Solid Waste News & Notes

A Newsletter from the Solid Waste Unit of the Hazardous Materials and Waste Management Division

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THE UNIVERSE OF UNIVERSAL WASTES

What's usually small in size, subject to widespread use, and commonly generated by non-residential sources such as businesses, governmental agencies and schools? Need a hint? Solid waste landfills in Colorado are not allowed to accept these for disposal, unless they're from residential sources. Give up? Oh, we know this could cover a lot of things, but what we're referring to is a group of wastes generally called "universal wastes."

Universal wastes are hazardous wastes such as certain electronic devices and components (computers, cell phones, televisions), mercury-containing lighting wastes (fluorescent bulbs, high pressure sodium lamps), other mercury-containing devices (thermostats, thermometers, blood pressure cuffs), many types of batteries (nickel cadmium, lithium, lead acid), aerosol cans containing hazardous wastes (brake or carburetor cleaner), and agricultural pesticides that have been recalled, banned or are no longer needed. Managing these wastes as universal wastes provides a conditional exemption from full regulation as hazardous waste for non-residential generators, while still ensuring the safe management of these wastes. These rules reduce the management requirements for generators in order to encourage them to participate in collection and recycling programs for these common wastes.

Colorado Department of Public Health and Environment

The waste does not count toward the monthly total of hazardous waste in determining generator category; the waste can be shipped without a hazardous waste manifest; the waste can be shipped by common carrier instead of a hazardous waste transporter; there are reduced notification and record-keeping requirements; and the storage time limits are less restrictive.

Keeping hazardous wastes out of Colorado's solid waste landfills is, in reality, a joint responsibility between the generator of the waste, the landfill owner/operator and the trash hauler. The ultimate responsibility rests with the waste generator to determine if their wastes are hazardous wastes, but landfill owner/operators are required to implement a program to detect and prevent the illegal disposal of hazardous wastes at their facility. This program should include random inspections of incoming loads, training of facility personnel to recognize unacceptable wastes and a contingency plan for handling any hazardous waste that is discovered.

Trash haulers are often the first line of defense for the landfill against illegal disposal of hazardous wastes. They need to be aware of the rules for what can and can't be disposed of in a landfill, and by whom. Remember,

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Compliance Assistance from the Unit Leader

Imminent and substantial endangerment! What does this phrase bring to mind? Landfill gases? Water contamination?

During the 2001 legislative session the Solid Waste Act was amended to define imminent and substantial endangerment and to provide a course of action. House Bill 01-1387 defines imminent and substantial endangerment as "…conditions involving landfill gases, ground water contamination, landfill leachate, discharges to surface water, or physical hazards originating from solid waste that present a threat to public health and safety or the environment." Further, the new provision specifically directs the Department to give priority to and use its best efforts to mitigate the particular problem and not expend efforts unnecessarily characterizing the endangerment.

This provision is intended for activities where no viable responsible party exists to mitigate a given situation. The Department is authorized to spend authorized money to mitigate identified hazards. The Department is currently in the process of implementation of this new provision.

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Additional changes under HB 01-1387 include a change to the Hazardous Substance Response Fund (25-16-104.5 C.R.S.). This fund is the state "tipping fee" levied at solid waste facilities. In 1998 this fee was reduced from $0.30 per cubic yard to $0.20 per cubic yard, and provisions were set in place that $0.05 per cubic yard was to be directed into the Solid Waste Management fund to support the solid waste program. The exception being local governments with sites that have been designated as National Priorities Listed (NPL) under the federal Comprehensive Environmental Response Compensation Liability Act (CERCLA), and for which the local government is responsible for response costs at the site! These local

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Composting: A Practical Method for Managing Animal Mortalities

I've been composting for over two years. My "recipe" includes the normal stuff; grass, leaves, some paper, coffee grounds, vegetable and fruit scraps and one not-so-normal ingredient, being Knock-Knock (my youngest daughter's goldfish). So even in backyard composting, using animal mortalities is becoming more common.

