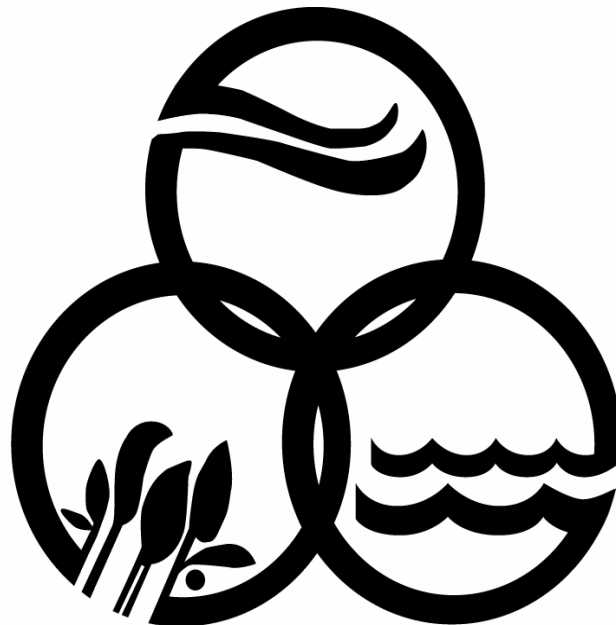


WASTE MINIMIZATION GUIDANCE MANUAL

**FOR
LARGE QUANTITY
HAZARDOUS WASTE GENERATORS
AND
SARA SECTION 313
TOXIC RELEASE INVENTORY FILERS**



**A GUIDANCE DOCUMENT DEVELOPED BY
THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL PERMITS DIVISION – P2**

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I. ABOUT THIS GUIDANCE MANUAL

This guidance manual has been developed and designed to help your facility prepare a waste reduction/waste minimization plan. It is a tool to help you reap the benefits of reducing/minimizing waste generation at your facility. The manual has been prepared to provide facilities with practical information on how to approach, plan, and implement a hazardous and nonhazardous waste reduction/minimization program. The manual concentrates on procedures that motivate people to search, screen, and put into practice measures involving administrative, material, or technology changes that result in decreased waste generation.

Your waste minimization plan will help you achieve reduction/minimization goals at your facility. This manual discusses the assessment team process approach to reviewing operations, identifying and assessing waste reduction/waste minimization options, and implementing and measuring progress towards contributing to the state-wide goal of reducing the use of toxic chemicals and the generation of hazardous and nonhazardous wastes.

Because individual facility circumstances and needs vary widely, users of this manual are encouraged to modify the procedures to meet their unique requirements. The manual is intended to serve as a point of reference, not as a set of rigid requirements.

The Mississippi Department of Environmental Quality's Environmental Permits Division is conducting statewide assistance programs to help Mississippi industries comply with the facility waste minimization planning requirements of the Mississippi Pollution Prevention Act of 1990. The goal is to promote the reduction of waste generation in Mississippi through these innovative assistance programs. The assistance programs will integrate waste reduction/waste minimization ethics into the industrial decision-making processes.

II. Mississippi Multimedia Pollution Prevention Act

A. INTRODUCTION AND AUTHORITY

In response to a growing concern that hazardous waste and nonhazardous waste problems needed far more attention than they previously had received, the Mississippi Legislature passed legislation during the 1990 Regular Session that established a state waste reduction/waste minimization goal and provided statutory authority for the Mississippi Multimedia Pollution Prevention Program. This legislation established that:

“The state’s goal is to reduce or minimize the generation and toxicity, or other characteristics, of waste generated within Mississippi by a minimum of twenty-five percent (25%) by January 1, 1996.”

Chapter 31 of Title 49 of the Mississippi Code of 1972 was indeed landmark environmental legislation. It placed Mississippi among the first states in the nation to mandate waste reduction/waste minimization planning. The attainment of the State’s waste reduction/waste minimization goal will require a significant commitment to waste prevention and reduction by industry, government, and the general public through education, planning, and technical assistance programs.

Chapter 31 of Title 49 of the Mississippi Code of 1972 (Senate Bill 2568, or Section 49-31-1 et seq., Mississippi Code of 1972, or the Mississippi Multimedia Pollution Prevention Act of 1990), states that “no later than January 1, 1992, the Department of Environmental Quality shall require waste minimization plans to be provided by each generator of hazardous who is regulated as a large quantity generator or a small quantity generator under Mississippi hazardous waste management regulations or each facility operator required to file a report under Section 313 of the Emergency Planning and Community Right-to-Know Act, Public Law 99-499. Such generators and facility operators shall provide a plan for each site where waste is generated.” (See Appendix A.) The law is designed to achieve in-plant changes that reduce, avoid, or eliminate the use of toxic materials and generation of hazardous wastes and nonhazardous solid wastes. This planning requirement is expected to lower industrial costs and liabilities, and to benefit public health, safety, and the environment.

Waste reduction/waste minimization has been shown to have positive impacts on industry. Waste reduction can provide economic returns from reducing costs in raw materials, waste treatment and/or disposal. Elimination of wastestreams reduces liabilities. Companies that reduce their wastestreams also improve their public image in the community. Waste reduction/minimization makes sense in today’s competitive marketplace.

B. DEFINITIONS

1. **Multimedia** - all environmental media including but not limited to air, water, and land.
2. **Pollution prevention** - means any action taken by business, industry, government or individual consumers to conserve natural resources while providing and using needed products in a manner that prevents or reduces the generation, disposal or release of pollutants to the environment. Pollution prevention does not include dewatering, dilution or evaporation before handling, release, storage, treatment or disposal of hazardous waste.
3. **Waste Minimization** - the reduction, to the extent feasible, of waste that is generated or subsequently treated, stored, or disposed of. It includes any source reduction or recycling activity undertaken by a generator or facility operator that results in either (i) the reduction of total volume or quantity of waste, or (ii) the reduction of toxicity or other characteristics of hazardous waste, or both, so long as the reduction is consistent with the goal of minimizing present and future threats to human health and the environment.

Mississippi's primary objective for this waste minimization planning law is to promote hazardous and nonhazardous waste reduction. Waste reduction is limited to source reduction techniques and on-site and off-site recycling methods. The federal Pollution Prevention Act of 1990 establishes a new definition for source reduction.

4. **Source Reduction** - any practice which reduces the amount of any hazardous substance, pollutant, or contaminant entering any wastestream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

Source reduction includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

Source reduction implies any action that reduces the amount of waste exiting from a process.

5. **Recycling** - the reuse or reclamation, through a process or activity separate from the production of the primary product or the provision of the primary service, of a waste.

Recycling refers to the effective use or reuse of a waste as a substitute for a

commercial product, or to using waste as an ingredient or feedstock in an industrial process. It also refers to reclaiming useful constituent fractions within a waste material or removing contaminants from a waste to allow it to be reused. Recycling implies use, reuse, or reclamation of a waste, either on-site or off-site, after it is generated by a particular process.

6. Waste - sewage, industrial wastes, oil field wastes, and all other liquid, gaseous, solid or other substances which may pollute the lands, waters or air of the state.

It is mandated that each facility consider all waste streams and all media in preparing the facility waste minimization plan.

C. ANNUAL UPDATES

All hazardous waste generators and facility operators required to prepare a waste minimization plan are required to update their waste minimization plan annually. The annual update will include, at a minimum, analysis and quantification of progress made, if any, in waste minimization relative to each performance goal, and any amendments to the plan, and an explanation of the need for the amendments.

D. PLAN REVIEW

All hazardous waste generators or facility operators shall permit the MDEQ or any designee of the MDEQ to review the waste minimization plan.

E. CERTIFIED REPORT

From the waste minimization plan and each annual update, hazardous waste generators and facility operators shall submit to MDEQ a certified report of the types and quantities of wastes generated, and the types and quantity of wastes minimized.

The certified report shall include a narrative summary explaining the waste generation and minimization data, a description of goals and progress made in reducing the generation of wastes, and a description of any impediments to the reduction of wastes. Subsequent reports are due by July 31 of each year.

F. PROPRIETARY SAFEGUARD

A waste minimization plan and any updates developed by hazardous waste generators and facility operators under the Mississippi Multimedia Pollution Prevention Act shall be retained at the facility and shall not be subject to inspection, examination, copying or reproduction under Section 25-61-9 of the Mississippi Code of 1972.

III. FACILITY WASTE MINIMIZATION PLAN/WHAT IS REQUIRED BY THE LAW

As businesses and industries grow and as product lines change, planning is necessary. Planning for increased waste reduction/minimization should go hand in hand with any business planning effort. Waste reduction/minimization should not be viewed as “new technology” but should be part of business practices just as productivity and goal setting are. Unfocused, ill-timed, or poorly managed waste reduction/minimization efforts will lead to low performance and high cost. Conversely, a well planned and effectively implemented waste reduction/minimization program leads to reduced costs.

Plans for reducing/minimizing wastestreams, and any general recommendations, will form the basis of the waste reduction/minimization program. Once developed, the waste minimization plan becomes a guide for increased attention to all wastes. The plan can increase motivation to change, to present alternatives, to guide decision-making, and to provide information to evaluate change.

Writing and implementing the waste minimization plan is similar to writing any other business plan. There must be a clear understanding of why a waste reduction/minimization program is being implemented, what will be done, and who will do it.

