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Backhaul Manual

November 28th – 30th, 2023

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Section 1



Backhaul Cycle & Overview

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Backhaul Cycle and Overview

- 1) Introduction
- 2) Inventory
- 3) Vendor Selection
- 4) Planning
 - a. Location
 - b. Collection
 - c. Packaging Supplies
 - d. Personal Protective Equipment (PPE)
 - e. Training
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- 5) Collection
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Introduction

When looking at the process of backhauling material it may be helpful to observe it as a cycle. Each successive cycle builds into the next. The more cycles that are completed, the more mature the program grows and the more knowledgeable those involved become. Below is an example of common steps involved in executing a hypothetical backhaul project.



Backhaul Cycle

The steps to the cycle are not set in stone; depending on a project or other circumstances, some steps may be omitted, added, occur concurrently or occur in an alternative order. The cycle above no more than a general overview of common aspects to address when backhauling materials.

Inventory

An inventory is the single most important information when planning a backhaul of any materials. Developing an inventory is as simple as answering the following question...

- What needs to be backhauled? and
- How much is there?

Contacting vendors the type and amount of material you have will likely be the first pieces of information they will inquire about. Having an inventory ready should allow potential vendors to provide more accurate quotes and better assistance. Further, a good inventory will allow planners to...

- Prioritize which items will be backhauled,
- Determine the best method of managing materials,
- Determine how much space, labor, packaging materials, and other supplies will be needed,
- Budget the backhaul project, and
- Determine the approximate amount of time a project will take.

In short, the inventory is the framework in which an entire backhaul project can be built around.



Vendor Selection

Once a reliable inventory has been recorded, it can be used to establish the scale of a project and how the materials are to be managed. Knowing the type and quantity of the materials to be managed will help determine what vendors are needed. Examples of the type of vendors that may be needed for a backhaul project include, but are not limited to, the following:

- Shippers/Transporters
- Recyclers
- Waste Disposal Companies
- Hazardous Waste Contractors
- Consultants
- Training
- Equipment/Supply Shops

When determine what sort of vendors you need, it may be helpful to "think backwards." Decide how and where backhauled material will ultimately be managed (disposal, recycle, reclaim, etc...) and work back from there:

- Who will ultimately accept and dispose of the material (i.e. what's the end destination)?
- Who will transport the material to the end destination?
- How will the material get to the transporter?
- What do you need to safely collect and package the material?
- Is there any training, work, or materials needed before collection?

Vetting potential vendors is an important step to help ensure a project runs as efficiently as possible. When obtaining quotes and assessing potential vendors, pricing is important, but also try to evaluate additional aspects such as the following (as relevant):

- Do they provide reasonable transparent pricing?
- Have they performed similar work in Alaska/rural communities?
- Can they provide supplies?
- Can they help administer the logistics?
- Can they provide training your workers?
- Are they available for additional guidance?

Obtaining a good price is important, but you may find that the cheapest vendor is not always the best. Sometimes the optimal vendor is the one that can provide the best service. Knowing all the ways a vendor can contribute to a project ahead of time will help you obtain the best cost, service, and assistance for your project.

Obviously some vendors will be more vital to a project than others; it is worth identifying which vendors will be the most involved and could conceivably be used again in the future. Maintaining good communication and developing long term relationships with vendors will help benefit your future projects and similar projects in rural communities.



<u>Planning</u>

Diligent planning of a backhaul prior to collecting and packaging materials will support the project in a number of ways such as:

- Addressing worker safety
- Determining what of supplies and equipment will be needed
- Ensuring the budget is spent efficiently and appropriately
- Being able to respond to spills and emergency situations

When performing the planning phase of a backhaul project, consider the following aspects:

- Location
- Collection
- Packaging
- Personal Protective Equipment (PPE)
- Training
- Spill/Emergency Response
- Budgeting

Location

When determining what location (or locations) backhaul activities will occur, take into account the full extent of the onsite tasks. Consider how the material will be moved, collected, packaged and loaded. Items to consider include:

- Access...
 - How easy is it for laborers to work in the area?
 - Alternatively, is there a need to limit the public's access to the site?
- Ventilation...
 - If managing HHW or other potential hazards, does the area have adequate ventilation/fresh air access?
- Dry Covered Storage...
 - Can materials that cannot get wet, freeze, or exposed to outdoor elements be stored in a dry covered area?
- Use of Heavy Equipment...
 - Will heavy equipment be needed?
 - Is there room for heavy equipment to operate, if needed?
- Minimize Handling of Material...
 - Is there a central location large enough to hold all materials?
 - Is the collection/staging site near the transporter/loading area?
 - Does the chosen location help minimize the time and effort needed to collect, package, and load materials?
- Minimize Risk in Case of an Emergency...
 - How accessible is the location to emergency personnel?
 - Is there spill and/or fire response equipment available?



- If a fire occurs is there an immediate risk of spreading to other buildings or the surrounding area?
- If a spill occurs is there an immediate risk to wells, lakes, streams, public areas, etc.?

Collection

The inventory should provide a reasonable idea of what how much material will be collected. However, if time, money and supplies allow, collections can be open to businesses and the public to accumulate further material (ex: hold a "collection event"). If a collection event occurs, is important to have an idea of what type and how much material you're willing to accept so that supplies and/or funds aren't overused. Items to consider when preparing to collect or "round-up" material to be backhauled

- What are you collecting?
 - Are specific materials being targeted?
 - What items are NOT acceptable?
 - Are outside organizations and/or the public allowed to bring in more material?
- Resources...
 - Is community outreach needed?
 - Is additional transportation needed to get material to the collection site?
 - Are there any time constraints that could limit the project?
 - How many people are needed to assist with the project?

Packaging

All materials that will be shipped out of a community must be appropriately packaged to ensure material arrives safely intact at the end destination. The inventory should help determine what type and how much packaging materials will be needed.

If there is any confusion on how material should be packaged, reach out to your vendors (shippers, recyclers, contractors, etc.). Good vendors should be able to provide you with assistance such as packaging advice and/or instructions, and in some cases they may be able to sell or supply you with packaging materials.

Some materials may require specific packaging and labeling (ex: Haz Mat, Hazardous Waste, Universal Waste, etc.). Be sure to identify any materials that may require specific packaging or labeling. Again, reach out to vendors for assistance if there are any questions regarding packaging, label, and separating of materials.

Some general considerations regarding packing include:

- Ensure containers are in good condition
- Determine if any specific packaging materials are needed (ex: DOT approved containers, UN rated containers, etc.)
- It typically better to have too overestimate the amount of packaging materials needed
- Identify any additional/supplementary packaging supplies needed (stretch wrap, banding material, boxes, buckets, etc.)
- Determine if any specific labels and/or placards are needed



Personal Protective Equipment (PPE)

To minimize the risk of injury to workers and volunteers, appropriate PPE should be readily available for anyone participating in backhaul activities. The extent of PPE needed is relative to the type of materials and activities an individual is exposed to. The amount of PPE needed is mostly a factor of how many people are participating, the amount of material to be managed, and the duration of project.

Determining the type of PPE needed can be determined using a variety of methods, such as:

- Conduct Risk Analyses for all activities
- Evaluate any legal requirements
- Review Safety Data Sheets (SDSs)for the materials to be handled
- Consult individuals with prior experience
- Contact relevant vendors

In determining what PPE is needed, it would be best to apply a combination methods rather than relying on once source of information. Further, it is better to error on the side of having too much PPE available. Excess PPE can always be utilized during future projects. Additionally, it is important to train anyone assisting with backhaul activities in proper PPE use.

Training

Individuals participating in backhaul activities should be trained relative to the activities they will be performing. Determining and, when relevant, conducting necessary trainings prior to collection should help create a safer work environment and make the project run more efficiently.

The type and extent of trainings needed for a project largely depends on what materials are being managed, the equipment being used, and the experience of individuals assisting with the project. Some general examples of training relevant to backhaul projects include, but are not limited to, the following

- PPE
- Emergency Response/Spill Cleanup/HAZWOPER
- Forklift/Heavy equipment operation
- Safety Briefings
- Procedures, Manuals, Guidelines, etc...

Spill and Emergency Response

If managing materials that pose a risk of spill, fire, release or another situation that can directly threaten human health or the environment, it is imperative that there are plans and equipment in place to quickly and safely respond to the situation.

Use the inventory to identify potentially hazardous materials; what materials are being managed will determine what emergency supplies will be needed. If questions arise, contact relevant vendors for advice and suggestion regarding equipment and cleanup measures.

Common examples of spill and emergency equipment include:

- Fire Extinguishers
- Absorbents
- Acid/Alkali Neutralizers
- Emergency Eye Wash
- First Aid Kits
- Spill Pads, Booms, Spill PPE, etc...



Additionally, developing spill/emergency response cleanup plans and/or procedures in conjunction with worker training will help ensure a quick and thorough response if a spill or emergency situation occurs.

Budgeting

A combination of an accurate inventory, quotes from vendors, and thorough planning should allow for the development of a reasonably accurate budget. Careful planning and budgeting will help determine and prioritize what materials can be managed and backhauled from a community. Further, a good estimate of expenses can help identify during the planning phase...

- 1. Shortfalls where additional funds or donations can be solicited ahead of time, or
- 2. Surpluses where additional supplies, services or activities can be added.

Having a detailed budget is also beneficial after the project is complete. Comparing estimates with true costs help with future planning and can be shared with other communities conducting similar projects.

Collection

With good planning the collection and subsequent packaging of materials should go efficiently. Further, good planning should folks to respond to unforeseen obstacles in a more effective manner. When collecting and packaging materials for backhaul it is helpful to accomplish the following:

- Record an estimate of the types and quantities of materials collected.
- Sort materials into like types and categories (unless mixing is allowed by vendors/transporter).
- If feasible, package materials in preparation for shipment.
- Ensure all packaged materials are fully contained and secure.
- Ensure all materials are appropriately labeled, when applicable.

After collection is complete, it becomes easier to assess if any additional materials or shipments will be needed. Further, if material is consolidated and packaged efficiently, there could be additional space available within a shipping container for further material.

Once all the material has been collected, it would be good to contact relevant vendors (ex: recyclers) and inform them of the type and quantity of materials you intend to backhaul. During this time, it allows the opportunity to discuss any questions or concerns about the project with vendors. Further, if changes are needed, it is best for them to occur prior the material is loaded and shipped.

Staging

Under ideal conditions packaged material is loaded and shipped shortly after collection. However, sometimes packaged and unpackaged materials have to be staged/stored for a period of time prior to loading and shipment. When storing or staging materials prior to shipment, consider the following:

- Keep materials sorted into like items and categories
- Label items, as appropriate
- Limit access to people not involved in the project
- Keep storage and staging areas clean and organized (messes have a tendency to expand, grow, and attract trash).
- Utilize dry covered areas for materials that cannot get wet.
- Periodically inspect the staging area; cleanup as needed and reinforce packaging if it becomes weathered.



Maintaining a clean and organized staging area will help facilitate loading and shipping when the time arises. Having materials already packaged and labeled in the staging area with further help with efficient loading and shipping.

<u>Shipping</u>

When loading materials to be shipped, ensure they are loaded in a manner that prevents any accidental breakage or chance of material becoming unpackaged during transit:

- Ensure all pallets are packaged securely and labeled appropriately.
- Try to balance the weight inside the container as well as possible.
- Block and/or brace heavy material into place, as needed (ex: pallets of lead acid batteries)
- When double stacking pallets of material ensure...
 - o Denser, heavier materials are on the bottom layer
 - Bottom pallets are built so they have as flat and level top as possible.
 - Top layers are stable and sit squarely on top of the lower pallet.
- For material near the container door...
 - Ensure the last pallets are blocked, braced, tied, and/or ratcheted into place so they cannot shift, spill or break during transport.
 - Any loose material (i.e: large items not secure on pallets) are blocked, braced, tied, and/or ratcheted securely in to place.

If material is not secure or comes unpackaged while in transit, material spilling out becomes a serious safety hazard for the individuals responsible for opening the container doors, offloading the pallets, and handling the material.

Once a shipment has gone out, notify the recipient vendor of the incoming shipment. Once the material has been received by the vendor and all accounting is taken care of, ensure the vendor provides weights/quantities of backhauled materials so they can be documented.

<u>Review</u>

Upon completion of a backhaul project, it is beneficial to:

- 1) Review the process
 - Was the planning and budgeting accurate?
 - What worked, what didn't, what should be done differently next time?
 - Was there an adequate amount of supplies, training, packaging materials?
 - Which vendors were helpful? Would you use any different vendors next time?
- 2) Save records of the project
 - Itemize expenses
 - Record number of shipments, material type, weight
 - Which vendors were utilized?
 - How were materials packaged, where were they sent, what supplies were used?

