

HAZWOPER

Household Hazardous Waste



1

HAZWOPER

- **Hazardous Waste Operations and Emergency Response**
- Federal 29 CFR §1910.120
- California Code of Regulations §5192
 - (D) HHW Operations (TSDF) (§5192 (p) = 24 hours)
 - (E) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.
- "Competent" means possessing the skills, knowledge, experience, and judgment to perform assigned tasks or activities satisfactorily as determined by the employer.



2

HAZWOPER Refresher

- Review/retraining on relevant initial training topics
- Update on regulatory and safety standards
- Additional subject areas as appropriate.
- Hands-on review
 - New or altered PPE
 - Decontamination equipment, or
 - Procedures.



3

HAZWOPER Topics

- Safety and health program
- Hazard communication program
- Medical surveillance program
- Decontamination program
- New technology program
- Material handling program
- Training program
- Emergency response program



4

Topics

Injury and Illness Prevention

- Training Standards
- Hazard Communication
- Ergonomics
- Personal protective equipment
- Bloodborne pathogen
- Slips, trips and falls
- Heat Illness Prevention
- Emergency action
- Lock-out/Tag-out
- Confined spaces

HAZWOPER Programs

- Safety and health program
- Hazard communication program
- Medical surveillance program
- Decontamination program
- New technology program
- Material handling program
- Training program
- Emergency response program



Emergency or Incidental Spill*

- **Emergency**
 - High hazard
 - Need help
 - Spill to waterway
 - Life or injury threat
 - Requires immediate attention and/or evacuation
 - Reportable to agencies
 - OES, 911, Health/Fire
- **Incidental**
 - Low hazard
 - Limited quantity
 - Cleanup without assistance
 - Not reportable to agency but keep record (Log)



*OSHA guidance

6

HazMat Response Levels

- First Responder Awareness Level
- First Responder Operations Level
- Hazardous Materials Technician
- Hazardous Materials Specialist
- On Scene Incident Commander

- HAZWOPER



SA

7

First Responder Awareness

- OSHA definition
 - Likely to witness/discover a release
 - Can initiate notifying authorities
 - Take no further actions beyond notifying the authorities of the release



SA

8

First Responder Awareness Level

Have sufficient training or sufficient experience to objectively demonstrate competency in the following areas related to hazardous substances in an incident or emergency:

- Understand what hazardous substances are, and risks
- Understand potential outcomes associated with an emergency
- Ability to recognize the presence of hazardous substances
- Ability to identify the hazardous substances, if possible.
- Understand role of the first responder awareness individual in the employer's emergency response plan
- Ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

SA

9

Why Train?

- It's your Life
 - Protect yourself
- It's the Law
 - Regulatory Standards
 - Permit Requirements



SA

11

Training Frequency

- Initial
- Refresher/Annual
- Periodic
 - Change in process or new chemicals
 - In response to incidents
 - New requirements
 - Interest



SA

12

Training Methods

- This Refresher
- Tailgate Safety
- On-the-job training
- On-line Courses
- Site Specific Requirements (Essential)
- Equivalent documentation or certification of work experience or training



SA

13

Training Requirements



- HAZWOPER
 - Initial & annual refresher
- DOT hazardous materials transportation
 - Initial & 3 year refresher or for changes
- Respiratory protection (annual)
- Bloodborne pathogen (annual)
- Universal Waste (annual)
- **Includes temporary workers**



14

Hazard Communication



15

Hazard Communication

- A hazard is a source of risk, danger, or peril capable of causing injury.
- What is it?
 - Communication of the hazards present
 - How to protect yourself.
- Why Do it?
 - It's the Law
 - 29 CFR 1910.1200
 - CCR Title 8, section 5194



16

Hazard Communication

- Employer - Develop HazCom program
 - Provide effective information and training on hazardous chemicals in their work area at the time of initial employment.
 - Provide training when a new physical or health hazard is introduced.
 - Chemical specific information must always be available through labels and material safety data sheets.
- Employees - Know program details & follow them.
 - Be aware of the work practices, emergency procedures, PPE, and the specific chemicals they may be working with or around.



17

Toxicology and interaction

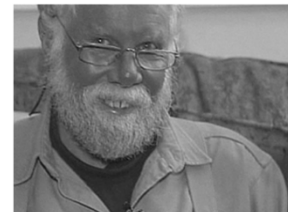
- Everything is toxic at a certain concentration and duration of exposure
- Interactions and bodily reactions are dependent upon;
 - Routes of entry
 - Distribution mechanism: blood, Lymph, Mucous
 - Biotransformation: Metabolism/Detoxification
 - Routes of elimination
 - Exhalation, Perspiration, Excretion
 - Bioaccumulation



18

Man Claims Skin Treatment Turned Face Permanent Blue

Fourteen years ago, Paul Karason developed a bad case of dermatitis, which results in swollen, reddened and itchy skin. He started self-medicating, using a treatment called colloidal silver, which is made by extracting silver from metal.



19

Toxicity – Degree of Severity

- Acute – short term - reversible
- Chronic – long term - irreversible
- Additive $3 + 3 = 6$
 - DDT and Chlordane
- Synergism $3 + 3 = 8$
 - Asbestos fibers and smoking
- Potentiation $0+3=6$
 - non-toxic increases toxicity of toxic
 - ethanol and carbon tetrachloride
- Antagonism $3+3=4$
 - two chemicals react-reduced toxicity
 - lead and phosphate



SA

20

LD₅₀ Toxicity

- Extremely toxic <1mg/kg
- Highly toxic 1-50 mg/kg
- Moderately toxic 50-500 mg/kg
- Slightly toxic 500-5000 mg/kg
- Practically nontoxic >5000 mg/kg

SA

21

Comparative Acutely Lethal Doses

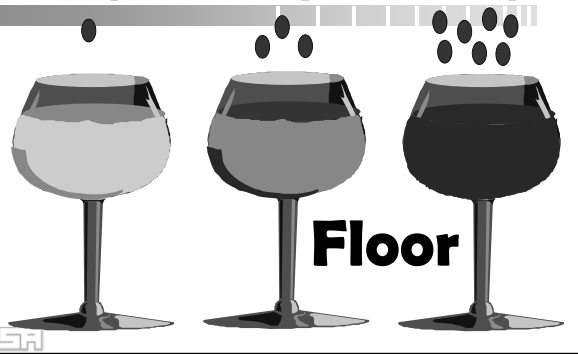
LD50(mg/kg)	Ounces/ 200 pound person	Toxic Chemical
15,000	48	PCBs
10,000	32	Alcohol (ethanol)
4,000	13	Table salt - sodium chloride
1,500	4.8	Ferrous Sulfate - an iron supplement
1375	4.4	Malathion - pesticide
900	2.9	Morphine
192 (rat)	0.61	Caffeine
150	0.48	Phenobarbital - a sedative
142	0.45	Tylenol (acetaminophen)
50	0.16	Mercury
2	0.0064	Strychnine - a rat poison
1	0.0032	Nicotine
0.5	0.0016	Curare - an arrow poison
0.001	0.0000032	2,3,7,8-TCDD (dioxin)
0.00001	0.000000032	Botulinum toxin (Food poison)

SA

22

Dose / Response

One tequila Two tequila Three tequila

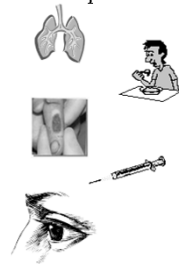


SA

Routes of Entry

There are 5 main routes of exposure:

- Inhalation
- Ingestion
- Absorption
- Injection
- Eye Contact

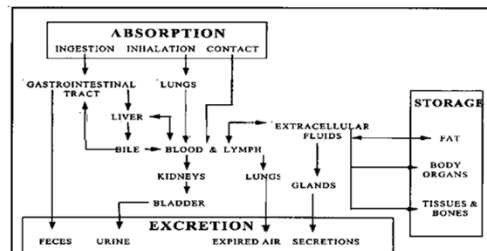


SA

24

Absorption, Distribution, Excretion

KEY ROUTES OF CHEMICAL ABSORPTION, DISTRIBUTION AND EXCRETION



SA

25

Signs of Exposure

The following symptoms could be an indication of chemical exposure:

- Loss of Smell
- Dizziness
- Choking or Coughing
- Headache
- Nausea
- Eye Irritation
- Change in Normal Behavior



26

Measuring Exposure

Comparative analogies are

- ppm (parts per million)
 - 1 teaspoon in 1,000 gallons
 - 1 second in 12 days
- ppb (parts per billion)
 - 1 teaspoon in one million gallon
 - 1 second in 32 years
- Examples
 - >5 ppm soluble lead in a waste is hazardous waste limit
 - Benzene 1 ppm (permissible exposure limit = PEL)
 - Methylene chloride 25 ppm (PEL)



27

DETECTABLE ODORS

Acids	Identifying odor
Acetic Acid, CH_3COOH	Sour vinegar
Hydrochloric Acid, HCl	Pungent, irritating
Nitric Acid, HNO_3	Acrid, sharp
Sulfuric Acid, H_2SO_4	Odorless
Solvents	Identifying odor
Acetone, $(\text{CH}_3)_2\text{CO}$	Fragrant, mint-like
Freon/oxygen	Sweet, chloroform-like
Isopropyl Alcohol, $\text{C}_3\text{H}_8\text{O}$	Fragrant, rubbing alcohol
1,1,1-Trichloroethane, TCA	Sweet, chloroform-like
Nylene, C_8H_{10}	Aromatic
Gases	Identifying odor
Phosphine, PH_3	Fishy, garlic-like
Hydrogen Sulfide, H_2S	Rotten Eggs
Silane, SiH_4	Repulsive
Ozone, O_3	Pungent



28

Evaporation

- Temperature
- Surface area
- Evaporation rate

Mercury Vapor



Definitions Exposure

- PEL/TWA
 - Permissible Exposure Limits
 - Time Weighted Average calculation
 - OSHA (enforceable)
- TLV
 - Threshold Limit Values
 - ACGIH annual update
- STEL
 - short-term exposure limits
 - 15 Minutes, 4 per day, wait 1 hour
- Ceiling
 - NEVER EXCEED WITHOUT PPE
- REL
 - (Recommended Exposure Limits)
 - NIOSH recommendations to OSHA
 - 10 hour averages

e.g. Methylene chloride

PEL=25 ppm STEL=125 ppm TLV=50 ppm



IDLH Definitions (Immediately Dangerous to Life and Health)

- atmosphere that poses an immediate threat to life,
- would cause irreversible adverse health effects, or
- would impair an individual's ability to escape from a dangerous atmosphere
- e.g. Hydrogen Sulfide IDLH 100 ppm



31

Flash Point



- Flash point
 - Minimum temperature at which the liquid's vapor ignites
 - The lower the flash point, the greater the hazard

140°F

DTSC/DOT	Flammable	Combustible
OSHA/NFPA	Flammable	Combustible

100°F

GHS

Flammable 1 fp <73.4, bp <95	Flammable 2 fp <73.4 bp >95	Flammable 3 ≥73.4 & <140	Flammable 4 >60 & ≤199.4
------------------------------------	-----------------------------------	-----------------------------	-----------------------------

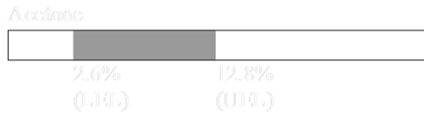
32

Classes of Some Flammable Liquids

	Common Name	Flash Point (°F)
CLASS IA	Ethyl Ether	-49
CLASS IB	Gasoline	-45
	Methyl Ethyl Ketone	21
	Toluene	40
CLASS IC	Xylene	81-115
	Turpentine	95
	Diesel	136

33

Explosive Range



34

What is GHS? What is SDS?



