



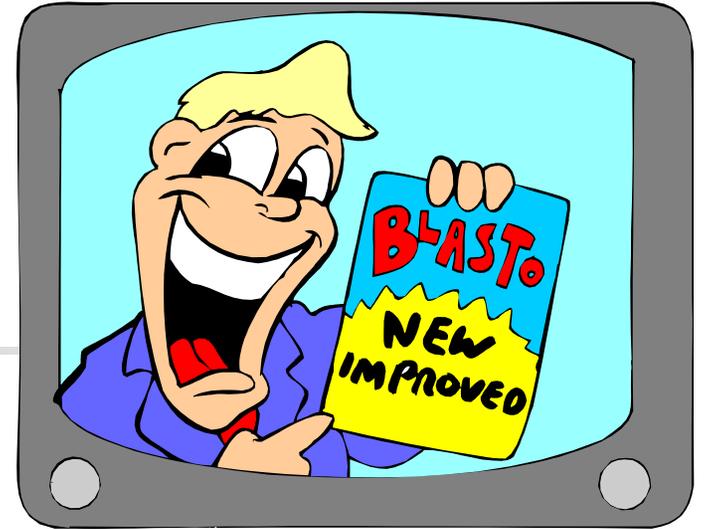
# Land Disposal Restrictions

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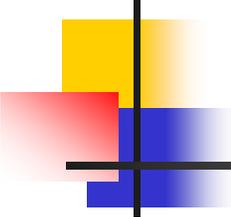
Hugh Davis – EPA

Jim Harford - NDEQ

# Overview



- The Big Picture
- The Basics
- FAQs and Common Mistakes
- Notification Requirements
- Recordkeeping
- Waste Analysis Plan

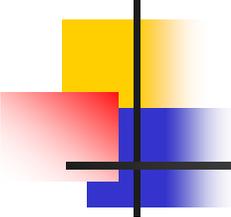


# The Big Picture

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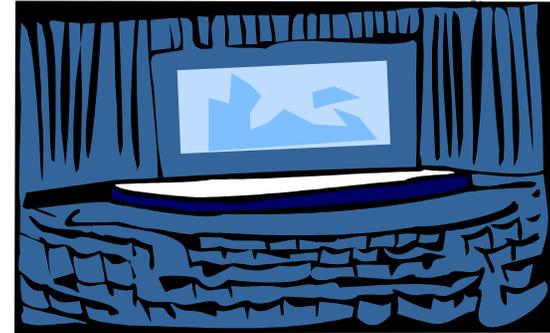


- RCRA (1976)
  - Protect HHE from dangers associated with the generation, transport, storage, treatment and disposal of hazardous waste
- HSWA 3004(m) (1984)
  - Minimize short and long-term threats to HHE by reducing the toxicity or mobility of hazardous constituents

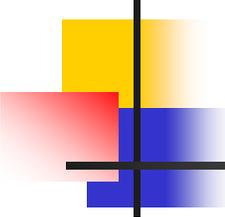


# The Big Picture

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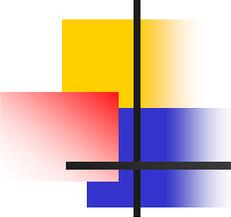
- EPA developed the LDR program in 9 stages!
  - Congress set schedule for wastes listed pre-1984
    - Solvent and Dioxin wastes
    - California List
    - "Thirds"
  - Four "Phases" for newly identified or listed wastes



# The Big Picture



- LDR Program: Extensive technical requirements
  - Prohibits hazardous wastes from land disposal
  - Establishes treatment standards (40CFR Part 268)
    - Reduce the mobility and toxicity of hazardous constituents
  - Adds a second level of protection over that from physical barriers
- What is up at EPA today?
  - Dyes and Pigments Listing
  - Focus on wastes that don't fit the LDR framework
    - Variances
    - Determinations of equivalent treatment
  - Implementation issues
- States can be more restrictive
- There is some room for interpretation



# The Basics

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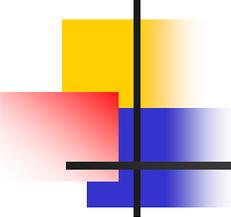
- What are the Prohibitions that form the framework of the LDR program?
  - Disposal—requires adequate treatment
  - Dilution—ensures proper treatment
  - Storage—prevents indefinite storage
- We will cover these in more detail