The review and record keeping process can be summarized in a report. Having a written record will help for future planning. Further, in the case of employee turnover, having a written records or reports provides valuable information to incoming employee (so they don't have to plan the next backhaul from scratch). Additionally, documenting a backhaul can also be useful when developing plans, manuals, or procedures relevant to solid waste.



Conclusion

No backhaul projects are the same and each have a unique set of challenges. It is impossible to provide a "*one size fits all*" procedure for backhauling materials from rural communities. However, it is the authors' hope that this document can provide a framework and guidance for individuals tasked with organizing and carrying out backhaul projects.

The subsequent sections in this document will provide more detailed guidance on how to manage a variety of hard-to-handle materials. Though each section provides comprehensive information regarding collecting, packaging, and shipping various materials, it is ultimately the user of this document's responsibly to ensure all backhaul materials are handled and managed in a safe and legal manner.

Further, there are many additional resources available to assist communities with backhaul projects. There is an abundance of smart and helpful individuals statewide willing to assist and share their knowledge. Utilizing multiple resources only increases the chance of success; the more successes there are, the stronger and more robust our statewide backhaul effort will become.

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Section 2



Planning

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Planning

- 1) Inventory Sheets (Blank)
- 2) Worker Training
- 3) Supply Lists



Note that your total materials to be backhauled equals what you have now plus what you will accumulate before the barge/plane gets there. If you are planning a backhaul for next year or the year after, you can calculate how much you will generate each year in the meantime by using the form/spreadsheet at this link: www.zendergroup.org/docs/avg_annual_generation_future_backhaul.xls

Date the inventory was carried out:_____

Electronics

| Item | Description | Quantity (write in the number & circle count or pounds) | Avg weight of single item in pounds | Estimated total weight of wastes in pounds | How the materials should be prepared | Are your materials prepared? (circle one) |
|----------------------|-------------|--|---|--|--|--|
| Televisions | | Count / Pounds | 50 | | Stacked on pallets or contained boxes. | Yes No Partially |
| Computer Monitors | | Count / Pounds | 20 | | Stacked on pallets or contained boxes. | Yes No Partially |
| Computer Towers | | Count / Pounds | 30 | | Stacked on pallets or contained boxes. | Yes No Partially |
| Laptops | | Count / Pounds | 7 | | Stacked on pallets or contained boxes. | Yes No Partially |
| Other Electronics | | Count / Pounds | | | Stacked on pallets or contained boxes. | Yes No Partially |

Household Hazardous Wastes

| Item | Description | Quantity (write in the number & circle count or pounds) | Average weight of single item in pounds | Estimated total weight of wastes in pounds | How the materials should be prepared | Are your materials prepared? (circle one) |
|--|-------------|---|--|--|---|---|
| Fluorescent light bulbs | | Count / Pounds | 0.20 | | Contained in a sturdy box or container (ideally the original box). Seal seams and corners (with tape). Ship boxes full to prevent breakage. | Yes No Partially |
| Fluorescent tube lights (4 ft tubes) | | Count / Pounds | 0.75 | | Contained in a sturdy box or container (ideally the original box). Seal seams and corners (with tape). Ship boxes full to prevent breakage. | Yes No Partially |



Household Hazardous Wastes

| Item | Description | Quantity (write in the number & circle count or pounds) | Average weight of single item in pounds | Estimated total weight of wastes in pounds | How the materials should be prepared | Are your materials prepared? (circle one) |
|---|-------------|--|--|--|---|---|
| Batteries – Household | | Count / Pounds | 0.05 | | Contained in a 5 gallon bucket (or similar container). Li, Li-Ion, Ni-MH and batteries over 9-volts need to have their terminals secured (i.e. taped) to prevent short circuits/fires. | Yes No Partially |
| Batteries – Lead Acid | | Count / Pounds | From: Boats = 40 ATV's = 12 Snogo = 12 Car/truck = 40 | | Shipping by air – Contained in a DOT approved container or Fish tote w/lid (Fish totes require a special permit). Terminals must be secured to prevent short circuits/fires. Shipping by land/sea – Stacked on a pallet or within a sturdy container. Terminals must be secured to prevent short circuits/fires. | Yes No Partially |
| Mercury Devices (Thermometers, Thermostats, Switches, etc.) | | Count / Pounds | | | Devices should be double bagged (using plastic – such as a ziplock bag). All devices should be sealed in a plastic container (such as a plastic 5- gallon bucket). | Yes No Partially |
| Paints | | Count / Pounds | | | Paints should be separated into petroleum based and water based paints. | Yes No Partially |
| Full 55 gallon drums of used oil | | Count / Pounds | 600 | | Used Oil is stored in labeled leak-proof containers and is <u>not</u> mixed with other materials. | Yes No Partially |
| Full 55 gallon drums of antifreeze | | Count / Pounds | 600 | | Glycol/Antifreeze is stored in labeled leak-proof containers and is <u>not</u> mixed with other materials. | Yes No Partially |
| Other HHWs | | Count / Pounds | | | Material is stored in labeled leak-proof containers and is <u>not</u> mixed with other materials. | Yes No Partially |



Scrap Metals

| Item | Description | Quantity (write in the number & circle count or pounds) | Average weight of single item in pounds | Estimated total weight of wastes in pounds | How the materials should be prepared | Are your materials prepared? (circle one) |
|---|-------------|---|--|--|---|---|
| Household Refrigerators /Freezers | | Count / Pounds | 250 | | No food or other material is left inside the unit. Freon has been removed. | Yes No Partially |
| Business Refrigerators /Freezers | | Count / Pounds | 1000 | | No food or other material is left inside the unit. Freon has been removed. | Yes No Partially |
| Washers/ Dryers | | Count / Pounds | 200 | | No material is left inside the unit. Mercury switches have been removed (if present). | Yes No Partially |
| Wood Stoves, Cooking Stoves | | Count / Pounds | 200 | | No material is left inside the unit. Mercury switches have been removed (if present). | Yes No Partially |
| ATVs | | Count / Pounds | 800 | | Batteries removed, All fluids drained, Tires removed, Miscellaneous materials taken off. | Yes No Partially |
| Snow- machines | | Count / Pounds | 1000 | | Batteries removed, All fluids drained, Tires removed, Miscellaneous materials taken off. | Yes No Partially |
| Cars/Trucks | | Count / Pounds | 2000 | | Batteries removed, All fluids drained, Tires removed, Miscellaneous materials taken off. | Yes No Partially |
| Aluminum Skiffs/Boats | | Count / Pounds | 1000 | | Batteries removed, All fluids drained, Tires removed, Miscellaneous materials taken off. | Yes No Partially |
| Outboard Motors | | Count / Pounds | 30-200 | | All fluids drained. | Yes No Partially |
| Heavy Equipment | | Count / Pounds | 10,000 | | Batteries removed, All fluids drained, Tires removed, Miscellaneous materials | Yes No Partially |



Scrap Metals

| Item | Description | Quantity (write in the number & circle count or pounds) | Average weight of single item in pounds | Estimated total weight of wastes in pounds | How the materials should be prepared | Are your materials prepared? (circle one) |
|--|-------------|---|--|--|---|---|
| | | | | | taken off, Metal pieces cut into appropriate sizes. | |
| Empty 55 gallon drums | | Count / Pounds | 50 | | Emptied. No standing fluid or material within. | Yes No Partially |
| Fuel Tanks | | Count / Pounds | | | Emptied. No standing fluid or material within. | Yes No Partially |
| Nonferrous Items (Aluminum Cans, Copper Pipes, Brass, etc.) | | Count / Pounds | | | Items are separated (to maximize value). Like items are stacked on pallets or contained boxes. Is the material baled? | Yes No Partially |

Other notes:

For more information about backhaul and other backhaul supplies go to: <u>http://www.zendergroup.org/backhaul.html</u>

For assistance with backhaul or further information, contact Zender Environmental at 907 277 2111, <u>ssebalo@zendergroup.org</u> Or see this document for regional/statewide resources: <u>www.zendergroup.org/docs/Who to contact for backhaul assistance.pdf</u>

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The following training topics that workers involved in Backhaul programs should consider. When applicable, certain trainings are required by regulation:

| Training Component | Description & Further Information |
|---|---|
| General Workplace Safety | General Workplace Safety involves a safety orientation specific to the position and the site(s) where trainees will be performing work activities. More extensive worker safety training, such as OSHA 10 & OSHA 30, are also available. Employers should determine which safety training(s) best fit their programs – <u>29 CFR 1910</u> |
| Personal Protective Equipment (PPE) | OSHA requires employers to train employees when PPE use during work is required by regulation – $29 \text{ CFR } 1910.132(f)$ |
| Hazardous Communication (HazCom) | OSHA requires employers to inform & train employees regarding any hazardous chemicals in their work area. This includes initial assignment (ex: upon hire), and whenever a new chemical hazard the employees have not previously been trained about is introduced into their work area – <u>29 CFR 1910.1200(h)</u> |
| Hazardous Materials Regulations (HMR) | DOT requires employers to provide HMR training for any employee involved in the preparation and transportation of hazardous materials – $\frac{49 \text{ CFR } 172.700}{172.700}$ |
| Collection, Handling, & Packaging Best Practices | Employer should provide best practices for safe and proper handling and packaging of backhaul materials. If any backhaul materials are classified as HazMat, then this becomes a requirement under DOT's HMR training regulations (see above) |
| Universal Waste Management | The EPA requires any organization that is a small quantity handler of universal waste to train employees (who handle or have responsibility for managing universal waste) in the proper handling and emergency procedures appropriate to the type(s) of universal waste handled $- \frac{40 \text{ CFR } 273.16}{100000000000000000000000000000000000$ |
| Hazardous Waste Operations and Emergency Response (HAZWOPER) | OSHA requires all employees (such as, but not limited to, equipment operators, general laborers – including supervisors & managers) exposed to hazardous substances, health hazards, or safety hazards to receive training regarding hazardous waste operations that could expose them to hazardous substances, safety, or health hazards. Regulations define which employees require 24 hr training vs. 40 hr training – <u>29 CFR 1910.120(e)</u> |
| Powered Industrial Truck (PIT – a.k.a Forklift) | OSHA requires employers train and evaluate powered industrial truck operator to ensure employees are competent to operate a powered industrial truck safely – $\underline{29}$ CFR 1910.178(I) |
| Heavy Equipment Operation | In general, heavy equipment operator training requirements are the same as powered industrial truck operator training requirements – <u>29 CFR 1926.602(d)</u> |
| Lockout-Tagout | OSHA requires employers to train authorized and affected employees as part of their energy control program. The program and employee training must communicate the knowledge and skills required for the safe application, usage, and removal of energy controls used by the organization – $29 \text{ CFR } 1910.147(c)(7)$ |
| Respirators (including volunteer-use) | OSHA requires employers to provide training to all employees who are required to wear respirators in carrying out their work activities. If respirators are not required, but are available for volunteer use, then employers must provide employees basic information regarding respirator use (as found in the regulations) – $\underline{29 \text{ CFR}}$ $\underline{1910.134(k)}$ |

Note, this list is not comprehensive and additional training requirements and programs may be required, dependent on the worker activities and worksite conditions. Please review your program's processes & practices to develop a compliant & comprehensive worker training program.



Backhaul Supplies

E-waste Packaging

• Stretch Wrap (18-in, 80 Gauge or similar)

Fluorescent Lamp Packaging

- Lamp Boxes (use original, when possible)
- Packaging Tape
- Tape Gun

Lead Acid Batteries Packaging

- Strapping
 - Strapping (Metal or Plastic)
 - Strapping Clips
 - o Tensioner
 - Sealer (Metal Strapping)
 - Cart (Metal Strapping)
- Vermiculite
- Insulating Material (Cardboard, Plywood, Foam Board, Waffle Board, etc.)
- Electrical Tape, Plastic Spray, Other means of insulating terminals

Battery Spill Cleanup

- Baking Soda
- Absorbent (Vermiculite, Kitty Litter, etc.)
- Broom
- Dust Pan
- Heavy Mil Plastic Bags
- Buckets w/lids (UN rated if available)

General Spill Cleanup

- Oil absorbent pads
- Universal absorbent pads

Spill PPE

- Chemical Resistant Gloves
- Chemical Apron (when needed)
- Chemical Resistant Suit (when needed)
- Berm
- Safety Goggles
- Nitrile Gloves

General PPE

- Work Gloves
- Safety Glasses
- Side Shields (when needed)
- Steel Toed Work Boots (or equivalent)
- Hi Vis Vest
- Ear Plugs/Hearing Protection
- First Aid Kit (working in the field)
- Fire Extinguisher

General Tools

- Socket Set
- Screw Drivers/Screw Gun (Philips, Flat Head, Hex, Allen, etc.)
- Wire Cutters/Diagonal Cutters
- 3-5 lb Sledge Hammer
- Punch
- Box Cutters
- Reciprocating Saw (i.e. Sawzall)
- Metal cutting blades
- Buckets with sealing lids

Junk Vehicle Preparation

- 55-gal Drums (Oil, Antifreeze, Fuel)
- Hand Pumps (Fluid extraction)
- Hoses (for hand pumps)
- Drain Pans
- Funnels
- Tire Iron (or equivalent)
- Non-Sparking Punch (ex: Brass Punch)
- R134a and R12 Couplers for refrigerant recovery.

