Safety at the Transfer Station

Tribal Transfer Stations
March 23, 2011
Albuquerque, New Mexico

Roberta Tohannie
Institute for Tribal Environmental Professionals
Worker Protection at the Transfer Station

• Safety protocol and risks at facilities will differ depending on site layout and design, and types and volumes of wastes received. Thus, it is important to ensure safety and hazard management plans are developed specific for each site.

• Risks however that are commonly evident at many types of waste management facilities include:
  - Injury from operating and handling equipment
  - Falling off from platforms/floors/surfaces
  - Contact with sharp or corrosive materials
  - Contact with toxic or otherwise hazardous materials
  - Inhalation of dust or other offensive air borne particles
  - Blood borne pathogens
  - Vectors/insects
  - Other
Safety Matters

Tribal TS Employees

- Understand Regulations & Compliance
- Recognize Health Hazards
- Implement Safety Program
- Practice Safety Program
OUTLINE

• Federal Regulations and Compliance (Brief Overview)
• Occupational Health: Controls and Hazards
• Development of Safety and Emergency Plans
• Demonstration of PPE
• Group Activity
OSHA: Occupational Safety and Health Act/Administration

- Enacted by Congress in 1970
- Purpose: To “assure so far as possible every working man and woman in the nation safe and healthful working condition and to preserve our human resources”
- Known as “The Right to Know” law for employees

**Two OSHA Act duties for employers:**
- Provide a place of employment free from recognized hazards that could cause or likely cause death or serious harm to employees
- Shall comply with occupational safety and health standards under OSHA Act

For employees, the Act states that “Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to the Act which are applicable to his own actions and conduct.”
OSHAdministration

• Began in 1971; housed within the U.S. Department of Labor
• Enforces the OSHAct:
  - Enter workplaces to investigate alleged violations of OSHAct and to perform routine inspections
  - Hear formal complaints from employees
  - Issue citations and penalties
  - Provide for employee walkarounds or interview of employees during an inspection
  - Require employers to maintain accurate records of exposures to potentially hazardous materials and to inform employees of the monitoring results
  - Provide 50/50 funding with states that wish to create state OSHA programs that are parallel federal programs
OSHA and Tribes

- OSHA does not have an official Indian policy or program
- Tribes are considered “private sector employers”
- Tribes do not receive funding from OSHA to establish and implement occupational safety and health programs
- “OSHA has jurisdictional authority for inspection of tribal businesses’ work sites and OSHA standards are required to be followed by the employer; the agency also offers Indian-owned businesses the same consultation and compliance assistance centers it would offer to any private sector business.”

http://www.epa.gov/air/tribal/announce/pdfs/synergistarticle.pdf

OSHA Sections 1975.4(b)(3) and 1975.4(c):

NIOSH: National Institute for Occupational Safety and Health

- Housed w/IN the Centers for Disease Control and Prevention (CDC)
- Provides technical advice to OSHAdministration
- Principal federal agency engaged in occupational health and safety research
- Responsible for identifying hazards and making recommendations for regulations. These recommendations are called Recommended Exposure Limits (RELs).
- Issues criteria documents and health hazard alerts on various hazards and is responsible for testing and certifying respiratory protective equipment.
- Coordinates training programs
- Pocket Guidebook to Chemical Hazards (Online Resource)

http://www.cdc.gov/niosh/npg/
RCRA: Resource Conservation and Recovery Act

- Regulation and management of solid waste, hazardous waste, universal waste, and used oil
- Authorizes EPA to regulate hazardous waste generation, transportation, storage, treatment, and disposal from “cradle to grave.” (3.3 Subtitle C)
- Characteristics of Hazardous Waste:
  - Ignitability (liquid, flash point <140 F (60 C))
  - Corrosivity (pH<=2 or >=12.5)
  - Reactivity (unstable)
  - Toxicity (contains specified levels of hazardous constituents)
- Sets forth a framework for the management of non-hazardous solid waste (3.4 Subtitle D)
  - Includes waste from most garbage items, non-recycled household appliances, residue from burned tires, refuse such as metal scrap, wall board and empty containers, and sludge from industrial and municipal waste water and water treatment plants and from pollution control facilities; addresses household hazardous waste and small quantity generators exempt from Subtitle C
Other Federal Regulations

TSCA (Toxic Substance Control Act)
- Regulates chemicals from “cradle to grave”
- Tracks the thousands of new chemicals that industry develops each year with either unknown or dangerous characteristics. EPA then can control these chemicals as necessary to protect human health and the environment.

