#### YaleNewHavenHealth

Yale New Haven Hospital

#### **Department of Lab Medicine**

#### HAZARDOUS WASTE TRAINING MARCH 2020

# **YNHH Hospital Wastes**

# YNHH Hospital generates many different types of wastes:

- Hazardous and nonhazardous chemical wastes, pharmaceutical wastes
- Universal wastes (e.g., fluorescent lamps, used batteries, used electronics)
- Used oil
- Sharps, patient care wastes
- Radioactive waste
- General solid waste (paper, food wastes, etc.)

#### Different types of wastes are subject to different standards

 Today's training focuses on hazardous waste requirements

# **Topics for Today**

- Brief Regulatory Background
- What is Hazardous Waste
- Waste Management Requirements
- Hazardous Waste Contingency Plan/Emergency Response Procedures
- Overview of Shipping Wastes Offsite



**EPA** 

- Regulates hazardous waste on a <u>federal</u> level
- RCRA = Resource Conservation & Recovery Act (1976)
- **40 C.F.R. 260 279**
- EPA grants "Authorization" to state agencies to implement RCRA; states can be more stringent





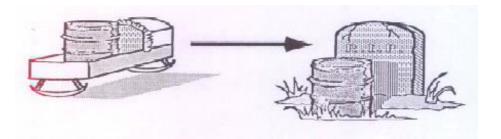
Regulates hazardous waste on a <u>state</u> level

- CTDEEP Hazardous Waste Regulations
- Includes most EPA rules with modifications
- **22a-449(c)-100-119**
- More stringent than EPA (e.g., state-specific rules)



Intent of these programs: to ensure hazardous waste is managed safely from point of generation to final disposal

**Generator** of waste has "Cradle to Grave" responsibility under these programs



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#### **Identification of Hazardous Wastes**



# **Generator Responsibility**

- All generators must determine if wastes they generate are hazardous by:
  - Sampling and analysis, or
  - Applying knowledge of waste composition and process used to generate it
- Must be a "waste" to be a "hazardous waste"
- When does a waste become a waste?
  - Spent materials when spent
  - Unused materials no longer usable, no longer intend to use

CT DEEP requires generators to evaluate wastes <u>at least once during each 12 month period</u>, or when process generating waste changes

# **Definition of Hazardous Waste**

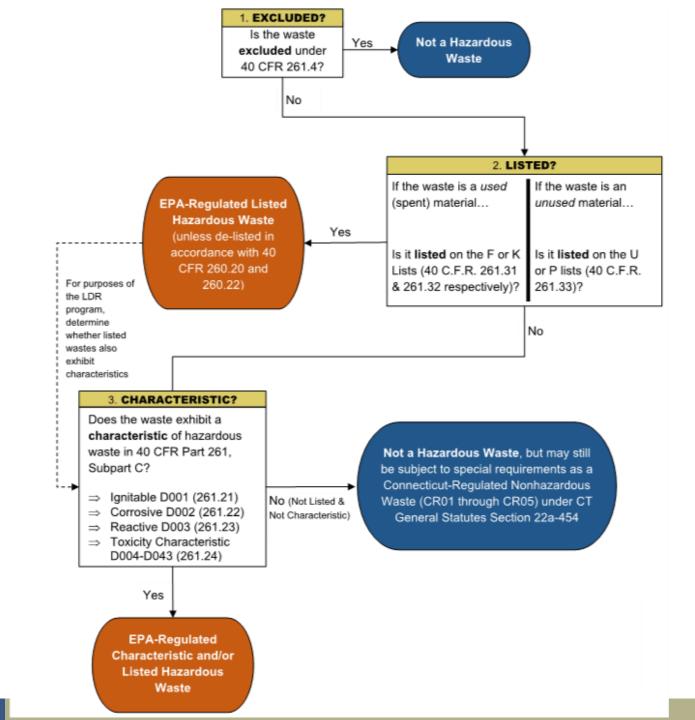
1. Waste is not **Excluded** from regulation and is:

#### 2. Listed as EPA Hazardous Waste,

Includes toxic and/or acutely hazardous wastes
 Identified with F, K, U or P waste codes (F003, U190, etc.)

#### **3. Or exhibits an EPA Characteristic of Hazardous Waste**

- Ignitable, Corrosive, Reactive, or Toxicity Characteristic
- Identified with D waste codes (D001, D002, D003, etc.)