Note that Junk Vehicle Preparation would require refrigeration recovery, when present.

Refrigerant Recovery

- Recovery Pump
- Manifold Gauge Set
- ¹/₄ inch charging hoses (at least 4)
- Extra Gaskets (for charging hoses)
- Piercing Clamps (at least 2)
- Recovery Cylinder (at least one 30lb cylinder)
- Hand Torch (small propane Torch)
- Extension Cords
- Generator (if no power is available)
- Scale (for weighing cylinders)

Labels

- #8 Corrosive
- #8 Corrosive Placards
- #9 Miscellaneous
- #9 Miscellaneous (Lithium Battery)
- #2 or 2.2 Nonflammable compressed gas (refrigerant cylinders)
- Universal Waste
- Up Arrows (if shipping wet batteries in a tote)
- Cargo Aircraft Only (if shipping wet batteries by air in a tote)



Suggested Backhaul Supplies

| Items | General | E-waste | Fluorescent | Household Batteries | Lead Acid Batteries | Refrigerant Recovery | Junk Vehicle Pren* |
|---|---------|---------|-------------|------------------------|------------------------|-------------------------|-----------------------|
| Packaging Supplies | | 1 | Lampo | Buttonioo | Batteriee | Receivery | Пор |
| ¹ / ₄ inch recovery hoses | | | | | | X | |
| 3-5 lb Hammer | X | | | | | X | X |
| 55 gallon Drums | | | | | | | X |
| Box Cutter | X | | X | | | | |
| Buckets w/sealing lids | X | | | X | X | | X |
| Cardboard (scrap) | | | | | X | | |
| Drain Pans | | | | | | | X |
| Electrical Tape | | | | X | X | | |
| Extension Cord | | | | | | Х | |
| Extra Gaskets (for charging hoses) | | | | | | Х | |
| Foam Board | | | | | X | | |
| Funnels | | | | | | | X |
| Generator | X | | | | | X | |
| Hand Pumps | | | | | | | X |
| Hand torch | | | | | | Х | |
| Hoses | | | | | | Х | |
| Lamp Boxes | | | X | | | | |
| Manifold gauge set | | | | | | X | |
| Metal cutting blades (for Reciprocating Saw) | X | | | | | | X |
| Non-Sparking Punch | | | | | | | X |
| Packaging Tape | X | X | X | X | | | |
| Piercing Tools | | | | | | Х | |
| Plastic Spray | | | | X | X | | |
| Plywood | | | | | X | | |
| Punch | | | | | | X | X |
| Reciprocating Saw (ex: Sawzall) | X | | | | | | X |
| Recovery Cylinder | | | | | | X | |
| Refrigerant Recovery Pump | | | | | | X | |
| Scale | | | | | | X | |
| Screw Drivers | X | X | | | | | |
| Socket Set | X | X | | | | | |
| Strapping | X | X | | | X | | |
| Stretch Wrap | X | X | | | X | | |
| Tape Gun | X | | X | X | | | |
| Tire Iron (or equivalent) | | | | | | | X |
| Waffle Board | | | | | X | | |
| Wire Cutters/Diagonal Cutters | X | X | | | | X | X |



| Items | General | E-waste | Fluorescent | Household Batteries | Lead Acid | Refrigerant Recovery | Junk Vehicle |
|---|---------|---------|-------------|------------------------|-----------|-------------------------|--------------|
| Spill Cleanup Supplies | | | Lamps | Datteries | Batteries | Recovery | Пер |
| Absorbent (Vermiculite, Kitty Litter, etc.) | X | | | | X | | X |
| Baking Soda | | | | | X | | |
| Broom | X | Х | X | | X | | |
| Buckets w/lids | X | X | X | X | X | X | X |
| Dust Pan | X | X | X | | X | | |
| Heavy Mil. Plastic Bags | X | | X | X | X | | |
| Oil Absorbent Pads | X | | | | | | X |
| Universal Absorbent Pads | X | | | | | | X |
| PPE | | | 1 | | | | |
| Absorbent Berm | X | | | | X | | X |
| Chemical Resistant Apron | | | | | X | | |
| Chemical Resistant Gloves | | | | | X | | |
| Chemical Resistant Suit | | | | | X | | |
| Ear Plugs/Hearing Protection | X | | | | | | |
| Eyewash | | | | | X | X | X |
| First Aid Kit | X | X | X | X | X | X | X |
| Fire Extinguisher | X | | | X | X | | X |
| Hi Vis Vest | X | X | X | X | X | X | X |
| Nitrile Gloves | X | | | X | X | | X |
| Safety Glasses | X | X | X | X | X | X | X |
| Safety Goggles | | | | | X | | |
| Side Shields (when needed) | X | X | X | X | X | X | X |
| Steel Toed Work Boots (or equivalent) | X | X | X | X | X | X | X |
| Work Gloves | X | X | X | X | X | X | X |
| Labels | | | | | | | |
| #2 or 2.2 Nonflammable compressed gas | | | | | | X | |
| #8 Corrosive | X | | | X | X | | |
| #8 Corrosive Placards | X | | | X | X | | |
| #9 Miscellaneous | | | | X | | | |
| #9 Miscellaneous (Lithium Battery Specific) | | | | X | | | |
| Cargo Aircraft Only | | | | X | X | | |
| UN3091 (Lithium Primary) | | | | X | | | |
| UN3480 (Lithium Ion) | | | | X | | | |
| Universal Waste | X | | X | X | X | | |
| Up Arrows | X | | | | X | | |

* Please note that Junk Vehicle Preparation would require refrigeration recovery, when present

Common Landfill Equipment and Products

| Item | Brand/ Model/or Supplier | Contact Info |
|---|---|---|
| GLASS CRUSHER | | |
| | | Joseph Trujillo, |
| Glass Crusher | Cemco Glass Gator | joseph@cemcoturbo.com |
| USED OIL BURNERS | | |
| Smart Ash burner | Smart Ash from Spill Shield | lark@spillshield.com |
| Oil away attachment for Smart Ash | Smart Ash from Spill Shield | lark@spillshield.com |
| | | Doug Huntman |
| Used Oil Furnace | Energy Logic | dhuntman@dbcalaska.net |
| | | Nenana Heating Services, David Shaw |
| Used Oil Furnace | Clean Burn CB 140 with Recycling Center | NHSI@alaska.net |
| BURN UNITS | | |
| | Using whatever local materials are | |
| Homemade burn unit | available | contact your local craftsman |
| | | christokmarshall@hotmail.com; |
| Tok Burn unit | Tok Welding | www.alaskanstoves.com |
| Tire Mounted serves population up to 250 | Tok Welding | |
| Skid Mounted serves population up to 475 | Tok Welding | |
| | | dconstantine@scsalaska.com or |
| Summit Burn unit | Summit Consulting Services Inc | scsalaska.com |
| Summit #2, serves up to 100 people | Summit Consulting Services Inc | |
| Summit #4, serves up to 300 people | Summit Consulting Services Inc | |
| Summit #10, serves up to 900 people | Summit Consulting Services Inc | |
| Summit #12, serves up to 1200 people | Summit Consulting Services Inc | |
| FENCING | | |
| | | aaafenceak.com Jeffery Johnson |
| AAA Fencing | 8 ft. chain link fencing | jeffery@aaafenceak.com |
| | | amefence.net. Alex Wiita |
| ACME Fencing | 8 ft. chain link fencing | alex@acmefence.net |
| SIGNANGE | | |
| | | |
| | | Vital Signs, Sign Pro, Alcan Signs, Signs |
| Aluminum | reflective backing | Now. Arctic Signs. Action Signs. etc. |
| Plastic or Vinyl | last longer when backed with plywood | Same as metal Signs |
| | last longer when backed with prywood | |
| | | containerspecialtiesak.com: |
| 40ft FOB ANC | Container Specialties Alaska | akcontainer com |
| | | containerspecialtiesak com: |
| 20 ft. FOB ANC | Container Specialties Alaska | akcontainer.com |
| | Summit Logistics | summitlogisticsalaska.com |
| 20Ft FOB FAI | Summit Logistics | summitlogisticsalaska.com |
| Contact your Local Barge Service | | |
| FISH TOTES | Arctic Fire and Safety | arcticfireandsafety.com |
| | Appion G5Twin, Bobinair BG3, Fieldniece | Highly recommend training prior to |
| FREON EXTRACTION FOLUPMENT | MR45 (can buy on Amazon) | nurchase |
| | | ADEC Solid Waste Program rural |
| | ADEC | landfill specialist |
| SMALL COMPACTOR/CAN CRUSHER | | |
| SMALL COMPACION CAN CROSHER | | Mark Montzor at |
| Proumatic Can Cruchar | Mil tok 2101 cap crushor | mmontzer@miltekuse.com |
| | | minentzei@mitekusa.com |
| | | |
| 4 Drum Spill Containment Pallet w/ drain | ULINE | uline.com |
| Roll Top Hardcover Spill Pallet (2 Drum) for | | |
| outdoor storage | New Pig | www.newpig.com |
| 20 Gallon Universal Spill Kit for oil, coolant, | | |
| and solvents | New Pig | www.newpig.com |
| Oil Only absorbent Pads-Box of 100 | New Pig | www.newpig.com |
| COLLECTION/STORAGE/HHW SHED | Spenard Builders Supply | |
| 12X16 All Purpose Shed, assembly required | Spenard Builders Supply | sbsalaska.com |
| 10X12 Shed, assembly required | Spenard Builders Supply | sbsalaska.com |
| 8X8ft Shed, assembly required | Spenard Builders Supply | sbsalaska.com |
| FIRE SUPPRESSION PUMPS | | |
| JJS Fire Supply | Home Firefighting Pump System | jjsfiresupply.com |
| Arctic Fire and Safety | Honda portable pump | arcticfireandsafety.com |
| COLLECTION TRAILERS AND BINS | | |
| Stationary Collection Bin | Tok Welding | see above |
| Wheeled Collection Trailer | Tok Welding | |
| 3 cubic yd. roll off dumpster, bear proof | Summit Consulting Services Inc | see above |
| Collection Trailer 4 cubic yd. | Summit Consulting Services Inc | |

This list was compiled and provided by The Alaska Department of Environmental Conservation - Solid Waste Program

NOTE: This is not an exhaustive list of products and equipment nor meant as preferential list of vendors. For informational purposes only.

November 28th – 30th, 2023

Section 3



Packaging Guidelines & Best Practices

November 28th – 30th, 2023

Packaging Guidelines & Best Practices

- 1) Electronics
 - a. Overview
 - b. Packaging Guidance
- 2) Fluorescent Lamps
 - a. Overview
 - b. Packaging Guidance
- 3) Mercury Bearing Devices
 - a. Overview
 - b. Packaging Guidance
- 4) Wet Batteries (Lead Acid & Ni-Cad)
 - a. Overview
 - b. Packaging Guidance Pallets
 - c. Packaging Guidance Totes
- 5) Household Batteries
 - a. Overview
 - b. Packaging Guidance General
 - c. Packaging Guidance Individual Chemistries



Inventory Estimates

The following are rough average weights and estimates that can be used for planning purposes:

| Material | Avg. Weights | Estimated Quantity per Pallet | Estimated Pallet Weights |
|-------------------------|-----------------|----------------------------------|--------------------------------|
| CRT Monitors | 35 lbs | 18 CRT Monitors (9 per layer) | CRT Pallet: 500-600 lbs |
| CRT TV | 65 lbs | 8 TVs per pallet (4 per layer) | TV Pallet: 400-500 lbs |
| LCD Monitors | 13 lbs | 30-40 LCDs per Pallet | LCD Pallet: 300-500 lbs |
| Computer Towers (CPUs) | 23 lbs | 40 CPUs per pallet | CPU Pallet: 700-800 lbs |
| Mixed/Misc. Electronics | Varies | Varies | Mixed Electronics: 500-600 lbs |

Personal Protective Equipment (PPE)

Suggested PPE for the consolidation and packaging of electronic waste includes the following items:

- o Gloves
- Eye protection/Safety Glasses

Supplies/Packaging Materials

Suggested supplies and packaging materials for preparing electronic waste for backhaul includes the following items:

- o Sturdy Pallets
- o Stretch Wrap (80 gauge or similar)
- Miscellaneous Boxes (For containing small items that would otherwise fall through a pallet, as needed)
- Miscellaneous Tools that may be of use (Wire cutters, Screwdrivers, Hammer, Sockets, etc.)

