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Medications and Infectious Waste Disposal

This guidance document will provide information regarding pharmaceutical waste disposal and infectious or biohazard waste considerations. Personal care products are often included in pharmaceutical waste discussions and are included here as well. Regulatory requirements will be stated and best management practices applicable to the majority of what we will now call “medical waste” (MW) will be presented to assist in making informed disposal decisions. The prime reason for this document is to provide information to assist keeping medications from entering the hydrologic cycle, contaminating surface and groundwater. See Attachment 1 titled “Pharmaceuticals and Personal Care Products (PPCPs)” for background information.

Pharmaceutical & Personal Care Product (PPCP) hazardous wastes.

PPCP hazardous waste generated from *households* is excluded from the hazardous waste regulations (Title 128 –Nebraska Hazardous Waste Regulations, Chapter 2, §009.01).

- Household hazardous waste (HHW) means any material including garbage & trash derived from households (including single & multiple residences, hotels, motels, campgrounds, and crew quarters).

All other waste generators are required to determine if any of their wastes are hazardous waste. See Title 128, Chapter 4, §002. The NDEQ has developed an Environmental Guidance Document titled Waste Determinations & Hazardous Waste Testing to help you do the waste determination. You can view this document on the NDEQ website. Many, but not all, pharmaceuticals will be regulated as hazardous waste.

If you generate hazardous waste you must add up all the hazardous waste you generate in that calendar month to determine your hazardous waste generator status. The total weight determining your generator status will determine which hazardous waste regulations apply to you. See the Guidance Documents on our web site for more information. What is most important here is that Small Quantity Generators (SQGs) and Large Quantity Generators (LQGs) must send their hazardous waste to permitted treatment, storage, & disposal facilities (TSDFs). Conditionally Exempt Small Quantity Generators (CESQGs) have more options.

If you generate or accumulate at or over 1 kilogram (2.2 pounds) of **acute hazardous waste** in a calendar month, that waste will classify you as a Large Quantity Generator (LQG) of hazardous waste and you will be subject to all LQG regulations. Acute hazardous waste is almost always caused by generating P-listed hazardous waste (Title 128, Chapter 3, §015 & Table 6).

- If you generate or accumulate greater than 1 kg (2.2 lbs) of acute hazardous waste in a calendar month, that waste is regulated as LQG hazardous waste.

Note that most medications are not hazardous waste. However, the Department wants to prevent non-hazardous waste meds from entering our water so disposal down a toilet or the sanitary sewers is not recommended. Under no circumstances should you ever place waste medications of any type in a septic system.

Law enforcement is not required to monitor the disposal of medications unless the meds are Federal Controlled Substances. There are specific requirements under Title 21 CFR Part 1307.21 that must be met. The Drug Enforcement Administration (DEA) administers those rules along with local law enforcement. The scope of this document prevents further discussion of this requirement. Unfortunately, it is almost impossible to hold a collection event without a law enforcement monitor because the event organizers cannot assure that participants won't arrive with controlled substances to be disposed.

PPCP Disposal Best Management Practices.

Household Hazardous Waste: HHW is not regulated as hazardous waste, but we want to limit the amount of drugs being disposed in our sewers. Knowing this, there must be an alternative to flushing unwanted drugs. Some of the best ways to dispose of old, unused, or unneeded medications and other PPCPs are to:

1. Bring your medical waste to a collection event. These events are generally randomly scheduled and so may not be very convenient. Contact your local health department or waste official to see if when and where you can expect a collection event.
 - Nebraska MEDS, now a state-wide program, promotes pharmacies to allow take-back of medications to be disposed of by this state funded program. Check the references section for a link to their website for more information.
2. Render your medications unusable by crushing with dirt, cat litter, or similar material, place in a plastic bag, close it, and dispose to the trash. If you use the original container we recommend you remove identifying markings. We also recommend you do not put the trash out until just before normally anticipated trash removal by the haulers.

Non-HHW (hospital, clinic, veterinarian, doctor, health department, dentist, pharmacy, etc.): These types of waste generators do not have any hazardous waste exclusion or exemption, so a hazardous waste determination must be done. If the PPCP is a hazardous waste there are two broad forms of allowable management depending on the total amount of hazardous waste that is generated:

1. Manage as a CESQG. Go to the NDEQ web site to see the Environmental Guidance Document titled Conditionally Exempt Small Quantity Generators to assist you in proper and allowed management.

