

# **SOLID WASTE MANAGEMENT**

*Abstracts from the Literature  
1975-1978*

**BEVERAGE CONTAINER  
RECYCLING AND  
REUSE**



S O L I D   W A S T E   M A N A G E M E N T

Abstracts from the Literature, 1975--1978

BEVERAGE CONTAINER RECYCLING AND REUSE

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## INTRODUCTION

This document makes available in printed form one of the eleven major subject categories of the solid waste management literature abstracted and stored on computer by the U.S. Environmental Protection Agency. A decision to close the computerized abstracting activities of the Solid Waste Information Retrieval System (SWIRS) in 1979 was influenced by rising costs and moderate growth of requests from users. However, EPA's Office of Solid Waste has undertaken to publish the 1975 through 1978 data; abstracts from earlier years may appear in some sections. The SWIRS monthly abstracts series formerly published are no longer available.

### User Requests

The basic documents listed in the abstracts as "Retained in SWIRS library" may be requested via interlibrary loan through recognized libraries.

This abstracts series will not cover publications of EPA's Office of Solid Waste. Instead, users may request the catalog *Solid Waste Management: Available Information Materials*, which covers the years 1966 to present. Address the request to: Solid Waste Information, U.S. Environmental Protection Agency, 26 West Saint Clair Street, Cincinnati, Ohio 45268. The above catalog includes indexes by subject, author, and title, with order blanks.

### Format, Abbreviations, and Typographic Errors

In the interest of making the data available expeditiously, the computer printout is being reproduced without change of minor typographic errors. Main abbreviations and acronyms are listed in the appendixes.





## Section 1 GENERAL

(1) SWIRS ACC.NO.: 048490  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Recycling aluminum energy and cost advantages.  
 (4) AUTHOR: Hodson R  
 (6) JOURNAL TITLE: Recycling Today  
 (10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK; 1US (10) PUB. YEAR: 1978  
 (11) ABSTRACT: Energy and cost advantages associated with aluminum recycling are delineated. If the aluminum industry is to continue to produce competitively and to enjoy growth markets for its products, it must employ recycling as one way of reducing total energy costs. Aluminum can be recycled for about 15 cents a lb. In England, recycling has primarily been confined to recirculating metal among producers and large sources of aluminum scrap from merchants, fabricators, and aluminum using factors. Secondary aluminum plants in England have an output of 187,000 t/yr, compared with primary production of the metal at 334,000 t/yr and total consumption of about 600,000 t/yr. The recycling of beverage cans and litter reduction in the U.S. are discussed. The trend in the secondary metals industry is toward the pretreatment of scrap destined for secondary smelters. Secondary smelting and recycling are developing together. The need to recycle foil and its associated coatings is forcing secondary smelters to conduct research on pretreatment and melting methods.  
 (12) KEYWORDS: ALUMINUM; CONTAINER; ECONOMICS; ENERGY; GREAT BRITAIN; RECLAMATION; SCRAP; US  
 (14) HIERARCH TERMS: 1MK/2AM; 1SD  
 (15) STIMS ACC.NO.: 00S47544  
 (16) CITATION: 16(3):24, 26, 28, Mar. 1978.

(1) SWIRS ACC.NO.: 047832  
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: T  
 (3) ARTICLE TITLE: Atervinning av burkskrot möjlig i stor skala. (Recovery of tin scraps is possible on a large scale).  
 (4) AUTHOR: Jonsson T  
 (6) JOURNAL TITLE: Teknisk Tidskrift  
 (10) LANGUAGE: SD (10) GEO. AREA: 1EU/2SR (10) PUB. YEAR: 1976  
 (11) ABSTRACT: Scrap iron from used food and beer cans is an energy rich material. Each ton that can be recovered diminishes the need to import energy corresponding to 200-600 l oil. The difference is due to the amount of energy consumed when the scrap iron is recovered. More than 100,000 t of tin plate is destroyed each year in Swedish dumps. This corresponds to 35,000 t/yr of oil. Since 1972, the tin plate fraction of the cinder from central refuse combustion stations has been examined metallurgically at Gullspangs Elektrokemiska AB. It has proven to be an excellent raw material for the production of steel ingot and for 45% silicon iron. The steel ingot from Gullspang that is of reinforcement bar quality is rolled into steel bars at Quarnhammars Iron Mill. The hot rolling of crude iron that contains tin has usually caused problems at the steel mills, because cracks are easily formed. Crack formation does not occur with the Gullspang method even when there is as much tin as 0.5%, which is ten times more than is usually tolerable at the traditional steel mills. The tin of the Bullspang steel ingot serves as an alloy metal. The 45% silicon iron does not contain tin or lead and it is used as an alloy metal at the steel mills. To produce crude steel by way of low percent silicon iron is probably the most energy saving way of reusing tin plate. (Original text in Swedish).

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(12) KEYWORDS: IRON; METAL; RECLAMATION; SCRAP; SWEDEN; UTILIZE  
 (14) HIERARCH TERMS: 1MI/2IN/3UT; 1MK/2TI; 1RG  
 (15) STIMS ACC.NO.: 00S46885 (15) SECONDARY AUTHORS: Larsson P  
 (16) CITATION: 106(7):23, Apr. 8. 1976.

(1) SWIRS ACC.NO.: 046097  
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: The national perspective.  
 (4) AUTHOR: Deuel P  
 (6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.  
 (9) GRANT NO.: T90551-01-0  
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2MA; 1US/2MJ (10) PUB. YEAR: 1977

(11) ABSTRACT: A national perspective is given on the beverage container issue as a part of the total solid waste proliferation and disposal problem. Deposit legislation was passed in 1976 in Michigan and Maine, EPA promulgated guidelines calling for deposits on all beverage containers sold on federal property, and the media has begun to devote more attention to the issue in response to growing public consciousness. National beverage container legislation has been introduced in the Senate and House with many cosponsors, but hearings have not yet been scheduled. The Environmental Action Foundation is setting up a clearinghouse on deposit legislation to expedite state and local efforts to control beverage container disposal. (Retained in SWIRS library).

(12) KEYWORDS: BOTTLE; CONTAINER; ENVIRONMENT; LAW; MAINE; MICHIGAN; PACKAGING; RECLAMATION; RESOURCE; STATE  
 (14) HIERARCH TERMS: 1CI/2DV; 1LB/2LD; 1LB/2LG  
 (15) STIMS ACC.NO.: 00S45147  
 (16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.53.

(1) SWIRS ACC.NO.: 045488  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Bottle bills or resource recovery?  
 (4) AUTHOR: Weinberg RS  
 (6) JOURNAL TITLE: Brewers Digest  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: Issues related to recyclable bottles and resource recovery are discussed in terms of litter, energy, solid waste, and prices. A spokesman for the brewery industry claims that returnable bottle bill proponents are making exaggerated claims of return rates and energy savings in order to justify their suggestions. For example, a 10-trip returnable bottle ultimately conserves mostly coal and some natural gas, but it uses more petroleum than a nonreturnable steel can because of the petroleum consumed in returning the bottle through the chain of distribution. The proportion for solid waste represented by beverage cans (20 percent) is not certified as large enough to let arguments against litter justify bottle bills. The spokesman also says that claims for lower prices for beverages under mandatory deposit legislation are a myth, because increases in shipping, handling, and display costs for wholesalers and retailers along with new investment required of brewers will more than offset any savings. A program called positive litter reduction which has been proven effective in multiple U.S. locations is recommended by the spokesman.  
 (12) KEYWORDS: BOTTLE; BREWERY; ECOLOGY; ECONOMICS; FUEL; INDUSTRY; LITTER; RESOURCE  
 (14) HIERARCH TERMS: 1KG; 1SB  
 (15) STIMS ACC.NO.: 00S44536  
 (16) CITATION: 52(10):19-20, Oct. 1977.

# GENERAL

(1) SWIRS ACC.NO.: 044734  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Cities mine solid waste piles in search for wasted profits.  
 (6) JOURNAL TITLE: Engineering News Record  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: Interest in resource recovery is growing throughout the world. About 300 U.S. communities have taken at least one of three possible steps to increase recovery. Some states enacted waste reduction laws which impose packaging restrictions or beverage container deposits to lower the amount of solid waste generated and thereby reduce collection and disposal costs. Another possibility is source separation, where localities separate recyclable wastes from other wastes and sell the recyclables for reuse. Other cities have chosen to build mixed waste recovery plants. Resource recovery has been prompted by little landfill space and a market for recovered materials and energy produced. The Resource Conservation and Recovery Act of 1976 phases out open dumps by 1983 and puts landfills under strict federal regulations. The harvest from a resource recovery plant can be great. By 1985, the U.S. could be recovering energy equivalent to 500,000 bbl of oil a day. However, some plants have had problems in turning a profit due to fluctuations in marketing the fuel or recyclables; a higher plant cost resulted than originally planned; variable amounts of waste produced variable amounts of fuel; and equipment shakedowns ensued. The EPA is offering grants for planning, research and development, market studies, feasibility studies and the like to encourage states in developing their own resource recovery programs.  
 (12) KEYWORDS: ECONOMICS; ENERGY; MUNICIPALITY; PACKAGING; RECLAMATION; REFUSE; REFUSE DERIVED FUEL; RESOURCE; SEPARATION  
 (14) HIERARCH TERMS: 1EA; 1EC/2ET; 1MJ/2NA; 1SB  
 (15) STIMS ACC.NO.: 00343779  
 (16) CITATION: 199(11):20-24, Sept. 1977.

(1) SWIRS ACC.NO.: 044610  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Yosemite concessionaire runs successful recycling program; public relations is the key.  
 (6) JOURNAL TITLE: Solid Waste Systems  
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA/3YO (10) PUB. YEAR: 1977  
 (11) ABSTRACT: Solid waste management in Yosemite National Park is outlined. Two views are given for handling the waste produced by the park's 2.5 million visitors annually. A five cent deposit is required on all soft drink and beer containers sold in the park. 73 percent were returned. Partial credit for the success is continuing the public information activity of a park newspaper distributed free to visitors. A truck collects containers every day from well marked refuse recycling locations. The cans are sold uncompact to Reynolds Aluminum for \$300 per week's haul. One ton of baled cardboard is also collected and sold daily, along with other refuse. The program is breaking even financially. Yosemite is a unique self contained community with an environmentally conscious client. EPA has ordered all National Parks to begin similar programs soon.  
 (12) KEYWORDS: ALUMINUM; CALIFORNIA; CAN-FOOD; ECONOMICS; PUBLIC RELATIONS; RECLAMATION; RECREATION AREA  
 (14) HIERARCH TERMS: 1ME/2MW; 1MJ/2MB; 1PJ; 1RC; 1SB  
 (15) STIMS ACC.NO.: 00543655  
 (16) CITATION: 6(4):5-6, Aug. 1977.

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(1) SWIRS ACC.NO.: 040128  
(2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G (10) GEO.  
AREA: 1EB/2ED (10) PUB. YEAR: 0000  
(11) ABSTRACT: A list of films published by Keep America Beautiful, Inc. stresses constructive work that individuals can undertake to improve the quality of their environment. Films are coded as to audience applicability, i. e. , colleges, public service groups, elementary schools, institutions, etc. Only films which may be rented for \$30 or less are listed. (Retained in SWIRS library)  
(12) KEYWORDS: ASSOC; AUDIO-VISUAL; DIRECTORY; ENVIRONMENT; LEASE; POLLUTION; PUBLIC RELATIONS; SURVEY  
(14) HIERARCH TERMS: 1ED  
(15) STIMS ACC.NO.: 00539172  
(18) DOC.CIT.: Keep America Beautiful, Inc. Catalog of environmental films. New York, Keep America Beautiful Inc. , n. d. 9 p.

(1) SWIRS ACC.NO.: 035985  
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T (10) PUB.  
YEAR: 1975  
(11) ABSTRACT: An indepth analysis was performed by the Michigan Public Service Commission which focused on the possible effects of employment and energy savings due to a shift to a refillable beverage container system and the employment and energy effects of deposit regulations for nonreturnable beverage containers, with particular reference to Michigan House Bill No. 4296. The basic purpose of the study was to provide an objective evaluation of the problems involved in a nonreturnable beverage container system versus a refillable system and to enlighten the public and governmental decision makers so as to enable them to make rational judgments in the maximization of social welfare. Chapter I of the analysis study focuses on national solid waste problems and on Michigan's solid waste generation and management problems. Chapter II discusses the nature and dimensions of the beverage industry and presents information on historic growth rates and projections of glass and metal beverage container use. Chapter III examines direct and indirect employment effects of deposit regulations on nonreturnable beverage containers. Chapter IV comparatively analyzes energy savings due to a returnable system versus the present nonreturnable system. Chapter V discusses the economic and energy implications of solid waste resource recovery, with particular reference to the recycling of beverage containers, and Chapter VI presents summary findings and policy recommendations.  
(12) KEYWORDS: BOTTLE; BREWERY; CANNING; CONTAINER; ECONOMICS; INDUSTRY; MANAGEMENT; MICHIGAN; PACKAGING; PERSONNEL; PROJECTION; RECLAMATION; REGULATIONS; UTILIZE  
(15) STIMS ACC.NO.: 00535030  
(18) DOC.CIT.: Rao, G. B. Michigan Department of Commerce. An economic analysis of energy and employment effects of deposit regulation on non-returnable beverage containers in Michigan - a systems approach. Lansing, Michigan Department of Commerce, Oct. 1975. 438 p.

## Section 2 ECONOMICS

(1) SWIRS ACC.NO.: 048119  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T  
 (3) ARTICLE TITLE: Optimal recycling of aluminum beverage cans: an empirical approach.  
 (4) AUTHOR: Ogbudinkpa RN  
 (6) JOURNAL TITLE: J Environ Systems  
 (10) LANGUAGE: EN (10) PJB. YEAR: 1978  
 (11) ABSTRACT: The recycling of aluminum beverage cans as a method of solid waste disposal in the light of the growing importance of beverage cans in solid waste is surveyed in order to find economic justification for recycling, which, if found, will be evoked to complement ecological reasons for better disposal of solid wastes. The analysis employed the Simplex Method, which illustrated that, of the main products from recycling the beverage cans, copper is the most important, followed by aluminum and zinc.  
 (12) KEYWORDS: ALUMINUM; CONTAINER; RECLAMATION  
 (14) HIERARCH TERMS: 1C2; 1MK/2AM; 1RG  
 (15) STIMS ACC.NO.: 00547172  
 (16) CITATION: 7(4):343-354, 1978.

(1) SWIRS ACC.NO.: 047676  
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: The buyback strategy: an alternative to container deposit legislation.  
 (4) AUTHOR: Eardach E  
 (6) JOURNAL TITLE: Resource Recovery Conserv  
 (10) LANGUAGE: EN (10) PJB. YEAR: 1978  
 (11) ABSTRACT: A programmatic alternative to legislation that mandates the imposition of deposits on beer and soft drink beverage containers is described and defended. This program is essentially a consumer financed and privately administered "buyback" recycling system that utilizes the government as a financial intermediary. This system, like the deposit system, can achieve any desired level of container recovery and reuse. Unique characteristics of this buyback system include: it can be phased in gradually; it can minimize the economic cost of the "backhaul" industry (i.e., collection, storage, transportation); and it can alter the long run mix of container materials in accordance with economic common sense. It offers a superior alternative to the deposit system from nearly every point of view.  
 (12) KEYWORDS: CONTAINER; GOVERNMENT; RECLAMATION; SYSTEM  
 (14) HIERARCH TERMS: 1C2; 1aG  
 (15) STIMS ACC.NO.: 00546729 (15) SECONDARY AUTHORS: Gibbs C; Marseille E  
 (16) CITATION: 3(2):151-164, May 1978.

(1) SWIRS ACC.NO.: 045880  
 (2) DOMESTIC: D (2) CATEGORY: 13 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Volume II. Basic conversion factors. Glass bottles.  
 (4) AUTHOR: Hunt RG  
 (6) BOOK TITLE: In Resource and Environmental Profile Analysis of Nine Beverage Container Alternatives. Final Report. (8) REPORT NO.: EPA/530/SW-91c (9) CONTRACT NO.: 68-01-1848  
 (10) LANGUAGE: EN (10) PJB. YEAR: 1974  
 (11) ABSTRACT: Basic conversion factors used to convert raw fuel and electric energy input values into corresponding environmental

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impact parameters (mobile and stationary sources, electric energy, transportation, and conversion from conventional to metric units) and calculations made to determine the resource and environmental profiles of glass beverage containers are detailed. It was concluded that reusable glass beverage containers (particularly the 19-trip on-premise glass bottle) produce less environmental impact than single use glass containers, even after the additional weight needed for structural integrity, additional processing, and transportation is taken into account for returnable systems. The potential for waste glass recycling is also considered as an asset in reducing environmental impact of the use of glass containers. (Retained in SWIRS library).

(12) KEYWORDS: BOTTLE; CONTAINER; ECONOMICS; ENVIRONMENT; GLASS; RECLAMATION

(14) HIERARCH TERMS: 1CI/2DV; 1ED; 1GB/2GB/3GD; 1PA/2PC; 1SB

(15) STIMS ACC.NO.: 00S44929 (15) SECONDARY AUTHORS: Cross JA; Welch RO

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1974. p.44-92.

(1) SWIRS ACC.NO.: 045346

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Introduction.

(4) AUTHOR: Goen RL

(5) CORPORATE AUTHOR: Stanford Research Institute

(6) BOOK TITLE: In Potential for Reusable Homogeneous Containers, Interim Report

(8) NTIS NO.: PB 265 100 (8) REPORT NO.: NSF/HA-770030

(9) GRANT NO.: AER 76-02396

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The rationale for reusable packaging in the food service industry is discussed, with particular emphasis on the use of returnable beverage containers. Strategies for reducing resource consumption and solid waste production associated with packaging have been proposed, including the recovery of materials from solid waste streams and the use of solid waste to produce energy through combustion or pyrolysis. One major impediment to a reusable packaging system is the difficulty of sorting used containers according to product and manufacturer and returning them to the original packager. Various studies dealing with reusable beverage containers are cited. Alternatives to reusable packages that might accomplish the same objectives as reusable beverage container systems are discussed. Three alternatives are identified: containers that require less energy and materials, recycling of container materials after use, and energy recovery from combustible container materials.

(12) KEYWORDS: CONTAINER; FOOD; INDUSTRY; PACKAGING; SYSTEM

(14) HIERARCH TERMS: 1CI; 1PA/2PC

(15) STIMS ACC.NO.: 00S44393 (15) SECONDARY AUTHORS: Somogyi LP; Steele RV

(16) CITATION: Washington, DC, National Science Foundation, Feb. 1977. p.1-6.

(1) SWIRS ACC.NO.: J44261

(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The impact of source separation and waste reduction on the economics of resource recovery facilities.

(4) AUTHOR: Skinner JH

(6) JOURNAL TITLE: Resource Recovery and Energy Review

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Estimates are made of the effect paper separation programs and beverage container reduction programs could have on the economics of mixed waste recovery facilities. Such programs could cause

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significant reductions in the quantity of recyclable materials. These materials provide a source of supporting revenue and their removal could adversely effect plant economics. Economic estimates are based upon assumptions concerning the composition of the waste stream, technology performance and costs, and recovered material market prices. Analysis showed that the impact of paper separation on plant disposal charges could range from a few cents per ton to several dollars per ton, (the likely increase would be less than \$1). For plants recovering only ferrous metals, the removal of beverage container materials could reduce net revenues by about \$.50 per ton of solid waste processed. Plants recovering aluminum and glass could suffer reduced revenues by an additional \$.35 to \$1.15 per ton of solid waste processed. (For most plants, the likely impact of beverage container reduction programs would be less than \$1 per ton.)

(12) KEYWORDS: ALUMINUM; ANALYSIS; CHARGING; CONTAINER; DISPOSAL; ECONOMICS; FACILITY; GLASS; IRON; PAPER; RECLAMATION; RESOURCE; SEPARATING

(14) HIERARCH TERMS: 1EA/2EA; 1RG

(15) STIMS ACC.NO.: 00S4J305

(16) CITATION: 4 (2):5p, Mar./Apr. 1977.

(1) SWIRS ACC.NO.: 043540

(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G

(5) CORPORATE AUTHOR: Research Triangle Inst., Franklin Assoc

(6) BOOK TITLE: Energy and Economic Impacts of Mandatory Deposits.

(8) REPORT NO.: FE4/D-76/406 (9) CONTRACT NO.: CO-04-50175-00

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: This study examines the energy, capital and labor impacts that would be caused by a five cent deposit on beer and soft drink containers. The study examines the range of potential impacts that could occur given various market responses to a nationwide mandatory deposit law. Appendices include projected beverage consumption, packaging, energy utilization requirements, analysis methodology, and public opinion survey. (Retained in SWIRS library).

(12) KEYWORDS: ALUMINUM; CAN-FOOD; CONTAINER; COST REDUCTION; ECONOMICS; ENERGY; GLASS; METAL; PACKAGING; PLASTIC; RECLAMATION

(14) HIERARCH TERMS: 1EA; 1EC/2EV; 1RG

(15) STIMS ACC.NO.: 00S42583

(16) CITATION: Wash. D.C., Federal Energy Administration, Sept. 1976. 740 p.