The composting of farm and ranch animal mortalities also is increasing as a practical and an economical management option. Managing farm animal mortalities has become a significant problem. Typically, mortalities can be managed by 1) on-site burial, 2) disposal at a landfill (if the facility agrees), 3) rendering and 4) composting. The first three have become environmentally problematic, less available or cost prohibitive. Inevitably death occurs on every animal farm, so composting is becoming the preferred management choice.

Ohio State University (OSU) studied mortality composting and developed recommended procedures to be used in open piles or windows. First, a layer of dry absorbent material (sawdust or straw) is put down. Then the carcass is placed on the absorbent material and then covered with a thick layer of fine, moist, high carbon material. To optimize the decomposition of a carcass, carcasses must be put in as single layers. Multiple mortality layers can be constructed as long as each layer is separated by a thick layer of moist, high carbon material. The windrow is capped with a biofilter to absorb odors.

The OSU study revealed that controlling moisture is critical in this composting process. The absorbent layer must be dry and thick enough to capture and contain bodily fluids from the decomposing carcass. Just as important is maintaining enough moisture in the biofilter to minimize odors. The OSU study has shown that sawdust is exceptionally good for both these functions.

The study found that each carcass must reach temperatures in excess of 131° F for at least three days. The higher temperatures provide greater bacterial activity and therefore better

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Compliance Assistance from the Unit Leader

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governments would remit only the $0.05 for the solid waste portion of the fee. The local government would continue to use the remainder of the fee for designated Superfund activities.

This year's changes to the law have decreased the fee from $0.20 per cubic yard to $0.17 per cubic yard for all facilities *except* for facilities affiliated with local governments that have sites designated under the NPL, which would continue to collect a tipping fee of $0.20 per cubic yard. For facilities that collect the $0.17, 30 percent is credited into the Solid Waste Management Fund and the remaining 70 percent is credited to the Hazardous Substance Response Fund. Any unexpended solid waste money above specified limits are to be credited to the Hazardous Substance Response Fund at the end of each fiscal year.

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Just a note on financial assurance for solid waste facilities. We will be at the five year update point by April 2002. All facilities should begin to take this fact into consideration at this time. What does this mean? It means that all facilities must, at the fifth anniversary of their initial financial assurance (or sooner if specifically required by the Department), fully update their entire closure and post-closure plan.

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When you purchase that steak for your next barbecue you may not realize that it represents approximately 43 percent of the animal. The remaining 57 percent is meat by-products and some waste material. The majority of this by-product material is manufactured into a variety of products such as animal feed, pet food, cosmetics, and fertilizer.

Because of changes in federal laws, the use of animal feed manufactured from some of this material has been prohibited. Specifically the feeding to ruminants animal feed manufactured from ruminants is no longer allowed. This is beginning to have an effect upon the by-product material generated from cattle, for instance. There are also prohibitions regarding the use of deer and elk by-product material.

The reason why I am bringing up this topic is that solid waste facilities may begin seeing an increase in the amount of meat processing wastes in the future. This is especially so in regards to the deer and elk taken in the state. Also, there is a recently formed task force that is looking into the various aspects and ramifications of this topic. The issue is far reaching and cuts across an eclectic cross section of industries.

Your ideas and thoughts on this interesting topic would be appreciated.

Enjoy your barbecue.

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Universe (continued)

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household waste is excluded from regulation under the State's hazardous waste regulations, so households can dispose of things that businesses and governmental agencies can't.

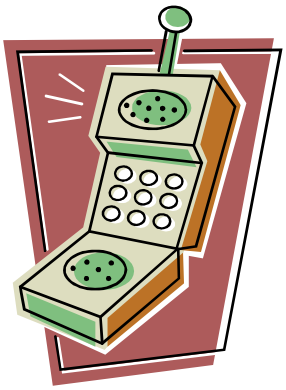
The two universal wastes that you'll probably be hearing the most about are electronic devices or components and lighting wastes. Electronic devices and components are recent additions to the State's universal waste rule. Color monitors, color televisions, central processing units (CPUs) and other electronic devices have printed circuit boards or other complex circuitry that contain heavy metals such as silver, chromium and lead that likely exceed the toxicity characteristics for these constituents. Some older vintage CPUs contain mercury switches, and many kinds of electronic devices contain batteries, including nickel-cadmium or sealed lead acid. Recent data demonstrate that waste cathode ray tubes (CRTs) from color monitors and color televisions consistently exceed the regulatory limit for lead when tested using the toxicity characteristic leaching procedure (TCLP). Due to their notable weight and size, CRTs comprise a significant portion of the overall monitor or television and will cause the entire unit to be considered hazardous waste. Therefore, color monitors and color TVs from non-residential sources can't be disposed of in a solid waste landfill.

