UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM:

SUBJECT: Response to Questions from California Department of Toxic Substances Control Regarding Various Issues on the Combustion of

FROM: Elizabeth A. Cotsworth, Acting Director
Hazardous Waste
Office of Solid Waste

TO: Julie Anderson, Director
Waste Management Division, Region IX

On July 24, 1995, the State of California sent a letter to EPA, Region IX requesting, answers to the questions listed below. Region IX then forwarded the California letter to us for response. The questions were subsequently discussed during various conference calls with the Waste Combustion Permit Writers: Workgroup. Based on these discussions and others within OSW, we have prepared the following responses. However, I would like to point out that the view of this Office is that, in most cases, the literal line between incineration and non-incineration is not the main concern. Rather, the primary concern from an environmental standpoint is whether proper controls are applied to the combustion or thermal treatment process in question. The RCRA regulatory framework provides the authority and responsibility to impose adequate controls whether the unit is classified as a combustor or miscellaneous unit. If you have any further questions or comments on these issues, feel free to contact Andrew O'Palko of my staff at (703) 308-8646.

1. Can you clarify the meaning of "controlled flame combustion," as specified in the incineration definition? Does this imply that an engineered burner must be utilized to generate "controlled flame ?" We presume that an engineered burner is necessary for "flame combustion" to be considered "controlled," but would like confirmation.

Answer: Combustion is an exothermic chemical reaction involving the rapid thermal oxidation of a substance. Controlled flame combustion refers to a steady-stare, or near steady-state, process wherein fuel and/or oxidizer feed rates are controlled. An engineered burner is not necessarily needed in order for a combustion process to be considered controlled. EPA does not specify the term "engineered burner" in the

regulatory definition for incineration devices. EPA notes there is not always a clear distinction whether a particular process meets the definition of an incinerator. Some processes need to be evaluated on a sire-specific basis. Again, the important consideration is that appropriate controls be applied to the unit.

2. Does EPA consider fluidized bed hazardous waste oxidizers to be incinerators? In these devices, the bed material (sand) is preheated via a burner device prior to the introduction of waste. Subsequently charged waste is then oxidized in the bed after the burner has been disengaged. Does this constitute a controlled flame system? Does the physical state of the waste feed affect the classification of the unit (solids versus liquids versus gases)?

Answer: Yes, EPA considers fluidized bed devices to be incinerators and regulated under 40 CFR 264 (and 265) Subpart O (see 55 FR 17870, April 27. 1990). These devices are considered a specialized form of controlled flame combustion in which the flame is dispersed throughout a fluidized bed. That is. fuel and oxidizer feed rates are properly controlled so that combustion (i.e., rapid thermal oxidation) will occur throughout the bed. The physical state of the waste feed would not affect the classification of fluidized bed devices as incinerators.

3. U.S. EPA has stated that catalytic converters are distinct from controlled flame afterburners (57 FR 38562). Can you clarify how such converters differ from controlled flame afterburners? Catalytic converter units are able to oxidize wastes at temperatures lower than that necessary for a typical flame unit due to the catalyst's ability to lower the energy necessary for the oxidation reaction to occur. What are the criteria for distinguishing one from the other?

Answer: As stated in the question, a true catalytic converter is able to oxidize wastes at temperatures lower than necessary for a typical flame unit. In addition, the catalytic oxidation reaction is generally thought to take place at a much slower heat release rate than normal combustion. Such a unit would generally not be considered a controlled flame combustion device and, therefore, would be regulated as a miscellaneous unit under Subpart X (§264.600). One factor that indicates whether the device is regulated under Subpart O or X is whether rapid oxidation (i.e., combustion) would cease without the presence of the catalyst. If the reaction ceases without the catalyst, then it would be a Subpart X unit. In contrast, the use of a catalyst only to enhance traditional combustion would not allow a classification as Subpart X.

4. If a premixed, gaseous waste is processed in a device which uses a preheated chamber at which the system is operated outside the limits of flammability, would this imply that a controlled flame is nor employed. and therefore it is nor

considered incineration? We presume this to be the case but would like confirmation.

Answer: Controlled flame combustion is the defining character of incineration. If the system discussed operates outside the limits of flammability, such that a flame is never formed, it is reasonable to conclude that it is not an incinerator.

5. If a waste processing system produces a gas with commercial value, what restrictions, if any. apply to the disposition of that material? For example, if a molten bath processing system produces a synthesis gas, that gas could:

a) Be used as a feedstock for a chemical manufacturing process;
b) Be burned for its fuel value; or
c) Be flared.

Would any of these examples cause the process to be deemed incineration? We presume that they would not cause the whole process to be considered incineration, but would like confirmation. If the synthesis gas meets commercial product specifications, is it free from subsequent hazardous waste regulations?

Answer: These issues are difficult to address generically since often the specific operations at a particular site bear heavily on the final conclusions that are reached. Historically. these types of issues have been handled on a case-by-case basis. However, please be aware that it is the process, not the product, which determines a unit's classification. Also, if a syngas is hazardous waste derived, it is subject to regulation if used as a fuel (see 62 FR 24253, May 2, 1997). There are four policy memoranda (attached) which can be used for assistance. These are: 1) Clarification Regarding Single Emission Point, Multi-Device Combustion Facilities, July 29, 1994 from Michael Shapiro; 2) Exide Corporation's Proposed Fuming/Gasification Unit. November 15, 1994 from Michael Shapiro; 3) Application of the BIF Rule to Heritage Environmental Services, December 30, 1992 from Sylvia Lowrance; and 4) an April 12, 1996 letter from Mike Shapiro to Molten Metal Technology with respect to synthesis gas from Catalytic Extraction Processing.

In addition, the new MACT rule proposed a comparable fuels exemption for hazardous waste, which includes a syngas exemption based on a set of specifications for the gas (see 61 FR 17465, April 19, 1996, and 62 FR 24253, May 2, 1997). Syngas meeting these specifications could be burned as a fuel without triggering RCRA obligations. If and when this exemption is implemented, it will, hopefully, minimize the need for these site-specific determinations.

cc: RCRA Senior Policy Advisors, Regions I-VIII, X

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Attachments (4)