The new and improved
Globally Harmonized System of
Classification and Labeling of
Chemicals (GHS)

35

Why Change?

- Consistency with international standard
- Improved employee's safety
- Facilitates international trade in chemicals
- Reduce need for testing and evaluation



SA

What's included in the GHS?

- Hazardous chemical substances
- Dilute solutions
- Mixtures



SA

What's not included?

- Pesticide residues in food
- Pharmaceuticals
- Food additives
- Cosmetics



Photo by Steve Snodgrass
www.flickr.com/photos/10710442@N08/4459923137



What's changed?

- Labels
 - On products
- Safety Data Sheets (SDS)
 - Replace MSDS
- Employee training



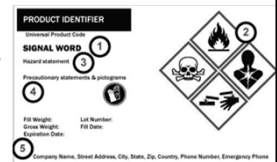
Implementation Schedule

Effective Completion Date	Requirement (s)	Who
December 1, 2013	Train employees on the new label elements and SDS format.	Employers
June 1, 2015*	Comply with all modified provisions of this final rule, except:	Chemical manufacturers, importers, distributors and employers
December 1, 2015	Distributors may ship products labeled by manufacturers under the old system until December 1, 2015.	
June 1, 2016	Update alternative workplace labeling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.	Employers
Transition Period	Comply with either 29 CFR 1910.1200 (this final standard), or the current standard, or both.	All chemical manufacturers, importers, distributors and employers



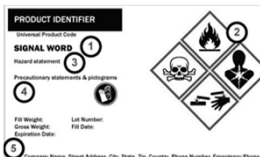
GHS Required Label Elements

1. Harmonized signal word
 - *Danger*
 - *Warning*
2. Pictogram (e.g., skull and crossbones),
3. Hazard statement
 - (e.g., *Fatal if Swallowed*)
4. Precautionary statements
5. Manufacturer Info



GHS Required Label Elements

1. Harmonized signal word
 - *Danger*
 - *Warning*
2. Pictogram (e.g., skull and crossbones),
3. Hazard statement
 - (e.g., *Fatal if Swallowed*)
4. Precautionary statements
5. Manufacturer Info



Pictograms and Hazards

Health Hazard <ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity 		Flame <ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides 		Exclamation Mark <ul style="list-style-type: none"> • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory) 	
Gas Cylinder <ul style="list-style-type: none"> • Gases Under Pressure 		Corrosion <ul style="list-style-type: none"> • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals 		Expanding Bomb <ul style="list-style-type: none"> • Explosives • Self-Reactives • Organic Peroxides 	
Flame over Circle <ul style="list-style-type: none"> • Oxidizers 		Environment <ul style="list-style-type: none"> • Aquatic Toxicity (Non-Mandatory) 		Skull over Crossbones <ul style="list-style-type: none"> • Acute Toxicity (fatal or toxic) 	



Safety Data Sheets

1. Identification;
2. Hazard(s) identification;
3. Composition/information on ingredients;
4. First-aid measures;
5. Fire-fighting measures;
6. Accidental release measures;
7. Handling and storage;
8. Exposure controls/personal protection;
9. Physical and chemical properties;
10. Stability and reactivity;
11. Toxicological information;

Non-Mandatory
 12. Ecological information;
 13. Disposal considerations;
 14. Transport information; and
 15. Regulatory information

16. Other information, including date of preparation or last revision



44

Acute Oral Toxicity

	Category 1	Category 2	Category 3	Category 4	Category 5
LD ₅₀ (mg/kg)	≤5	> 5 < 50	50 < 300	300 < 2000	2000 < 5000
Pictogram					No symbol
Signal word	Danger	Danger	Danger	Warning	Warning
Hazard statement	Fatal if swallowed	Fatal if swallowed	Toxic if swallowed	Harmful if swallowed	May be harmful if swallowed
NFPA	Ranges 4 - 0				



Flammable Liquid Definitions

GHS Category	GHS		Flammable and Combustible Liquids Standard (29 CFR 1910.106)		
	Flashpoint	Boiling Point	Class	Flashpoint	Boiling Point
Flammable 1	<73.4	≥95	Flammable Class IA	<73	<100
Flammable 2	<73.4	>95	Flammable Class IB	<73	≥100
Flammable 3	≥73.4 & <140		Flammable Class IC	≥73 and <100	
			Combustible Class II	≥73 and <100	
Flammable 4	>60 & ≤199.4		Combustible Class IIIA	≥140 & <93.3	
None			Combustible Class IIIB	≥93.3	



46

Pictograms not in GHS (Still needed in transport)

Class 6.2	Class 7	Class 9
Infectious substances	Radioactive material	Misc. dangerous Substances/articles (e.g. lithium batteries, asbestos)



Sample Label

OVEN CLEANER

DANGER



HAZARD STATEMENTS:
 Causes severe skin burns and eye damage.

- PRECAUTIONARY STATEMENTS:**
- Wear Protective gloves, protective clothing, eye protection, face protection.
 - Wash ... thoroughly after handling
 - IF SWALLOWED:** Rinse mouth. Do NOT induce vomiting.
 - IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. continue rinsing
 - IF ON SKIN:** Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
 - Dispose of contents/container in accordance with local regulations.
- SEE SDS FOR MORE INFORMATION



49

Safe Handling Fundamentals

- Read label before storing or using
- Practice good housekeeping
- Clean up spills immediately
- Only use approved or original container
- Keep the containers closed when not in use
- Store away from exits or passageways
- Use flammable liquids only with plenty of ventilation
- Keep flammable liquids away from ignition sources such as open flames, sparks, smoking, cutting, welding, etc.



50

Safety and Health Program

- Identify, evaluate, and control safety and health hazards for the purpose of employee protection
- Address as appropriate site analysis, engineering controls,
- Maximum exposure limits,
- Hazardous waste handling procedures



51

General Hazards

- Physical Hazards
- Chemical Hazards
- Biological Hazards
- Environmental Hazards



52

Hazard Types

- Physical hazards are associated with equipment operations, use of PPE, and work site conditions.
- Chemical hazard is a substance's ability to pose harm based on its chemical properties.
- Biological hazards are induced by biological things, such as animal bites, poisonous plants, and pathological microorganisms.
- Environmental hazards are weather related typically heat and cold related

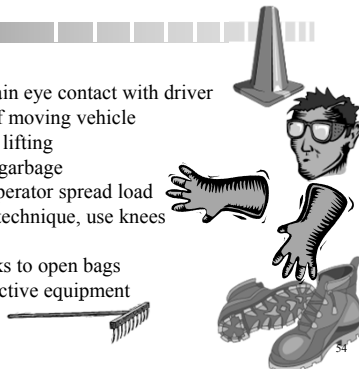


53

Physical Hazards –SAFETY MEASURES

ISSUE

- Be visible - Maintain eye contact with driver
- Stand to the side of moving vehicle
- Use equipment for lifting
- Avoid walking on garbage
- Have equipment operator spread load
- Use proper lifting technique, use knees
- Use carts
- Use tools like hooks to open bags
- Use personal protective equipment
 - glasses, gloves



Physical Hazards

- There are many different types of physical hazards. The most notorious are:
 - Vehicle Safety
 - Slips, trips, and falls
 - Back injuries = Lifting and carrying
 - Inclement weather = heat stress
 - Electrical Hazards
 - Hearing damage



55

Slips, trips, and falls

- **Slips can be caused by wet surfaces, spills, or other weather hazards.**
 - Taking shorter steps under wet conditions.
 - Clean spill immediately, even small ones.
 - Wear proper shoes, for your work area.
- **Trips occur when your foot hits an object and you are moving with enough momentum to be thrown off balance.**
 - Don't carry loads above your line of sight.
 - Keep areas well lit.
 - Proper housekeeping. Clean, tidy, and properly stored.
- **Falls**
 - Don't jump of loading docks or trucks.
 - Repair any broken steps.
 - Proper housekeeping.
 - Wear proper shoes and clothing for your job.



56

Lifting and Carrying

- Most people will suffer some type of back injury in their life. Simple techniques can assure these do not happen.
 - Get a firm footing.
 - Keep your feet shoulder width apart and point your toes out.
 - Bend your knees.
 - Bend at your knees and hips not at your waist.
 - Tighten your stomach muscles.
 - Stomach muscles help support your spine.
 - Lift with your legs.
 - Maintain your backs natural three curves.
 - Keep the load close.
 - The closer it is to the spine the less stress on your back.
 - Keep your back upright.
 - Shoulders should be back and your back should always remain straight.
 - Maintain line of vision and proper housekeeping.



57

Electrical Hazards

- Electrical hazards can be present from exposed wires, misusing equipment / broken equipment, and construction practices.
 - Bond and ground equipment
 - Don't use damaged power cords or tools.
 - Use proper lockout / tagout procedures.
 - Check for underground electrical lines before digging.



58

Hearing damage

- Once 85dBA is reached in your work place you must initiate a hearing conservation program.
- Continuous noise levels at 90dBA or spikes of 100dBA can cause hearing damage (increase blood pressure, headaches, fatigue, and permanent loss).
- Safety precautions include;
 - Reduce source of loud noise
 - Use hearing protection
 - Reduce time of exposure
 - Increase distance from source of noise
 - Have an annual audiogram done to monitor changes



59

Eating, Drinking, & Smoking

- Eating and Drinking areas – 29 CFR 1910.120 (g)(2)
 - No employee shall be allowed to consume food or beverage in a toilet room nor in any area exposed to toxic material.
- Smoking at HHW's
 - Don't do it!