# **Excluded Wastes**

#### Examples

- Household wastes
- Used CFC refrigerants being reclaimed
- Scrap metal that is sent offsite for recycling
- Samples until analysis/hold times complete
- Others
- If excluded, not subject to regulation
- If not excluded, continue to next step...

# "Listed" Wastes

#### F & K Lists – USED/SPENT Materials Only:

- F List (Non-Specific Sources)
  - Includes certain spent cleaning or extraction solvents (F003: xylene, methanol, acetone)
- K List (Specific Sources N/A to YNHH)

# U & P Lists - UNUSED Chemicals Only

- Old or unwanted chemicals being discarded
  - Pure or commercial/technical grade chemicals, or
  - Mixtures whose sole active ingredient is U- or P- listed
- Includes expired chemicals, spill residues, container residues, expired pharmaceuticals
- All P-listed wastes are "acutely hazardous"

# **Examples of YNHH Hospital "Listed" Hazardous Wastes**

#### F-Listed Hazardous Wastes

Used lab solvents such as methanol, xylene (F003)

#### U-Listed Hazardous Wastes

- Unused laboratory solvents such as xylene (U239) and methanol (U154);
- Waste pharmaceuticals such as Mitomycin (U010); Lindane (U129); Leukeran (U035); Phenaseptic (U188); Selenium Sulfide (U205)

#### P-Listed Hazardous Wastes (acutely haz)

 Warfarin/Coumadin (P001); Nicotine (P075); Arsenic Trioxide (P012); Epinephrine (P042)

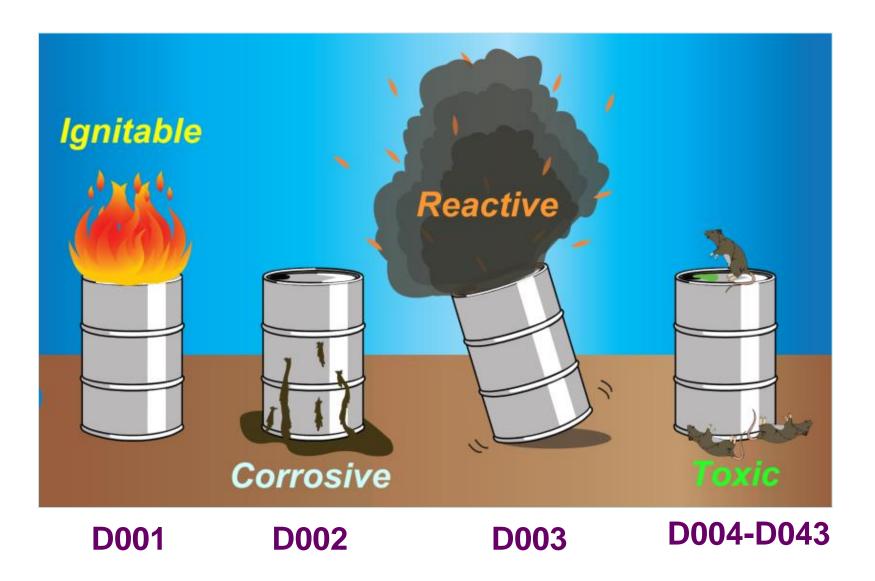
# Watch out for unused products that are no longer usable



These could be hazardous wastes



# 3. "Characteristic" Hazardous Wastes



# **Ignitable Hazardous Wastes**

Liquids with Flash Points less than 140°F



- Spontaneously Combustible Solids
- Ignitable Compressed Gases
- Oxidizers

# **D001**

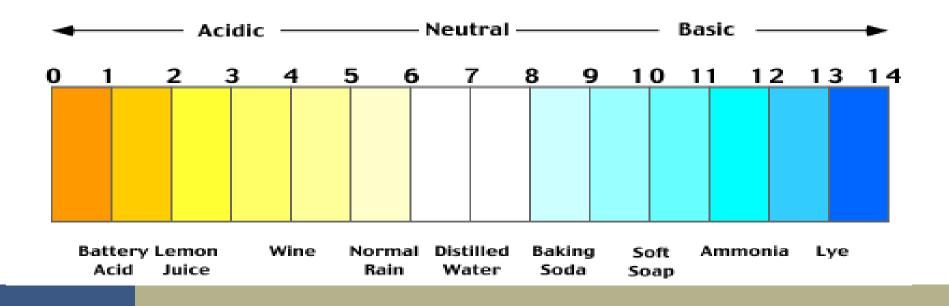
Examples: Methanol, xylene, IPA, mineral spirits, other solvents, oil-based paints, partially full aerosol cans