This manual is designed to help you begin writing your facility waste minimization plan. Your waste minimization plan, per Section 49-31-21(2) of the Mississippi Code of 1972, must include at a minimum the following:

Section 49-31-21 (2)(a)- - A written policy describing ownership and/or management support for waste minimization and implementation of the plan.

Section 49-31-21 (2)(b)- - Plan scope and objectives, including the evaluation of technologies, procedures, and personnel training programs to ensure waste minimization.

Section 49-31-21 (2)(c)- - Explanation and documentation of waste minimization efforts completed or in progress before the first reporting date.

Section 49-31-21 (2)(d)- - Analysis of waste streams, and identification of opportunities to eliminate waste generation. Such analysis shall include a review of individual processes and facilities and other activities where wastes may be generated, evaluation of data on the types, amounts, and hazardous and toxic constituents of waste generated, and potential waste minimization techniques applicable to those wastes.

Section 49-31-21 (2)(e) - Identification of all waste management costs.

Section 49-31-21 (2)(f) - Identification of employee awareness and training programs to involve employees in waste minimization planning and implementation to the maximum extent feasible.

Section 49-31-21 (2)(g) - Establishment of performance goals for the minimization of wastes which shall be expressed in numeric terms to the extent practicable.

IV. DEVELOPING A WASTE MINIMIZATION PLAN

A. Section 49-31-21 (2) (a)- - WRITTEN POLICY

A successful waste reduction/minimization program requires corporate commitment. The program must become an integral part of a company's corporate policy, product development, operational procedures, and training. Such a high-level management commitment will keep the waste reduction/minimization program active in all parts and levels of the company, from new product development to maintenance. Management must commit time, personnel, and financing. Lack of this commitment often becomes a major obstacle to waste reduction/minimization.

A formal policy statement or management directive best conveys the objectives of a waste reduction/minimization program to employees. A facility's upper management should establish a formal commitment throughout all levels of the facility. A formal policy statement should include the following points:

- 1. The production line must be responsible for environmental protection. Employee performance will be measured against this goal. Every employee is responsible for environmental protection in the same manner he or she is for safety.**
- 2. Eliminating, reducing, or minimizing the generation of waste is a main goal in research, process design, and plant operations and is as important to management as safety, yield, and loss prevention.**
- 3. Reusing and recycling materials must be considered first before classifying and disposing of it as a waste.**

While policy statements will vary in detail, they should answer the why, what, and who questions:

**Why is the facility going to implement waste reduction/minimization?
What will be done to implement waste reduction/minimization?
Who will implement waste reduction/minimization?**

In the policy statement for your facility, you may also wish to mention one or more of the motivations for doing waste reduction/minimization planning, such as regulatory requirements, product quality, cost and liability control, and worker health and safety. The exact language should be appropriate to your facility. (See Appendix D for examples of policy statements.)

Although a commitment to reducing/minimizing waste should begin with management, the employees can often suggest improvements in the day-to-day operations of the facility. Employees often generate the waste and they can contribute to the overall success of the waste reduction/minimization plan/program. The employees need to be informed and involved at all steps in developing and starting a plan/program. Employees can also evaluate a waste reduction/minimization plan/program and identify ways to improve performance.

Once management signs and dates the policy statement, display it prominently and distribute it widely. The way the written policy is first presented to employees is an indication of overall commitment. Letting the policy show up unexpectedly at work stations sends a negative message, but distributing copies of your facility's own policy, and asking for employee ideas, sends a positive message.

It is recommended that the plan be signed and dated by: 1st choice -CEO/ Owner; 2nd choice-Plant Manger; 3rd choice-Chief Financial Officer/C.P.A.; Optimum choice-All of the above.

B. SECTION 49-31-21 (2) (b) -- SCOPE AND OBJECTIVES

The keys to reducing/minimizing waste generation - - commitment, involvement, and teamwork - - are basic to many work place successes. Owners and managers can assign the priority and set the tone of the company's waste management efforts. Management can give direction and support. But it takes everyone to make it happen. Once everyone understands how reduction/minimization of toxic substances, hazardous wastes, and nonhazardous wastes fit into facility policies and practices, opportunities for participation are unlimited.

Understanding your facility usually means that someone must gather and analyze information. They will start with records and other written material, but soon a look at the operation of a facility to see how work is actually performed must be done. Everyone in a facility will be involved in some way in changing how your facility operates.

Planning for waste reduction/minimization should involve people who can help you understand your facility, who can help you change how your facility operates, and who can help you maintain your waste minimization plan in the dynamic atmosphere of your facility.

The team approach has proven best since it combines a wider range of experience, knowledge, and perception of the problem. An in-house team can include management and plant personnel from engineering, environmental engineering,

safety and health, purchasing, materials and inventory control, finance, and product quality control. A technically competent person with sufficient authority to do the job should select and lead the team.

Waste reduction/minimization is not only a program, but it's an attitude. In order to keep the program moving and improving, one may find an idealistic overall goal useful. In the case of product quality, some facilities state a goal of "zero defects." And in the case of worker health and safety, the ultimate goal may be "zero lost work days." For waste reduction/minimization, a goal of "Zero Generation" or "90% Reduction by 2006" may be difficult to actually achieve. But such a goal can serve as a slogan and a motivation for constant improvement.

When your commitment is clear and everyone understands your overall goals, it's time to set specific objectives. Whatever your objectives, make sure everyone understands exactly what substances and wastes you're talking about, the amounts, and the target dates for achieving your goals.

C. SECTION 49-31-21 (2) [c] -- PRIOR WASTE MINIMIZATION EFFORTS

It is critical that the waste minimization plan contain an explanation and documentation of all prior efforts and actual implementation of waste reduction/minimization programs, training, process changes, etc. Credit shall be given where credit is due for prior waste minimization efforts.

As an example, has your facility previously accomplished any of the following waste reduction/minimization efforts:

1. Gained top management support for waste minimization initiatives;
2. Changed raw materials or purchased new equipment that resulted in the reduction of the toxicity or the volume of a process waste stream;
3. Developed a characterization of your waste generation;
4. Generated a raw materials or waste cost allocation system;
5. Implemented employee waste reduction/minimization information and training programs;
6. Implemented reclaiming, recycling, and reusing methods or processes; and
7. Participated in waste exchanges?

If your facility has pursued any efforts prior to January 1, 1992, provide an

explanation and documentation of those efforts and their results in your waste minimization plan.

The following “waste minimization efforts” language is offered for consideration:

(Company Name) already has an extensive program of waste reduction/minimization underway. The waste reduction/minimization program leader, (Employee Name), and assessment team are actively addressing many waste reduction/minimization issues and have developed action plans in some of the more critical areas. In fact, (Company Name) has implemented or is in the process of:

(List and describe previous efforts which have resulted in the reduction/minimization of volume and/or toxicity of a wastestream. If possible, explain the reduction/minimization in terms of pounds or tons per production unit, savings in costs, or benefits for employees or the environment. Explain why these previously implemented efforts may be an impediment to further minimization of these specific wastestreams.)

D. SECTION 49-31-21 (2) (d) -- ANALYSIS OF WASTE STREAMS AND IDENTIFICATION OF OPPORTUNITIES TO ELIMINATE WASTE GENERATION

The likelihood of finding cost-effective options for reducing/minimizing wastes is directly related to understanding the links between your operations, the toxic, hazardous, and nonhazardous substances used, and the wastes generated. Your understanding of these links can be enlarged by reviewing plant operations and conducting a “toxics use” and waste reduction/minimization assessment. The assessment is a series of easy-to-follow steps that sets the stage for selecting reduction/minimization options for your current operations.

It is useful to consider a waste reduction/minimization assessment in several stages:

Stage 1. Preview your plant’s operations, chemical usage, business practices, and wastes generated.

Stage 2. Make a thorough walk-through of your facility. Examine operational processes, waste streams, current waste minimization practices, maintenance/housekeeping procedures, etc.

Stage 3. Document your findings.

The size and type of your facility will influence the amount of effort you put into a waste reduction/minimization assessment. The owner of a very small facility might conduct an assessment alone in 4 to 6 hours. Larger manufacturing or multiple-process facilities will benefit from an assessment team approach that may take

several weeks. Several people with diverse skills may be needed to evaluate complicated waste streams, analyze multiple kinds of equipment, and contribute to an economic analysis.

You should begin planning for waste reduction/minimization by asking the following questions about your current operations:

- 1. What current processes/operations are at this facility?**
- 2. Why do we do each process/operation this way?**
- 3. What are the consequences of doing each process/operation this way?**
- 4. What are the wastestreams generated from each process? And how much?**
- 5. Which wastes are classified as hazardous and which wastes are classified as nonhazardous? What makes them either hazardous or nonhazardous?**
- 6. Where are the emission points? What controls do we have on these?**
- 7. What are the input materials used to generate wastestreams of a particular process or area?**
- 8. How much of a particular input material enters each wastestream?**
- 9. How much of a raw material can be accounted for through fugitive losses?**
- 10. How efficient is the process?**
- 11. Are unnecessary wastes generated by mixing otherwise recyclable hazardous wastes with other process wastes?**
- 12. What types of housekeeping practices are used to limit the quantity of wastes generated?**
- 13. What types of process controls are used to improve process efficiency?**

Based on the collected information, a general flow diagram and material balance for each process step can be developed. The diagram should clearly identify the source, type, quantity, and concentration of each identified wastestream. The background information can be used to develop the plant survey and to identify data gaps, sampling points, problem areas, and data conflicts.

