classes, types, and sizes of units within a category in establishing the standards and guidelines. In other words, EPA may subcategorize the MWI source category in establishing standards and guidelines. After reviewing the population of MWI's, the EPA believes that, for the purpose of regulatory development and of determining MACT, the MWI population should be divided into three subcategories: (1) continuous MWI's, (2) intermittent MWI's, and (3) batch MWI's. These three subcategories are based on differences in the design of the MWI's as discussed in the following paragraphs.

In each of the design systems, sequential combustion operations typically are carried out in two separate chambers: primary and secondary. In the primary chamber, the waste is loaded and ignited, the volatile organic components driven off, and the nonvolatile materials combusted to ash. The volatile organic components released from the primary chamber are combusted in the secondary chamber. Newer MWI's are typically designed with 1-second (1-sec) residence time secondary chambers; older MWI's were designed with smaller, 0.25-second (0.25 sec) residence time secondary chambers.

While there are similarities in the three design types of MWI's, there are also key design differences that make each type unique. The primary differences between the three design types of MWI's are the methods of charging waste to and removing ash from the primary chamber. These differences cause variations in the way the waste is burned and in the pollutant emission profile for each MWI design type.

Continuous units, which are the largest of the three types, have mechanical ram feeders and continuous ash removal systems. These features allow the unit to operate 24 hours per day for many days at a time. Continuous MWI's achieve steady-state operation in the beginning of their operating cycle and maintain this mode of operation throughout the remainder of the cycle. Waste is charged and ash is removed simultaneously (i.e., on a continuous basis). During operation, waste is burned at the same rate as it is charged into the unit, and pollutant emission rates and primary and secondary chamber temperatures tend to be relatively constant.

Most intermittent MWI's also have mechanical ram feeders that charge waste into the primary chamber at about 5- to 10-minute intervals. However, because there is no means for ash removal during the burning phase of the operating cycle, the unit can only be operated for a limited number of hours before the accumulation of ash in the primary chamber requires the unit to be shut down for ash removal. Intermittent units, which are usually much smaller than continuous units, typically operate on a daily burn cycle of 10 to 14 hours. While these units tend to approach steady-state operation during the middle of their operating cycle, waste is normally being charged faster than it is being burned. Primary chamber temperatures tend to climb throughout the operating cycle until waste is no longer charged into the unit. Because there is a significant accumulation of unburned material in the primary chamber at the end of the charging period, these units are designed with a burndown/cooldown phase. Generally, pollutant emissions continue through this phase, which can continue for several hours after charging has ceased.

The batch operating cycle consists of three phases: low-air, high-air, and cooldown. All of the waste to be burned during a complete cycle is loaded into the primary chamber before the unit begins operation. Once the unit is filled with waste and the burning cycle begins, the charging door is not opened again until the cycle is complete and the unit is cool. This cycle normally takes 1 or 2 days, depending on the size of the unit and the amount of waste charged. During the low-air phase, temperatures in the primary chamber rise slowly because combustion is occurring only on the surface of the waste pile and because combustion air is restricted. When the high-air phase begins, the temperatures climb more rapidly, more volatiles are exposed to the flame front, and the combustion process quickens. Batch MWI's tend to approach steadystate operation at the end of the low-air

phase, when the primary chamber temperature reaches the design operating range. Pollutant emission rates also tend to increase in the second half of the low-air phase, then level off, and continue steadily during the highair and cooldown phases. Pollutant concentrations during the high-air phase of batch MWI's are similar to concentrations during the charging period for continuous and intermittent units.

The differences in typical hours of operation, discussed above, affect the potential for total emissions (on a mass basis) from each MWI type. Continuous MWI's, which can accommodate waste charging for an unrestricted length of time, will have the greatest potential emissions because waste burning and subsequent emissions can occur continuously. Intermittent MWI's, designed to accept waste charges at periodic intervals for between 8 and 14 hours, will be limited in potential emissions by periods of shutdown required to remove ash from the incinerator. The hours of operation, limited by the time required to remove ash, result in less potential emissions from intermittent MWI's than from continuous MWI's. Batch MWI's are designed to burn only one load of waste at a time. The operating cycle normally takes 1 or 2 days, depending on the size of the unit and the amount of waste charged. Potential emissions from batch MWI's are lower than continuous and intermittent MWI's because of the significant difference in the total amount of waste burned over a given period of time.

Typical uncontrolled emission levels for each of the three subcategories are presented in Tables 11a and 11b. Table 11a shows uncontrolled emissions from new MWI's, while Table 11b shows uncontrolled emissions from existing MWI's. These emission levels reflect concentrations when the MWI is operating at steady-state conditions, which include the high-air phase for the batch MWI and the charging period for continuous and intermittent MWI's. As noted elsewhere, the EPA specifically solicits comment on the determination to distinguish between continuous, intermittent, and batch units.

TABLE 11a.—TYPICAL UNCONTROLLED EMISSIONS FROM NEW MWI'S

Pollutant	Continuous	Intermittent	Batch
PM, mg/dscm CO, ppmv CDD/CDF, ng/dscm HCI, ppmv	300 300 6,600 1,400	300 300 6,600 1,400	300 300 6,600 1,400
NO _X , ppmv	140	140	140