60

Chemical Hazard SAFETY MEASURES

Avoid exposure

- Use protective clothing
 - Safety glasses
 - Hand protection
- NEVER intentionally smell a container or material. If you can smell it you are inhaling it into your body
- Beware of unsafe containers



61

Sources of Ignition

Must take adequate precautions to prevent ignition of flammable vapors. Some sources of ignition include:

- Open flames
- Smoking
- Static electricity
- Cutting and welding
- Hot surfaces
- Electrical and mechanical sparks
- Lightning



62

Static Electricity

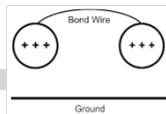
- Generated when a fluid flows through a pipe or from an opening into a tank
- Main hazards are fire and explosion from sparks containing enough energy to ignite flammable vapors
- Bonding or grounding of flammable liquid containers is necessary to prevent static electricity from causing a spark



63

Bonding

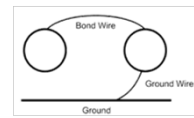
- Physically connect two conductive objects together with a bond wire to eliminate a difference in static charge potential between them
- Must provide a bond wire between containers during flammable liquid filling operations, unless a metallic path between them is otherwise present



64

Grounding

- Eliminates a difference in static charge potential between conductive objects and ground
- It will not eliminate a difference in potential between these objects and earth unless one of the objects is connected to earth with a ground wire



65

Biological Hazards

Medical Waste	Insects
Bloodborne Pathogens	Mammals
Sharps	Reptiles



66

Bloodborne Pathogen Standard Who is covered by the standard?

- All employees who could be “reasonably anticipated” as the result of performing their job duties to face contact with blood and other potentially infectious materials
 - Physicians, nurses, paramedics and emergency personnel
 - Dentists and other dental workers
 - Law enforcement & firefighters personnel
 - Anyone providing first-response medical care
- Title 8, Section 5193
- Solid Waste? Load checkers?



67

Bloodborne Pathogen

- Exposure Control Plan address prevention
- Universal Precautions - Treat all human blood and certain body fluids as if they are infectious
- Hepatitis B Vaccination available
- Training requirements
- Sharps Injury Log



68

How does exposure occur?

- Most common: needlesticks
- Cuts from other contaminated sharps (scalpels, broken glass, etc.)
- Contact of mucous membranes (for example, the eye, nose, mouth) or broken (cut or abraded) skin with contaminated blood



69

HIV/AIDS

- Human immunodeficiency virus infection (HIV)
- Acquired immunodeficiency syndrome (AIDS)
- AIDS Transmission
 - Sexual Contact
 - Blood Contact
 - Needles
 - Fluid
- The HIV virus is very fragile and will not survive very long outside of the human body.



70

HBV Or Hepatitis

- Inflammation of the liver - most common bloodborne disease
- Is transmitted primarily through "blood to blood" contact
- Symptoms range from flu-like to none at all
- No symptoms - person is infectious and can spread the disease. Can survive in dried blood for up to seven days
- Hepatitis infects about 300,000 people in USA annually
- Can lead to serious conditions such as cirrhosis & liver cancer



71

Hepatitis A, B, and C

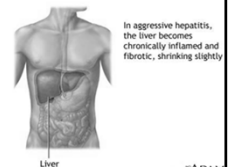
- Hepatitis A
 - Acute hepatitis & almost always gets better on its own
 - Easily spread from person to person, in food and water, and can infect many people at once
- Hepatitis B
 - Can be both acute and chronic
 - Spread by blood or other body fluids, various ways.
- Hepatitis C
 - Almost always chronic
 - Spreads only by blood.



72

Hepatitis A, B, and C

- Hepatitis A and B can be prevented by vaccination, but not Hepatitis C.
- There are now many good medications available to treat chronic Hepatitis B and C.



#ADAM

If Needles are Found

- Inform other employees
- Use tools like tongs to collect needles
- Always use gloves
- Place needles in sharps container at location



SAI

74

If Stuck by a Needle

- Encourage the wound to bleed,
 - Do not suck the wound
- Rinse thoroughly under running water. If water is not available, use cleansing wipes
- Cover the wound
- Collect needle if possible and take to clinic
- Formally record the incident including details of the action taken
- Seek medical advice and treatment immediately

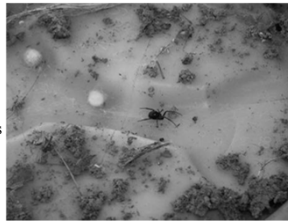


SAI

75

Biological Hazards Insects & Mammals

- Spread pathogens
 - Ticks
 - Spiders
 - Bees & Wasps
 - Biting and stinging insects
 - Mosquitoes
- Mammals
 - Dogs, cats, rodents
- Reptiles
 - Snakes



SAI

76

Biological Hazards - SAFETY MEASURES

- Use proper personal protection
 - Eye protection, Hand protection, Clothing
- Use tools to avoid handling materials
- Wash hands and any other body parts that contacted suspected medical wastes, chemicals, and waste
- Inform supervisors of potential exposure

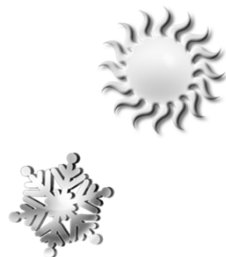


SAI

77

Environmental Hazards

- Heat Stress
- Cold Weather



SAI

78

Heat Illness – Cal/OSHA Reg

- Identifying, evaluating, and controlling exposures
- Types, signs and symptoms
 - Mass Sweating = Heat Stress
 - No Sweating = Heat Stroke
 - Nauseous and dizziness.
 - 104 °F are life-threatening. At 106 °F, brain death begins.
- Title 8, §3395



SAI

79

When Temperature Exceeds 85°F

- Access to 1 quart fresh water/person/hour
- Shade required, available for all employees
- Located as close as practical to the area where employees are working, but no further than a 2.5 min walk away.
- Accommodate at least 25% of the employees on the shift at any one time.
- Encouraged to take a cool-down rest in the shade for a period of no less than five minutes at a time



80

Employee Training



- Environmental and personal risk factors for heat illness
- Employer's procedures
- Importance of frequent consumption of water
- Importance of acclimatization
- Different types of heat illness and the common signs and symptoms
- Immediate reporting
- Emergency procedures



81

Supervisor training



Supervisors should receive training on the following topics prior to supervising employees performing work that should reasonably be anticipated to result in exposure to the risk of heat illness, :

- The information required to be provided to employees.
- Procedures the supervisor is to follow to implement the applicable provisions
- Procedures the supervisor is to follow when an employee exhibits symptoms consistent with possible heat illness, including emergency response procedures.
- How to monitor weather reports and how to respond to hot weather advisories.



82

How dehydrated are you?

- Highly dehydrated!
Go drink a large bottle of water immediately!!!
 - You are still seriously dehydrated. Drinking a bottle of water now will make you feel much better.
 - Moderately dehydrated. You lose water on a regular basis throughout the day. Drink more water.
 - You're almost there. Get some water in your system to flush out all those toxins from your workout. Stay hydrated and healthy!
 - Great job! Now don't let yourself get dehydrated. Drink at least 8-12 large glasses of water throughout the day.
- Caffeinated drinks dehydrate - limit your consumption.
• Sport drinks can provide supplementary electrolytes, but
WATER is the Key!



83

Inclement Weather: Cold

- Acute
 - the body temperature drops very swiftly, often in a matter of minutes, such as when a victim falls through an ice-covered lake.
- Subacute
 - occurs on a scale of hours, most commonly by remaining in a cold environment for an extended period of time.
 - Shivering, tremors
 - Low blood pressure
 - Confusion
 - weakness



84

Personal Protective Equipment



85

Personal protective equipment

- In use as required
- Appropriate for activity
- Operations plan compliance
- Respiratory
- New development in PPE
 - “New Technology Program”



SA

Why PPE is Used



Aerosol paint can exploded while cleaning bale

87

PPE Limitations

- Provides temporary protection only
- Does not eliminate hazards
- No single combination of PPE and clothing provides protection against all hazards
- Watch for breakthrough, leaks



88

SA

Typical PPE

- Head Protection
- Eye protection
- Hand protection
- Foot protection
- Clothing
- Respiratory



89

SA

PPE - SUMMARY

- Assess hazards
- Seek engineering controls
- If not sufficient, then select PPE
- PPE is not fail safe. Good work practices essential
- Wearing PPE can present own hazards
- Inspect PPE and maintain in good order
- Use buddy system
- Staff must be training in all aspects of PPE

SA

90

PPE – EMPLOYER RESPONSIBILITIES

- Assessment of workplace hazards
 - Health hazards
 - Physical hazards
- Providing PPE
- Recordkeeping
- Maintenance of PPE
- Training employees

SA

91

PPE – EMPLOYEE RESPONSIBILITIES

- Assess potential hazards prior to starting the job.
- Attend training sessions
- Follow ALL warnings & precautions
- Listen & follow directions from supervisor
- Report any & all safety hazards or conditions to supervisor



92

Chemical Protective Clothing

- **Degradation-** Visible, gross damage to the material such as blistering, cracking, swelling or dissolving.
- **Penetration-** Chemicals leaking through seams, stitching or zippers.
- **Permeation-** Chemicals soaking into and through the material.
- **Breakthrough time-** The time it takes before enough permeation occurs so that the chemical can be measured. Tested in Laboratory.



93

Glove Selection Chart

- 4 Excellent, breakthrough times generally greater than 8 hrs
 3 Good, breakthrough times generally greater than 4 hrs
 2 Fair, breakthrough times generally greater than 1 hr
 1 Not Recommended, breakthrough times generally less than 1 hr
 ? Not tested or No information, check other references

	Natural Rubber	Neoprene	Butyl	PVC	Nitrile
Acetic acid	2	3	Insufficient data	2	3
Benzene					
PCB's		4	2	?	2
Hydrochloric acid <37%	3	3	4	3	3
Acetone			3		
Hydrogen Peroxide	4	2	3	3	4



94

PPE – HEAD PROTECTION

Common causes of head injury include:

- Falling or flying objects
- Falling or walking into hard objects

Injury prevention methods include:

- Wearing a hardhat
- Warning signs such as “low head room”



95

PPE – EYE & FACE PROTECTION

Common causes of eye & face injury include:

- Flying objects & particles
 - Grinding, sanding, chiseling
- Toxic gases, vapors & chemical splashes
 - Testing of chemicals, opening containers
- Being struck by a swinging object
 - Overhead crane hoist, chains, cables



96

Safety Glasses With Vented Side Shields (Impact Only)



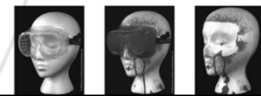
Safety Glasses With Nonvented Side Shields (Impact Only)



Visorgogs® (Impact Only)



Impact Safety Goggles (Impact Only)



97

PPE – EYE & FACE PROTECTION

Injury prevention methods include:

- Eye protection
- Use of machine guards
- Barriers
- Good lighting
- Signs & warnings



98

Safety Glasses

- Rated for impact
 - ANSI Z87 or Z94 (Canadian)



99

Exploding Container



<http://www.dryiceinfo.com/Pictures/dry%20ice%20bomb%20injury.jpg>



100

PPE – EYE & FACE PROTECTION

Emergency Eyewash Station Requirements

“Emergency eyewash facilities and deluge showers shall be in accessible locations that require no more than 10 seconds for the injured person to reach”