Spill Cleanup/Emergency Response

In general, electronic waste does not pose a significant spill threat or potential emergency situation.

- o Broom/Brush
- o Buckets with lids
- o Dust Mask

General Packaging Guidelines

The following general packaging guidelines and notes apply to packaging and shipping electronic waste for recycling:

- If possible, package like materials on the same pallet. This should help achieve the best value for the material.
- Choose pallets that are not split, broken, or otherwise significantly damaged. Pallets should be able to support the full load of the packaged material.
- Materials on pallets should be wrapped tightly with stretch wrap. Material should not shift, spill, or collapse while being transported.

More detailed packaging guidelines are provided in the *Electronic Waste – Packaging Guidance* section.

Labeling

There are no labeling requirements for electronic waste. Be sure to check with transporters and vendors to see if there are any labeling requirements specific to them.

Shipping

If possible, staged materials should be kept dry prior to shipment. Individual boxes or full pallets of material may be shipped via plane, truck, or barge. Be sure to check with transporters and vendors to see if there are any additional requirements prior to shipping.



Electronic Waste Packaging Guidance

Smaller Shipments

Small shipments of electronics do not have to be palletized. Electronics just need to be packaged in cardboard boxes.





communities

Please do not send miscellaneous office equipment, or other nonelectronic items such as binders, notebooks, towels, etc.

Be sure to contact your recycling vendor to determine what materials are acceptable for electronic recycling.

Pallatizing Miscellaneous Electronics

Many times what may seem like a lot of material can actually be consolidated into a small area. This is the advantage of packaging miscellanous electronics on pallets.



Place heavy and flat items on the pallet first. This will build a strong, stable foundation. Build up the pallet of material. A good stopping point is when the material is between waist and chest height.

80-gauge strechwrap works well for wrapping electronics. To tightly wrap the pallet, pull the stretchwrap tight as you go around the corners. When finished wrapping, give the material a push to check how tightly bound it is. Continue wrapping if needed.



Finishing off a pallet by tightly securing it with stretchwrap



Electronic Waste

Packaging Guidance

Palletizing Computer Monitors

Begin placing computer monitors on a pallet. Start with one on each corner and one in the middle, all positioned facedown. Try to use the monitors with the flattest faces and backs for the first layer.

Next, place monitors face up between face down monitors. The curves in the monitors should allow them to fit together snugly (see below).





Monitors will normally fit together nicely when using the face up/face down pattern





Start the second layer, placing the monitors the same way as the first layer. Next, use stretchwrap to secure the load. 80-gauge strechwrap works well for wrapping monitors. To tightly wrap the pallet, pull the stretchwrap tight as you go around the corners. When finished wrapping, give the stack a push to check how tightly bound it is. Continue wrapping, as needed.

Palletizing Other Similar Electronics

If a large quantity of electronics has been collected, then it may be possible to palletize computer towers, televisions, and printer separately. Packing materials separately may help reduce recycling fees.



Computer Towers



Televisions

Printers



Inventory Estimates

The following are rough average weights and estimates that can be used for planning purposes:

| Lamp Length | Boxes | Drums | Gaylord/Pallet Box |
|-------------|----------------------------------|-----------------------------------|-----------------------------------|
| | Appx Weight: 35 lbs | Appx Weight: 65 lbs | Appx Weight: 600 lbs |
| 4-ft Lamps | <u>Appx Qty</u> : T12 – 64 lamps | <u>Appx Qty</u> : T12 – 120 lamps | <u>Appx Qty</u> : T12 – 800 lamps |
| | T8 – 120 lamps | T8 – 240 lamps | T8 – 1200 lamps |
| | Appx Weight: 30 lbs | Appx Weight: 60 lbs | |
| 8-ft Lamps | <u>Appx Qty</u> : T12 – 25 lamps | <u>Appx Qty</u> : T12 – 60 lamps | Not Applicable |
| | T8 – 50 lamps | T8 – 120 lamps | |

Personal Protective Equipment (PPE)

Suggested PPE for the consolidation and packaging of fluorescent lamps includes the following items:

- Gloves (if possible, cut resistant gloves)
- o Eye Protection/Safety Glasses
- o Long sleeves

Supplies/Packaging Materials

Suggested supplies and packaging materials for preparing fluorescent lamps for backhaul includes the following items:

- o Sturdy Lamp Boxes (if possible, utilize the original lamp boxes)
- o Fiber Drums, if appropriate
- Gaylord/Pallet Boxes, if appropriate
- Packaging Tape
- o Stretch wrap (80 gauge or similar) if shipping multiple boxes on a pallet
- o Labels

Spill Cleanup/Emergency Response

Exposure to mercury vapor is the main risk when fluorescent lamps break. If a fluorescent lamp breaks, the EPA recommends the following steps prior to cleaning up the material:

- o Have everyone leave the immediate area
- o Allow the area to ventilate for 5-10 minutes
- o Detailed Cleanup guidelines are provided here: www.epa.gov/cfl/cleaning-broken-cfl

Materials for cleaning up fluorescent lamps include the following

- o Broom/Brush & Heavy plastic bag (for containing spill cleanup matter)
- o DOT approved 5-gallon bucket with lid

Broken lamp material safety should be contained in a sealed bucket may be labeled as "*Accidentally Broken Fluorescent Lamps*."

General Packaging Guidance

The following general packaging guidelines and notes apply to packaging and shipping fluorescent lamps for recycling:

- \circ $\;$ Lamps can be contained in boxes, drums, or in some cases, pallet boxes.
- o Lamp containers must be structurally sound
- Lamps must be fully contained within a container (no open tops, holes, gaps, etc...Lamps must not be exposed in any manner).
- Containers must be completely sealed; if lamps break within the container, no material should be able to "leak" out.
- Lamps boxes may be stacked on pallets and secured using stretch wrap.

More detailed packaging guidelines are provided in the *Fluorescent Lamps – Packaging Guidance* section.

Fluorescent Lamps



Labeling

The following labels should be used for staging and shipping fluorescent lamps to be recycled.

- o Universal Waste Label
- o Optional "Fragile" Label
- o Optional "Glass" Label

Shipping

Lamp containers *must* be kept dry prior to shipment. Further, ensure the following prior to shipping:

- All containers are appropriately labeled
- o Ensure lamps are completely contained
 - Ends should be sealed (ex: with packaging tape)
 - Any holes, gaps, loose seams must be sealed (ex: with packaging tape)
 - If the box/package breaks, material should not be capable of leaking from the package
- o Do not stack items on top of lamp boxes, drums, or pallets.

Individual boxes and full pallets can be shipped via plane, truck or barge. Be sure to check with transporters and vendors to see if there are any additional requirements prior to shipping.



1) Be sure to use gloves and safety glasses when handling fluorescent lights.



Using gloves and safety glasses



2) If available, use the original box for packing fluorescent lamps. When a new bulb is taken out, put the expired bulb in its place. Mark the old bulb to indicate it no longer works.

Marked used fluorescent tube

3) Contact your vendor if no boxes are available in your community. Carefully place the expired fluorescent lamps in the light boxes. Be careful not to over-fill the boxes, BUT also make sure boxes are shipped full.



Full box of used fluorescent tubes ready to be closed and labeled



Taped box lid

4) Tape both ends of the boxes to seal them securely. Carefully tape all seams of the boxes and tape the corners so that if lamp breakage occurs, toxic components will stay in the box.

5) Contact your shipper concerning proper labeling. Boxes should include "Universal Waste" labels indicating they are Used Fluorescent Lamps and the start accumulation date.



An example of labeling



Lamp boxes can be shipped individually or multiple boxes may be shipped on pallets. Ensure pallets containing boxes of lamps are stretch wrapped securely to pallets. Additionally, lamp drums (fiber and plastic) can be utilized, in lieu of boxes, to contain large volumes of lamps.



Wrapped Pallet of 4-ft Lamps



Wrapped Pallet of 4-ft Drums

Additional Lamp Packaging Notes

When collecting and packaging fluorescent lamps for shipment, consider the following:

- <u>Do not</u> tape groups of lamps together Taping lamps together increases the chance of breakage, increases the risk of cuts to lamp recycling personnel, and increases the chance of damaging lamp recycling equipment.
- All Lamp containers must be closed, structurally sound, and compatible with its contents Lack evidence of leakage, spillage, or damage that could cause leakage under reasonable foreseeable conditions
- **Minimize the risk of lamp breakage** Accumulate lamps in packages/containers that are structurally sound and adequate to prevent leakage
- Keep lamp containers dry Universal waste lamps must be stored within containers that are staged in a manner that prevents the containers from being exposed to the elements (i.e. indoors, shed, connex, etc.).
- Accidentally broken lamps can be managed as Universal Waste Place accidentally broken lamps in a plastic bag and seal. Then place the bag in a bucket or drum and seal. Buckets or drums containing accidentally broken lamps must be labeled "Accidentally Broken Fluorescent Lamps".
- Intentionally crushed lamps <u>must</u> be managed as Hazardous Waste Any intentionally crushed lamps <u>cannot</u> be shipped/transported as Universal Waste.



Inventory Estimates

Mercury containing devices can vary in size. Typically, actual components containing the mercury are relatively small (switches, relays, ampules). Mercury has been used in a wide variety of equipment. Examples of mercury containing devices includes the following:

- o Thermometers
- o Thermostats
- o Navigation equipment (ex: aircraft and vessel autopilot systems)
- Equipment designed to measure pressure (ex: barometers, manometers, etc.)
- o Tilt switches (ex: chest freezers, vehicle hood and trunk lights)
- o Telecommunication equipment (mercury wetted relays on circuit boards.)
- o Gas fired appliances (ex: stoves, water heaters)

Personal Protective Equipment (PPE)

Suggested PPE for the consolidation and packaging mercury containing devices includes the following items:

- Gloves (ex: cut resistant gloves)
- Eye protection (ex: protective glasses).

Supplies/Packaging Materials

Suggested supplies and packaging materials for preparing mercury containing devices for backhaul includes the following items:

- o Plastic Bags
- o DOT approved sealable bucket with a lid
- o Labels

Spill Cleanup/Emergency Response

Exposure to mercury vapor is the main risk when mercury is released. The following materials are recommended to manage mercury spills:

- o Nitrile Gloves
- o Mercury Spill Kit
- o Plastic Bags
- o DOT approved sealable bucket with a lid

If possible, ventilate the area where the spill occurred after cleanup. Use mercury indicator powder (it be included in the spill kit) to determine if mercury is still present.

General Packaging Guidance

The following general packaging guidelines and notes apply to packaging and shipping mercury bearing devices for recycling:

- o Contain mercury bearing devices in a DOT approved plastic container with a lid that seals
- o Contain individual devices in plastic bags
- Carefully lay bagged devices in the plastic container; pack in a manner that minimizes the chance of breakage
- o Keep the lid on the plastic container sealed whenever the container is not being actively filled.

More detailed packaging instructions can be found in the *Mercury Bearing Devices – Packaging Guidance* section



Labeling

The following labels should be used for staging and shipping mercury containing devices to be recycled.

- o Universal Waste Label
- o #8 Corrosive Label
- o #6 Poison Label

Shipping

Keep containers dry prior to shipment. Further, ensure the following prior to shipping:

- Declare as Hazmat
- All containers are appropriately labeled
- Ship materials upright
- o #8 Corrosive placards will be needed for the shipping container

Contained mercury bearing devices can be shipped via plane, truck or barge. Be sure to check with transporters and vendors to see if there are any additional requirements prior to shipping.



Manufactured articles that contain mercury (mercury bearing devices) should be handled with extreme care. If mishandled, switches, relays, and ampules that contain the mercury may break. Mercury, when released, can contaminate the environment and poses a risk to human health.



Examples of Mercury Bearing Devices

Mercury is extremely corrosive when it comes in contact with certain metals, especially aluminum. To protect people, equipment, and the environment from mercury releases, mercury bearing devices should be packaged in completely sealed containers (preferably plastic containers).