# The Basics

- What is “land disposal”
  - Placement in or on the land including landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome or bed formation, cave, or in a concrete vault or bunker intended for disposal



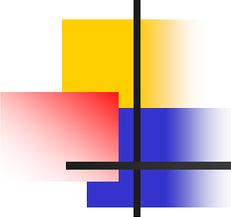


# The Basics

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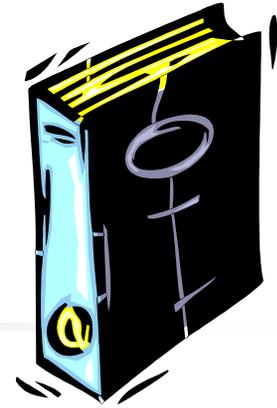
- What are Restricted and Prohibited Wastes?
  - “Restricted” waste -- waste subject to LDR
  - “Prohibited” waste – waste that has an EPA established treatment standard in effect



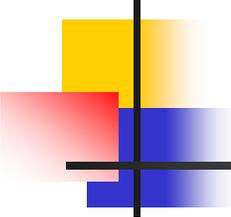


# The Basics

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- What are the two types of treatment standards?
  - Technology-based (§268.42 Table 1)
    - Must use a specified technology such as CMBST or DEACT
    - For information on these technologies, see [www.epa.gov/epaoswer/hazwaste/ldr/backgrd.htm](http://www.epa.gov/epaoswer/hazwaste/ldr/backgrd.htm)
  - Concentration-based (§268.40)
    - Must meet specified concentration limits
    - Any technique allowed except dilution (in most cases)

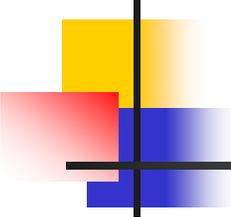


# The Basics

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- Let's test your knowledge:
  - What Treatment Technologies are approved to meet the concentration-based treatment standards?

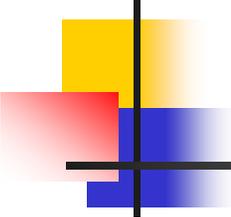




# Test Answer

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- Any treatment technology that is not impermissible dilution may be used to meet the concentration-based treatment standards.

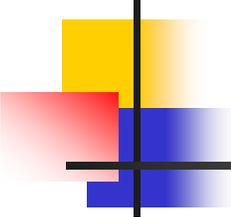


# The Basics—§268.40

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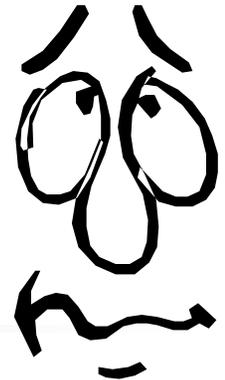


- §268.40 contains treatment standards for all of the characteristic, listed wastes, and treatment subcategories
  - Treatment standards for soil, debris and lab packs are listed in separate subparts (discussed below)
- §268.40 has separate standards for “wastewater” and “nonwastewater”
- What is nonwastewater?
  - Wastes that are 1% or greater by weight of total organic carbon or total suspended solids

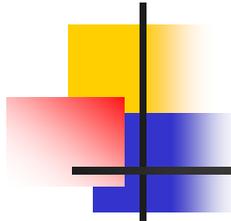


# The Basics

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- Exclusions (§268.1): LDRs do not apply to:
  - Household hazardous waste
  - Conditionally-exempt small quantity generator hazardous waste
  - Waste to Clean Water Act treatment and pretreatment systems
  - De minimis losses of characteristic wastes to facility wastewaters
  - Pesticide/container residue disposed by farmer on own land---the "farmer exclusion"



# The Basics

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- Alternative Treatment Standards address wastes that don't fit the general LDR framework
  - Soil (§268.49)
  - Debris (§268.45)
  - Lab Packs (§268.42)
  - Waste variances (§268.44)
  - Determinations of equivalent treatment (DETs) (§268.42(b))
  - Remediation waste regulations and policies



# FAQs & Common Mistakes

When do the LDRs attach to waste?

