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Hidden Dangers? Transportation & Management of Overlooked Waste Streams

Solid and Hazardous Waste Management—Remediation and Demolition in the Modern World

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Introduction

Has it already been 25 years since the first set of hazardous waste regulations were published by the Environmental Protection Agency? Those were the good old days—when definitions of solid and hazardous wastes were simple, and it was easy to know what wastes required what sorts of management. Some of the definitions required different ways of thinking ("solid wastes" include liquid wastes?), but the 1980 rules were pretty simple.

Then Congress helped EPA in its implementation of the hazardous waste program by passing the Hazardous and Solid Waste Amendments of 1984 (HSWA). Liquids might still be solid wastes, but under HSWA, free liquids could no longer be managed in landfills. For that matter, most hazardous wastes could not be disposed of in landfills, unless and until they were first treated to meet land disposal restrictions.

Throughout the 1980s, EPA issued numerous clarifications, exemptions, and special interpretations of the hazardous waste rules, with the result that many hazardous waste practitioners lost track of what is a hazardous or a solid waste. To make matters more interesting, a number of states have published solid and hazardous regulations that differ somewhat from the Federal approach. The result is an often confusing crazy quilt of regulatory requirements for waste management, with relatively innocuous materials demanding management as hazardous wastes, while materials that are potentially more dangerous sometimes avoiding almost any sort of regulatory scrutiny.

This paper is written from the perspective of an engineer active in Brownfields redevelopment, who tries to help clients follow the rules, both in spirit and literally. A few common examples of the sorts of waste management problems that arise are considered, together with practical suggestions for resolving them. Among the materials considered are so-called remediation wastes, certain building materials (lead paint, pressure-treated lumber, and similar), and universal wastes.

A Brief Review—Definitions for Solid and Hazardous Waste

Solid waste practitioners know that solid waste need not be "solid" or "waste" to be considered solid waste under RCRA. Solid waste is "any garbage, refuse, sludge, and other discarded materials, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities." (RCRA Section 1004, 42 U.S.C. 6903). For that matter, "discarded materials" do not really have to be discarded—in EPA's view, under the regulations, "discarded materials" include not only materials actually abandoned or disposed, but also many materials having value and in the process of being reclaimed or recycled.

Not all wastes are solid wastes, despite the broad definitions in RCRA. Excluded from the definition of solid waste are domestic sewage, wastewater discharges regulated under the Clean Water Act, irrigation return flows, special nuclear or by-product materials regulated under Atomic Energy Act, materials subjected to in-situ mining techniques which are not removed from the ground as part of the extraction process, and fifteen categories of secondary materials if they fit into specific management practices. (40 CFR 261.4(a)).

To be a hazardous waste under RCRA, a material must first be a solid waste. Two broad types of solid wastes are considered hazardous wastes—(1) those that display a characteristic of a hazardous waste (ignitability, corrosivity, reactivity, or toxicity), and (2) those that are listed on any of several lists of hazardous wastes:

- wastes from non-specific sources (so-called "F Code" wastes)
- wastes from specific industrial sources (so-called "K Code" wastes)
- discarded, spilled, or off-specification chemical products (so-called "U Code" wastes)
- discarded, spilled, or off-specification acutely-hazardous chemical products (so-called "P Code" wastes)

It is not quite this simple, of course. There are exceptions to both broad types of hazardous wastes (characteristic and listed), and generators are able to petition to delist specific wastes produced by their faculties. In addition to the exceptions to hazardous waste characteristics and lists, the mixture and derived-from rules further complicate definitions of solid and hazardous waste. Briefly summarized, these rules mean that a mixture of a solid waste and a listed hazardous waste is itself a listed hazardous waste, and that solid wastes resulting from the treatment of listed hazardous wastes are themselves considered listed hazardous wastes. Of course, there are a number of exceptions to the rigid application of these rules. The exceptions—and exceptions to exceptions—provide the basis for much of the following discussion.