The following provides guidance for packaging and containing multiple mercury bearing devices:

1) Use a sturdy, plastic, leak-proof container (such as a screw-top bucket with a lid) for consolidating mercury bearing devices.







3) Enclose mercury bearing devices into plastic bags.




Packaging Guidance

4) Gently pack the mercury bearing devices into the lined container.



5) Close up the liner.



6) Seal the lid and label appropriately.



Labels used for packaging *Manufactured Articles Containing Mercury* (i.e. mercury bearing devices).





Inventory Estimates

The following are rough average weights and estimates that can be used for planning purposes:

| Battery Type | Weight |
|---------------------------------------|---|
| ATV & UPS Batteries | 5 – 20 lbs |
| Car and Truck batteries | 40 lbs |
| Deep Cycle Marine and Solar Batteries | 80 – 120 lbs |
| Pallet of Wet Batteries | 2,500 – 3,200 lbs (800 – 1,200 lbs per layer) |
| Tote of Wet Batteries | 1,600 – 2,000 lbs (800 – 1,000 lbs per layer) |

Note: Wet batteries shipped in totes by air under special permit number SP 12283 are limited to a gross weight of 1,800 lbs (combination of batteries and packaging materials).

Personal Protective Equipment (PPE)

Suggested PPE for the sorting, consolidation, and packaging of wet batteries includes the following items:

- Gloves (ex: chemical resistant gloves)
- Eye protection (ex: protective goggles).
- Long sleeves
- o Heavy pants
- o Steel/composite toed boots

Supplies/Packaging Materials

Suggested supplies and packaging materials for preparing wet batteries for backhaul includes the following items:

- o Plastic Spray (for insulating terminals)
- o Sturdy Pallet
- o Material to separate battery layers (Cardboard, Waffle board, etc.)
- Stretch Wrap (80 gauge or similar)
- o Banding
- Non-leaking Fish Tote with a lid, as needed
- o Labels

Spill Cleanup/Emergency Response

The potential for fire/explosion and the risk of leaking electrolyte are the main risk when managing wet batteries; Battery terminals should be insulated and to reduce the threat of fire/explosion. Batteries should be handled, stacked, and staged in a responsible manner to limit the risk of spilling electrolyte.

When handling batteries the following materials will assist with emergency response and spill cleanup:

- o Nitrile Gloves
- o Chemical Resistant gloves
- o Absorbent (ex: vermiculite, kitty litter, absorbent powder)
- o Electrolyte neutralizer (ex: Baking powder for Acid, Vinegar for Alkali)
- o Broom/Brush & Heavy plastic bag (for containing spill cleanup matter)
- o Fire Extinguisher

General Packaging Guidance

The following general packaging guidelines and notes apply to packaging and shipping wet batteries for recycling:

- Packaging Wet Batteries on Pallets
 - Choose pallets that are not split, broken, or otherwise significantly damaged. Pallets should be able to support the full load of the packaged batteries.



- Materials on pallets should be wrapped tightly with stretch wrap and secured with banding. Material should not shift, spill, or collapse while being transported.
- Do not stack more than 3 layers of batteries.
- Ensure each layer (including the top layer) has a significant amount of insulating material separating the layers of batteries.
 - Insulating layers should prevent accidental short circuit (leading to fires/explosions)
 - Insulating layers should protect against battery terminals on lower layers from puncturing the bottom of batteries stacked on top of them.
 - Insulation on the top layer should be thick enough to ensure banding material does not come in contact with any battery terminals.
- o Packaging Wet Batteries in Totes
 - Typically, totes can hold 2 layers of batteries.
 - Ensure each layer (including the top layer) has a significant amount of insulating material separating the layers of batteries.
 - Insulating layers should prevent accidental short circuit (leading to fires/explosions)
 - Insulating layers should protect against battery terminals on lower layers from puncturing the bottom of batteries stacked on top of them.
 - Ensure the lid can fully cover the tote and securely band the lid shut when finished packaging

More detailed packaging guidelines are provided in the *Wet Battery – Packaging Guidance* sections (for packaging on pallets and totes, respectively)

Labeling

The following labels should be used for staging and shipping wet batteries to be recycled.

- Labeling for transport by barge or road
 - Universal Waste Label
 - Corrosive #8
- Labeling for transport by air (Batteries packed in a Tote utilizing SP 12283)
 - Universal Waste Label
 - Corrosive #8
 - Up arrows
 - "Danger Do not ship on passenger aircraft" or similar
 - Special Permit Full document attached to the container

Shipping

If possible, keep pallets and totes dry prior to shipment. Further, ensure the following prior to shipping:

- o All battery containers are appropriately labeled
- o Declare batteries as Hazmat
- Ship materials upright
- o Do not stack battery pallets/totes on top of any other pallets of material.
- o Block/brace battery pallets/totes into place to ensure materials don't shift during transport
- o #8 Corrosive placards will be needed for the shipping container
- Remember, wet batteries shipped in totes by air under special permit number SP 12283 are limited to a gross weight of 1,800 lbs.

Battery containers can be shipped via plane, truck or barge. Be sure to check with transporters and vendors to see if there are any additional requirements prior to shipping.



Packaging Guidance – Pallets

Important Pallet and Packaging Specifications:

1. Maximum pallet sizes: 40" x 48" or 44" x 48"



2. Maximum layers per pallet: 3 – roughly 24 batteries/layer = 72 batteries for 3 layers.



- 3. Typical Pallet Weight (for 3 layers): *Between 2800 and 3300 lbs Pallets are not to exceed 3300 lbs.*
- 4. Only lead-acid batteries may be packaged: No mixing in other batteries or recyclables.
- 5. Pallet must be built with a minimum of <u>3</u> bottom boards and durable enough to handle the weight of the batteries.

This pallet has 3 bottom boards



Instructions for Stacking Wet Batteries on a Pallet

1. Select a sturdy pallet with no broken or missing boards. Be sure there are no nails sticking out, which could puncture the batteries or pose a safety hazard.



An example of a typical wood pallet

2. Place a layer of cardboard on the pallet to create a flat work surface and help prevent batteries from sliding off of the pallet.



A pallet with a layer of cardboard



Packaging Guidance – Pallets

- 3. Make the first layer of batteries as level and as close together as possible.
 - If some of the batteries are shorter, they should be placed in the center of the layer.
 - Batteries that are relatively taller should be saved and placed on the top layer (if stacking more than 1 layer).
 - Ensure no batteries are hanging over the edge of the cardboard/pallet.



Single layer of batteries

- 4. Place cardboard (multiple sheets if necessary) between each layer of batteries.
 - It is best to use the thick honeycomb cardboard (if available).



Examples of honeycomb cardboard

• Alternatively, multiple layers of cardboard can also be used.





Examples of layers of typical cardboard

- Enough layers of cardboard must be applied to achieve the following:
 - Prevent the possibility of short circuits; and
 - Prevent the terminals from puncturing the underside of the batteries in the layer above.





<u>Note #1</u>: Side terminal batteries must be stacked so the posts are facing away from each other and not facing towards the outside of the pallet. Side terminals must never touch (below displays overhead views of "Side Terminal Batteries").





Packaging Guidance – Pallets

<u>Note #2</u>: Top posts must be positioned toward the outside of the pallet so the layer above it leans toward the center. Make sure that no batteries are overhanging the cardboard.

Example: The top battery has the terminals positioned toward the outside of the pallet.





Note #3: Stud post batteries (such as Marine Batteries) should be on the top layer. If this is not possible, you will need extra layers of cardboard between the layers of batteries to prevent punctures. This is also important when stacking three layers high.

Example: The top "stud post" battery has its terminals positioned toward the outside of the pallet, and would need extra layers of cardboard to prevent puncturing the next layer of batteries.

5. A maximum of 3 layers of batteries may be placed on a pallet. When stacking is complete, place cardboard on top of the final layer of batteries.



6. Any battery that has been damaged and has the potential to leak must first be placed in a container capable of holding its contents.



Examples of damaged lead acid batteries

- Damaged batteries that are not visibly leaking electrolyte should be put in heavyweight polyethylene plastic bags (minimum: 6 mil), properly sealed with plastic tie, and placed in the middle of the top layer.
- Damaged batteries that have the potential to leak must be placed in a container that is capable of holding its contents (i.e. will not leak fluid) such as a DOT approved 5- gallon bucket.



An example of a DOT approved 5-gallon container



Instructions for Wrapping Pallet

All batteries should be secured to the pallet with stretch wrap. An 80 gauge (or stronger) stretch wrap is recommended. Stretch wrap works best if it is pulled tight before stretching it around the corners.

- 1. Start with the stretch wrap turned sideways to create a "rope-effect". Wrap around the top layer twice.*
- 2. Using the rope-effect, wrap the top layer twice* more, each time crossing over the top to form an "X-pattern." This should pull the batteries towards the center, preventing batteries from falling off of the pallet.



Creating a "rope-effect" with stretch wrap

3. Holding the stretch wrap open, wrap around the bottom layer twice*, being sure to catch the edges of the pallet.



Holding the stretch wrap open

 After placing a layer of cardboard on top of the batteries, wrap around the top layer at least twice* and tear-off the stretch wrap at the last corner.

*Note: After wrapping twice (during each step) judge the load; wrap as many times as necessary to stabilize the load.



Fully wrapped pallet of batteries

5. To further secure the load, band the material to the pallet.



A wrapped and banded pallet <u>of lead acid batteries (3 levels)</u>

6. Finally, ensure the pallet is properly labeled. At minimum, the pallet should include a #8 Corrosive and a Universal Waste Label. Check with your transporter to see if any additional labeling is required.

3 layers of batteries wrapped up





Zender

Packaging Guidance – Totes

Suggested Material List

- Safety Glasses and Gloves
- Fish Tote (No cracks or holes)
- Absorbent (Vermiculite or other absorbent)
- Plywood
- Blue board, heavily corrugated cardboard, or regular cardboard (to separate layers of batteries and protect their terminals)
- Shipping Labels
- Special Permit (for shipping by air)
- Straps (for securing the tote lid)
- 1) It is important to use a nonreactive container to backhaul wet batteries if they are being shipped by air. Plastic fish totes are perfect containers for backhauling lead acid batteries.
- 2) To prepare a fish tote for backhauling wet batteries, first apply some sort of absorbent to the bottom of the fish tote. This absorbent can be vermiculite, kitty litter, or some other absorbent material capable soaking up any leaking battery acid.







3) Next, cut a piece of plywood to fit snugly in the bottom of the fish tote (if needed, you can cut multiple pieces and jigsaw them to fit on the bottom). The plywood will give you a level surface on which to stack batteries. After the plywood is in place, apply some more absorbent.



Plywood, cut to fit the bottom of the tote



Plywood with absorbent (vermiculite) sprinkled on top



Packaging Guidance – Totes

4) You are now ready to stack a first layer of batteries. Carefully, place batteries in the tote so they are sitting upright. Batteries that are not stacked upright are more likely to spill their electrolyte (i.e. battery acid).



First layer of batteries being stack upright



5) The first layer is complete when you can easily fit another battery onto the bottom. If needed, you can place excess cardboard into fill in gaps to keep the batteries from jostling during transport.



A completed first layer of lead acid batteries



Batteries with cardboard inserted between them for better stability

6) Once the first layer is complete, a protective layer is needed before beginning the second layer of batteries. Heavily corrugated cardboard is ideal for protecting the terminals of the first layer. Also acceptable is blue board (blue Styrofoam) and multiple layers of regular cardboard.



Applying multiple layers of thinner regular cardboard.

Heavily corrugated cardboard, notice the holes created by the battery terminals. The cardboard protects against the terminals on the lower layer from punching through the bottom of the batteries on the upper layer



7) Before beginning a second layer, it is a good idea to apply some additional absorbent. Stack a second layer of batteries just like the first.



Separating layer of cardboard with more absorbent sprinkled on top



Beginning a second layer of batteries

- 8) Once full, the lid can be placed onto the tote. The lid will have to be secured with straps. The entire tote needs to be properly labeled before it can be shipped by air. Check with you shipper to determine proper labeling. Typically, a fish tote of lead acid batteries will need the following labels:
 - 4 Up arrow stickers (1 placed on each side of the tote);
 - 5 "Danger" stickers (1 placed on each side and 1 on the lid);
 - 5 #8 Corrosive stickers (1 placed on each side and 1 on the lid).



Examples of a typical "up arrow" sticker, "#8 corrosive sticker, and a "Danger" sticker. Check with your carrier to see if they can provide labels. If not, call Total Reclaim to request labels.