29 CFR 1910.151(c)

Title 8, §5162

ANSI Z358.1



101

Shower/Eyewash Temperature

- OSHA (Enforceable)
 - 60 to 95 degrees (appendix reference)
 - OSHA generally defers to most recent standard
 - 29 CFR 191.151(c)
- ANSI (New recommendation)
 - tepid water-moderately warm or lukewarm
 - considered to be 78 degrees F to 92 degrees F
 - ANSI Z358.1-1998



102

Spills on skin or eyes

- The best immediate treatment for chemical spills on skin or eyes is to:
 - Flush the area with water for at least 15 minutes
 - If spill is to the eye, seek medical attention immediately
- The standard for plumbed eyewash is:
 - 0.4 gallons per minute
- Bottled eyewash have limited emergency uses



103



Respiratory Protection

Equipment Inspection

After Each Use Check For

- Proper Cartridges & Air Bottle Level
- Face Piece Integrity
- Couplings, Regulator, Fittings, Gaskets
- Harness Integrity
- Alarm Operation

112

Respiratory Protection

Medical Surveillance

- Certification by a Physician or Licensed Health Care Professional
 - Pulmonary function test and/or equivalent physical evaluation
- Ability to wear a “tight-fitting” mask
- Medical history

113

Fit Test

- Positive Pressure Fit Check
- Negative Pressure Fit Check
- Qualitative or Quantitative Fit Test



114

Positive Pressure Fit Check

- Close off the exhalation valve and exhale gently into the facepiece.
- Satisfactory fit if
 - Slight positive pressure built up inside the facepiece
 - No evidence of outward leakage of air at the seal.

115

Negative Pressure Fit Check

- Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s),
- Inhale gently so that the facepiece collapses slightly
- Hold the breath for ten seconds
- If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

116

Qualitative Fit Test

- One minute each exercise
 1. Normal breathing
 2. Deep breathing
 3. Turning head side to side
 4. Moving head up and down
 5. Talking - Rainbow Passage
 6. Bending over
 7. Normal breathing



117

Service Life



- Defined as how long it provides employee with adequate protection from harmful chemicals in the air
- Depends on:
 - Environmental conditions (e.g. high humidity)
 - Breathing rate
 - Cartridge capacity
 - Concentration contaminant in air
 - Breathing rate
 - Hours used per day
- Some cartridges have end-of-service-life indicator

Change schedule

- Manufacturer's recommendation
- Conduct experimental tests
 - Most reliable
- Math model
- “Rule of Thumb” (AIHA)
 - Chemical boiling point >70°C & concentration <200 ppm = service life ~8 hours normal rate
 - Service life inversely proportional to work rate
 - Reducing concentration by factor of 10 increases service life by factor of 5
 - Humidity > 85% reduces service life by 50%

Factors affecting cartridge usage

- Exposure time
- Contaminants
- Concentration
- Exertion level/Work Rate
- Frequency of use (e.g., continuously, intermittently) throughout the shift
- Temperature
 - Reduce 1-10% per 10 degree Celsius
- Humidity
 - Higher humidity reduces service life
- The presence of potentially interfering chemicals.

Cartridge Types

Contaminant	Color Coding on Cartridge/Canister	Color
Acid gases	White	
Acid gases & organic vapors	Yellow	
Acid gases and ammonia gas	Green with 1/2 inch white stripe completely around the canister near the bottom.	
Acid gases, organic vapors, and ammonia gases	Brown	
Ammonia gas	Green	
Any particulates - P100	Purple	
Any particulates free of oil - N95, N99, or N100	Teal	
Carbon monoxide	Blue	
Chlorine gas	White with 1/2 inch yellow stripe completely around the canister near the bottom.	
Hydrocyanic acid gas	White with 1/2 inch green stripe completely around the canister near the bottom.	
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2 inch blue stripe completely around the canister near the bottom.	
Multi-Contaminant and CBRN agent	Olive	
Organic vapors	Black	
Pesticides	Organic vapor canister plus a particulate filter	
R95, R99, R100	Orange	
Radioactive materials, except tritium & noble gases	Purple (magenta)	

End of Life Service Indicator (ESLIs)

- NIOSH has approved ESLIs for only four cartridges or canisters:
 - Mercury vapor;
 - Carbon monoxide;
 - Ethylene oxide; and
 - Hydrogen sulfide.

EXAMPLE



Figure 2-The yellow background changes to blue as the service life shortens.



Figure 3-The yellow is completely gone when the service life of the cartridge is expired.



Warning signs



- Detect chemical breakthrough
- Odor
- Eye irritation
- Respiratory irritation
- Restricted breathing
- Excess sweating
- *Not allowed as sole indicator*

Waste Classification

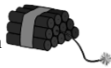


SA

124

Common Hazardous Wastes

- Flammable
 - Propane
 - Gasoline
 - Solvents
- Corrosive
 - Car batteries (acid)
 - Muriatic acid
 - Alkaline batteries
 - Drain cleaner
- Poison/Toxic
 - Pesticide
 - Weed killer
- Reactive
 - Ammunition
 - Flares
 - Hydrogen Cyanide



SA

125

HW - Flammable/Ignitability

- (1) it is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume, and has a flash point less than 60 °C (140 °F),
- (2) solid capable of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard;
- (3) it is an ignitable compressed gas
- (4) it is an oxidizer



CCR, Title 22 §66261.21

126

Neutral – Compatible Storage

- Examples
 - Flammable
 - Gasoline
 - Solvents
 - Pesticides
 - Poison
 - Pesticides
 - Oil
 - Non flammable
 - Latex paint



SA

127

Neutral/Flammable - Poisons

- | | | |
|----------------------------|----------------------|---------------------------|
| • Ant and Roach Killer | • Disinfectants * | • Moth Crystals |
| • Anti-Freeze | • Dog Repellent | • Pentachlorophenol |
| • Arsenic Compounds | • Ethylene Glycol | • Pesticides |
| • Automotive Cleaners | • Fertilizers | • Pharmaceuticals |
| • Bacterial Pipe Cleaners | • Flea Spray/Powder | • Plant Food |
| • Bordeaux Mix | • Fungicides * | • Pruning Paint |
| • Boric Acid | • Gopher Killer | • Pyrethrins |
| • Bug Remover | • Insect Sprays | • Rat Poison |
| • Chlordane | • Lead Compounds | • Rose Dust |
| • Chrome-Silver Polishes * | • Lice Powder | • Sheep Dip |
| • Chromium | • Lindane | • Snail/Slug Killer |
| • Copper Sulfate | • Malathion | • Strychnine |
| • DDT | • Mercury | • Tar Remover |
| • Diazinon | • Methylene Chloride | • Weed and Grass Killer |
| • Dimethylamine Salts | • Mole Killer | • Windshield Wiper Fluid* |

* Check Ingredients for proper classification

SA

129

Oxidizer

- Initiates or promotes combustion in other materials
- Cause fire by itself or releases oxygen or other gases
 - e.g. Hydrogen Peroxide bubbles on skin



*Require new label 1/1/14



SA

130

Oxidizers

- All pH ranges
- Bases/ Alkaline
 - Bleach
 - Pool chlorine
- Neutral
 - Hydrogen peroxide
 - Methyl ethyl ketone peroxide
- Acid
 - Nitric, concentrated
 - Sulfuric, concentrated



SA

131

Inorganic oxidizers donate oxygen

- Chlorates and chlorites
- Nitrates and nitrites
- Chromates
- Inorganic “per-” compounds
 - Peroxides
 - Permanganates
 - Persulfates
 - Periodates



SA

132

Organic Peroxides

- Forms explosive peroxides
- Usually small volume
- Examples:
 - Methyl ethyl ketone peroxide
 - Benzoyl peroxide
 - Diethyl ether (ether)
 - Ether (diethyl ether)
 - Tetrahydrofuran



SA

133

Common Signal Words for Oxidizers

Oxidizer Identification	
Store away from other materials	
Oxidizer Key Word Prefix or Suffix	Examples
-ate	Ammonium nitrate
	Potassium permanganate
-ite	Calcium hypochlorite
-peroxide	Methyl ethyl ketone peroxide
-peroxy	
Many exemptions	

SA

134

Chlorates are powerful oxidizers



SA

135

HW - Toxic



- Acute Oral Toxicity Criterion - LD₅₀ < 2,500 mg/kg body weight
- Acute Dermal Toxicity - - LD₅₀ < 4,300 mg/kg body weight
- Acute Inhalation Toxicity - - LD₅₀ < 10,000 ppm gas/vapor
- Acute Fish Toxicity - 96 hour LC₅₀ < 500 mg/l of water
- Carcinogens
- Specific Compounds greater than limit



WARNING
This Product May Contain
A Chemical Known To
The State Of California
To Cause Cancer, Or Birth
Defects Or Other
Reproductive Harm.

CCR, Title 22 § 66261.24 136

HW - Corrosive



- (1) liquid with a pH less than or equal to 2 or greater than or equal to 12.5
- (2) it is a liquid and corrodes steel
- (3) solid that, when mixed with an equivalent weight of water, produces a solution having a pH less than or equal to 2 or greater than or equal to 12.5
- (4) solid, when mixed with an equivalent weight of water, produces a liquid that corrodes steel

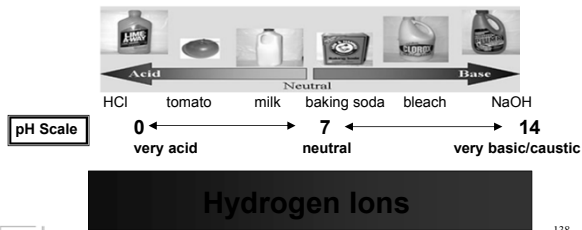


CCR, Title 22 § 66261.22 137

pH - Measures corrosivity



- Acid to base
- Scale from 0 to 14



138

pH Test for Corrosivity

pH Scale for Compatibility Classification

pH 0	1	2	3	4	5	6	7	8	9	10	11	12	13
0—4 Acid Corrosive HW ≤ 2				5—9 Neutral Flammable/Poison					10—14 Base/Caustic Corrosive HW ≥ 12.5				

139

Acids



- Examples
 - Hydrochloric
 - Muriatic
 - Battery Acid
 - Sulfuric
- Corrosive to skin and materials
- Typical immediate pain



140

Base/Alkaline/Caustic

- Examples
 - Drain cleaner (non-industrial)
 - Lye
 - Metal polish
 - Bleach
- Typical slippery feel –
DO NOT TEST!
- Long exposure results in deep tissue burn