Remediation Wastes

For many years, U.S. EPA has had a policy on the subject of soil and other environmental media that are contaminated by releases of materials that might be considered hazardous wastes under applicable regulations. For example, a reference to the policy was made in the preamble to the Amendments to the Corrective Action Management Unit rule published on January 22, 2002 (67 Fed Reg 2962 at 2964):

> Under the Agency's longstanding contained-in policy, EPA requires that contaminated environmental media, although not hazardous wastes themselves, be managed as if they were hazardous waste as long as they contain hazardous waste or exhibit a characteristic of hazardous waste.

The quoted language is followed by a footnote referencing an October 1998 memorandum, "Management of Remediation Waste Under RCRA," (EPA A530-F-98-026). The memorandum compiles a number of related EPA policy statements, including an extended discussion of the contained-in policy:

> **Contained-in policy.** Contaminated environmental media, of itself, is not hazardous waste and, generally, is not subject to regulation under RCRA. Contaminated environmental media can become subject to regulation under RCRA if they "contain" hazardous waste. As discussed more fully below, EPA generally considers contaminated environmental media to contain hazardous waste: (1) when they exhibit a characteristic of hazardous waste; or, (2) when they are contaminated with concentrations of hazardous constituents from listed hazardous waste that are above health-based levels.
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> If contaminated environmental media contain hazardous waste, they are subject to all applicable RCRA requirements until they no longer contain hazardous waste. EPA considers contaminated environmental media to no longer contain hazardous waste: (1) when they no longer exhibit a characteristic of hazardous waste; and (2) when concentrations of hazardous constituents from listed hazardous wastes are below health-based levels. Generally, contaminated environmental media that do not (or no longer) contain hazardous waste are not subject to any RCRA requirements; however, as discussed below, in some circumstances, contaminated environmental media that contained hazardous waste when first generated (i.e., first removed from the land, or area of contamination) remain subject to LDR treatment requirements even after they "no longer contain" hazardous waste.
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> The determination that any given volume of contaminated media does not contain hazardous waste is called a "contained-in determination." In the case of media that exhibit a characteristic of hazardous waste, the media are considered to "contain" hazardous waste for as long as they exhibit a characteristic. Once the characteristic is eliminated (e.g., through treatment), the media are no longer considered to "contain" hazardous waste. Since this determination can be made through relatively straightforward analytical testing, no formal "contained-in" determination by EPA or an authorized state is required. Just like determinations about whether waste has been adequately de-characterized, generators of contaminated media may make independent determinations as to whether the media exhibit a characteristic of hazardous waste. In the case of media that are

contaminated by listed hazardous waste, current EPA guidance recommends that contained-in determinations be made based on direct exposure using a reasonable maximum exposure scenario and that conservative, health-based, standards be used to develop the site-specific health-based levels of hazardous constituents below which contaminated environmental media would be considered to no longer contain hazardous waste. Since this determination involves development of site-specific health-based levels, the approval of EPA or an authorized state is required.

In certain circumstances the, RCRA land disposal restrictions will continue to apply to contaminated media that has been determined not to contain hazardous waste. This is the case when contaminated media contain hazardous waste when they are first generated (i.e., removed from the land, or area of contamination) and are subsequently determined to no longer contain hazardous waste (e.g., after treatment), but still contain hazardous constituents at concentrations above land disposal restriction treatment standards. It is also the case when media are contaminated as a result of disposal of untreated (or insufficiently treated) listed hazardous waste after the effective date of an applicable LDR treatment requirement. Of course, if no land disposal will occur (e.g., the media will be legitimately recycled) the LDR treatment standards do not apply. In addition, contaminated environmental media determined not to contain any waste (i.e., it is just media, it does not contain solid or hazardous waste) would not be subject to any RCRA Subtitle C requirements, including the LDRs, regardless of the time of the "contained-in" determination.

The contained-in policy was first articulated in a November 13, 1986 EPA memorandum, "RCRA Regulatory Status of Contaminated Groundwater." It has been updated many times in Federal Register preambles, EPA memos and correspondence, see, e.g., 53 FR 31138, 31142, 31148 (Aug. 17, 1988), 57 FR 21450, 21453 (May 20, 1992), and detailed discussion in HWIR-Media proposal preamble, 61 FR 18795 (April 29, 1996). A detailed discussion of the continuing requirement that some soils which have been determined to no longer contain hazardous waste (but still contain solid waste) comply with land disposal treatment standards can be found in the HWIR-Media proposal preamble, 61 FR 18804; the September 15, 1996 letter from Michael Shapiro (EPA OSW Director) to Peter C. Wright (Monsanto Company); and the preamble to the LDR Phase IV rule, 63 FR 28617 (May 26, 1998).