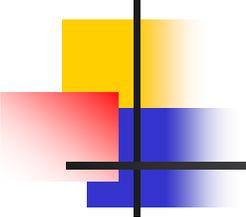
- At the point of waste generation
  - Not at the point of disposal
  - Example
    - D001 solid ignitable paint filter may lose its D001 characteristic in a tub of water, but all D001 LDR rules still apply because it was D001 when it was generated
  - Important concept; once attached, LDRs apply until treatment standards are met

# FAQs & Common Mistakes



How is an “LDR Waste Determination” made?  
(§268.7)

- Analysis
  - TCLP (metals)
  - Totals analysis (organics)
  - Must be a grab sample, not composite
- Knowledge of process
  - Must document the basis of knowledge determination
  - Must be correct!

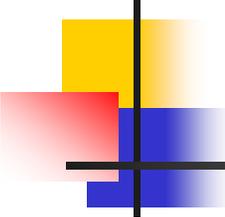


# FAQs & Common Mistakes

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How do the LDRs apply to Characteristic and Listed wastes?

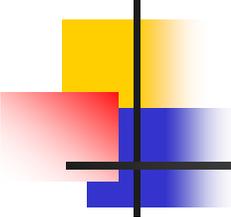
- Listed: Must meet the §268.48 treatment standards for regulated hazardous constituents specific to the waste (or use a specified technology)
- Characteristic: Must remove the characteristic (or meet the specified technology for a treatment subcategory in §268.40), *and* remove any underlying hazardous constituents (UHCs) (unless § 268.40 specifically does not require it).



# FAQs & Common Mistakes

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- What are Underlying Hazardous Constituents (UHCs)?
  - Must determine if UHCs present in characteristic waste
    - “Reasonably expected to be present” at the point of generation
    - D001 High TOC subcategory exception (§268.9(a))
  - 250 plus chemicals on the Universal Treatment Standards Table (§268.48)

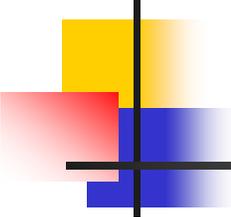


# FAQs & Common Mistakes

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What are the Universal Treatment Standards (UTS)?

- Historically, EPA set treatment standards based on “BDAT” (best demonstrated available technology) for each waste.
- Unintended consequence: numeric treatment standards from BDAT could vary for different hazardous wastes.
- To simplify the LDR program, EPA set a single numeric value for each hazardous constituent. This is the UTS table in §268.48.
- EPA also changed the values for constituents in the §268.40 treatment standards table to be the same as the UTS.

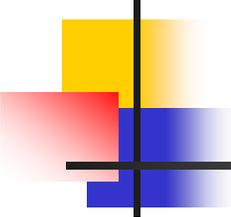


# FAQs & Common Mistakes

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Just to make sure you're not confused...

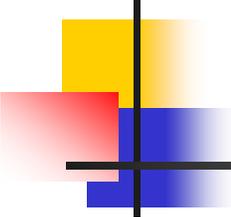
- How is a “regulated hazardous constituent” different from an “underlying hazardous constituent (UHC)?”



# FAQs & Common Mistakes

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- “Regulated hazardous constituents” are the constituents known to be in listed and TC wastes, and are found in the §268.40 table for the listed waste code.
- “UHC’s” are identified in characteristic wastes, and are found in the UTS table at §268.48 (except for fluoride, selenium, sulfides, vanadium, and zinc—see §268.2).



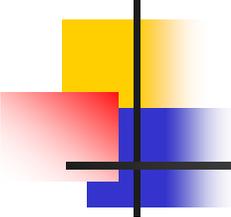
# FAQs & Common Mistakes

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On the off chance that you are still confused.....

- Do listed wastes have to meet the UHC treatment standards?

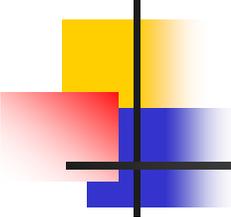




# FAQs & Common Mistakes

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- There are no Yes/No answers in RCRA...
  - Almost always, listed wastes do not have to meet the UHC treatment standards—only the regulated constituents must be treated to meet the LDRs.
  - However, if listed waste also exhibits a characteristic other than that addressed by the listing and its regulated constituents, the waste must be treated to address that characteristic and any UHCs that are not already covered by the listing.
  - Also, soil contaminated with listed waste is also subject to the UHC standards.