Discussion: CESQGs are allowed to dispose their CESQG hazardous waste **only** by the following methods (Title 128, Chapter 8, §006.03 et seq.):

- A permitted hazardous waste treatment, storage, or disposal facility (TSDF),
- A facility that beneficially uses or reuses or legitimately recycles or reclaims the wastes,

- A facility that treats the wastes prior to beneficial use or re-use or legitimate recycling or reclamation,
- A facility that mixes its CESQG hazardous waste with used oil destined for burning for energy recovery.
- CESQGs are allowed to dispose of their own CESQG hazardous waste to permitted municipal solid waste landfills --- if the waste has no bulk or free liquids. Local ordinances must still be followed, Check with your local waste handler and the receiving MWS Landfill before disposing of your CESQG hazardous waste in your regular refuse.

A CESQG is allowed to take its CESQG waste to another location if the waste is to be disposed at or by one of the five facilities or processes immediately above.

A CESQG may bring its hazardous waste medications to a household hazardous waste collection event. If the collection event sponsors are shipping the collected waste to a permitted TSD, or having the waste legitimately recycled, then a CESQG is allowed by Title 128 to bring its CESQG hazardous waste to the collection event. Most HHW collections do not dispose of HHW to a landfill. **NOTE:** Even though the regulations allow HHW collections to accept CESQG hazardous waste, the sponsors may refuse to accept CESQG hazardous waste. The sponsors are allowed to place whatever restrictions they want or deem necessary on the wastes they accept at a collection. Often the restrictions are budget driven. DEA and Nebraska restrictions (Neb. Rev. Stat. 71-2421) are the primary factors when managing pharmaceutical wastes.

2. Manage as SQG or LQG waste. Go to the NDEQ web site to see the Environmental Guidance Document titled [Comparison of Hazardous Waste Generator Requirements](#) to assist you in proper and allowed management.

Discussion: SQGs and LQGs are only allowed to dispose of their hazardous waste pharmaceuticals to a permitted hazardous waste facility. That hazardous waste must be transported by a hazardous waste transporter who has a hazardous waste transporter ID number issued by the EPA or an authorized state. HHW events are not allowed to accept any SQG or LQG hazardous waste.

Non-Hazardous Waste?

Most excess or waste PPCPs are not hazardous waste. This is true even for most controlled substances. Even though the PPCP waste might not be a hazardous waste we recommend the waste not be disposed down the drain. If a collection event/location is available bring your PPCP waste there. If an event is either impractical or unavailable then we recommend you render the PPCP unusable and dispose of the waste at a municipal solid waste landfill.

What is Biohazardous Waste?

Biohazardous waste is not discussed in Nebraska waste regulations. This waste is adequately defined in Occupational Safety & Health Administration (OSHA) and Department of Transportation (DOT) regulations and those rules must, of course, be followed. Nebraska does regulate “infectious waste” at [Title 132 – Integrated Solid Waste Management Regulations](#), Chapter 13, §004. The rule is simple – **you cannot dispose of infectious waste to a municipal solid waste landfill until it is first rendered non-infectious.** Much like the HHW exemption, Households are also exempt from this restriction. Title 132, Chapter 1, §053 defines infectious waste. Infectious waste includes used sharps. See the Environmental Guidance Document titled [Medical Waste Disposal](#) on our web site for more information.

Infectious waste is not regulated as hazardous waste unless it coincidentally carries a hazardous waste listing or characteristic. This would be unusual.

- Never commingle hazardous waste with infectious waste. This can occur when somebody, for example, attempts to dispose of hazardous waste such as an unused nicotine patch in a sharps container or a “red bag” containing blood-soaked bandages. The unused nicotine patch is an acute hazardous waste.
- Biohazardous waste is not normally hazardous waste of and by itself. Don’t regulate it as hazardous waste unless it is also a listed waste or demonstrated to be characteristic as a hazardous waste.

What is considered a HHW generating facility?

We receive this question often from retirement homes and long term care (LTC) facilities. HHW can only be generated as waste from the household itself. Generally speaking, NDEQ considers locations that are an actual residence to be eligible for the HHW exclusion. Some examples follow:

An apartment in a retirement home is a household. If a nurse, for example, administers an injection in a resident’s quarters then that waste is considered household waste and exempt from both hazardous waste and infectious waste regulation. See the Environmental Guidance Document titled [Handling Household Medical Waste](#) on our web site for recommendations on how to dispose of that waste.

If that same resident received the injection at a nurse’s station, common area, or treatment room, then that waste is not household waste and carries no exclusions.

A hospital room is not considered a residence because it’s primary function is treatment, not a place to merely reside.