Note that the contained-in policy applies only to environmental media (soil, ground water, surface water and sediments) and debris. The contained-in policy for environmental media has not been codified. As discussed below, the contained-in policy for hazardous debris was codified in 1992.

Note that under the contained-in policy, in order to be considered to contain a hazardous waste, the contaminated media must either (1) exhibit a characteristic of a hazardous waste, or (2) must contain hazardous waste constituents above health-based concentrations. The latter suggests, and experience confirms, that human health risk assessments are often used in making a “contained-in determination.”

Rules regarding what solid wastes are defined as listed hazardous wastes are highly technical, and often require information regarding the specific process or source of the contamination as well as

the timing of the contamination (e.g., contamination arising prior to the promulgation of hazardous waste lists is not considered to contain listed hazardous wastes). EPA's October 1998 memorandum provides the following discussion on the subject:

> **Determination Of When Contamination is Caused by Listed Hazardous Waste.** Where a facility owner/operator makes a good faith effort to determine if a material is a listed hazardous waste but cannot make such a determination because documentation regarding a source of contamination, contaminant, or waste is unavailable or inconclusive, EPA has stated that one may assume the source, contaminant or waste is not listed hazardous waste and, therefore, provided the material in question does not exhibit a characteristic of hazardous waste, RCRA requirements do not apply. This approach was first articulated in the Proposed NCP preamble which notes that it is often necessary to know the source of a waste (or contaminant) to determine whether a waste is a listed hazardous waste under RCRA. Listing determinations are often particularly difficult in the remedial context because the listings are generally identified by the sources of the hazardous wastes rather than the concentrations of various hazardous constituents; therefore, analytical testing alone, without information on a waste's source, will not generally produce information that will conclusively indicate whether a given waste is a listed hazardous waste. and also notes that, "at many CERCLA sites no information exists on the source of the wastes." The proposed NCP preamble goes on to recommend that the lead agency use available site information such as manifests, storage records and vouchers in an effort to ascertain the sources of wastes or contaminants, but that when this documentation is not available or inconclusive the lead agency may assume that the wastes (or contaminants) are not listed RCRA hazardous wastes. This approach was confirmed in the final NCP preamble. See, 53 FR 51444, December 21, 1988 for proposed NCP preamble discussion; 55 FR 8758, March 13, 1990 for final NCP preamble discussion.
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> This approach was also discussed in the HWIR-Media proposal preamble, 61 FR 18805, April 29, 1996, where it was expanded to also cover dates of waste disposal – i.e., if, after a good faith effort to determine dates of disposal a facility owner/operator is unable to make such a determination because documentation of dates of disposal is unavailable or inconclusive, one may assume disposal occurred prior to the effective date of applicable land disposal restrictions. This is important because, if hazardous waste was originally disposed of before the effective dates of applicable land disposal restrictions and media contaminated by the waste are determined not to contain hazardous waste when first generated (i.e., removed from the land, or area of contamination), the media are not subject to RCRA requirements, including LDRs.

In its January 2002 Corrective Action amendments, EPA added a requirement that facility owner/operators submit information on (1) the origin of the waste (including a discussion of timing and circumstances of the release), (2) whether the waste was listed or identified as hazardous when it was released, and (3) whether the waste was subject to land disposal restrictions at the time of release. See, 67 Fed Reg 2973-2976 (January 22, 2002).