- **Title I: Control of Toxic Substances**
  - Regulates the manufacture, processing, use, distribution in commerce, and disposal of chemical substances and mixtures; regulates PCBs

- **Title II: Asbestos Hazard Emergency Response Act (AHERA)**
  - EPA created a model program designed to minimize the hazards of asbestos-containing materials in schools and requires accreditation of persons who inspect for asbestos-containing materials.

- **Title III: Indoor Radon Abatement Act**
  - Seeks to reduce the threat of radon from all types of buildings/schools

- **Title IV: Lead Exposure Reduction Act**
  - Requires EPA to identify lead contamination in the environment, regulate amount of lead in products, and establish programs to monitor and reduce exposures
Other Federal Regulations

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act or Superfund Law)

• Gives federal authority to respond to emergencies involving toxic and hazardous substances and to pollutants or contaminants that pose “imminent and substantial danger to public health and welfare or the environment.”

SARA (Superfund Amendment Reauthorization Act)

• Title III Emergency Planning and Community Right to Know Act (EPCRA)

  - Requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous chemicals present at facilities within local communities.
Occupational Health

- Chemical (gases, vapors, fumes, dust, mists)
- Physical (noise, radiation, temperatures)
- Biological (bacteria, viruses, fungi, insects)
- Ergonomics (man/machine, repetitive motion)
Occupational Health

Routes of entry of how toxic substances can enter the body:

a) Inhalation
b) Skin absorption
c) Ingestion
d) Injection
Occupational Health Controls

Three control methods for health hazards in the workplace:

1. **Engineering Controls** – engineer the hazard, either by initial design specifications; include ventilation to minimize dispersion of airborne contaminants, isolation of a hazardous operation or substance of a material, equipment, or process to provide hazard control. *First line of defense.*

2. **Administrative Controls** – reduce employee exposures by scheduling reduced work times in contaminant areas; employee training that includes hazard recognition and specific work practices that help reduce exposure (this training is required by law for employees exposed to hazardous materials in their work).

3. **Personal Protective Equipment (PPE)** – when it has been established that the work environment is unsafe, it may be necessary to protect the worker from that environment by using PPE. *Last line of defense.*
Occupational Health Controls

Other national resources to consider:

• AIHA: American Industrial Hygiene Assoc.
• ASSE: American Society of Safety Engineers
• ANSI: American National Standards Institute
• ACGIH: American Conference of Governmental Industrial Hygienists
• Local resources:
  - Occupational Health Nurse or Physician
  - Health Physicist
  - Safety Professional
Occupational Health Controls

ACGIH Health Standards: Threshold Limit Values

• **Time-Weighted Average (TLV-TWA)** – avg. concentration for a conventional 8-hr workday and 40-hr workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect.

• **Short-Term Exposure Limit (TLV-STEL)** – a 15-min. TWA exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA.

• **Ceiling (TLV-C)** – maximum concentration which should never be exceeded

OSHA Health Standards:

• **Permissible Exposure Limit (PEL-TWA)** – airborne concentration which should not be exceeded in an 8-hr. day, 40-hr work week.

• **Ceiling (PEL-C)** – maximum concentration which should never be exceeded
Occupational Health Controls

Dose-Response Terms

- **TD$_{10}$ Toxic dose low** - lowest dose for effect except radiation
- **TC$_{10}$ Toxic concentration low** used to express toxic concentration via inhalation
- **LD$_{10}$ Lethal dose low** - Lowest dose that causes death in 10% of the test population
- **LD$_{50}$ Lethal dose 50%** - The dose that causes death in 50% of the test population
- **LC$_{10}$** - Lethal concentration low in air
- **LC$_{50}$** - Lethal concentration 50%. The concentration that causes death in 50% of the test population
- **IDLH** – Immediately Dangerous to Life and Health
Occupational Health Hazards

HAZARDS

Physical

Chemical

Health
Occupational Health Hazards

KEY TERMS:

- **Flash point**: Lowest temperature liquid will give off enough vapor to form an ignitable mixture in air
- **Lower Explosive Limit (LEL)**: Lowest % of air/vapor mixture that will burn
- **Upper Explosive Limit (UEL)**: Highest % of air/vapor mixture that will burn
- **Flammable liquid**: Flash point of 100 °F or less
- **Combustible Liquid**: Flash point of >100 °F and less than 200 °F
Chemical Hazards

- Forms or States: Solid, Liquid, Gas
- Properties: Vapor pressure, boiling point, melting point, viscosity; solubility/miscibility, density, spec. gravity, vapor density; flammable range, flash point, ignition temperature