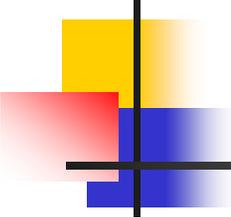
# FAQs & Common Mistakes

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## Dilution Prohibition §268.3

- Impermissible to dilute hazardous waste (e.g., adding soil or water) to meet concentration standards.
  - Dilution circumvents proper treatment and does not reduce the overall load of toxics.
  - Also inappropriate to “treat metals” by incineration or biodegradation.
- This is RCRA, and there are exceptions:





# FAQs & Common Mistakes

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Exceptions to dilution prohibition:

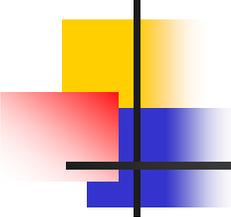
- Ignitable, corrosive and reactive hazardous wastes may be diluted to meet the LDR treatment standards, *if*
- They are sent through a CWA or CWA-equivalent system or a Class I SDWA underground injection well.

# FAQs & Common Mistakes



What is the Storage Prohibition §268.50?

- Storage of prohibited wastes is only allowed to accumulated a sufficient volume of waste to facilitate proper treatment, recovery, or disposal.
- For storage up to one year, burden is on EPA/state to demonstrate non-compliance.
- Beyond one year, burden of proof with waste handler to justify storage; not required to submit notification.
- In all cases, generators/TSDFs subject to standard accumulation time, labeling, unit requirements.

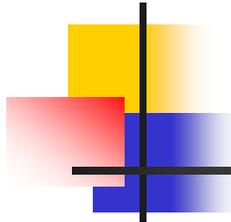


# Land Disposal Restrictions

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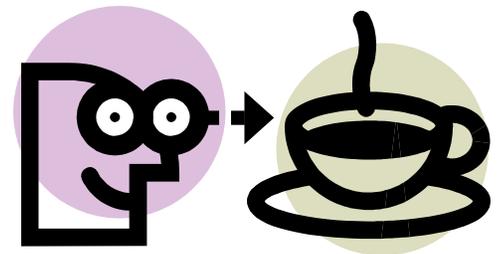
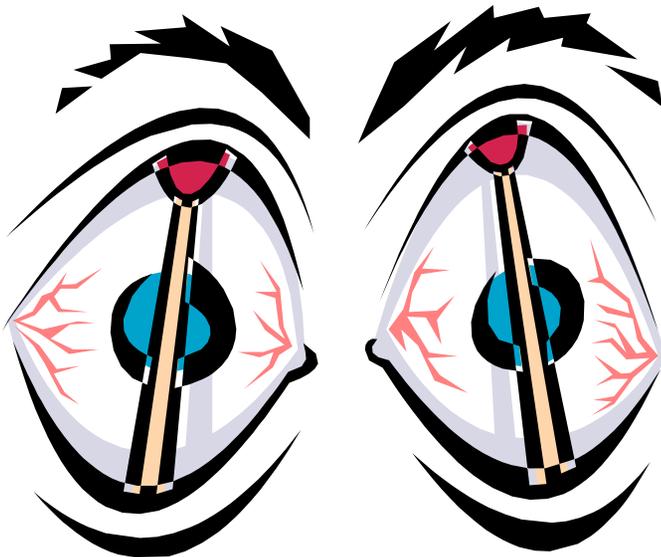
- Questions





# Land Disposal Restrictions

**BREAK!**

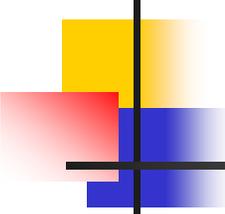




# FAQs & Common Mistakes

## Alternative LDR Treatment Standards for Contaminated Soil (§268.49)

- Requires 90% reduction in hazardous constituents, capped at 10 times UTS
- Applies to each UHC when such constituents are initially expected to be present at greater than 10 times the UTS



# FAQs & Common Mistakes

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## Soil Standards (continued)

- Do not apply to in situ soils
- Must meet UTS for both characteristic and listed designations
- Only apply in states that have been authorized for them or when EPA administers the program
- Incidental mixing of soil and haz waste is ok under some circumstances; otherwise impermissible dilution
- Characteristic soil can go to Subtitle D when it meets soils standards
- Listed soil can go to Subtitle D when it meets soil standards AND has a “contained-in” determination

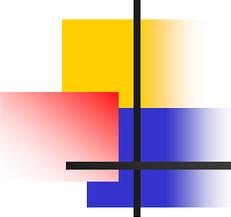


# FAQs & Common Mistakes

## “Contained-in” Policy

- Contaminated environmental media\* are not hw, unless they “contain” hw:
  - Exhibit a characteristic, or are
  - Contaminated with concentrations of hazardous constituents from listed wastes above health-based levels.
- Media “containing” hw subject to applicable RCRA requirements, until they no longer contain hw.