EPA's various guidance documents on its contained-in policy, and its approach to contaminated media, make it clear that media such as soil are not solid wastes, and therefore not hazardous wastes. "Contaminated media are not considered solid wastes in the sense of being abandoned,

recycled, or inherently waste-like as those terms are defined in RCRA regulations." [September 15, 1996 letter from Michael Shapiro (EPA OSW Director) to Peter C. Wright (Monsanto Company]. The preamble to the proposed Requirements for Management of Hazardous Contaminated Media published earlier in 1996 also drew a distinction between media and solid wastes:

> Since ***media are not solid wastes***, these rules [referring to the mixture and derived-from rules] do not apply to mixtures of media and hazardous wastes. . . .
>
> Under the contained-in policy, ***media contaminated with listed hazardous wastes are not wastes themselves***, but they contain hazardous wastes and must therefore be managed as hazardous wastes until they no longer contain the waste. This concept is based on the idea that at some point (e.g., at some concentration of hazardous constituents) the media would no longer contain the hazardous waste, or be subject to RCRA Subtitle C regulations.
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> Because the regulations that serve as the basis for the contained-in policy are part of the "base" RCRA program that was in effect prior to 1984, the Agency has taken the position that EPA or the State agency authorized to administer the "base" RCRA regulations may determine whether media contain listed wastes. Decisions that media no longer contain listed hazardous wastes (or "contained-in" decisions) have typically been made on a case-by-case basis, according to the risks posed by the contaminated media. The Agency has not issued any definitive guidance or regulations for determining appropriate contained-in levels; however, EPA Regions and States have been advised that conservative, health-based levels derived from direct exposure pathways would clearly be acceptable as "contained-in" levels. (See memorandum from Sylvia K. Lowrance to Jeff Zelikson, Region IX, (January 24, 1989)). It has been the common practice of EPA and many States to specify conservative, risk-based levels calculated with standard conservative exposure assumptions (usually based on unrestricted access), or site-specific risk assessments. With regard to mixtures of media and characteristic wastes, EPA has often stated that media are regulated under RCRA Subtitle C if they exhibit a hazardous waste characteristic. (See 57 FR 21450, 21453, (May 20, 1992)). But, ***since media generally are not wastes***, they become regulated when they have been contaminated with solid or hazardous wastes and the resultant mixture exhibits a characteristic. EPA has also taken the position that contaminated media cease to be regulated as hazardous waste when sufficient quantities of hazardous constituents are removed so that the mixture ceases to exhibit a characteristic [footnote omitted] (57 FR 21450, 21453, May 20, 1992).

(61 Fed Reg 18795, April 29, 1996, emphasis added). That the "contained-in" determination is considered part of the "base" authorization granted to states by EPA means that every state authorized to administer any part of the RCRA Subtitle C hazardous waste program has the authority to make "contained-in" determinations.

Elsewhere in the 1996 proposed Requirements for Management of Hazardous Contaminated Media, EPA made clear that the contaminated media rules apply after a decision has been reached under other rules and guidance to excavate contaminated media—the proposed rules only would go into effect after it was otherwise decided to remove contaminated media from the ground and manage them other than in-situ:

> EPA wishes to emphasize that the proposed HWIR-media rules would not affect which media or wastes at a site must be cleaned up, or how much contaminated media should be excavated. Such decisions are usually made according to Federal or State cleanup laws and regulations, most of which specify certain guidelines or criteria for determining how sites are to be cleaned up. Only after those decisions are made would these HWIR-media regulations come into play.

(61 Fed Reg 18789, April 29, 1996).

The agency explicitly addressed the point that hazardous waste regulations do not apply to in-situ contaminated soils in its 1998 Phase IV Land Disposal Restriction (LDR) rulemaking:

> Land disposal restrictions only attach to prohibited hazardous waste (or hazardous contaminated soil) when it is (1) generated and (2) placed in a land disposal unit.[footnote omitted] Therefore, if contaminated soil is not removed from the land (i.e., generated), LDRs cannot apply. Similarly, if contaminated soil is removed from the land (i.e., generated) yet never placed in a land disposal unit, LDRs cannot apply.[43] In other words, ***LDRs do not apply to contaminated soil in situ or force excavation of contaminated soil***. If soils are excavated, however, LDRs may apply, as discussed below.

(63 Fed Reg 28555, May 26, 1998 at page 28617, emphasis added).