CRTs associated with monochrome monitors and black & white televisions do not tend to fail the toxicity test for lead and are generally not considered hazardous waste. These may be managed as solid waste. Data is not available yet to show whether other intact waste electronic devices are hazardous waste or not. In the meantime, the Department is allowing intact waste electronic devices (other than color monitors or televisions) to be disposed of as solid waste. Individual components removed from these devices (circuit boards, batteries) may fail the toxicity test, however, and a hazardous waste determination would have to be made on each component.

In order to encourage recycling, color monitors, color televisions and other electronic devices sent to an electronics recycler are not considered wastes, but are considered useable and useful equipment. Typically, the decision on whether a piece of electronic equipment is a waste or not is made by the electronics recycler. The recycler determines whether the unit can be resold, donated or otherwise repaired or refurbished as a useable item. The recycler may also dismantle the equipment to directly reuse or sell parts from the equipment and it is not until the recycler determines that the equipment or disassembled components are no longer useable that a waste is generated.

In this case, the recycler is considered to be the generator of the waste and is responsible for proper waste management. Recyclers who disassemble electronic devices into components, or who generate other solid waste as a result of these activities, must determine whether the separated components and/or other solid wastes exhibit a characteristic of hazardous waste. If the components exhibit a characteristic of hazardous waste, they must be managed as hazardous waste. If the components or other solid wastes generated do not exhibit a characteristic of hazardous waste, they can be disposed of as solid waste.

If the electronics recycler wants to dispose of any electronic devices or components in a solid waste landfill, he/she must be able to document that the wastes being disposed of are not hazardous wastes. Since electronics recyclers accept used electronic equipment from residential and non-residential sources, the recyclers have to use a tracking system to track each incoming electronic device so that they can demonstrate which equipment is from residential sources and which is from non-residential sources. Alternatively, the recycler can co-mingle the equipment and manage it all as universal waste. The household exemption would no longer apply to any wastes generated from the co-mingled equipment.



Mercury-containing lighting wastes include fluorescent bulbs and high pressure sodium, mercury vapor and metal halide lamps. These wastes contain elevated levels of mercury and lead and generally can't be disposed of in a solid waste landfill. Mercury-containing lighting wastes are assumed to be hazardous unless the generator of the waste can demonstrate, either with his/her own analytical testing or data obtained from the manufacturer, that his/

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Composting (continued)

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composting. Also, the higher temperature conditions eliminate most pathogens and disease organisms.

More information regarding the OSU study is provided in *Ohio's Livestock and Poultry Mortality composting Manual* (OSU Extension) and *On-farm Composting Handbook* (Northeast Regional Agricultural Engineering Service).

In Colorado, people who compost animal mortalities are exempt from the solid waste regulations 6 CCR 1007-2 if: (1) compost materials are derived from on-site agricultural activities by the generator; (2) the site only imports other compatible materials in quantities necessary for effective composting and (3) compost activities occur at the site of generation. However, operators must utilize best management practices which help to minimize nuisance conditions such as flies and odors, protect surface and ground waters from pollution and control access.

As the composting of animal carcasses becomes more prevalent, it is interesting to note a recent study in the *Composting News* regarding the composting of the human body.

Apparently, the Church of Sweden has given its blessing to compost human corpses. The article explains that scientists in Sweden have concerns that cremation may emit poisonous gases and the scientists were looking for the most environmentally friendly form of burial. The composting method involves immersing the body in a bath of liquid nitrogen and placing the body into a thin, easily degradable coffin. This composting method turns the expired body into organic matter is a few weeks compared with coffin burial, that takes 50 to 60 years for the body to decompose.

