Chapter 1 : Assessment of Industrial Hazardous Waste Practices, Rubber and Plastics Industry: Appendice

*Plastics and Rubbers Data Collection (PDL Handbook Series) [Plastics Design Library Staff] on calendrierdelascience.com *FREE* shipping on qualifying offers. This CD-ROM takes the difficulty out of finding unique data.*

The findings should be attributed to the contractor and not to the Office of Solid Waste. Department of Commerce Springfield, Virginia U. Publication does not signify that the contents necessarily reflect the views and policies of the U. Environmental Protection Agency, nor does mention of commercial products constitute endorsement by the U. An environmental protection publication SWc. Data collection Data analysis and application of economic modeling techniques Definition of potentially hazardous waste. Each of these elements are discussed below. Overall study logic is provided in Exhibit A-l, at the end of the appendix, followed by a task definition in Exhibit A Review of published information Data collected during our previous work for government agencies on the rubber and plas- tics industry Information obtained from trade association participation Information obtained from personal contact and visits to the various plants and corpor- ate offices of companies classified in the industry and to waste disposal firms handling hazardous wastes. Of the above information sources, direct industry contacts proved to be most useful in providing the detailed data require- ments. Because almost all facilities visited varied significantly in the manner in which wastes were generated and disposed of, the same questions could not be asked of all the individuals contacted. Instead, questions were tailored for each situation. However, as a guide to the types of questions and probes used to collect data, a data acquisition form is provided as Exhibit A-3, following Exhibit A A-l As can be seen from Exhibit A-3, industry representatives were generally asked questions regarding: Plant type, size, locations, etc. Processing methods Waste stream generation Waste properties Treatment and disposal methods Costs for treatment and disposal of potentially hazardous wastes. In addition, the representatives were asked if they would supply the Study Team with waste samples for analysis in our laboratories. The results of the sampling program are described in Appendix B. As presented by the exhibit, there are approximately com- mercially significant processes. During the data collection phase of this study, more than 60 field trips were made. A field trip is defined as a visit to a plant site. However, in many cases, visits were actually made to a plant complex using more than one major process. Therefore, processes observed significantly exceeded field trips completed and provided coverage of most relevant processes in use at the time of the study. Exhibit A-5, following Exhibit A-4, provides a breakdown of contacts by groups visited. In addition, to the field trips, between and telephone calls were made to industry representatives to supplement data. Exhibit A-6, following Exhibit A-5, provides the distribu- tion of waste samples obtained and analyzed. Note that the purpose of the spot sampling program was to provide evidence of the reli- ability of assumptions made concerning the general composition of the wastes and the concentrations of related components. Definition of processes used to manufacture materials Estimate of waste streams and wastes gener- ated from each unit operation by waste type and quantity Classification of wastes into non-hazardous and potentially hazardous categories Determination of waste disposal methods, their adequacy and their costs Estimating the quantity of potentially hazardous wastes to be disposed of by state and EPA regions and nationwide for the year , and Estimates of potentially hazardous wastes to be disposed of on a geographic basis were made by: Developing hazardous waste factors as the weight of hazardous waste per weight of product produced for a typical process type in a representative plant. Multiplying these factors by the volume of production in a given geographic area. Adding wastes produced by geographic area to arrive at national numbers. Current production values and plant location were obtained from data, industry-supplied information, other published litera- ture and professional judgments. The model uses industry groupings or sections to cover the entire economy. The forecasts proceed year-by-year for a decade into the future. The value of wastes is estimated from the projected value deflated to constant dollars of material consumption and final production in each industry for selected years and from the waste generation factors calculated for typical processes. Based on an anlysis of projected versus actual production and consumption as actual data becomes available, it is known that the INFORUM model provides a reasonably accurate means for estimating economic conditions. Instead, we relied on several published sources which are compendia of much of the required information. Gleason, Gosselin, Hodge and Smith, Baltimore: The following paragraphs detail the parameters which were used in determining if a waste as defined in the study may be potentially hazardous. Oral toxicity Inhalation toxicity Dermal penetration toxicity Dermal irritation reaction Aquatic toxicity Phytotoxicity. For the pupose of this study, oral toxicity was accepted as the basis for defining a toxic substance because much more data is generally available to support published conclusions based on this