

**INTERPRETATIONS OF WASTE MANAGEMENT ACTIVITIES:**  
**RECYCLING, COMBUSTION FOR ENERGY RECOVERY,**  
**TREATMENT FOR DESTRUCTION,**  
**WASTE STABILIZATION AND RELEASE**

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**PREFACE:** This document has been revised from the original April, 1997 version to reflect the changes discussed in the **Federal Register** of September 30, 1998 (63 FR 52183). Specifically, EPA has replaced the 5,000 Btu per pound threshold criterion in the discussion of combustion for energy recovery with the term “significant heating value.”

**Interpretations of Waste Management Activities: Recycling, Combustion for Energy Recovery, Treatment for Destruction, Waste Stabilization and Release**

The purpose of this document is to provide EPA's interpretation of the term "waste management" which is used in the Emergency Planning and Community Right-to-Know Act (EPCRA) section 313 regulatory definition of "otherwise use."<sup>1</sup>

**I. Introduction**

EPA interprets waste management to include the following activities: recycling, combustion for energy recovery, treatment (treatment includes treatment for destruction and waste stabilization), and release, including disposal. Waste management does not include the storage, container transfer, or tank transfer of the toxic chemical if no recycling, combustion for energy, treatment or release of the chemical occurs at the facility. The quantity released is defined at EPCRA section 329(8).<sup>2</sup> Disposal<sup>3</sup>, treatment

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<sup>1</sup>"Otherwise use" means any use of a toxic chemical, including a toxic chemical contained in a mixture or other trade name product or waste, that is not covered by the terms "manufacture" or "process." Otherwise use of a toxic chemical does not include disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction unless A) the toxic chemical that was disposed, stabilized, or treated for destruction was received from off-site for the purposes of further waste management; or B) the toxic chemical that was disposed, stabilized, or treated for destruction was manufactured as a result of waste management activities on materials received from off-site for the purposes of further waste management activities. Relabeling or redistributing of the toxic chemical where no repackaging of the toxic chemical occurs does not constitute otherwise use or processing of the toxic chemical.

<sup>2</sup>EPCRA section 329(8) defines release to mean "any spilling leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any hazardous chemical, extremely hazardous substance, or toxic chemical."

<sup>3</sup>"Disposal" means any underground injection, placement in landfills/surface impoundments, land treatment, or other intentional land disposal.

for destruction<sup>4</sup> and waste stabilization<sup>5</sup> are defined at 40 CFR 372.3. EPA's interpretation of recycling and combustion for energy recovery is provided below; a brief discussion of treatment for destruction follows.

## II. EPA's Interpretation of the Terms "Recycling," And "Combustion for Energy Recovery"

To interpret "recycling" and "combustion for energy recovery," EPA applies two concepts to determine when a practice or activity is best described as a waste management practice or activity. First, EPA considers the intended and ultimate functions of the toxic chemical. Second, EPA considers the direction of the toxic chemical or the chemical stream of which the toxic chemical is a constituent based primarily on the type of device or process handling the toxic chemical or chemical stream. This approach would therefore consider the original use or intended use of the toxic chemical and the intended function of the equipment or device handling the toxic chemical and chemical stream.

To determine the "intended or ultimate function of the chemical," EPA considers the following: 1) whether the toxic chemical was "manufactured," "processed," or

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<sup>4</sup>"Treatment for destruction" means the destruction of a toxic chemical in waste such that the substance is no longer the toxic chemical subject to reporting under EPCRA section 313. Treatment for destruction does not include the destruction of a toxic chemical in waste where the toxic chemical has a heat value greater than 5,000 British thermal units and is combusted in any device that is an industrial furnace or boiler as defined at 40 CFR 260.10.

<sup>5</sup> "Waste stabilization" means any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquid as determined by Test Method 9095 (Paint Filter Liquids Test) in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992. A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture. Other synonymous terms used to refer to this process are "stabilization," "waste fixation," or waste solidification."