Footnote 43 in the quoted text discusses EPA's area of contamination policy: "Note that, as discussed later in today's preamble, nothing in today's final rule affects implementation of the existing 'area of contamination' policy. Therefore, soil managed within areas of contamination, even if it is 'removed from the land' within such an area, would not be considered to be 'generated.' Application of this policy has important implications for a landowner considering consolidation of contaminated media into a single area, or who is considering "re-placement" of partially-excavated contaminated soils where they were excavated:

> In the area of contamination policy, EPA interprets RCRA to allow certain discrete areas of generally dispersed contamination to be considered a RCRA unit (usually a landfill). 55 FR 8758-8760 (March 8, 1999). ***This interpretation allows hazardous wastes (and hazardous contaminated soils) to be consolidated, treated in situ or left in place within an area of contamination*** without triggering the RCRA land disposal restrictions or minimum technology requirements--since such activities would not involve "placement into a land disposal unit," which is the statutory trigger for LDR. EPA clarifies that its interpretation of LDR applicability for contaminated soil does not, in any way, affect implementation of the area of contamination policy.

(63 Fed Reg 28620, May 26, 1998 at page 28617, emphasis added).

Selected Building Materials

When a building is renovated or demolished, a variety of waste materials are produced. In the old days, we called these sorts of materials "rubble," and they might be disposed of almost anywhere. Later, they were called "construction and demolition debris" (C&D), and they often were taken to the nearest C&D landfill, inert fill site, or similar.

Specific kinds of materials that might be produced during demolition include asbestos-containing materials (ACM), lead-based paint (LBP) contaminated materials, and lumber treated with arsenical chemicals (pressure-treated lumber). ACM, LBP, and pressure-treated lumber are obvious concerns in C&D wastes—they can present hazards if improperly managed. Mercury switches, PCB ballasts and other PCB articles, and fluorescent light bulbs also may be present in buildings to be demolished, and may require special handling.

Perhaps less obvious are the risks presented by other C&D materials. For example, drywall is composed of calcium sulfate, which can form significant amounts of hydrogen sulfide if placed in a wet fill under specific conditions. Hydrogen sulfide can present both aesthetic (odor) and health concerns. Another example includes deep fills that include organic materials (wood, stumps, leaves, even topsoil). Again, under specific circumstances, buried organics can produce methane gas. Methane is odorless and colorless, and is the main component in natural gas. If allowed to collect in sufficient amounts in the presence of air and a source of ignition, methane gas can explode.

ACM wastes are regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP) program of the Clean Air Act (40 CFR 61.145, 61.150, and 61.154). For asbestos found in schools, regulations under the Asbestos Hazard Emergency Response Act (AHERA) govern inspections and abatement (40 CFR 763). Removal and packaging of ACM depends on the form of ACM being managed (e.g., friable or non-friable). If a threshold amount (for example, 160 square feet of surface ACM, or 260 lineal feet of thermal pipe insulation, etc.) of ACM will be disturbed by renovation or demolition activities, then the appropriate regulatory agency must be notified at least ten days before ACM is disturbed. Specific records must be maintained, including shipping paper documents to show where ACM wastes were disposed.

ACM waste disposal facilities have to control dust, cover wastes, maintain records, provide site security and post specific warning signs, among other requirements. In addition, if a disposal facility needs to excavate or otherwise disturb ACM wastes that have been covered, the facility must provide at least 45 days notice to the appropriate regulatory agencies (40 CFR 60.154(j)). This notice requirement can be a challenge for facilities that do not know where ACM wastes are buried, as they could require notice to EPA of essentially every earthwork operation at the facility.

LBP wastes present a host of problems for someone trying to comply with regulatory requirements. My grandfather told me that years ago he used to make white barn paint by mixing 50 percent white lead with 50 percent linseed oil. This information helps explain why paint chips sometimes are found to contain 60 or 70 percent lead by weight. LBP is nothing if not durable, so it was used on surfaces such as doors, windows and trim in a wide variety of structures.

EPA has promulgated rules under the Toxic Substances Control Act (TSCA), as amended by the Residential Lead-Based Paint Hazard Reduction Act of 1992, to establish standards for lead-based paint hazards in most pre-1978 housing and child-occupied facilities. If you have tried to buy, sell, lease, or renovate a house or apartment in the last five years, you probably are familiar with disclosures of known LBP hazards and similar disclosures now required under this program.

In addition to known LBP disclosures, the rules provide additional regulation of LBP activities (inspections, hazard screens, risk assessments, and abatement). These rules rely heavily on training and certification programs administered by either EPA or the states. The rules do not

require anyone to undertake LBP activities, but instead require those who offer such services to be trained and certified, and to comply with certain workplace standards.