A LTC facility can be complex regarding the household waste exemptions, and the individual situation drives the answer. If the resident is primarily just receiving care much like a hospital then the household exemption is not applicable. If a LTC facility resident is primarily residing in the room and receiving care much like a retirement home resident, then the household waste exclusion applies to waste generated from the resident’s room.

The same reasoning applies to hospice care. If the resident is primarily residing at the location and receiving palliative care, treatment given as necessary for comfort or pain, then the department would consider this a household waste situation if waste is generated.

Many elder patients opt for home care. Wastes generated from and at the home from home care treatments are covered by the household waste exclusion.

Incineration

The “gold standard” of PPCP disposal is incineration in a fully permitted hazardous waste facility. This ensures the PPCP is completely destroyed and any combustion by-products are properly captured. Any other incineration is not as fully protective of the environment.

A common PPCP collection scenario has law enforcement present, along with a mobile incinerator or a container used to safely convey the collected PPCP to a nearby, convenient incinerator, such as an animal carcass or medical incinerator.

In these cases, even if state Air regulations allow burning the PPCP, these types of incinerators are

rarely, if ever, hazardous waste permitted. Under Title 128, the state's hazardous waste regulations, there are restrictions that prohibit certain hazardous waste PPCP from being incinerated in non-permitted hazardous waste incinerators. What follows is a short guide to what is and isn't allowed. It assumes that Title 129, the Nebraska Air Quality Regulations, otherwise allows the incinerator operation.

- Non-hazardous waste PPCP is allowed to be incinerated in a non-permitted incinerator.
- HHW PPCP is allowed to be incinerated in a non-permitted incinerator.
- Hazardous waste PPCP from CESQGs is allowed to be incinerated in a non-permitted incinerator.
- Hazardous waste PPCP from SQGs or LQGs is prohibited from being incinerated in a non-permitted incinerator.

RESOURCES:

- NDEQ Home Page <http://deg.ne.gov/>
- Nebraska Pharmacists Association: [Nebraska MEDS Program](#)

Contacts:

- NDEQ Waste Management Section (402) 471-4210
- NDEQ Toll Free Number (877) 253-2603
- NDEQ Hazardous Waste Compliance Assistant (402) 471-8308
- Email questions to: NDEQ.moreinfo@nebraska.gov

NDEQ Publications:

- Environmental Guidance Document – “Comparison of Hazardous Waste Generator Requirements”
- Environmental Guidance Document – “Conditionally Exempt Small Quantity Generators”
- Environmental Guidance Document – “Handling Household Medical Waste”
- Environmental Guidance Document – “Medical Waste Disposal”
- Environmental Guidance Document – “Waste Determinations & Hazardous Waste Testing”
Guidance is available on the NDEQ Home Page under “Publications & Forms”.

- [Title 128 – Nebraska Hazardous Waste Regulations](#)
- [Title 132 – Integrated Solid Waste Management Regulations](#)

Titles are available on the NDEQ Home Page under “Laws/Regs & EQC”, “Rules & Regulations”

Attachments:

- Pharmaceuticals and Personal Care Products (PPCPs) (With the gracious permission of The Groundwater Foundation)
Statements in this document are being provided as ancillary information

ATTACHMENT 1:

Pharmaceuticals and Personal Care Products (PPCPs)

An Emerging Issue

Overview

Most of us take some kind of medication, whether it's a prescription drug or an over-the-counter product. Most of us probably have an out of date bottle of something in our medicine cabinets and have wondered what to do with it. Before you flush that medication or pour it down the drain, learn more about an emerging issue of concern - pharmaceuticals and personal care products (PPCPs) in water supplies. PPCPs are a diverse group of chemicals that include:

- Human and veterinary drugs.
- Dietary supplements.
- Other consumer products, like fragrances, cosmetics and sunscreens, laundry and cleaning products.
- All the inert, or inactive, ingredients that are part of these products, which can often be just as or more harmful than a product's active ingredients.

The U.S. Geological Survey conducted a breakthrough study in 1999 of surface and groundwater samples from around the U.S. to check for the presence of materials such as pharmaceuticals, antibiotics, sterols, hormones, and other compounds. At least one chemical was detected at low levels in 80% of streams and 93% of groundwater sampled. Low levels of steroids, nonprescription drugs, and insect repellents were the chemical groups most frequently detected. Seven streams in Nebraska and aquifers in eastern Nebraska were included in the 1999 study.