(1) SWIRS ACC.NO.: 039556

(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Reasons for the discrepancy in pricing of soft drinks, especially carbonated beverages, are examined. Bottling companies offer a lower price to stores on returnable packages and stores in turn offer a lower price to the consumer. During the sugar shortage, prices of soft drinks soared but sales did not decline drastically. And, sales of powdered drink mixes picked up. Bottlers feel that as long as they can justify the price increase of sugar and other ingredients consumers will buy soft drinks. In many cities, although sugar costs are down (which was the primary reason for 1974 price hikes) supermarket shelf prices for carbonated beverages have continued to grow. One reason given by industry is that other soft drink ingredients have become more costly as have packaging and materials. However, a Labor Department spokesman commented that when prices go up they rarely come down since consumers get used to the extra cost and the stores act accordingly.

(12) KEYWORDS: BOTTLE; COMMERCIAL; ECONOMICS; FOOD; INDUSTRY; MARKET; PACKAGING; SUGAR

(15) STIMS ACC.NO.: 00S38600

(18) DOC.CIT.: Soft drink pricing: a function of market and costs. Beverage Industry, 60(7):11-12, Apr. 2, 1976.

# BEVERAGE CONTAINER RECYCLING AND REUSE

(1) SWIRS ACC.NO.: 038967

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G (10) PUB.  
YEAR: 1975

(11) ABSTRACT: The role of nonreturnable packages in the solid waste problem is examined. Packaging beer and soft drinks consumes 25 billion cans per year in the United States. Returnable containers are considered as one solution to the solid waste problem, although attempts to initiate their use have met with little success. The scrap value of metals in waste cans is estimated at \$200 million. Less than 4 percent is recovered, but technology is available to recover and recycle more than 90 percent. The deterrent to recovery in municipal waste is that scrap metal represents less than 5 percent in a typical community. Such a small fraction of total waste, even though it is valuable, cannot support the cost of processing all waste material if the other 95 percent is discarded in an open dump or sanitary landfill. Metal cans typically represent 3 to 5 percent of total household waste. Of this, approximately 95 percent are steel cans and the other 5 percent are aluminum cans. The ideal system for subsequent processing is considered to be segregation of cans by the householder into separate garbage cans before pickup. The most simple form of recovery is magnetic separation of incoming refuse after coarse shredding. Waste reprocessing systems can result in a clean, finely divided metallic fraction. In some communities, solid waste is incinerated before any attempt is made to separate ferrous fractions. It is concluded that citizens pay \$4 billion for scrap and refuse collection and that an investment of up to 50 percent of this figure may be necessary to fully recover valuable elements in solid waste.

(12) KEYWORDS: CAN-FOOD; CONTAINER; DOMESTIC; ECONOMICS; MAGNET; MARKET; METAL; PACKAGING; RECLAMATION; SEPARATING; VOLUME

(15) STIMS ACC.NO.: 00538011

(18) DOC.CIT.: Nonreturnable packages. In Mantell, C. L., ed. Solid Wastes: Origin, Collection, Processing, and Disposal. New York, John Wiley and Sons, 1975. p. 915-919.

(1) SWIRS ACC.NO.: 035985

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T (10) PUB.  
YEAR: 1975

(11) ABSTRACT: An indepth analysis was performed by the Michigan Public Service Commission which focused on the possible effects of employment and energy savings due to a shift to a refillable beverage container system and the employment and energy effects of deposit regulations for nonreturnable beverage containers, with particular reference to Michigan House Bill No. 4296. The basic purpose of the study was to provide an objective evaluation of the problems involved in a nonreturnable beverage container system versus a refillable system and to enlighten the public and governmental decision makers so as to enable them to make rational judgments in the maximization of social welfare. Chapter I of the analysis study focuses on national solid waste problems and on Michigan's solid waste generation and management problems. Chapter II discusses the nature and dimensions of the beverage industry and presents information on historic growth rates and projections of glass and metal beverage container use. Chapter III examines direct and indirect employment effects of deposit regulations on nonreturnable beverage containers. Chapter IV comparatively analyzes energy savings due to a returnable system versus the present nonreturnable system. Chapter V discusses the economic and energy implications of solid waste resource recovery, with particular reference to the recycling of beverage containers, and Chapter VI presents summary findings and policy recommendations.

(12) KEYWORDS: BOTTLE; BREWERY; CANNING; CONTAINER; ECONOMICS; INDUSTRY; MANAGEMENT; MICHIGAN; PACKAGING; PERSONNEL; PROJECTION;



## ECONOMICS

RECLAMATION; REGULATIONS; UTILIZE

(15) STIMS ACC.NO.: 00835030

(16) DOC.CIT.: Rao, G. B. Michigan Department of Commerce. An economic analysis of energy and employment effects of deposit regulation on non-returnable beverage containers in Michigan - a systems approach. Lansing, Michigan Department of Commerce, Oct. 1975. 438 p.

### Section 3

## LAWS AND REGULATIONS

(1) SWIRS ACC.NO.: 046101  
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: The beverage container issue & resource conservation.  
 (4) AUTHOR: Stern Cb  
 (6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.  
 (9) GRANT NO.: T90551-01-0  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: A technical analysis of the issues and requirements for passing effective legislation for beverage container control to effect real resource conservation is presented. There appears to be a choice between soft legislation (requiring container deposits) and hard legislation (specifying reliable containers), with unknown longterm consequences. The most thorough study of long term economics of these two approaches (by the Federal Energy Administration) is criticized on the grounds that while materials processing and use were followed and analyzed from source through recycling, including energy resources and labor required, the capital involved was not considered as thoroughly. It was concluded that including the capital requirements of the container maker, mining companies, and energy facilities would contradict the FEA's conclusion that the deposit system is more capital intensive. (Retained in SWIRS library).  
 (12) KEYWORDS: ANALYSIS; BOTTLE; CONTAINER; ECONOMICS; ENVIRONMENT; LAW; RECLAMATION; RESOURCE  
 (14) HIERARCH TERMS: 1AN; 1CZ/2DP; 1LF  
 (15) STIMS ACC.NO.: 00545151  
 (16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.67-69.

(1) SWIRS ACC.NO.: 046100  
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: The beverage container issue: the Michigan story.  
 (4) AUTHOR: Rustem B  
 (6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.  
 (9) GRANT NO.: T90551-01-0  
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2MJ (10) PUB. YEAR: 1977  
 (11) ABSTRACT: A description is given of the successful 1976 beverage container legislation campaign in Michigan. Since legislative bills aimed at beverage container control had repeatedly failed despite strong statewide public support, an initiative petition was circulated to give the voters the chance to decide the issue in a general election. Over 400,000 voter signatures were collected in five weeks so that the issue could be put on the November ballot. The issue was supported by a wide coalition of governmental and public service groups, including the Michigan Farm Bureau, the League of Women Voters, Federated Garden Clubs, and individual citizens. Opponents of the legislation attempted to keep the referendum off the ballot but were defeated in court. Media efforts to defeat the issue concentrated on rising prices, consumer inconvenience, degraded sanitation, unemployment, and continued litter. The environmental coalition concentrated on grass roots support, information dissemination, and public media, emphasizing the two week period just before the election. It was reported that citizen participation, rather than expenditures, was the key to success. (Retained in SWIRS library).  
 (12) KEYWORDS: BOTTLE; CONTAINER; ECONOMICS; ENVIRONMENT; LAW;

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MICHIGAN; RECLAMATION; RESOURCE

- (14) HIERARCH TERMS: 1CZ; 1LF/2SW
- (15) STIMS ACC.NO.: 00S45150
- (16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.62-66.

- (1) SWIRS ACC.NO.: 046099
- (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
- (3) ARTICLE TITLE: The beverage container issue: Massachusetts.
- (4) AUTHOR: Duxbury D
- (6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.
- (9) GRANT NO.: T90551-01-0
- (10) LANGUAGE: EN (10) GEO. AREA: 1US/2MH (10) PUB. YEAR: 1977
- (11) ABSTRACT: An evaluation is given of the unsuccessful 1976 effort to pass beverage container control legislation in Massachusetts. The measure was brought up to the legislature on an initial signature of 100,000 persons, but was defeated in May, so that an additional 20,000 signatures were required to qualify for the November referendum. Coalition endorsements by various civic, community, and state groups were sought, including the Massachusetts Public Interest Research group, Massachusetts Audubon, and the League of Women Voters. The opposition spent 35 times as much money as the coalition, which depended more on public media and grass roots information dissemination. Although the opposition had about three times the media coverage, the use of articulate and knowledgeable spokespersons to present the conservationist issues and viewpoints was felt to be offsetting during the campaign. It was concluded that the principal reason for failure of the referendum was the number of referenda on the ballot (nine), which served to split the interest and resources of groups who would otherwise have been stronger supporters of the beverage container referendum. (Retained in SWIRS library).
- (12) KEYWORDS: BOTTLE; CONTAINER; ECONOMICS; ENVIRONMENT; LAW; MASSACHUSETTS; RECLAMATION; RESOURCE
- (14) HIERARCH TERMS: 1CZ; 1LF/2SW
- (15) STIMS ACC.NO.: 00S45149
- (16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.60-61.

- (1) SWIRS ACC.NO.: 046098
- (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
- (3) ARTICLE TITLE: Maine's bottle bill: a history from 1940 to 1977.
- (4) AUTHOR: Ginn W
- (6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.
- (9) GRANT NO.: T90551-01-0
- (10) LANGUAGE: EN (10) GEO. AREA: 1US/2ME (10) PUB. YEAR: 1977
- (11) ABSTRACT: A historical account is given of Maine's bottle bill effort from 1940 to 1977. Returnable container legislation was introduced (but not passed) in Maine in 1940, with the major motivation of commercial protectionism. A citizens' association was formed in 1973 after several legislative defeats so that money could be collected and intensive lobbying could be carried out. The support of individuals and existing environmental groups was solicited, and a letter writing campaign to the legislature and newspapers was initiated. Legislation was finally passed in 1976 requiring deposits on beer and soft drink containers, approving redemption centers to handle empties, setting deposits on all one way beverage containers, and providing the grocer a

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handling fee. Problem areas in the legislation are identified as lack of provision for final disposal of containers, ambiguous administration, passing on handling charges, the inefficiency of the redemption centers, and the wording of the referendum in Maine is outlined in terms of planning, targeting, simplification, media, soliciting grass roots support, speaker circulation, using fairness doctrine media time, soliciting commercial endorsements, maintaining press relations, and budgeting. (Retained in SWIRS library).

(12) KEYWORDS: BOTTLE; CONTAINER; ECONOMICS; ENVIRONMENT; LAW; MAINE; PROBLEMS; RECLAMATION; RESOURCE

(14) HIERARCH TERMS: 1CZ; 1LF/2SW

(15) STIMS ACC.NO.: 00S45148

(16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.54-59.

(1) SWIRS ACC.NO.: 046097

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The national perspective.

(4) AUTHOR: Deuel P

(6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.

(9) GRANT NO.: T90551-01-0

(10) LANGUAGE: EN (10) GRO. AREA: 1US/2MA; 1US/2MJ (10) PUB. YEAR: 1977

(11) ABSTRACT: A national perspective is given on the beverage container issue as a part of the total solid waste proliferation and disposal problem. Deposit legislation was passed in 1976 in Michigan and Maine, EPA promulgated guidelines calling for deposits on all beverage containers sold on federal property, and the media has begun to devote more attention to the issue in response to growing public consciousness. National beverage container legislation has been introduced in the Senate and House with many cosponsors, but hearings have not yet been scheduled. The Environmental Action Foundation is setting up a clearinghouse on deposit legislation to expedite state and local efforts to control beverage container disposal. (Retained in SWIRS library).

(12) KEYWORDS: BOTTLE; CONTAINER; ENVIRONMENT; LAW; MAINE; MICHIGAN; PACKAGING; RECLAMATION; RESOURCE; STATE

(14) HIERARCH TERMS: 1CI/2DV; 1LB/2LD; 1LB/2LG

(15) STIMS ACC.NO.: 00S45147

(16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.53.

(1) SWIRS ACC.NO.: 045541

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: All in a week's work.

(6) JOURNAL TITLE: Modern Packaging

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The virtual impossibility of keeping up with all federal, state, and local actions which affect packaging is illustrated. To prove this point, just the rulings and proposals initiated on the state level in one week are listed; the week at the end of February and the beginning of March, 1977 being the period investigated. 14 state legislatures worked on bills that could pose potential problems for packagers. Some examples are: (1) Minnesota's H. 400 prohibiting pull tabs; (2) Ohio's H. 288 requiring a tax on nonreturnable containers; (3) California's S. 342 requiring recyclable nondeposit glass and aluminum beverage containers to be identified as

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such; and (4) Oregon's S. 674 requiring that all, excluding glass, beverage containers be marked with refund values.

(12) KEYWORDS: ALUMINUM; CONTAINER; GLASS; PACKAGING; RECLAMATION; REGULATIONS; RESEARCH; STATE; TAXES

(14) HIERARCH TERMS: 1LB/2LG; 1MA/2MG; 1RE

(15) STIMS ACC.NO.: 00S44589

(16) CITATION: 50(4):12, Apr. 1977.

(1) SWIRS ACC.NO.: 045484

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The whys behind a bottle bill.

(4) AUTHOR: Selby E

(6) JOURNAL TITLE: Reader's Digest

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OR; 1US/2VT (10) PUB.

YEAR: 1976

(11) ABSTRACT: The popularity of returnable bottle bills is explained by its appeal to public pride and economic incentives being offered by commercial waste collectors and private and local government bodies. Experience with the bills in Vermont and Oregon has reportedly reduced littering (66 percent in Oregon and 76 percent in Vermont). The beverage and container industries have opposed such bills by financing the Keep America Beautiful (KAB) campaign urging stricter enforcement of antilitter laws, more litter collections, and no cutbacks in containers comprising litter. A KAB roadside litter survey showing that containers were only 20 percent of the solid waste problem is challenged on the grounds that the survey was limited to a small area and to certain types of litter. KAB litter reduction programs in various sites have claimed success, but documentation is not available. Bottle bills are recommended on the grounds of saving materials and energy and reducing pollution.

(12) KEYWORDS: BOTTLE; BREWERY; CONTAINER; ENVIRONMENT; INDUSTRY; LITTER; RECLAMATION

(14) HIERARCH TERMS: 1LB/2LC; 1LD/2LH; 1SB

(15) STIMS ACC.NO.: 00S44532 (15) SECONDARY AUTHORS: Selby M

(16) CITATION: 109(651):169-174, Jul. 1976.

(1) SWIRS ACC.NO.: 045252

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The case for mandatory beverage deposits.

(4) AUTHOR: Jeffords JM

(6) JOURNAL TITLE: Beverage Industry

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OR; 1US/2VT (10) PUB.

YEAR: 1977

(11) ABSTRACT: Since beverage container deposit legislation is unavoidable, industry's best strategy is to cooperate in the development of the most acceptable legislation. Even if national legislation is delayed by opposition, state-level initiatives will continue to be successful. Although, a single national system would be easier to deal with than a mixed bag of state and municipal deposit laws. Deposit legislation can provide substantial benefits while significant savings can be realized by reclaiming cans. National benefits include savings of energy, steel, and aluminum and preservation of space in sanitary landfills. The Vermont and Oregon deposit laws have been successfully received by the public. H.R. 936 would allow consumers freedom of choice as to the type of beverage container they prefer. It would require a deposit of at least 5 cents on each container. If the bill was passed, cans would retain roughly their present share of the market and the bill would minimize adverse effects on the industry. A Federal Energy Administration study which

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determined impacts of a beverage container deposit system is examined. The FEA anticipates consumer savings from the use of refillables would range from \$1.8 billion to \$2.6 billion a year.

- (12) KEYWORDS: ALUMINUM; CONTAINER; ENERGY; INDUSTRY; IRON; LAW; LOCAL; NATIONAL; OREGON; RECLAMATION; SANITARY LANDFILL; STATE; VERMONT
- (14) HIERARCH TERMS: 1CI; 1LB/2LG; 1SB
- (15) STIMS ACC.NO.: 00S44299
- (16) CITATION: 62(6):14, 18, 20, 20A, 24, Mar. 18, 1977.

- (1) SWIRS ACC.NO.: 045044
- (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
- (3) ARTICLE TITLE: Canadian federal and provincial solid waste legislation.
- (4) AUTHOR: Willis Le
- (6) JOURNAL TITLE: APWA Reporter
- (10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1975
- (11) ABSTRACT: Canadian federal and provincial solid waste legislation is examined. The federal government has no constitutional legislating base and can only act by leadership to influence the situation in nonfederal areas. The government has proposed some short term solid waste legislation but there is considerable potential for the federal government to enact legislation relating especially to freight rates, tax incentives, market development, and standardization of containers and packaging. Before this can occur, many basic programs and information gathering projects must be completed. Multijurisdiction between federal, provincial, and municipal agencies complicates decision making required to initiate good solid waste management. Legislation and regulations controlling solid waste management are in the hands of the respective provincial governments. Recent provincial legislation has emphasized reduction of unauthorized open dumps and better control of authorized landfills. Three provinces have legislated litter acts or beverage container regulations affecting the use of carbonated beverage bottles.
- (12) KEYWORDS: BOTTLE; CANADA; DUMP; FEDERAL; FEE; INCENTIVE; LAW; LITTER; LOCAL; MANAGEMENT; MARKET; MUNICIPALITY; REFUSE; REGIONAL; REGULATIONS; STANDARD; TAXES; TRANSPORT
- (14) HIERARCH TERMS: 1DF/2DU; 1LB/2LD; 1LD; 1MA/2ME
- (15) STIMS ACC.NO.: 00S44090
- (16) CITATION: 42(3):16-17, Mar. 1975.

- (1) SWIRS ACC.NO.: 044005
- (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
- (5) CORPORATE AUTHOR: U.S. Environmental Protection Agency
- (6) BOOK TITLE: Yosemite National Park Beverage Container Deposit Experiment Final Report. (9) CONTRACT NO.: 68-01-2981
- (10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA/2YO (10) PUB. YEAR: 1977
- (11) ABSTRACT: On May 17, 1976 the Yosemite Park and Curry Co. with the support of the National Park Service and the Environmental Protection Agency voluntarily instituted a 5 cent deposit on all beer and soft drink containers, both retail and vended, sold in Yosemite National Park, California. Prior to the promulgation of Beverage Container Guidelines applicable to Federal installations in September 1976, the Yosemite Park and Curry Co. decided to make the deposit system a permanent operating feature. The purpose of the deposit is to provide consumers with a monetary incentive to return empty containers for a deposit refund. Beverage containers are returned to the beverage distributor if they are refillable bottles or sold as scrap if they are nonrefillable bottles or cans. Environmental benefits are obtained when recycled materials are substituted for virgin materials at the production level. The purpose of this report is to present the results

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or impacts of the deposit experiment over its first summer of operation. (Retained in SWIRS library).

(12) KEYWORDS: BOTTLE; CALIFORNIA; CLEANUP; CONTAINER; FEDERAL; INCENTIVE

(14) HIERARCH TERMS: 1CI; 1ED; 1LD/2LJ; 1RC

(15) STIMS ACC.NO.: 00S43048

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 45 p.

(1) SWIRS ACC.NO.: 043884

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Legislation, policy, and guidelines.

(6) BOOK TITLE: In Improving Military Solid Waste Management: Economic and Environmental Benefits, Department of Defense.

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Federal legislation and Department of Defense (DOD) guidelines pertaining to the solid waste problem are reviewed. Particular attention is given to the Solid Waste Disposal Act of 1965, the Resource Recovery Act of 1970, the National Environmental Policy Act of 1970, and the Resource Conservation and Recovery Act of 1976. Guidelines issued by the Environmental Protection Agency are noted. They concern incineration, landfills, source separation systems, resource recovery facilities, and beverage containers. The overall policy of DOD is to comply with environmental laws and regulations and demonstrate leadership in controlling environmental pollution. DOD's policy for solid waste is to design, use, store, handle, and ultimately dispose of all materials to minimize the possibility of pollution; conserve resources; and dispose of waste to the extent practicable by reprocessing, recycling, and reuse. Requirements embodied in DOD Directive 6050.3 and DOD Directive 4165.60 for the military services to fulfill in reprocessing, recycling, and disposing of solid waste are outlined. Guidelines issued by the Navy in 1975 which provide a systematic approach for evaluating solid waste management alternatives are noted.

(12) KEYWORDS: CAN-FOOD; CONSERVATION; DISPOSAL; INCINERATION; LAW; MANAGEMENT; MILITARY; RECLAMATION; REGULATIONS; SANITARY LANDFILL; SEPARATING; STORAGE

(14) HIERARCH TERMS: 1DD; 1MA; 1RG

(15) STIMS ACC.NO.: 00S42927

(16) CITATION: Washington, DC, U.S. General Accounting Office, June 2, 1977. p.3-6.

(1) SWIRS ACC.NO.: 042951

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Bottle bills: state-by-state.