A fish tote completely packed with lead acid batteries for recycle. The tote has been properly labeled and the lid has been securely strapped down for air transport.

NOTE: The information, guidance, and instructions herein are made in good faith and are believed to be accurate at the date of preparation. The authors of this document make no guarantee of the information's current and future accuracy, either expressed or implied. It is incumbent of individuals collecting, packaging, and shipping materials to be aware of and comply with all current applicable regulations and other relevant requirements. Page 46



Packaging Guidance – Totes

9) Shipping wet batteries by air requires a special permit if you are using non-DOT containers such as fish totes. You can request a party status to a special permit by 1) writing a *hardship letter* to US Dept. of DOT or 2) applying online through the US DOT PHMSA Portal (for the internet link, Google the phrase "*PHMSA Portal Access Page*").

If you obtain a special permit, be sure to comply with <u>all</u> the conditions within the special permit. Failure to follow all the requirements within the special permit can result in major fines.

In addition to providing your air carrier with a copy of the Special Permit, an additional copy needs put in a clear plastic bag (to be protected and visible) and attached to the tote lid. The Special Permit Number (ex: SP12283) will must be visible on the tote. Always check with your carrier to ensure that packaging is done properly.



Example - Special Permit used to ship lead acid batteries by air

Be sure to work with your recycler and transporter to ensure the return of your fish tote.

Household Batteries



Inventory Estimates

The following are rough average weights and estimates that can be used for planning purposes:

- o 1-Gallon Container 15 lbs
- o 5-Gallon Bucket 80 lbs

Note: Lithium/Lithium Ion/Lithium Polymer containers are limited to a gross weight not exceeding than 66 lbs (Combination of batteries and packaging materials)

Personal Protective Equipment (PPE)

Suggested PPE for the sorting, consolidation, and packaging of household batteries includes the following items:

- o Gloves
- o Eye protection

Supplies/Packaging Materials

Suggested supplies and packaging materials for preparing household batteries for backhaul includes the following items:

- o DOT approved Buckets with lids
- o Insulating material (ex: packaging tape, electrical tape)
- o Labels

Spill Cleanup/Emergency Response

The potential for fire and explosion is the main risk when managing batteries; Lithium, Lithium-Ion, and Lithium Polymer batteries pose the greatest threat of fire/explosion. When handling batteries the following materials will assist with cleanup and emergency response.

- o Nitrile gloves
- o Chemical resistant gloves
- o Absorbent (ex: vermiculite, kitty litter, absorbent powder)
- Broom/Brush & Heavy plastic bag (for containing spill cleanup matter)
- o Bucket or other container with a sealable lid;
- o Fire Extinguisher

General Packaging Guidelines

The following general packaging guidelines and notes apply to packaging and shipping electronic waste for recycling:

- The following batteries must be insulated to prevent short circuits (leading to fires/explosions)
 - All batteries greater than 9-volts
 - All Ni-MH batteries, if shipped by barge/vessel
 - All "Lantern" style batteries
 - All batteries containing lithium (Lithium, Lithium-Ion, Lithium Polymer, etc.)
 - Any battery with an "unknown" chemistry
- o Batteries should be fully contained in a DOT approved shipping container with a sealing lid.
- o Avoid storing batteries in a manner that could allow water to mix with the batteries

More detailed packaging guidelines are provided in the Household Battery – Packaging Guidance sections.



Labeling

The following labels maybe needed (depending on the shipping method & quantity) be used for staging and shipping batteries to be recycled.

- o Universal Waste Label (Ni-Cad, Lithium Primary, Lithium-Ion, Lithium Polymer)
- Corrosive #8 (Lead Acid, Ni-Cad)
- Miscellaneous #9 (NiMH)
- o Miscellaneous #9 Lithium Batteries (Lithium, Lithium-Ion, Lithium Polymer)
- o UN 3090 (Lithium Primary)
- o "Lithium Metal Batteries Do not ship on passenger aircraft" (Lithium Primary)
- o UN 3480 (Lithium-Ion, Lithium Polymer)
- "Do not ship on passenger aircraft/Cargo Air Craft only" (Lithium Primary, Lithium-Ion, Lithium Polymer)

Shipping

Further, ensure the following prior to shipping:

- All battery containers are appropriately labeled
- o Identify & declare batteries that are classified as HazMat, when applicable
- o Ship materials upright
- o Block/brace into place to ensure containers don't shift during transport
- o #8 Corrosive placards will be needed for the shipping container, when applicable
- Ensure all Lithium, Lithium-Ion, and Lithium Polymer battery containers' gross weight do not exceed 66 pounds
- Remember all Lithium, Lithium-Ion, and Lithium Polymer batteries cannot be shipped on passenger aircraft.

There are avenues for shipping battery containers via plane, truck or barge. Be aware of the most current HazMat requirements and be sure to check with transporters and vendors to see if there are any additional requirements prior to shipping.



Household Batteries

Packaging Guidance

Battery Types

The following are examples of common battery chemistries:

- Alkaline
- Nickel-Cadmium
- Nickel Metal Hydride
- Lithium
- Lithium-Ion
- Lithium-Polymer
- Carbon-Zinc

Contact your recycling vendor if you are uncertain if a specific battery chemistry is recyclable.



<u>Staging</u>

There is always a chance of fire when managing batteries; the following safety items are recommended:

- Batteries should be kept in an inflammable container (i.e. plastic 5 gallon bucket, a *plastic-lined* metal drum).
- Batteries should be kept covered (lids should be secured on the container when it is not being filled).
- Batteries should be stored away from flammable materials.
- Batteries should be stored at a stable room temperature.
- Handle batteries carefully; mishandling may cause them to leak or explode.
- The following batteries must be packaged in a manner that protects against short circuits. This can be completed by *taping all terminals*.
 - o All batteries containing lithium (Lithium, Lithium-ion and Lithium Polymer, etc.).
 - All batteries greater than 9-volts.
 - Any "Lantern" style battery
 - o Any Nickel Metal Hydride (Ni-MH) battery shipped by barge
 - Any "unknown" batteries that cannot be identified by chemistry
- Batteries should be sorted by chemistry (ex: Alkaline, Lithium, Lithium-Ion, Ni-Cad, etc...).



<u>Shipping</u>

Examples of insulated batteries

HazMat regulations & requirements may apply. Be aware of the most current HazMat regulations and also to check with your carrier & vendor for additional requirements regarding shipping household batteries.



Chemistry: Alkaline

Identification Information:

- Alkaline Batteries look like "Typical" household batteries that are commonly used in everyday devices.
- In general, Alkaline Batteries are not rechargeable (but rechargeable Alkaline do exist).
- Carbon-Zinc batteries can be easily confused with Alkaline Batteries.
- Alkaline Batteries also exist in button cell form.

Labels:



Note: This is not a DOT label.

Suggested Packaging:



Screw-top plastic bucket

Examples:



Detailed Shipping Description:

Batteries, dry, sealed n.o.s. (Alkaline Batteries)

Special Handling Instruction:

- Preferably, contain in a sturdy undamaged screw top plastic bucket;
- Insulate terminals on any lantern style batteries and any batteries greater than 9-volts; and
- Do *not* mix with Lithium, Lithium Ion, Nickel Metal Hydride, and Nickel Cadmium batteries.



Chemistry: Carbon-Zinc (also Zinc-Chloride)

Identification Information:

- Carbon-Zinc look like "Typical" household batteries that are commonly used in everyday devices (similar applications as Alkaline Batteries).
- Alkaline Batteries can be easily confused with Carbon-Zinc Batteries.
- Carbon-Zinc Batteries are often labelled "Heavy Duty", "Extra Heavy Duty", and "Super Heavy Duty."
- Carbon-Zinc Batteries are not rechargeable.



Detailed Shipping Description:

Batteries, dry, sealed n.o.s. (Carbon-Zinc Batteries)

Special Handling Instruction:

- Preferably, contain in a sturdy undamaged screw top plastic bucket;
- Insulate terminals on any lantern style batteries and any batteries greater than 9-volts; and
- Do not mix with Lithium, Lithium Ion, Nickel Metal Hydride, and Nickel Cadmium batteries.



Chemistry: Nickel Cadmium (Ni-Cad)

Identification Information:

- Nickel Cadmium Batteries occur in multiple forms:
 - Some look like "Typical" household batteries;
 - o They are found in Power Packs (ex: power tools, cordless phones).
- Nickel Cadmium Batteries can be easily confused with Nickel Metal Hydride (NiMH) Batteries.
- Nickel Cadmium Batteries are rechargeable.
- The base voltage (of a single cell) for a Ni-Cad Battery is 1.2 Volts.
- Nickel Cadmium Batteries also exist in button cell form (rarely).
- Wet Nickel Cadmium Batteries (similar to Lead Acid Batteries) also exist See *Wet Battery Packaging Guidance* section



Examples:



Detailed Shipping Description:

Batteries, dry, sealed n.o.s. (Nickel Cadmium Batteries)

Special Handling Instruction:

- Preferably, contain in a sturdy undamaged screw top plastic bucket;
- Insulate terminals on any lantern style batteries and any batteries greater than 9-volts; and
- Do not mix with Lithium, Lithium Ion, Nickel Metal Hydride, and Alkaline batteries.



Chemistry: Nickel Metal Hydride (NiMH)

Identification Information:

- Nickel Metal Hydride Batteries occur in multiple forms:
 - o Some look like "Typical" household batteries;
 - o They are found in Power Packs (ex: power tools, cordless phones).
- Nickel Metal Hydride Batteries can be easily confused with Nickel Cadmium (Ni-Cad) Batteries.
- Nickel Metal Hydride Batteries are rechargeable.
- The base voltage (of a single cell) for a NiMH Battery is 1.2 Volts.
- Nickel Metal Hydride Batteries also exist in button cell form (rarely).



Examples:



Detailed Shipping Description:

UN3496, Batteries, Dry, Nickel-Metal Hydride, 9

Note: The above HazMat Proper Shipping Description is used in reference to Barge Shipments. Under shipping modes, spent Ni-MH cells that are 9 Volts or less may be shipping as "Batteries, Dry, n.o.s." (similar to Alkaline Batteries). Check current HazMat regulations to determine the appropriate designation for your shipment.

Special Handling Instruction:

- Preferably, contain in a sturdy undamaged screw top plastic bucket;
- Insulate ALL terminals (regardless of size and shape); and
- Do not mix with Lithium, Lithium Ion, Nickel Cadmium, and Alkaline batteries.



Packaging Guidance

Chemistry: Lithium Ion (Li-Ion) & Lithium Polymer (Li-Poly) Batteries

Identification Information:

- Li-lon and Li-Poly batteries are all rechargeable batteries.
- Li-Ion and Li-Poly batteries will generally have a label indicating it is a rechargeable lithium battery.

Suggested Packaging:



Screw-top plastic bucket - Not to exceed 66 lbs

Insulate All Terminals:



- Terminals can be insulated using tape.
- Avoid excessive taping and ensure labels can be read.

Required Labels: (Different Labels Required for Different Shipping Methods & Quantities)



Detailed Shipping Description:

UN3480, Lithium Ion Batteries, 9

Special Handling Instruction:

- *Handle carefully* Damaged and short circuited Li-Ion and Li-Poly batteries can cause intense fires/explosions.
- Insulate terminals on all Li-Ion and Li-Poly batteries without recessed terminals.
- Contain in a screw-top plastic bucket <u>Not to exceed 66 lbs</u>.
- Do not mix with other battery chemistries.
- Always contact your transporter prior to shipment. Transporters may have additional packaging labelling and/or documentation requirements.

Chemistry: Lithium Metal (Li) Batteries

Identification Information:

- Lithium batteries are <u>non-rechargeable</u> batteries found in high-energy household items (ex: cameras), but also in commercial equipment such as medical devices.
- Lithium batteries are can be very similar to common household batteries (double check labels).

Suggested Packaging:

Insulate All Terminals:

- Terminals can be insulated using tape.

Screw-top plastic bucket – *Not to exceed 66 lbs*

Avoid excessive taping and ensure labels can be read.

Required Labels: (Different Labels Required for Different Shipping Methods & Quantities)

Examples:

Detailed Shipping Description:

UN3090, Lithium Metal Batteries, 9

Special Handling Instruction:

- *Handle carefully* Damaged and short circuited Lithium batteries can cause intense fires/explosions.
- Insulate terminals on all Lithium Batteries.
- Contain in a screw-top plastic bucket <u>Not to exceed 66 lbs</u>.
- Do <u>not</u> mix with other battery chemistries.
- Always contact your transporter prior to shipment. Transporters may have additional packaging labelling and/or documentation requirements.

