Batteries & HHW

Identifying their hazards and how to avoid them.
Why this topic?

• It is pertinent to complying with your permit.
• It effects you and your customers on a daily basis.
• Batteries are becoming more diverse.
• The chemical make-up is ever changing.
• And there is the obvious reason ...

...The safety of you, your customers, everyone around you and the environment.
Why this topic?
Agenda

• Types of Batteries
• Dangers and Hazards Associated with Batteries
• Options for Disposal of Batteries
• Management of Batteries at Your SW Facility
• Activity
• Used Oil & HHW Grants
• How Different Wastes at HHW Events can Effect the Cost
• Educating Your Residents Before the HHW Event
Presenters for the Day

• Dean Robinson, HHW Coordinator, NHDES
  o Dean.F.Robinson@des.nh.gov
  o (603) 271-2047

• Sean Plasse, Program Manager, Northeast Region/Call2Recycle, Inc.
  o Splasse@call2recycle.org
  o (802) 310-4123

• Tara Mae Albert, SWOT Coordinator, NHDES
  o Tara.M.Albert@des.nh.gov
  o (603) 271-3713
TYPES OF BATTERIES
Dean Robinson
TYPES OF BATTERIES

- Button Cell
- Alkaline
- Lead Acid
- Lithium
- Rechargeable
BUTTON CELL BATTERIES

- Have a Pos. and a Neg.
- Hard to Read
- Treat as Universal Waste
BUTTON CELL BATTERIES

Button Cells
Thermostats
Thermometers
Switches
Relays
Other

“Treat them as Mercury Containing Devices”
ALKALINE BATTERIES

1. SAFE
   Toxins removed since 1984

2. S.W.
   OK to throw away

3. Recycle
   Some vendors can recycle them
LEAD ACID BATTERIES

- Heavy metals & acid
- Money Maker
MANAGING LEAD ACID BATTERIES

1. Separate battery poles
2. Must be able to inspect
3. Impervious Surface & under cover
LITHIUM & LITHIUM-ION BATTERIES

Li-ion
LITHIUM ION BATTERIES

7,104 CELLS

1,200 LBS
RECHARGEABLE BATTERIES

Rechargeable = Recyclable
DANGERS & HAZARDS
DANGERS & HAZARDS

Battery fires happen in transport

Lithium Batteries are a DOT Haz-Mat
DANGERS & HAZARDS

Teenage Girl Killed When Her Mobile Phone Explodes While She Is Talking To Relative

https://koko.ng/teenager-girl-killed-when-her-mobile-phone-explodes-while-she-is-talking-to-relative/

Terrifying moment passenger’s hand luggage bursts into flames

https://www.theson.co.uk/news/5670028/fire-video-china-southern-plane-explosion/
How small batteries have become the new child killer: They look innocuous, but batteries cause devastating injuries

The Bottom Line

Swallowed batteries burn through a child’s esophagus in just 2 hours, leading to surgery, months with feeding and breathing tubes, and even death. About the size of a nickel, 20 mm, 3-volt lithium coin cells are the most hazardous as they are big enough to get stuck and burn faster. Secure battery compartments and keep loose batteries away from children.
OFF-GASSING

- Designed to release gasses
- Can build up in confined spaces
SORTING AREA

- Protected from Weather
- Magnification Tools
- Deal with leaking batteries ahead of time
- Bags & Tape
- P.P.E. (Gloves, Glasses, Gasses)

Alkaline
Rechargeable
Lithium
SORTING AREA
CO2, Methane, Ethane, & Ethylene

**DANGER**
- Methane gas

**WARNING**
- Carbon dioxide gas
  - Discharge into nearby space can collect here
  - When alarm operates, vacate immediately
  - Carbon dioxide gas can cause injury or death

No smoking or naked lights
DANGERS & HAZARDS

Transfer Station Fires

Don’t let it be your fault
OPTIONS

1. Vender
   Ship to a certified vendor

2. U.W.C.
   Universal Waste Contract (Mercury)

3. Refuse
   Research other resources
#1 THING YOU CAN DO

Give your customers options!

- Hand Outs -
- Signs -
- Links -
- Keep it Local -
- Other?
KEEP IT LOCAL

Batteries Plus Bulbs
Manchester, NH
(603) 621-0100
Open until 8:00 PM

Batteries Plus Bulbs
Newington, NH
(603) 433-1677
Open until 8:00 PM

Batteries Plus Bulbs
Nashua, NH
(603) 883-5060
Open until 8:00 PM

Batteries Plus Bulbs
Salem, NH
(603) 685-0293
Open until 8:00 PM
KEEP IT LOCAL
IF IT’S RECHARGEABLE...IT’S RECYCLEABLE
FINAL THOUGHTS

Prepare
A good sorting location will reduce confusion. Safety equipment will reduce accidents.