(4) AUTHOR: Lederer B

(6) JOURNAL TITLE: Beverage World

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OR; 1US/2SD; 1US/2VT (10) PUB. YEAR: 1976

(11) ABSTRACT: Some 1,300 beverage container bills were introduced in state legislatures from 1969 through 1976 but less than half of 1 percent have been passed. Only Oregon, Vermont, South Dakota, California, Minnesota, and Virginia have approved bills designed to reduce litter caused by beverage containers. From 1970-75, citizens in 8 localities given the chance to decide for themselves have turned down referenda which would restrict use of nonreturnables. Breakdown on U.S. and state legislation in 1976 is given. Most bottle bill activity is on the Eastern Seaboard and in the Midwest. There is a contradiction between how the states as a block have been voting against bills and

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how Senators from those states voted on the national deposit bill. Three courts (in Maryland, New York, and Virginia) have addressed themselves to specific restrictive container legislation. Most of the bills introduced recently have resembled the Oregon bottle bill. Variations on the theme are noted. A state by state legislation and regulation breakdown is presented which notes: population; plants (soft drink and beer); bills introduced 1974-1976; 1976 bills according to litter, container, recycle, local; and comments. Another table shows how U.S. Senators voted on the national deposit bill.

(12) KEYWORDS: BOTTLE; CALIFORNIA; CONTAINER; FEDERAL; LEGAL; LEGISLATION; LITTER; LOCAL; MARYLAND; MINNESOTA; NEW YORK; OREGON; SOUTH DAKOTA; STATE; VERMONT; VIRGINIA

(14) HIERARCH TERMS: 1LB/2LD; 1LB/2LG

(15) STIMS ACC.NO.: 00S41994

(16) CITATION: 95(1234):25-29, \*64, Sept. 1976.

(1) SWIRS ACC.NO.: 042736

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Congress report asks deposits.

(4) AUTHOR: Hickox B

(6) JOURNAL TITLE: Food and Drug Packaging

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OR (10) PUB. YEAR: 1977

(11) ABSTRACT: Mandatory deposits on beverage cans and bottles, excise taxes on nonreturnable containers, and product disposal charges on other consumer product packaging have been recommended by a Congressional commission as the best method for recycling precious resources. The National Commission on Supplies and Shortages' report urges Congress to step up recycling efforts. Among its arguments for greater materials recycling, the Commission notes energy savings, reduced demand for virgin resources, development of domestic materials sources, and reduced cost of handling solid waste. As guides for future deposit legislation, the Commission offered the Oregon bottle bill which has greatly stimulated recycling and reduced roadside litter while leaving beverage prices essentially unchanged. Positions of the U.S. Department of Commerce, the Environmental Protection Agency, and the Federal Energy Administration are noted and findings of their studies discussed.

(12) KEYWORDS: AUTHORITY; BOTTLE; CAN-FOOD; CONTAINER; DISPOSAL; DOC; ENERGY; EPA; FEDERAL; FEE; LAW; LITERATURE; OREGON; PACKAGING; RECLAMATION; TAXES

(14) HIERARCH TERMS: 1CI/2DV; 1GB/2GB/3GF; 1SB

(15) STIMS ACC.NO.: 00S41779

(16) CITATION: 36(4):4,31, Feb. 24, 1977.

(1) SWIRS ACC.NO.: 042023

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Here's what they're saying on both sides of the non-returnable beverage container controversy.

(6) JOURNAL TITLE: Resource Recovery and Energy Review

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Opposing views on the topic of regional as well as a national ban on the manufacture and sale of disposable drinking containers are presented. Those in favor of such a ban claim that a) our environment would be cleaner, b) minerals now in short supply would be conserved, and c) a profitable recycling industry would be created. Those against feel that a) people would avoid the ban by crossing jurisdictional districts, b) the canning and bottling industries would suffer financially, creating greater unemployment, and c) there would not be any noticeable improvement in the environment. Further research



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is needed to verify either party's claims.

- (12) KEYWORDS: BOTTLE; CAMPAIGN; ENERGY; ENVIRONMENT; EPA; FOOD; LAW; LITTER; RECLAMATION
- (14) HIERARCH TERMS: 1LB/2LG; 1LD/2LH; 1PA/2PA
- (15) STIMS ACC.NO.: 00S41067
- (16) CITATION: 3(5):10-13, Sept./Oct. 1976.

- (1) SWIRS ACC.NO.: 041824
- (2) DOMESTIC: F (2) CATEGORY: 15 (2) SUBJ.TYPE: G (10) GEO. AREA: 1CD/2ON (10) PUB. YEAR: 1977

(11) ABSTRACT: A new film contends that restrictive beverage can legislation is ineffective in dealing with garbage disposal problems and that solid waste disposal can only be dealt with by a vigorous program of resource recovery through recycling. The film was made by the Metal Container Manufacturers' Advisory Council which represents the can producing companies and major metal suppliers in Ontario. Litter is seen as a behavioral problem which will continue until people change their ways. The Council recommends adoption of Keep America Beautiful's Clean Community System, an anti litter program based on behavioral reprogramming. The Council anticipates that banning nonrefillable cans could increase the garbage load. Banning nonrefillable cans in Ontario would also mean the loss of more than 1,000 jobs. Conversely, solid waste management generates jobs.

- (12) KEYWORDS: AUDIO-VISUAL; BOTTLE; CAMPAIGN; CAN-FOOD; CANADA; DISPOSAL; INDUSTRY; LAW; LITTER; ONTARIO; PACKAGING; PSYCHOLOGICAL; PUBLIC RELATIONS; RECLAMATION

- (14) HIERARCH TERMS: 1CI/2DV; 1EB/2ED; 1LB; 1LD
- (15) STIMS ACC.NO.: 00S40368
- (18) DOC.CIT.: New film deals with solid waste. Canadian Packaging, 30(1):126-127, Jan. 1977.

- (1) SWIRS ACC.NO.: 041125
- (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
- (4) AUTHOR: Topka G (10) GEO. AREA: 1CD/2ON (10) PUB. YEAR: 1976

(11) ABSTRACT: Ontario legislation calls for mandatory deposits on all returnable soft drink and beer containers, with the stipulation that the retailer must refund the consumer's deposit in cash. Advertising must show that a returnable version of any promoted nonreturnable container is available. And, equal shelf space must be given to returnable versions of nonreturnable packages. Canadian bottlers commenting on the law agree that for most major brand bottlers, the success of a return system would be beneficial; small bottlers were less enthusiastic. The retailers are seen as the ones who must bear most of the impact of the law. A Coca Cola spokesman said that because there has been a progressive changeover to refillables in Ontario there has been no disruption of soft drink operations. Potential enforcement problems were noted. The Canadian Ministry of the Environment is studying the feasibility of standardizing soft drink containers. Beer is currently packaged in standard containers throughout Canada.

- (12) KEYWORDS: BOTTLE; CANADA; CONTAINER; FOOD; LAW; ONTARIO; PACKAGING

- (14) HIERARCH TERMS: 1LB/2LG; 1PA
- (15) STIMS ACC.NO.: 00S40169
- (18) DOC.CIT.: Topka, G. Bottler reaction varies as Ontario adopts restrictions. Beverage Industry, 1, 4, 5, 14, Dec. 17, 1976.

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(1) SWIRS ACC.NO.: 040926  
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Futch M (10) GEO. AREA: 1US/2CO; 1US/2MA (10) PUB. YEAR: 1976  
 (11) ABSTRACT: Beverage container legislation in several States is reviewed. Voters in Michigan and Maine approved a law to require mandatory deposits on soft drink and beer containers. In Michigan, the law is to become effective in November 1978. The law calls for a deposit of at least 10 cents on each beverage container, with a deposit of 5 cents on certified containers or those which may be used by more than one bottler or brewer. Pull tab closures will be prohibited. The law in Maine will prohibit pull tab closures, as well as plastic loop carriers, and calls for a minimum deposit of 5 cents on all beverage containers. The law will become effective on January 1, 1978. Beverage container legislation that did not pass in Colorado, New York, Massachusetts, and Pennsylvania is noted. The debate over beverage container legislation among industry, environmental, and governmental groups is discussed.  
 (12) KEYWORDS: BOTTLE; BREWERY; COLORADO; DISCUSSION; EFFECT; ENVIRONMENT; INDUSTRY; LAW; MAINE; MASSACHUSETTS; MICHIGAN; NEW YORK; PACKAGING; PENNSYLVANIA  
 (14) HIERARCH TERMS: 1GB/2GB/3GB; 1PA  
 (15) STIMS ACC.NO.: 00S39970  
 (18) DOC.CIT.: Futch, M. Referendum: ballot box attack on convenience packaging. Beverage Industry, 61(11):4A-4B, 26A-26C, Dec. 3, 1976.

(1) SWIRS ACC.NO.: 040502  
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) GEO. AREA: 1US/2NY (10) PUB. YEAR: 1975  
 (11) ABSTRACT: A report on local, State, and Federal action related to beverage container legislation is presented. On the State level, 575 container bills have been under consideration since 1974. Over 1,000 have been introduced in State legislatures since 1969. Six communities and one State have held referenda on proposals to restrict beverage containers. In every case (one in 1975, three during 1974, and three earlier), the proposals were defeated by popular vote. In two communities, restrictive ordinances were overturned or enjoined in courts during 1974. Bills in the District of Columbia; Montgomery County, Maryland; Bowie, Maryland; Howard County, Maryland; Loudoun County, Virginia; and Oberlin, Ohio are noted. In 1974, restrictive beverage container legislation was introduced in virtually every State legislature which convened during the year. In 1975, restrictive beverage container legislation was introduced in 42 States. State legislative action in South Dakota, Vermont, Minnesota, and Oregon is discussed, and proposed Federal beverage container legislation centering on a national two level deposit system is examined. Also provided is information on resource recovery, litter, the Oregon bottle bill, and the recycling of aluminum cans. (Retained in SWIRS library)  
 (12) KEYWORDS: ADMINISTRATION; ALUMINUM; CONTAINER; CONTROL; COUNTY; DISTRICT OF COLUMBIA; FEDERAL; LAW; LITTER; LOCAL; MARYLAND; MINNESOTA; MUNICIPALITY; OHIO; OREGON; RECLAMATION; SOUTH DAKOTA; STATE; VERMONT; VIRGINIA  
 (14) HIERARCH TERMS: 1CI; 1LB/2LG  
 (15) STIMS ACC.NO.: 00S39546  
 (18) DOC.CIT.: Beverage container legislation . . . a status report. New York, NY, The Aluminum Association, Inc. , Aug. 1975. 5 p.

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(1) SWIRS ACC.NO.: 040501  
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) GEO. AREA: 1US/2OR (10) PUB. YEAR: 1975  
 (11) ABSTRACT: The implementation of Oregon's 1972 beverage container legislation is detailed. Oregon's bill requires beverage distributors and retailers to charge consumers a deposit even on convenience containers. Deposits range from 2 to 24 cents but must be at least 5 cents unless the container is reusable by more than one manufacturer. The bill also requires beverage makers to stamp, emboss, or label containers with refund information and requires stores and distributors to accept the containers and pay the refunds. Any metal beverage container with a closure that can be removed without the aid of a can opener is prohibited. Data are provided on litter reductions resulting from implementation of the legislation. It is estimated that litter was reduced by 20 percent from 1973 to 1974. The economic impact of the bottle bill is assessed. Alternatives to the bottle bill are discussed, including an action research model (ARM), reclamation, and resource recovery. (Retained in SWIRS library)  
 (12) KEYWORDS: ALUMINUM; BOTTLE; CAN-FOOD; CONTROL; DATA; ECONOMICS; EFFECT; FEE; LAW; LITTER; OREGON; RECLAMATION; REGULATIONS  
 (14) HIERARCH TERMS: 1CI; 1LB/2LG  
 (15) STIMS ACC.NO.: 00S39545  
 (18) DOC.CIT.: Report on the Oregon bottle bill. Pittsburgh, PA, Aluminum Company of America, Oct. 1975. 1 p.

(1) SWIRS ACC.NO.: 040207  
 (2) DOMESTIC: D (2) CATEGORY: 15 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Uhrhammer J (10) GEO. AREA: 1US/2CA/3YO (10) PUB. YEAR: 1976  
 (11) ABSTRACT: An experiment in California's Yosemite National Park is described that concerns returnable bottles. A park concessionaire began charging a five cent deposit on every beverage container sold. The purpose was to encourage consumers to collect cans and bottles rather than toss them away as litter. As a result of the experiment, the return rate reached 75 percent and the amount of litter in the park was greatly reduced. In 1971, the Oregon legislature passed a law requiring deposits on all beer and soft drink containers and banning the pull tab bottle. The return rate for bottles averaged 80 percent. It is concluded that the high return rates achieved in Yosemite and Oregon strongly suggest that the deposit system may be the answer to litter reduction problems. Opposition to and proponents of returnable bottle legislation are noted.  
 (12) KEYWORDS: BOTTLE; CALIFORNIA; CAN-FOOD; EFFECT; FEE; LAW; LITTER; OREGON; PUBLIC RELATIONS; RECREATION AREA; REDUCTION  
 (14) HIERARCH TERMS: 1CI; 1LB/2LG; 1RC  
 (15) STIMS ACC.NO.: 00S39251  
 (18) DOC.CIT.: Uhrhammer, J. The point or no returns. Sports Illustrated, 42, 44-45, Aug. 2, 1976.

(1) SWIRS ACC.NO.: 040157  
 (2) DOMESTIC: D (2) CATEGORY: 15 (2) SUBJ.TYPE: T  
 (4) AUTHOR: Waygoner D (10) GEO. AREA: 1US/2OR (10) PUB. YEAR: 1976  
 (11) ABSTRACT: The Oregon Bottle Bill, which requires that a refund be paid by the retailer for empty beer and soft drink containers, is examined with reference to the problem of waste reduction. A minimum two cent refund is required on all bottles which are reusable but all other beverage containers (cans included) require a five cent minimum

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refund. Beverage sales do not seem to be affected by the refund policy. There has been a 20 percent decrease in roadside litter in a test area in the two years following enactment of the law. Opposition to the law from the aluminum industry are detailed. It is suggested that the type of legislation passed in Oregon should be copied by other states since it has proved that a financial incentive to return a container results in increased sales in refillable containers and it helps bring the container back. The people of the state saved 1.4 trillion BTUs in one year which is enough energy savings to provide for the annual home heating needs for 45,000 Oregonians heating with natural gas.

(12) KEYWORDS: BOTTLE; BTU; CAN-FOOD; ENERGY; ENVIRONMENT; LAW; OREGON; RECLAMATION

(14) HIERARCH TERMS: 1CI; 1DD/2DN; 1GB/2GB/3GD

(15) STIMS ACC.NO.: 00S39201

(18) DOC.CIT.: Waggoner, D. The Oregon Bottle Bill--facts and fancies. Environmental Action Bulletin, 7(18):2-3, Sept. 4, 1976.

(1) SWIRS ACC.NO.: 040134

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G (10) GEO. AREA: 1US/2CO; 1US/2MA; 1US/2ME; 1US/2MI (10) PUB. YEAR: 1976

(11) ABSTRACT: It is reported that mandatory beverage container deposit proposals have been rejected by Massachusetts and Colorado but approved in Maine and Michigan. In the latter two States, a five cent deposit on refillable bottles is now required, pull tab cans are outlawed, and the refund value is to be stamped on the container. The Maine referendum measure also bans nonbiodegradable six pack carriers. In Michigan, bottles must be state certified as refillable and the State's name must be stamped on returnables alongside the refund value. It is estimated that brewers and bottlers spent almost \$1 million to defeat the bill in Massachusetts.

(12) KEYWORDS: BOTTLE; CAMPAIGN; COLORADO; CONTAINER; FOOD; INDUSTRY; LAW; MAINE; MASSACHUSETTS; MICHIGAN; PACKAGING

(14) HIERARCH TERMS: 1CI/2DV; 1LB/2LB

(15) STIMS ACC.NO.: 00S39178

(18) DOC.CIT.: State scores: Mich. , Me. yea, Colo. , Ma. nay. Food and Drug Packaging, 35(10):1, 14, Nov. 18, 1976.

(1) SWIRS ACC.NO.: 040133

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G

(4) AUTHOR: Futch M (10) GEO. AREA: 1CI/2DV (10) PUB. YEAR: 1976

(11) ABSTRACT: The campaign against restrictive container legislation and the upcoming referendum in four States is reported. Colorado, Maine, Massachusetts, and Michigan voters have the opportunity to accept or reject measures which call either for mandatory deposits on all beverage containers or ban pull tab closures and plastic retainers. Enactment of restrictive container legislation is anticipated to have extensive ramifications on beverage and container manufacturers, supermarkets, and the consumer. The massive campaigns which have been mounted in the effected States to educate the consumer as to the repercussions of restrictive legislation are described.

(12) KEYWORDS: BOTTLE; CAMPAIGN; CANNING; COLORADO; CONTAINER; EFFECT; FOOD; INDUSTRY; LAW; MAINE; MASSACHUSETTS; MICHIGAN; PACKAGING; PUBLIC RELATIONS

(14) HIERARCH TERMS: 1LB/2LB

(15) STIMS ACC.NO.: 00S39177

(18) DOC.CIT.: Futch, M. Beverage manufacturers await referendum results. Beverage Industry, 61(8):1,3,4-5, Oct. 22, 1976.

# LAWS AND REGULATIONS

(1) SWIRS ACC.NO.: 040042  
 (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Downey W (10) GEO. AREA: 1LB (10) PUB. YEAR: 1976  
 (11) ABSTRACT: The beverage industry's problem of public and legislative pressure to ban nonreturnable bottles is anticipated as accelerating unless the public can be better informed of the disadvantages of such legislation. It is suggested that this might be accomplished by an industry wide committee. Advertising in the national press is suggested as a way to inform the public. The franchise system, which is also under attack, is commented upon. Franchises are said to be good for local communities, small and big businesses alike, and the consumer. Those in the industry who consistently sell below cost price destroy the economic vitality of many bottling companies and should be stopped in those areas where below cost statutes are the law.  
 (12) KEYWORDS: BOTTLE; CONTAINER; ECONOMICS; INDUSTRY; INFORMATION; LAW; LITTER; PACKAGING; PUBLIC; RECLAMATION  
 (14) HIERARCH TERMS: 1CI/2DB  
 (15) STIMS ACC.NO.: 00S39086  
 (18) DOC.CIT.: Downey, W. Fighting container laws. Beverage Industry, 61(9):28, 96, Nov. 5, 1976.

(1) SWIRS ACC.NO.: 040041  
 (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Winter WE (10) GEO. AREA: 1LB (10) PUB. YEAR: 1976  
 (11) ABSTRACT: Challenges besetting the beverage industry are intensifying. The FTC's threat to the present franchise distribution system, the trend increasing general government over regulation of all free enterprise, and efforts to enact restricting packaging legislation are named. It is anticipated that unless the beverage industry mounts effective programs to communicate their views of the packaging and solid waste litter problem legislation will be passed banning nonreturnable containers. The recently enacted ban on red dye no. 2 is considered an example of government's tendency to regulate for the sake of regulating. The industry's bend towards widespread price promotions is discouraged and the responsibilities of the franchise companies are enumerated. Bottlers are considered as having indispensable marketplace information and companies are urged to communicate more with them.  
 (12) KEYWORDS: BOTTLE; CONTAINER; FEDERAL; FOOD; GOVERNMENT; INDUSTRY; INFORMATION; LAW; LITTER; PACKAGING; PROGRAM; PUBLIC  
 (14) HIERARCH TERMS: 1CI/2DB  
 (15) STIMS ACC.NO.: 00S39085  
 (18) DOC.CIT.: Winter, W. E. Industry challenges become more intense. Beverage Industry, 61(9):16, 108, Nov. 5, 1976.

(1) SWIRS ACC.NO.: 039098  
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976  
 (11) ABSTRACT: Oregon legislation on beverage containers is noted that requires the payment of a refund by retailers for empty beer and soft drink bottles. In order to encourage the use of standard reusable containers, a minimum two cent refund is required on all bottles which are certified as being used by more than one manufacturer. For all other beverage containers, a five cent minimum refund is required. The law was passed in 1971. As of September 1976, the beer can moved from 33 to 40 percent of the beverage container market. The nonreturnable beer bottle which held 31 percent of the market has been virtually eliminated and the returnable, refillable beer bottle has increased from 36 to 96 percent of the market. A similar pattern has occurred for

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soft drinks. Cans held 40 percent of the market prior to enactment of the law. They moved to 9 percent of total sales during the second year after the law's effective date. Litter reduction is the primary objective of Oregon's legislation on beverage containers. Lobbying against the law's passage is discussed. Economic aspects of the law are considered, as well as its impact on recycling.

(12) KEYWORDS: BOTTLE; CONTROL; ECONOMICS; LAW; LITTER; MARKET; OREGON

(15) STIMS ACC.NO.: 00S38142

(18) DOC.CIT.: Waggoner, D. The Oregon bottle bill - what it means to recycling. Compost Science, 17(4):10-13, Sept. /Oct. 1976.