During the preview period, the assessment team members should be acquainting

themselves with the various operations of the business and should develop ideas for improvements. The team should prepare a checklist which will insure that all pertinent information is collected and which will help guide the team through the facility walk-through.

Before the facility walk-through, the assessment team should prepare an agenda of points still needing clarification. The list can contain objectives, questions and issues to be resolved, and/or further information requirements. The checklist should include:

1. A full description of all waste streams and points of origin, to be verified during the facility walk-through.
2. A list of all waste reduction/minimization practices already in place that have been identified, to be verified and evaluated during the facility walk-through.
3. A list of potential waste reduction/minimization options identified during pre-assessment, to be verified during the facility walk-through.
4. A list of other opportunities for reducing/minimizing waste that might work for the specific type of facility being assessed.

Waste reduction/minimization assessments identify and describe wastestreams, production processes responsible for generating each particular wastestream, and the amount of waste generated by each. The results of a waste reduction/minimization assessment help facilities identify cost-effective approaches to reduce/minimize the volume and toxicity of wastes generated. The facility can then better decide how to use resources for source reduction and recycling programs. A waste assessment alone will not reduce/minimize a facility's waste. It is only the starting point.

Waste reduction/minimization assessments should not be one-time projects. Goals should be regularly re-evaluated as changes occur. For example, such changes might be in available technology, raw material supplies, environmental regulations, and economic climate. It should be noted that Section 49-31-12(4) of the Mississippi Code of 1972 requires an analysis and quantification of progress made in waste minimization and any amendments to the plan.

After the assessment team identifies the wastestreams and develops a checklist, they should then perform the facility walk-through. The assessment team members should familiarize themselves with the facility as much as possible. Although the collected information is critical to understanding the processes involved, seeing the actual operations of the facility is important. For example, a process unit may operate differently from the method originally described in the operations manual.

Changes not recorded in the flow diagrams or equipment lists may have been made to the equipment. The inspection resolves questions that surface during the preview period.

The facility walk-through also provides additional information to supplement information obtained earlier. Throughout the facility walk-through, team members should use the inspection checklist, ask questions about the items discussed above, and look for specific opportunities to reduce/minimize waste. They should verify information gathered during preassessment.

Assessment team members should talk with employees who operate processes and equipment and who perform maintenance and housekeeping activities. The employees experience and opinions are valuable concerning various waste reduction/minimization options. The assessment team members should review the data during or just after the facility walk through. This review can help identify missing or inaccurate information. They can make additions and corrections to the waste flow diagram and the overall data for completeness. They should examine each step in the manufacturing process from the delivery of the material to the storage of the final product.

For each wastestream the following information should be collected for inclusion in the plan:

1. Point of origin;
2. Subsequent handling/treatment/recycling/disposal;
3. Physical and chemical characteristics;
4. Quantity;
5. Rate of generation (i.e., lbs/unit of product);
6. Variations in generation rate;
7. Potential for contamination or upset; and
8. Cost to manage or dispose.

Once wastes are identified, they need to be quantified and costed as accurately as possible. Of great help in this activity are the reports which have to be submitted to regulatory authorities, such as biennial and annual hazardous waste generation reports and toxic release inventory reports. Another helpful source of determining hazardous waste quantities and costs are waste disposal manifests. For

nonhazardous waste, records are usually available of the number and cost of “pulls” of trash dumpsters and associated “tipping fees.” Further detail may have to be developed by having members of the team actually measure individual waste streams over a period of time to establish a generation rate. Estimates may be made by comparing material purchases with quantities of materials shipped as product components, the difference being waste. Identification of each current or potential wastestream is of paramount importance.

Once the causes of waste generation are understood, the assessment process enters the creative phase. The objective of this phase is to generate a comprehensive set of waste reduction/minimization options for further consideration. Consider every wastestream to be an opportunity until proven otherwise. Most of the time, an opportunity exists if a wastestream exists!

Following the collection of data and the facility walk-through, the assessment team members will have begun to identify possible ways to reduce/minimize waste in the assessed areas. Identifying potential options relies both on the expertise and creativity of the assessment team members. Much of the required knowledge may come from their education and on-the-job experience. However, technical literature, contacts, and other sources are always helpful.

Use available waste reduction/minimization information resources such as the Waste Reduction Resource Center for the Southeast (WRRC), or the EPA’s telephone hotlines and Pollution Prevention Information Exchange System (PIES). Appendix C contains a listing of recommended web sites that can assist in identifying what other facilities have done to reduce/minimize waste generation. The wheel need not be reinvented.

The hierarchy of identifying options should be source reduction options first, followed by recycling options with treatment as a final option. The reason for this hierarchy is that source reduction is the preferred means of reducing and minimizing waste. Assessment team members should consider treatment options only after they identify acceptable waste reduction/minimization techniques.

The options should be ranked, using the following hierarchy of environmental acceptability:

1. Source reduction options:
 - a. Improved operating practices;
 - b. Employee training and awareness programs;

- c. **Scheduling to eliminate frequent equipment cleaning;**
 - d. **Process or equipment improvements;**
 - e. **Input changes;**
 - f. **Changes in the composition or design of a product; and**
 - g. **Segregation of wastes.**
- 2. Recycling options:**
- a. **Return a waste into the originating process as a substitute for a raw material;**
 - b. **Use a waste as a raw material in another process;**
 - c. **Reclaim a waste for sale or use as a fuel; and**
 - d. **Utilize waste exchange services.**
- 3. Treatment option:**
- a. **Process a waste, hazardous or not, to reduce disposal cost and to minimize environmental damage.**

The facility management and assessment team members should encourage creativity and independent thinking throughout this process. Individual assessment team members will suggest many potential options on their own. The process, however, can be enhanced by using some techniques for group decisions (i.e., brainstorming or the nominal group technique). These techniques allow the assessment team to identify options that the individual members might not have suggested on their own.

The assessment team should list all the possible opportunities to reduce/minimize waste within the facility. The list may include several options for a single wastestream or process. At this stage in the assessment process, the assessors should not consider in detail the technical or economic aspects of any particular option. They should develop this list based on a broad range of general opportunities identified by asking questions. Assessment team members should use these basic questions as they identify specific opportunities to reduce/minimize waste.

- 1. Product design -- Does product design require use of hazardous materials in later stages of production? Could negotiation with the customer produce desirable changes in product formulation or design?**
- 2. Raw material substitutions -- Would different materials result in a less hazardous or less toxic product? Do raw materials require use of hazardous materials in later stages of production?**
- 3. Materials handling -- Is the form in which raw materials are received constraining design or processing? Are materials delivered in just-enough, just-in-time fashion?**
- 4. Changes in processes, equipment, or operations -- Would upgrading machinery result in less use or release of hazardous materials? Do production runs and schedules optimize the use of material?**
- 5. Housekeeping procedures -- What housekeeping or operational procedures cause problems later on?**
- 6. Maintenance procedures -- Is maintenance adequate, regularly scheduled, and implemented?**
- 7. Training procedures -- Are operators trained in (and using) the most efficient production processes?**
- 8. In-process recycling/reuse -- Are there ways to recycle materials within the production process for later reuse?**
- 9. Reclaiming, recycling, and reusing of wastestreams and scrap materials -- Are there ways to recycle materials outside the process, at the facility, in a way that minimizes the risk of release to the environment?**

The assessment team should then discuss the results of the first screening and the ranking of waste reduction/minimization actions with plant personnel and company management. The screening activity should promote the successful options for technical and economic feasibility analysis. A detailed analysis from both the technical and economic viewpoints is required to choose the waste reduction/minimization options which are to be implemented.

Technical evaluation is a determination of whether a proposed option will work, and whether there are any facility constraints or product requirements

which will cause it to be unwise or uneconomical to install and operate. The completed technical evaluation should be reviewed by ALL affected groups.

Economic evaluation should take into account the following factors:

- 1. Capital Costs:** If capital expenditures will be necessary, as accurate an estimate of the total installed cost as possible must be generated. Facilities with sizeable engineering departments probably have pre-set methods of estimating capital projects. Smaller facilities should be sure that the capital cost estimate includes ALL costs which will be incurred in getting the new process or equipment to the site, installed, and ready to operate.
- 2. Operating Costs:** In addition to reduction/minimizing waste disposal and raw material costs, there are a number of other factors (either positive or negative in net effect) which must be considered in operating cost estimates such as liability, compliance, and oversight costs.

The capital and operating cost estimates may now be used as the basis for arriving at a final recommendation by whatever method the facility normally uses for profitability analysis (i.e. return on investment, payback period, net present value).