141

Acids

- Car batteries
- Muriatic acid
- Hydrochloric acid
- Flux
- Metal cleaner
- Rust removers
- Boric Acid
- Car Battery Acid
- Copper Cleaners
- Etching Solutions
- Ferric Chloride
- Drain cleaners can be either acid or base
- Hydrochloric Acid
- Hydrofluoric Acid
- Metal Cleaners
- Muriatic Acid
- Navel Jelly
- Phosphoric Acid
- Pool Acid
- Sheep Dip
- Sodium Bisulfate
- Sulfuric Acid
- Toilet Bowl Cleaners *

* Check Ingredients for proper classification

142

Base/Alkaline/Caustic

- Alkaline batteries
- Bleach
- Sodium hydroxide (Lye)
- Drain cleaners can be either acid or base *
- Ammonia and Ammonia Based Cleaners
- Battery Terminal Cleaner
- Caustic Soda
- Cesspool Cleaners *
- Household cleaners *
- Lime
- Oven Cleaners *
- Window Cleaners

* Check Ingredients for proper classification

143

HW - Reactive



- (1) it is normally unstable and readily undergoes violent change without detonating;
- (2) it reacts violently with water;
- (3) it forms potentially explosive mixtures with water;
- (4) when mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment;
- (5) it is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment;
- (6) it is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement;
- (7) it is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure;
- (8) it is a forbidden explosive, Class A explosive, or Class B explosive



CCR, Title 22 § 66261.23

144

Explosive HHW Examples



145

“Empty” means:



- Emptied household hazardous material and pesticide container, of five gallon or less in capacity
(Not including used oil filters and PCB containers)
- No hazardous material can be poured or drained ... when the container or inner liner is held in any orientation (e.g., tilted, inverted, etc.)
- No hazardous material remains in or on the container that can feasibly be removed by physical methods (A thin uniform layer of dried material or powder is considered acceptable)
- A compressed gas cylinder is exempt from regulation ... when the pressure in the container approaches atmospheric pressure.
- Aerosol containers are exempt from regulation ... if the aerosol container was emptied of the contents and propellant to the maximum extent practical under normal use

CCR Title 22, §66261.7. Contaminated Containers.



146

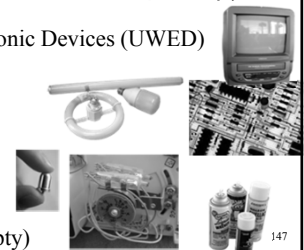
Universal Waste



- “Universal waste” means a hazardous waste identified as a listed universal waste and is exempt from hazardous waste management requirements and, therefore, are not fully regulated as hazardous waste. [Health & Safety Code → 25123.8, CCR Title 22, →66261.9]

Universal Waste Electronic Devices (UWED)

- E-waste
- CRTs
- Batteries, dry cell
- Fluorescent Lights
- Mercury devices
- Aerosol cans (non-empty)



147

Universal Waste Concepts

- Typically sent for recycling
- Allowed some exemptions from:
 - EPA Identification Number
 - Hazardous Waste Manifest (Use Bill of Lading)
 - Hazardous Waste Transporter
 - TSDF
 - (HW Treatment, Storage, and Disposal Facility)
 - Storage time
- Limitations on export – notifications and consent



148

Management Standards

- Store in compatible container
- Properly labeled
- Maximum one calendar year storage
- Personal protection as needed
- Training required



149

Label For Universal Wastes

- Date required for first item in container

Universal Waste-	
<input type="checkbox"/> Battery(ies)	
<input type="checkbox"/> CRT(s)	
<input checked="" type="checkbox"/> CRT Glass	
<input checked="" type="checkbox"/> Electronic Device(s)	
<input type="checkbox"/> Lamp(s)	
<input type="checkbox"/> Mercury-containing Equipment	
Accumulation Date: 2/29/10	



Treatment

- Dismantling and/or physical processes such as shredding, grinding, sawing, cutting, compacting etc.
- Separation based upon physical properties and/or
- Screening to separate components based upon size



151

Emergency release

- Immediately contain all releases and residue
- Package as universal waste
- Mercury spills require special procedures



152

Universal Waste Electronic Devices (UWED)



153

UWED - E-waste

- DTSC tested these as hazardous
 - printers,
 - CPUs,
 - VCRs,
 - cell phones,
 - telephones,
 - radios, and
 - microwave ovens
- Now includes DVD Players, LCD (flat) screens & CRT Devices
- Label
 - "Universal Waste Electronic Device(s)"



154

Electronics/CRT Differences

Electronic Devices	CRT	CRT Glass
Storage Label		
Universal Waste– Electronic Device(s)	Universal Waste– CRT(s)	Universal Waste– CRT Glass
E-Waste Fee (Payment Program)		
None	Covered Electronic Devices (CED) Flat screens & CRTs only	None



155

Label/Signage

- Label - **NEW**
 - Container
 - Area
 - Boundary marked
 - Labeled
 - No other materials
- Also consider posting a Proposition 65 warning
- Storage container or area must note the start date of accumulation



156

Hazard Potential

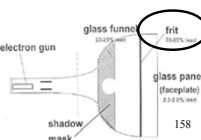
- Weight
 - Lift with knees
 - Dropping
- Implosion
 - Broken glass
- Shock Potential from Capacitor
- Lead
 - Leach and absorbed by body
- Other metals – being investigated
- Plastic – flame retardants



157

Lead Health Effects

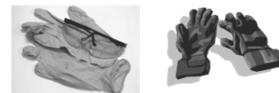
- Lead can damage the central and peripheral nervous systems, blood system and kidneys in humans.
- Effects endocrine system observed
- Serious negative effects on children's brain development
- Lead accumulates in the environment
- High acute & chronic toxic effects on plants, animals and microorganisms.



158

Handling Precautions

- Proper lifting – estimate by slight tilt
- Use cart to transport CRTs over distance
- Tie up cord to prevent trip hazard
- Personal Protective Equipment
 - Work gloves,
 - Glasses
 - Dust mask (if handling broken glass)



159

Storage

- Storage containers or packages must be structurally sound, adequate to prevent breakage, and compatible with the contents of the container (including shrink-wrap on pallets)
- Maximum one year accumulation



160

Packaging

- Bulk – Gaylord, trailer
Pallet with Shrink wrap



161

Disassembly

- Allowed to remove CRTs from CRT devices if prevent breakage and work over containment.
- Employees must be trained
- Discharge stored charge or get SHOCKED



SA

Broken Glass Handling



- Immediately contain all releases of CRT material, broken CRTs or any CRTs that shows evidence of breakage, leakage, or damage that could cause the release of lead or other hazardous constituents to the environment
- Residues can be managed as universal waste
- Containers shall be structurally sound, and compatible with the contents of the container
- Use personal protection

163

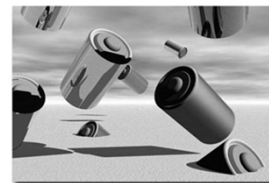
Recycling & Disposal Options

- Must use a
 - CRT material handler (prior agreement),
 - a destination facility, or
 - a foreign destination (Must notify DTSC and CUPA)
- Can ship with Bill of Lading
- Receipts must be kept for at least 3 years
- Special Rules for export including Asian Markets



SA

Household Batteries



166

Household Batteries Definitions

- AA, AAA, C cells, D cells and button batteries (e.g. hearing aid batteries).
- Automotive type batteries are not universal waste.



SA

167

Battery Types & Chemistries

General purpose disposable household batteries include:

- Zinc carbon
- Zinc chloride
- Alkaline manganese

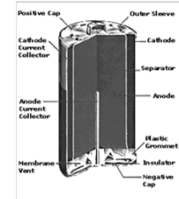


Primary button cells:

- Mercuric oxide
- Zinc air
- Silver oxide
- Lithium

Dry-cell rechargeable

- Nickel cadmium (NiCd)
- Nickel metal hydride (NiMH)
- Lithium ion (Li-Ion) batteries



168

Lithium

- DANGEROUS !!
- Known fire hazard from storage
- Still enough power for spark
- Tape both ends, bag, or separate



SA

169

Danger from Batteries



SA

170

Hazards

- Corrosive/Base
 - Alkaline/Caustic Potassium hydroxide
 - Chemical burns/Skin irritation
 - Wash hands soap and water
- Toxic
 - Heavy metals
 - Lithium
 - Cadmium
- Keep away from lead acid batteries



SA

171

Rechargeable Batteries

Protect contacts as needed

Lead Acid Battery Store Separate



Call-to-Recycle

<http://www.rbrc.org/call2recycle/index.html>

- Maybe lead-acid
- *Maybe just lead

SA

172

Fluorescent Lamps

SA 173

Hazards

- Mercury is a toxic metal
- Liquid at room temperature
- Evaporates quickly
- Can cause harm to people and animals including nerve damage and birth defects.
- If mercury is released into the environment
 - Can contaminate the air
 - Enter streams, rivers, and the ocean, where it can contaminate fish that people eat.
- FOLLOW MERCURY SPILL RESPONSE

SA 174

Fluorescent Tubes, Bulbs and Other Mercury-Containing Lamps

- Types
 - Fluorescent light tubes and bulbs,
 - high intensity discharge (HID),
 - metal halide,
 - Sodium bulbs, and
 - neon bulbs
- **ALL tubes are hazardous**

SA 175

Lamp Crushers

- Great Idea!
- Almost?
- There are NO approved fluorescent lamp crushers for California

SA 177

Mercury Spill Response

- **Cleaning Up a Small Number of Lamps**
- Sweep up debris with a small broom or a whisk broom. Sweep gently to avoid suspending phosphor powders in the air.
- **DO NOT VACUUM** broken lamp debris. The exhaust from the vacuum will disperse mercury into the air. If you must vacuum the debris, only vacuum after sweeping up as much debris as possible and wiping up the powder with a wet paper towel.
- Place the debris in an airtight container (a sealable bag, glass jar, or pail with a tight fitting lid).
- Seal the container and label it, Universal Waste – Lamp(s), or Waste Lamp(s), or Used Lamp(s). In addition, it is recommended that you write on the label “accidentally broken”.
- Try to disperse the mercury vapor by opening windows or doors.