(1) SWIRS ACC.NO.: 037237

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G (10) PUB.  
YEAR: 1975

(11) ABSTRACT: Based on national averages, it is estimated that about 42 percent of all individually packaged soft drinks and 22 percent of beer consumed in Pennsylvania are sold in refillable bottles. The remaining beverage packages consist of one-way no-deposit cans and bottles. Based on experience in Oregon and Vermont, it is expected that if mandatory legislation were enacted in Pennsylvania, the percentage of beverage units sold in refillable bottles would increase to about 80 percent. This study indicates that there would be two major economic effects of enacting mandatory deposit legislation in Pennsylvania. First, it is predicted that an increase in refillable beverage containers will cause a decrease of about \$2.2 million in the labor costs incurred by the beverage industry in delivering packaged beer and soft drinks to consumers. Second, mandatory deposit legislation is expected to cause the loss of about 3,000 jobs in the bottle and can manufacturing industries, and at the same time cause a gain of about 3,800 jobs in those industries engaged in the bottling, distribution, and sale of packaged beverages. The net effect of the state-wide legislation on employment would be to provide about 800 additional jobs to Pennsylvania in beverage-related industries. Also it is indicated that mandatory deposit legislation would also reduce litter, solid waste, and energy utilization in Pennsylvania. (Author Abstract Modified) (Document retained in SWIRS library)

(12) KEYWORDS: BENEFIT; BOTTLE; BREWERY; CAN-FOOD; CANNING; ECONOMICS; EFFECT; ENERGY; GLASS; LAW; LITTER; MARKET; METAL; PACKAGING; PENNSYLVANIA; PERSONNEL; PROJECTION; REDUCTION

(15) STIMS ACC.NO.: 00S36282

(18) DOC.CIT.: Merriman, J., and S. Rebeck. The impact of mandatory deposit legislation for beverage containers on employment in Pennsylvania. Dickinson College Senior Research Project. Harrison, PA, Pennsylvania Alliance for Returnables, Inc., June 1975, 20 p.

(1) SWIRS ACC.NO.: 037014

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB.  
YEAR: 1976

(11) ABSTRACT: The legislative approach taken in Oregon to solve problems associated with disposable beverage containers is described. The following legislative goals of beverage container legislation are identified: litter reduction, solid waste reduction, energy and resource conservation, and safety. Potential legislation approaches to the control of beverage container disposal include a container tax and a selective container ban. Oregon's legislative efforts to minimize problems in the disposal of beverage containers are discussed, with emphasis on the economic impact of legislation requiring a deposit on

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all containers. Businesses directly affected by container legislation are considered to include container manufacturers, brewers, beer distributors, soft drink bottlers and canners, and retailers. It is pointed out that the most direct potential impact of container legislation on consumers is its effect on beverage prices. Indirect effects relate to product choices, competition, inconvenience, deposits, and utility and interest losses. The effect of Oregon legislation on the market is assessed. Legislative techniques for dealing with the impact of container regulation are proposed. It is concluded that a mandatory deposit on beverage containers in Oregon has been effective in promoting environmental goals while not being detrimental to the beverage industry itself. The major impact of such legislation is felt by the container industry.

(12) KEYWORDS: BOTTLE; BREWERY; CAN-FOOD; CANNING; COMMERCIAL; CONSERVATION; CONTAINER; ECONOMICS; LAW; LITTER; OREGON; PERSONNEL; PROBLEMS; REDUCTION; SAFETY; TAXES

(15) STIMS ACC.NO.: 00S36059

(18) DOC.CIT.: Gudger, C. M., and K. D. Walters. Beverage container regulation: economic implications and suggestions for model legislation. Ecology Law quarterly, 5(2):265-290, 1976.

(1) SWIRS ACC.NO.: 036813

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The trend in court decisions has been to uphold legislation restricting throwaway beverage containers. Major examples discussed include the Vermont Supreme Court decision of 1954, the Oregon Court of Appeals decision of 1973, and the Maryland Court decision of 1975. An exception to this trend is the Michigan decision that struck down an Ann Arbor mandatory deposit ordinance in 1974. If too many states enact laws restricting throwaway containers, the enactment of federal controls may become necessary, due to the effects on interstate commerce and compliance by bottles. The economic impact of the legislation in Oregon has been job reduction and profit losses by soft drink, beer, and packaging industries and higher prices for consumers. Total litter was reduced by about 10.6 percent two years after the Oregon law went into effect.

(12) KEYWORDS: BOTTLE; CONTAINER; ECONOMICS; INDUSTRY; LAW; LEGAL; LITTER; MARYLAND; MICHIGAN; MUNICIPALITY; OREGON; PACKAGING; REGULATIONS; STATE; VERMONT

(15) STIMS ACC.NO.: 00S35858

(18) DOC.CIT.: McCord, J. How the courts view restrictions on throwaway beverage containers. Solid Wastes Management, 19(2):46-47, 54, 56, Feb. 1976.

(1) SWIRS ACC.NO.: 034561

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This article presents the views of the President of the Glass Container Manufacturers Institute on compulsory deposits on beverage containers. The basic position of the Institute is that the choice between convenience packaging and returnable or refillable packaging must be made by the consumers rather than by Federal legislation. It is suggested that neither energy nor resource conservation considerations are substantial factors in the decision to recycle glass containers. Although all glass represents about 9 percent of municipal solid waste, only about 2 percent is nonreturnable beverage containers. It is claimed that where solid waste is deposited in landfills, glass presents no problem. Investigations indicate that

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glass containers comprise about 6 percent of highway litter, and that 3 percent of this litter is non-returnable containers. It is suggested that people do not make the decision to litter based on the refund value of the container. Source reduction would induce high unemployment and severe economic and human dislocation, according to the Institute.

(12) KEYWORDS: CAN-FOOD; DISPOSABLES; DISPOSAL; ECONOMICS; FEDERAL; GENERATION; GLASS; INCENTIVE; LAW; LITTER; PACKAGING; PROBLEMS; PUBLIC; RECLAMATION; REDUCTION

(15) STIMS ACC.NO.: 00S33605

(18) DOC.CIT.: Returnables vs. no-returns: GCM1 upholds free choice. *American Glass Review*, 96(3):7-8, 1975.

(1) SWIRS ACC.NO.: 032965

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB.  
YEAR: 1975

(11) ABSTRACT: Four "bottle bills" of the type in effect in Oregon have been introduced in the House, and eventually forgotten. Now a fifth is scheduled for introduction by Senator Mark O. Hatfield of Oregon, which has started the controversial ball rolling again. The Bill, S. 613, calls for a 3-year phase-in period for a ban on non-returnable bottles with a 1-year phase-in for a prohibition on detachable ends. EPA is working on its own version of a bottle bill. There are problems in initiating such a legislative step, however, not least among them an economic disruption to several parts of the country. EPA is reviewing suggested guidelines for a test, to be run at federal facilities, on a non-returnable bottle ban, with a 0.05 dollar deposit of all beer and carbonated beverage containers. The packaging industry has been asked to take a look at: (1) reusable or refillable packages (2) larger sizes where appropriate (3) low energy-consuming materials (4) easy-to-recycle packages (5) elimination of materials whose production creates more pollution than acceptable and (6) elimination of potentially hazardous package materials.

(12) KEYWORDS: CONTAINER; INDUSTRY; LAW; PACKAGING; PROBLEMS;  
RECLAMATION; RESEARCH

(15) STIMS ACC.NO.: 00S32009

(18) DOC.CIT.: Tempers flare over Federal ban-the-bottle proposals. *Modern Packaging*, 48(3):9, 15, 16, 19, Mar. 1975.



## Section 4

### ANALYSIS, RESEARCH, AND DEVELOPMENT

(1) SWIRS ACC.NO.: 048285  
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G  
(3) ARTICLE TITLE: Conservation committee deposits beverage container issue on Carter's desk.  
(6) JOURNAL TITLE: Solid Wastes Mgmt/RRJ  
(10) LANGUAGE: EN (10) PUB. YEAR: 1977  
(11) ABSTRACT: The Resource Conservation Committee provided for by the Resource Conservation and Recovery Act (RCRA) of 1976 is described in terms of its intended functions and criticized for its failure in performing them. The committee is supposed to investigate ways to make resource conservation work in the U.S. The slow start of the committee in this investigation is attributed to changing administrations void of leadership in EPA and other agencies because of the transition, and EPA's continued narrow interpretation of RCRA with emphasis on regulatory functions in hazardous wastes and land disposal. The initial studies of the committee concern beverage containers and product charges, with EPA's and the Executive Office's viewpoints and commitments on these issues still unknown. It was concluded that the committee's efforts will be perceived as more oriented and productive in whatever policy steps and programs are formulated.  
(12) KEYWORDS: BOTTLE; CONTAINER; DISPOSAL; EPA; GOVERNMENT; INVESTIGATION; LAW; RECLAMATION; REGULATIONS  
(14) HIERARCH TERMS: 1LF/2DP; 1LF/2PF  
(15) STIMS ACC.NO.: 00S47339  
(16) CITATION: 20 (11):52-54, Nov. 1977.

(1) SWIRS ACC.NO.: 047359  
(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G  
(4) AUTHOR: Olson JA  
(5) CORPORATE AUTHOR: Research Triangle Institute  
(6) BOOK TITLE: Preliminary Estimates of the Transitional Price Impacts of Mandatory Beverage Container Legislation. (9) CONTRACT NO.: 68-01-2981  
(10) LANGUAGE: EN (10) PUB. YEAR: 1976  
(11) ABSTRACT: A theoretical model and an empirical specification are used to derive preliminary estimates of the transitional price impact of mandatory beverage container deposit legislation. A simple model of price and output determination in beverage markets with mandatory deposit legislation is outlined. It is divided into two parts: long term equilibrium and short term equilibrium. Critical variables in the empirical estimation are: beverage demand, long term supply, short term supply, and the rapidity with which short term supply curves can be shifted outward. Procedures used to incorporate these variables in the empirical projection model are discussed. Assumptions inherent in the development of the model are listed. Data on the impact of mandatory beverage container deposit legislation on beer and soft drink prices are provided. (Retained in SWIRS library).  
(12) KEYWORDS: CONTAINER; ECONOMICS; MARKET  
(14) HIERARCH TERMS: 1C2; 1EC/2C6; 1EC/2MG  
(15) STIMS ACC.NO.: 00S46412  
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Jun. 1976. 22 p.

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(1) SWIRS ACC.NO.: 047194  
(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: G  
(4) AUTHOR: Rogoff JT  
(5) CORPORATE AUTHOR: Research Triangle Institute  
(6) BOOK TITLE: Case Studies of the Potential Impact of Guidelines Mandating Beverage Container Deposits at Federal Installations.  
(10) LANGUAGE: EN (10) PUB. YEAR: 1977  
(11) ABSTRACT: This report is concerned with the impact of guidelines mandating beverage container deposits at federal installations. The guidelines, proposed in 1976 by the Environmental Protection Agency, require that all carbonated beverages sold in one way containers at federal installations carry a minimum deposit of five cents. Due to the number and significance of military installations, investigations were conducted at various military sites to determine the impact of the guidelines. The severity of alleged impacts appeared to depend, to a large extent, upon regional characteristics of the installation and the dependence of the local community (in particular, producers and distributors of beverages) on the federal installation for jobs and revenues. Information collected from specific military installations is compiled, along with information dealing with the labeling aspect of the guidelines. (Retained in SWIRS library).  
(12) KEYWORDS: CONTAINER; EPA; FEDERAL; MILITARY; REGULATIONS; RESEARCH; SITES  
(14) HIERARCH TERMS: 1CZ; 1LF/2FF; 1BP  
(15) STIMS ACC.NO.: 00S46248  
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Jun. 1977. 61 p.

(1) SWIRS ACC.NO.: 046101  
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G  
(3) ARTICLE TITLE: The beverage container issue & resource conservation.  
(4) AUTHOR: Stern CD  
(6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.  
(9) GRANT NO.: T90551-01-0  
(10) LANGUAGE: EN (10) PUB. YEAR: 1977  
(11) ABSTRACT: A technical analysis of the issues and requirements for passing effective legislation for beverage container control to effect real resource conservation is presented. There appears to be a choice between soft legislation (requiring container deposits) and hard legislation (specifying refillable containers), with unknown longterm consequences. The most thorough study of long term economics of these two approaches (by the Federal Energy Administration) is criticized on the grounds that while materials processing and use were followed and analyzed from source through recycling, including energy resources and labor required, the capital involved was not considered as thoroughly. It was concluded that including the capital requirements of the container maker, mining companies, and energy facilities would contradict the FEA's conclusion that the deposit system is more capital intensive. (Retained in SWIRS library).  
(12) KEYWORDS: ANALYSIS; BOTTLE; CONTAINER; ECONOMICS; ENVIRONMENT; LAW; RECLAMATION; RESOURCE  
(14) HIERARCH TERMS: 1AN; 1CZ/2DP; 1LF  
(15) STIMS ACC.NO.: 00S45151  
(16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.67-69.

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(1) SWIRS ACC.NO.: 046096  
 (2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: EPA's involvement in waste reduction.  
 (4) AUTHOR: Canfield TM  
 (6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.  
 (9) GRANT NO.: T90551-G1-0  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: The involvement of the Environmental Protection Agency in waste reduction is described as primarily supporting studies on waste generation, milk containers, disposables, packaging growth, product life extension, and resource use and environmental impacts for all products. A special effort has been made with regard to developing beverage container guidelines applicable to Federal facilities and implementing the program. EPA is also authorized to carry out resource conservation actions under the new Resource Conservation and Recovery Act in developing guidelines, providing technical aid, providing guidance for state planning, and funding implementation programs. (Retained in SWIRS library).  
 (12) KEYWORDS: BOTTLE; CONSERVATION; CONTAINER; ENVIRONMENT; EPA; FEDERAL; LAW; MANAGEMENT; RECLAMATION; REDUCTION; RESOURCE  
 (14) HIERARCH TERMS: 1CZ; 1MA/2FF; 1PB  
 (15) STMS ACC.NO.: 00545146 (15) SECONDARY AUTHORS: Butler HP  
 (16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.46-52.

(1) SWIRS ACC.NO.: 046092  
 (2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: International approaches to waste reduction.  
 (4) AUTHOR: Conn WD  
 (6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.  
 (9) GRANT NO.: T90551-01-0  
 (10) LANGUAGE: EN (10) GEO. AREA: 1EU/2FR; 1EU/2GN; 1EU/2NF; 1EU/2SR; 1EU/2SU (10) PUB. YEAR: 1977  
 (11) ABSTRACT: Findings on international policy approaches to waste reduction were reviewed in terms of taxes and fiscal instruments, government regulation, industry-government cooperation, and deposits, bounties, or buy-back approaches. Sweden, Norway, and Finland use taxes and charges on beverage containers to control their disposal and discourage the use of nonrefillable containers. Sweden, Norway, and France regulate production and distribution of certain products (i.e., packaging thereof), while proposals for such legislation are pending in other European countries. Voluntary industry-government cooperation is noted in Denmark, Germany, and Norway. Incentive packaging return programs are being operated in Denmark, Finland, Germany, The Netherlands, Norway, and Switzerland, with mixed packaging practices in other countries. It is concluded that, although packaging is only a portion of the solid waste disposal problem, it is important because of its visibility and symbolism for more extensive conservation efforts. (Retained in SWIRS library).  
 (12) KEYWORDS: CONSERVATION; ECONOMICS; ENVIRONMENT; EUROPE; FRANCE; GERMANY; INTERNATIONAL; MANAGEMENT; NETHERLANDS; PACKAGING; RECLAMATION; REDUCTION; RESOURCE; SWEDEN; SWITZERLAND; TAXES  
 (14) HIERARCH TERMS: 1EC/2TX; 1LF/2IB; 1MA/2IB; 1PB  
 (15) STMS ACC.NO.: 00545142  
 (16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.27-31.

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(1) SWIRS ACC.NO.: 046086  
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Pilcher K ed  
 (6) BOOK TITLE: Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.  
 (9) GRANT NO.: T90551-01-0  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: Twenty-five papers given at the meeting of the National Coalition on Solid Waste, held March 4-7, 1977, Washington, DC, are presented. The focus of the meeting was on citizen involvement in solid waste issues such as resource conservation. Topics of papers included aspects of the Resource Conservation and Recovery Act of 1976, waste reduction concepts and programs, the beverage container issue, source separation, rural solid waste, resource recovery, and economics and solid waste. (Retained in SWIRS library).  
 (12) KEYWORDS: BOTTLE; CONSERVATION; ECONOMICS; ENVIRONMENT; PROCESS; PUBLIC RELATIONS; RECLAMATION; REDUCTION; RESOURCE  
 (14) HIERARCH TERMS: 1DP/2LF; 1DP/2MX; 1PT; 1PV; 1RR  
 (15) STIMS ACC.NO.: 00S45136  
 (16) CITATION: Washington, DC, Environmental Action Foundation, 1977. 112 p.

(1) SWIRS ACC.NO.: 045878  
 (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Hunt RG  
 (6) BOOK TITLE: Resource and Environmental Profile Analysis of Nine Beverage Container Alternatives. Final Report. (8) REPORT NO.: EPA/530/SW-91c (9) CONTRACT NO.: 68-01-1848  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1974  
 (11) ABSTRACT: A resource and environmental profile analysis was performed for nine beverage container options concerning four basic raw materials: glass, steel, aluminum, and plastic. The analysis encompassed parameters of virgin raw materials use, energy use, water use, industrial solid wastes, post-consumer solid wastes, air pollutant emissions, and water pollutant effluents assessed for each manufacturing and transportation step in the life cycle of a container. Containers were ranked according to environmental impact. Manufacturing systems are overviewed for each of the containers studied. The potential for recycling and reusing the various types of beverage containers is also discussed. (Retained in SWIRS library).  
 (12) KEYWORDS: ALUMINUM; BOTTLE; CAN-FOOD; CONTAINER; ECONOMICS; ENVIRONMENT; GLASS; METAL; PLASTIC; RECLAMATION; RESEARCH  
 (14) HIERARCH TERMS: 1CI/2DV; 1EA/2EA; 1ED; 1PA/2PC; 1SB  
 (15) STIMS ACC.NO.: 00S44927 (15) SECONDARY AUTHORS: Franklin WE; Welch RO  
 (16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1974. 178 p.

(1) SWIRS ACC.NO.: 045347  
 (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Food packaging.  
 (4) AUTHOR: Goen RL  
 (5) CORPORATE AUTHOR: Stanford Research Institute  
 (6) BOOK TITLE: In Potential for Reusable Homogeneous Containers, Interim Report  
 (8) NTIS NO.: PB 265 100 (8) REPORT NO.: NSF/KA-770030  
 (9) GRANT NO.: AER 76-02396  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977

# ANALYSIS, RESEARCH, AND DEVELOPMENT

(11) ABSTRACT: The food packaging share of the packaging market and the generation of packaging waste are examined in relation to the feasibility of reusable containers. Food packaging accounts for nearly half of the dollar volume of packaging in the United States. Containers and packaging contribute to 35 percent of residential and commercial solid waste, or 55 percent of nonfood product waste. Food containers account for 23 percent of packaging waste. The potential reduction in solid waste through the use of reusable food containers is considered to be comparable to that for reusable beverage containers. Cans for fruits, vegetables, and juices account for nearly half of all cans used for food. A survey of the food service industry by the Department of Agriculture in 1969 is reported. It is shown that the food service industry accounted for one sixth of the total quantity of food used in the United States.

(12) KEYWORDS: CONTAINER; FOOD; INDUSTRY; MARKET; PACKAGING

(14) HIERARCH TERMS: 1CI; 1PA/2PC

(15) STIMS ACC.NO.: 00S44394 (15) SECONDARY AUTHORS: Somogyi LP; Steele RV

(16) CITATION: Washington, DC, National Science Foundation, Feb. 1977. p.7-17.

(1) SWIRS ACC.NO.: 044553

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Continuing the container controversy.

(4) AUTHOR: Bate R

(6) JOURNAL TITLE: New Scientist

(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977

(11) ABSTRACT: The debate between advocates of nonreturnable beverage containers and those who favor returnable recycling measures poses public interest problems. Written by two members of Friends of the Earth (an environmentalist conservationist citizens action group), this article reviews the lack of action in months following the publication of an FOE study on container recycling. With specific application to British policy, few official previous reports are useful; they are either desk studies or relate to North American experience which is not transferable. Little original work had been done in Europe in the authors' opinion. In light of the FOE report a subsequent study has advanced a more precise method of handling the problem. The study, presented to WMAC, concentrates on a total system model, from extraction of raw materials through manufacture, filling, retailing, consumption, to disposal or reclamation. Process design includes not only economic costs but also energy consumption, raw material usage, pollution generation and solid waste disposal aspects. This is the first attempt to apply a systems analysis model to determine the most acceptable mix of socially and environmentally acceptable actions.