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<tr>
<th>Solid Hazards</th>
<th>Liquid Hazards</th>
<th>Gas Hazards</th>
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<tr>
<td>Skin Contact (dust powders)</td>
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<tr>
<td>Inhalation (particulates)</td>
<td>Eye Contact (flush w/ water)</td>
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<td>Fire and Explosion (combustible dust)</td>
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<td></td>
<td>Fire &amp; Explosion</td>
<td>Oxygen Deficiency</td>
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</table>
Oxygen Deficiency

- 4 to 6 minutes without oxygen may result in brain damage or death
- OSHA Oxygen deficiency = 19.5%
- Oxygen deficiency occurs in poorly ventilated spaces (i.e. confined spaces)
  - Inert gases (carbon dioxide, nitrogen, argon)
  - Volatile Liquids (solvents)
  - Combustion (fumes, gases, oxygen)
- Signs and Symptoms
  - Increased rate and depth of breathing
  - 16% oxygen causes dizziness, rapid heartbeat and headache
  - <14% can cause death
  - Usually no warning signs
Physical Hazards

Fire Hazards

- **Flammable** (highly combustible at ambient temps)
- **Combustible** (not necessarily flammable but will burn)
- **Pyrophoric** (will ignite at room temps in the presence of air)
- **Explosive** (extremely or violently flammable)

![Fire Triangle Diagram](attachment:image.png)
NFPA 704M – Hazard Identification System

NFPA 704M Hazard Diamond

**BLUE HAZARD:** Health

**RED HAZARD:** Flammability

**YELLOW HAZARD:** Reactivity (Stability)

**WHITE HAZARD:** Specific (or Special)
NFPA 704M – Hazard Identification System

Health Hazard (blue)

4-Lethal
Gases, liquids, vapors:
LC50 ≤ 1000 ppm
Dusts & Mists:
LC50 ≤ 0.5 mg/L
Materials:
Dermal LD50 ≤ 40 mg/kg
Oral LD50 ≤ 5 mg/kg

3-Serious or Permanent Injury
Gases, liquids, vapors:
LC50 > 1000 ppm and ≤ 3000 ppm
Dusts & Mists:
LC50 > 0.5 mg/L and ≤ 2 mg/L.
Materials:
Dermal LD50 > 40 mg/kg and ≤ 200 mg/kg
Oral LD50 > 5 mg/kg and ≤ 50 mg/kg
Corrosive to skin, eyes, respiratory tract

2-Temporary Incapacitation/Residual Injury
Gases, liquids, vapors:
LC50 > 3000 ppm and ≤ 5000 ppm
Dusts & Mists:
LC50 > 2 mg/L and ≤ 10 mg/L.
Materials:
Dermal LD50 > 200 mg/kg and ≤ 1000 mg/kg
Oral LD50 > 50 mg/kg and ≤ 500 mg/kg
Skin, eye, or respiratory tract irritants

1-Significant Irritation
Gases, liquids, vapors:
LC50 > 5000 ppm and ≤ 10,000 ppm
Dusts & Mists:
LC50 > 10 mg/L and ≤ 200 mg/L.
Materials:
Dermal LD50 > 1000 mg/kg and ≤ 2000 mg/kg
Oral LD50 > 500 mg/kg and ≤ 2000 mg/kg
Slight skin, eye, or respiratory tract irritants

Material Hazards:
Gases, liquids, vapors:
LC50 > 10,000 ppm
Dusts & Mists:
LC50 > 200 mg/L
Materials:
Dermal LD50 > 2000
Oral LD50 > 2000 mg/kg
Nonirritating to skin, eye, or respiratory tract

Specific Hazards (white)

Include symbols when the following hazards are present:

OX oxidizer
W water reactive

Example: If these are the chemicals in your laboratory.

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HEALTH HAZARDS

Target Organs:
- Corrosives
- Carcinogens
- Sensitizers

Irritants

Reproductive Hazard:
- Teratogens
- Mutagens

Carcinogens: cancer-causing
Sensitizers: cause a cellular reaction
Teratogens: cause damage to fetus
Mutagens: affect DNA
Orientation and Training

- Who are your workers/employees?
- Hiring of qualified staff ensures productivity and injury-free workplaces; review and update job descriptions
- New employees must attend orientation sessions

Transfer Station Supervisor

**Job Title:** Transfer Station Supervisor

**Job Summary:** Answering to the Board of Selectmen through the Town Administrator, the position is responsible for the movement of Municipal Solid Waste (MSW), recyclables, and other materials in and out of the transfer facility. The position is also responsible for all aspects of the overall facility operation.