As landfill tipping fees and burial costs continue to increase, composting is viewed by many as a viable management option. When compared to other disposal methods, composting can be an economical and environmentally friendly method of decomposing animal mortalities, from goldfish to hogs.

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THE LIFE AND TIMES . . . STAFF BIOGRAPHIES

Mr. Doug Ikenberry

Lucky number seven in our continuing biography series is not only a Colorado native, but a born and raised Denverite as well! Doug Ikenberry represents what seems to be a growing minority of late, a graduate not only of a local college, the University of Colorado at Denver, but also a local high school as well, West Denver (go Cowboys!).

Doug's path towards the Solid Waste unit began in the early 1970s – a time of great political turmoil. Doug spent the last semester of his senior year of high school attending Denver University part time. He earned an academic half scholarship and spent his freshman year at DU studying accounting through 1971. Following a couple of years of working and traveling, Doug volunteered for the Navy in 1973, where he spent the next four years. He was initially stationed in San Diego. In 1974 he experienced a tour of the Western Pacific as part of a helicopter squadron. At that time, he was aboard the *first* American aircraft carrier to visit the Persian Gulf since WWII. This tour proved exciting in that his squad endured a twenty-four hour silence alert triggered by the presence of a tailing Soviet submarine. This, however, paled in comparison to the excitement 1975 brought when Doug's squad helped retrieve the Apollo-Soyuz astronauts! As an eyewitness to this historic event, Doug clearly recalls hearing the sonic boom generated by the capsule upon re-entering the earth's atmosphere.

Doug's college years started up again in 1977 at the University of Colorado at Denver, where he enrolled in the Civil and Environmental Engineering program, graduating in December of 1983. Degree in hand, Doug was ready to get to work, and for approximately five years following graduation, he worked for civil and geotechnical engineering consulting firms – tasked with civil engineering design and construction materials testing duties. In 1988, Doug was transferred to exploratory drilling as a field engineer working on well abandonment operations at the Rocky Mountain Arsenal. He also sampled ground water at Rocky Flats and performed soil sampling at Denver Radium Superfund site. In 1989 and 1990, Doug served as a crew chief for the initial phase of the National Academy of Science's (NAS) Strategic Highway Research Program. This yearlong project involved testing and sampling interstate highway pavements and underlying soils in the U.S and Canada. Doug was assigned to the western portion of the U.S. (including Hawaii) and Alberta, Canada. This NAS study is scheduled to conclude in about ten years, when Doug's work will be a part of the resulting re-

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Universe (continued)

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her wastes are not hazardous waste.

Newer lines of fluorescent lighting are now available that have significantly less mercury in each bulb. These bulbs are identified by green lamp endcaps or green printing on the fluorescent tube to make it easier to recognize them as low-mercury lamps. The low-mercury fluorescent bulbs have been tested by the manufacturers and do not tend to fail the toxicity test. Lighting wastes that don't exhibit the toxicity characteristic can be disposed of in a solid waste landfill. If you are unsure, ask for documentation from the waste generator to show that his/her wastes are not characteristic hazardous wastes.

Mercury-containing devices include any electrical or medical product or component (excluding batteries and lamps) that contain elemental mercury that is necessary for its operation. The mercury acts as a conductor of temperature, pressure or electricity. Mercury-containing devices include thermometers, thermostats, barometers, blood pressure cuffs, electrical switches and relays, gauges and flow regulators, manometers, pyrometers, thermocouples, and mercury-filled vacuum pumps. Such devices frequently exhibit one or more characteristics of hazardous waste and may not be disposed of in a solid waste landfill. Generators of mercury-containing devices are allowed to remove mercury-containing ampoules from these devices and may remove elemental mercury from open-ended mercury-containing devices. The generator then needs to determine, prior to disposal, if the remaining device or other wastes generated by this process are hazardous.