"otherwise used" (as defined under 40 CFR 372.3); 2) whether the toxic chemical was brought on-site to be managed through recycling, treatment for destruction, waste stabilization, or disposal activities; and 3) whether the toxic chemical or the stream containing the toxic chemical is identified as a hazardous waste or a constituent of a hazardous waste under RCRA and its implementing regulations under 40 CFR 261.

To determine the "direction of the toxic chemical and the stream containing the toxic chemical," EPA considers the following three ways in which the toxic chemical or the stream containing the chemical is directed: toward further use or reuse,<sup>6</sup> toward management to make the stream more amenable for some additional management or release; or toward release to the environment. EPA also believes that the determination of the "direction" of a toxic chemical or chemical stream can be based on the function of the device or process affecting the chemical and chemical stream. The function of the device or process would be to either prepare the stream containing the toxic chemical for further "processing" or for management to either make the stream amenable for further management or release to the environment. Therefore, the function of the device or process can be used to determine whether the direction of the chemical and stream is towards further "processing" or further management or release.

(1) "*Processed*" toxic chemicals. If a toxic chemical is "processed" according to the statutory definition of "process," the chemical is incorporated into a product for

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<sup>6</sup>The terms 'reused or used,' 'used,' or 'reused' are not synonymous with the regulatory term "otherwise use." These terms include "processing" activities and "otherwise use" activities, except for disposal, waste stabilization, and treatment for destruction. In this document, the regulatory term "otherwise use" is always enclosed within quotes.

distribution into commerce. EPA believes that, once a toxic chemical is incorporated into a product, this is evidence that the function of the chemical is integral to the production of that product. To conclude that the toxic chemical is not reportable as a toxic chemical in waste, one should determine that the stream containing the toxic chemical has always been directed toward further processing.

EPA believes the best method for determining whether the toxic chemical is directed towards further processing into a product, and therefore not considered to be waste management, is to consider the function of the equipment or process affecting the toxic chemical. Equipment or processes, such as treatment<sup>7</sup> or pollution control devices or processes, whose primary function is to make a chemical stream amenable for further management or release, is not integral to production, even if a toxic chemical is removed from the stream and reintroduced to a processing stream.

For example, an air scrubber removes toxic chemicals from an airstream prior to discharge. Some of the toxic chemicals, including certain metal compounds, are recovered from the slurry produced by the scrubber and returned to the process for continued processing. The quantity of the chemicals recovered from the slurry and returned to the process would be reportable as "recycled" because the scrubber prepares the stream containing the toxic chemical for release. Thus, the practice would not be considered integral to production. Contrast this with a second

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<sup>7</sup>For purposes of this discussion, "treatment" is interpreted to be any method, technique or process designed to change the physical, chemical, or biological character or composition of any waste stream containing an EPCRA section 313 toxic chemical so as to recover material resources from the waste; render the waste stream less toxic or hazardous, safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

example. In the manufacture of plastic fluff that contains a toxic chemical, an airstream carries the fluff through several separation steps to sort the particles by size. The lighter parts are captured in a filter. The various size particles are then further processed. The airstream is discharged to the environment but does not contain any of the fluff. The collection of particles of fluff for further processing is considered integral to the production process even though the airstream carrying the fluff is released to the environment because the purpose of the separation is further processing, and not management, of the fluff prior to release.

(2) *"Otherwise used" toxic chemicals.* EPA believes that the function of a toxic chemical that is "otherwise used," except when it is "otherwise used" through disposal, waste stabilization, or treatment for destruction, is integral to production until it becomes unusable for that or other "manufacturing" or "processing" activities unless it is recovered. To conclude that the chemical is not integral to production and reportable as a toxic chemical in waste when it is "otherwise used," one should determine that the stream containing the toxic chemical has become spent or contaminated such that it cannot be reused or used without some form of recovery, except for disposal, waste stabilization, or treatment for destruction.

Consistent with this analysis, EPA believes "otherwise used" chemicals that can be recirculated within a system and reused are not considered to be managed as waste. For example, Freon 113 is constantly recirculated within a refrigeration system. EPA believes that the recirculation of the Freon 113 within the refrigeration system would not be reportable "recycling" because the Freon 113 is only recirculated and does not require

some form of recovery to continue to be used.