**Major Duties:**
- Oversees operations to maximize efficiency and employee safety
- Ensures that all regulations and guidelines are adhered to
- Oversees operation and maintenance of all transfer station equipment
- Ensures all activities are conducted in a safe and efficient manner
- Oversees the implementation of all safety and environmental regulations

Transfer Station Operator

**Definition:**
Under general supervision, operate all types of solid waste transfer station equipment and perform routine maintenance on such equipment.

**Examples of Duties:**
1. Operate transfer truck.
   - Operate truck and auxiliary equipment.
   - Maintain truck and equipment in good working order.
2. Operate transfer station equipment.
   - Operate transfer station equipment in a safe and efficient manner.
3. Operate front-end loader.
   - Operate front-end loader to load transfer truck.
   - Operate compactors to compact materials.
5. Perform maintenance and repair work on equipment.
   - Perform routine maintenance on equipment.
6. Maintain records and reports.
   - Maintain records and reports on equipment and operation.

Solid Waste Program Assistant

**Job Code:** 10800

**Per Grade:** 2112

**Nature of Work:**
This is technical work assisting in all phases of the Solid Waste Department’s specialized and general work reduction programs. Positions in this class also provide support services to other programs within the Solid Waste Department. Responsibilities include operating the Solid Waste Transfer Station supervisor, Solid Waste Program Manager, and the Management and Operations of the Technical Support Section. Responsibilities involve the management of workers and the supervision of the program.

**Minimum Qualifications:**
- 3 years of experience in recycling and solid waste operations, or equivalent
- A high school diploma or GED
- Valid driver’s license
- Experience in the management of workers and the supervision of the program

**Examples of Duties:**
1. Assist in the management of workers and the supervision of the program.
2. Assist in the development and implementation of program goals and objectives.
3. Assist in the coordination of program activities with other departments.
4. Assist in the preparation of reports and surveys.

**Salary:**
Depending on experience and qualifications.

**Contact Information:**
For more information, please contact the Town Administrator at 555-1234.
Orientation and Training

Why should TS workers attend training sessions?

- To help improve the operation and overall management of transfer stations.
- Gain a better understanding of Department/federal regulations and concerns;
- Learn methods of operation that achieve compliance, improve efficiency and possibly save money; and
- Possibly have the opportunity to become a Certified Transfer Station Operator or Haz Mat Technician (HazWoper or Emergency Response)

Examples of Safety Training programs:

- Public access and safety
- Operator safety
- Waste handling
- OSHA/DOT standards
- Equipment Operation
- Fire Extinguisher Equipment and Use

Training Costs: No charge - $1800 per person
## 5.1 Training Curriculum Table

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### 5.2 Footnotes For Training Curriculum Table

Legend: **X** = Mandatory Training  **R** = Recognition / Awareness Training Only  **AA** = As Appropriate, based on company’s assessment of applicable training
Facility Audit/Checklists

Assess your facility for maintenance, repairs, and safety compliance

### Part VII Section D Appendix 1.
Sample Transfer Station Checklist

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<th>Item or Condition Examined</th>
<th>Indicate whether condition is Satisfactory or Unsatisfactory (S or U)</th>
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<td>Electrical Wiring</td>
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<tr>
<td>Safety Rails</td>
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<td>Stairs and Rails</td>
<td></td>
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<tr>
<td>Fire Extinguishers</td>
<td></td>
</tr>
<tr>
<td>Grounds</td>
<td></td>
</tr>
</tbody>
</table>
Questions for Transfer Station Staff

• Who are your generators and what type of waste could potentially pose a danger or threat to the staff?

• How well do you communicate with other programs and departments within your tribe? Example: Utilities/Environmental Dept.; Health Centers/Utilities

• Does your tribe or tribal community have a TERC (Tribal Emergency Response Committee)? Does your region have a LEPC (Local Emergency Planning Committee)?
Safety Recognition

- Hard Hat
- Safety Gloves
- Safety Goggles
- Boots
- Ear Plugs
- Ear Muffs
- Protective Suit
- Respirator (Dust)
- Safety Vest
- Lift Support
- Fall Harness
Safety Recognition

• Ensure spill kits stored onsite are appropriate for management of the likely spills to be encountered; kit contents include:
  - 5-gallon bucket
  - Goggles
  - Emergency Response Guidebook
  - Pair of gloves
  - Disposable bags
  - Absorbent pads/pillows
  - Shovel

• Provide a safety shower and/or eyewash facilities in where workers may come into contact with corrosive or toxic substances wherever possible
Safety Recognition

Display prominent signs regarding safety

Facility Safety

Fall/Slips

Emergency Info
Safety Recognition

Display prominent signs regarding handling of hazardous wastes and prohibition of behaviors such as smoking.
Safety Recognition

Establish Lock-Out, Tag-Out (LOTO) Procedures:
Requires employers to implement practices and procedures to disable machinery or equipment and to prevent the release of potentially hazardous energy while maintenance and servicing activities are being performed.