# **Corrosive Hazardous Wastes**

- Aqueous Solutions with  $pH \le to 2.0$  or  $\ge 12.5$
- Liquids that Corrode Steel > ¼ Inch/Year

# **D002**

#### Examples: Waste Sodium Hydroxide, Other Bases, Acids



# **Reactive Hazardous Wastes**

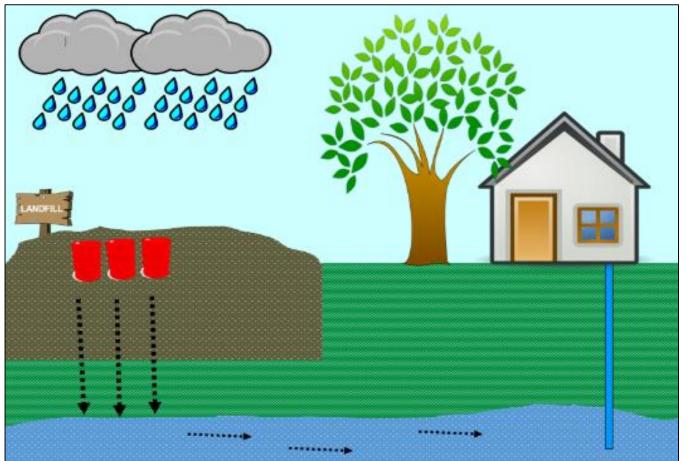
- Unstable Wastes that Readily Undergo Violent Changes
- React Violently With Water

- Generate Toxic Gases in Harmful Quantities when Mixed with Water
- Certain Cyanide or Sulfide Wastes
- Explosives

# **D003**

# **Toxicity Characteristic (TCLP)**

Based on potential for groundwater contamination
 TCLP test simulates the conditions in a landfill



Waste codes D004-D043

#### **Toxicity Characteristic**

Metals				Volatile Organic Compounds			
Contaminant	EPA HW #	CAS #	Regulatory Level (mg/L)	Contaminant	EPA HW #	CAS #	Regulatory Level (mg/L)
Arsenic	D004	7440-38-2	5.0	Benzene	D018	71-43-2	0.5
Barium	D005	7440-39-3	100.0	Carbon tetrachloride	D019	56-23-5	0.5
Cadmium	D006	7440-43-9	1.0	Chlorobenzene	D021	108-90-7	100.0
Chromium	D007	7440-47-3	5.0	Chloroform	D022	67-66-3	6.0
Lead	D008	7439-92-1	5.0	1,2-Dichloroethane	D028	107-06-2	0.5
Mercury	D009	7439-97-6	0.2	1,1-Dichloroethylene	D029	75-35-4	0.7
Selenium	D010	7782-49-2	1.0	Methyl ethyl ketone	D035	78-93-3	200.0
Silver	D011	7440-22-4	5.0	Tetrachloroethylene	D039	127-18-4	0.7
Semi-Volatile Organic Compounds				Trichloroethylene	D040	79-01-6	0.5
Contaminant	EPA HW #	CAS #	Regulatory Level (mg/L)	Vinyl chloride	D043	75-01-4	0.2
o-Cresol	D023	95-48-7	200.0*		Pesticides		
m-Cresol	D024	108-39-4	200.0*	Contaminant	EPA HW #	CAS #	Regulatory Level (mg/L)
p-Cresol	D025	106-44-5	200.0*	Chlordane	D020	57-74-9	0.03
Cresol	D026	*	200.0*	Endrin	D012	72-20-8	0.02
1,4-Dichlorobenzene	D027	106-46-7	7.5	Heptachlor (and its epoxide)	D031	76-44-8	0.008
2,4-Dinitrotoluene	D030	121-14-2	0.13	Lindane	D013	58-89-9	0.4
Hexachlorobenzene	D032	118-74-1	0.13	Methoxychlor	D014	72-43-5	10.0