During the screening procedure, the assessment team should consider the following questions:

- 1. What is the main benefit gained by implementing this option (e.g., economics, compliance, liability, workplace safety, etc.)?**
- 2. Does the necessary technology exist to develop the option?**
- 3. How much does it cost? Is it cost effective?**
- 4. Can the option be implemented within a reasonable amount of time without disrupting production?**
- 5. Does the option have a good “track record”? If not, is there convincing evidence that the option will work as required?**
- 6. Does the option have a good chance of success? (A successful start for a waste reduction/minimization program will gain wider acceptance as the program progresses.)**

7. What other benefits will occur?

These discussions should lead to the final ranking of the most reasonable options. Some options such as procedural changes may be inexpensive and quickly implemented without further evaluation. The screening procedure should account for ease of implementation. If an option is clearly desirable and inexpensive, the assessment team should promote it.

Operational, procedural, or materials changes to reduce/minimize waste without changing equipment should be implemented as soon as the potential cost savings have been determined. Installing a waste reduction/minimization project which involves equipment changes is essentially no different from any other capital improvement project. The phases of the project include planning, design, procurement, and construction.

Once the reduction/minimization techniques are identified, an implementation plan should be developed for each wastestream. The implementation plan should include an implementation schedule which takes into account equipment needs, conceptual design, implementation requirements, management requirements, and cost estimates.

The waste assessment tracks all wastes produced at a facility to find out where it was generated. When the tasks outlined above are completed, you should be ready to write into the waste minimization plan a description of technically and economically practical waste reduction/minimization options to be implemented and a planned schedule for implementation.

The implementation schedule and goals for the waste minimization plan should include:

- 1. Selecting alternatives for implementation (prioritize and list conditions for implementation);**
- 2. Identifying measurable performance goals for each wastestream;**
- 3. Establishing outcome objectives and ranges of acceptability;**
- 4. Identifying steps or phases and timing for implementation;**
- 5. Identifying tasks and personnel assignments;**
- 6. Training and involving all personnel in the facility; and**
- 7. Setting target dates for completion of goals.**

It is suggested that, in the identification of opportunities to eliminate waste

generation, three lists should be generated: one of reduction/minimization options considered, another of all options selected for a detailed review, and finally, a list of those options scheduled for implementation and the projected dates of implementation. Further, an explanation of why options considered were not implemented. And finally, identification of any positive or negative cross-media effects on the environment, public health and safety, and other waste reduction/minimization measures.

It is important to note that the waste assessment team should not consider the job complete until the recommended waste reduction/waste minimization measures are implemented. We all know the standard barriers to implementation:

Funding - - “there ain’t no money in the budget;”

Skepticism - - “it won’t work;”

The Status Quo - - “if it ain’t broke, don’t fix it.”

The waste reduction/minimization program has been designed and organized to meet the barriers head-on from the start by:

Obtaining high-level commitment;

Including representatives of all groups in the facility on the assessment team;

Careful analysis and evaluation of all options.

E. SECTION 49-31-21 (2) (e) -- WASTE MANAGEMENT COSTS

The waste minimization plan should identify “fully-loaded” waste management costs for all the wastes generated at the facility, factoring in liability, compliance, and oversight costs to the extent possible. The determination of the true cost of waste management includes:

- 1. Calculating the costs of the materials found in the wastestream based on the purchase price of those materials.**
- 2. Calculating the cost of managing the wastes that are generated, including costs for personnel doing recordkeeping, reporting, monitoring, training, inspections, manifesting, and labeling. Also costs for transportation,**

laboratory fees, penalties and fines, liability insurance, pollution control equipment, treatment and disposal, and any other waste management related cost should be included.

- 3. Estimating the cost of waste reduction/minimization including initial costs, amortization, depreciation, tax rebates, and payback potential.**
- 4. Estimating liability costs, especially long-term.**

It is suggested that, in the identification of waste management costs, an accounting system, which to the extent technically and economically feasible, should identify the following costs:

- 1. Cost of toxic substances used;**
- 2. Cost of waste recycling;**
- 3. Cost of waste disposal;**
- 4. Cost of waste storage;**
- 5. Cost of waste treatment;**
- 6. Cost of environmental liability; and**
- 7. Cost of compliance including oversight.**

F. SECTION 49-31-21 (2) (f) -- EMPLOYEE AWARENESS AND TRAINING PROGRAMS

Although a commitment should begin with management, production operators and line employees can often suggest improvements in the operations of the facility. They possess first-hand knowledge and experience with production and operation processes. They can assist especially in assessing operational or procedural changes, or in equipment modifications affecting the way they work.

Many facilities have set up “quality circles” to improve product quality and production efficiency. These quality circles consist of workers and supervisors who meet to propose and evaluate improvements. Quality circles involve the production people closely associated with the operations and foster participation and commitment to improvement. Several large facilities have gained successful

suggestions from quality circles for reducing/minimizing waste.

To reduce/minimize waste successfully, management must recognize the value of assessment and employee involvement. If management initiates the assessment and encourages employees to develop and implement a program, waste reduction/minimization changes will most likely occur in plant operations.

No waste reduction/minimization program can be successful without the full cooperation of all employees. Experience by other facilities has shown that cooperation can be achieved by training the workers, especially the supervisors, in the importance of waste reduction/minimization performance goals for the smallest practical operating entity (which could be an individual worker) and to provide incentives to the employees for achieving or surpassing those goals. The workers should participate in the setting of the goals and agree to them before they are brought to management for endorsement.

Secure employee commitment to waste reduction/minimization by training them in waste reduction/minimization procedures, encouraging them to come forth with ideas, asking them to participate in the setting of waste reduction/minimization goals and procedures, and by providing them with incentives to achieve those goals.

G. SECTION 49-31-21 (2) (g) -- ESTABLISHMENT OF PERFORMANCE GOALS

The objective of a waste reduction/minimization measure is to reduce/minimize the quantity of waste and the costs incurred when wastes are generated. To demonstrate that these objectives have been achieved is essential to the on-going waste reduction/minimization program. The following are some useful measurements:

1. Savings in raw materials and waste disposal cost.
2. Quantities of waste generated before and after implementation.
3. Ratio of waste generated to production rate, before and after implementation.
4. Ratio of raw materials consumed to production rate, before and after implementation (an indirect measure of waste reduction/minimization).

Measuring waste reduction/minimization by comparing quantity of waste or input materials to production rate is generally more useful if applied to a single production unit rather than to an entire facility. This is especially true of facilities where dissimilar processes and operations are included in one facility. Wastes generated on a periodic basis, such as waste from maintenance or construction, should be considered apart from production wastes, unless the evaluation includes at least one repetition of the periodic cycle. One measure of effectiveness for a waste

reduction/ minimization project is the project's effect on the facility's cash flow. The project should pay for itself through reduced waste management costs and reduced raw materials costs. However, measuring the actual reduction/ minimization of waste is also important. The easiest way to measure waste reduction/minimization is by recording the quantities of waste generated before and after a waste reduction/ minimization project has been implemented. The difference, divided by the original rate of waste generation, represents the percentage of waste reduced/minimized. However, this simple measurement ignores other factors also affecting the quantity of waste generated.

In general, waste generation directly depends on the production rate. Therefore, the ratio of waste generation rate to production rate is a convenient way to measure waste reduction/minimization. Expressing waste reduction/minimization in terms of the ratio of waste to production rates is not free of problems, however. One of these problems is the danger of using the ratio of infrequent large quantities to the production rate. In general, a distinction should be made between production-rated wastes, maintenance-related wastes, and clean-up wastes.

Also, a few waste streams may be inversely proportional to production rate. For example, a waste resulting from outdated input materials is likely to increase if the production rate decreases. This change occurs because the age-dated materials in inventory are more likely to expire when their use in production decreases. For these reasons, care must be taken when expressing the extent of waste reduction/ minimization. This requires that the means by which wastes are generated be well understood.

In measuring waste reduction/minimization, businesses should measure the total quantity of an individual waste stream as well as the individual waste components. Many businesses have greatly reduced/minimized the quantities of waste disposed. In these instances, good housekeeping and concentrating a dilute aqueous waste has been reasonable for much of the reduction/minimization. Although concentration, as such, does not fall within the definition of waste reduction/minimization, practical benefits result from concentrating wastewater streams, including decreased disposal costs. Concentrating a waste stream makes it easier to recycle and lessens the load if a facility's current wastewater treatment system is overloaded.

Obtaining good quality data for wastestream quantities, flows, and composition can be costly and time consuming. For this reason, in some instances, expressing waste reduction/minimization indirectly in terms of the ratio of input materials consumption to production rate may be more practical. These data are easier to obtain although the measure is not direct.

Measuring waste reduction/minimization with a ratio of waste quantity to material throughput or product output is generally more meaningful for specific operations rather than for an entire facility. Therefore, preserving the focus of the waste

reduction/minimization initiative when measuring and reporting progress is important. For those operations without chemical reactions, measuring progress with the ratio of input material quantity to material throughput or production rate may be helpful.

It is important to understand that a single method of measuring performance goals must be selected for use. If one does not, the results obtained may be meaningless. One may not be able to compare results due to the “apples” vs “oranges” syndrome.