(12) KEYWORDS: ANALYSIS; CONTAINER; DISPOSABLES; ECOLOGY; ECONOMICS; ENVIRONMENT; GREAT BRITAIN; PACKAGING; PLANNING; RECLAMATION; SYSTEM; SYSTEMS ANALYSIS

(14) HIERARCH TERMS: 1CI/2DV; 1ED; 1MA/2MH; 1RG; 1SB; 1SP

(15) STIMS ACC.NO.: 00S43598 (15) SECONDARY AUTHORS: Burke T

(16) CITATION: 75(1061):171, July 21, 1977.

(1) SWIRS ACC.NO.: 044062

(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: T

(5) CORPORATE AUTHOR: Research Triangle Inst/Franklin Assoc

(6) BOOK TITLE: Energy and Economic Impacts of Mandatory Deposits. Executive Summary.

(8) NTIS NO.: PB 258 637 (8) REPORT NO.: FEA/D-76/405 (9) CONTRACT NO.: CO-04-50175-00

# BEVERAGE CONTAINER RECYCLING AND REUSE

(10) LANGUAGE: EN (10) PUB. YEAR: 1976  
 (11) ABSTRACT: Executive summary of a study that examines the energy, capital and labor impacts that would be caused by a proposed mandatory national beverage container deposit legislation putting a five cents deposit on beer and soft drink containers. Three major areas of potential impact are examined. Changes in annual energy consumption, changes in capital investment requirements (in terms of fixed plant and equipment, and changes in labor requirements (in terms of jobs and earning). These impacts are developed for those industries in the total beverage system that would be most affected by changes caused by a mandatory deposit. Results are reported for a 1982 steady state situation. (Retained in SWIRS library).  
 (12) KEYWORDS: BOTTLE; CONTAINER; ECONOMICS; ENERGY; INDUSTRY; PACKAGING; RECLAMATION  
 (14) HIERARCH TERMS: 1CI; 1EA/2EA; 1EC/2EV; 1SB  
 (15) STIMS ACC.NO.: 00S43105  
 (16) CITATION: Washington, DC, Federal Energy Administration, Sept. 1976. 15 p.

(1) SWIRS ACC.NO.: 043744  
 (2) DOMESTIC: D (2) CATEGORY: 06 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Solid waste and litter.  
 (4) AUTHOR: Ackoff RI  
 (6) BOOK TITLE: In Redesigning the Future: A Systems Approach to Societal Problems.  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1974  
 (11) ABSTRACT: Litter is viewed as a social problem, and a program of action is proposed to control litter and solid waste. It is noted that beverage containers contribute to litter and solid waste. Litter is defined as improperly disposed of solid waste. Beverage containers constitute about 3.5 percent of the weight of domestically produced solid waste. The impact of a ban on one-way containers on the litter problem and on the solid waste problem is assessed. It is felt that a beverage container ban is not an efficient way of minimizing litter and solid waste. Consideration is given to the use of deposits on one way containers and to voluntary reclamation programs. It is believed that these alternatives are also ineffective in reducing litter and solid waste. Other approaches to litter reduction and solid waste disposal are examined. The penny per pound tax on nonconsumables proposed in Senate Bill 3058 is discussed. The statement is made that such a unit tax would encourage the use of larger containers and would reduce the amount of material used in containers. Procedures to follow in the development, financing, and administration of improvement programs are outlined. It is proposed that the cost of preventing or correcting damage to the environment be added to the cost of goods, services, and activities that produce such damage and that positive incentives be provided to encourage individuals and organizations to seek environmentally constructive actions.  
 (12) KEYWORDS: ADMINISTRATION; CAMPAIGN; CONTAINER; CONTROL; ECONOMICS; FEDERAL; INCENTIVE; LAW; LITTER; PROGRAM; RECLAMATION; SOLID; TAXES  
 (14) HIERARCH TERMS: 1EA/2EA; 1EA/2EC; 1LB/2LD; 1LD/2LH  
 (15) STIMS ACC.NO.: 00S42787  
 (16) CITATION: New York, NY, John Wiley and Sons, 1974. p.173-192.

(1) SWIRS ACC.NO.: 041604  
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Geller ES (10) GEO. AREA: 1EB/2ED (10) PUB. YEAR: 1975

(11) ABSTRACT: A field application of behavior modification studied the relative effectiveness of different prompting procedures for increasing the probability that customers entering a grocery store would select their soft drinks in returnable rather than nonreturnable containers. Six different 2 hr experimental conditions during which bottle purchases were recorded were (1) No Prompt (i. e. , control), (2) one student gave incoming customers a handbill urging the purchase of soft drinks in returnable bottles, (3) distribution of the handbill by one student and public charting of each customer's bottle purchases by another student, (4) handbill distribution and charting by a five-member group, (5) handbills distributed and purchases charted by three females. The variant prompting techniques were equally effective, and in general increased the percentage of returnable bottle customers by an average of 25 percent.

(12) KEYWORDS: BOTTLE; COMMERCIAL; CONTAINER; CONTROL; DISPOSABLES; LITTER; PSYCHOLOGICAL; SURVEY

(14) HIERARCH TERMS: 1LD/2LH

(15) STIMS ACC.NO.: 00S40648 (15) SECONDARY AUTHORS: Farris JC; Post DS

(18) DOC.CIT.: Geller, E. S. , J. C. Farris, and D. S. Post. Prompting a consumer behavior for pollution control. Journal of Applied Behavior Analysis, 6(3):367-376, 1975.

(1) SWIRS ACC.NO.: 037880

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Packaging techniques adopted by the Fred Koch Brewery Inc. in Dunkirk, New York are detailed. Studies were made by the brewery to develop a package that would meet their market area's consumer needs and thus increase the brewery's share of the market. The decision was made to switch from the production of standard 24 bottle returnable cases to a light and more attractive package with 12 returnable bottles. Criteria established for any new package required that it serves as a shipper, retail box, and vehicle for returning the empty bottles and that it help sell the beer at the local supermarket. The brewery consulted with St. Regis Paper Company whose Corrugated Container Division recommended its new Structur-pak system, a corrugated box with up to 30 percent greater stacking strength than conventional boxes. Advantages of the 12 bottle package are discussed in terms of cost, space, and marketing advantages such as its easiness to carry and its stacking stability. The Fred Koch Brewery can deliver 12 bottles at a cost ranging from \$2. 19 to \$2. 25, excluding the one time \$1. 00 deposit for the bottles which is eventually returned.

(12) KEYWORDS: BOTTLE; BREWERY; MARKET; PACKAGING; RECLAMATION

(15) STIMS ACC.NO.: 00S36924

(18) LOC.CIT.: Twelve pack of returnables, Brewers Digest, 51(15):46, 43, May 1976.

(1) SWIRS ACC.NO.: 035140

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: A recent study by the Midwest Research Institute Kansas City, Missouri, showed that the use of returnable bottles would lead to 21 percent less virgin material use, 30 percent less water pollution, 60 percent less air pollution, and 60 percent less energy use. The U. S. Environmental Protection Agency (EPA) does recommend bottle legislation at the Federal level. At present the EPA is working on guidelines calling for the use of returnable containers at all Federal agencies, unless a particular agency can solidly justify

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noncompliance. Bottle legislation has been left to the States. Oregon has the oldest Bottle Law. The dire predictions presented by the anti-Bottle Bill spokesman did not happen in that State. Beverage sales did not go down and neither did the number of jobs in the marketplace. More jobs were actually created by the reusing of bottles. (Vermont and South Dakota now have laws similar to the Oregon law. ) Reynolds is trying to blunt the forces for bottle bills by recycling aluminum.

(12) KEYWORDS: ALUMINUM; BOTTLE; DISPOSABLES; ECONOMICS; ENERGY; EPA; FEDERAL; LAW; OREGON; POLLUTION; RECLAMATION; REGULATIONS; SOUTH DAKOTA; STATE; VERMONT

(15) STIMS ACC.NO.: 00S34185

(18) DOC.CIT.: How is the battle of the bottle going? Environmental Science and Technology, 9(10):906, Oct. 1975.

(1) SWIRS ACC.NO.: 034561

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This article presents the views of the President of the Glass Container Manufacturers Institute on compulsory deposits on beverage containers. The basic position of the Institute is that the choice between convenience packaging and returnable or refillable packaging must be made by the consumers rather than by Federal legislation. It is suggested that neither energy nor resource conservation considerations are substantial factors in the decision to recycle glass containers. Although all glass represents about 9 percent of municipal solid waste, only about 2 percent is nonreturnable beverage containers. It is claimed that where solid waste is deposited in landfills, glass presents no problem. Investigations indicate that glass containers comprise about 6 percent of highway litter, and that 3 percent of this litter is non-returnable containers. It is suggested that people do not make the decision to litter based on the refund value of the container. Source reduction would induce high unemployment and severe economic and human dislocation, according to the Institute.

(12) KEYWORDS: CAN-FOOD; DISPOSABLES; DISPOSAL; ECONOMICS; FEDERAL; GENERATION; GLASS; INCENTIVE; LAW; LITTER; PACKAGING; PROBLEMS; PUBLIC; RECLAMATION; REDUCTION

(15) STIMS ACC.NO.: 00S33605

(18) DOC.CIT.: Returnables vs. no-returns: GCMI upholds free choice. American Glass Review, 96(3):7-8, 1975.



## Section 5 RECYCLING

(1) SWIRS ACC.NO.: 047832  
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: T  
 (3) ARTICLE TITLE: Atervinning av burkskrot möjlig i stor skala.  
 (Recovery of tin scraps is possible on a large scale).  
 (4) AUTHOR: Jonsson T  
 (6) JOURNAL TITLE: Teknisk Tidskrift  
 (10) LANGUAGE: SD (10) GEO. AREA: 1EU/2SR (10) PUB. YEAR: 1976  
 (11) ABSTRACT: Scrap iron from used food and beer cans is an energy rich material. Each ton that can be recovered diminishes the need to import energy corresponding to 200-600 l oil. The difference is due to the amount of energy consumed when the scrap iron is recovered. More than 100,000 t of tin plate is destroyed each year in Swedish dumps. This corresponds to 35,000 t/yr of oil. Since 1972, the tin plate fraction of the cinder from central refuse combustion stations has been examined metallurgically at Gullspangs Elektrokemiska AB. It has proven to be an excellent raw material for the production of steel ingot and for 45% silicon iron. The steel ingot from Gullspang that is of reinforcement bar quality is rolled into steel bars at Quarnhammars Iron Mill. The hot rolling of crude iron that contains tin has usually caused problems at the steel mills, because cracks are easily formed. Crack formation does not occur with the Gullspang method even when there is as much tin as 0.5%, which is ten times more than is usually tolerable at the traditional steel mills. The tin of the Bullspang steel ingot serves as an alloy metal. The 45% silicon iron does not contain tin or lead and it is used as an alloy metal at the steel mills. To produce crude steel by way of low percent silicon iron is probably the most energy saving way of reusing tin plate. (Original text in Swedish).  
 (12) KEYWORDS: IRON; METAL; RECLAMATION; SCRAP; SWEDEN; UTILIZE  
 (14) HIERARCH TERMS: 1MI/2IN/3UT; 1MK/2TI; 1RG  
 (15) STIMS ACC.NO.: 00S46885 (15) SECONDARY AUTHORS: Larsson P  
 (16) CITATION: 106 (7):23, Apr. 8. 1976.

(1) SWIRS ACC.NO.: 047598  
 (2) DOMESTIC: D (2) SUBJ.TYPE: T  
 (3) ARTICLE TITLE: Can slitting device.  
 (4) AUTHOR: Torres L  
 (7) PATENT DATA: U.S. Patent No. 4,030,392  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: A device for the cutting of cans is described. The device may be used to cut slits in cans, such as beverage cans, to produce ornamental objects. The apparatus consists of a vertical member supported on a base. A cylindrical support extends from the vertical member and is configured to extend into and support a can. A lever is pivotally mounted on the vertical member. A blade on the lever cuts the can upon the urging of the lever toward the cylinder. The cylindrical support has at least one narrow axially extending peripheral slot adapted to receive the blade as the can is cut. The outer peripheral surface of the cylindrical support abuts an inner peripheral surface of the can, the slot is generally axial of the can and the lever is positioned to engage the can surface at such an angle that the blade cuts the can in a shearing action as the blade is received in the slot.  
 (12) KEYWORDS: CONTAINER; EQUIPMENT; INDUSTRY; PATENT; PROCESS;  
 RECLAMATION  
 (14) HIERARCH TERMS: 1ET/2SK; 1IN/2MP; 1SD  
 (15) STIMS ACC.NO.: 00S46651  
 (16) CITATION: filed Jan. 29, 1976 issued Jun. 21, 1977. 4CAT: 12

# BEVERAGE CONTAINER RECYCLING AND REUSE

(1) SWIRS ACC.NO.: 047304  
 (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Returnables versus nonreturnables.  
 (4) AUTHOR: Samtur HR  
 (6) BOOK TITLE: In Glass Recycling and Reuse.  
 (9) GRANT NO.: GI-29731  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1974  
 (11) ABSTRACT: Returnable versus nonreturnable beverage container production and related problems are addressed. Data on returnable and nonreturnable beverage containers between 1955 and 1970 are tabulated. To examine the overall impact of returnable versus nonreturnable beverage containers, it is necessary to consider the impact on the use of metal cans. A ban on nonreturnables could not discriminate between metal and glass containers. Glass manufacturers have promoted the use of nonreturnables as a means of increasing their volume of shipments. Some of the claims made in support of returnable containers include: their use saves scarce resources; the cycle of returnable production, filling, refilling, and ultimate disposal requires less input of energy per filling; the deposit on returnables reduces litter; the consumption of less glass means less solid waste to collect and dispose of; and returnables are more economical for both bottlers and consumers. Litter and solid waste are discussed in detail, and economic aspects of returnable versus nonreturnable beverage containers are considered. Legislation enacted or proposed to encourage the use of returnables or to completely ban one way containers is reviewed. (Retained in SWIRS library).  
 (12) KEYWORDS: CONTAINER; DATA; ECONOMICS; LAW; LITTER; METAL; PACKAGING  
 (14) HIERARCH TERMS: 1CZ; 1EC/2C6; 1LR; 1PB  
 (15) STIMS ACC.NO.: 00S46358  
 (16) CITATION: Madison, WI, University of Wisconsin, Mar. 1974.  
 p.74-82.

(1) SWIRS ACC.NO.: 047019  
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T  
 (3) ARTICLE TITLE: Can crusher.  
 (4) AUTHOR: Kaminski SH  
 (7) PATENT DATA: U.S. Patent No. 4,062,283  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: A manually operated wall mountable, beverage can crusher is detailed. The crusher consists of a hollow housing for the wall mounting, a baseplate for supporting the can to be crushed, a ram mounted for sliding movement within the housing and a lever arm pivotally mounted in the housing. A thrust link is pivotally connected to the ram and to the lower arm to transmit force to the ram on movement of the lever arm. A can ejector operates as the ram is raised to eject the can from the housing. The lever arm has a hollow channel section which in part surrounds the thrust link as the arm is lowered to a closed position, for increased compactness of construction. The device is lightweight, compact and inexpensive.  
 (12) KEYWORDS: COMPACTION; CONTAINER; ECONOMICS; EQUIPMENT; METAL; PATENT; PROCESS; REDUCTION  
 (14) HIERARCH TERMS: 1CO/2EF; 1CZ; 1EC/2C6; 1ET/2CO; 1PT; 1RM  
 (15) STIMS ACC.NO.: 00S46072  
 (16) CITATION: filed Apr. 26, 1976 issued Dec. 13, 1977.

# RECYCLING

(1) SWIRS ACC.NO.: 045563  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Arizona recycling program wins approval of consumers, legislators.  
 (6) JOURNAL TITLE: Food Drug Pkg  
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2AZ (10) PUB. YEAR: 1977  
 (11) ABSTRACT: The successes of the Beverage Industry Recycling Program (BIRP), a state-wide voluntary effort in Arizona, in the field of reclamation are reported. Foregoing legislative measures involving laws and taxes, BIRP has come far in solving litter and packaging problems by appealing directly to the people. Without government intervention, Arizona has a recovery rate of aluminum cans that is almost twice the national average. The program was started in 1971 by Arizona bottlers and distributors; it was subsidized by them in the first year of operation, but has been completely self-sustaining since. BIRP success is attributed to its broadly based nature. It created a market for everything the beverage industry generates (tin, glass, aluminum); it operates one-stop recycling centers; extensive public relations, via the media, is used to reach the general public. BIRP saves the Arizona cities an estimated \$25 for every ton of material it collects (2.1 million lbs were collected in Dec. 1976 alone). Food cans and newspapers have recently been added to the list of materials BIRP handles.  
 (12) KEYWORDS: ALUMINUM; ARIZONA; CONTAINER; COST REDUCTION; GLASS; INDUSTRY; MARKET; PUBLIC RELATIONS; RECLAMATION  
 (14) HIERARCH TERMS: 1GB/2GB/3GP; 1MC; 1PJ; 1SB  
 (15) STIMS ACC.NO.: 00S44611  
 (16) CITATION: 36(7):8, Apr. 7, 1977

(1) SWIRS ACC.NO.: 045451  
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Reclamation will be vital in meeting world metal needs to 2000 and beyond.  
 (6) JOURNAL TITLE: Materials Reclamation Weekly  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: U.S. Bureau of Mines studies show the steadily growing importance of recycling in meeting the metal demands of the future. In 1976, about two million pounds sterling worth of old scrap was recovered in the U.S. Amounts of copper, ferrous, and lead scrap used in 1976 are noted. The Bureau forecasts world demand in the year 2000 for primary and secondary copper, nickel, and chromium and predicts the probable average annual growth rate. Greater recovery of old copper scrap and possibly significant exploitation of ocean nodules may augment terrestrial copper mining. The increased level of recycling of aluminum beverage cans is an efficient use of limited resources and an environmental benefit. No difficulty is foreseen in meeting primary nickel demands to the year 2000. A particularly high rate of growth in reclamation of chromium is forecast to meet the projected demand. Recovery from industrial waste is envisioned as a possible means of meeting secondary chromium needs.  
 (12) KEYWORDS: ALUMINUM; BU MINES; CAN-FOOD; CHROMIUM; IRON; METAL; MINE; NON-FERROUS; OCEAN; RECLAMATION; RESEARCH; US  
 (14) HIERARCH TERMS: 1ME/2MW; 1ME/2MX; 1RE; 1SB  
 (15) STIMS ACC.NO.: 00S44499  
 (16) CITATION: 130(16):22-23, Oct. 15, 1977.

# BEVERAGE CONTAINER RECYCLING AND REUSE

(1) SWIRS ACC.NO.: 045345  
 (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Goen RL  
 (5) CORPORATE AUTHOR: Stanford Research Institute  
 (6) BOOK TITLE: Potential for Reusable Homogeneous Containers, Interim Report.  
 (8) NTIS NO.: PB 265 100 (8) REPORT NO.: NSF-RA-770030  
 (9) GRANT NO.: AER 76-02396  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: The feasibility of reusable containers for food products, excluding beverages, is explored. Five objectives of the study are to identify product areas with potential for reusable packaging, to formulate concepts and requirements associated with reusable packaging, to formulate concepts for a reusable packaging return system, to estimate energy and materials consumption for reusable packaging, and to estimate the relative costs of a reusable packaging system. Various studies on reusable beverage containers are cited. The food packaging share of the packaging market is examined. Consideration is given to the significance of food packaging in solid waste generation and to quantities of food used in the food service industry. Glass and plastic reusable food containers are discussed. Two types of return systems are evaluated, a deposit system and a nondeposit system. Total energy use for both glass and plastic reusable container systems is estimated. (Retained in SWIRS library).  
 (12) KEYWORDS: CONTAINER; ECONOMICS; ENERGY; FOOD; GLASS; PACKAGING; PLASTIC; RECLAMATION; SYSTEM  
 (14) HIERARCH TERMS: 1EA/2EA; 1PA/2PC  
 (15) STIMS ACC.NO.: 00S44392 (15) SECONDARY AUTHORS: Somogyi LP; Steele RV  
 (16) CITATION: Washington, DC, National Science Foundation, Feb. 1977. 48 p.

(1) SWIRS ACC.NO.: 045253  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Miller reclamation nets 7.8 million pounds of aluminum cans in 1976.  
 (6) JOURNAL TITLE: Beverage Industry  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977  
 (11) ABSTRACT: Miller Brewing Company's Aluminum Reclamation Program has reclaimed over 7.8 million pounds of aluminum since it was launched in 1976. The company is promoting reclamation as a way of saving energy and as an alternative to container legislation. Company distributors run the program. They pay between 15 and 17 cents a pound for 100 percent aluminum beverage containers. Distributors set up their own reclamation centers and make arrangements with scrap dealers or with aluminum companies. Miller supports the distributors with advertisements, promotional material, and a reclamation handbook. The handbook shows distributors how to organize and run the operation, gives advice on how to plan a reclamation center opening, and suggests ways for getting local civic and other groups involved in the recycling effort.  
 (12) KEYWORDS: ALUMINUM; CAMPAIGN; COMMUNITY; CONTAINER; ENERGY; FACILITY; LAW; LITTER; MANAGEMENT; MARKET; PUBLIC RELATIONS; RECLAMATION; SCRAP  
 (14) HIERARCH TERMS: 1AE/2MW; 1PJ; 1SB  
 (15) STIMS ACC.NO.: 00S44300  
 (16) CITATION: 62(7):3, 32, Apr. 1, 1977.