**Examples**: Waste pharmaceuticals containing metals, organics

# **The Mixture Rule**

#### Listed hazardous waste + nonhazardous waste = Listed hazardous waste

- Example: F005 + waste oil = F005
- Once listed, always listed

#### In general, don't mix hazardous wastes with other nonhazardous materials

# **Empty Container Exemption**

#### Empty, for most wastes means:

- Remove all wastes that can be removed by normal means (e.g., pouring, pumping, scraping) <u>AND</u>
- Remaining residue must be
  - I inch, or < 3% of capacity (for containers  $\leq$  119 gal)
- If "empty" then nonhazardous
- For compressed gas, empty when pressure approaches atmospheric
- For acutely hazardous wastes (all *P-Listed* wastes), container is not empty until triplerinsed with an appropriate solvent
  - Bottles, vials, ampules or tubes that previously held a Plisted material are hazardous waste (e.g., warfarin)
  - P-listed containers must be collected as hazardous waste

# CT DEEP-Regulated Nonhazardous Wastes



- **CR01:** Waste containing ≥50 ppm PCBs
- CR02: Waste oil (fuel oil, lubricating oil, diesel fuel, motor oil, etc.). Waste oil is subject to CT DEEP used oil standards.
- CR03: Waste water-soluble oil (cutting oil emulsions, coolants, etc.)
- **CR04:** Waste Chemical Liquids (e.g., latex paint, antifreeze)
- CR05: Waste Chemical Solids (e.g., grinding dusts, dried paint waste, etc.)

Only use these codes when no other EPA waste codes apply

Not subject to hazardous waste regulations, but must be stored in a safe manner, shipped via a permitted hauler (typically with a manifest) to a permitted facility, and report spills to DEEP

# **Typical YNHH Hospital Wastes**

- Hazardous waste laboratory solvents (F003, D001)
- Hazardous pharmaceutical wastes (Various codes such as D001, D002, D009, D011, D022, D024, P001, P075, P188, U010, U035, U058, U188, R006)
- Nonhazardous wastes (CR04) such as Formalin and DAB Waste (3,3 Diaminobenzidene)

# YNHH Hazardous Waste Regulatory Status

#### Different activities subject to different standards

- Generators: Generate HW and ship offsite
  - Cannot treat/store/dispose except as allowed for generators
  - YNHH is in this category
- Transporters: Transport hazardous wastes over public roads
  - Must be permitted by CTDEEP
- Treatment, Storage, Disposal Facilities: Receive and treat/store/dispose hazardous wastes
  - Must be permitted by CTDEEP

# **CTDEEP HW Generator Categories**

#### CESQG

■ Generate ≤ 100 kg/Month Hazardous Waste (~26 gallons)



- Accumulate < 1,000 kg onsite</p>
- Generate & Accumulate < 1 kg Acutely Hazardous Waste (or 100 kg acute HW spill residue)

SQG

- Generate < 1,000 kg/Month Hazardous Waste</p>
- Accumulate ≤ 1,000 kg onsite
- Generate & Accumulate ≤ 1 kg Acutely HW (or 100 kg acute HW spill residue)

# VSC and SRC are LOGS

#### LQG

- Generate/accumulate greater ≥1,000 kg/Month Hazardous Waste
- Accumulate ≥1,000 kg onsite
- Generate & Accumulate > 1 kg Acutely HW

# **HW Generator Responsibilities**

#### As an LQG, YNHH must:

- Properly identify hazardous wastes
- Notify CTDEEP & get EPA ID # (one-time, site-specific)
  - > CTD075406561 (YNHH YSC)
  - > CTD075406579 (YNHH SRC)
- Properly label, store, and manage wastes on-site
  - Satellite Accumulation
  - Central Accumulation (90-day storage)
- Comply with emergency preparedness, prevention, response, and contingency planning
- Hazardous waste training w/annual review
- Use a licensed HW transporter when shipping off-site (with a manifest) to a licensed HW facility
- Comply with recordkeeping and reporting