Batteries may be hazardous wastes because they contain heavy metals and corrosive electrolyte solutions that are the source of their energy. Nickel-cadmium (ni-cad), silver oxide, mercury-oxide, lithium, some zinc, lead-acid and most alkaline batteries are hazardous wastes upon disposal. These batteries are commonly used in pagers, cameras, computers, cell phones and emergency lighting. Newer lines of alkaline and zinc batteries may contain lower amounts of mercury and may not be considered hazardous wastes upon disposal. However, this information is usually only printed on the packaging material and not on the battery itself. In general, batteries from non-residential generators should not be accepted by a solid waste landfill for disposal.

Aerosol cans sometimes need to be discarded before they are completely empty. This occurs for a variety of reasons, including when the spray mechanism no longer operates as designed, the propellant is spent, or the product is no longer used by the generator facility. In this case, the waste generator must determine if the contents of the can are hazardous waste, either by exhibiting a characteristic of hazardous waste (such as ignitability) or because the can contains a listed waste (P or U listed wastes).

If the contents of the can are hazardous waste, then the can must be managed as hazardous waste. Generators are allowed to puncture aerosol cans in order to remove any remaining product. In that case, the contents of the can must be managed as hazardous waste, but the empty cans can be recycled or disposed of as solid waste.

Pesticides that have been banned or recalled should never be disposed of in a solid waste landfill. Other pesticides may exhibit one or more hazardous characteristics or are listed hazardous wastes and can't be disposed of in a solid waste landfill, either.

Farmers, ranchers, commercial applicators, golf courses, greenhouses, nurseries and other non-residential facilities that have pesticides to dispose of should contact the Colorado ChemSweep program. ChemSweep is a pesticide collection program conducted under the universal waste rule, which allows the hazardous waste contractor to more easily pickup and transport waste pesticides to an out of state facility for incineration. The ChemSweep Hotline is (888) 242-4362.

It's important to note that sometimes it's hard to tell a hazardous waste from a non-hazardous waste just by looking at it. They can look a lot alike, and the landfill owner/operator and trash hauler may have to ask some questions before they accept certain wastes for disposal. By including these common wastes in the universal waste rule and encouraging collection and recycling programs, the State is hoping to reduce the universe of universal wastes that reach our solid waste landfills.

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LIFE AND TIMES (continued)

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port on highway improvement.

In 1990, Doug came across an announcement for an engineering position at CDPHE. Though working in Nebraska at the time, Doug found a co-worker to manage the crew, while he returned to Colorado to sit for the state exam. Having successfully "passed" the test, Doug was performing quality control for the soils backfill around United Concourse B at DIA, when he hired on with the Hazardous Materials and Waste Management Division in April of 1991. His first job as a Colorado state employee was as the on-site coordinator at the Eagle Mine Superfund site.

As the on-site coordinator representing the state, Doug was responsible for approving the remedial cleanup and construction projects. Doug had it pretty rough, residing in Vail from May to October over a period of four years. From 1995 to June 1999, Doug was part of the Federal Facilities program where he was involved with remediation at Rocky Flats and the Rocky Mountain Arsenal. It was in April of 1999 that Doug heard of the position in the Solid Waste unit. Following an interview with Glenn Mallory, Doug went to work in June of 1999, taking over my thirteen counties!

Doug was never able to actually visit each of these counties, as the Unit re-evaluated the delegation of duties among all staff. It was decided that Doug would handle the greater part of Weld county, as well as Teller and Boulder counties, while lending engineering support elsewhere. Doug enjoys his work as part of the Solid Waste unit, as he gets to witness successful, positive steps towards protection of the environment.

Though it seems he couldn't possibly have time for anything other than his solid waste duties, Doug lifts weights and jogs and does take time to relax by skiing and roller blading – though not as much as he would like. He also enjoys women's soccer and has been a Broncos fan since 1960. Doug responded to the question - what best describes you – by saying, "I'm a free spirit." Just so long as he remains free to continue his excellent work for Solid Waste and the environment! Thanks Doug!

—Brenda Lujan, Contributing Columnist
Extended Family & Former Solid Waste Unit Staff member

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