An "otherwise used" chemical can also be used in one operation and, although the chemical cannot be reused in that same operation, it can be used in a different operation without any reclamation to make it usable. EPA has consistently stated previously that it believes feedstocks or any direct reuse of a chemical is integral to the production process. The reuse of an "otherwise used" chemical without reclamation to make it usable would not be reportable as waste management of the toxic chemical.

An "otherwise used" chemical can become contaminated or spent and require reclamation in order to be usable again. If the chemical were not reclaimed, the chemical would have to be managed or discarded in some way. In such situations, EPA believes it is a reasonable distinction that "otherwise used" chemicals that become spent or contaminated and must be recovered to be used in either the original or other operations or processes are not considered integral to production. Basing the reportable activity on whether the "otherwise used" chemical needs some form of reclamation before it can be used is reasonable because once the "otherwise used" chemical is unusable, the chemical is amenable to source reduction. For example, a solvent is used to degrease parts after production. The solvent becomes heavily contaminated and is sent to a distillation unit to be recovered so that it can be reused in the degreasing operation. The "otherwise used" chemical is not capable of being reused without recovery and consequently must be managed as waste.

(3) *"Manufactured" toxic chemicals and chemicals that are intended to be "processed" but are not "processed."* For a chemical that is intended to be "processed"



but is not incorporated into a product or for a chemical that is “manufactured,” EPA believes that there are three potential scenarios:

First, the toxic chemical that is “manufactured,” or was intended to be “processed,” may be a product or “processed” into a product on-site or off-site. In this case, facilities would use the approach presented above for "processed" toxic chemicals to evaluate whether the activities involving the toxic chemical are integral to production and therefore not reportable management activities.

Second, the toxic chemical that is “manufactured,” or was intended to be “processed,” may subsequently be “otherwise used.” In this situation, facilities would use the method described above for "otherwise used" chemicals when determining whether these quantities would be reported as managed.

Third, it is possible that the toxic chemical is “manufactured” as a byproduct or an impurity. These “manufactured” toxic chemicals that are incorporated into a product, are also "processed" and these quantities would be evaluated as "processed" toxic chemicals.

However, “manufactured” byproducts, as well as toxic chemicals that were intended to be “processed” but were not “processed,” may not be incorporated into products or “otherwise used.” In such cases, the toxic chemical is either directed toward release to the environment or some form of management. As management or release activities are not integral to production, the quantity of toxic chemical would be considered to be managed as waste.

*RCRA Hazardous Wastes and Constituents of RCRA Hazardous Waste.* EPA also considered consistency with RCRA, which regulates the management of hazardous

wastes. To ensure that there is some consistency between reporting under EPCRA and other environmental statutes, EPA believes that toxic chemicals that are constituents of or are hazardous wastes under RCRA should be considered toxic chemicals that are managed as waste, since by definition RCRA hazardous wastes are intended to be discarded. Therefore, practices affecting a toxic chemical identified as a RCRA hazardous waste, or that is a constituent of a RCRA hazardous waste would be considered to be waste management.

A. Recycling

EPA interprets for the purposes of EPCRA section 313 "recycling" to be the following:

"Recycling" is (1) the recovery for reuse of a toxic chemical from a gaseous, aerosol, aqueous, liquid, or solid stream; or (2) the reuse, or the recovery for reuse of a toxic chemical that is a RCRA hazardous waste or is a constituent of a RCRA hazardous waste as defined in 40 CFR 261.

"Recovery" is the act of extracting or removing the toxic chemical from a waste stream and includes: (1) the reclamation of the toxic chemical from a stream that entered a waste treatment or pollution control device or process where destruction of the stream or destruction or removal of certain constituents of the stream occurs (including air pollution control devices or processes, wastewater treatment or control devices or processes, Federal or State permitted treatment or control devices or processes, and other types of treatment or control devices or processes); and (2) the reclamation for reuse

of an "otherwise used" toxic chemical that is spent or contaminated and that must be recovered for further use in either the original or any other operations.