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Yale New Haven Hospital

# **Onsite Waste Management**

# **Hazardous Waste Management**

## Special Requirements for:



Satellite Accumulation Areas - Containers

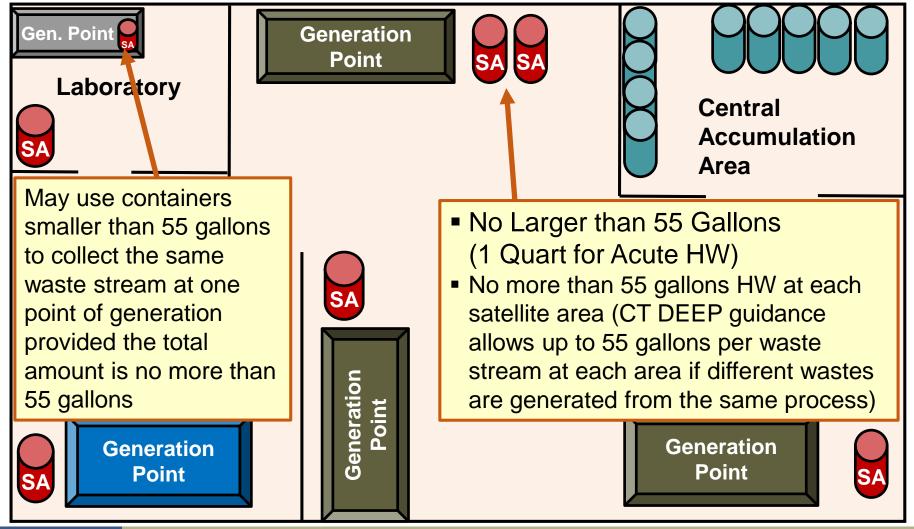
used for collecting wastes at or near the point of generation until the container is filled

- No storage time limit while waste is being collected
- Central Accumulation Areas Any area other than satellite accumulation
  - Allows us to store wastes onsite <u>temporarily for</u> <u>90-days</u>

At Central Accumulation, clock starts when the first drop of waste is placed into the container



# What is Satellite Accumulation? Container located <u>at or near the point of generation</u> (same room) & <u>under control of operator</u>



# Examples – YNHH Satellite Accumulation



Pharm waste on patient floor



Laboratory – chemical wastes

## **Satellite Accumulation Area Requirements**

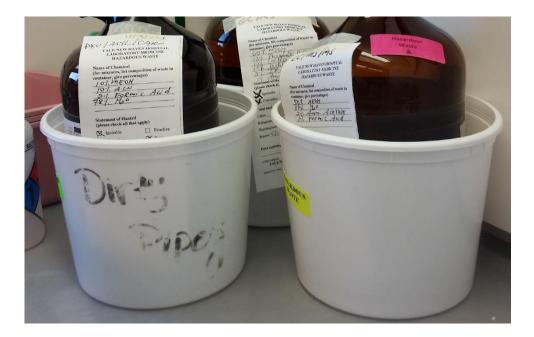
#### Containers must be:

- Compatible with the waste
- In good condition (not leaking, bulging or dented)
- Handled in a manner that prevents damage/spills
- Labeled with:
  - "Hazardous Waste" and



- Identity of contents (e.g., xylene, flammable solvents, etc.)
- Kept closed except when adding/removing waste
- When full, mark w/accumulation start date & move w/in 3 days to waste storage room

Labels can be any color, size, or format as long as they are clear, legible and complete



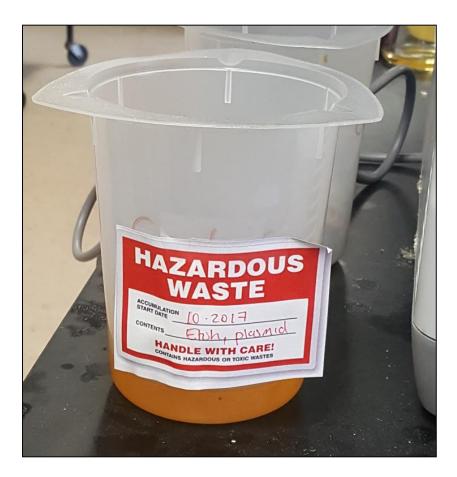
- Must include the required minimum info:
  - "Hazardous Waste" and other words that identify contents
  - Do <u>not include</u> accumulation start date while collecting waste at satellite accumulation

#### Watch Out for Open Containers

- Make sure containers are closed tightly enough to prevent releases through evaporation, and to prevent spills if tipped over
- These are not closed:

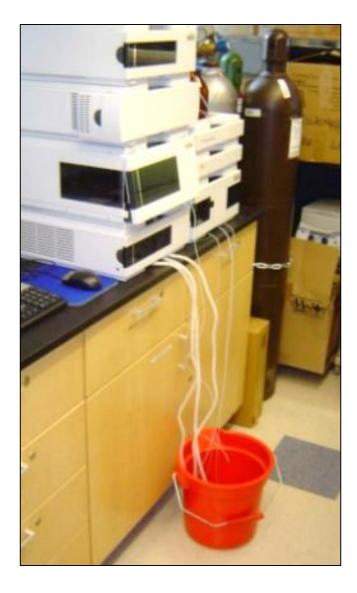


#### What's wrong with these?





#### What's wrong with these?





# Waste Pick-ups from Satellite

- Full containers moved from SAA to storage by trained Lab personnel.
- Must move directly from satellite to central accumulation
  - Don't stage containers anywhere

Summary for Satellite Accumulation At or near the point of generation **Under control of operator of process** Good condition **Compatible** Label "Hazardous Waste" and identity of contents Date & move to central accumulation area w/in 3 days of reaching quantity limit

## Central HW Accumulation Area Requirements

Alternet of Hazard (please check all that apply) Statement of Hazard (please check all that apply) Market Marke	ALE REVER VERSERVERATIONS Market States for ensurementation of water to manage apprecentages Market States for an and to market States for an	Hazardous Waste
Dist	THE YALES MARINE	

# Central HW Accumulation Area Management Requirements

- Similar to satellite accumulation standards
  - Closed, compatible, in good condition, etc.
- Plus additional requirements...

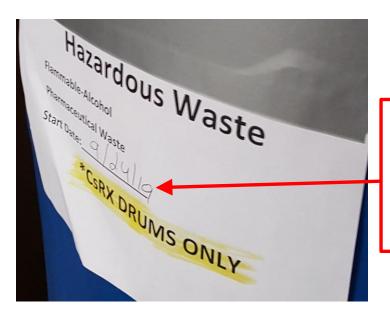


# **Container Labeling at Central Accumulation Areas**

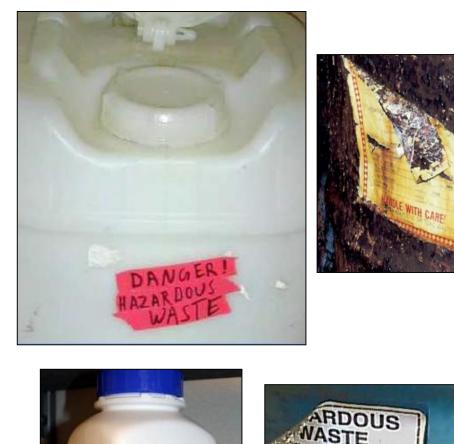
### Label Containers\*

- "Hazardous Waste"
- Identity of contents
- Accumulation start date

The Park Street Lab has two storage areas (PS-657 and PS-526) and the SRC Lab has one storage area (the Boom Room).



Ship offsite within 90 days of accumulation start date!



### Labels Should be Intact, Clear, Legible, and Include the Required Information

### HAZARDOUS WASTE FEDERAL LAW PROHIBITS IMPROPER DISPOSAL.

IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

GENERATOR INFORMATION:

NAME	
ADDRESS	PHONE
спту	STATEZIP
EPA /MANIFE	ST
ACCUMULATION START DATE	10-3-2019 EPA WASTE NO
Г	Waste Xylene 7
	i
D.O.T. PR	OPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX
	HANDLE WITH CARE!
******	**********************

Good



WITH CARE

# Label all Containers

### Unlabeled containers could result in:

- Mixing of incompatibles
- Hazards to workers
- Non-compliance
- Increased need for lab analyses and \$\$\$





Summary - Central HW Accumulation Area Container Management ✓Good condition ✓Compatible ✓Closed

- ✓Label
  - "Hazardous Waste," identity of contents, and accumulation start date
- Secondary containment
- Adequate aisle space
- Precautions for ignitable & reactive wastes
- Separate incompatibles
- **Weekly inspections & records**
- **⊘**Onsite < 90 days

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### Hazardous Waste Management Plans, Emergency Prevention & Response, and Other Generator Requirements

# Hazardous Waste Training for LQGs

## Written HW Training Plan

- Names & job titles for applicable employees
- Applicable employee hazardous waste duties, required skills, & education
- Type & amount of initial & refresher training provided to each employee
- Train w/in 6 months of employment or assignment to new position (don't work unsupervised until trained)
- Annual refresher