SA 178

PCB Sources

- Products made before 1977 that may contain PCBs include:
 - old fluorescent lighting fixtures
 - electrical devices containing PCB capacitors,
 - old microscope and hydraulic oils
- The amount in the ballast is VERY small
- Less than a thimble full but very concentrated
- Manufactured between 7/1/78 & 7/1/98 = **No PCBs**
- **Not Universal Waste**

SA 179

Lead Acid Batteries

CAUTION

**Batteries,
Wet Filled with Acid**
Accumulation Date: _____

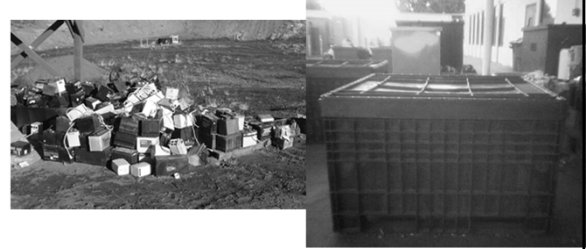
- Lead-acid storage battery that are cracked, caps are missing, or otherwise damaged shall be stored and transported in a nonreactive, structurally secure, closed container capable of preventing the release of acid and lead. (Title 22, Section 66266.81)
- **Keep away from alkaline batteries**
- Transport 10 or fewer
 - No Bill of Lading



Hazardous Waste Label for Lead Acid Batteries
Hazardous Waste Identification Number: 290000
Hazard: H361 (May Cause Allergic Reaction) H373 (May Cause Sensitization When Used)
UN3091 (Corrosive to Metals) (Pb) (D015) (D020)

186

Battery Storage



187

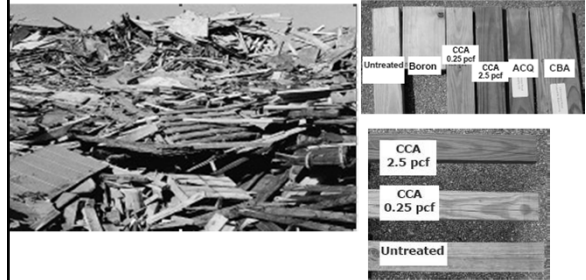


AB 1353 (Matthews) Treated Wood Ban

- Treated wood is wood treated with a chemical preservative to protect against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to the decay of the wood and the chemical preservative is registered under FIFRA.
- Arsenic, Chromium, Copper, Pentachlorophenol
- Cresote (Not Definitive TWW)
- http://www.dtsc.ca.gov/HazardousWaste/Treated_Wood_Waste.cfm

188

Treated Wood Samples



189

“Staple” Marks



190

TWW Storage Requirements

- Protect from run-on and run-off for 90 days
- Maximum one year storage allowed



191

TWW Label

- Required during accumulation, storage, and transport (except for households self-transporting to approved facility)

EXAMPLE

TREATED WOOD WASTE
-Do not burn or scavenge.

TWW Handler Name and Address:

Accumulation Date: _____



192

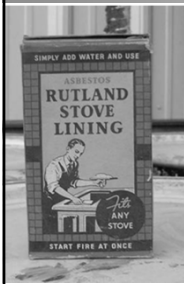
Treated Wood Waste Records

- DTSC Notification 30 days after generate 10,000 pounds per calendar year
- Shipping record
 - Name/Address – generator, disposal
 - Weight
 - Shipment date
- Twice a year reports – 7/30 & 1/30
- http://www.dtsc.ca.gov/HazardousWaste/Treated_Wood_Waste.cfm



193

Asbestos



194

Asbestos Ban Timeline

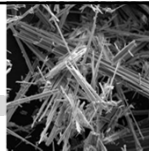
- Used in homes until **late 1970s**
- 1977 banned in wallboard patching compounds and gas fireplaces, voluntary ban in hair dryers
- **1989, EPA banned all new uses of asbestos**
- 2000 EPA guidelines for use vermiculite



195

Identifying Asbestos

- **Friable** - crumbled with hand pressure
 - Title 8, §5208, Appendix G
- **Nonfriable** – e.g. transite pipe
- <1% Asbestos is not Hazardous
 - Title 22, §66261.24 (a)(2)
- PEL 0.1 fiber per cubic centimeter (<HW)
- Impossible to identify positively without lab analysis
 - Typically about \$35/sample



196



197

Asbestos-Containing Materials

- Cement Pipes
 - Cement Wallboard
 - Cement Siding
 - Asphalt Floor Tile
 - Vinyl Floor Tile
 - Vinyl Sheet Flooring
 - Flooring Backing
 - Construction Mastics (floor tile, carpet, ceiling tile, etc.)
 - Acoustical Plaster
 - Decorative Plaster
 - Textured Paints/Coatings
 - Ceiling Tiles and Lay-in Panels
 - Spray-Applied Insulation
 - Blown-in Insulation
 - Fireproofing Materials
 - Taping Compounds (thermal)
 - Packing Materials (for wall/floor penetrations)
 - High Temperature Gaskets
 - Laboratory Hoods/Table Tops
 - Laboratory Gloves
 - Fire Blankets
 - Fire Curtains
- * Source: EPA



(This list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.)

198

Asbestos-Containing Materials (Continued)

- Elevator Equipment Panels
- Elevator Brake Shoes
- HVAC Duct Insulation
- Boiler Insulation
- Breaching Insulation
- Ductwork Flexible Fabric Connections
- Cooling Towers
- Pipe Insulation (corrugated air-cell, block, etc.)
- Heating and Electrical Ducts
- Electrical Panel Partitions
- Electrical Cloth
- Electric Wiring Insulation
- Chalkboards
- Roofing Shingles
- Roofing Felt
- Base Flashing
- Thermal Paper Products
- Fire Doors
- Caulking/Putties
- Adhesives
- Wallboard
- Joint Compounds
- Vinyl Wall Coverings
- Spackling Compounds



199

Certified Lead-Based Paint Renovation Contractor

- Required effective April 2010
- Construction contractors performing renovations on pre-1978 buildings or child occupied facilities
- What are they going to do with the wastes?



200

Renovation

- Modifying any existing surface that results in the destruction of painted surfaces does not include minor repair and maintenance.
 - 6 square feet or less of interior painted surface
 - 20 square ft or less of exterior painted surface
- Any window installation, regardless of size, is not minor repair and maintenance.



201

Medical Waste

- Regulated
- Non-regulated



Inside Red Bag

September 1, 2008

Home sharps ban - solid waste, recyclable materials, or greenwaste



202

Home-generated Sharps Waste

- Not considered medical waste
- Includes: hypodermic needles, pen needles, intravenous needles, lancets, and other devices that are used to penetrate the skin for the delivery of medications
- Household includes:
 - Household, multifamily residence, farms, or ranches



203

Liquid Wastes

- Prohibition greater 50% liquid
 - Paint filter test



SA

204

Radioactives



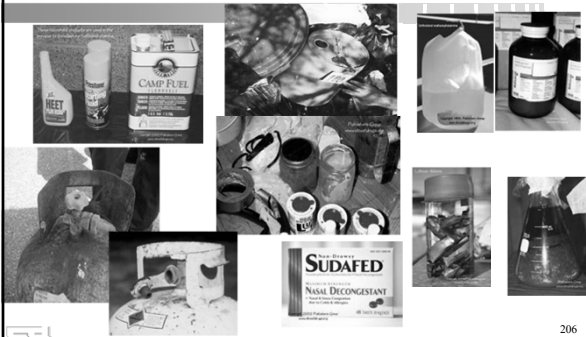
- Natural and manmade sources
- Some smoke alarms, mantles, medicine
- Photo = Fiesta ware plate, radioactive rocks, heliarc welding rods, and KCl salt substitute
- Decommissioned wastes
- SWRCB Landfill Study - Tritium



SA

205

Drug lab chemicals



SA

206

One Pot lab Evidence



SA

207

Identification Signs

Clues?

SA

208

Purpose

- Provide guidance on proper basic segregation of hazardous wastes to minimize the potential for incompatible materials to be stored together.
- Provide for safety
- Avoid incompatibility (See Demo)
- > 30 hazard class for shipment but only 3 basic classes used for safe storage



SA

209

Disclaimer

- General rules
- Use extreme caution
- Watch for unusual
 - Smells (**DO NOT SNIFF**)
 - Sounds (hissing, popping)
 - Crystals growing
- Some exceptions to all the rules
- **DO NOT HANDLE IF THERE ARE ANY DOUBTS REGARDING SAFETY**



SA

210

General Rules

- Do not mix chemicals
- Keep incompatible materials away from each other
- Segregate unknowns in a plastic tub away from all other materials
- When examining a container, be extremely careful
- Watch for danger signs

SA

211

WARNING

- Danger signs include:
 - Rotting containers
 - Bulging containers
 - Missing or poor fitting lids
 - Old military containers
 - Reactions in the container
 - Crystals in or round the container
 - May indicate the presence of an unstable or explosive chemical



SA

212

Segregate Incompatibles

- Basic segregation
 - Flammables , Poison, Neutral
 - Corrosive – Acid (lead acid batteries)
 - Corrosive – Base (alkaline batteries)
 - **Oxidizers – Separate acid, base, & neutral pH**
 - Others
 - Ammunition, explosives
 - Asbestos
 - Water reactive

SA

213

Kaboom Confusion



Shower Tub and Tile Cleaner
pH: 1.0 - 1.3
Urea monohydrochloride 5-7%
Only corrosive with aluminum, not with steel or plastic

Acid

Toonastik Bathrooms Cleaner with Oxi
pH 12
Water, Ethylenediamine tetraacetic acid, Tripropylene glycol methyl ether, Dipropylene glycol n-propyl ether

Base

STAINBUSTER MOLD & MILDEW STAIN REMOVER w BLEACH
Sodium Hypochlorite, Sodium Hydroxide

Base, Oxidizer

SA

Windex (base) with Vinegar (acid) Is mixture Acid or Base?

Page 1 of 4 MSDS # 12660208
WINDEX® MULTI-SURFACE CLEANER WITH VINEGAR
Date Issued: 06Sep2005 Supersedes: 02Apr2003

EMERGENCY WEIGOV EDWARDS LINTY/TOXICITY
Ethylene glycol n-butyl ether 0-21.9 20 ppm (skin irritation) 1000
Isopropanol 1-11 20 ppm (skin irritation) 1000
Water 60-100 NOT ESTABLISHED

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Color: Clear
Physical State: Liquid
Odor: Pungent
pH: 9.5-10.5
Solubility in Water: Soluble

Material Safety Data Sheet
According to MSD 2405-1, 2004 and 29 CFR 1910.1205

WINDEX® MULTI-SURFACE CLEANER - VINEGAR
Version: 1.2 File Date: 06/22/2014
Revision Date: 05/21/2014 MSDS Number: 30000017346

Chemical Name	CAS No.	Weight Percent
Ethylenediamine	110-54-4	1.00 - 8.00

PHYSICAL AND CHEMICAL PROPERTIES

Form: liquid
Color: colorless transparent
Odor: pleasant
pH: 3.3

SA

Compatible Separation

Typical examples but many exceptions exist.