Add Links
Have links on your web page that you can refer residents to when it gets busy.

Educate Residents
Reach out at schools, town days, and throughout the year. Provide handouts, cable TV information, and workshops.

Have Options
Make it easy for residents to find vendors for the things you cannot accept.

Create an Image Library
Take and save photos for training purposes.

Don’t be a Stranger
Reach out to NHDES for help and assistance whenever needed. Let us know about your successes.
Managing Batteries

Sean Plasse
Program Manager, Northeast Region
splasse@call2recycle.org
Battery Awareness
Lithium Battery Fire

Video Shared with Permission from DEM-CON
Call2Reycle’s Defining Moment - June 5, 2017
Tioga County, NY
January 2020
Batteries
Two Battery Types

Primary – One and done.
Rechargeable – Use it more than once.

Latin Roots
Prime (one)
Re (repeat)
DDR Batteries

Damaged, Defective, Recalled LITHIUM batteries.

A Department of Transportation statutory term that ONLY applies to lithium batteries. Declares a hazardous material. Requires CFR 49 certification and procedures.

EPA – Determines ‘hazardous waste.’ Example, NiCd Battery.
DOT – Determines ‘hazardous material.’ Lithium DDR Battery.
Battery Trends
The Dynamic Lithium Battery Market

**Electric dreams**
Manufacturing capacity
Gigawatt-hours per year

<table>
<thead>
<tr>
<th>Company</th>
<th>Capacity (GWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panasonic*(Japan)</td>
<td>2020</td>
</tr>
<tr>
<td>CATL (China)</td>
<td>2017</td>
</tr>
<tr>
<td>BYD (China)</td>
<td>2017</td>
</tr>
<tr>
<td>LG Chem (South Korea)</td>
<td>2017</td>
</tr>
<tr>
<td>Samsung SDI (South Korea)</td>
<td>2017</td>
</tr>
</tbody>
</table>

*Includes Tesla gigafactory*
Internet of Things (IOT)

2020 - 10 billion
2025 - 62 billion

400% Increase in Lithium Manufacturing Capacity
Internet of Things (IOT)
Internet of Everything
Enterprise of Things

- Wearables
- Smart Homes
- Healthcare
- Small Businesses
- Banking
- Education
- Retail
- E-Commerce
- Transportation
- Agriculture
- Smart Cities
- Insurance
- Supply Chain
- Utilities
Lithium Batteries
Winners of the 2019 Nobel Prize in Chemistry
John B. Goodenough, Akira Yshino, M. Stanley

“They have laid the foundation of a wireless, fossil fuel-free society, and are of the greatest benefit to mankind.”
Call2Recycle
The country’s largest, most reliable battery recycling program.

Funded by 300 battery producing stewards.
Call2Recycle Battery Program

Free program for municipalities to recycle rechargeable batteries. Includes free boxes, shipping, and recycling costs.

Improves the fire safety and environmental mission of collection sites.

Call2Recycle can also take non-rechargeable (primary) batteries as a fee-based service.
Battery Recycling
Call2Recycle Mixed-Battery Boxes

DOT approved for 66lbs, mixed battery use.

Display, collections, storage.

No cost to municipal facilities for rechargeable or mixed-use.

Pre-paid, pre-labeled for shipping.
Patented Flame-Resistant Liner

Third-Party Tested - Extensive testing by independent laboratory, withstood up to 1,100 degrees F.

Containment - Prevents flames & heat from spreading outside the box.
Rechargeable Batteries – Free for Munis

Nickel Cadmium (Ni-Cd)  
Lithium Ion (Li-Ion)  
Nickel Metal Hydride (Ni-MH)  
Small Sealed Lead Acid (SSLA/Pb)  
Nickel Zinc (Ni-Zn)
Non-Rechargeable Batteries – Fee Based

**Alkaline: AA, AAA, 6V, 9V, C, D, button cells**

$0.40/lbs + shipping

**Lithium Primary**

$3.75/lbs + shipping
# Minimum Terminal Protection Guidelines

## SHIPPING IN CALL2RECYCLE BOXES

Below are the minimum requirements for preparing household batteries for shipment. When in doubt of the battery type, Call2Recycle recommends the battery be individually bagged or taped.