Electrical Lock-Out Kit
Safety Recognition

Vehicles and Equipment
• Free moving mobile equipment
• Mobile equipment
• Preventative Maintenance/Checklist
• L.O.T.O.

Operators/Workers
• Training
• Certifications
• Waste Acceptance and Screening Protocols
Safety Recognition

Back Health & Exercises

The shoulders, neck and back endure stress and tension from prolonged sitting and repetitive movements common in many workplace settings. Below are a few ways to relax the muscles and increase circulation.

**Shoulder Shrugs:**
While sitting or standing, lift the shoulders up toward your ears. Hold for 2-3 seconds and roll your shoulders back as you lower them. Repeat for 8-10 reps. This relaxes tension in the shoulders, upper back and neck.

**Spinal Twist:**
Sit straight up with the feet flat on the floor. Cross the left and gently twist the torso towards the right, using your hands to help deepen the stretch. Do this twist as far as you comfortably can. Keep your back straight while keeping the hips square. Hold for 10-15 seconds and repeat in the opposite direction. You should feel the stretch throughout your back, sides and abdomen.

**Back/Side Stretch:**
Hinge forward, tuck your elbows over your head and interlace your fingers, keeping the elbows straight. Place arms as far back as you can. nestled into the left and then to the right. You should feel the stretch in your back, sides and obliques.

**Butterfly Back Stretch:**
Lean your fingers together behind your back, bring your elbows back as far as possible. Separate your shoulder blades together. Hold for 20 seconds. Release, then repeat. This stretches the muscles in your chest, upper back and back.

**Chest Stretch:**
While standing, drip your hands behind your back with your palms facing up. Pull your hands down straightening your elbows. Press your shoulder blades together while lifting your hands/shoulders. Your chest should pinch. Hold for 10-15 seconds. You should feel the stretch in your upper arms, shoulders and sides.

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Ergonomics

- Discomfort
- Injury prone

**Proper Lifting Techniques:**

- Human versus Machine
- Load Handling
- Designing for Body Strength
Safety Recognition

First Aid Kit
- 25 -70 Person bulk first aid kit
- Large 106 piece supply
- OSHA recommended
- Ensure appropriate aid contents
- Strong metal case, wall mountable

Blood Borne Pathogens
- OSHA Standards (if applicable and where needed)
  - Needlestick Safety and Prevention Act
  - Engineering and work practice controls to eliminate or minimize employee exposure to bloodborne pathogens.
  - Exposure Control Plan

Examples of Tip Floor Safety

TRANSFER STATION

TIP FLOOR SAFETY and OPERATING RULES

1.) Drivers must maintain 8’ of space between unloading vehicles.

2.) All Waste Hauler employees must wear a Fluorescent Colored Garment (shirt, vest, or jacket) when on the Tipping floor.

3.) Drivers/Helpers **DO NOT** cross beyond **YELLOW LINE** marked on side walls. **FALL DANGER** beyond this point.

4.) Driver and Helper **stay within 8’ of your vehicle at all times**.

5.) Be Aware of Heavy Equipment and Truck Traffic at all times. **STAY ALERT!!**

6.) **NO** Blade or Head cleaning on the tipping floor **after 12:30p.m.**

7.) Drivers please unload and **EXIT** tip floor as quickly as possible.

8.) **Smoking** is prohibited on LCSWMA property.

9.) **No scavenging or salvaging** of material on the tipping floor.

10.) **Children** and **Pets** must remain in vehicles at all times.


Hand Signals

All personnel involved in the movement of mobile refuse equipment are to be familiar with and utilize standard hand signals as follows:

- **Distance Left to Back** – Hold hands apart and above the head with palms facing inward. When the distance is less than the hand spread (approximately 3 feet), bring hands together as distance decreases. When truck reaches proper position, rotate the right palm toward the driver. (See Stop)

- **Stop** – Raise both hands above the shoulders with open palm facing the driver (emergency stop may be indicated by closing of the hands).

- **Move to the Right** – Raise the right hand above the shoulder, and with the index finger of the left hand pointing to the right, make repeated motions to the right with the left hand.