It is suggested that each generator explain the rationale for each performance goal, implement waste reduction/minimization options that are technically and economically feasible, and explain how you arrived at your decision. The rationale for a particular performance goal should address any impediments to hazardous and nonhazardous waste reduction/minimization, including but not limited to the following:

- 1. The availability of technically practical waste reduction/minimization methods, including any anticipated changes in the future.**
- 2. Previously implemented reductions/minimization of waste.**
- 3. The economic practicability of available waste reduction/minimization methods, including any anticipated changes in the future. Examples of situations where hazardous waste reduction/minimization may not be economically practical include but are not limited to:**
 - a. For valid reasons of prioritization, a particular facility has chosen first to address other more serious hazardous waste reduction/minimization concerns.**
 - b. Necessary steps to reduce/minimize hazardous waste are likely to have significant adverse impacts on product quality.**
 - c. Legal or contractual obligations interfere with the necessary step that would lead to hazardous waste reduction/minimization.**

It is suggested that any impediments to nonhazardous solid waste reduction/minimization be included also. Example:

- a. Lack of economics or the availability of markets for potentially recyclable goods, i.e., anything from wood pallets to office waste paper.**

To insure continued program effectiveness, a facility must monitor and evaluate techniques once they are in place. The program should address updating procedures as well as combining the program into the management structure. In

addition, the program should be dynamic to allow for production change and development of new waste reduction/minimization techniques.

Waste assessment and planning offer ways to improve management of a waste reduction/minimization program and introduce new technologies and practices. Much of the planning necessary for a waste reduction/minimization program requires:

- 1. Increased awareness and attention to hazardous chemicals;**
- 2. Increased awareness and training to change old work patterns;**
- 3. Knowledge of options for change;**
- 4. Management's willingness to provide resources for change; and**
- 5. Willingness to follow through, evaluate, and learn from such changes.**

Management commitment to the change makes the difference between simply preparing a plan, and preparing and implementing a plan. Implementation is the key, since the Mississippi Multimedia Waste Minimization Act requires annual progress reports summarizing progress made in implementing both the general and numerically specific objectives set out in your plan.

Since changes seldom occur as planned, and facilities change over time, you need a way to maintain your waste minimization plan to keep it a useful document. This will mean long-term management support which will include staying abreast of the waste reduction/minimization program and making changes as needed.

APPENDIX A

MISSISSIPPI MULTIMEDIA POLLUTION PREVENTION ACT

CHAPTER 31 OF TITLE 49 OF THE MISSISSIPPI CODE OF 1972

Chapter 31. Mississippi Multimedia Pollution Prevention Act

SEC. 49-31-1. Short title.

This chapter shall be known and may be cited as the "Mississippi Multimedia Pollution Prevention Act."

SOURCES: Laws, 1990, ch. 507, Sec. 1, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 1, eff from and after July 1, 1994

SEC. 49-31-3. Legislative findings.

The Legislature finds that:

- (a) Inefficient and improper methods of managing waste create hazards to public health, cause pollution of the air and water resources and constitute a waste of natural resources;
- (b) Problems in preventing pollution are statewide in scope and necessitate state action in improving methods and processes to promote more efficient methods of managing and reducing the waste generated in the state;
- (c) The economic and population growth of our state and improvements in the standard of living enjoyed by our population have required increased industrial production which, coupled with expanding commercial and agricultural operations, have resulted in a rise in the amounts of waste generated;
- (d) State government should take a pro-active role to assist business, industry, academic institutions, governmental entities and the citizens of the state in the development of a coordinated pollution prevention program that addresses the need for both environmental protection and economic growth;
- (e) There are significant opportunities for business, industry, academic institutions and governmental entities to eliminate or reduce the generation of waste at the source through cost-effective pollution prevention technologies and procedures. Use of these technologies and procedures offers business, industry, academic institutions and governmental entities savings in materials, waste management and liability costs;
- (f) The opportunities for pollution prevention are often not realized because existing regulations focus more upon treatment and disposal than pollution prevention and do not emphasize multimedia management of waste; and
- (g) Pollution prevention is the ultimate goal in waste management. The use of pollution prevention policies and technologies as an integral part of the waste management system, thereby reducing the need for the creation of additional management capacity, is strongly endorsed.

SOURCES: Laws, 1990, ch. 507, Sec. 2, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 2, eff from and after July 1, 1994

SEC. 49-31-5. Legislative intent.

- (1) It is the intent of the Legislature to promote pollution prevention, require state agency recycling programs, encourage the recycling industry and promote public education on waste management issues.
- (2) The Legislature declares it to be the policy of the State of Mississippi that the generation of waste should be reduced or eliminated at the source, whenever feasible; waste that is generated should be recycled or reused whenever feasible; waste that cannot be reduced or recycled should be treated in an environmentally safe manner; and disposal or other permitted release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.
- (3) The state's goal is to reduce the quantity of waste generated within Mississippi by a minimum of twenty-five

percent (25%) by January 1, 1996. For purposes of measuring the reduction of hazardous waste, the department shall use as a baseline the quantity of hazardous waste generated, as reported for the 1989 calendar year. For purposes of measuring the reduction of nonhazardous solid waste, the department shall use as a baseline information submitted to the State Tax Commission pursuant to Section [17-17-219](#) for the 1992 calendar year. For other wastes, the department shall establish a baseline.

SOURCES: Laws, 1990, ch. 507, Sec. 3, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 3, eff from and after July 1, 1994

SEC. 49-31-7. Purposes of chapter.

The purposes of this chapter are:

- (a) To establish state policy with regard to the role of pollution prevention and recycling in waste management;
- (b) To promote pollution prevention, reuse and recycling of waste in lieu of treatment or disposal of waste;
- (c) To require all state agencies to aid and promote the development of recycling through the establishment of recycling programs;
- (d) To require all state agencies to aid and promote the development of recycling through the establishment of policies for the procurement of goods containing recycled materials;
- (e) To establish statewide pollution prevention and waste reduction goals;
- (f) To provide for the creation and administration of the Mississippi Multimedia Pollution Prevention Program;
- (g) To promote pollution prevention through the requirement of educational curricula for primary and secondary schools;
- (h) To foster the education of the general public and the training of waste management professionals to reduce the production of waste, to prevent pollution and to encourage recycling;
- (i) To establish and maintain a cooperative state program of planning and technical and financial assistance for the use of pollution prevention and recycling in waste management;
- (j) To mandate waste minimization planning by certain generators and facility operators for the reduction of waste;
- (k) To encourage the development of pollution prevention and recycling programs as a means of managing waste and conserving resources through planning, grants, technical assistance and other incentives;
- (l) To encourage local governments to develop and implement recycling programs within their jurisdictions to return valuable materials to productive use and to protect capacity at waste management facilities;
- (m) To further the development of the state's recycling industry by promoting the successful development of markets for recycled items; and
- (n) To provide for the funding of the Mississippi Multimedia Pollution Prevention Program through the establishment of a pollution prevention fee.

SOURCES: Laws, 1990, ch. 507, Sec. 4, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 4, eff from and after July 1, 1994

SEC. 49-31-9. Definitions.

For purposes of this act the following terms shall have the meanings ascribed to them in this section or in Section [17-3](#) unless the context clearly indicates otherwise:

- (a) "Department" means the Department of Environmental Quality.
- (b) "EPCRA" means the Emergency Planning and Community Right-To-Know Act, Public Law 99-499, as amended.
- (c) "Facility operator" means an operator of a facility required to file a report of toxic chemical releases under Section 313 of EPCRA.
- (d) "Generator" means any person whose act or process produces waste.
- (e) "Multimedia" means all environmental media including, but not limited to air, water and land.
- (f) "Pollution prevention" means any action taken by business, industry, government or individual consumers to conserve natural resources while providing and using needed products in a manner that prevents or reduces the generation, disposal or release of pollutants to the environment. Pollution prevention does not include dewatering, dilution or evaporation before handling, release, storage, treatment or disposal of hazardous waste.
- (g) "Recovered materials" means those materials having known recycling potential, which can be feasibly recycled and have been diverted or removed from the waste stream for sale, use or reuse, by separation, collection or processing.
- (h) "Recyclable materials" means those materials which are reasonably capable of being recycled and which would otherwise be processed or disposed of as waste.
- (i) "Recycling" means the use, reuse or reclamation of a waste. Recycling does not include the burning of waste as a fuel for the recovery of energy or the use of waste treatment technologies.
- (j) "Waste" means sewage, industrial wastes, oil field wastes, and all other liquid, gaseous, solid or other substances which may pollute the lands, waters or air of the state.
- (k) "Waste minimization" means the reduction, to the extent feasible, of waste that is generated or subsequently treated, stored or disposed of. It includes any source reduction or recycling activity undertaken by a generator or facility operator that results in either (i) the reduction of total volume or quantity of waste, or (ii) the reduction of toxicity or other characteristics of hazardous waste, or both, so long as the reduction does not result in the displacement of pollutants from one medium to another and is consistent with the goal of minimizing present and future threats to human health and the environment.

SOURCES: Laws, 1990, ch. 507, Sec. 5, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 5, eff from and after July 1, 1994

SEC. 49-31-11. Mississippi Multimedia Pollution Prevention Program; purposes; rules and regulations; promotion of alternative to waste disposal.