parameter. A-5 References 1 and 2 above were chosen as the primary sources determining if the wastes contain toxic materials. Two works were chosen for use because many substances needed to be categorized. The most serious deficiency of the literature for the purposes of the project is that it is nearly all occu- pationally or laboratory oriented. The result is that toxic effects documented are responses to higher concentrations than levels which may be expected to accrue from deposition of relatively small quantities of these substances in land- fill. Since few epidemiological facts are available, infor- mation developed on the basis of occupational or laboratory exposure was substituted. Exhibit A-7, following Exhibit A-6, presents the toxicity rating scale for Reference 1. Exhibit A-8, following Exhibit A-7, presents the scale for Reference 2. Therefore, any substance having a toxicity rating 2 moderate or above including U unknown in Reference 1; and 3 moderate and above, in Reference 2, was considered toxic in the context of this study. Wastes containing such substances in either the pure form or combined with other materials were considered potentially hazardous. Other adverse effects may occur as a result of rapid or violent chemical reactions of substances. Flame, explosion or reactions produce heat which causes many compounds to emit highly toxic fumes or to react more vigorously with oxidizing materials. Some compounds can react rapidly with ground water, for example, to produce toxic or flammable vapors. Acids may be produced by reactions, and heat generated by flame or reaction may itself be a serious hazard to many ecosystems. A-6 Just as there are levels of toxicity, there are degrees of flammability, explosivity and reactivity. To judge the potential hazard of the wastes in terms of these factors,-we relied heavily on Reference 3 where many sub- stances have been ranked as to their potential hazard capacity in this area. In addition, information contained in the other two references was taken into account. This is the limit which has been made by the Department of Transportation to designate hazardous flammable solvents which require a red warning level. Any waste containing substances having a rating above 2 moderate hazard includ- jng U unknown was considered to be potentially hazardous. If any constituent of a waste stream met the criteria described above as hazardous for any of the categories, the waste was considered potentially hazardous. Spot sampling of the waste described in Appendix B was used to confirm assumption on the presence of potentially hazardous compon- ents in the wastes. Wastes directly generated from manu- facturing processes. Wastes produced by air or water pollution control procedures HAZARDOUS WASTES Especially those containing; asbestos, arsenic, beryllium, cadmium, chromium, copper, cyanides, lead, mercury, halogenated hydrocarbons, pesticides, selenium, zinc and carcinogens, including those which are radioactive. Combinations of the above. Level I - techniques presently employed ,. Waste Characterization and Screening 2. Develop hazardous materials priority list by process based on the substances Identified in 2. Rank processes for potential for production of wastes destined for land disposal I 2. Hazard potential related to materials consumed based on Task 2. Process potential for producing wastes destined for land disposal, based on Task 2. Develop detailed engineering material balances and definition of practices around the 20 processes to be studied further and characterize wastes using sampling and analysis where required 8. In what quantities and from what specific process steps are these wastes generated. How they are treated and disposed of. Points of contacts in responding to the attached data acquisition inquiry are: Kushnir, Survey Coordinator or Mr. Nagy, Research Director Foster D. Plant Location and Age c. Major Process Steps including receiving and shipping e. Material Balances emphasizing solid waste generation 2. Can we take represen- Comments tative samples? Why was he chosen? What does he do with your wastes? Do you have criticism of his procedures? Do you expect an increase or decrease in wastes to be disposed of due to process changes, local regulations, etc.? Of Commercially Significant Processes 40 15 5 10 Industries classified under SICs , , and probably have a lower relative hazard potential In their wastes compared to the others on the list. Waterproof footwear Comments Approx. Wattes produced by indus- tries clarified in SICs Compounding ingredients are the likely potential hazards In their watte streams. The digester process Is the major process in this SIC, representing Rubber hose and tubing Sponge and foam rubber goods Rubber floor and wall covering Mechanical rubber goods. Visits will be to those plants in a position to provide meaningful Information as assessed by the telephone interviews. By and large, the major process found here is molding. Approximately 10 visits will be to industry organizations, S to disposal firms and 70 to plants. However, in many cases visits were actually made to a plant complex where more than one major process exists. Therefore, processes observed exceeded field trips completed. The sampling program provides spot evidence of the reliability of assumptions made concerning the general composition of the wastes and the concentrations of selected components. Causes readily reversible changes which disappear after end of exposure. May involve both irreversible and reversible changes not severe enough to cause death or permanent injury.