EPA considers the direct recirculation of a toxic chemical within a process or between processes without any reclamation to be "reuse" of the toxic chemical rather than "recycling." The direct use, direct further use, or direct reuse of the toxic chemical is not "recycling" provided that there is no reclamation of the chemical prior to that continued use or reuse.

EPA believes its approach most accurately describes practices that are not integral to production and practices affecting toxic chemicals that are amenable to source reduction and other forms of management. A practice that is not integral to production may be classified as a management activity, including recycling. EPA's interpretation of reportable "recycling" is therefore based on identifying practices involving the toxic chemical that are not integral to production.

*Recovery of a toxic chemical for reuse.* EPA's interpretation of "recycling" includes the recovery of a toxic chemical from a chemical stream and the reuse of that chemical. The key to determining what is or is not integral to production is the definition of "recovery," which is the act of extracting or removing the toxic chemical from a chemical stream. EPA believes that recovery activities that are not integral to production include the following: (1) the recovery for reuse of a chemical from a stream that has entered a treatment or control device or process; and (2) the recovery for reuse of an "otherwise used" chemical that must be recovered prior to continued use. This

interpretation of "recovery" is intended to limit the scope of "recycling" based on the function of the toxic chemical, as well as the direction of the toxic chemical and chemical stream and the function of the device affecting the toxic chemical.

EPA believes that when the toxic chemical is recovered after entering a device or process that controls or treats the toxic chemical or chemical stream in order to make the toxic chemical or chemical stream more amenable for release or further management, the chemical should be considered as "recycled." EPA believes that such devices or processes are not integral to production because the direction of the stream is toward management or release and not toward the immediate processing of the toxic chemical. Therefore, regardless of the function or nature of the toxic chemical, the recovery and reuse of any toxic chemical after it has entered a treatment or control device or process is reportable "recycling" of that toxic chemical.

For example, a baghouse removes chemicals from an airstream prior to discharge.

Some of the chemicals, including certain metal compounds, are recovered from the baghouse and returned to the process for "processing." The quantity of the chemicals recovered from the baghouse and returned to the process would not be considered integral to production and would be reportable as "recycled" because the baghouse prepares the stream containing the toxic chemical for release.

For the purposes of the EPCRA section 313 reporting requirements, the treatment devices are NOT limited to those treatment devices that are Federally or State permitted. For EPCRA section 313 purposes, basing the criterion on whether a device is permitted is an unnecessary distinction. Not all devices that treat or control waste streams are

permitted. In many situations, non-permitted devices can perform the same function as a permitted device. Thus, any treatment or control device or process should be considered because this approach focuses on the purpose of the device or process.

There may be situations where a device serves multiple purposes at a facility in either different operations or at different stages of a single operation. A device may be used in the “processing” of a chemical and in other situations, the same device may be used to recover the toxic chemical to prepare the stream for release to the environment or to recover spent or contaminated otherwise used chemicals. Where a single device serves multiple purposes at one facility, the determination of whether the use of that device to recover a toxic chemical is "recycling" depends on the function and direction of the chemical or stream containing the toxic chemical.

For example, a distillation column is used to bring a chemical that is a raw material to a higher level of purity. The same distillation device is used to recover a contaminated “otherwise used” material and prepare it for further use. When the distillation device is used to process the raw material to a higher level of purity, the raw material and device are considered integral to production because the stream is directed toward further processing. When the device recovers the contaminated “otherwise used” toxic chemical, the device and contaminated “otherwise used” chemical are not considered integral to production and the recovery of that chemical is reportable "recycling."