- **Move to the Left** – Raise the left hand above the shoulder, and with the index finger of the right hand extended to the left, make repeated motions to the left with the right hand.

- **Back** – With the left hand raised above the head, and the palm of the hand turned inward, roll the arm in a circular motion (toward the body if behind the truck, away from the body if in front of the truck).

https://www.summitholdings.com/safety/safetyPrograms/industry/transferStations.pdf
Good Housekeeping

• Nuisance Management
  - Litter: potential for unsightly and unsanitary storage of waste on and around property
  - Dust: non hazardous; equipment and other items will become dirty
  - Odor: avoid pungent and annoying smell

• Your facility represents YOU and STAFF
  - Avoid horseplay
  - Avoid negligence and apathy
  - Customers may not utilize your facility if problems (internal and external) exist
Fire Extinguisher Program

- **ABC** ratings are determined under ANSI/UL Standard 711 and look something like "3-A:40-B-C". Higher numbers mean more firefighting power.

- **Water extinguishers** or APW extinguishers (air-pressurized water) are suitable for **class A fires only**. Never use a water extinguisher on grease fires, electrical fires or class D fires - the flames will spread and make the fire bigger!

- **Dry chemical** extinguishers come in a variety of types and are suitable for a combination of **class A, B and C fires**. These are filled with foam or powder and pressurized with nitrogen.
  - **BC**: This is the regular type of dry chemical extinguisher. It is filled with sodium bicarbonate or potassium bicarbonate and leaves a mildly corrosive residue which must be cleaned immediately to prevent any damage to materials.
  - **ABC**: This is the multipurpose dry chemical extinguisher. The ABC type is filled with monoammonium phosphate, a yellow powder that leaves a sticky residue that may be damaging to electrical appliances such as a computer.
**Fire Extinguisher Program**

### Know your fire extinguishers

<table>
<thead>
<tr>
<th></th>
<th>WATER</th>
<th>FOAM SPRAY</th>
<th>CO2</th>
<th>ABC POWDER</th>
<th>WET CHEMICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood, paper and textiles.</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Flammable liquids.</td>
<td>✗</td>
<td>✓</td>
<td></td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>Gaseous fires.</td>
<td>✗</td>
<td></td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Cooking oils and deep fat fires</td>
<td>✗</td>
<td></td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Live electrical equipment.</td>
<td>✗</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

PASS Password

```
KNOW HOW TO USE A FIRE EXTINGUISHER
FOLLOW THE P-A-S-S WORD
PULL AIM SQUEEZE SWEEP
```
Hazardous Waste Management

- If necessary, prepare a hazardous waste management plan for receiving, handling, and storing such waste; include Haz-Comm

Do NOT accept if:
- Not properly labeled
- Package is not intact
- No MSDS

Emergency Equipment
PPE

Spill/release procedures
Emergency Response Guidebook

ERG2008 Sections:

1) Telephone numbers (page 8)
2) Table of placards (pages 16-17)
3) Railcar and Road Trailer ID Charts (pages 18-19)
4) YELLOW Section (ID No.)
5) BLUE Section (Shipping Names)
6) ORANGE Section (Guide Pages)
7) GREEN Section (Initial Isolation and Protective Action Distances for highlighted substances)

Online overview of guidebook (power point):

Mobile Download:
http://phmsa.dot.gov/hazmat/library/erg#page6

To order a copy of guidebook:  www.jjkeller.com
Free online version:  http://www.ehso.com/hmerg.php
Hazardous Waste Management

Non bulk packaging (less than 110 gallons) offered for shipment must bear the EPA Hazardous Waste label.
Material Data Safety Sheets

• If applicable, view or utilize Material Safety Data Sheets (MSDS) for any hazardous substances or dangerous goods commonly received, stored or used on-site.

• There are many websites to view for MSDS sheets, here are a few:
  http://www.jtbaker.com/asp/Catalog.asp
  http://hazard.com/msds/

• For household products, view the U.S. Department of Health and Human Services “Household Products Database website at:
Hazardous Waste Management

- If you are **not** an actual **producer**, **storer**, **handler**, **user**, or **disposer** of any hazardous materials, then you may **not** have an actual need for a “**Hazardous Materials Policy or Program**.”
- What you may need is a “**Hazardous Communication Policy or Program**,” or possibly nothing at all.
- At the minimum, however, have a basic understanding of hazardous waste/materials, i.e., recognize the presence of such materials and how you can utilize certain resources to help you identify, handle, and/or dispose of.
Hazards Resources:

• OSHA/EPA Chemical Database:
  http://www.osha.gov/web/dep/chemicaldata/

• Chemicals listed chemicals listed in PELs given at:

• Chemicals which have a TLV (Threshold Limit Value):
  http://www.acgih.org/tlv/

• Agency for Toxic Substances & Disease Registry:

• National Toxicology Program (Carcinogens):
  http://ntp-apps.niehs.nih.gov/ntp_tox/index.cfm

• US EPA Chemicals in the Environment:
  http://www.epa.gov/chemfact/

• American Chemical Society
  http://portal.acs.org/portal/acs/corg/content
Exposure

• Routes of Exposure
  – how the toxin enters the body
    • inhalation, injection, absorption, ingestion

• Engineering Controls or PPE
  – control of the toxin to prevent exposure
Exposure

HAZARDS TO THE LUNGS

• Inhalation - the major source of toxic substance exposures
• Inhalation Hazards
  – Emphysema - loss of bronchiole elasticity
  – Pleurisy - loss of lubricant between lung & chest cavity means irritation and pain
  – Pneumonitis - inflammation of lung tissue
  – Bronchitis - inflammation the bronchioles
  – Pneumoconiosis - (Greek - dusty lung)
• Example: Particle Deposition

PM: Particulate Matter

Cross-Section of a Human Hair ~ 60µm

PM-10 µm Dust Particles

PM 2.5 µm Combustion Particles
Exposure

Larger particles (> PM$_{10}$)

Smaller, inhalable particles (≤ PM$_{10}$)
Exposure

SKIN DISORDERS

• Dermatitis - one of the “top ten” occupational illnesses listed by NIOSH

• Causes:
  – Chemicals (skin absorption)
    • Skin is “selectively” permeable to chemicals
      – Some chemicals pass through & others do not
    • Some chemicals pass through the skin almost instantaneously (DMSO)
    • Other chemicals take several hours (toluene)
    • Other chemicals only get through broken skin (barium sulfate)
Exposure

Hydrofluoric Acid (HF) - very corrosive and rated #4 on the NFPA Blue Diamond; very poisonous; fluorine source for freon

2 days after being exposed to HF

Graphic from “Chemistry of Hazardous Materials” book
Exposure

Other Hazards and locations

- **RODENTS**
  - Hantavirus
  - Pits, truck engines, burrows

- **MOSQUITOS**
  - West Nile Virus
  - Tires, wetlands near facility

- **BED BUGS**
  - Bites, rash, sores
  - Bedding brought into facility
Exposure

- **Fumes**
  - Metal sources
  - Example: Zinc, magnesium or their oxides

- **Mists**
  - Liquid, acidic, alkali, oil sources
  - Example: spray painting

- **Solvents**
  - Used to dissolve another material
  - Example: paint thinners, spot removers, wax cleaners, etc.

- **Paints, Compressed Gases, Pesticides**

- **Noise**
Bottle Bombs

- Explosive
- Easy and common to produce
- Hazardous to face, chest, and hands
- Can be hidden in garbage bags/containers, if shaken it can detonate
- Observe/recognize contents during screening

CONTENTS

Types of Bottles:
- Water bottles
- 2-liter bottles
Meth Lab Materials

What to look for . . .

Haz Mat specialist handling hydrochloric acid generator from a meth bust

Burned propane tank
Fire Hazard

• What gas causes the most fatalities (in a fire) than any other product of combustion?

• Carbon Monoxide
  – Found at every fire
  – Colorless and odorless
  – Leftover from incomplete combustion
  – Prevents from O2 from attaching to hemoglobin
  – 500 ppm dangerous
Other Dangerous Waste

These items could be disguised as regular garbage or included in regular garbage containers and dropped off at the facility knowingly or unknowingly:

• Bullets, firearms
• Animal carcasses
• Household Hazardous Waste
• Pharmaceuticals
• School waste (chemicals, animal dissections, etc.)
• Mercury-contained products
  - Bulbs
  - Thermostats
  - Light ballasts
PPE

- Head protection
- Eye and face protection
- Hand protection
- Specialized components: Vent valves, Gastight zipper
- Totally-encapsulating chemical protective suit
- Foot protection
- Body protection
- Other types: Apron, Coveralls, Splash suit, Coat, Pants
Respirators

• When is it needed at the Transfer Station?
  - Oxygen deficient environment
  - Determination based on TLVs, PELs, or any other available exposure limits; check for IDLH conditions
  - Substance specific health standard (e.g. lead or asbestos)
  - Physical state and concentration of contaminant