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Section 4

Spill & Emergency Response

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Spill & Emergency Response

- 1) Wet Battery Spill Cleanup Guidance
- 2) Mercury Spill Cleanup Guidance
- 3) Used Oil Spill Cleanup Guidance
- 4) Local Spill/Emergency Response Plan (*Blank*)

1.0 Purpose

This document provides guidance in the cleanup of wet battery spills (i.e. Lead Acid and Nickel Cadmium).

2.0 Health and Safety

When cleaning up a wet battery spill, avoid skin and clothing from coming in contact with the electrolyte. Suggested PPE includes wear heavy chemical resistant gloves, eye protection (splash goggles), and a chemical resistant apron.

3.0 Procedure

- Don appropriate PPE.
- If needed, prevent the spread of electrolyte fluid by creating a berm around the spill with absorbent or sausage berm.
- Place the broken battery into plastic pail that has a tight fitting cover/lid:
 - Neutralize electrolyte on the battery (see below)
 - o Place absorbent in the container
 - Broken batteries may be managed as universal waste as long as they are properly packaged and shipped to an approved battery recycler.
- Neutralize the electrolyte:
 - Neutralize acid spills (i.e. lead acid battery electrolyte) with baking soda or mixture of baking soda and water;
 - Neutralize alkali spills (i.e. Ni-Cad battery electrolyte) with vinegar.
- Use an absorbent pads, powder, vermiculite, or similar absorbent to soak up the neutralized liquid.
- Place contaminated absorbent and PPE into a separate pail.
- Restock spill cleanup materials as needed.
- Label and dispose of cleanup material in accordance with local, state and federal requirements.

Suggested Battery Spill Kit contents:

- □ Baking Soda or similar <u>acid</u> neutralizing agent (ex: Spill X)
- □ Vinegar or similar <u>alkali</u> neutralizing agent
- □ Eye Goggles
- □ Nitrile Gloves
- □ Heavy Chemical Resistant Gloves
- □ Chemical Resistant Apron
- □ Absorbent (Absorbent powder, Kitty Litter, Vermiculite, etc.)
- □ Absorbent Pads
- □ Absorbent Snake Berm
- □ Heavy Duty Garbage Bags
- □ Instructions

1.0 Purpose

This document provides guidance in the cleanup of spills from mercury devices utilizing a mercury spill kit.

2.0 Health and Safety

When cleaning up mercury spills suggested PPE includes: nonreactive (nitrile or similar) gloves, eye protection, and a dust mask.

Ensure the area is ventilated, but not too windy (wind can blow mercury droplets into crack and crevices). Avoid allowing mercury to come in contact with your skin.

The following should be taken into consideration:

- Keep kids, pets, and other people away from the spill area.
- Do not use a vacuum to cleanup a spill; vacuuming a spill can result in airborne mercury, increasing the risk of exposure.
- If a spill occurs on an absorbent surfaces (carpet, upholstery, etc), cut and remove the affected portion of the contaminated carpet for disposal.
- o Do not use a broom to clean a liquid mercury spill; sweeping can spread the spill.
- Do not dispose of mercury down a drain; mercury may lodge in the plumbing and/or pollute wastewater/septic systems.
- Avoid walking through the spill area; mercury can be spread when it sticks to shoes and clothing.

3.0 Procedure

Mercury containing devices contain significantly more mercury than most mercury containing lamps. Immediate action is necessary when cleaning up accidentally broken mercury containing devices. The following should occur during cleanup:

- 1. Utilize the mercury spill kit to clean up any loose/spilt mercury.
 - Consolidate the mercury in a small area;
 - o Apply the mercury absorbent powder;
 - Wet the powder/mercury mixture and mix within the entire contaminated area;
 - Seal in an air tight baggy, then double bag;
 - Double bag any remaining debris/broken parts and clean-up materials;
- 2. Sprinkle mercury vapor absorbent in a plastic DOT approved air tight/sealable container.
- 3. Insert a plastic liner/bag in the container and apply more mercury vapor absorbent within the liner.
- 4. Insert all cleanup materials (including the broken mercury-bearing device(s)), seal the liner, and then seal the container.
- 5. Restock spill cleanup materials as needed.
- 6. Label and dispose of cleanup material in accordance with local, state and federal requirements.

Suggested Mercury Spill Kit contents:

- □ Mercury Absorbent
- □ Mercury Vapor Absorbent
- □ Mercury Indicator Powder
- □ Mercury Absorbent Sponge
- □ Plastic Scoop
- □ Nitrile Gloves, or other Nonreactive/Nonabsorbent Gloves
- Dust Mask
- □ Sealable Baggies (Ziploc or Similar)
- □ Instructions

1.0 Purpose

This document provides guidance in the cleanup of used oil spills (compressor oil spills)

2.0 Health and Safety

When cleaning up spilt used oil, suggested PPE includes nonreactive (nitrile or similar) gloves and eye protection. For larger spills, an apron is recommended.

3.0 Procedure

3.1 Small Spills

Smaller spills (about 1 gallon or less) will generally not require a berm to consolidate the spill. Follow these guidelines to clean up:

- Alert others in the area to be careful not to walk through the spill;
- Apply an absorbent (powder or pads), and let it soak up the oil (apply more as needed);
- Sweep up the cleanup material put in a sealable container;
- Restock spill cleanup materials as needed.
- Label and dispose of cleanup material in accordance with local, state and federal requirements.

3.2 Large Spills

Large Spills are spills that are greater than 1 gallon. These spills will likely need a berm to contain the spill to a smaller area. Follow these guidelines to clean up:

- Apply a berm to contain and stop the flow of oil by
 - o Using an absorbent sock; or
 - Building a berm using absorbents
- Ensure the berm is effective then apply an absorbent (powder or pads), and let it soak up the oil (apply more as needed);
- Sweep up the cleanup material put in a sealable container;
- Mop the area with simple green and water;
- Restock spill cleanup materials as needed.
- Label and dispose of cleanup material in accordance with local, state and federal requirements.

Suggested Oil Spill Kit contents:

- □ Absorbent Pads
- Stardust, Vermiculite, or Other Similar Absorbent Powder
- □ Snake Absorbent Drum
- □ Nitrile Gloves, or other Nonreactive/Nonabsorbent Gloves
- □ Garbage Bags
- □ Instructions

Local Spill/Emergency Response Plan

| Organization: Physi | | cal Address: | | |
|--|----------------------|--------------|-------|--|
| Potential Emergency Situations: | | | | |
| Fire □ Spill/Accidental Release □ | Worker Injury \Box | Other: | | |
| Wastes Managed/Stored Onsite: | | | | |
| Lithium Batteries | Glycol | | Other | |
| Lead Acid Batteries | Fluorescent Lamps | | Other | |
| Used Oil | Other | | Other | |
| Chemicals Used/Stored Onsite: | | | | |
| Spray Paint/Aerosols | Hydraulic Fluid | | Other | |
| Gasoline | Other | | Other | |
| • Diesel | Other | | Other | |

List of Emergency/Spill Response Equipment & Locations:

| Equipment | Equipment Location | Additional Notes |
|-------------------|--------------------|------------------|
| Fire Extinguisher | | |
| Spill Kit | | |
| First Aid Kit | | |
| Eyewash Station | | |
| Cleanup Materials | | |
| Cleanup PPE | | |
| Other | | |
| Other | | |

Emergency, First Response, and Reporting Contact List:

| Contact | Phone Numbers | Additional Notes |
|---|----------------|------------------|
| Fire/Injury/First Responders: | | |
| Clinic/Hospital: | | |
| VPSO/Public Safety Officer: | | |
| Onsite Spill Cleanup /Emergency Response Coordinator(s): | | |
| AK DEC- Division of Spill Prevention & Response (Hazmat Spills) | 907-465-5250 | |
| US Coast Guard- National Response Center (Pollution and Hazmat Spills) | 1-800-424-8802 | |
| Other: | | |

Completed By: _____

Date Completed: _____

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Section 5

Appendix

Backhaul Manual

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Appendix

- 1) Material Management Plan (*Example Haines Recycling Center*)
- 2) Local Spill/Emergency Response Plan (*Example Haines Recycling Center*)
- 3) Junk Vehicle Preperation Checklists

EXAMPLE Material Management Plan Onsite Management

| | _ | | • | | | |
|-----------------|--------------------------|---|---|----|----------|--|
| Material | Fees | Collection Schedule | Storage | UW | H | M Management Method |
| E-waste | \$0.40/lb | Annual Event | Bay3 until loaded | | | Annual Collection Event |
| | | | Overflow stored in 20ft container in back fenced area | | | Remove Li-Ion Batteries |
| | | | | | | Collect, Package, Load, Ship (40ft) on collection weekend |
| | | | | | | Separate into CBT LCD, CPU// anton, Misc, Cords (cut all cords) |
| | | | | | | Extra or late droppoffs overwintered in 20ft contain in back of facility |
| | | | | | | |
| HH Batteries | Do not collect | Do not collect | Buckets w/ lids in Bay3 | | | Spent primary abtteries to landfill |
| | | | | х | X | K Ni-Cad/NiMH - Put in DOT approved bucket & send out with Ewaste |
| | | | | ~ | | Lithium-Ion - Put in DOT approved bucket & send out with Ewaste |
| | | | | | | |
| Lead Acid | Do not collect | Do not collect | Pallet on Bay3 | X | <u> </u> | X If found/left onsite by public: Take to NAPA/Bigtoot for recycling |
| Flamps | \$2.00/lb | Drop-off during open hours | Short term - Bay1 (near doors) | | | Collect from public and store until full container |
| | | | Long term - Bay 3 | Х | X | V Use Bulb crusher to consolidate |
| | | | | | | Contact Borough during HHW event for disposal |
| 11 101 | B I I I | <u> </u> | | | | |
| Used Oil | Do not collect | Do not collect | Buckets in Bay 3 | | | if found/accumulated: Dispose of at Harbor in Used oil collection container |
| Glycol | Do not collect | Do not collect | Buckets in Bay 3 | | | If found/accumulated: Dispose of at Harbor in Glycol collection container |
| Scrap | General Scrap - Free | Annual Event (All) | Back fenced area | | | Annual Collection Event |
| | High Value - Free | Open Hours (Hi Value) | | | | Cut down to fit on pallets |
| | Appliances - \$10/unit | By Appointment (Appliances) | | | | Bale light scrap |
| | | | | | | Use processed refers/freezers as collection bins for small loose scrap |
| | | | | | | Fill 40ft containers loose with gen scrap - containerize and label Hi Value (load Hi Value last) |
| | | | | | | Do not accept fluids/undrained material batteries or pieces over 4ft & No loose roofing material |
| Pofors/Eroozors | \$50/Lipit | Annual Scrap Event | Back fenced area | | | Eaclitate refrigerant recovery |
| | \$50/01iit | By Appointment | Back leneed area | | | After recovery out compressors & drain ail |
| | | ву Арропппет | | | × | After recovery, cut compressors & drain on |
| | | | | | | • Use shells for scrap metal accumulation |
| | | | | | | Ship out during scrap backhaul opportunities |
| Junk Vehicles | Do not collect | Do not collect | Refuse/No Storage | | _ | Contact Police/Borough if abandoned onsite |
| Salvare/Reuse | Donation Request | General Salvage - Open Hours or by | General Salvage: Collection Bins & Back fenced area | | | General Salvage: one to public, request donation, request it be done during open hours. |
| Galvage/Reduce | Scrap Box Pricing | appointment | Scrap Boy: Boy 1 | | | Scran Boy: Donations, purchases & pricing by board approved appointed personal |
| | Scrap box Friding | Seven Bays Seturdays (anning fell) | Scrap Box. Day 1 | | | Scrap box. Donations, purchases, & proing by board approved apported personer |
| | | Scrap Box: Saturdays (spring-fail) | | | | |
| Paper | Free | Ongoing - Open Dropoff | General: Outdoor Dropoff bins | | | Separate into: 1) Low Grade Paper, 2) Newspaper, 3) White Ledger, 4) Shredded, 5) Cardboard |
| | | | Bales: Bay 3 | | | Bale as needed |
| | | | | | | Store Bales in Dry Storage (Bay 3) on pallets |
| | | | | | | Ship (40ft) when 45-50 fiber bales accumulate (do not ship pallets) |
| | | | | | | Load by material type if possible - Do not mix with any other recycle streams |
| | | | | | | |
| Plastic | Free | Ongoing - Open Dropoff | General: Outdoor Dropoff bins | | | Separate into: 1) #1 Bottles. 2) #2 Cloudy Bottles. 3) #3 Colored Bottles |
| | | 5 5 1 1 | Supersacks (loose): Back of Bay 1 (Near baler) | | | Store supersacks in back of Bay 1. |
| | | | Bales: Back yard near loading ramp | | | Bala as needed (usually about 5.7 supersacks per bala) use loading conveyor |
| | | | Dales. Daok yard near loading ramp | | | Steep Bales in back are now loading come to all a come come to all the come of |
| | | | | | | Store bales in back area hear loading ramp |
| | | | | | | Ship (40ft) when 45-50 plastic bales accumulate (do not ship pallets) |
| | | | | | | Load by material type, it possible - Do not mix with any other recycle streams |
| Al Cans | Free | Ongoing - Open Dropoff | General: Outdoor Dropoff bins | | | Store supersacks in storage sheds in open front vard |
| | | 33 | Supersacks (loose): In storage sheds in open front vard | | | Bale as needed (usually about 3-4 supersacks per bale) use loading conveyor |
| | | | Bales: Back yard near loading ramp | | | Store Bales in back area near loading ramn |
| | | | Dales. Dack yard fical loading famp | | | Ship (40ff) when 45 Challes of Al + Tip Cone accumulate (de not ship pollete) |
| | | | | | | Ship (400) when 45-50 bales of ALF The Cars accumulate (do not ship panets) |
| | | | | | | Load by material type, if possible: Fill available space with scrap (notifity vendor for approval) |
| Tin Cans | Free | Ongoing - Open Dropoff | General: Outdoor Dropoff bins | | | Store supersacks in storage sheds in open front yard |
| | 1100 | Oligoling - Open Diopoli | Supersacks (loose): In storage sheds in open front yard | | | Bala se poseded (usually should all operations particular) DO NOT USE loading conveyer |
| | | | Deles, Beek verd neer leading remn | | | Date as needed (doually about 3-4 supersacks per bale), <u>DO NOT OSE</u> loading conveyor |
| | | | Dales. Dack yaru near loaung ramp | | | Store bales in back area near loading ramp |
| | | | | | | Ship (40ft) when 45-50 bales of AI + 1 in Cans accumulate (do not ship pallets) |
| | | | | | | Load by material type, if possible: Fill available space with scrap (notifiy vendor for approval) |
| Fish Nets | Prepared: \$10/Net (all) | 1st Saturday of the Month (spring-fall) | Loose & Unprepared: Supersacks in Back fenced area | | | Check incoming nets to see if they need prep/stripping |
| 1 | Unprepared: \$20/Sub Net | By Appointment | Prepared: 40ft container near loading ramp | | | Stage unprepped nets in back yard in supersacks |
| | Unprepared: \$40/Comm Ne | t | | | | Strip nets as needed |
| | | | | | | Store Prenned net in 40ft container near ramp |
| | | | | | | Arrange for shipment through vendor (get preapproval for shipments) may be I CL 20ft 40ft possible |
| 1 | | | | | | Arrange for supprise an output venuer (get preapproval for shipments) may be LCL, 2011, 4011, possible |
| | | | | | | some vendors can take when shipped with Plastic |