# RECYCLING

(1) SWIRS ACC.NO.: 045205  
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Recycling of glass.  
 (4) AUTHOR: Willerup OH  
 (6) JOURNAL TITLE: Conservation and Recycling  
 (10) LANGUAGE: EN (10) GEO. AREA: 1EU/2DN; 1EU/2SW; 1EU/2UK (10)  
 PUB. YEAR: 1976

(11) ABSTRACT: The recycling of glass in some European countries is examined. In Denmark, household refuse contains 5 to 10 percent glass. Per capita production of refuse is about 300 kg per annum, of which an unusually low percentage comprises beer and soft drink bottles, which are returnable. Government legislation permits brewers to sell only up to four percent of their total consumption in nonreusable bottles. Arguments for and against nonreturnable beverage containers are discussed. In some countries a continuing decline in the return rates of returnable bottles and their retreat from the marketplace is seen to be due to population affluence rather than bottle fragility. A Swedish study reports the energy consumption required for returnable bottles, nonreturnable PVC bottles; nonreturnable steel cans, and nonreturnable glass bottles. Studies of British, Danish and Swedish test collections of paper, glass, and metal are reported. Reuse procedures for collected glass are described.

(12) KEYWORDS: BOTTLE; COLLECTION; CONTAINER; DOMESTIC; ENERGY; EUROPE; GLASS; GREAT BRITAIN; LAW; LITTER; METAL; PAPER; RECLAMATION; REFUSE; RESEARCH; SCANDINAVIA

(14) HIERARCH TERMS: 1GB/2GB/3GD; 1SB

(15) STIMS ACC.NO.: 00S44252

(16) CITATION: 1(1):149-159, 1976.

(1) SWIRS ACC.NO.: 041369  
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Willerup OH (10) GEO. AREA: 1EU/2DN (10) PUB. YEAR: 1976

(11) ABSTRACT: Household refuse generally contains 5 to 10 percent of glass. Per capita production of refuse in Denmark is about 300 kg per annum of which an unusually low percentage comprises beer and soft drinks bottles in a country where the tradition persists of using returnable containers. Further, government legislation permits brewers to sell only up to 4 percent of their total consumption in nonrenewable bottles. The arguments for and against nonreturnable beverage containers are discussed and a continuing trend towards shorter trippage noted in some countries.

(12) KEYWORDS: BOTTLE; BREWERY; COLLECTION; DOMESTIC; GLASS; RECLAMATION; REGULATIONS; SCANDINAVIA

(14) HIERARCH TERMS: 1CI; 1GB/2GB/3GF

(15) STIMS ACC.NO.: 00S40413

(18) DOC.CIT.: Willerup, O. H. Recycling of Glass. Conservation and Recycling, 1(1):149-159, 1976.

(1) SWIRS ACC.NO.: 041095  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T  
 (4) AUTHOR: Montagna D (10) GEO. AREA: 1SB (10) PUB. YEAR: 1976  
 (11) ABSTRACT: The fluxless recovery of metallic aluminum from wastes is described. Dross, beverage can scrap and the like is heated in a closed furnace to a temperature above the melting point of

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aluminum under an inert gaseous atmosphere. The dross is gently agitated by stirring to agglomerate the metallic aluminum contained in the dross and to physically separate metallic aluminum from aluminum oxide and other nonmetallic constituents of the dross. The aluminum is tapped from the furnace leaving a solid residue which may be further processed. Argon is the preferred inert gas atmosphere. Nitrogen and carbon dioxide are not as satisfactory. Beverage cans contain from two to four percent of organic materials such as linings, inks, labels and the like. When heated, these materials pyrolyze and decompose to form flammable and explosive gases. Provisions must be made to properly dispose of these gases by controlled burning while the scrap charge within the furnace is heated.

(12) KEYWORDS: ALUMINUM; EXPLOSION; GASSES; HEAT; METAL; PATENT; PROCESS; PYROLYSIS; RECLAMATION; SCRAP

(14) HIERARCH TERMS: 1ME/2MW

(15) STIMS ACC.NO.: 00540139

(18) DOC.CIT.: Montagna, D. (The United States of America, Secretary of the Interior). Fluxless recovery of metallic aluminum from wastes. U. S. Patent No. 3,999,980; filed May 9, 1975; issued Dec. 28, 1976.

(1) SWIRS ACC.NO.: 040213

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T (10) GEO. AREA: 1ME/2MW (10) PUB. YEAR: 1976

(11) ABSTRACT: National Compactor/American Baler's introduction of an aluminum scrap baler is reported. The Model NA-1450 aluminum scrap baler was introduced in an effort to improve scrap handling systems and is intended to be used primarily for the recycling of aluminum and tin cans. Increased emphasis on the recycling of cans, both by the beer and beverage companies as well as aluminum mills, prompted the new aluminum scrap baler's development. The Model NA-1450 baler is an automatic horizontal closed door baler. It is activateyd by an electric eye to eliminate guess work and reduce labor. Uniform bale density, acceptable for both shipping and recycling purposes, has been achieved through the use of a balanced hydraulic system. The machine features heavy duty components, and an extra large feed opening allows for easy feeding either manually or by a conveyor chute automatic feed.

(12) KEYWORDS: ALUMINUM; BALING; BENEFIT; COMPACTION; DESIGN; EQUIPMENT; INDUSTRY; RECLAMATION; SCRAP; SPECIFICATION; TECHNOLOGY

(14) HIERARCH TERMS: 1EE/2EG

(15) STIMS ACC.NO.: 00539257

(18) DOC.CIT.: National Compactor introduces its Model NA-1450 aluminum scrap baler. Scrap Age, 33(9):162, Sept. 1976.

(1) SWIRS ACC.NO.: 040132

(2) DOMESTIC: D (2) CATEGORY: 13 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: A review is presented of the National Soft Drink Association's technical bulletin on elimination of crown dust in soft drinks. Several methods are delineated which bottles can use to lessen or eliminate particle contamination. Factors found to be of significance as causes of excessive dusting are cited. Bottlers should pay special attention to the observation that crown dust accumulates faster in the hopper and down chutes at high speeds and that vacuum and forced air combinations on machines can significantly reduce number of particles, can reduce frequency of cleaning needed, and may provide the plant operator with a semiquantitative basis of evaluating closures. A prototypical capper modification designed for such an air vacuum system is outlined. For crowners, a vacuum system fitted to the crown

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discharge head is recommended. The bulletin includes recommendations for closure storage prior to use to minimize dust, suggests optimal stacking practices, and warns equipment operators not to leave cartons on the closure hopper during capping.

(12) KEYWORDS: ASSOC; BOTTLE; CONTAINER; CONTROL; DUST; FOOD; HOPPER; LITERATURE; PACKAGING; PARTICULATE MATTER; VACUUM

(14) HIERARCH TERMS: 1CI

(15) STIMS ACC.NO.: 00539176

(18) DOC.CIT.: NSDA releases bulletin on crown dust. Beverage Industry, 61(1):2,29, July 9, 1976.

(1) SWIRS ACC.NO.: 039872

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: EPA activities in the field of municipal resource recovery are reviewed. The reasons why resource recovery is becoming urgent are outlined together with progress made in the field. EPA helps with demonstration projects, aiding cities that are willing to experiment. Two completed projects are mentioned, one where solid waste is processed to produce a fuel substitute that can be fired in suspension with pulverized coal and another that wet processes solid waste producing low quality fiber. Two incomplete projects are outlined. Source separation and collection of waste may facilitate reclamation and EPA has awarded grants to two municipalities to demonstrate the feasibility of separate collection of paper, glass, and cans. Smaller grants have been made to other agencies. Technical information gathered from study results is disseminated by EPA, while a few communities committed to resource recovery are aided by technical teams. EPA is required to publish guidelines in the Federal Register, and Federal government is expected to comply. Source separation guidelines should have significant results in the paper industry. Guidelines for beverage containers have been published aiming to impose a returnable deposit and thus reduce litter and make savings. Military installations are testing this proposal as well as a limited test in Yosemite National Park. Guidelines encouraging use of recycled material in products purchased by Federal agencies have been published. Tax policies and freight rates should be reviewed to ensure no discrimination against recycled materials. The Solid Waste Disposal Act requires EPA to investigate methods to stimulate markets for recycled materials. Waste prevention is another aspect of resource conservation, and EPA's efforts have concentrated on returnable beverage containers and voluntary waste reduction. Prohibition of unacceptable land disposal of waste would encourage resource recovery and EPA has issued guidelines for incineration and landfilling.

(12) KEYWORDS: COLLECTION; CONTAINER; DEMONSTRATION; DISPOSAL; ECONOMICS; EPA; GRANT; INFORMATION; MARKET; MUNICIPALITY; PROGRAM; RECLAMATION; REGULATIONS; RESEARCH

(15) STIMS ACC.NO.: 00538916

(18) DOC.CIT.: Meyers, S. EPA and municipal resource recovery. NCRR Bulletin, VI(3):62-65, Summer 1976.

(1) SWIRS ACC.NO.: 038362

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Recycling activities in the city of Millburn, New Jersey are reported. Efforts are directed toward three types of material: paper, glass, and aluminum. There are four different bins at the recycling center in the city where residents bring their materials. The paper area accepts only newsprint, the aluminum bin accepts only beverage cans, and two glass bins take clear glass in one and a mixture

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of green and amber glass in the other. A processor from another city picks up material from the recycling center. Equipment involved in the recycling program is described, as well as equipment associated with the city's sanitation system. Landfill operations for the city are noted, in addition to a leaf composting program.

(12) KEYWORDS: ALUMINUM; EQUIPMENT; GLASS; MANAGEMENT; MUNICIPALITY; NEW JERSEY; PAPER; RECLAMATION; SEPARATING; SYSTEM

(15) STIMS ACC.NO.: 00S37406

(18) DOC.CIT.: N. J. town recycles - for recycling's sake. Solid Wastes Management, 19(6):14-15, June 1976.

(1) SWIRS ACC.NO.: 037881

(2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The use of returnable bottles by the Lone Star Brewing Company in San Antonio, Texas is discussed. In 1940, the company was a 38,000 barrel brewery. As of 1976, its production capacity is 1.2 million barrels. During the period between 1970 and 1974, the sales volume of its bottle beer, in both returnable and nonreturnable containers, declined at a much greater rate than could be made up by gains in canned beer sales. In 1975, however, the company scored a sales increase of 750,000 cases. This increase was accomplished by a marketing emphasis on the 12 ounce returnable bottle, adoption of a nostalgic name for the traditional container with which many of the younger beer drinkers were unfamiliar, increased promotion and involvement with on-premise accounts, a marketing program aimed at the youth market, and a company identification with Texas music and lore.

(12) KEYWORDS: BOTTLE; BREWERY; MARKET; RECLAMATION

(15) STIMS ACC.NO.: 00S36925

(18) DOC.CIT.: Sullivan, B. C. Lone Star turns it around with returnables, youth emphasis. Brewers Digest, 51(5):28-30, May 1976.

(1) SWIRS ACC.NO.: 037549

(2) DOMESTIC: D (2) CATEGORY: 29 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: The impact of solid waste generation on the natural resource supply in the United States, environmental quality, and the management of solid waste in Minnesota is explored. Historical trends in the generation of solid waste are reviewed, and the U. S. standard of living is reviewed in relation to consumption patterns. Solutions to the problems of solid waste generation in Minnesota are suggested, with emphasis on source reduction. Source reduction benefits are considered to include the conservation of natural resources, environmental quality benefits, and solid waste management savings. Two source reduction strategies in Minnesota are discussed in detail: (1) packaging regulatory authority; and (2) beverage container legislation. Source reduction goals are identified as follows: reuse containers rather than immediately disposing of them, reduce the consumption of energy and materials per product, extend product life, and decrease product consumption. Consideration is given to materials and energy recovery from solid waste, and the impact of energy recovery from solid waste on source reduction and paper recycling is assessed.

(12) KEYWORDS: BENEFIT; BOTTLE; CAN-FOOD; EFFECT; ENVIRONMENT; GLASS; LAW; MANAGEMENT; METAL; MINNESOTA; NON-FERROUS; PACKAGING; PLASTIC; PROBLEMS; RECLAMATION; REDUCTION; STATE; US

(15) STIMS ACC.NO.: 00S36593

(18) DOC.CIT.: Wendt, K. A. Damming the solid waste stream: the beginning of source reduction in Minnesota. Roseville, Minnesota, Minnesota Pollution Control Agency. Jan. 1975, 159 p.



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(1) SWIRS ACC.NO.: 037342  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T (10) PUB.  
 YEAR: 1976  
 (11) ABSTRACT: The aluminum can recycling program of the Pearl Brewing Company in San Antonio, Texas is described. The company operation is unique in that the recycling center, can manufacturing plant, and can filling lines are all part of a single complex located on the grounds of the brewery. Collection centers are maintained by the company which pay the public 15 cents per pound for returned aluminum cans. Between March 1973 and October 1975, the brewery paid out \$1.4 million for slightly over 9 million lbs of aluminum which constituted in excess of 208 million individual cans. In 1974, about 82.5 million cans were returned. During the first 10 months of 1975, 108 million cans were reclaimed, compared to 161 million cans of beer sold. This represented a return rate of nearly 67 percent. Operation of the recycling center and the can manufacturing plant is detailed, and the ultraviolet curing process of the brewery is described. It is estimated that about \$400,000 has been saved by adopting the ultraviolet curing system. Economical aspects of aluminum can use and recycling are discussed.  
 (12) KEYWORDS: ALUMINUM; BREWERY; CANNING; COLLECTION; COMMERCIAL; COST REDUCTION; ECONOMICS; FACILITY; PROGRAM; RECLAMATION  
 (15) STIMS ACC.NO.: 00S36387  
 (18) DOC.CIT.: Kuhnner, J. G. Pearl's total aluminum can program. Brewers Digest, 51(1):45-48, 60, Jan. 1976.

(1) SWIRS ACC.NO.: 035498  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G (10) PUB.  
 YEAR: 1975  
 (11) ABSTRACT: Coors is reporting the best year ever for its cash-for-cans recycling campaign. Reports from the 1167 independent Coors distributors in 11 States show that for the first 5 months of 1975, about 480 million aluminum beer and soft drink containers were traded for cash. This is 155 million more than for the same period last year. Around 2.9 million dollar was paid out for the cans. The redemption rate is 0.15 dollar per lb. The returns this year are equivalent to 48 percent of all the cans Coors sells. Since the start of the program in Jan. 1970, over 150 million lb of cans have been collected.  
 (12) KEYWORDS: ALUMINUM; CAMPAIGN; CAN-FOOD; COLLECTION; ECONOMICS; METAL; NON-FERROUS; RECLAMATION  
 (15) STIMS ACC.NO.: 00S34543  
 (18) DOC.CIT.: Coors reports record can recycling rate. Modern Metals, 31(10):92-93, Nov. 1975.

(1) SWIRS ACC.NO.: 034264  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T (10) PUB.  
 YEAR: 1975  
 (11) ABSTRACT: These articles discuss efforts being made to establish a wastes exchange among companies in the St. Louis, Missouri area and the anticipated ban on non-recyclable beverage bottles and cans sold on Federal property. Chemical process companies with operations in the St. Louis area are working with State and Federal agencies to develop an industrial waste exchange among the companies. The exchange would serve as a clearinghouse, providing lists of

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available waste materials and solicitations for materials that might be found in waste streams. Current efforts are directed at finding a sponsor who would could be trusted to keep waste figures and information confidential. The U. S. Environmental Protection Agency is considering a regulation banning the sale of non-returnable beverage containers on Federal property. Both private industry and other governmental agencies are opposed to the ban on the basis that it would increase costs and reduce jobs.

(12) KEYWORDS: BOTTLE; CAN-FOOD; CHEMICAL; DISPOSABLES; ECONOMICS; EPA; FEDERAL; INDUSTRY; MISSOURI; PROBLEMS; RECLAMATION; REGIONAL; REGULATIONS; ST LOUIS; UTILIZE

(15) STIMS ACC.NO.: 00S33308

(18) DOC.CIT.: Top of the news: wastes exchange sought; no-deposits a no-no? Chemical Week, 117(12):17, Sept. 17, 1975.

(1) SWIRS ACC.NO.: 034077

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G (10) PUB.  
YEAR: 1975

(11) ABSTRACT: Highway and traffic safety in Texas includes the use of aluminum beer cans as crash cushions. All-aluminum beverage cans play an essential role in installing crash attenuator barrels before interchanges and hazardous areas on Highway 69. The barrels were positioned to fill the gaps left in the 3 ft retaining wall. The barrels themselves serve as a barrier in the crash of lightweight automobiles, and filling the remaining barrels with the aluminum cans provides an added protection needed in crashes involving much heavier vehicles. Aluminum cans were used because they do not rust, although the Texas Department of Highways did not specify that they be used.

(12) KEYWORDS: ALUMINUM; AUTOMOBILE; CONTAINER; HIGHWAY; SAFETY; TEXAS; UTILIZE

(15) STIMS ACC.NO.: 00S33121

(18) DOC.CIT.: Can-filled barrels provide crash cushion. Roads and Streets, 118(5):134, May 1975.

(1) SWIRS ACC.NO.: 034005

(2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G (10) PUB.  
YEAR: 1975

(11) ABSTRACT: A club has been formed by three major British companies for the purpose of reclaiming food and beverage tins for pressing into fresh material for can making. A total of 300,000 pounds sterling is to be invested in the venture, two-thirds of which will go for machinery. The company, which will be called Material Recovery, is being formed by British Steel Corp., Metal Box and Batchelor Robinson. The plant, it is estimated, will ultimately handle up to 6,000 tons per year of scrap cans, which should be extracted from 100,000 tons of rubbish processed at the site every year. One reason given for the formation of the company, is that scrap steel is seen as a shortages material in the long term. The 300,000 pounds sterling investment is to be split equally among the three companies participating in the project.

(12) KEYWORDS: CAN-FOOD; ECONOMICS; GREAT BRITAIN; INDUSTRY; METAL; PROJECTION; RECLAMATION; SCRAP

(15) STIMS ACC.NO.: 00S33049

(18) DOC.CIT.: Sumner, J. companies club to reclaim tin scrap from cans. The Engineer, 240(6213):7, Apr. 1975.

## Section 6 ENERGY

- (1) SWIRS ACC.NO.: 047305
- (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G
- (3) ARTICLE TITLE: Energy and the glass cycle.
- (4) AUTHOR: Samtur HR
- (6) BOOK TITLE: In Glass Recycling and Reuse.
- (9) GRANT NO.: GI-29731
- (10) LANGUAGE: EN (10) PUB. YEAR: 1974
- (11) ABSTRACT: Energy consumption in glass manufacture, cullet collection from the public, and the separation of glass from municipal solid waste is analyzed. Consideration is also given to the consumption of energy in the mining of raw materials. The manufacturing segment of the glass cycle accounts for most glass related energy consumption. Energy consumption for the manufacture of glass containers is less than the energy required for making metal cans, for a given volume of containers. The higher energy consumption for nonreturnable glass containers, as compared to returnables, is due almost entirely to the higher weight of the container per gallon of beverage flowing through the cycle. Volunteer or public collections of cullet for reuse are noted, and energy requirements for the transport of cullet are enumerated. Energy is required to operate systems for the separation of postconsumer glass waste. From an energy standpoint, it is felt that there is little justification for drastic governmental action to require the recycling of disposed glass products but that beverage container production should be regulated. (Retained in SWIRS library).
- (12) KEYWORDS: COLLECTION; CONTAINER; ENERGY; GLASS; SEPARATING; TRANSPORT
- (14) HIERARCH TERMS: 1EN/2EC; 1GL/2IN/3PT
- (15) STIMS ACC.NO.: 00S46359
- (16) CITATION: Madison, WI, University of Wisconsin, Mar. 1974. p.83-91.

- (1) SWIRS ACC.NO.: 045350
- (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G
- (3) ARTICLE TITLE: Energy use.
- (4) AUTHOR: Goen RL
- (5) CORPORATE AUTHOR: Stanford Research Institute
- (6) BOOK TITLE: In Potential for Reusable Homogeneous Containers, Interim Report
- (8) NTIS NO.: PB 265 100 (8) REPORT NO.: NSF/RA-770030
- (9) GRANT NO.: AER 76-02396
- (10) LANGUAGE: EN (10) PUB. YEAR: 1977
- (11) ABSTRACT: Energy savings data from studies of returnable beverage containers are used as a basis to estimate the consumption of energy by alternative reusable packaging systems in the food service industry. Material and energy requirements for 1,000 lb of Cycopac 920 containers are listed in terms of processing steps for acrylonitrile, styrene, and butadiene. It is shown that about half the energy requirement for container production is made up of the energy content of crude oil and natural gas which serve as raw materials for the production of a container's chemical constituents. In addition to manufacturing the basic container, energy requirements for manufacturing some type of closure must be considered. A conceptual system for the production, distribution, use, and return of reusable containers is constructed to calculate the energy requirements for reusable Cycopac 920 containers. The overall energy requirement for a reusable container system based on Cycopac 920 is 1,460 BTU per filling, assuming 10 return trips per container.
- (12) KEYWORDS: CONTAINER; ENERGY; PACKAGING; UTILIZE
- (14) HIERARCH TERMS: 1CI; 1EC/2EU; 1PA/2PC

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(15) STIMS ACC.NO.: 00S44397 (15) SECONDARY AUTHORS: Somogyi LP; Steele RV  
 (16) CITATION: Washington, DC, National Science Foundation, Feb. 1977. p.39-46.

