

SPECIAL WASTES

THE GOOD THE BAD AND THE UGLY

Alliance of Hazardous Materials Professionals (AHMP)
Orlando 2013



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Iowa Department of Natural Resources

Solid Waste Disposal... why the concern?

Jackson County Sanitary transfer station destroyed by fire





Worker safety: Can toxic wastes sneak in?



Landfill cell contained liner system of shredded tires.
Equivalent of 1.3 million tires consumed about 7.5 acres



Topics to cover:

- Iowa's Special Waste Authorization (SWA) Program
- What is special waste?
- Waste determination helpful hits
- Examples of special wastes and solid waste disposal



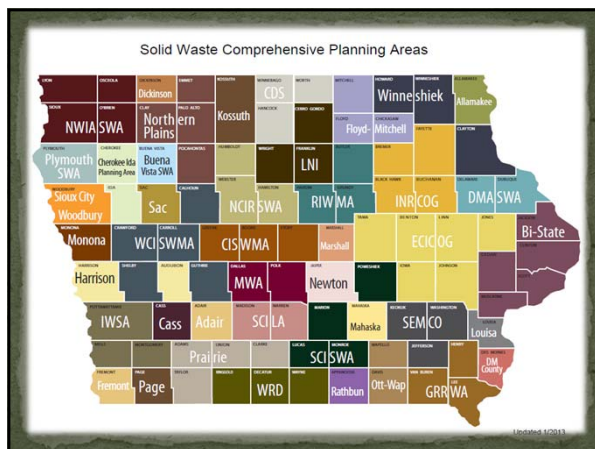
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Background for Iowa

- Not RCRA Authorized State
 - Iowa and Alaska
- EPA region 7 administers (Topeka KS)
- Iowa has 42 operating landfills (subtitle D)
- Waste flow control



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Special Waste Authorization (SWA)

Provide safe proper management:


- Threat to human health
- Threat to environment
- Properties that make it difficult to manage
- Need assistance in reviewing waste properties.
- Not be a RCRA hazardous waste

Examples:

- Industrial waste, spill cleanup, brownfields, large quantity of waste, off spec waste, paint filters, sand blasting, Meth lab cleanup, etc.

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Parkersberg EF5 Tornado May 2008



Wastes: Household, business & farm



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Mercury

- Mercury released from wastewater treatment plant during maintenance



- Mercury spill in NW Iowa; child pokes finger in hazardous liquid



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What happens to the waste generated?






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Now What?


When it's all over,
Who cleans up the mess?



APPROACHING A SCENE



Donut test



- If you can't see the whole site through the hole, you are too close.
- If the powder blows in your face, you are on the wrong side of the scene!

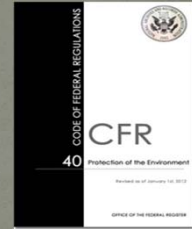
Options to consider

- Recycled – Iowa Waste Exchange
- Land applied, or landfarmed (PCS)
- Regulated under TSCA, (PCBs)
- Asbestos (NESHAP)
- RCRA
- OSHA

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Helpful Tips: Waste Determinations

40 CFR 262.11 - states a person who generates a solid waste as defined in 40 CFR 261.2, must determine if that waste is a hazardous waste.

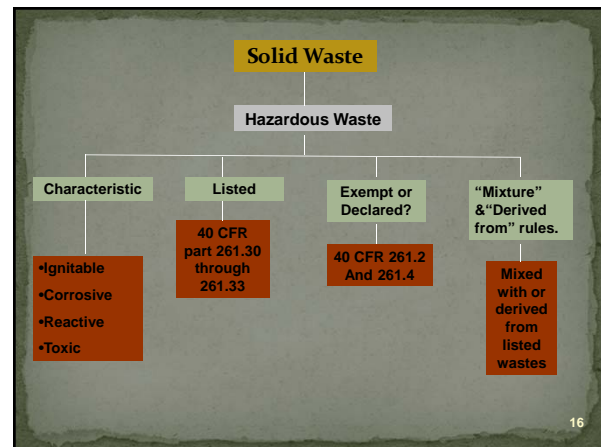


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Using “Generator Knowledge”

- ❖ The knowledge that is applied must be valid, verifiable and be able to demonstrate the basis for their claim.
- ❖ More often than not, it is easier to use knowledge of the waste to characterize it as hazardous than it is to characterize it non-hazardous.
- ❖ The information reflects the current processes and materials being used and that no differences exist between the process in the documented data and your own..

