code Hazard Classes (by priority): Corrosive
View/Edit Additional Firecodes
DOT Hazard Class: 8 - Corrosives (Liquids and Solids)
State Waste Code: 792 Lookup Code

Federal Hazard Categories
- ☐ Fire (Obsolete)
- ☐ Reactive (Obsolete)
- ☐ Pressure Release (Obsolete)
- ☐ Acute Health (Obsolete)
- ☐ Chronic Health (Obsolete)

Federal Hazard Categories
- ☐ PHYSICAL: Flammable
- ☐ PHYSICAL: Gas Under Pressure
- ☐ PHYSICAL: Explosive
- ☐ PHYSICAL: Self-heating
- ☐ PHYSICAL: Pyrophoric
- ☐ PHYSICAL: Oxidizer
- ☐ PHYSICAL: Organic Peroxide
- ☐ PHYSICAL: Self-reactive
- ☐ PHYSICAL: Pyrophoric Gas
- ☑ PHYSICAL: Corrosive to Metal
- ☐ PHYSICAL: In Contact with Water Emits Flammable Gas
- ☐ PHYSICAL: Combustible Dust
- ☐ PHYSICAL: Hazard Not Otherwise Classified (HNOC)
- ☐ HEALTH: Carcinogenicity
- ☐ HEALTH: Acute Toxicity
- ☐ HEALTH: Reproductive Toxicity
- ☑ HEALTH: Skin Corrosion or Irritation
- ☐ HEALTH: Respiratory or Skin Sensitization
- ☑ HEALTH: Serious Eye Damage or Eye Irritation
- ☐ HEALTH: Specific Target Organ Toxicity
- ☐ HEALTH: Aspiration Hazard
- ☐ HEALTH: Germ Cell Mutagenicity
- ☐ HEALTH: Simple Asphyxiant
- ☐ HEALTH: Hazard Not Otherwise Classified (HNOC)

Inventory Location and Quantity

Chemical Location: Shop area
Chemical Location Confidential EPCRA: ○ Yes ◉ No
Map # (Optional):
Grid # (Optional):
Average Daily Amount: 250
Maximum Daily Amount: 500
Largest Container: 5
Annual Waste Amount:
Days on Site: 365
Units: ◉ gallons ○ cubic feet ○ pounds ○ tons

Inventory Storage Information

- ☐ Aboveground Tank
- ☐ Underground Tank
- ☐ Tank Inside Building
- ☐ Steel Drum
- ☐ Plastic/Non-Metallic Drum
- ☐ Can
- ☐ Carboy
- ☐ Silo
- ☐ Fiber Drum
- ☐ Bag
- ☐ Box
- ☐ Cylinder
- ☐ Glass Bottle
- ☐ Plastic Bottle
- ☐ Tote Bin
- ☐ Tank Truck, Tank Wagon
- ☐ Tank Car, Rail Car
- ☑ Other: Battery