• Respirator Protection Program (Written Program)
Respirators

- Tested and certified by NIOSH and ANSI
- NIOSH: 9 Filters; divided into 3 filter series, N, R, and P, and each has 3 levels of filter efficiency: 95%, 99%, and 99.97 (100)%
  - **N Series** (use in oil aerosol-free environment)
  - **R Series** (removal of any particle including oil-based liquid aerosol; used for any solid or liquid airborne particulate hazard)
  - **P Series** (removal of any particle including oil-based liquid aerosol; longer use periods than R series)
- Types: Air-purifying and air-supplied respirators
  - Positive and negative pressure
  - Self-Contained Breathing Apparatus (SCBA); probably will not use this type at the facility, but good to know what it is
Respirators

Dust Respirator

Basic Half-Face Mask

PAPR (Powered Air-Purifying Respirator)

Standard Full-Face

Air-Line Respirator, regulator

Hood - Continuous flow hose
Respirators

Cartridges

Color-Coded Cartridges:
(pictured here)
• Purple (Any particulates)
• Yellow (Acids, organic vapors)
• Black (Organic vapors)
• Green (Ammonia gas)

Stacked HEPA & Combination

Mask + Cartridges = Protection
PPE Boots, Gloves, Suits, & Gloves

**BOOTS**
- Steel toe & shank
- Big, easy to clean treads

**TYVEK SUIT**
- Resistant to vapors and chemicals

**GOGGLES**

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**Latex**

**Rubber**

**Nitrile**

**Butyl Rubber**
Classes of Protective Equipment

- **Level A:** positive pressure respirators, protective (totally-encapsulated) suits, gloves, and boots

- **Level B:** Positive pressure respirators, resistive (chemical-resistive) suits, gloves, and boots

- **Level C:** Negative pressure air purifying respirators, resistive (chemical-particulate-resistive) suits, gloves, and boots

- **Level D:** Minimal protection, (respirators optional), resistive (chemical-particulate-resistive) suits, safety vests, gloves, and boots
Emergency Planning

What actions would you include in your emergency plan?

• Identification of potential emergencies

• Roles and responsibilities of management, employees and coordination of roles of potential off-site responders such as police and fire departments or hazardous materials teams.

• Description of how emergencies might be recognized and communicated within the facility

• Identify evacuation routes, safe rally areas and procedures for accounting for personnel and visitors

• Describe procedures for personnel to obtain emergency medical treatment and first aid

• Training for personnel (Haz Mat, HazWoper, etc.)

• Provide PPE inventory and other equipment and tools
Safety Program

• Written program; create “safety manual” for workers and “safety brochure or sign” for customers/visitors

• A recognized program will also reflect favorably on your department and staff; anticipate increased productivity and morale and better customer relationships

• View your state’s OSHA safety program (if it is available) for guidance and referral

• Document worker progress, injuries, and training

• Identify local resources (programs, specialists, etc.) to expand or improve safety procedures

• Conduct staff meetings consistently; “refresher Mondays”

• Conduct audits and/or inspections

• Possibly include processes/procedures on how to deal with difficult customers

• Work with community and educate about proper disposal of wastes to protect workers; host an Open House or participate in or plan an environmental fair
Summary

Regulations

• **29 CFR 1910** – Workplace Safety (OSHA)
• **40 CFR** – Environment (US EPA)
• **49 CFR** – Transportation (DOT)

Worker protection mechanisms and devices:

• Safety program (health hazard anticipation, recognition, and evaluation)
• Emergency Plans (not just for the staff, but for community members, too)
Resources

OSHA General Industry Regulations

• 2) 29 CFR 1910.1200 & .1020, Hazard Communication
• 3) 29 CFR 1910.132-.138, Personal Protective Equipment
• 4) 29 CFR 1910.157, Fire Extinguishers
• 5) 29 CFR 1910.146, Confined Space Entry
• 6) 29 CFR 1910.134, Respirator Use
• 7) 29 CFR 1910.147, Lockout /Tagout
• 8) 29 CFR 1910.1030, Bloodborne Pathogens
• 9) 29 CFR 1910.178, Powered Industrial Trucks

Website:  http://osha.gov/

Emergency Response Video:  http://www.csb.gov/

Book:  “Fundamentals of Industrial Hygiene” 5th Edition; Barbara Plog


The Simpson Safety Posters:
http://www.safetyemporium.com/ILPI_Site/WebPagesUS/safety/simpsons.htm

Any questions?

Thank you!

Roberta Tohannie
ITEP
Phone: 928-523-2082
Email: roberta.tohannie@nau.edu