Eventually, EPA may issue workplace standards for LBP activities for a wide variety of commercial and other structures. For now, however, workplace standards are in place only for "target housing" and facilities such as day care centers and kindergarten classrooms that are frequently used by small children. (40 CFR 745.227) "Target housing means any housing constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any child who is less than 6 years of age resides or is expected to reside in such housing) or any 0-bedroom dwelling." (40 CFR 745.223).

Although LBP abatement must be performed by certified firms and individuals, building repairs, renovations, landscaping, and similar activities do not require certified contractors, even though they may reduce the hazards presented by LBP. The distinction is that LBP abatement is designed to permanently eliminate LBP hazards. Abatement requires advance notice to affected residents, as well as at least five business days advance notice to EPA or an authorized state. (40 CFR 745.227(e)(4))

There currently are few rules specific to disposal of LBP wastes as such. Soil excavated as part of an abatement activity is not allowed to be used as topsoil in a residential property or child-occupied facility. Whether LBP abatement wastes must be managed as hazardous wastes depends first on the type of building from which they were taken. If taken from a residential structure like a single family home, apartment building, row house, military barracks, or college dormitory, EPA considers LBP wastes to be "household wastes," which are a type of solid waste that is excluded from the definition of a hazardous waste (40 CFR 201.4(b)(1)). No hazardous waste testing or special management are required for household wastes, including LBP wastes, even if the LBP wastes are generated by a contractor working at a household.

LBP waste transportation and disposal rules under TSCA were proposed by EPA in 1998 that would limit disposal of LBP wastes generated by contractors to non-municipal solid waste landfills. Under the proposed rule, LBP wastes could be disposed of at C&D landfills, industrial waste landfills, hazardous waste landfills, or lead smelters or municipal solid waste combustors. (63 Fed. Reg. 70190 (December 18, 1998)) At the same time, EPA proposed to exclude LBP managed under the proposed TSCA rules from the RCRA hazardous waste system. (63 Fed. Reg. 70233 (December 18, 1998)) The propose rules would not apply to homeowners, who presumably could continue to avail themselves of the household waste exclusions under RCRA.

Another building material that has been in the news in recent years is pressure treated lumber, often used for landscape structures, decks, play equipment, docks, utility poles, and wood construction in contact with soil or concrete. There have been several types of pressure treated lumber of the years, but one of the most widespread in recent years has been wood treated with Chromated Copper Arsenate (CCA). Millions of cubic yards of CCA lumber are removed from buildings and structures in the United States and disposed of every year. Depending on the CCA formulation, CCA-lumber can contain arsenic at concentrations of between 2,700 and 17,000 milligrams per kilogram (mg/kg, or ppm). Although discarded CCA lumber might fail the toxicity characteristic for arsenic, and thus require management as a hazardous waste, theses solid wastes are excluded from the definition of hazardous waste:

> . . . discarded arsenical-treated wood or wood products which fails the test for the Toxicity Characteristic for Hazardous Waste Codes D004 through D017 and which is not a hazardous waste for any other reason if the waste is generated by

> persons who utilize the arsenical-treated wood and wood product for these materials' intended end use as wood and wood product for these materials' intended end use. (40 CFR 261.4(b)(9).

CCA lumber that is removed from households (e.g., play-structures, decks, picnic tables, landscaping timbers, residential fencing, patios and walkways/boardwalks) presumably also would qualify for the same exclusion as household wastes discussed above for LBP wastes, and thus would not be considered hazardous wastes even in the absence of the exclusion for arsenical-treated wood. The voluntary decision by the wood treatment industry to remove CCA from consumer uses, formally adopted by EPA as of January 1, 2004, means that eventually there should be reduced volumes of CCA lumber wastes produced from residential construction.

Other materials (lamps, mercury switches) often removed from buildings during renovation, demolition, or otherwise, are considered universal wastes as discussed below.

Universal Wastes

Universal wastes are common materials that might technically meet the definition of hazardous waste, but which EPA has decided to regulate as something other than hazardous waste in order to promote recycling of these materials. Some kinds of lamps, mercury thermostats, batteries and pesticides are included in the universal waste rules, found at 40 CFR 273.