<table>
<thead>
<tr>
<th>BATTERY TYPE / CHEMISTRY</th>
<th>TERMINAL PROTECTION REQUIRED?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rechargeable</strong></td>
<td></td>
</tr>
<tr>
<td>Nickel Cadmium (Ni-Cd)</td>
<td><strong>9V or Less = NO</strong> (drop in the box)</td>
</tr>
<tr>
<td>Nickel Metal Hydride (Ni-MH)</td>
<td></td>
</tr>
<tr>
<td>Nickel Zinc (Ni-Zn)</td>
<td></td>
</tr>
<tr>
<td><strong>Primary (Select sites only)</strong></td>
<td></td>
</tr>
<tr>
<td>Alkaline &amp; Carbon Zinc</td>
<td><strong>Greater than 9V = YES</strong> Terminal protection REQUIRED</td>
</tr>
<tr>
<td><strong>Rechargeable</strong></td>
<td><strong>12V or Less = NO</strong> (drop in the box)</td>
</tr>
<tr>
<td>Small Sealed Lead Acid (SSL/VPb)</td>
<td></td>
</tr>
<tr>
<td>Lithium Ion (Li-Ion)</td>
<td><strong>Greater than 12V = YES</strong> Terminal protection REQUIRED</td>
</tr>
<tr>
<td><strong>Primary (Select sites only)</strong></td>
<td></td>
</tr>
<tr>
<td>Lithium</td>
<td>All = YES Terminal protection REQUIRED</td>
</tr>
<tr>
<td>Button/ Coin Cell</td>
<td></td>
</tr>
</tbody>
</table>

### Charge Up Safety!

**call2recycle.org/safety**

**Avoid the spark!**

Battery terminals that touch metal surfaces or other batteries can spark, causing a fire or explosion.

**Protect terminals before shipping Bag or Tape Each Battery!**

1. Place each battery into a clear plastic bag.
   - Call2Recycle-provided bags
   - Proveo bags
   - Newspaper bags
   - Ziplock bags

2. If no bags are available, tape the positive (+) terminal with a non-conductive tape.
   - Clear packing tape
   - Electrical tape
   - Snert tape
   - No masking tape; Do not cover chemistry paper

**REMINDER:** Call2Recycle only accepts battery shipments in Call2Recycle boxes or those pre-approved by Call2Recycle.
Do not use any of the following for protecting battery terminals.

Do not put anything else in the box.

- Grocery bags
- Paper bags
- Paraffin or other dipping products
- Masking tape
- Scotch tape
- Plastic bags
For button/coin cells, make a ravioli.

CLEAR packing tape, sticky side up.
Button/coin batteries on the tape with space between each battery.
Cover with a second layer of CLEAR tape.
CellBlock DDR Kits

DDR lithium-ion batteries.
U.S. DOT approved recycling kit.

U.S. DOT Special Permit 20549 that fully complies in transporting hazardous materials.

Pre-paid shipping and recycling. Order online.
www.call2recycle.org
Bulk DDR Kits

132 lbs. of DDR Batteries

U.S. DOT Special Permit 20549. Fully complies in transporting hazardous materials.
High Watt-Hour Box - 300Wh to 800Wh – End of Life

>300 WH is Hazardous Material (even not DDR)
80 volts x 40 amp-hours = 320 watt-hours
Kit Pre-Permitted for 300Wh to 800Wh
For “end of life” only, not DDR.
No CFR Training or Paperwork
Lithium Fire
Heat
Fuel
Oxygen
Toxic Gases
CellBlockEX

Fire-suppression material. 100% recycled glass granules.

Heat – As glass melts, it pulls heat from fire.
Fuel – The porous surface absorbs electrolytes.
Oxygen – Glass melts to form a silicate coating, cutting off O2.

Class D, combustible metals, lithium-ion battery fires.

Non-Toxic – Glass is inert, and also does not chemically react with lithium fire.
Absorption – Granules absorb vapors.
Lithium-Ion Battery Incident Kits (LIBIK)

The Protection You Need
Call2Recycle® offers the highest level of safety with these convenient EHS Kits. Add these safety protocols with the tools you need to quickly extinguish a lithium-ion battery fire.

Fire Shield Blanket
Provides an impervious barrier between the fire fighter and the burning device and increases the suppressive effect of the PED-Pad pillow.
- Constructed from incredibly robust fire-proof fabrics that have undergone rigorous testing.