Acids

- Muriatic
- Hydrochloric
- Car batteries
- Sulfuric
- Metal cleaner

Oxidizer
• Nitric

Neutral

- Paints,
- Solvents,
- Pesticides
- Roofing tar
- Furniture polish

Bases/Alkaline/Caustic

- Alkaline batteries
- Ammonia
- -hydroxide
- Metal polish

Oxidizer
• Bleach
• "Oxy"

Oxidizer/Peroxide
• Ammonium Nitrate
• Hydrogen Peroxide
• MEK peroxide

Others

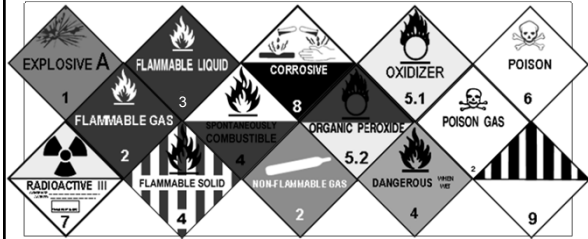
Ammunition, explosives, asbestos, propane

SA

216

DOT Label

- The various Department of Transportation (DOT) Labels for hazardous materials shipments look like this:



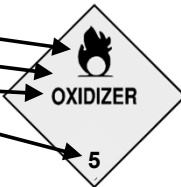
SA

217

DOT Label

- Each label has four means of determining the hazard classification

- Picture
- Color of label
- Name
- Hazard class number



SA

218

GHS Pictograms



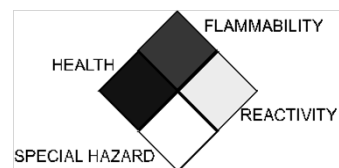
SA

219



SA

NFPA Hazard Rating - Fire Diamond



Numerical Rating 0 to 4 (most hazardous)

Special Hazards: OXY, W, COR

SA

221

Hazardous Materials Information System (HMIS)

Product Name	
<input type="radio"/>	HEALTH
<input type="radio"/>	FLAMMABILITY
<input type="radio"/>	REACTIVITY
<input type="radio"/>	PROTECTIVE EQUIPMENT

Hazard Index

- 0 = Minimal Hazard
- 1 = Slight
- 2 = Moderate
- 3 = Serious
- 4 = Severe

Personal Protection Index

- A thru K, Standard Equipment
- L thru Z, Custom



222

Lab Chemical Label



223



- Use caution when handling containers
- Some containers have been weathered or corroded to the point that the container is unstable and handling it can result in spillage or puncture
- Always use proper protective equipment
- Also realize that some labels do not correctly identify the contents. Watch for inconsistencies :
 - Brown liquid in a lemon-lime soda bottle
 - Could be oil or a pesticide
 - Grey powder in a baking soda container
 - It was determined to be an arsenic compound



224



- The term “POISON” is overly used on common hazardous materials and can not be relied upon for classification or safe handling purposes
- Also, the storage and disposal instructions usually do not provide sufficient information for proper storage and the disposal instructions on older products indicate disposal of used portion in the trash even though disposal is illegal in California



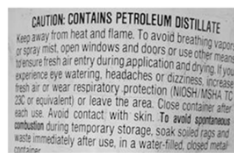
225

Common signal words and classification

Signal Words	Hazard Class
Flammable	Flammable
Inflammable	Flammable
Poison	Overused – Check ingredients
Corrosive	Corrosive, acid or base
Keep away from flames	Flammable
Avoid skin contact	Likely corrosive, maybe poison
Keep away from skin	Likely corrosive, maybe poison



226



http://ced.jccogov.org/hazardous_materials/Household/hhw_labelreading.htm

228

bleach contains a strong oxidizer. Always flush drains before and after use. Do not use or mix with other household chemicals, such as toilet bowl cleaners, rust removers, acids or ammonia containing products. To do so will release hazardous gases. Prolonged contact with metal may cause pitting or discoloration.

Storage and disposal. Store bleach in a cool, dry place. Do not reuse empty container, rinse container and put in trash collection.

HAZARD: FLAMMABLE. KEEP AWAY FROM HEAT, SPARKS, OPEN FLAME AND ALL OTHER SOURCES OF IGNITION.

WARNING! CONTAINS PETROLEUM DISTILLATE VAPOR HARMFUL. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. CAUSES EYE, SKIN, NOSE AND THROAT IRRITATION.

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal.

KEEP OUT OF REACH OF CHILDREN

229

... spray spread more evenly and stick better to cover insects or waxy plant surfaces.

LAWNS: To Control: Ants, Armyworms, Bermuda Mites, Chiggers, Chick Peas, Clover Mites, Crickets, Cutworms, Dichondra Flea Beetle, Earwigs, Grasshoppers, Crane Fly (larvae), Fleas, Lawn Billbugs, Lawn Moths, Leafhoppers, Sod Webworms, Brown Dog Ticks - Apply 4 fl. oz. (1/2 cup) in 15 gals. water to cover 500 sq. ft.

Notes: Thoroughly wet lawn before applying. For Lawns...

Insect Killer

DIRECTIONS FOR USE: It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

KEEP OUT OF REACH OF CHILDREN

230

... not swallow. If swallowed, drink two glasses of water. Those with sensitive skin should seek medical attention.

INGREDIENT

Diethylene Glycol	CAS# 111-46-6
Enzyme	9000-92-4
Sodium Benzoate	532-32-1
Surfactant	NJTSR# 37540800-5014
Water	7732-18-5

Wm. Zinsser & Co., Inc.
173 Belmont Drive, Somerset, NJ 08875
Made in U.S.A. An RPM Company
Product No. 02422 2422 - 4/0

231

Unknowns

- If unable to determine classification, store by itself in a plastic tub

232

HHW Program Type

CESQG
Permanent
Temporary Events

233

CESQG

- "Conditionally exempt small quantity generator" or "CESQG" means a business concern which meets the criteria specified in Section 261.5 of Title 40 of the Code of Federal Regulations
- Includes government agencies and non-profits
- HHW Facility authorized by DTSC to accept HW from CESQGs
 - Limited to accepting, per calendar month, no more than
 - 100 kilograms (220 pounds) of HW, or
 - 1 kilogram of extremely or an acutely hazardous waste HW
- Not your job to verify status - only limit acceptance
- 40 CFR 261.5 & Health and Safety Code 25218.3. (b)

234

CESQG Responsibilities

- EPA ID Number
- CESQG contacts HHW Facility prior to each delivery to confirm waste acceptable
- Vehicle owned and operated by the CESQG
- transported in “closed containers and packed in a manner that prevents the containers from tipping, spilling, or breaking during transport”
- Different wastes shall not be mixed within a container before or during transport



235

CESQG – HHW Facility Role

- Provide
 - Oral, written, or electronic instructions to the CESQG prior to each delivery
 - Proper packing for the safe transportation
- Track name, address, and EPA ID Number
- Track type and quantity of wastes
- Track fee, if any
- Refuse amounts over the limit



236

Permanent facilities

- A permanent or semipermanent structure at a fixed location that meets both of the following conditions:
 - (1) The facility is operated at the same location on a continuous, regular schedule
 - (2) The hazardous waste stored at the facility is removed within one year after collection.



237

Temporary facilities

- A household hazardous waste collection facility that meets both of the following conditions:
 - (1) The facility is operated not more than once for a period of not more than two days in any one month at the same location
 - (2) Upon termination of operations, all equipment, materials, and waste are removed from the site within 144 hours



238

Operations Plan Permanent vs. Temporary

Permanent

- Continuous base, free of cracks and Sufficiently impervious
- *(Plastic not required)*
- Not required to have a separate area for wastes to be transported off-site

Temporary

- All waste handling areas (with exception of traffic areas) must be covered with continuous plastic sheeting of at least 6 mil thickness
- Punctured or torn plastic must be repaired immediately



239

Managing Wastes Operations, Compliance and Permitting



240

Lowe's \$18 Million Hazardous Waste Settlement



- Alameda, San Joaquin, Sacramento and Solano counties District Attorneys filed civil action
- More than 118 Lowe's stores throughout California over a 6-1/2 year period disposed of hazardous waste in landfills including:
 - Pesticides, aerosols, paint and colorants, solvents, adhesives, batteries, mercury-containing fluorescent bulbs, electronic waste and other toxic, ignitable and corrosive materials.
 - Batteries and lamps from recycling kiosks

4/6/14



STATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In the Matter of:

City of Glendale, California
Public Works Department
Integrated Waste Management
Division
548 W. Chevy Chase Drive
Glendale, California 91204-1814

Docket HWCA 20071363

CONSENT ORDER
Health and Safety Code
Section 25187

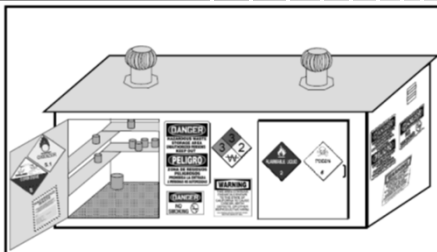
ID No. CFI00000002

- \$13,000 Penalty
- Failure to immediately clean up and contain
- Manage residue
- Lack training



242

Facility Signage



Household Hazardous Waste Locker Signage Locations
Side signs should be repeated on both sides and back of locker to be visible from all directions.
Door DOT hazard class signs need to also be visible when doors are open.

243



Signage

- Visible from all approaches
- Legible from a distance of at least 25 feet.
- Language on the signs will be in English and in any other language predominant in the area surrounding the facility



Storage Issues

- Avoid incompatible storage
 - Acid, base, flammable/neutral, oxidizer, other
- Permitting
 - Hazardous materials
 - Universal waste
- Storage time limit
- Reuse/material exchange
- Integrate with HHW programs



245



Storage Time



- Most Hazardous Wastes (including CRTs but not other universal waste)
 - Typically - 90 days
 - IF CESQG, date starts once exceed 100 kg (220 pounds)
- Universal Wastes = 1 year
 - Electronics, CRTs, Dry Cell Batteries,
 - Aerosol Cans, Fluorescent Lamps
- Recyclable Hazardous Waste
 - Lead Acid Batteries
 - < 1 ton = 1 year
 - > 1 ton = <180 days



246

Written Inspection Log

- Name of the inspector
- Date of the inspection
- Condition of all waste containers
- Description of any problem noted during the inspection and action taken to fix it



247

Facility Inspections



248

HW – Area, Containers/Drums

- Containers must have tight-fitting lids that are kept closed except when wastes are being added or removed.
 - Funnel must be removed or be equipped with a valve or cover to prevent leakage if drum turned over.
- DOT Certified for Hazardous Wastes
- Inspected weekly



249

Aboveground Storage Tanks

- Inspect daily
 - No apparent structural defects, or deterioration
 - No severe rusting,
 - No leaking
 - Correct label
- Certification
- Inspection under CUPA Authority



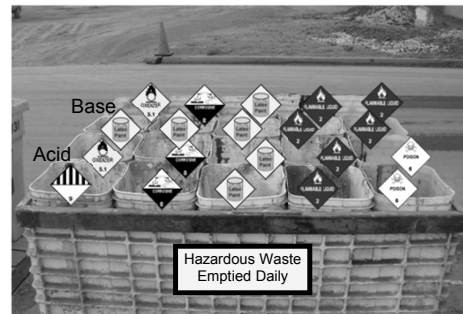
250

Inspection – How Many Issues?