\*environmental media include soil, groundwater, surface water and sediments

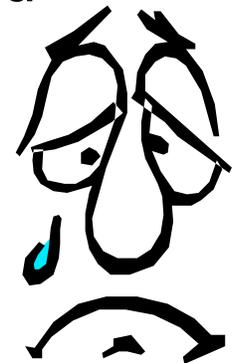


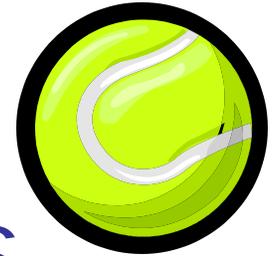
# FAQs & Common Mistakes

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## “Contained-in” Policy (continued)

- “Contained-in determination”—no longer contains hw when:
  - no longer exhibits a characteristic (note the policy does not require treatment of UHCs to UTS levels)
  - for listed wastes, below health-based levels, based on conservative, direct exposure
- **NOTE:** waste that is “contained-out” is still subject to LDRs, if there are constituents above LDR treatment levels





# FAQs & Common Mistakes

## **Debris Standards** §268.45 and §268.2(g) and (h)

- Debris (see §268.2 for complete definition): solids exceeding 60 mm (tennis ball) intended for disposal and are: manufactured objects, plant or animal matter, natural geologic material. There are exemptions, including: wastes with specific treatment standards (e.g., lead acid batteries); process residuals (e.g., sludges); intact containers.
- Hazardous debris: exhibits characteristic or contains listed waste
- 50% "rule": mixtures of debris and other material that are greater than 50% debris by visual inspection are regulated as debris
- Mixing of wastes with debris to change treatment classification is illegal
- 3 technology types: extraction, destruction, immobilization
  - Characteristic debris treated by extraction or destruction and that are not characteristic can be disposed in Subtitle D landfill
- Debris treatment residuals must meet §268.40 treatment standards

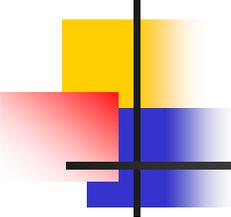
# FAQs & Common Mistakes

Summary—LDRs and Remediation Waste—a complex area:

- Area of Contamination (AOC) policy
- Corrective Action Management Units (CAMUs)
- Temporary Units
- Policy on when contaminated caused by listed waste
- Site-specific LDR treatment variances
- Treatability studies exemptions
- Spill response exemptions
- Contained-in policy
- §3020 exemption for groundwater reinjection
- Alternate LDR standards for soil and debris



See Management of Remediation Waste Under RCRA  
[http://www.epa.gov/correctiveaction/resource/guidance/remwaste/spd\\_mem.pdf](http://www.epa.gov/correctiveaction/resource/guidance/remwaste/spd_mem.pdf)

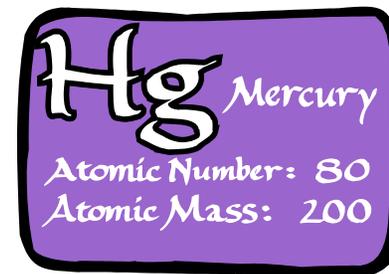


# FAQs & Common Mistakes

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What is a “Lab Pack?”

- Lab Pack – Drum or container filled with many smaller containers of chemicals
- Lab Packs have an alternative LDR requirement—incineration (§ 268.42(c))
- However, certain wastes are excluded (see 268 Appendix IV)





# FAQs & Common Mistakes

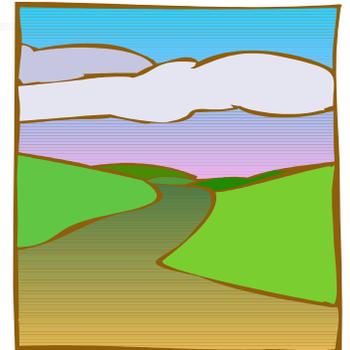
Do Universal Waste handlers need to comply with LDRs?

