MARQUETTE
UNIVERSITY

Marquette University

Waste Minimization and Pollution Prevention Policy

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I. INTRODUCTION

In accordance with 40 CFR 262.27(a), Marquette University has developed a waste minimization policy that will encourage and direct employees to conscientiously strive to reduce waste and minimize, or prevent, pollution.

Marquette University understands the importance of reducing the amount of hazardous waste generated, from an economical and environmental standpoint. The University would like to encourage awareness and innovation in reducing the amount of hazardous waste it generates.

Waste Minimization is the reduction, to the extent feasible, of hazardous waste that is generated prior to treatment, storage and disposal. It is defined as any source of reduction or recycling activity that results in either 1) reduction of the total volume of hazardous waste, 2) reduction of the toxicity of the hazardous waste, or 3) both. Practices that are considered waste minimization include recycling, source separation, product substitution, manufacturing process change, and the use of less toxic raw materials.

Pollution Prevention is the use of materials, processes, or practices that reduce or eliminate the creation of pollutants or wastes at the source. It includes practices that reduce the use of hazardous and non-hazardous materials, energy, water, or other resources as well as those that protect natural resources through conservation or more efficient use. Pollution Prevention is the maximum feasible reduction of all wastes generated at production sites.

II. COMPONENTS OF THE POLICY

A. Source Reduction

Changing practices and processes to reduce or eliminate the generation of hazardous wastes and materials is referred to as source reduction. Some source reduction methods include process modification, chemical substitution, and improved operating procedures. It is the policy of Marquette to encourage the source reduction techniques discussed below, whenever possible.

1. Substitution of Raw Materials:

Whenever possible, non-hazardous materials should be substituted for materials that produce hazardous waste. If a non-hazardous substitution does not exist or is not available, the least toxic material available should be used. For example, non-halogenated solvents should be used instead of halogenated solvents, when possible, because they are less toxic. Researchers, professors, and lab managers should

evaluate procedures and actively search for substitutions for their hazardous raw materials.

2. Inventory Control:

A large quantity of the material that is disposed of as hazardous waste is unused, expired chemicals. A detailed inventory of chemicals should be kept at all times, to prevent the purchasing of chemicals already in stock and in keeping track of shelf life. Chemical purchasing will be coordinated through one person in each department. All chemicals will be dated when received so that older products will be used first.

It is also important to only purchase the amount of chemical that you will use and to factor in the disposal cost when purchasing a new chemical. A bulk price may seem like a better deal, but it only is if all of the material is actually going to be used. For example, 500 grams of Sigma supplied hexachlorocyclohexane (Lindane gamma isomer) at $46.35 costs less per gram than the 100 gram or 50 gram packaging size ($16.85 and $9.35), however if only 150 grams are needed, disposal costs for the unused 350 grams range from $30.00 to $75.00 depending on disposal contractor and disposal methodology. The waste minimization aware researcher would take into account the disposal costs and purchase the two smaller quantities. Multiply the number of researchers by the number of material purchases annually and it is apparent that significant savings will occur. Whether chemicals are purchased in milligram or gallon quantities, Hazardous Waste Disposal costs must always be considered.

Marquette University will no longer accept donations of chemicals, without written approval from the Risk Management Department. These donations are often from businesses that are closing or modifying their processes. While a donation might seem like a benefit to the University, these chemicals are usually not used and then Marquette is required to pay for the costly hazardous waste disposal. University personnel will have to justify why these materials should be accepted, what they will be used for, the amount needed, and in what time period these materials will be consumed.

3. Good Housekeeping and Maintenance:

Something as simply as good housekeeping procedures can affect the amount of hazardous materials generated. Containers should be stored properly to avoid spills and leaks. Liquid wastes will be kept in secondary containers to minimize the effect if the container were to leak. Containers are also to be kept closed at all times, to reduce the possibility of a spill and to minimize the release of vapors into the atmosphere through evaporation or fumes. Employees should take care when weighing and transferring materials to minimize spills and waste.

Wastes should be segregated as much as possible to facilitate recycling and disposal. For example, uncontaminated oil should be kept separate from contaminated oil. Uncontaminated oil can be sent for recycling, while contaminated oil requires treatment or incineration. Never mix a hazardous and non-hazardous waste. Mixing these

wastes will not dilute the hazardous component to make it less hazardous – it will only increase the volume of material that is to be considered hazardous. Keeping non-hazardous and hazardous wastes segregated will reduce the cost of disposal and the volume of hazardous waste generated.

Chemical containers must be labeled at all times to prevent the accumulation of unknown products. The labels must contain no abbreviations or chemical formulas. Unknown chemical analysis is quite costly. Unknown chemicals also open the door for incompatible materials to mix. It is imperative to always clearly label materials, for the safety of employees and to minimize disposal costs.

3. Process/Procedure Modification:

When possible, experiments should be scaled down and procedures should be reviewed to identify areas for waste minimization. Always use the smallest scale laboratory experiment possible.

Substitute computer simulations and modeling, or video demonstrations for wet laboratory experiments, when possible.

B. Recycling

Although source reduction is the preferred method of waste minimization, recycling is also important in waste minimization and conserving resources. Recycling is when a waste material is used for other purposes, treated or reused in the same process or reclaimed for another process. It is the policy of Marquette to encourage the recycling techniques discussed below, whenever possible.

1. Disposal Options

Marquette University recycles as much hazardous waste as possible. Only when recycling options are not possible or are not feasible are other disposal options considered. Marquette consults with its hazardous waste disposal contractor to determine the best possible means for disposing of waste.

2. Material Reuse or Redistribution

Marquette plans to develop a chemical redistribution program. In cases where a chemical still has value, but is no longer of need to a particular researcher or employee these chemicals can be added to the redistribution program. Other researchers or employees can choose to use this chemical. These chemicals will be offered at no cost. If no one is interested in the chemical over a given period of time, only then will the chemical be discarded.

Marquette also encourages employees to reuse materials, if possible. For example, acetone or ethanol used for drying glassware can be collected and reused several times before disposal.

It is also the policy of Marquette to purchase gas cylinders from manufacturers who will accept the return of the empty or partially used cylinder. The manufacturer can recycle the cylinder or reuse it. This eliminates unnecessary hazardous waste generation and minimizes disposal costs.

III. CONCLUSION

All members of the University community should make waste minimization an active and ongoing component of their operations. That means taking responsibility for the byproducts of operations and the waste that is generated. Because the actual generators are most familiar with their work and the materials they use, they are the best source for new ideas to prevent pollution and to minimize waste. Therefore, the success of the Marquette Waste Minimization Policy is dependent on the willing and active participation of the entire University Community.

By preventing or elimination pollution production, we can improve the quality of our services, we can reduce our expenses, we can improve our efficiency and we can protect our environment.