(1) SWIRS ACC.NO.: 044425  
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: The case for keeping throwaways.  
 (4) AUTHOR: King HB  
 (5) CORPORATE AUTHOR: U.S. Brewers Assoc., Inc  
 (6) JOURNAL TITLE: The Washington Post  
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2DC (10) PUB. YEAR: 1977  
 (11) ABSTRACT: In the opinion of the author, energy cannot be saved by implementing a returnable only beverage container system. The latest figures from EPA show that beverage containers constitute only six percent of total municipal waste, leaving 94 percent to be dealt with otherwise. When consideration is given to the amount of petroleum used to return the containers through the chain of distribution, the energy saved in coal and natural gas is later burned up in petroleum use. The author believes that the major reduction of containers from the solid waste stream will dampen recycling efforts, even though the brewing industry is concerned about resource conservation and energy.  
 (12) KEYWORDS: BTU; CONTAINER; ECONOMICS; ENERGY; RECLAMATION  
 (14) HIERARCH TERMS: 1CI/2DV; 1EA/2EA; 1GB/2GB/3GE; 1SB  
 (15) STIMS ACC.NO.: 00S43469  
 (16) CITATION: 100 yr (243):A20, 1977.

(1) SWIRS ACC.NO.: 043541  
 (2) DOMESTIC: D (2) CATEGORY: 30 (2) SUBJ.TYPE: G  
 (3) ARTICLE TITLE: Energy utilization requirements of beverage containers.  
 (5) CORPORATE AUTHOR: Research Triangle Inst., Franklin Assoc  
 (6) BOOK TITLE: In Energy and Economic Impacts of Mandatory Deposits. (8) REPORT NO.: FEA/D-76/406 (9) CONTRACT NO.: CO-04-50175-00  
 (10) LANGUAGE: EN (10) PUB. YEAR: 1976  
 (11) ABSTRACT: This appendix contains the data, calculations, and documentation used for the determination of the energy requirements of total beverage container systems. The container systems are plastic bottles, aluminum cans, steel cans, and glass bottles. The analysis includes industrial operations such as mining of raw materials; manufacturing; filling and distribution operations; final disposal of containers; and manufacture of associated materials such as closures, labels, and paper packaging. (Retained in SWIRS library).  
 (12) KEYWORDS: ALUMINUM; CAN-FOOD; ENERGY; GLASS; METAL; PACKAGING; PLASTIC; RECLAMATION  
 (14) HIERARCH TERMS: 1CI; 1EC/2EV; 1RG  
 (15) STIMS ACC.NO.: 00S42584  
 (16) CITATION: Wash. D.C., Federal Energy Administration, Sept. 1976. p.D-1 thru D-155.

(1) SWIRS ACC.NO.: 040135  
 (2) DOMESTIC: D (2) CATEGORY: 18 (2) SUBJ.TYPE: G  
 (4) AUTHOR: Hickox B (10) GEO. AREA: 1CI (10) PUB. YEAR: 1976  
 (11) ABSTRACT: An FEA (Federal Energy Administration) study on container deposits is reported which anticipates that a decrease in energy consumption, a net gain in jobs, and hundreds of millions in capital requirements which would be triggered by a mandatory five cent container deposit. The report concedes the unpredictability of accurate market response which would determine the precise impact of a national "bottle law." A set of possible scenarios are offered by the report, all dependent upon the whims of consumers. The report says that if no deposit law is passed, beverage production and distribution will consume about one half of 1 percent of the nation's total energy use,

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another \$7.3 billion in capital investment would be required, and some 369,000 jobs would be created.

(12) KEYWORDS: BOTTLE; CONTAINER; EFFECT; ENERGY; FEDERAL; FOOD; LAW; MARKET; PACKAGING; PERSONNEL

(14) HIERARCH TERMS: 1LB/2LB

(15) STIMS ACC.NO.: 00S39179

(18) DOC.CIT.: Hickox, B. FEA study on container deposit looks at effect on energy, jobs. Food and Drug Packaging, 35(10):1, 10, Nov. 18, 1976.

(1) SWIRS ACC.NO.: 035985

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: An indepth analysis was performed by the Michigan Public Service Commission which focused on the possible effects of employment and energy savings due to a shift to a refillable beverage container system and the employment and energy effects of deposit regulations for nonreturnable beverage containers, with particular reference to Michigan House Bill No. 4296. The basic purpose of the study was to provide an objective evaluation of the problems involved in a nonreturnable beverage container system versus a refillable system and to enlighten the public and governmental decision makers so as to enable them to make rational judgments in the maximization of social welfare. Chapter I of the analysis study focuses on national solid waste problems and on Michigan's solid waste generation and management problems. Chapter II discusses the nature and dimensions of the beverage industry and presents information on historic growth rates and projections of glass and metal beverage container use. Chapter III examines direct and indirect employment effects of deposit regulations on nonreturnable beverage containers. Chapter IV comparatively analyzes energy savings due to a returnable system versus the present nonreturnable system. Chapter V discusses the economic and energy implications of solid waste resource recovery, with particular reference to the recycling of beverage containers, and Chapter VI presents summary findings and policy recommendations.

(12) KEYWORDS: BOTTLE; BREWERY; CANNING; CONTAINER; ECONOMICS; INDUSTRY; MANAGEMENT; MICHIGAN; PACKAGING; PERSONNEL; PROJECTION; RECLAMATION; REGULATIONS; UTILIZE

(15) STIMS ACC.NO.: 00S35030

(18) DOC.CIT.: Rao, G. B. Michigan Department of Commerce. An economic analysis of energy and employment effects of deposit regulation on non-returnable beverage containers in Michigan - a systems approach. Lansing, Michigan Department of Commerce, Oct. 1975. 438 p.

(1) SWIRS ACC.NO.: 035984

(2) DOMESTIC: D (2) CATEGORY: 30 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Sources and inputs of energy used in the production, processing, delivery, and marketing of selected food items are examined. The amount of energy needed to produce and deliver meat products is particularly emphasized. In this quantification, special efforts were made to draw distinctions between the sources of meat products (whether from forage-fed or grain-fed sources) and the type of livestock. For all food items, it was found that a considerable portion of the energy expended in food production occurs in packaging. High energy users include such processed food items as aerosolized cooking oil, flavorings and spreads, TV dinners, frozen prepared foods, and canned beverages. Several practices are identified for reducing energy

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consumption while preserving nutrition standards at current levels or with anticipated improvement in the United States. These are increased home gardening and fruit growing, shift from animal protein, to vegetable, reduced use of overprocessed foods, avoidance of nonreturnable beverage containers, and increased purchase of bulk and unpackaged foods.

(12) KEYWORDS: AEROSOLS; CAN-FOOD; CONTAINER; DOMESTIC; ENERGY; FOOD; FOOD PROCESSING; FREEZING; MARKET; PACKAGING; PROCESS; PROTEIN; RESIDENTIAL; TRANSPORT; VEGETABLE

(15) STIMS ACC.NO.: 00S35029

(18) DOC.CIT.: Fritsch, A. J. , L. W. Dujack, D. A. Jimerson. Energy and food: energy used in production, processing, delivery and marketing of selected food items. Washington, DC, Center for Science in the Public Interest, 1975. 74 p. CSPI Energy series VI.

## Appendix A

### ABBREVIATIONS

Administration	Admin
Agrarie	Agra
Agricultural	Agric
Agriculture	Agri
America(n)	Amer
Annals, Annali, Annales	Ann
Applied	Appl
Archiv (e, es)	Arch
Association (cion)	Assoc
Australasian	Austral
Berichte	Ber
British	Brit
Buildings	Bldg(s)
Bulletin	Bull
Canada(ian)	Can
Chemical, Chemistry	Chem
Company	Co
Communication(s)	Comm
Control	Contr
Conservation Development	Conser Devt
Deutschen	Deutsch
Corporation	Corp
Department	Dept
Division	Div
Energy	Ener
Engineer(s)	Engr(s)
Engineering	Engring
Environment	Env
Environmental	Environ
Experimental	Eptl
Government	Govt
Highway(s)	Hgwy(s)
Incorporated	Inc
Indian	Indn
Industrial	Indus
Industry	Ind
Institute	Inst
Institution	Instit
International	Inter
Izvestiya	Izv
Japan	Jpn
Japanese	Jpnse
Journal	J
Laboratory	Lab
Limited	Ltd
Management	Mgmt
Manufacture(r)	Manuf
Materials	Mater
Metallurgical, Metallurgy	Metall
Microbiology (ical, ia)	Micro
Mining	Mng
National	Natl
New	N
Number	No.
Organization	Org
Packaging	Pkg
Pollution	Poll
Proceedings	Proc
Production	Prod

# HAZARDOUS WASTE MANAGEMENT

Professional	Prof
Publication(s)	Pub(s)
Reclamation	Reclam
Report(s)	Rpt(s)
Research	Rsch
Resource	Res
Review(s), Revue, Revista	Rev
Service(s)	Svc(s)
Science(s)	Sci
South	S
Technological	Technol
Technology, Technische, Technica, etc.	Tech
Toxicology	Toxicol
Transactions	Trans
Treatment	Trtmt
University and variations	Univ
United States	U.S.
Water	Wtr
Wissenschaftlichen	Wissen
Zeitschrift	Zeit
Zentrallblatt	Zent
Zhurnal	Zh



## Appendix B

### QUANTITATIVE MEASUREMENTS

acre (acre)	millimeter (mm)
acre-foot (acre-ft)	mile (mile)
centimeter (cm)	newton (N)
cubic centimeter (cu cm)	one kilogram force (kgf)
cubic foot (cu ft)	one pound force (lbf)
cubic inch (cu in)	pascal (Pa)
cubic meter (cu m)	pound (lb)
cubic meters per minute (cu m/min)	pounds per square foot (psf)
cubic yard (cu yd)	pounds per square inch (psi)
ft (ft)	square centimeter (sq cm)
gallon (gal)	square foot (sq ft)
gallons per minute (gal/min)	square inch (sq in)
hectare (ha)	square kilometer (sq km)
inch (in)	square meter (sq m)
kilogram (kg)	square mile (sq mile)
meter (m)	square yard (sq yd)
	ton (ton)
	yard (yd)

#### Months of the Year

Jan.  
Feb.  
Mar.  
Apr.  
May  
June  
July  
Aug.  
Sep.  
Oct.  
Nov.  
Dec.

## Appendix C

### LANGUAGE CODES

<u>Language</u>	<u>Code</u>	<u>Language</u>	<u>Code</u>
Mixed	AA	Lingala	NG
Afrikaans	AF	Macedonian	MC
Albanian	AL	Malayan	ML
Amharic	AR	Malayalam	MA
Arabic	AR	Malay-Indonesian	MI
Armenian	AE	Malagasy	MS
Belorussian	BE	Maltese	MT
(White Russian)		Mandarin	CH
Bulgarian	BU	Marathi	MR
Burmese	BR	Mongolian	MO
Cambodian	CA	Nepali	NE
Cantonese	CH	Ngala	NG
Chinese	CH	Norwegian	NO
Croatian	CR	Papuan	PA
Czech	CZ	Persian	PE
Danish	DA	Polish	PO
Dutch	DU	Portugese	PR
English	EN	Punjabi	PU
Estonian	ES	Pustu	PS
Finnish	FI	Romanian	RO
Flemish	FL	Russian	RU
French	FR	Rwanda	RW
Georgian	GE	Servian	SE
German	GM	Sinhalese	SI
Greek	GR	Slovak	SL
Gujarati	GU	Slovene	SV
Hebrew	HE	Somali	SO
Hindi	HI	Spanish	SP
Hindustani	HI	Swahili	SW
Hungarian (Magyar)	HU	Swedish	SD
Icelandic	IC	Tagalog	TA
Indonesian	MI	Tamil	TM
Italian	IT	Telugu	TE
Japanese	JA	Thai	TH
Javanese	JV	Tibetan	TI
Kashmiri	KA	Turkish	TU
Khmer	CA	Ukrainian	UK
Kirundi	KI	Urdu	UR
Korean	KO	Vietnamese	VI
Latin	LA	White Russian	BE
Latvian	LN	Yiddish	YI
Lithuanian	LI		

## Appendix D

### HIERARCHIC TERMS

1AC	ACCIDENT (See also PETROCHEMICALS)
1AG	AGRICULTURAL WASTES (See also ANIMALS, MANURE, FOOD PROCESSING)
	2C8 CROP RESIDUE
	2LW LOGGING WASTES
	2PT PROCESSING
	2UT UTILIZATION
1AI	AIR POLLUTION
	2AN ANALYSIS
	2C2 CONTROL EQUIPMENT
	2DU DUMPS
	2FD FEEDLOTS
	2IC INCINERATOR
	2IN INDUSTRY
	2LF LAWS
	2SQ SMOKE CONTROL
1AL	ALGAE (See MICROORGANISM)
1AN	ANALYSIS
1AQ	ANIMALS (See also MANURE)
	2CD CARCASS
	2FD FEEDLOTS
	2VC VECTOR CONTROL
1AS	ASH
	2CN COMPOSITION
	2DP DISPOSAL
	2UT UTILIZATION
1AU	AUTOMOBILES
	2BU BURNING
	2CL COLLECTION
	2C6 COSTS
	2DP DISPOSAL
	2IC INCINERATION
	2LF LAWS
	2QU QUANTITY
	2RT RAIL TRANSPORT
	2TT TRANSPORT
	2UT UTILIZATION
	2VR VOLUME REDUCTION
1AY	AUTOMOTIVE INDUSTRY (See also AUTOMOBILES)
	2DP DISPOSAL
	2PT PROCESSING
	2UT UTILIZATION

# HAZARDOUS WASTE MANAGEMENT

1BC	BACTERIA (See MICROORGANISMS)	
1BL	BALING	
	2ET	EQUIPMENT
	2PD	PAPER
	2SC	SCRAP METAL
1BU	BULKY WASTES	
	2CL	COLLECTION
	2DP	DISPOSAL
	2TT	TRANSPORT
	2UT	UTILIZATION
	2VR	VOLUME REDUCTION
1CF	CELLULOSE	
1CH	CHEMICALS	
	2IN	INDUSTRIAL WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
	2PC	POST CONSUMER WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
1CL	COLLECTION (See also CONTAINERS)	
	2CJ	CHUTE SYSTEMS
	2CM	COMMERCIAL WASTES
	2CZ	CONTAINERS
	2CI	CONTRACTORS
	2C6	COSTS
	2ET	EQUIPMENT
	2FR	FREQUENCY
	2IN	INDUSTRIAL WASTES
	2IW	INSTITUTIONAL WASTES
	2LF	LAWS
	2MY	MUNICIPAL WASTES
	2PH	PERSONNEL
	2PQ	PNEUMATIC
	2RO	ROUTES
	2RW	RURAL AREAS
	2TU	TRUCKS
1CO	COMPACTION	
	2ET	EQUIPMENT
1CP	COMPOST	
	2AN	ANALYSIS
	2HE	HEALTH AND SAFETY
	2MG	MARKETS
	2UT	UTILIZATION
1CQ	COMPOSTING	
	2CC	CANNERY WASTES
	2CF	CELLULOSE
	2C6	COSTS
	2DP	DISPOSAL
	2ET	EQUIPMENT
	2HE	HEALTH AND SAFETY
	2IC	INCINERATION
	2IT	INSTALLATIONS
	2LF	LAWS
	2MX	METHODS

# HIERARCHIC TERMS

	2PD	PAPER
	2PS	PROBLEMS
	2SI	SEPARATION OF NON-ORGANICS
	2SP	SLUDGE
1CT	COMPUTER	
	(See MANAGEMENT AND PLANNING)	
1CX	CONSTRUCTION	
	(See also DEMOLITION WASTES)	
	2IN	INDUSTRIAL WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
	2PC	POST CONSUMER WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
1CZ	CONTAINERS	
	2DP	DISPOSAL
1DA	DAIRY (INDUSTRY)	
1DE	DEEP WELL STORAGE	
1DM	DEMOLITION WASTES	
	(See also CONSTRUCTION)	
1DP	DISPOSAL	
	(See also INDIVIDUAL METHODS)	
	2AG	AGRICULTURAL WASTES
	2CM	COMMERICAL WASTES
	2C6	COSTS
	2DG	DREDGING
	2FC	FACILITIES
	2HC	HAZARDOUS WASTE
	2HE	HEALTH AND SAFETY
	2IN	INDUSTRIAL WASTES
	2IW	INSTITUTIONAL WASTES
	2LF	LAWS
	2MX	METHODS
	2MY	MUNICIPAL WASTES
	2RP	RESEARCH
	2RV	RURAL AREAS
1DR	DRUGS	
	(See also PHARMACEUTICAL WASTES)	
1DU	DUMPS	
	2EL	ELIMINATION
	2HE	HEALTH AND SAFETY
	2LF	LAWS
1EC	ECONOMICS	
	2C6	COSTS
	2MG	MARKETS
	2TX	TAXES
1EI	EDUCATION	
	2PH	PERSONNEL
	2PO	PROFESSIONAL
	2PV	PUBLIC

## HAZARDOUS WASTE MANAGEMENT

1EN	ENERGY	
	2EC	ECONOMICS
	2RD	REFUSE DERIVED FUELS
	2UT	UTILIZATION
1EP	ENVIRONMENTAL PROTECTION	
1ET	EQUIPMENT	
	2AN	ANALYSIS
	2BR	BALERS
	2CL	COLLECTION
	2CO	COMPACTION
	2C3	CONVEYOR
	2HM	HAMMERMILLING
	2MH	MATERIALS HANDLING
	2SD	SALVAGE AND RECLAMATION
	2SG	SANITARY LANDFILL
	2SI	SEPARATORS - FITTERS
	2SK	SHEARING
	2SL	SHREDDING
	2SU	SPREADING
	2TT	TRANSPORTATION
	2WT	WASTEWATER TREATMENT (CONTROL EQUIPMENT)
1FE	FERTILIZER	
	(See also	COMPOST, HAZARDOUS)
	2DP	DISPOSAL
	2RF	REFUSE DERIVED FERTILIZER
1FI	FIRE	
1FL	FLY ASH	
	2AN	ANALYSIS
	2DP	DISPOSAL
	2MS	MINE STABILIZATION
	2RC	RECOVERY OF CONSTITUENTS
	2SS	SOIL CONDITIONER
	2UT	UTILIZATION
	3AR	AGGREGATE
1FO	FOOD PROCESSING WASTES	
	2BG	BAGASSE
	2BK	BAKERY
	2BP	BIOLOGICAL PROCESSING
	2BW	BREWERY
	2CC	CANNERY
	2CI	CHEMICAL PROCESSING
	2CK	COFFEE
	2DA	DAIRY
	2DP	DISPOSAL
	2FR	FRUITS
	2GF	GRAIN AND FEED CROPS
	2MF	MEAT PACKING PLANTS
	2MP	MECHANICAL PROCESSING
	2MU	MOLASSES
	2PA	POULTRY
	2SE	SEAFOOD
	2SO	SLAUGHTERHOUSE
	2SX	SUGAR
	2UT	UTILIZATION
	2VG	VEGETABLE
1FU	FUNGI	
	(See	MICROORGANISMS)
1GA	GARBAGE GRINDING	

# HIERARCHIC TERMS

1GL	GLASS	
	2IN	INDUSTRIAL WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
	2PC	POST CONSUMER WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
1GR	GRANTS	
1GW	GROUND WATER	
1HC	HAZARDOUS WASTES	
	(See also RADIOACTIVE WASTES, HOSPITALS, PESTICIDES)	
	2AN	ANALYSIS
	2DP	DISPOSAL
	2PT	PROCESSING
1HE	HEALTH AND SAFETY	
1HH	HEAT RECOVERY	
	(See INCINERATION)	
1HO	HOG FEEDING	
1HS	HOSPITALS	
	(See also INSTITUTIONAL WASTES; HAZARDOUS WASTES)	
	2CL	COLLECTION
	2DI	DISPOSABLE ITEMS
	2DP	DISPOSAL
	2HE	HEALTH AND SAFETY
	2IC	INCINERATION
1IC	INCINERATION	
	(See also SPECIFIC WASTES)	
	2AI	AIR POLLUTION
	2CM	COMMERCIAL WASTES
	2CQ	COMPOSTING
	2C6	COSTS
	2EM	EMISSIONS
	2ET	EQUIPMENT
	2IN	INDUSTRIAL WASTES
	2IW	INSTITUTIONAL WASTES
	2LF	LAWS
	2MC	MANAGEMENT AND PLANNING
	2MY	MUNICIPAL WASTES
	2OS	ON SITE
	2PE	PLANT DESIGN
	2PG	PLANT OPERATION
	2PS	PROBLEMS
	2RS	RESIDUE
	2SD	SALVAGE AND RECLAMATION
	2WA	WASTE HEAT UTILIZATION
	2WE	WATER POLLUTION
1IE	INCINERATOR	
	2FB	FLUIDIZED BED
	2OP	OPEN PIT
	2RK	ROTARY KILN
	2SP	SLUDGE
	2ST	SPECIAL PURPOSE