PED-Pad Fire Suppression Pillow
Designed to be a quick and concise method of extinguishing a lithium-ion battery fire, while protecting the fire-fighter and reducing interaction time.
- Place oven flame to release inner
- CallBlockEX®, our industry trusted and proven extinguishing agent used for fighting lithium-ion battery and device fires.
- CallBlockEX® is mineral-based, entirely environmentally-friendly and non-toxic.

CallBlock High Heat Gloves
These durable, high-heat resistant gloves are designed to protect the user when approaching overheating devices.
- Manufactured using composite textiles made to withstand extreme temperatures.

Convenient wall mount bracket provided. Custom kits and configurations available.
CellBlock Drums for Storage and Transportation

Great solution for storing DDR and E-Waste.

Drums are lined with CellBlockEX granules to filter heat, smoke and fumes, with a vented lid.

Transport lithium-ion batteries when packaged with CellBlockEX.

Access to DOT Special Permit 20549.

Reusable.
Battery Collection & Recycling Services

Charge up battery recycling with best-in-class recycling solutions that are convenient, compliant and safe. Call2Recycle offers turnkey and flexible options to ship in boxes or in bulk. Contact us at 1-877-723-1297 to learn more about these services or to discuss your recycling needs in more detail.

Large Needed Battery & Cellphone Recycling Boxes  $115.00
Large Battery & Cellphone Recycling Box  $65.00
Small Battery & Cellphone Recycling Box  $45.00
Pallet of 50 Small Battery & Cellphone Recycling Boxes  $600.00 - $2,000.00
Pallet of 50 Large Battery & Cellphone Recycling Boxes  $750.00 - $2,500.00

Add to cart  Add to cart  Add to cart  Select options  Select options
Battery Strategic Planning

Battery Program
Budgeting
Facility Layout
Training
Safety Products
Outreach

Future Proofing
thank you!

Sean Plasse
Program Manager, Northeast Region
splasse@Call2Recycle.org

Corporate Headquarters:
1000 Parkwood Circle, Suite 200
Atlanta, Ga 30339
HHW SORTING
EXERCISE
IDENTIFY THE HAZARDS

- Ignitable/Flammable
- Corrosive
- Reactive
- Toxic
- Non hazardous
- Unknown

*Recognize Incompatibles
- Burns or Ignites easily.

- The label says:
  - Combustible. Flammable.
  - Do not use near heat or flame.
  - Do not smoke while using this product.

- Paint, automotive products, thinners and other solvents are the most flammable household products.
Can burn skin/tissue, clothing or other materials.

The label could say:
- Causes severe burns on contact.
- Can burn eyes, skin or throat.

Oven, drain and toilet bowl cleaners are common corrosive products.
- Could create a poison gas when mixed with other products. Explodes when exposed to heat, shock or pressure.

- The label could say:
  - Do not mix with other household products or keep away from heat or pressure.

- Chlorine bleach reacts with many other common cleaners. Household products should never be mixed.
TOXIC/POISON

- Can cause short or long-term illness or death.

- The label could say:
  - Harmful or fatal if swallowed.
  - Use only in a well-ventilated area.

- Pesticides, paint thinners, many automotive products and some cleaners are toxic.
Identify what you see and then figure out which of the characteristic it may have:
- Ignitable, Corrosive, Reactive, and/or Toxic
- Are any of them compatible?
- How should they be stored?
Who Can Apply?

Towns
- Peterborough
  - Planning Commission

Cities
- Portsmouth
  - Solid Waste Districts

Planning Commissions
What is Reimbursable?

HHW

- HHW Events
  - Vendor Expenses
  - Police Support
- Outreach
- Training
- Labor
What is Reimbursable?

Used Oil

• Burner Service
• Repairs
• Concrete Pads
• Fencing
• Anything Collection Related
How Much Can I Have?
HHW Match Grant

HHW facility used in absence of hauler

HHW Facility used to reduce hauler costs

Multiple events and/or multiple communities

Single community holding a single event
Used Oil Gift Grant

$2,500 for a single community

$5,000 for a multiple community collection center
Waste

Focusing on waste management, regulation, and remediation.

Responsible waste management and emergency responses and regulated materials are properly handled and disposed of in order to protect public health and the environment. NHDES works to identify and prompt remediation to restore contaminated sites to productive use while protecting the environment and public health.

- Hazardous Waste
- Solid Waste
- Household Hazardous Waste
- Wastewater
- Spill Response
- Contaminated Sites
- Asbestos
- Septic Systems
Stay on Schedule!