## **Contingency Plan & Emergency Preparedness, Prevention, Response**

### Hazardous Waste Contingency Plan

Describes actions to take during an emergency involving hazardous chemicals & wastes

### YaleNewHavenHealth Yale New Haven Hospital

#### HAZARDOUS WASTE CONTINGENCY PLAN

Yale New Haven Hospital 20 York Street New Haven, CT 06510

January 2020

Separate plans have been prepared for YSC and SRC

# **Contingency Plan**

## Basic elements of plan:

- Facility description chemicals & wastes onsite
- Emergency coordinators & chain of command
- Emergency equipment
- Response procedures
- Evacuation procedures
- Notification requirements & procedures

## Plan locations:

- Onsite at YNHH (EVS office)
- Copies sent to local authorities: Fire & Police

# **Emergency Coordinators (EC)**

- Coordinate response measures
- Familiar with the hospital and onsite or on call (primary & alternates)
- Authority to commit resources
- Emergency Coordinator:
  - John Jordan EVS
  - Alternates:
    - Stephen Branch EVS, YSC
    - Shahid Abdul-Karim EVS, SRC

# **Emergency Equipment**

Must be immediately accessible at hazardous waste storage areas



- Internal and external communication device (e.g., alarm, telephone)
- Fire extinguishers, fire control equipment, & water at adequate volume & pressure to supply sprinklers, spray systems, etc.
- Spill control and decontamination equipment
- Must have adequate supplies, and must be accessible (nearby, not blocked)
- Must test/maintain equipment as necessary to assure proper operation during emergencies

 YNHH Hosp. Emergency Response
 Incidental response only by YNHH personnel

### Incidental response =

Limited in quantity



- Pose no emergency or threat to safety and health of workers in immediate vicinity
- Substance can be absorbed, neutralized, or otherwise controlled at time of release by trained employees in immediate area, or by maintenance personnel, without aid of coordinated response effort from employees outside area

# **Emergency Response**

### Hazardous Waste Spill

- Leave the area immediately and call 155 at YNHH and SRC, 911 at offsite locations
- Request a First Response Team for [describe the danger, such as a significant spill or smell of a chemical]
- Cordon off the area and prevent anyone from going into the area.
- Final cleanup/disinfection by outside spill response contractor. YNHH's current contractor for hazardous waste emergencies is Stericycle.
- Fire/Explosion call 155 at YNHH and SRC, 911 at offsite locations

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## **Shipping Hazardous Wastes Offsite**



- Use permitted hazardous waste transporter
- Ship only to permitted hazardous waste Treatment, Storage, or Disposal Facility (TSDF)

Please print or type. Form Approved. OMB No. 2050-0039									
1		ORM HAZARDOUS	RM HAZARDOUS 1. Generator ID 2. Page 1 of 3. Emergency Response Phone 4. Manifest Tracking Number						
	5. Ger	nerator's Name and Mailing	g Address		Generator's Site Address (if different than	mailing address)			
	Gener	rator's Phone:							
	Certrasitio a r Lotte: 6. Transport of Company Name U.S. EPA ID Number								
	7. Tra	nsporter 2 Company Name	e			U.S. EPA ID Number			
	8. De:	signated Facility Name and	d Site Address			U.S. EPA ID Number			
						1			
	Facilit	y's Phone:				<u> </u>			
	9a. HM	9b. U.S. DOT Descriptio and Packing Group (if a	on (including Proper Shipping Name, Hazard Class, ID Num nv))	iber,	10. Containers	11. Total Quantity Wt /Vol	13. Waste Codes		
	TIN	1.	111		No. Type	Quantity Wt./Vol.			
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AT									
GENERATOR	<u> </u>	2.							
6									
		3.							
						r			
		4.							
	14 9	acial Handling Instructions	s and Additional Information						
	14. 0	Jecial Harluing marketona							
			R'S CERTIFICATION: I hereby declare that the contents of						
			ded, and are in all respects in proper condition for transport ontents of this consignment conform to the terms of the atta			I regulations. If export shipr	nent and I am the Primary		
			mization statement identified in 40 CFR 262.27(a) (if I am a			tor) is true.			
	Gener	ator's/Offeror's Printed/Type	ed Name	Sig	gnature		Month Day Year		
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Ē	18b. A	Iternate Facility (or Genera	ator)			U.S. EPA ID Number			
ACILITY									
ATE			· · · · · · · · · · · · · · · · · · ·				Month Day Year		
DESIGNATED	19. Ha	zardous Waste Report Ma	anagement Method Codes (i.e., codes for hazardous waste	treatment, disposal.	, and recycling systems)				
<b>B</b>	1.		2.	3.		4.			
[_									
	20. De	signated Facility Owner or	r Operator: Certification of receipt of hazardous materials co	overed by the manife	est except as noted in Item 18a				
	Printe	d/Typed Name		Sig	gnature		Month Day Year		
ł									
FP/	Form	8700-22 (Rev 12-17)	Previous editions are obsolete.		DESIGNATED	FACILITY TO FPA	A A MANIEEST SYSTEM		