# HAZARDOUS WASTE MANAGEMENT

**1IN INDUSTRIAL WASTES**  
 (See also SPECIFIC INDUSTRY, SPECIFIC TREATMENT METHODS)  
 2AN ANALYSIS  
 2BP BIOLOGICAL PROCESSING  
 2CG CENTRALIZED DISPOSAL PLANTS  
 2CI CHEMICAL PROCESSING  
 2C6 COSTS  
 2EF EFFLUENT CHARGES  
 2LF LAWS  
 2MP MECHANICAL PROCESSING  
 2MY MUNICIPAL WASTES  
 2PY PYROLYSIS  
 2SJ SEWAGE  
 2TT TRANSPORTATION  
 2UT UTILIZATION

**1IS INSECTS**

**1IW INSTITUTIONAL WASTES**  
 2DP DISPOSAL  
 2PT PROCESSING  
 2UT UTILIZATION

**1LC LAGOONS**

**1LD LAND RECLAMATION**  
 (See also MINES, SANITARY LANDFILL)

**1LF LAWS**  
 2CL COLLECTION  
 2DP DISPOSAL  
 2ER ENFORCEMENT  
 2FF FEDERAL  
 2IB INTERNATIONAL  
 2MB MUNICIPAL  
 2SW STATE

**1LH LEACHATE**  
 (See also SANITARY LANDFILL, WATER POLLUTION)

**1LR LITTER**  
 2CB CAMPAIGNS  
 2C6 COST OF REMOVAL  
 2RJ RECREATION AREAS

**1LU LUMBER**  
 2IN INDUSTRIAL WASTES  
 3DP DISPOSAL  
 3PT PROCESSING  
 3UT UTILIZATION  
 2PC POST CONSUMER WASTES  
 3DP DISPOSAL  
 3PT PROCESSING  
 3UT UTILIZATION

**1MA MANAGEMENT AND PLANNING**  
 2C7 COUNTY  
 2FF FEDERAL  
 2IB INTERNATIONAL  
 2MB MUNICIPAL  
 2RI REGIONAL  
 2RW RURAL  
 2SW STATE  
 2TQ TECHNIQUES



# HIERARCHIC TERMS

1ME	MANURE (See also ANIMALS)
2CE	CATTLE
2HE	HEALTH AND SAFETY
2PA	POULTRY
2PT	PROCESSING
2SL	SHEEP
2SN	STORAGE
2SZ	SWINE
2UT	UTILIZATION
1MG	MARKETS
1MI	METAL, FERROUS
2EC	ECONOMICS
2IN	INDUSTRIAL WASTES
3DP	DISPOSAL
3PT	PROCESSING
3UT	UTILIZATION
2PC	POST CONSUMER WASTES
3DP	DISPOSAL
3PT	PROCESSING
3UT	UTILIZATION
2SC	SCRAP
2SN	SLAG
2SY	SWARF
1MK	METAL, NON-FERROUS
2AM	ALUMINUM
2C4	COPPER
2EC	ECONOMICS
2HV	HEAVY
2LB	LEAD
2NI	NICKEL
2PK	PRECIOUS METALS
2TI	TIN
2ZI	ZINC
1MM	MICROORGANISMS
1MO	MINERALS
1MR	MINES (See also LAND RECLAMATION)
1MT	MINING INDUSTRY
2DP	DISPOSAL
2PT	PROCESSING
2UT	UTILIZATION
1MV	MONITORING
1MY	MUNICIPAL WASTES (See also REFUSE)
2CO	COMPACTION
2DP	DISPOSAL
2SH	SEPARATION
2TT	TRANSPORT
2UT	UTILIZATION
1NO	NOISE
1OC	OCEAN DISPOSAL
2AG	AGRICULTURAL WASTES
2CM	COMMERCIAL WASTES
2IN	INDUSTRIAL WASTES

## HAZARDOUS WASTE MANAGEMENT

	2IW	INSTITUTIONAL WASTES
	2IX	INTERNATIONAL CONTROL
	2MY	MUNICIPAL WASTES
	2SP	SLUDGE
1OF	ODOR CONTROL	
1OL	OIL	
1PB	PACKAGING WASTES	
	2DP	DISPOSAL
	2PT	PROCESSING
	2UT	UTILIZATION
1PD	PAPER AND PULP	
	2IN	INDUSTRIAL WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
	2NE	NEWSPAPERS
	2PC	POST CONSUMER WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
1PF	PATHOGENIC WASTES	
1PH	PERSONNEL	
1PJ	PESTICIDES	
1PL	PETROCHEMICALS	
	2IN	INDUSTRIAL WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
	2OI	OIL SPILLS
	2PC	POST CONSUMER WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
1PN	PHARMACEUTICAL WASTES	
1PP	PLANNING	
1PR	PLASTICS	
	2IN	INDUSTRIAL WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
	2PC	POST CONSUMER WASTES
	3DP	DISPOSAL
	3PT	PROCESSING
	3UT	UTILIZATION
1PT	PROCESSING	
1PV	PUBLIC RELATIONS (See EDUCATION)	
1PY	PYROLYSIS (See also INCINERATION)	
1RD	RADIOACTIVE WASTES (See also HAZARDOUS WASTES)	

# HIERARCHIC TERMS

	2DP	DISPOSAL
	2SW	STORAGE
1RG	RECLAMATION (See SALVAGE AND RECLAMATION)	
1RJ	RECREATIONAL AREAS (See also LAND RECLAMATION)	
1RM	REDUCTION	
1RN	REFUSE (See also SPECIFIC TYPES)	
	2CA	CALORIFIC VALUE
	2CO	COMPOSITION
	2QU	QUANTITY
1RP	RESEARCH (See SPECIFIC TOPICS; GRANT)	
1RR	RESOURCE RECOVERY	
1RU	RUBBER	
	2IN	INDUSTRIAL WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
	2PC	POST CONSUMER WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
	2TS	TIRES
1SB	SAFETY (See HEALTH AND SAFETY)	
1SD	SALVAGE AND RECLAMATION (See also SPECIFIC TYPES)	
1SF	SAND	
1SG	SANITARY LANDFILL (See also LAND RECLAMATION; SPECIFIC WASTES)	
	2CQ	COMPOSTING
	2C6	COSTS
	2DC	DECOMPOSITION
	2DS	DESIGN
	2ET	EQUIPMENT
	2GS	GASSES
	2GW	GROUND WATER
	2MC	MANAGEMENT AND PLANNING
	2OE	OPERATIONS
	2RL	REGULATIONS
	2SL	SHREDDING
	2SO	SITES
1SI	SEPARATION	
	2CH	CHEMICAL
	2LS	LIQUID-SOLID
	2MD	MECHANICAL
	2ML	METAL
	2MX	METHODS
	2RN	REFUSE
1SJ	SEWAGE (See also SLUDGE)	
	2AN	ANALYSIS

## HAZARDOUS WASTE MANAGEMENT

	2BP	BIOLOGICAL PROCESSING
	2CI	CHEMICAL PROCESSING
	2C6	COSTS
	2HE	HEALTH AND SAFETY
	2IP	IRRADIATION PROCESSING
	2MP	MECHANICAL PROCESSING
	2TT	TRANSPORTATION
1SL	SHREDDING	
1SN	SLAG (See METAL, FERROUS)	
1SO	SLAUGHTERHOUSE (See FOOD PROCESSING WASTES)	
1SP	SLUDGE (See also INDUSTRIAL WASTES)	
	2AN	ANALYSIS
	2BP	BIOLOGICAL PROCESSING
	2CI	CHEMICAL PROCESSING
	2C6	COSTS
	2DP	DISPOSAL
	2ET	EQUIPMENT
	2HE	HEALTH AND SAFETY
	2HP	HEAT PROCESSING
	2IP	IRRADIATION PROCESSING
	2MP	MECHANICAL PROCESSING
	2TT	TRANSPORTATION
	2UT	UTILIZATION
1SR	SNOW REMOVAL	
1ST	SOIL	
1SU	SOURCES OF INFORMATION	
1SW	STORAGE	
	2CZ	CONTAINERS
	2C6	COSTS
	2LF	LAWS
	2MX	METHODS
	2SO	SITES
1SX	STREET CLEANING	
1SY	SURVEYS	
1SZ	SYSTEMS ANALYSIS (See MANAGEMENT AND PLANNING)	
1TB	TANNERY WASTES	
1TE	TEXTILES	
	2IN	INDUSTRIAL WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
	2PC	POST CONSUMER WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
1TM	TOXIC MATERIALS (See also HAZARDOUS WASTES)	

# HIERARCHIC TERMS

1TR        TRANSFER STATIONS  
          (See also COLLECTION)

1TT        TRANSPORTATION  
          (See also SPECIFIC WASTES)

          2C6        COSTS  
          2MX        METHODS  
          2PM        PIPELINES  
          2PQ        PNEUMATIC  
          2RB        RAILROADS  
          2SN        SHIPS  
          2TK        TRUCKS

1TV        TREATMENT  
          (See PROCESSING)

1TY        TREES  
          (See BULKY WASTES; LUMBER)

1VC        VECTOR CONTROL  
          (See ANIMALS; INSECTS)

1VG        VEGETATION

1VR        VOLUME REDUCTION

1WE        WATER POLLUTION  
          (See also GROUND WATER)

          2AG        AGRICULTURAL WASTES  
          2AN        ANALYSIS  
          2CM        COMMERCIAL WASTES  
          2C2        CONTROL EQUIPMENT  
          2EC        ECONOMICS  
          2HE        HEALTH AND SAFETY  
          2IN        INDUSTRIAL WASTES  
          2LF        LAWS  
          2MY        MUNICIPAL WASTES  
          2SJ        SEWAGE

1WO        WOOD  
          (See LUMBER)

## Appendix E

### GEOGRAPHIC CODES

1AF	Africa	2LI	Libya
1AN	Antarctica	2LT	Lithuania
1AS	Asia	2LU	Louisiana
1AU	Australia	2MA	Maine
1CA	Canada	2MD	Maryland
1CB	Caribbean	2MH	Massachusetts
1EU	Europe	2MI	Melbourne
1MA	Marshall Islands	2MJ	Michigan
1ME	Mexico	2MN	Minnesota
1MI	Middle East	2MP	Mississippi
1NZ	New Zealand	2MR	Missouri
1SA	South America	2MT	Montana
1SU	Soviet Union	2NB	Nebraska
1US	United States	2NE	Nepal
		2NF	Netherlands
2AA	Alabama	2NG	Nevada
2AC	Alaska	2NH	New Hampshire
2AE	Alberta	2NJ	New Jersey
2AG	American Samoa	2NM	New Mexico
2AI	Arizona	2NQ	New York
2AN	Argentina	2NR	North Carolina
2AR	Arkansas	2NT	North Dakota
2AS	Austria	2NY	Norway
2BE	Belgium	2OH	Ohio
2BI	Brazil	2OK	Oklahoma
2BR	British Columbia	2ON	Ontario
2CA	California	2OR	Oregon
2CH	China (Mainland)	2PC	Pakistan
2CI	China (Taiwan)	2PE	Pennsylvania
2CO	Colorado	2PJ	Peru
2CT	Connecticut	2PL	Poland
2CZ	Czechoslovakia	2PR	Puerto Rico
2DE	Delaware	2RI	Rhode Island
2DN	Denmark	2SA	Saskatchewan
2DT	District of Columbia	2SF	South Africa
2FI	Finland	2SI	South Carolina
2FL	Florida	2SK	South Dakota
2FR	France	2SP	Spain
2GB	Gabon	2SR	Sweden
2GE	Georgia	2SU	Switzerland
2GM	Germany (East)	2SY	Sydney
2GN	Germany (West)	2TA	Tasmania
2GU	Guam	2TE	Tennessee
2HI	Hawaii	2TK	Texas
2HK	Hong Kong	2TN	Thailand
2HU	Hungary	2UG	Uganda
2IA	Idaho	2UK	United Kingdom
2II	Illinois	2UT	Utah
2IL	India	2VA	Venezuela
2IN	Indiana	2VE	Vermont
2IO	Indonesia	2VI	Victoria
2IQ	Iowa	2VN	Virginia
2IR	Ireland	2VR	Virgin Islands
2IS	Israel	2WA	Washington
2IT	Italy	2WR	West Virginia
2JM	Jamaica	2WW	Wisconsin
2JP	Japan	2WY	Wyoming
2KS	Kansas	2YU	Yugoslavia
2Ky	Kentucky		
2LE	Lebanon	3AI	Aiken
		3AK	Akron

## GEOGRAPHICAL

3AL	Albany	3GL	Glasgow
3AM	Ames	3HA	Hague
3AS	Amsterdam	3HF	Haifa
3AT	Atlanta	3HG	Hamburg
3BA	Baltimore	3HJ	Hanford
3BC	Bangkok	3HL	Harlem
3BI	Basel	3HM	Hartford
3BK	Barking	3HO	Honolulu
3BL	Bavaria	3HR	Hopewell
3BN	Berkeley	3HU	Houston
3BR	Berlin	3IT	Ithaca
3BS	Birmingham	3JE	Jerusalem
3BT	Boston	3JH	Johannesburg
3BV	Bridgeport	3JP	Joplin
3BW	Broward	3KC	Kansas City
3CA	Calumet	3KH	Karlsruhe
3CD	Camden	3KN	Knox
3CF	Casteljaloux	3KS	Kosovo
3CI	Cheshire	3KW	Kracow
3CJ	Chicago	3LC	Lancaster
3CN	Cincinnati	3LI	Lima
3CP	Cleveland	3LL	Liverpool
3CT	Clinton	3LO	London
3CU	Columbus	3LS	Los Angeles
3CY	Cook	3LY	Lycoming
3CZ	Czestochowa	3MA	Madras
3DE	Denver	3MD	Madrid
3DI	Detroit	3MH	Manchester
3DN	Dublin	3MI	Maui
3DT	Duluth	3ML	Melbourne
3DU	Dusseldorf	3MM	Miami
3EB	Ebingen	3MO	Milwaukee
3ED	Edinburgh	3MP	Minneapolis
3EK	Elk Creek	3MR	Mobile
3EM	Elmira	3MT	Montgomery
3EY	Ely	3MU	Munich
3FB	Fairbanks	3MY	Muskegon
3FI	Finham	3NA	Nashville
3FL	Flagstaff	3ND	New Delhi
3FN	Frankfort	3NL	New Orleans
3FR	Franklin	3NO	New York City
3SA	St. Croix	3NR	Niagara
3SC	St. Joseph	3NU	Nurnberg
3SD	St. Louis	3OC	Ochtrup
3SE	St. Paul	3OT	Ottawa
3SG	St. Petersburg	3PA	Paris
3SI	San Diego	3PC	Passaic
3SN	San Francisco	3PH	Philadelphia
3SO	Santa Ana	3PN	Phoenix
3SP	Santa Barbara	3PS	Pinellas
3SR	Savannah	3PW	Piscataway
3ST	Stockholm	3RC	Rochester
3SU	Stuttgart	3RO	Rocky Flats
3TA	Tel Aviv	3VE	Ventura
3TC	Tock's Island	3VI	Virginia Beach
3TK	Tokyo	3WA	Walcheren
3TN	Toronto	3WE	Weidenau-Geisweid
3TO	Trenton	3WK	West Nyack
3TR	Tripoli	3WM	Willamette River
3TU	Tucson	3WY	Winnebago
3VC	Venice	3YO	Yosemite
3GA	Gainesville	3ZU	Zurich
3GE	Geneva		

## Appendix F

### DOCUMENT CATEGORY CODES

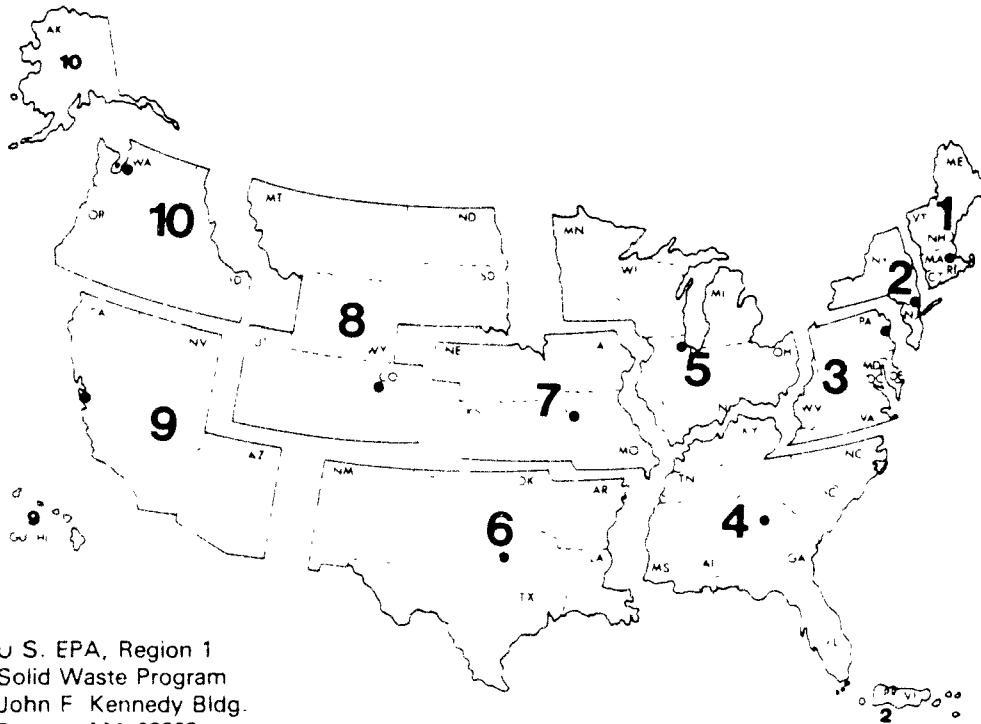
01	AGRICULTURAL WASTES		Rural
	Crop residues		State
	Manure	17	OCEAN DISPOSAL
	Timber/other vegetation	18	PACKAGING
02	ANALYSIS OF SOLID WASTE	19	PROCESSING/REDUCTION
	Data	20	RECYCLING
03	AUTOMOBILES		Incinerator residue
04	BULKY WASTES		Industrial wastes
05	COLLECTION		Mining wastes
06	COMPOST		Municipal refuse
07	DISPOSAL		Scrap metal
08	ECONOMICS	21	RESEARCH
	Disposal costs	22	SANITARY LANDFILL
	Financing facilities	23	SEPARATION
	Pollution control costs	24	SLUDGE
	Marketing information	25	STORAGE
	Taxes and incentives	26	STREET CLEANING
09	HAZARDOUS WASTES	27	TRAINING, EDUCATION,
10	HEALTH/SAFETY		PUBLIC RELATIONS
11	INCINERATION	28	TRANSPORT
12	INDUSTRIAL WASTES	29	SOURCE REDUCTION
13	INSTITUTIONAL WASTES	30	ENERGY
14	LAWS/REGULATIONS		Demand, for solid waste
15	LITTER		management
16	MANAGEMENT		Fuel from wastes
	Municipal		Heat utilization from
	Regional		incineration

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SW-785



# EPA REGIONS

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U S. EPA, Region 1  
Solid Waste Program  
John F. Kennedy Bldg.  
Boston, MA 02203  
617-223-5775

U.S. EPA, Region 2  
Solid Waste Section  
26 Federal Plaza  
New York, NY 10007  
212-264-0503

U.S. EPA, Region 3  
Solid Waste Program  
6th and Walnut Sts.  
Philadelphia PA 19106  
215-597 9377

U.S. EPA, Region 4  
Solid Waste Program  
345 Courtland St., N.E.  
Atlanta GA 30308  
404-881-3016

U.S. EPA, Region 5  
Solid Waste Program  
230 South Dearborn St  
Chicago, IL 60604  
312-353-2197

U.S. EPA, Region 6  
Solid Waste Section  
1201 Elm St  
Dallas, TX 75270  
214-767-2734

U S. EPA, Region 7  
Solid Waste Section  
1735 Baltimore Ave.  
Kansas City, MO 64108  
816-374-3307

U.S. EPA, Region 8  
Solid Waste Section  
1860 Lincoln St.  
Denver, CO 80295  
303-837-2221

U S EPA, Region 9  
Solid Waste Program  
215 Fremont St.  
San Francisco, CA 94105  
415-556-4606

U S. EPA, Region 10  
Solid Waste Program  
1200 6th Ave  
Seattle, WA 98101  
206-442 1260