To contrast that example, an aqueous stream containing a “manufactured” product and excess reactants, both EPCRA section 313 toxic chemicals, exits a reaction

vessel and enters a distillation unit in which the product chemical is separated for further processing and the excess reactants are returned to the reaction vessel for direct reuse. The remaining stream is sent to an on-site wastewater treatment unit and ultimately is transferred to a POTW. The distillation of the product chemical and excess reactants is considered integral to production of a product, even though the aqueous stream eventually is transferred off-site for treatment for destruction or release. Neither the product nor the reactants are reported as "recycled" under EPA's interpretation. The product and reactants were extracted from the stream before the stream reached a pollution control or treatment device. This is because the purpose of the distillation process is to further process the product chemical and reactants, not management of the stream prior to transferring it to the POTW.

EPA believes that the recovery and reuse of an otherwise used toxic chemical to be reportable "recycling." EPA believes that any practice affecting an "otherwise used" chemical that can no longer be reused is not integral to production. Absent recovery, the toxic chemical in the chemical stream would be directed toward some form of management or release.

For example, a catalyst is "otherwise used" in a reaction process and becomes heavily contaminated. The catalyst is sent off-site to a distillation unit and is recovered so that it can be reused. The quantity of the catalyst recovered from the distillation column and made available for reuse would be reported as "recycled." In contrast, Freon 113 is constantly recirculated within a refrigeration system. The recirculation of the Freon 113 within the refrigeration system would not be

reportable "recycling" because the Freon 113 is only recirculated and does not become contaminated during its use and does not require some form of recovery to continue to be used. In that case, the function of the chemical is to refrigerate the system and is an "otherwise use" activity. When the chemical becomes spent for the refrigeration process, it may be reused in another process without reclamation. If it is reused, the function of the chemical would then be to serve that process. Thus, any immediate reuse of an "otherwise used" chemical, such as Freon 113, for any other process would not be "recycling" of that toxic chemical. However, once the Freon 113 is spent and cannot be used as a refrigerant or for any other process, the reclamation and reuse of the Freon 113 would be a "recycle" activity.

*When to count a quantity as recycled.* Facilities should calculate the amount as "recycled" on-site for the reporting year in which the toxic chemical was recovered on-site and made into a reusable product.

For example, a facility removes chromium from sludge created during wastewater treatment. The chromium is then recovered from the sludge and is sold for reuse. Assuming all of these steps occur at the facility within the reporting year, the quantity of chromium recovered from the sludge and sold for reuse is considered to be recycled. However, if the facility treated the wastewaters and then stored the resulting sludge, the facility would consider the chromium to be recycled only after the metal is recovered from the sludge for reuse. For example, the facility treats the wastewater during the 1997 reporting year and then stores the metal-bearing sludge. During the 1998 reporting year, the facility recovers the metal from the

sludge for sale. The facility would not consider the chromium to be recycled for 1997, but would consider it to be recycled for 1998 because that is when the metal is recovered to produce a reusable product.

A recovered toxic chemical does not need to be reused during the same reporting year to be considered to be "recycled."

For example, the facility treats the wastewaters, recovers the chromium from the sludge and then stores the reusable chromium during the 1997 reporting year.

During the 1998 reporting year, the chromium is sold for reuse. The chromium is considered to be recycled for the 1997 reporting year because that is when it was recovered into a usable product.

#### B. Combustion for Energy Recovery

EPA believes that while "combustion for energy recovery" could be considered "treatment for destruction" of the chemical because it results in the destruction of the toxic chemical, it could also be considered to have aspects of "recycling" because it may also result in the beneficial reuse of the chemical. Therefore, EPA believes that quantities of a toxic chemical that are "used for energy recovery" should not always be considered to be solely the treatment of the toxic chemical.

However, EPA believes that "combusted for energy recovery" should be restricted to devices where energy is produced from the combustion of the toxic chemical and harnessed. Such a restriction distinguishes between combustion of a toxic chemical in waste for the purpose of producing energy and destruction of the toxic chemical in waste with no recovery of energy. EPA also believes that whether the toxic chemical has a



significant heating value<sup>8</sup> (e.g., 5,000 British Thermal Units (Btu) per pound) should be considered when determining whether the toxic chemical should be reported as "used for energy recovery" or "treated for destruction."