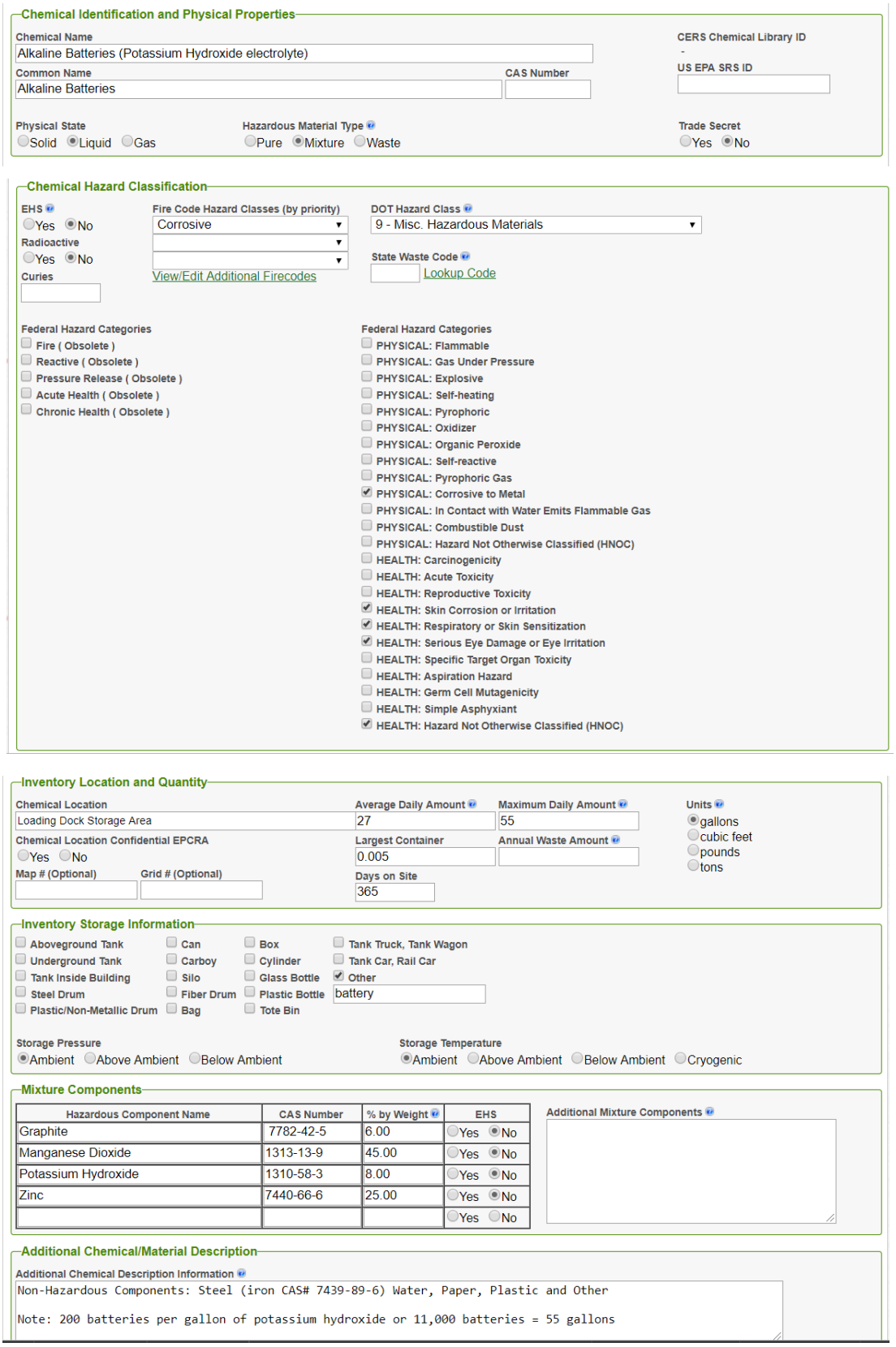
Storage Pressure: ◉ Ambient ○ Above Ambient ○ Below Ambient
Storage Temperature: ◉ Ambient ○ Above Ambient ○ Below Ambient ○ Cryogenic

Mixture Components

Hazardous Component Name	CAS Number	% by Weight	EHS
Sulfuric Acid	7664-93-9	40.00	◉ Yes ○ No
			○ Yes ○ No
			○ Yes ○ No
			○ Yes ○ No
			○ Yes ○ No

Additional Mixture Components:

D. Sample Chemical Inventory for Alkaline Batteries



Chemical Identification and Physical Properties

Chemical Name: Alkaline Batteries (Potassium Hydroxide electrolyte)
Common Name: Alkaline Batteries
CAS Number:
CERS Chemical Library ID: -
US EPA SRS ID:
Physical State: Solid / Liquid / Gas
Hazardous Material Type: Pure / Mixture / Waste
Trade Secret: Yes / No

Chemical Hazard Classification

EHS: Yes / No
Radioactive: Yes / No
Curies:
Fire Code Hazard Classes (by priority): Corrosive
View/Edit Additional Firecodes
DOT Hazard Class: 9 - Misc. Hazardous Materials
State Waste Code: Lookup Code

Federal Hazard Categories
- Fire (Obsolete)
- Reactive (Obsolete)
- Pressure Release (Obsolete)
- Acute Health (Obsolete)
- Chronic Health (Obsolete)

Federal Hazard Categories
- PHYSICAL: Flammable
- PHYSICAL: Gas Under Pressure
- PHYSICAL: Explosive
- PHYSICAL: Self-heating
- PHYSICAL: Pyrophoric
- PHYSICAL: Oxidizer
- PHYSICAL: Organic Peroxide
- PHYSICAL: Self-reactive
- PHYSICAL: Pyrophoric Gas
- [x] PHYSICAL: Corrosive to Metal
- PHYSICAL: In Contact with Water Emits Flammable Gas
- PHYSICAL: Combustible Dust
- PHYSICAL: Hazard Not Otherwise Classified (HNOC)
- HEALTH: Carcinogenicity
- HEALTH: Acute Toxicity
- HEALTH: Reproductive Toxicity
- [x] HEALTH: Skin Corrosion or Irritation
- [x] HEALTH: Respiratory or Skin Sensitization
- [x] HEALTH: Serious Eye Damage or Eye Irritation
- HEALTH: Specific Target Organ Toxicity
- HEALTH: Aspiration Hazard
- HEALTH: Germ Cell Mutagenicity
- HEALTH: Simple Asphyxiant
- [x] HEALTH: Hazard Not Otherwise Classified (HNOC)