EXAMPLE Material Management Plan

Shipping & Vendor Information

| Material | Current Disposal Vendor Options | Annual Volumes | Shipping Vendor | Shipment Fequency | Non-shipping Costs/Rev |
|-----------------|---|--|--------------------|---|--|
| E-waste | Metro Metals (Tacoma) | 10,000 - 15,000 lbs | Barge - AML | 40ft Container: 1 - Shipment/yr | Revs: \$4-5k Costs: \$1-2k |
| HH Batteries | Metro Metals (Tacoma) - Preapproval Total Reclaim, Inc/EcoLights NW (Anchorage, Kent/Seattle) | 100-200lbs | Barge - AML | With Ewaste | With Ewaste |
| Lead Acid | NAPA/Bigfoot (Haines) | None | N/A | None | None |
| Flamps | Haines Borough HHW (Haines) EcoLights NW (Anchorage, Seattle) | 2-4 drums 200-600lbs | None - w/HHW Event | None - w/HHW Event | Revs: \$100-\$200 Costs: \$0 |
| Used Oil | Haines Borough - Harbor (Haines) | None | N/A | None | None |
| Glycol | Haines Borough - Harbor (Haines) | None | N/A | None | None |
| Scrap | Seattle Iron & Metal (Seattle) Metro Metals (Tacoma) | 20,000-60,000 lbs | Barge - AML | 40ft Container: 1-3 Shipments/yr Hi Value every 2-3 years | Revs: \$1,000-\$2,000 (Scrap) Hi-Value: \$5,000-\$10,000 Costs: None |
| Refers/Freezers | Seattle Iron & Metal (Seattle) Metro Metals (Tacoma) | 20-40 units | Barge - AML | With Scrap | Revs: \$1,000-\$,2000 Costs: \$0 |
| Junk Vehicles | Haines Borough (Haines) | None | N/A | None | None |
| Salvage/Reuse | N/A | Varies | N/A | None | Revs: \$100-\$200 Costs: \$0 |
| Paper | Waste Management (MRF - Tacoma) International Paper (Kent) | Cardboard: 60,000-70,000lbs Other: 70,000-80,000lbs TOTAL: 130,000-150,000lbs | Barge - AML | 40ft Container: 3-5 Shipments/yr | Revs: \$500-\$1,000 Costs: \$0 |
| Plastic | Waste Management (MRF - Tacoma) International Paper (Kent) | #1 Bottles: 6,000-9,000lbs #2 Cloudy: 1,000-3,000lbs #2 Color: 3,000-5,000lbs TOTAL: 12,000-16,000lbs | Barge - AML | 40ft Container: 1 Shipment/yr | Revs: \$0-\$500 Costs: \$0 |
| Al Cans | Seattle Iron & Metal (Seattle) Metro Metals (Tacoma) | 6,000 - 10,000lbs | Barge - AML | 40ft Container: 1 Shipment/yr w/Tin Cans | Revs: \$2,000-\$4,000 Costs: \$0 |
| Tin Cans | Seattle Iron & Metal (Seattle) Metro Metals (Tacoma) | 6,000 - 10,000lbs | Barge - AML | 40ft Container: 1 Shipment/yr w/Al Cans | Revs: \$200-\$1,000 Costs: \$0 |
| Fish Nets | Net-Your-Problem (Seatte) Past Vendor Options: International Paper (Kent, WA) Skagit Steep & Recycling (Burlington, WA) | 5-15 Supersacks | Barge - AML | LCL, 20ft Container: Every 1-4 years | Revs: \$100-\$200 Costs: \$0 |

| Material | Shipments | Volumes |
|------------|-----------|---------------------|
| Ewaste | 1 | 10,000-15,000 lbs |
| Scrap | 1-3 | 20,000-60,000 lbs |
| Fibers | 3-5 | 130,000-150,000 lbs |
| Plastic | 1 | 12,000-16,000 lbs |
| Al/Fe Cans | 1 | 15,000-20,000 lbs |
| | 7-11 | 200,000-260,000lbs |

Local Spill/Emergency Response Plan

Haines Friends of Recycling – Haines, AK

| Organization: Haines Friends of Rec | ycling Physical Address | s: Mile 2.5 Small Tracts Rd. |
|---|---|---|
| | | Haines, Alaska 99827 |
| Potential Emergency Situations: | | |
| Fire ⊠ Spill/Accidental Release ⊠ | Worker Injury 🛛 Other: | |
| Wastes Managed/Stored Onsite: | | |
| Lithium/Li-Ion BatteriesOther Household BatteriesUsed Oil | UW LampsE-scrapFishnets | General RecyclablesScrap Metal |
| Chemicals Used/Stored Onsite: | | |
| GasolineDiesel | Hydraulic FluidPropane | Spray Paint/Aerosols |

List of Emergency/Spill Response Equipment & Locations:

| Equipment | Equipment Location | Additional Notes |
|--------------------|--------------------------------------|------------------|
| Fire Extinguishers | 3 – Shelving Near Front Door & Baler | |
| Oil Absorbent | 20ft Container in Back Fenced Yard | |
| First Aid Kit | Facility Office | |
| Cleanup Materials | Shelving Near Front Door & Baler | |
| Cleanup PPE | Shelving Near Front Door & Baler | |

Emergency, First Response, and Reporting Contact List:

| Contact | Phone Numbers | Additional Notes |
|---|------------------------------|------------------------------------|
| Fire/Injury/First Responders: | 911 | Haines Volunteer Fire Dept. |
| Clinic/Hospital: | 911 | Haines SEARHC Clinic |
| Public Safety Officers: | 911 | Haines Borough Police Dept. |
| Onsite Spill Cleanup/Emergency Response Coordinator(s): | 907-766-2185 907-766-3667 | Melissa Aronson Reilly Kosinski |
| AK DEC – Division of Spill Prevention & Response (Hazmat Spills) | 907-465-5250 | |

Completed By: Reilly Kosinski

Date Completed: <u>08/12/2020</u>
| Junk Car Preparation Checklist | | | | |
|---------------------------------|---|-----------|---|---|
| 1) PPE Check | See PPE Checklist on opposite page | COMPLETE? | Y | N |
| 2) Equipment Check | See Equipment Checklist on opposite page | COMPLETE? | Y | N |
| 3) Vehicle Check/Walkaround | See Vehicle Inspection Checklist on opposite page | COMPLETE? | Y | N |
| 4) Stage and Stability Check | Ensure the Vehicle is safely and securely elevated and blocked to prevent rolling, tipping, falling, etc. Do not prepare the vehicle unless you feel 100% safe working on it. | COMPLETE? | Y | N |
| 5) Battery Removal | Remove the car battery (lead acid battery) and properly stage it for backhaul/recycling. | COMPLETE? | Y | N |
| 6) Refrigerant Removal | If A/C is present, remove refrigerant into appropriate refrigerant recovery unit. | COMPLETE? | Y | N |
| 7) Merc Switch Removal | Remove accessible mercury switches (if present) | COMPLETE? | Y | N |
| 8) Fluid Removal | See Fluid Removal Checklist on opposite page | COMPLETE? | Y | N |
| 9) Tire Removal | Remove Tires and Rims. Stage tires for future backhaul or alternative use. | COMPLETE? | Y | N |
| 10) Value Added Item Removal | See Value Added Item Checklist on opposite page | COMPLETE? | Y | N |
| 11) Stage for Crushing/Backhaul | Stage the vehicle in a designated area for future crushing/backhaul | COMPLETE? | Y | N |

Before You Start Checklists

| 1) PPE Checklist | | |
|--------------------|--------|--|
| Item | Ready? | |
| Gloves | | |
| Hearing Protection | | |
| Boots | | |
| Eye Protection | | |
| Long Sleeves | | |

| 2) Equipment Checklist | | |
|----------------------------|--------|--|
| ltem | Ready? | |
| Refrigerant Recovery Kit | | |
| Generator + Fuel | | |
| Jack | | |
| Jack Stands | | |
| Dikes/Cutters | | |
| Steel Punch | | |
| Hammer | | |
| Sawzall, Blades, Batteries | | |
| Socket Set + Screwdrivers | | |
| Drain Pans | | |
| Buckets w/Lids | | |
| Drums | | |
| Labels + Marker | | |
| Hand Pump | | |
| Absorbent | | |
| Spray Paint | | |
| Tire Iron | | |

Per Vehicle Checklists

| 3) Vehicle Inspection/Walkaround Checklist | | | |
|---|-----------|--|--|
| Item | Complete? | | |
| Find Battery | | | |
| ID Refrigerant (ex: R12, R134a) | | | |
| See where/how Fluids are contained | | | |
| ID Merc Switches (presence/absence) | | | |
| Check the cab for items (trash, ammo, etc.) | | | |
| Find Locations of the Value added items | | | |

| 8) Fluid Removal Checklist | | | |
|----------------------------|-----------|--|--|
| ltem | Complete? | | |
| Motor Oil | | | |
| Transmission Fluid | | | |
| Transfer Case Fluid | | | |
| Brake Fluid | | | |
| Power Steering Fluid | | | |
| Antifreeze/Coolant | | | |
| Fuel | | | |

| 9) Value Added Item Checklist | | | |
|-------------------------------|-----------|--|--|
| Item | Complete? | | |
| Radiator | | | |
| Catalytic Converter | | | |
| Wiring Harness | | | |
| Alternator | | | |
| Motors (Starter, Wiper, etc) | | | |
| Aluminum Rims | | | |
| Lead Weights (on Rims) | | | |
| Other | | | |