

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

## Fluorescent Lamp Crushers

A Regulatory Discussion on Fluorescent Lamp Crushing in Missouri

Tony Pierce  
Hazardous Waste Program  
Compliance & Enforcement Unit



---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

## Overview

- Background
- DTC use under:
  - Universal waste
  - Hazardous waste
- Neighboring states
- DTC studies
- Remaining questions



---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

## Can lamps be crushed without a permit and managed under current **UW** rules?

- 40 CFR part 273 - Universal Waste Rule
  - Preamble & Comments
    - Federal Register/Vol. 64, No 128/July 6, 1999 (36466-36490)



---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### FR 36477

- “the Agency does not believe that universal waste handlers, who are not required to comply with the full Subtitle C management standards, should treat universal wastes. Therefore, under today’s rule, both small and large quantity handlers of universal waste lamps are prohibited from diluting or treating universal waste lamps except by responding to releases as provided in §§ 273.17 and 273.37.”

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### Missouri

- 10 CSR 25-16 – Missouri’s Universal Waste Rule
  - Treatment of universal waste is prohibited in Missouri

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### Can lamps be crushed and managed under current **HW** rules?



- 40 CFR 262.34 “Treatment in a Container”
  - Applicability to DTC
  - Requirements
    - 262.34 - Accumulation
    - 265 Subpart I – Container Management
- Currently prohibited in Missouri without a permit

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### Neighboring states

- Indiana: Yes - as HW
- Illinois: Yes - as UW with provisions
- Kentucky: No - DTC use not allowed without permit
- Tennessee: Yes - as UW with provisions
- Arkansas: Yes - as HW with provisions
- Oklahoma: Yes - as HW
- Kansas: Yes - as HW with provisions
- Nebraska: Yes - as HW with provisions
- Iowa: Yes -

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### FR 36478

- "EPA will consider authorization of state programs that include provisions for controlling treatment or crushing of universal waste lamps, where the state program application includes a **demonstration of equivalency to the federal prohibition**. Factors the Agency would expect such an application to address include the effectiveness of technical requirements in controlling emissions of hazardous constituents, the level of interaction of regulated entities with the regulatory agency to ensure compliance with control requirements, and other factors demonstrating that the state regulatory program would be equivalent to the federal treatment prohibition."

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### DTC Study (2003)



- Minnesota Department of Health conducted a DTC demonstration in Used Air Cycle model
  - Employee exposure exceeded OSHA limits
  - Concerns for health of public
  - MN subsequently banned DTC use

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### DTC Study (2003)



"Data from the "Bulb Eater" demonstration show that the operator and others nearby can be exposed to mercury vapor concentrations that exceed acute exposure levels recommended by MDH."

"Note that data suggests that an individual working near the "Bulb Eater" at this facility may be exposed to about **20 times the acute REL for mercury** (i.e. 35,000 ng/m3)."

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### DTC Study (2003)



"Filled drums of crushed fluorescent bulbs are expected to contain about 10 grams of mercury. This is a considerable amount of hazardous material. Implicit in an analysis of this demonstration is that the business that operates the drum-top crusher properly maintains the system. Filled 55-gallon drums of crushed fluorescent bulbs also must be handled and disposed as hazardous waste. Without specific regulation of the use and maintenance of drum-top crushers there is considerable opportunity for abuse. Failure to treat drum-top bulb crushers as systems that generate hazardous wastes could lead to additional mercury vapor exposures and additional mercury releases into the environment."

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40 years**  
Missouri Department of Natural Resources

### DTC Study (EPA 2006)



- EPA Study Scope and Conditions
  - 4 types of crushers
  - Better testing equipment
  - More controlled environment
- Results
  - OSHA limits exceeded
  - Posed additional questions
  - No new guidance resulted from the study

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40**  
years  
Missouri Department of Natural Resources

### Remaining questions

- Concerns on the safety of DTC
  - Operational concerns
  - Potential for improper use
- Allowing DTC use under HW (equivalencies?)
- “Low Mercury” lamp concerns
- Other metals to consider (Pb, Cd, Cr)
- Approaches in other states
- Additional considerations

---

---

---

---

---

---

---

---

Missouri Department of  
**Natural Resources**

Celebrating 40 years of taking care of Missouri's natural resources.  
**40**  
years  
Missouri Department of Natural Resources

### Questions?

- Tony Pierce  
Environmental Specialist  
Hazardous Waste Compliance and  
Enforcement Unit  
(573) 751-3465  
anthony.pierce@dnr.mo.gov

---

---

---

---

---

---

---

---