Inventory Location and Quantity

Chemical Location: Loading Dock Storage Area
Average Daily Amount: 27
Maximum Daily Amount: 55
Units: gallons / cubic feet / pounds / tons
Chemical Location Confidential EPCRA: Yes / No
Largest Container: 0.005
Annual Waste Amount:
Map # (Optional):
Grid # (Optional):
Days on Site: 365

Inventory Storage Information

- Aboveground Tank
- Underground Tank
- Tank Inside Building
- Steel Drum
- Plastic/Non-Metallic Drum
- Can
- Carboy
- Silo
- Fiber Drum
- Bag
- Box
- Cylinder
- Glass Bottle
- Plastic Bottle
- Tote Bin
- Tank Truck, Tank Wagon
- Tank Car, Rail Car
- [x] Other: battery

Storage Pressure: Ambient / Above Ambient / Below Ambient
Storage Temperature: Ambient / Above Ambient / Below Ambient / Cryogenic

Mixture Components

Hazardous Component Name	CAS Number	% by Weight	EHS
Graphite	7782-42-5	6.00	No
Manganese Dioxide	1313-13-9	45.00	No
Potassium Hydroxide	1310-58-3	8.00	No
Zinc	7440-66-6	25.00	No
			No

Additional Mixture Components:

Additional Chemical/Material Description

Additional Chemical Description Information:

Non-Hazardous Components: Steel (iron CAS# 7439-89-6) Water, Paper, Plastic and Other

Note: 200 batteries per gallon of potassium hydroxide or 11,000 batteries = 55 gallons

Fire Code
This guidance document is intended to standardize the reporting requirements for batteries as required in the Hazardous Materials Business Plan Program (HMBP) of the California Health & Safety Code. For fire-based Unified Program Agencies that also enforce the California Fire Code, it is important to note that recent changes to the Fire Code impact the quantity of batteries allowed in an occupancy which may have an effect on the reporting of these hazardous substances.

The growth and diversity of energy storage systems (ESS), along with recent fire incidents resulting in injuries to firefighters, has necessitated the development and update of fire-life safety codes to establish a minimum set of criteria to safeguard these systems. Both the California Fire Code (Chapter 12 - *Energy Systems*) and NFPA 855 (*Standard for the Installation of Stationary Energy Storage Systems*), establishes the minimum safety criteria required to mitigate the hazards associated with battery energy systems as it relates to their design, installation, operation, and maintenance. Whereas previous fire codes used the battery's weight or volume of electrolyte to determine code applicability; starting with the 2019 California Fire Code, the energy capacity of the battery system is now used for this purpose with battery storage systems capacities exceeding the Threshold Quantities listed below required to comply with additional fire code requirements.

2019 California Fire Code Table 1206.2
Battery Storage System Threshold Quantities

Battery Technology	Capacity
Flow batteries	20 kWh
Lead acid, all types	70 kWh
Lithium, all types	20 kWh
Nickel cadmium (Ni-Cd)	70 kWh
Sodium, all types	20 kWh
Other battery technologies	10 kWh

Analysis of the Health and Safety Code:
The intent of the HSC 25500 is to provide information about hazardous materials to first responders. However, items that are not specifically contained in HSC 25501(n) may not be reportable without an ordinance according to paragraph 3 of that section. The battery work group for the TAG gathered and reviewed a significant amount of information about many different types of batteries in use and available on the market. It was found that most batteries contain hazardous materials in liquid, solid or both forms. It is also determined that these hazardous materials may "pose a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment" (HSC 25501(n)). It would seem they fit the definition of a reportable hazardous material. In some cases, however, these batteries have been excluded from the list of hazardous materials in 25501(n)(2) due to being listed by the manufacturer as an article.

This group considered several different options that could resolve this issue and concluded that the best option may be that the TAG provide guidance that batteries are not considered an "article" for the purposes of HMBP reporting.