251

Temporary Storage Sample Configuration



252

Lockers

- Containment of 10% of container volume
- Base intact
- Spilled material removed in timely manner
- Engineer certification suitably designed



SA

253

Locker Inspection



SA

254

Engineer Certification – Lockers

- Certify containment system
 - A base under the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed;
 - The base shall be sloped or the containment system shall be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;
 - The containment system shall have sufficient capacity to contain precipitation from at least a 24-hour, 25-year storm plus 10 % of the aggregate volume of all containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination;

SA

255

Engineer Certification – Lockers

- Certify containment system (con.)
 - Run-on into the containment system shall be prevented unless the collection system has sufficient excess capacity in addition to that required in subsection (b)(3) of this section to contain any run-on which might enter the system; and
 - Spilled or leaked waste and accumulated precipitation shall be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system. If the collected material is a hazardous waste under chapter 11 of this division, it shall be managed as a hazardous waste in accordance with all applicable requirements

SA

256

Operations

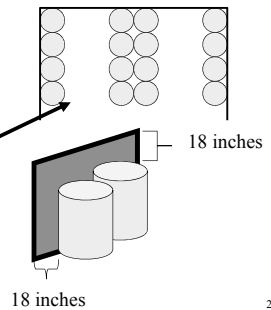
- Pre-acceptance
- Waste acceptance and segregation
- Waste analysis (HazCat)
- Daily closing procedures
- CESQG waste

SA

257

Container Storage

- Aisle space not specified
- Labels must be visible
- Able to inspect container for leakage
 - Typically 24 to 48 inches
- Separation wall
 - 18 inches top
 - 18 inches front



SA

258

Labeling

- Label everything
 - Hazardous waste
 - Universal waste
 - Recyclables
- Wording
 - “Hazardous”
 - Hazards
 - Physical state
 - Accumulation date

HAZARDOUS WASTE
STATE AND FEDERAL LAW PROHIBIT IMPROPER DISPOSAL OF HAZARDOUS WASTE. THE HAZARDOUS WASTE OR PUBLIC SAFETY OF HAZARDOUS WASTE IS THE RESPONSIBILITY OF THE GENERATOR.

GENERATOR INFORMATION:
NAME: ANARCHIST, INC.
ADDRESS: 1976 ALCHEMY LANE
CITY: NO WERE STATE: CA ZIP: 95008
EPA ID NO. / TRACKING NO.: CAZ 987654321
EPA WASTE NO.: K000 CA WASTE NO.: 612 ACCUMULATION START DATE:
CONTENTS, COMPOSITION: BAD STUFF

PHYSICAL STATE: SOLID LIQUID HAZARDOUS PROPERTIES: FLAMMABLE CORROSIVE REACTIVITY OTHER
1.4.5-DI - FORSUREANOL, NA 9999

259

Special Permits – get a copy



260

???

NON-HAZARDOUS WASTE
This waste is not regulated under 49 CFR Part 261. It may be subject to Department of Transportation regulations.

Generator - Epa Id CAH 111 000 720 Phone: _____
Proper D.O.T. Shipping Name: UNIVERSAL WASTE ELECTRONIC DEVICE(S)
Waste Category: 0900 Order: _____ Accumulation Date: 7/1/07
Physical State: Solid

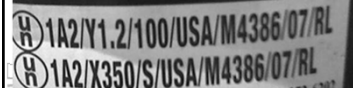
261

Package Certification

- United Nations marking

u
n or UN

Container type	Material	Covering	Packing Group	Weight limit	Physical State
1 = drum	A = steel	1 = closed	X = I, II, III	Decimal = specific gravity OR Kilograms (including drum)	L = Liquid S = Solid
4 = box	B = aluminum	2 = open	Y = II, III		
6 = composite	G = fiberboard H = plastic N = Metal		Z = III		



262

Drum Closure

- Close drum using torque wrench
 - Rings bolt and bungs
- Performance test to prevent leakage
- Drum supplier provides instructions
- Train workers on use
- Use calibrated torque wrench
- Get updates instructions annually
- Reject containers that do not properly close
- 49 CFR §178.2 (c)



263

Pool Chemicals for Reuse



266

Facility Daily Closure



- All wastes segregated into appropriate storage area by hazard class.
- All containers will be labeled with any known information.
- All container will be securely closed.
- Unknowns will be segregated into tubs or other suitable area.
- Any drums or other transport containers will be securely closed.
- All tools and equipment will be properly cleaned and stored.
- All trash is picked up and facility swept.
- All customer surveys, waste identification forms, and all other records will be filed at facility or returned to main office.
- All Facility doors will be closed and locked.



267

Storage Time



- Most Hazardous Wastes
 - 90 days
 - 180 days for generator <2200 lbs (~300 gallons)/month
 - 270 days if TSDf greater than 200 miles away
- Universal Wastes = 1 year
 - Electronics, CRTs, Dry Cell Batteries,
 - Aerosol Cans, Fluorescent Lamps
- Recyclable Hazardous Waste
 - Lead Acid Batteries
 - <1 ton = 1 year
 - > 1 ton = <180 days



268

Transportation

- Shipping records
 - Uniform Hazardous Waste Manifest
 - Bill of lading
- Pre-shipment
- Track status



269

Govt Transport Between Sites

- Government employees in government vehicles are exempt from DOT federal hazardous materials transportation
- California still applies
 - Manifest, bill of lading, or shipping paper
 - >1,001 pounds needs placard
 - Driver license hazmat endorsement "H" or "X"



270

This is why HHW goes in the trunk



271

Decontamination



272

Decontamination Procedures

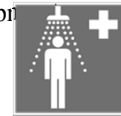
- Developed and implemented prior to employees or equipment entering
- Minimize contact with hazardous substances or equipment that contacted
- Decontaminate employees and equipment



273

Decontamination Procedures

- **Daily and emergency contact**
- Personal decontamination
 - Remove and discard or clean
- Equipment decontamination
- Medical emergencies
- Disposal of contaminated equipment



274

Emergency Response

Discuss basic emergency procedures applicable to load checking
Present types of emergency situations
Discuss basic response measures



275

Emergency Response Plan

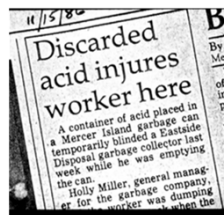
- Exempt from HAZWOPER ER if evacuate
- Subject to 8 CCR 3220
 - Assign responsibilities
 - Training
 - Emergency escape
 - Head count
 - Reporting procedures
 - Contact personnel
 - Alarm system



276

Worker Health and Safety

- Hazardous situations potentially exist at solid waste facilities
 - Fires
 - Spills
 - Injuries
- Responses to emergency situations requires specialized training
- Load checking personnel should be trained to clean up small low-hazard spills
 - e.g. paint can size spills of paint or oil



277

Emergency or Incidental Spill

- **Emergency**
 - High hazard
 - Need help
 - Spill to waterway
 - Life or injury threat
 - Requires immediate attention and/or evacuation
 - Reportable to agencies
 - OES, 911, Health/Fire
- **Incidental**
 - Low hazard
 - Limited quantity
 - Cleanup without assistance
 - Not reportable to agency but keep record (Log)



279

Emergency Preparedness

- Local Emergency Agency Relations
- Spill Equipment (Cart)
- Hot Load Area
- Training



SA

280

Evacuation Map

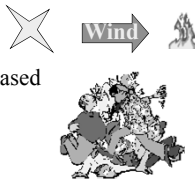


SA

281

Facility Evacuation Procedures

- Evacuation area, UPWIND
 - Head count
 - All personnel remain until released
- Assess Situation
- Isolate
- Notification
- **NEVER GET IN OVER YOUR HEAD!**



SA

282

Assess Emergency Situation

- Are you prepared?
 - Supplies ready
 - Emergency responders familiar with site
 - Hazardous waste contractor arrangements
- If suspect hazardous waste
 - May trigger Incident Command System
 - First Responder Awareness Training
 - Witness, notify, no further action
 - Response limited in emergency situation
- Gather information for response unit

SA

283

Notification

- Notify emergency agencies as necessary
- Once they arrive, they are in charge
- Provide only assistance that you are trained for and are comfortable in providing
- Document the incident in your log of special occurrences and any other reporting form needed

SA

284

Hazardous Materials

- Local Emergency Response Agency
 - 9-1-1 or Local Fire Department
- CUPA, Certified Unified Program Agency
- Office of Emergency Services
 - (800) 852-7550 or (916) 845-8911
- California Highway Patrol
 - spills on highways

SA

285

Hazardous Waste Exposure

- Remove contaminated clothing
- Rinse off – 15 minutes
- Medical attention?
- Report



SA

286

Mercury Spill Response - DTSC

- **Cleaning Up a Small Number of Lamps**
- Sweep up debris with a small broom or a whisk broom. Sweep gently to avoid suspending phosphor powders in the air.
- **DO NOT VACUUM** broken lamp debris. The exhaust from the vacuum will disperse mercury into the air. If you must vacuum the debris, only vacuum after sweeping up as much debris as possible and wiping up the powder with a wet paper towel.
- Place the debris in an airtight container (a sealable bag, glass jar, or pail with a tight fitting lid).
- Seal the container and label it, Universal Waste – Lamp(s). In addition, it is recommended that you write on the label “accidentally broken”.
- Try to disperse the mercury vapor by opening windows or doors.

SA

287

Serious Injury or Harmful Exposure

- Cal/OSHA
 - Report serious injury or illness, or death, of an employee
 - Immediately (not more than 8 hours after event)



SA

288

Emergency Response Guide (ERG)

- Sections
 - Yellow = ID number
 - Blue = Name
 - Green
 - Toxic Inhalation Hazard
 - Warfare agent
 - Dangerous Water Reactive
 - White = Other
 - Orange = Emergency Guide



SA

Post Emergency Review

- Record incident
- Conduct de-briefing of staff
- Review incident and response
 - What worked
 - What needs improvement
 - How to better prepare
- Follow-up with emergency agencies
- Incorporate any changes
- Schedule drill

SA

290

Recordkeeping

SA

291

Permits/Approval



- EPA Identification Number
- Hazardous Material Business Plan
- Universal Waste Handler
- Household Hazardous Waste Notification

- CUPA/DTSC Inspections



292

Recordkeeping

- Permits & Approvals
- Training
- Shipment
- Inspections
- Engineering certifications
- Material Safety Data Sheets



293

Documentation, General

- Permits/approvals
 - Solid waste facility permit
 - Waste discharge requirements
 - Tire program identification number
 - EPA ID Number
 - Universal waste handler

- Copies of all documents should be available
 - Remote location allowed under certain circumstances



294

Hazardous Waste Treatment, Storage, and Disposal Sites



Record Retention

- Regulatory
 - Load checking – no time limit, liability concern
 - Incidents – 3 years
 - Manifests – 3 years
 - Universal waste – 3 years
 - HazMat Bill of Lading – 2 years

- Reality
 - Forever



297

The End



298