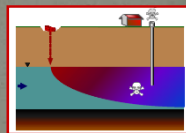
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TCLP (Toxicity Characteristic Leaching Procedure)

- Predicts if hazardous components of a waste are likely to leach out.
- 100 x drinking water standard
- Regulatory levels established for: 8 metals
32 organics



The **EXTRACT** from a waste will determine the Regulatory level of a **SOLID**.

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MAXIMUM CONCENTRATION OF CONTAMINANTS FOR TCLP AND ZHE			
Contaminant	Regulatory Level (mg/L)	Contaminant	Regulatory Level (mg/L)
Metals:		Volatiles, continued:	
Arsenic	5	1,1-Dichloroethylene	0.7
Barium	100	Methyl ethyl ketone	200
Cadmium	1	Tetrachloroethylene	0.7
Chromium	5	Trichloroethylene	0.5
Lead	5	Vinyl chloride	0.2
Mercury	0.2	Herbicides & Pesticides:	
Selenium	1	Chlordane	0.03
Silver	5	2,4-D	10
Volatiles:		Endrin	0.02
Benzene	0.5	Heptachlor (and its epoxide)	0.008
Carbon tetrachloride	0.5	Lindane	0.4
Chlorobenzene	100	Methoxychlor	10
Chloroform	6	Toxaphene	0.5
1,2-Dichloroethane	0.5	2,4,5-TP (Silvex)	1
Semivolatiles:		Semivolatiles:	
p-Cresol	200	1,4-Dichlorobenzene	7.5
m-Cresol	200	2,4-Dinitrotoluene	0.1
o-Cresol	200	Hexachlorobenzene	0.1
Hexachlorobenzene	0.1	Hexachlorobutadiene	0.5
Hexachlorocyclopentadiene	0.5	Hexachloroethane	3
Hexachloroethane	3	Nitrobenzene	2
Nitrobenzene	2	Pentachlorophenol	100
Pentachlorophenol	100	Pyridine	5
Pyridine	5	2,4,5-Trichlorophenol	400
2,4,5-Trichlorophenol	400	2,4,6-Trichlorophenol	2
2,4,6-Trichlorophenol	2		

SAMPLE MAXIMUM HOLDING TIMES (DAYS)				
Analytes	From Field collection to TCLP extraction	From TCLP to Preparative extraction	From Preparative extraction to Determinative analysis	Total elapsed time
Volatiles	14	NA	14	28
Herbicides & Pesticides	14	7	40	61
Semivolatiles	14	7	40	61
Mercury	28	NA	28	56
Metals, except mercury	180	NA	180	360

40 CFR 261.24

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Helpful hints:

Are results in:

- mg/L (TCPL)
- mg/kg (totals)
- ppm or ppb
- Synonym for chemical?

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ANALYTICAL REPORT

Sample ID: CUC1402-01 (Laser Dust (Cab Weld) - Solid/Soil) Sampled: 03/25/11 11:00 Recvd: 03/25/11 13:00

Analyte	Sample Result	Data Qualifiers	Units	Quant Limit	Dilution Factor	Date Analyzed	Analyst	Reg. Limit	Method
General Chemistry Parameters									
% Solids	99.8		%	0.100	1	03/25/11 12:39	ms		SM 2540 G
Flashpoint	>212°F		°F	NA	1	03/20/11 15:43	jc		ASTM D102
pH	6.20	IE	units	0.100	1	03/28/11 16:27	mh		SW 9640
Total Metals by SW 846 Series Methods									
Barium	<15.2	IE	mg/kg dwt	15.2	29.6	03/20/11 07:55	cp		SW 6010
Chromium	179		mg/kg dwt	30.3	29.6	03/20/11 07:55	cp		SW 6010
Lead	40.4		mg/kg dwt	3.38	3.35	03/20/11 16:05	ms		SW 6010
Manganese	1450		mg/kg dwt	15.2		03/20/11 07:55	cp		SW 6010
Nickel	581		mg/kg dwt	75.8		03/20/11 07:55	cp		SW 6010
Selenium	<1.69	SP	mg/kg dwt	1.69	1.68	03/20/11 09:31	kmf		SW 7740
Silver	<0.3	IE	mg/kg dwt	30.3	29.6	03/20/11 04:29	cp		SW 6010
Zinc	783		mg/kg dwt	30.3	29.6	03/20/11 04:29	cp		SW 6010
TCPL Metals									
Arsenic	<0.300	TR	mg/L	0.300	1	03/20/11 01:24	cp	5	SW 6010
Barium	<0.100	TR	mg/L	0.100	1	03/20/11 01:24	cp	100	SW 6010
Calcium	<0.0200	TR	mg/L	0.0200	1	03/20/11 01:24	cp	1	SW 6010
Chromium	<0.0200	TR	mg/L	0.020	1	03/20/11 01:24	cp	5	SW 6010
Lead	<0.100	TR	mg/L	0.100	1	03/20/11 01:24	cp	5	SW 6010
Mercury	<0.00200	TR	mg/L	0.00200	1	04/04/11 13:27	kmf	0.2	SW 7450A
Selenium	<0.0250	TR	mg/L	0.0250	5	03/20/11 18:18	ms	1	SW 7740
Silver	0.0220	TR	mg/L	0.0200	1	03/20/11 05:50	cp	5	SW 6010