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Chapter 2 : Plastics Manufacturing Software | Global Shop Solutions

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Food made up the largest component of MSW combusted at approximately 22 percent. Rubber, leather and textiles accounted for about 16 percent of MSW combustion. Plastics comprised about 16 percent, and paper and paperboard made up about 13 percent. The other materials accounted for less than 10 percent each. Top of Page Landfilling Check out our Municipal Solid Waste Landfills page for more information, and visit our Landfills web area for information on other landfills. In , about Food was the largest component at about 22 percent. Plastics accounted for about 19 percent, paper and paperboard made up about 13 percent, and rubber, leather and textiles comprised about 11 percent. Other materials accounted for less than 10 percent each. The amount of MSW recycled was The amount of MSW combusted with energy recovery was Presented below are details of these trends: Over the last few decades, the generation, recycling and disposal of MSW has changed substantially. Generation of MSW increased except in recession years from Generation decreased 1 percent between and , followed by a rise in generation of 5 percent from to The generation rate in was just 2. It increased to 3. In , it reached 4. The generation rate was 4. Over time, recycling rates have increased from just over 6 percent of MSW generated in to about 10 percent in , to 16 percent in , to about 29 percent in , and to over 34 percent in The amount of MSW combusted with energy recovery increased from zero in to 14 percent in In , it was almost 13 percent. The disposal of waste to landfills has decreased from 94 percent of the amount generated in to under 53 percent of the amount generated in Top of Page Generation Trends The generation of paper and paperboard, the largest material component of MSW, fluctuates from year to year, but has decreased from Generation of yard trimmings has increased since Generation of other material categories fluctuates from year to year, but overall MSW generation increased from to , with the trend reversing from to , and rising again from through Top of Page Recycling and Composting Trends In percentage of total MSW generation, recycling including composting did not exceed 15 percent until Growth in the recycling rate was significant over the next 15 years, spanning until The recycling rate grew more slowly over the last few years. The recycling rate was The recycling as a percentage of generation of most materials in MSW has increased over the last 45 years. See the table below for examples. The following provides a detailed breakdown of the numbers: There was a slight increase from 23 million to The recovery rate for recycling including composting was The recycling rate in including composting was 1. Listed here are the composting or recycling rates for three categories of materials, including yard trimmings, selected consumer electronics and food: The rate of yard trimmings composted in was In , the rate of selected consumer electronics recycling was In , the rate of food and other composting was 5. The rate of food composting was 2. That is the same amount of energy consumed by over The recommendations and analytical framework under the Road Ahead encourages the consideration of multiple environmental benefits when developing materials management strategies. This section shows those GHG reduction environmental benefits. The Agency is developing additional tools to provide information on other environmental benefits and will include these tools and data as they become available. In , the management of MSW through recycling, composting, combustion with energy recovery and landfilling prevented over These reductions are comparable to the annual emissions from over The energy and GHG benefits of recycling, composting, combustion with energy recovery and landfilling shown in the table below are calculated using the WARM methodology. The estimates of MMCO2E are calculated using WARM, and identify not only the environmental benefits of recycling, composting and combustion for energy recovery, but also the benefit of not landfilling materials.

Chapter 3 : - Plastics and Rubbers Data Collection by Plastics Design Library Staff

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2. Monomers: a collection of data and procedures on the basic materials for the synthesis of fibers, plastics, and rubbers 2. 3. Monomers: a collection of data and procedures on the basic materials for the synthesis of fibers, plastics, and rubbers 3.

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Chapter 6 : Plastics Design Library Staff (Author of Chemical Resistance, Volume 3)

Books by Plastics Design Library Staff, Chemical Resistance, Plastics and Rubbers Data Collection, The Handbook of Plastics Joining, Chemical Resistance, Volume 1, Chemical Resistance, Volume 2, Chemical Resistance, Volume 3, The Effect of Temperature And Other Factors On Plastics, Effect of Creep and Other Time Related Factors on Plastics and Elastomers.

Chapter 7 : Rubber and Plastics News

Monomers: a collection of data and procedures on the basic materials for the synthesis of fibers, plastics, and rubbers.