EPA interprets "combustion for energy recovery" as the combustion of the toxic chemical that is (1) (i) a RCRA hazardous waste or waste fuel, (ii) a constituent of a RCRA hazardous waste or waste fuel, or (iii) a spent or contaminated "otherwise used" material; and that (2) has a significant heating value (e.g., 5,000 Btu per pound) and is combusted in an "energy or materials recovery device."

EPA considers an "energy or materials recovery device" to be an industrial furnace or boiler as defined in 40 CFR 260.10.

EPA believes that destruction of the toxic chemical in an energy or materials recovery device is not integral to production when the toxic chemical is, or is a constituent of, a RCRA hazardous waste or is a spent or contaminated "otherwise used" toxic chemical. When a toxic chemical meets one of these criteria, EPA believes that the toxic chemical must be managed or disposed in some manner and that combustion in an energy or materials recovery device is a method of management.

In determining whether an EPCRA section 313 listed toxic chemical is combusted for energy recovery, the facility should consider the Btu value of the toxic chemical and

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<sup>8</sup>EPA has not issued a final statement on whether "combustion for energy recovery" may occur if a toxic chemical has a heating value of less than 5,000 Btu per pound and is combusted in an energy recovery device. However, EPA believes that 5,000 Btu per pound, the same threshold used in EPA's RCRA enforcement guidance (48 FR 11158, March 16, 1983), is a significant heating value and may be considered when distinguishing between energy recovery and incineration. If a toxic chemical is incinerated but does not contribute energy to the process (e.g., metals, metal compounds, chlorofluorocarbons) it must be considered treatment for destruction.

not of the chemical stream. This is because EPCRA section 313 is specific to the toxic chemical, and not the chemical stream of which the toxic chemical is or may be a constituent. Further, EPA is concerned that the application of the threshold to the chemical stream may not provide an accurate picture of how the toxic chemical is managed.

For example, in situations where a toxic chemical with a minimal heating value is blended with substances which have significant heating values and burned in an energy recovery device, the toxic chemical is not necessarily being combusted for the purpose of energy recovery. Rather, EPA believes the purpose for burning the toxic chemical is the destruction or treatment of the toxic chemical. Moreover, the converse is true as well; reporting "combusted for energy recovery" based on the Btu value of the waste stream may not give proper credit to the use of toxic chemicals to generate energy. Using the example above, if the toxic chemical has a significant heating value but is blended with substances that do not have significant heating values, the combustion activity would not be reported as "combustion for energy recovery," if reporting were based on the waste stream.

*A toxic chemical that is a RCRA hazardous waste or waste fuel, a constituent of a RCRA hazardous waste or waste fuel, or a spent or contaminated "otherwise used" material.* EPA believes that a RCRA hazardous waste or waste fuel, a constituent of these wastes, and spent or contaminated "otherwise used" materials are the only chemical streams containing the toxic chemical that would be "combusted for energy recovery" at a facility. A stream containing a toxic chemical that does not meet one of these criteria but

that has a Btu value over 5,000 Btu/lb, is likely to be a commercially available fuel or the equivalent. Such chemicals should not be considered to be a quantity of the toxic chemical managed as waste.

*Calculating quantities "combusted for energy recovery" on-site.* Combustion for energy recovery is an "otherwise use" activity because the toxic chemical is being used as a fuel (a waste-derived fuel). The amount that is applied to threshold determinations is the amount entering the on-site combustion unit.

### III. Treatment for Destruction

EPA believes that "treatment for destruction" should not include physical removal of the toxic chemical or other activities intended to render the stream more suitable for further use or processing, such as a distillation or sedimentation unit.

Treatment for destruction does not include the off-site transfer of a toxic chemical that cannot be destroyed (e.g., metals).

Simple dissociation of a chemical in water is not considered reportable treatment. When a toxic chemical is dissociated in water, it is in solution and still in a reportable form and is therefore not considered to be destroyed. Quantities treated for destruction do not include the amount of the toxic chemical that is prepared for disposal or simply removed from gaseous, aerosol, aqueous, liquid, or solid streams.