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Know exactly what you are dealing with!

What a slight difference can make:

- Chemical properties - safety
- Waste codes for waste determinations
- Waste codes to meet LDR's

2,4,5 - Trichlorophenol D041 400.0 mg/L
 2,4,6 - Trichlorophenol D042 2.0 mg/L

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Stable? Reactive? Incompatible?

Chemical Reactions with water:

- Release gas
- Release heat
- Flammable
- Toxic health hazard
- Combustible

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Using MSDS's (SDS) for waste determination

MSDS's are not required to list any carcinogenic components under .1% and non-carcinogenic components under 1%.

Do the math:

.1% = 1,000 ppm
 1% = 10,000 ppm

Section 13: Disposal Considerations

Waste Disposal:
 Waste must be disposed of in accordance with federal, state and local environmental control regulations.

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Emergency Response Guidebook

GUIDE 128 FLAMMABLE LIQUIDS (Non-Polar/Water-Immiscible) ERG2008 ERG2008 FLAMMABLE LIQUIDS (Non-Polar/Water-Immiscible) GUIDE 128

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Extremely FLAMMABLE. Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- These substances decompose with "P" may polymerize explosively when heated or involved in a fire.
- Residuals remain may cause fire or re-ignition.
- Boiling liquid may cause fire or re-ignition.
- Containers may explode when heated.
- Boys liquid and vapor are toxic.
- Substance may be transported hot.
- If a release should occur in hot weather, refer to GUIDE 118.

HEALTH

- Irritation on contact with material may be visible on face, skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or cleanup water may cause pollution.

PUBLIC SAFETY

CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the back cover.

As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.

For a complete precautionary measure, isolate spill or leak area for at least 300 meters (1000 feet).

Stay upwind.

Stay out of low areas.

Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Use proper clothing and contaminated breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions, also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

FIRE OR EXPLOSION EMERGENCY RESPONSE

CAUTION: All these products have a very low flash point! Use of water spray when fighting fire may be ineffective.

CAUTION: For mixtures containing alcohol or other solvent, alcohol-resistant foam may be more effective.

Small Fire

- Dry chemical, CO₂, water spray or regular foam.
- Water spray, fog or regular foam.
- Use water spray or fog; do not use straight stream.
- Move containers from fire area if you can do it without risk.

Fire Involving Tanks or Car/Pedal Trucks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or distribution of toxic gases.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and fire from.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flames, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material. Stop work if you can do it without risk.
- Prevent entry into sewers, basements or confined areas.
- A vapor suppressing foam may be used to reduce vapors.
- Always wear eye protection, gloves and other proper PPE.
- Use clean non-ignition proof tools to transfer to containers.
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FIRE FIGHTING

- Water spray may reduce vapor; but may not prevent fire from re-igniting.
- Call 911 or emergency response team.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush with 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible without causing further injury. Remove clothing if it does not adhere to the skin.
- Ensure that medical personnel are aware of the material involved in the incident.

2012 EMERGENCY RESPONSE GUIDEBOOK

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Infectious waste

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Alternative Fuels

B- biodiesel
E- Ethanol

Map courtesy of the Des Moines Register

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Filtering process

Filtering takes place at two stages using diatomaceous earth as the filter media

- Pretreatment of crude oil
- Final refining

Disposal Issues

Spontaneous combustion

Other ideas for use?