Did You Know – How PPCPs Enter the Environment

PPCPs enter the environment and become contaminants in several ways:

- Excretion by humans and domestic animals - All the components of each pharmaceutical and over-the-counter medication aren't fully metabolized by humans and animals, and the unmetabolized portions of these compounds are excreted from the body as waste.
- Disposal of unneeded or expired PPCPs by flushing them down a toilet or drain - Some experts recommend flushing as a safe method of PPCP disposal. Flushing does prevent accidental ingestion, but can cause eventual pollution of ground and surface water.
- Bathing and swimming - Compounds from products such as cosmetics, lotions and sunscreen enter surface water bodies through direct contact.
- Discharge from municipal sewage systems or private septic systems - Municipal wastewater treatment plants generally don't treat for the compounds found in PPCPs, so they are present in treated wastewater and discharged into surface water bodies. Septic system owners need to be especially careful about not flushing PPCPs down the toilet or drain – some PPCPs can disrupt the processes in a septic system, posing a risk of groundwater contamination from PPCP compounds and fecal matter.

PPCPs also enter the environment through leaching from landfills; runoff from confined animal feeding operations; discharge of raw sewage from storm overflow events, cruise ships, and some rural homes directly into surface water; and discharge to groundwater recharge areas.

Did You Know?

- No drinking water standard for PPCP compounds currently exists and most drinking water treatment plants can't and don't treat for these compounds.
- The technology and funding needed to remove PPCPs from water and wastewater are lagging behind science's ability to detect the chemicals. Current methods can detect these compounds at the part-per- trillion level.
- Scientists have found fewer male fish than anticipated in streams in recent years, and male fish with female reproductive characteristics. Many scientists attribute these findings to endocrine disrupting chemicals such as detergent metabolites (broken down components of the original compound) found in treated wastewater, which is discharged to surface water bodies.
- There are no Nebraska or federal laws regarding flushing or throwing away unneeded or expired pharmaceuticals by consumers. Federal law does prohibit anyone except a law enforcement officer from accepting controlled substances from an end user.

Emerging Issues

Recommended disposal methods and options and state and federal legislation for these materials continue to evolve. The research into PPCPs in water supplies is in its early stages. Research is ongoing in Nebraska and the U.S. on human and animal products to address questions related to the health impacts of these chemicals in drinking water, such as:

- What is the impact of exposure to low levels of PPCPs over time?
- What is the impact of exposure to mixtures of chemicals?
- Are the impacts acute (short-term) or chronic (long-term)?
- Are certain populations, such as the elderly, very young, or immuno-compromised, more vulnerable to the impacts of these compounds?

What You Can Do – Pharmaceuticals

- NEVER flush unused or expired medications down a toilet or drain, especially if a septic system is in use.
- Find out if any pharmacies in your community will take back unneeded or expired medications, or if a take-back program exists in your community.
- If no other disposal options exist, alter the medications in some way and place them in the trash. Opinions on altering medications vary – some believe the medications should be simply made unpalatable or undesirable to prevent accidental ingestion, while others believe they should be made totally unusable.
- If the medications will be landfilled, they should be left in their original containers to reduce seepage, making sure all identifying information has been removed. Add something to the medication to make it unusable (kitty litter to liquid medications, glue to pills, or a small amount of disinfectant to any medication) or unpalatable (a small amount of water to pills or salt, flour or a powdered spice like mustard or turmeric to liquid medications). Package in an obscure container, such as an empty margarine tub or non-transparent bag, and place it in the trash.

What You Can Do – Personal Care Products

- Use products sparingly, completely, and according to label recommendations.
- Unneeded products are best disposed of by landfilling. Leave products in their original containers.

- When purchasing new products, avoid unnecessary ingredients, such as scents or those labeled antimicrobial.
- Consider using products with ingredients that are more likely to biodegrade harmlessly in the environment, such as those with ingredients like vinegar, lemon juice, or baking soda.

For More Information

- USGS's Pharmaceuticals, Hormones and Other Organic Wastewater Contaminants in Ground Water Resources: toxics.usgs.gov/pubs/contaminant_studies_article.pdf*
- USGS's Pharmaceuticals, Hormones, and Other Organic Wastewater Contaminants in U.S. Streams: toxics.usgs.gov/pubs/FS-027-02/index.html*
- USGS's Is Septic Waste Affecting Drinking Water from Shallow Domestic Wells Along the Platte River in Eastern Nebraska?: <http://pubs.usgs.gov/fs/fs07203>*
- US Environmental Protection Agency: www.epa.gov/nerlesd1/chemistry/pharma/index.htm*
- Nebraska Health and Human Services System: <https://lincoln.ne.gov/city/health/>*



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*** This document contains links to non-NDEQ websites; these links will open in a new tab or window.**