(1) There is hereby created in the Department of Environmental Quality, the Mississippi Multimedia Pollution Prevention Program, herein referred to as "program," for the following purposes:

- (a) To compile, organize and make available for distribution information on pollution prevention and recycling technologies and procedures;
 - (b) To sponsor and conduct conferences and workshops on pollution prevention and recycling;
 - (c) To facilitate and promote the transfer of pollution prevention and recycling technologies and procedures among business, industry, academic institutions and governmental entities;
 - (d) To provide funds, as may be appropriated or otherwise made available therefor, to business, industry, academic institutions, private organizations and governmental entities:
 - (i) To conduct demonstration or pilot programs utilizing innovative pollution prevention and recycling technologies and procedures;
 - (ii) To defray costs of basic and applied research on pollution prevention and recycling; and
 - (iii) To subsidize costs of conducting pollution prevention potential analyses and studies, and developing, purchasing and implementing pollution prevention and recycling technologies and procedures or for other related purposes; - (e) To develop the necessary programs, information and materials:
 - (i) To collect data to assist in establishing program priorities and evaluation of the progress of pollution prevention and recycling;
 - (ii) To train business, industry, academic institutions and governmental entities to promote and provide information about pollution prevention and recycling practices and their applicability; and
 - (iii) To establish and implement waste exchange programs;
 - (f) To increase public education and public awareness of waste management issues;
 - (g) To provide pollution prevention and recycling technical assistance to industries, businesses and local governments; and
 - (h) To participate in state, federal and industrial networks of individuals and groups actively involved in pollution prevention and recycling activities and promotion.
- (2) The Commission on Environmental Quality may adopt, modify, repeal and promulgate, after due notice and hearing, and where not otherwise prohibited by federal or state law, to make exceptions to and grant exemptions and variances from, and to enforce rules and regulations implementing or effectuating the powers and duties of the commission under this chapter.
- (3) The Commission on Environmental Quality shall promote pollution prevention, recycling, reuse of wastes, in lieu of treatment and disposal of such wastes.

SOURCES: Laws, 1990, ch. 507, Sec. 6, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 6, eff from and after July 1, 1994

SEC. 49-31-13. Comprehensive study of status of pollution prevention and recycling activities.

(1) By July 1, 1996, the department shall complete a comprehensive study of the status of pollution prevention and recycling activities in Mississippi. The study shall address, but not be limited to, the following:

(a) The types and quantities of wastes generated in the state, the existing system for management of wastes, and pollution prevention and recycling efforts to date in the state;

(b) The advisability, feasibility and potential impacts of waste stream reduction through statutory restraints;

(c) The identification of key business, industry, academic institutions and governmental entities which should receive priorities in technical assistance;

(d) The establishment of the program priorities, objectives, missions and goals for pollution prevention and recycling in the state, including a methodology for assessing the efficiency and effectiveness of the program in attaining program goals and objectives;

(e) The development of a methodology to assess progress in minimizing waste, preventing pollution and recycling in the state; and

(f) Any other information deemed necessary by the department to carry out the purposes of this chapter.

(2) The study shall be updated not less than once every five (5) years.

SOURCES: Laws, 1990, ch. 507, Sec. 7, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 7, eff from and after July 1, 1994

SEC. 49-31-15. State agencies, branches and institutions to establish recycling programs and source reduction programs.

It shall be the duty of each state agency, the judicial branch of state government, the state institutions of higher learning and community colleges by July 1, 1992, to:

(a) Establish a program, in cooperation with the Department of Environmental Quality and the Department of Finance and Administration, for the collection of recyclable materials as determined by the Department of Environmental Quality, generated in state offices throughout the state.

(b) Provide procedures for collecting and storing recyclable materials, containers for storing recyclable materials and contractual arrangements with buyers of recyclable materials.

(c) Evaluate the amount of recyclable materials recycled and make all necessary modifications to the recycling program to ensure that recyclable materials, as determined by the Department of Environmental Quality, are effectively and practically recycled.

(d) Establish and implement, in cooperation with the Department of Environmental Quality and the Department of Finance and Administration, a source reduction program for materials, as determined by the Department of Environmental Quality, used in the course of agency operations. The program shall be designed and implemented to achieve the maximum feasible source reduction of waste as a result of agency operations.

SOURCES: Laws, 1990, ch. 507, Sec. 8, eff from and after June 1, 1990.

SEC. 49-31-17. Department of Economic and Community Development to assist and promote recycling industry; Recycling Market Development Council; report of actions

required to facilitate development and expansion of markets for materials and products recovered from solid waste; annual reports on recycling activities.

(1) The Department of Economic and Community Development shall assist and actively promote the recycling industry in the state. Assistance and promotion of the recycling industry shall include, but is not limited to:

- (a) Identification and analysis, in cooperation with the Department of Environmental Quality, of components of the state's recycling industry and present and potential markets for recyclable materials in the state or other states;
- (b) Provision of information on the availability and benefits of using recycled materials to business, industry, academic institutions and governmental entities within the state;
- (c) Distribution of any material prepared in implementing this section to business, industry, academic institutions, governmental entities and the general public upon request; and
- (d) Active promotion of the present markets and development of the potential markets of recyclable materials through the resources of the Department of Economic and Community Development.

(2) By July 1, 1991, the Department of Economic and Community Development shall prepare a report assessing the recycling industry and recyclable materials markets in the state.

(3)

(a) There is created a fourteen-member Recycling Market Development Council to be appointed as follows:

- (i) Five (5) members appointed by the Governor representing the paper, glass, aluminum, plastic, and ferrous and nonferrous metal industries, and trade associations which are active in recycling;
- (ii) One (1) member appointed by the Governor representing a statewide, chartered public interest group;
- (iii) One (1) member who is an elected city official to be appointed by the Governor;
- (iv) One (1) member who is an elected member of a county governing authority to be appointed by the Governor;
- (v) One (1) member designated by the Speaker of the House of Representatives;
- (vi) One (1) member designated by the President of the Senate;
- (vii) One (1) member appointed by the Governor representing the private recycling industry; and
- (viii) One (1) representative each from the Department of Finance and Administration, the Department of Environmental Quality and the Department of Economic and Community Development.

(b) The chair of the council shall be elected by the membership. The council shall adopt operating procedures and shall meet on the call of the chair or on the call of a majority of the members. A majority of the members shall constitute a quorum to do business. The Department of Economic and Community Development shall provide the necessary staff, administrative facilities and services to the council.

(c) The members shall be appointed by September 1, 1991, and the council shall convene by October 1, 1991.

(4) The council shall determine what actions, if any, are needed to facilitate the development and expansion of markets for materials and products recovered from solid waste in the state and shall prepare a report with

recommendations to the Governor and the Legislature. The report shall be due on January 1, 1993, and shall include, at a minimum, the following:

- (a) A description and analysis of the state's existing recycling industry, the types and estimated amounts of recovered materials being separated or reprocessed;
- (b) An analysis of the projected long-term capacity of existing markets to absorb materials generated by source separation, recovery or recycling programs;
- (c) An analysis of potential markets in the state, in other states or in foreign countries for source-separated or recovered materials or products from the state;
- (d) An analysis of institutional, economic and technical barriers to the use of source-separated or recovered materials or products;
- (e) Recommendations for actions which may be taken to increase demand for source-separated and recovered materials or products;
- (f) Recommendations for actions which may be taken to increase the incentives for private individuals and for business and industry to source-separate and recover materials;
- (g) Recommendations on categories of materials which should be source-separated and recovered in the state, given existing and potential markets for such materials;
- (h) Recommendations for a public education program to be implemented by the Department of Environmental Quality to provide information to the public and to business and industry on the benefits of source separation, recovery and recycling and on the availability of those materials or products;
- (i) A study of methods of source separation, recycling and disposal of household waste; and
- (j) A study of packaging reduction.

(5) Following its initial report, the council shall submit to the Governor and to the Legislature by the end of each calendar year an annual report on recycling activities within the state which shall, at a minimum, include the following:

- (a) Any revisions which the council determines are necessary to its initial report;
- (b) An analysis of changes that have occurred with markets for recovered materials since the last report;
- (c) Any other recommendations to facilitate the development of markets for source-separated and recovered materials in the state.

(6) Subsections (3), (4) and (5) of this section shall stand repealed on January 31, 1996.

SOURCES: Laws, 1990, ch. 507, Sec. 9, eff from and after June 1, 1990. Laws, 1991, ch. 494 Sec. 4, eff from and after passage (approved April 1, 1991).

SEC. 49-31-19. Department of Education to develop waste minimization awareness program; program of student instruction in minimization of waste.

(1) On or before July 1, 1991, the Department of Education is directed to develop curriculum, including materials

and resource guides, for a waste minimization awareness program at the elementary and secondary levels of education.

(2) In order to orient students and their families to the minimization of waste and to encourage the participation of schools, communities and families in waste minimization programs, the school board of each school district in the state shall provide a program of student instruction in the minimization of waste materials on or before September 1, 1992. The instruction shall be provided at both the elementary and secondary levels of education.

SOURCES: Laws, 1990, ch. 507, Sec. 10, eff from and after June 1, 1990.

SEC. 49-31-21. Generators of hazardous waste to provide waste minimization plans; contents of plan; annual update; review of plan; report of wastes generated and minimized.

(1) No later than January 1, 1992, the department shall require waste minimization plans to be provided by each generator of hazardous waste who is regulated as a large quantity generator or a small quantity generator under Mississippi hazardous waste management regulations and each facility operator required to file a report under Section 313 of EPCRA. The generators and facility operators shall provide a plan for each site where waste is generated or chemicals are released.