### Hazardous Waste Manifest

- Required for all Hazardous Wastes
- Complete properly and legibly
- Do not sign unless received DOT Hazardous Materials Shipping training

1		ORM HAZARDOUS	1. Generator ID Number CTD123456789	2. Page 1 o	of 3. Emergency Res (800)424-		4. Manifest	Tracking No.	umber 867	70 <b>J</b> ,	JK	
			ator's Name and Mailing Address Generator's Site Address (if different Cott Widgets, Inc.									
		6 Hopkins High										
	A	dams, CT 45320	<sup>0</sup> (203)704-1776									
Ī		sporter 1 Company Nam	e				U.S. EPA ID Number					
		untington Hauli	0.	14-14-14-14-14-14-14-14-14-14-14-14-14-1				CTD000654321				
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ŀ	8. Desi	ignated Facility Name and reat-It, Inc.	d Site Address				U.S. EPA ID N	lumber				
		7 Patrick Street										
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	Facility	r Test og					· · ·					
		Who is	s involved?			What is	s involv	ed?				
	9a. HM	9b. U.S. DOT Descripti and Packing Group (if		Shipping Narie, Hazard Class, ID Number, 10. Containers No. Type		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		S		
K-		<sup>1</sup> . RO, UN1992	3, Waste Flammable L	iquid, n.o.s. (tolue	ene, 4	DM	220	G	F005	F003	D001	
<b>GENERALOR</b>	X	xylene), 3, P		1 / (								
GENE	V	<sup>2.</sup> UN1832, W	aste Sulfuric Acid, Spe	ent, 8, PGII	3	DF	165	G	D002			
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		chromium), <sup>4</sup> Spent Oil, N	9, PGIII (D005, D007)	)								

1.1

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	15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.					
17	Generator's/Offeror's Printed/Typed Name S	ignature		Month	Day	Year
17		Jenna Raytor		10	110	110
*	Jenna Raytor	Jordina Karpior		10	18	18
	16. International Shipments Import to U.S.	U.S. Port of entry/exit:				
I.L.I						
=	Transporter signature (for exports only):	Date leaving U.S.:				
郎	17. Transporter Acknowledgment of Receipt of Materials	•				
5	Transporter 1 Printed/Typed Name Si	gnature		Month	Day	Year
TRANSPORTER						
NS N	Transporter 2 Printed/Typed Name Si	ignature		Month	Day	Year
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					,	
Manifest Reference Number:						
$\geq$	18b. Alternate Facility (or Generator)		U.S. EPA ID Number			
5	······					
U						
Ψ	Facility's Phone:					
<b>B</b>	18c. Signature of Alternate Facility (or Generator)			Month	Day	Year
F					1	1
ž						
DESIGNATED FACILITY	19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, dispos	al, and recycling systems)				
B	1. 2. 3.		4.			
	20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the mar	nifest except as orded in Item 18a	• • • • • • • • • • • • • • • • • • •			
		gnature		Month	Day	Year
		3		monut	I Day	1001
*						
PA	Form 8700-22 (Rev. 12-17) Previous editions are obsolete.	DESIGNATED I	ACILITY TO EPA's e-M	ANIF	EST S'	YSTEM

### Do not sign unless received current DOT shipping training

# **Manifest Record Keeping**

- Generator keeps copy
- Transporter & TSDF keep copy
- TSDF sends copy to EPA (electronically or by mail) and pays e-manifest user fees
- TSDF mails copy to generator (if generator not using e-manifest)
- Generator: make sure copy rec'd from TSDF within 35 days
  - If not received, track & locate waste
  - File exception report if no manifest copy w/in 45 days
- Keep for 3 years