- Universal wastes must be sent to a universal waste (or Subtitle C) destination facility
- All of the LDR requirements of §268 apply (see §273.60) at the destination facility

# FAQs & Common Mistakes

## **Destinations** of non-soil/debris wastes:

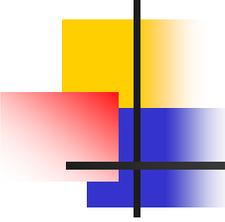
- Untreated Listed Waste
  - meets TS as generated (RCRA C disposal)
  - needs treatment (permitted RCRA C treatment facility)
- Treated Listed Waste (permitted RCRA C disposal facility)
- Decharacterized, no UHCs or treated UHCs (RCRA-D; CWA/CWA-EQ; Class I SDWA well for disposal)
- Decharacterized, UHCs (non-RCRA C unit for treatment)





# Notification Requirements

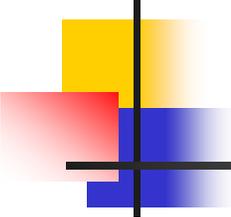
- I'll list **all** the notification requirements here and include the paperwork requirements tables at 268.7
- One-time notices
  - Excluded/exempted after point of generation
    - Disposition
    - On-site files



# Notification Requirements

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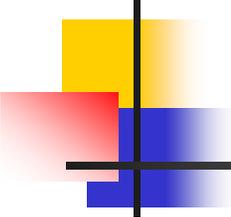
- One-time notices (cont.)
  - Initial shipment of waste not meeting treatment standard
    - To TSDf and generator file
    - Re-notify when waste or facility changes
  - Meets treatment standard at point of generation
    - To TSDf and generator file
    - Re-notify when waste or facility changes
    - Available waste analysis data



# Notification Requirements



- One-time notices (cont.)
  - Characteristic waste treated to non-hazardous
    - Certification
    - Generators files and
    - Send to State/EPA
    - Update when waste changes (process/operation) and/or
    - Subtitle D receiving facility changes
    - Annual re-notification if change occurs by Dec 31

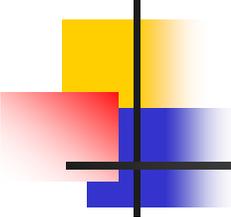


# Notification Requirements

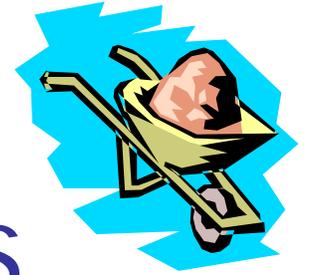
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- Characteristic waste treated to non-hazardous (cont.)
  - Notification requires
    - Name & Address of RCRA-D facility
    - Description of waste as initially generated
    - Include waste codes, treatability group, UHCs unless all UHCs are treated & monitored
  - Certification
    - Signed by authorized representative
    - Separate certification language if treatment removes characteristic, but not UHCs





# Notification Requirements

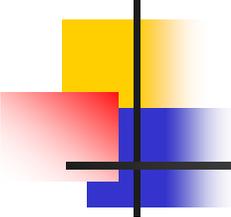


- Hazardous debris considerations
  - Include contaminants subject to treatment
  - “Indication” that the constituents being treated per the alternative treatment standards
- Contaminated soil considerations
  - One-time notice to receiving facility
  - One copy in generator’s file
  - Include 268.7 Paperwork Table #8 statement

# Recordkeeping



- Keep all determination records 3 years
- Waste Analysis Plan – Required if managing prohibited waste to meet treatment standards
  - Keep on site in generator files
- SQG with “tolling agreement”
  - LDR notice/certification required
  - Keep records 3 years after agreement termination



# Recordkeeping

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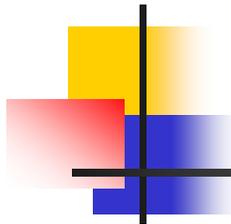
- Waste meets treatment standards as generated
  - One time notification/certification with initial shipment
- Waste does not meet treatment standards as generated
  - One time notification

# Recordkeeping

- Lab Packs

- One time notice/certification
- Certify pack contains only waste not excluded under Appendix IV to 40 CFR 268
  - e.g., mercury, P010 (arsenic acid), etc.
- UHCs for characteristic wastes need not be identified





# Recordkeeping

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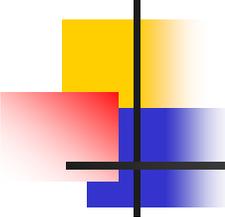