Composting

Fuel

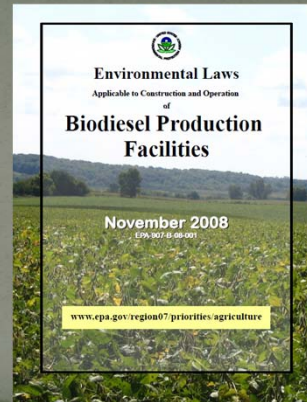
Land Application

BOD of 200,000 mg/L

- Requires a lot of land for very low application rate
- Strict controls on run-off and waterway/well setback distances



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FIRING RANGE

Concerns:

- 18" sections
- Lead
- PAH



July 20, 2007

CRTs and Sham Recycling

- paid the "recycler" thinking it would be properly recycled
- donated the material to a third party that sent the equipment to the 'recycler' for processing



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Generator Liability: Responsible Parties

CERCLA

CRTs and CRT glass collected from households or CESQG businesses are subject to the general prohibition on open dumps (40 CFR part 257) and may become subject to RCRA, Superfund, or state clean-up.



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**CERCLA liability –
If the recycler goes out of business**

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Superfund Site to Community Development

Former Ordnance plant

- 2,200 acre site, operated during WWII 1942-1945
- Produced over 2 million rounds of ammunition per day
- John Deere facility
- ISU Dairy Research farm
- Former unlined landfill
- grease pit lagoon
- 2003 - EPA declared it a superfund site.
- 2005 - purchased for transformation into a "new community" development, including schools, commercial, housing and business campus.



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Contaminants remediated

- Lead
 - Chelating treatment
- PAH
- Other metals
- Grease lagoon, needs to pass paint filter test
 - Used polymer, then fly ash



Industrial fire




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Water runoff

-~200,000 gallons used in fire fighting effort

•Headed towards Des Moines river - DSM drinking water source


Deployment of booms, is that enough?



•Surfactants

Storm water Basin

Sunlight + wind (oxygen) = natural remediation



½ mile from scene

Rising 1 ft. every 3 minutes

2" on basin floor every 5 minutes

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Solid waste disposal



1 ft. depth of ash debris

Cleanup efforts

- Metal waste
- Brick, rubble and debris
- Wastewater runoff
- Asbestos?



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"U" Listed Wastes Present

- Acetone (I)
- Butanol (I)
- 2-Butanone (I,T)
- Ethyl Acetate (I)
- Isobutyl Alcohol (I,T)
- Methanol (I)
- Methyl Ethyl Ketone (T)
- Methyl Isobutyl Ketone (I)
- Toluene (T)
- Xylene (I)



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RCRA's "Contained In" Policy



Contained-in-Policy:
Environmental media and debris contaminated by a listed hazardous waste must be managed as that listed waste regardless of the concentration of waste they contain

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Common carriers.....



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TRUCK WRECK

Carrying "Common" items?



- Cleaning products
- Bolts of fabric
- Clothing
- Books

And....



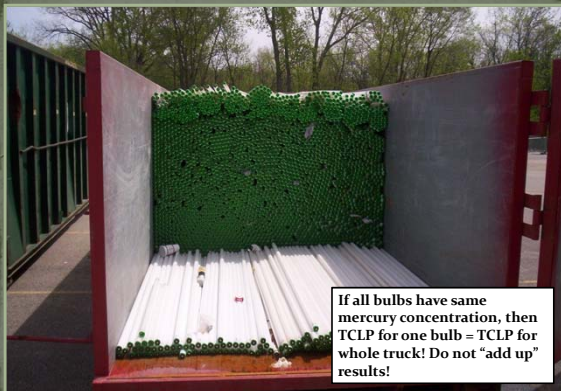
Sodium and Potassium nitrate
37 Ruger 38 cal. Automatics
22 long barrels
45 cal. automatics



What's in that truck driving through your neighborhood?



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If all bulbs have same mercury concentration, then TCLP for one bulb = TCLP for whole truck! Do not "add up" results!

Creative recycling

4 ft. fluorescent bulb fence



Property Transfer



Photos courtesy of Metro Waste Authority

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Oddest requests...

50,000 bottles of beer



Cheese oozing from landfill



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In Review

- Know what the waste consists of
- Know the process of how it was created
- Waste determination (RCRA)
- Special handling requirements
- Safety.. Safety.. Safety!!!!
- Learn from each incident

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Thank you!

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