(2) Waste minimization plans for large quantity generators and for facility operators required to file a report under Section 313 of EPCRA, shall include, at a minimum:

(a) A written policy describing ownership and management support for pollution prevention and waste minimization and implementation of the plan;

(b) The scope and objectives of the plan, including the evaluation of technologies, procedures and personnel training programs to ensure waste minimization;

(c) An explanation and documentation of waste minimization efforts completed or in progress before the first reporting date;

(d) An analysis of waste streams, and identification of opportunities to eliminate waste generation. The analysis shall include review of individual processes and facilities and other activities where wastes may be generated, evaluation of data on the types, amounts and hazardous and toxic constituents of waste generated, and potential waste minimization techniques applicable to those wastes;

(e) An identification of waste management costs;

(f) An identification of employee awareness and training programs to involve employees in waste minimization planning and implementation to the maximum extent feasible;

(g) The establishment of performance goals for the minimization of wastes which shall be expressed in numeric terms, to the extent practicable.

(3) The department shall develop appropriate, but less stringent, requirements for waste minimization plans to be prepared by small quantity generators.

(4) All generators and facility operators required to prepare a waste minimization plan shall update annually their waste minimization plan. The annual update shall include at a minimum:

(a) An analysis and quantification of progress made, if any, in waste minimization, relative to each performance goal

established under subsection (2)(g) of this section; and

(b) Any amendments to the waste minimization plan and an explanation of the need for the amendments.

(5) For purposes of this section, a generator or facility operator shall permit the department or its designee to review the waste minimization plan.

(6) From the waste minimization plan and each annual update, the generator or facility operator shall submit to the department a certified report of the types and quantities of wastes generated, and the types and quantities of wastes minimized. To the extent practicable, the department shall coordinate the submission of this certified report with other reporting requirements placed on large quantity and small quantity hazardous waste generators and facility operators.

(7) The certified report shall include a narrative summary explaining the waste generation and minimization data, a description of goals and progress made in minimizing the generation of wastes, and a description of any impediments to the minimization of wastes.

SOURCES: Laws, 1990, ch. 507, Sec. 12, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 8, eff from and after July 1, 1994

SEC. 49-31-23. Multimedia Pollution Prevention Fund.

(1) There is hereby created in the State Treasury a fund to be designated as the Multimedia Pollution Prevention Fund, hereinafter referred to in this section as "fund," which may be used for:

(a) Pollution prevention and recycling activities of the department, such as the administration of the multimedia pollution prevention program and its components and the collection and analysis of data received pursuant to section 313 of EPCRA;

(b) Pollution prevention and recycling technical assistance to business, industry, academic institutions and governmental entities;

(c) Planning and implementing waste management education and outreach programs with emphasis on pollution prevention and recycling;

(d) Pollution prevention and recycling research and development projects;

(e) Demonstration projects aimed at pollution prevention and recycling; or

(f) Any other purposes consistent with this chapter as determined by the department.

(2) Expenditures may be made from the fund upon requisition by the executive director of the department.

(3) The fund shall be treated as a special trust fund. Interest earned on the principal therein shall be credited by the Treasurer to the fund.

(4) The fund may receive monies from any available public or private source, including, but not limited to, collection of fees, interest, grants, taxes, public and private donations, oil overcharge refunds or rebates, and appropriated funds.

SOURCES: Laws, 1990, ch. 507, Sec. 13, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 9, eff from and after July 1, 1994

SEC. 49-31-25. Pollution prevention fee; penalty for failure to pay.

(1) There is imposed upon each large quantity generator and each small quantity generator that is regulated under the Mississippi hazardous waste management regulations and each facility operator, a pollution prevention fee. The fee upon each large quantity generator and each small quantity generator shall be measured by the quantity of hazardous waste which that generator generates annually. The fee upon each facility operator shall be measured by the quantity of chemicals which each facility releases annually and reports pursuant to Section 313 of EPCRA. For a fee payer that is both a large quantity hazardous waste generator and a facility operator, the fee shall be measured by adding the quantity of fugitive and stack air emissions reported under Section 313 of EPCRA plus the quantity of hazardous waste generated annually. For a fee payer that is both a small quantity hazardous waste generator and a facility operator, the fee shall be measured by the quantity of chemicals released as reported pursuant to Section 313 of EPCRA. The fee shall be assessed in an amount according to the following schedule:

TONS GENERATED/RELEASED			ANNUAL FEE
0.01	to	9.99	\$ 250.00
10.00	to	99.99	\$ 500.00
100.00	to	999.99	\$ 1,500.00
1,000.00	to	9,999.99	\$ 2,500.00
10,000.00	to	49,999.99	\$ 10,000.00
50,000.00	and above		\$ 50,000.00

specified by the department in the invoice which shall be no less than thirty (30) days following receipt of an invoice from the department, whichever is later. The fee shall be based on the quantity of hazardous waste generated and/or chemicals released during the preceding calendar year. The department shall annually prepare an invoice for the amount of the pollution prevention fee due from each generator or facility operator and furnish it to each generator or facility operator. The proceeds of the fee shall be deposited into the Multimedia Pollution Prevention Fund created in Section [49-31-23](#).

(2) From and after July 1, 1995, the department shall exclude from the calculation of the pollution prevention fee any hazardous waste recycled on-site or shipped off-site for recycling as reported on the Mississippi Annual Hazardous Waste Report or its equivalent and any chemicals recycled on-site or shipped off-site for recycling as reported under Section 313 of EPCRA. The hazardous waste generator or the facility operator shall submit any information the department deems necessary to substantiate that the hazardous waste or chemicals were recycled.

(3) At the discretion of the commission, a generator or facility operator shall be liable for a penalty not to exceed three (3) times the amount of the fee due and payable for failure to pay the fee on or before the due date, plus the amount necessary to reimburse the cost of collection.

(4) From and after July 1, 1995, the department shall exclude from any calculation of pollution prevention fee any hazardous waste or chemical for which a Title V permit fee is assessed to the same generator or facility operator.

SOURCES: Laws, 1990, ch. 507, Sec. 14, eff from and after June 1, 1990. Laws, 1994, ch. 637 Sec. 10; 1995, ch. 560, Sec. 1, eff from and after passage (approved April 6, 1995).

APPENDIX B

**INFORMATION FOR WASTE REDUCTION AND
POLLUTION PREVENTION ACTIVITIES**

APPENDIX B

INFORMATION FOR WASTE REDUCTION AND POLLUTION PREVENTION ACTIVITIES

A. SOURCES OF INFORMATION

- 1. The Mississippi Department of Environmental Quality
Environmental Permits Division
Harry Wilson – Division Chief
Harry_Wilson@deq.state.ms.us
P. O. Box 2261
Jackson, MS 39225
601-961-5073
601-961-5703 Fax**

**Richard Harrell, P.E., DEE
Management Support Branch/EPD
Richard_Harrell@deq.state.ms.us
601-961-5343
601-961-5703 Fax**

**Khairy Abu-Salah – P.E., BCEE
Pollution Prevention Multimedia Technical Assistance/EPD
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601-961-5284
601-961-5703 Fax**

**John David Burns – State TRI Coordinator/ Solid Waste Recycling/EPD
John_D_Burns@deq.state.ms.us
601-961-5005
601-961-5703 Fax**

- 2. The Mississippi Department of Environmental Quality
Environmental Resource Center
Tom Whitten, Director
P.O. Box 2249
Jackson, MS 39225
601-961-5241
601-961-5660 Fax**

**Jesse Thompson, Director
Small Business Ombudsman and MDEQ Ombudsman/ERC
Jesse_Thompson@deq.state.ms.us
601-961-5167
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Small Business Ombudsman and MDEQ Ombudsman/ERC
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601-961-5166
601-961-5660 Fax**

**Coen Perrott, Environmental Scientist
Environmental Resource Center
Coen_Perrott@deq.state.ms.us
601-961-5374
601-961-5660 Fax**

**Jennifer Kimbrough, Special Project Officer
Small Business Ombudsman and MDEQ Ombudsman/ERC
Jennifer_Kimbrough@deq.state.ms.us
601-961-5676
601-961-5524 Fax**

- 3. Mary Jean Gates, P.E., R.E.M. – Engineer, Technical Assistance
ESCOM, Inc.
P. O. Box 1152
Cleveland, MS 38732
maryjeangates@bellsouth.net
662-846-0448 phone
662-846-0448 fax**

- 4. Waste Reduction Resource Center for the Southeast (WRRC)
1639 Mail Service Center
Raleigh, NC 27699-1639
800-476-8686
E-Mail: Wrrc@p2pays.org**

APPENDIX C

RECOMMENDED WEB SITES

APPENDIX C

RECOMMENDED WEB SITES

MDEQ http://www.deq.state.ms.us/MDEQ.nsf/page/ERC_pollution_prevention?OpenDocument

EPA <http://www.epa.gov/opptintr/p2home/index.html>

Waste Reduction Resource Center <http://wrrc.p2pays.org>

Pollution Prevention Resource Exchange <http://www.p2rx.org>

Region 4 DOD/EPA/State Pollution Prevention partnership

<http://wrrc.p2pays.org/DODPartnership/>

The Defense Environmental Network & Information Exchange <https://www.denix.osd.mil>

The Department of Defense's Joint Service Pollution Prevention Technical Library

<http://environ.nfesc.navy.mil/p2library/>

Small Business Assistance <http://smallbiz-enviroweb.org/pollution.html>

EPA Asbestos & Small Business Ombudsman <http://www.epa.gov/ormisbol/whois.htm>

Enviro\$en\$e-Assisting Pollution Prevention Implementation.url <http://es.epa.gov/index.html>

Mississippi Materials Exchange –

http://www.deq.state.ms.us/MDEQ.nsf/page/Main_home?OpenDocument

(Then click on “Topics”, then “Recycling”).

