



Disposal Options for Expired or Surplus Medications/Pharmaceuticals

Technical Guidance Document SW-2007-G1

This technical guidance document provides information regarding the proper disposal of pharmaceuticals that are not currently regulated by Subtitle C of the Resource Conservation and Recovery Act (RCRA), including common over-the-counter and prescription medications.

Background

Non-regulated¹ medications are of concern to the Kansas Department of Health and Environment (KDHE) because as many as 10% of them may be as hazardous as those that are regulated by RCRA Subtitle C, and the effects of many others on human and environmental health are unknown. This document does not cover controlled substances, which are subject to stringent controls by the Drug Enforcement Administration (DEA).²

RCRA Subtitle C regulates hazardous waste but does not regulate many medications, including some hormones, antibiotics, antidepressants, and antihypertensives, that are very potent.³ Protecting our surface waters and groundwater from contamination that may affect both the environment and human health is very important as fresh water becomes an increasingly valuable resource.

Historically, surplus and expired medications were commonly disposed of through sanitary sewer systems. However, research has found medications and their byproducts in ground and surface waters, suggesting that this disposal method is not completely effective in preventing contamination. Effective August 21, 2019, federal regulation **prohibits** healthcare facilities, including pharmacies and long-term care facilities, from disposing of hazardous waste pharmaceuticals in the sanitary sewer (40 CFR § 266.505).

Another disposal option for medications has been disposal in permitted landfills. This method may have future consequences: over time, landfills generate leachate that contains the byproducts generated as medications degrade, and sometimes even the medications in their original state. Typically, the leachate is stored in tanks on-site until it is transported to a wastewater treatment plant for processing. In rare instances, leachate may migrate through the landfill liner systems and into the groundwater.

The disposal of non-regulated medications in municipal solid waste (MSW) landfills continues to be a legal option for generators such as nursing homes and the public. However, new concerns have arisen due to the unexpected persistence of many chemicals in the environment and the adverse human and ecological health impacts that may result from contamination.

Studies show that some chemicals can persist for several decades in groundwater. Most of the medications and their byproducts are found at very low concentrations; however, even low-level exposure to some of these chemicals may cause serious chronic effects. Potential problems include abnormal physiological processes, reproductive impairment, increased incidences of cancer, and development of antimicrobial-resistant organisms. But the effects of many chemicals on humans and the environment are not yet understood. Furthermore, little is known about possible synergistic or

antagonistic interactions between chemicals. Evidence indicates that some medications may degrade into more persistent and/or toxic compounds over time.

Disposal Options

The acceptable methods for disposal of expired or surplus medications by healthcare facilities and the general public are listed in order of preference below:

HEALTHCARE FACILITIES

1. Reverse distribution.
2. Incineration in an MSW incinerator⁴, a medical waste incinerator, or a hazardous waste incinerator or combustor.
3. Disposal in a permitted hazardous waste landfill.
4. For healthcare facilities that are Conditionally Exempt Small Quantity Generators of hazardous waste, disposal of **hazardous** waste pharmaceuticals in a permitted MSW landfill*
5. Disposal of **non-hazardous** waste pharmaceuticals in a permitted MSW landfill*.
6. Disposal of **non-hazardous** waste pharmaceuticals into the sanitary sewer system, with permission from the local publicly owned treatment works (i.e., sewage treatment plant). **KDHE strongly discourages this disposal option.** Remember that the disposal of hazardous waste pharmaceuticals into the sanitary sewer system is prohibited.

GENERAL PUBLIC

1. Collection at pharmacies, household hazardous waste (HHW) facilities, and other community locations.
2. Disposal in a permitted MSW landfill*.
3. Disposal into the sanitary sewer system. **KDHE strongly discourages this disposal option.**

*For disposal of surplus or expired medications in the trash, the following precautions should be taken to prevent diversion, theft, and accidents:

1. Crush or dissolve solid medications in water, coffee, or another liquid. Make a paste by adding the dissolved medication to an undesirable substance like coffee grounds or kitty litter. The undesirable substance may be directly added to liquid medications.
2. Put the paste in a container and close the container securely. If the container is not opaque, place it in a plastic bag, a coffee jar, a laundry detergent bottle, or an equivalent container, and throw it in the trash.

Even better disposal options may become available in the future. Reverse distribution, a system allowing the consumer to return unused or expired medications to the manufacturer for credit, is by far the safest and most cost-effective method of disposal. However, reverse distribution is available primarily to hospitals and pharmacies, not to individuals. Collection events, where available, allow individuals to dispose of medications free of charge, but may not be able to accept controlled substances.

Of the physical disposal methods, thermal destruction in an incinerator or hazardous waste combustor provides the highest level of environmental and human health protection from the potential effects of medications. Disposal in a permitted hazardous waste landfill is also an effective method, as these landfills are designed to prevent contamination of groundwater. Medications destined for disposal at a hazardous waste landfill or incinerator are usually collected at HHW facilities or at collection events. In the future, technologies such as plasma arc units may be used for disposal.

For additional information regarding the proper management of solid or hazardous waste in Kansas, you may visit the Bureau of Waste Management website at www.kdheks.gov/waste/ or contact the Bureau at: 785-296-1600, kdhe.bwmweb@ks.gov, or the address at the top of this document.

¹ Though medications are in fact regulated by a number of agencies, including the Food and Drug Administration and the Department of Justice, the term “non-regulated” in this document refers only to the authority of RCRA Subtitle C. This guidance tool is targeted to those medications that are not currently listed as hazardous by RCRA Subtitle C.

² Controlled substances are regulated by the DEA, a law enforcement agency of the U.S. Department of Justice. These drugs are considered to have a high potential for abuse or dependency and so are subject to more stringent controls, including witnessed destruction. A list of controlled substances can be found on DEA’s Office of Diversion Control website, at <http://www.deaiversion.usdoj.gov/schedules/schedules.htm>. State governments also regulate some drugs that are not controlled at the federal level.

³ Some medications are classified as P-listed or U-listed hazardous wastes. A complete list of regulated hazardous wastes can be found in the *Hazardous Waste Generator Handbook*, available on KDHE’s Bureau of Waste Management website at www.kdheks.gov/waste/forms/hazwaste/gen700-HWGenHandbook.pdf.

⁴ At this time, no municipal solid waste incinerators are located in Kansas.