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Event</th>
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<tbody>
<tr>
<td>2014</td>
<td>FEB</td>
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</tr>
<tr>
<td>2014</td>
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<td></td>
</tr>
<tr>
<td>2015</td>
<td>JUL</td>
<td></td>
</tr>
</tbody>
</table>

**Fall**

**Spring**
What to Remember

All HHW applications are due Feb 1\textsuperscript{st} and must be received by NHDES before the grant contracts can be sent out.

Used Oil applications are “first come, first serve” and will be accepted on a rolling basis until the money runs out for the year.

More collection/drop off opportunities = more money.
COST EFFECTIVE COLLECTIONS

What drives up costs?

What gives you the most for your money?
COST EFFECTIVE COLLECTIONS

- Location
- Traffic patterns
- High or low participation (per-capita costs)
- Staff & volunteer labor
Bulbs

State universal waste contract tends to be best price.

<table>
<thead>
<tr>
<th>LAMPS:</th>
<th>Unit of Measure</th>
<th>Unit Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Fluorescent</td>
<td>Price Per Foot</td>
<td>$0.055</td>
</tr>
<tr>
<td>U-Tubes, Circline and Compact Fluorescent</td>
<td>Price Per Lamp</td>
<td>$0.20</td>
</tr>
<tr>
<td>Specialty Mercury Vapor, Metal Halide, LPS, HPH</td>
<td>Price Per Lamp</td>
<td>$0.50</td>
</tr>
<tr>
<td>Broken/ Crushed Fluorescent Lamps</td>
<td>Price Per Pound</td>
<td>$0.50</td>
</tr>
<tr>
<td>Specialty UV Fluorescent</td>
<td>Price Per Lamp</td>
<td>$0.47</td>
</tr>
<tr>
<td>BALLASTS:</td>
<td>Unit of Measure</td>
<td>Unit Cost</td>
</tr>
<tr>
<td>Non-PCB</td>
<td>Price Per Pound</td>
<td>$0.10</td>
</tr>
<tr>
<td>PCB- Non Leaking</td>
<td>Price Per Pound</td>
<td>$0.45</td>
</tr>
<tr>
<td>PCB- Leaking</td>
<td>Price Per Pound</td>
<td>$0.45</td>
</tr>
<tr>
<td>MERCURY DEVICES:</td>
<td>Unit of Measure</td>
<td>Unit Cost</td>
</tr>
<tr>
<td>Intact Mercury Devices</td>
<td>Price Per Pound</td>
<td>$1.45</td>
</tr>
<tr>
<td>RECYCLING KITS - LAMPS</td>
<td>Unit of Measure</td>
<td>Unit Cost</td>
</tr>
</tbody>
</table>
Household Chemicals
Toxic, Corrosive, Flammable, Reactive

• Use HW Vendor

• Be your own permanent HHW facility
  ✓ Training
  ✓ Real Estate
  ✓ Liability
  ✓ Labor
Batteries

- HW Vendor
- Battery Recycling Vendor
  - Used to be free
  - Speak to your vendor
Pharmaceuticals

- Not usually reimbursable under HHW grant
- Law Enforcement (DEA requires double)
- Is a pharmacist required?
Pharmaceuticals

National Prescription Drug Take-Back Day
Turn in your unused or expired medication for safe disposal

Visit www.dea.gov or call 800-882-9539 for a collection site near you.
Sponsored by the U.S. Drug Enforcement Administration
THE COST OF PAINT

Contaminated / Old Gas 2%
Set Up Fees 8%
Solvents 10%
Aerosols 8%
Pesticides 3%
Acids 4%
Oxidizers 4%
Oil Based Paint 61%
Hosting a Successful HHW Event

Five Tips and Tricks
Getting the Word Out

- Social Media
- Newsletters
- TV/Radio
- Information at the TS
- Vendor Events
- Tax Bills
- Visit local schools
- Partner Organizations
Know Your Target Audience

• Who is coming to these events?
  • Residents
  • Old/Young/Families
• Do you have the potential to reach small businesses?
• What are these people bringing in?
Prepare for the Unexpected

- In your advertisements include a phone number for people to call in case they have items of concern.
- Give examples!
  - Foreclosure
  - Meth Lab
  - Old Barn Clean out
Education! Education! Education!

- What is HHW? What is NOT?
- Determine what you can and cannot take.
- Who to EDUCATE???
  - Residents
  - Volunteers
  - Workers
  - SW Operators
  - Vendors

Education & Outreach

Same Messaging to Everyone

Common Goal

Proper Mgmt. of HHW
Prep & Landing

- Know your site
- Prepare your site
- Prepare your volunteers and workers ahead of time