Basically, a person gathering universal wastes from a building to be demolished or renovated has to handle them in such a way that releases are prevented. This is relatively easy for materials such as batteries or thermostats. As anyone who has removed lamps knows, it is a little trickier to remove a few hundred bulbs without breaking any. Handlers have to be prepared for releases, and to immediately clean up spilled materials. Finally after collecting the universal waste materials, the handler must make sure they are properly packed and labeled (e.g., “Used Lamps”), and then arrange to transport them to another universal waste handler, a universal waste destination facility, or a foreign destination.

Small quantities of universal wastes (less than 11,000 pounds) may be accumulated indefinitely by a handler without notifying EPA. If more than 11,000 pounds will be accumulated, the handler must notify EPA in advance (40 CFR 273.32), obtain an identification number, and avoid accumulating universal wastes for more than one year, unless the large handler can demonstrate that it takes longer than one year to accumulate a proper amount to treat. (40 CFR 273.35)

If a universal waste being offered for off-site transportation meets the definition of hazardous materials under Department of Transportation regulations (HM-181, 49 CFR 171 through 180) then the appropriate packaging, labeling, marking, placarding, and shipping paper procedures must be followed.

A wide variety of universal wastes have been designated by various state agencies, and not every state has adopted the Federal universal waste regulatory scheme described here. An excellent website identifying many of the different state approaches to universal wastes is available at http://www.epa.gov/epaoswer/hazwaste/id/univwast/uwsum.htm.

Fluorescent lights require small electrical devices called ballasts to store electricity and make the bulb burn. Ballasts can get hot, and to reduce the risk of fires an insulator was needed. For many years, polychlorinated biphenyls (PCBs) were used to insulate ballasts. When a building is torn down, or the light fixtures replaced, the ballasts must be disposed of. Ballasts removed from

buildings are not considered universal wastes, but so long as they are small (less than 100 cubic inches in volume, or less than 200 cubic inches in volume if they weigh less than about 4 pounds), and have not leaked (no visible oil on the external surface of the ballast), they can be disposed as municipal solid waste under the Federal TSCA rules. (40 CFR 761.60(b)(2)(ii))

Ten years ago, EPA said it might develop specific regulations to govern small ballasts and capacitors containing PCBs. At least some EPA regions have taken it upon themselves to suggest restrictions in generating small ballast waste materials. For example, EPA Region III suggests:

> Until specific disposal requirements for non-leaking PCB ballasts are established by regulation, Region III recommends that no more than 25 intact and non-leaking PCB ballasts be disposed of within a 1-year time period (starting from the date when the first fluorescent light ballast is removed from service and transported) in a facility (excluding thermal treatment units) which is permitted, licensed, or registered by a State to manage municipal or industrial solid waste. These PCB ballasts should be packed in a lined, steel drum containing an absorbent material. Disposal of PCBs as municipal or industrial solid waste is subject to CERCLA reportable quantity requirements promulgated at 40 C.F.R. § 302.6.
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> If the number of PCB ballasts being disposed of exceeds the limit described in the preceding paragraph, Region III recommends packing the PCB ballasts in a lined, steel drum containing an absorbent material and disposing of them as PCB waste in order to reduce the potential for environmental contamination and potential liability for cleanup of any environmental release of PCBs from the ballasts.
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> The small capacitor exemption from the existing disposal requirements for PCB wastes does not apply under two circumstances. Under existing regulations, if a PCB Small Capacitor is leaking, it is regulated for disposal as a PCB Article and must be disposed of as a PCB waste. If the "potting material" (the insulating material inside the ballast) contains PCBs at concentrations greater than or equal to 50 ppm, then the PCB ballast is a PCB Article and the entire PCB ballast is regulated for disposal as PCB waste, even if the internal small capacitor remains intact and non-leaking.

(http://www.epa.gov/reg3wcmd/pcbs.htm)

Conclusion

We have come a long way over the last 25 years in terms of defining solid and hazardous wastes, particularly in the context of redeveloping sites that have been affected by historic spills and that might contain universal wastes. If the Brownfields movement is to be successful, there will be a continuing need for Federal leadership in terms of developing practical definitions that allow historical problems to be managed safely and economically.