- Characteristic wastes that are no longer hazardous
  - One time notification/certification to generator files and EPA/State
    - Include RCRA-D facility (if applicable)
    - Waste description: codes, treatability group, UHCs
    - If all UHCs will be treated and monitored, no need to list UHCs on notice
  - Update if changes occur &
  - Re-notify EPA/State annually NLT December 31

# Waste Analysis Plan



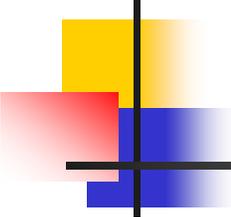
- Generator LDR requirements – not permitting
  - TSDF WAP not discussed here
- Managed to meet the LDR treatment standard
- Does not apply to alternative debris standards
- Keep on site
- Detailed chemical & physical analysis



# Waste Analysis Plan



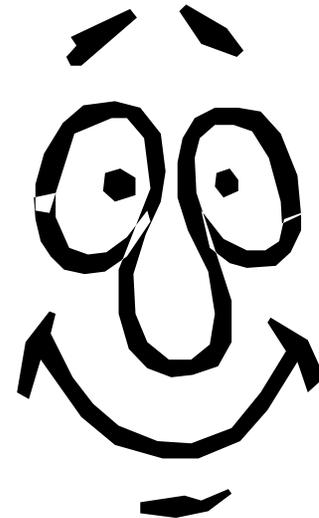
- All info needed to treat the waste
- Testing frequency
- Written
- Notification

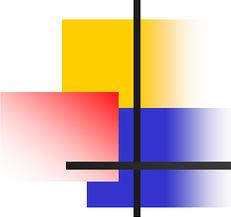


# Land Disposal Restrictions

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- Everything You Ever Wanted to Know About LDR in Two Hours!
  - OK – not everything, but
  - Do you have something we missed?

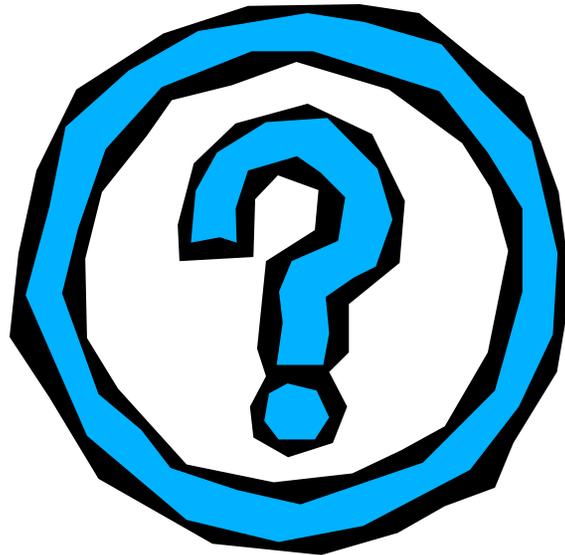




# Land Disposal Restrictions

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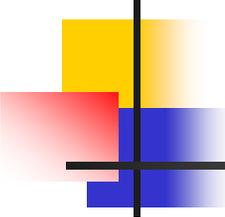
- Questions



# Who Do You Call?

- Hugh Davis (703) 306-0206
  - Davis.hugh@epa.gov
- Jim Harford (402) 471-8308
  - jim.harford@ndeq.state.ne.us





# Web Resources

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## ■ General

<http://www.epa.gov/epaoswer/hazwaste/ldr/index.htm>

<http://www.epa.gov/epaoswer/hotline/training/ldr.pdf>

## ■ Regulations

<http://www.epa.gov/epaoswer/hazwaste/ldr/rules04.htm>

## ■ Soils

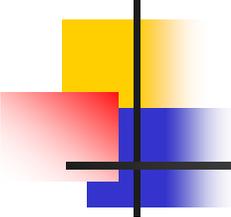
<http://www.epa.gov/epaoswer/hazwaste/ldr/ldr-soil.pdf>

## ■ WAPs

<http://www.epa.gov/epaoswer/hazwaste/ldr/wap330.pdf>

## ■ Remediation

[http://www.epa.gov/epaoswer/hazwaste/ca/resource/guidance/remwaste/pspd\\_mem.pdf](http://www.epa.gov/epaoswer/hazwaste/ca/resource/guidance/remwaste/pspd_mem.pdf)



# FAQs & Common Mistakes

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- “Extra Credit” Examples
  - F003 listed waste
  - F005 listed waste
  - D008 spent sandblast residue from a lead-based painted tower
  - Soil contaminated with gasoline