APPENDIX D

SAMPLE POLICY STATEMENTS

POLICY STATEMENT EXAMPLES

Issue a Waste Reduction Policy Statement

All employees need to be made aware of the need for waste reduction and the contribution that each individual can make. This can best be accomplished by issuing a policy statement on waste reduction. The policy should be issued by senior management and discussed with all employees to ensure commitment. Some of the major points that could be covered in the policy statement are listed below:

- **(Your Company)'s policy is to reduce all hazardous and nonhazardous waste to the minimum levels economically and technically practical and to be in full compliance with all Federal and State waste regulations;**
- **As both a responsible citizen and (Company Name) employee, each individual is responsible for reducing waste during working hours, for complying fully with all waste reduction program goals established by the company, and for not violating any Federal or State waste regulations.**
- **Employees are urged to come forth with suggestions for further reducing waste in their own work area and in any other areas about which they may have ideas.**
- **Mr./Ms. _____ has been given overall company responsibility for establishing the training programs and operating procedures required to implement this policy.**

Another sample:

(Your Company) advocates a clean and safe environment. Its policy is to minimize the generation of hazardous and nonhazardous solid wastes and, insofar as possible, to eliminate air and water pollutants. It seeks the help of all employees in the achievement of these objectives. Further, (Company Name) wants its employees to be fully aware of all hazardous and potentially dangerous chemicals or equipment used in the work place and to use them in a completely safe manner. Finally, it is (Company Name)'s desire to operate in full compliance with all applicable Federal and State environmental regulations.

Another sample:

(Your Company) is committed to excellence and leadership in protecting the environment. In keeping with this policy, our objective is to reduce waste and emissions. We strive to minimize adverse impact on the air, water, and land through excellence in waste reduction. By successfully reducing waste at its source, we can achieve cost savings, increase operational efficiencies, improve the quality of our products and services, and maintain a safe and healthy workplace for our employees. Secondly, (your company) promotes environmentally sound recycling, reuse, and reclamation of all waste streams.

(Your company's) environmental guidelines include the following:

***Environmental protection is everyone's responsibility. It is valued and displays commitment to (your company).**

***Reducing and eliminating the generation of waste and emissions at the source is a prime consideration in research, process design, and plant operations. (Your company) is committed to identifying and implementing waste reduction opportunities through encouragement and involvement of all employees.**

***Technologies and methods which substitute nonhazardous materials and utilize other source reduction approaches will be given top priority in addressing all environmental issues.**

***(Your company) seeks to demonstrate its corporate citizenship by adhering to all environmental regulations. We promote cooperation and coordination between industry, government, and the public toward the shared goal of reducing waste at its source and recycling in an environmentally sound manner.**

Another Sample:

At (Your Company), protecting the environment is a high priority. We are pledged to eliminate or reduce, wherever possible: 1) our use of toxic substances; 2) our release of toxic pollutants; and 3) our generation of hazardous and other wastes. When wastes or releases cannot be avoided, we are committed to recycling, treatment, and disposal in ways that minimize any undesirable impacts on the air, water, and land.

Policy Statements

- I. **(Company Name) and all its employees are committed to a sound environmental program directed to bring hazardous and all waste to the lowest level, using the best available technology.**
- II. **(Company name) is committed to protecting the environment. We will pledge to practice waste reduction with an emphasis on pollution prevention. This policy should curb all waste generation, thus enhancing profitability.**
- III. **(Company name) is committed to excellence in environmental protection. Our policy is to constantly seek opportunities in source reduction, thereby achieving advantages in cost minimization, operational efficiencies, and quality. This reaffirms our goals to provide a safe and healthy environment for the growth of our employees and neighbors in the community.**
- IV. **(Company name) and its employees are committed to preserving our environment through an innovative waste reduction program. Utilizing the latest waste reduction techniques, employee involvement, and top management support, we pledge to reduce generation of hazardous and other wastes to the maximum possible extent.**
- V. **As a steward of the public, (Company name) advocates maintaining a clean and safe environment through minimizing the generation of hazardous and industrial waste.**
- VI. **(Company name) is committed to excellence and leadership in protecting the environment. It seeks the help of all employees in the achievement of these objectives. We strive to minimize adverse impact on the air, water, and land through excellence in waste reduction. Finally, it is (Company name)'s desire to operate in full compliance with all applicable federal and state environmental regulations.**
- VII. **It shall be the policy of this company to bring about effective waste reduction by use of available technology in a manner that will enhance job security, regulation compliance, and provide continual effort in this direction.**
- VIII. **The policy of this company is to eliminate, reduce, recycle, substitute to user friendly products in order to provide for a safe and sound environment. Our policy is to protect the environment via employee participation and waste reduction.**

APPENDIX E
WORKSHEETS

Pre-Assessment Questionnaire

1. GENERAL PLANT INFORMATION

Company name: _____

Company address: _____

Company contact: _____

Telephone number: _____ Company SIC code(s): _____

Number of shifts: _____

2. PRODUCTS AND PROCESSES

Number of employees: _____

Square footage of facility: _____

2.1 Describe your firm's products and/or services:

2.2 Please check off which of the following information is available:

Facility layout diagrams: _____

Process flow diagrams: _____

Production material and energy balances: _____

Raw Material inventory records: _____

2.3 Raw Material List (including hazardous substances, MSDSs):

2.4 Check off the manufacturing processes your firm runs at this facility:

Electroplating _____

Painting _____

Anodizing _____

Cleaning _____

Heat Treating _____

Tumbling _____

Electroless Plating _____

Etching _____

Polishing _____

Welding _____

Brazing _____

Sintering _____

Tapping _____

Honing _____

Machining _____
Elctrstc. Pntg. _____
Circuit Board Mf _____
Etching _____
Solvent Dgrsng _____

Burnishing _____
Grinding _____
Broaching _____
Turning _____
Paint Stripping _____

2.5 Record any processes you run that are not listed above:

3. EXISTING POLLUTION PREVENTION ACTIVITY

3.1 Is there a written facility policy regarding pollution prevention? _____

3.2 Is there a pollution prevention program currently in place? _____

3.3 Has the company previously conducted a pollution prevention audit of the facility? _____

3.4 Do you have priority areas where you would like to focus your pollution prevention efforts? _____

4. REGULATORY INFORMATION

4.1 List your SARA TITLE III 313 substances:

Substance	Amount '2002 (lbs)	Amount '2003 (lbs)	Media Released To
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4.2 List your EPA RCRA hazardous wastes:

Material Name	Amount '2002 (lbs/gal)	Amount '2003 (lbs/gal)	RCRA Code
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4.3 RCRA Generator Status: (check one) LQG _____ SQG _____ VSQG _____

4.4 Check if the following waste oils are generated:

Hydraulic Oil _____ Lubrication Oils _____
Quenching Oils _____ Anticorrosion Oils _____
Metalworking Oils _____

4.5 Do you have a process wastewater discharge? _____
If yes, a NPDES (EPA) or a sewer (POTW) permit? _____
If applicable, list your categorical Industrial source number and
description: _____

4.6 Do you have a noncontact cooling water discharge? yes or no
If yes, a NPDES (EPA) or a sewer (POTW) permit?

4.7 Indicate your DEP Air Program Status: A1 _____ A2 _____ B1 _____

5. OPERATING COSTS

5.1 Please check which of the following cost information is available
during an on-site visit:

Raw Materials _____ RCRA Disposal _____ On-site Treatment _____

Permit _____ Costs _____ Off-site Treatment _____ Water Rates _____

Sewer Rates _____

WASTE ASSESSMENT WORKSHEET

INSTRUCTIONS: Copy this form and use one copy for each-process. Summarize each process for detailed review along with its associated toxic and hazardous substances and wastes.

Assessment Worksheet for (Company Name)

Date:

Process, Operation, or Activity:

List Wastestreams Generated:

- _ Point of origin;
- _ Subsequent handling/treatment/disposal;
- _ Physical and chemical characteristics;
- _ Quantity:
- _ Rate of generation (i.e., lbs/unit of product);
- _ Variations in generation rate;
- _ Potential for contamination or upset; and
- _ Cost to manage or dispose.

List all toxic and hazardous-substances used in this process:

List reduction/minimization options for this process:

Which option is economically most feasible? Explain:

Which option is technically most feasible? Explain:

How much reduction will be achieved? Develop a performance standard for this wastestream based on this information:

List the positive or negative cross-media Impacts on the environment or employee health and safety?

Toxic and hazardous substances affected:

Other wastestreams affected:

Products affected:

Option proposed an (date):

Option approved for implementation: YES NO DATE:

Reason for acceptance or rejection:

APPENDIX F

NOTICE

NOTICE

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