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POLLUTION PREVENTION OPPORTUNITY ASSESSMENT
UNITED STATES POSTAL SERVICE
MATERIALS DISTRIBUTION CENTER
TOPEKA, KS

by

Carole O. Bell, Mary Hoel, Henry Huppert, Steven Rolander
Science Applications International Corporation
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Project Officers

James S. Bridges
and
N. Theresa Hoagland
Sustainable Technology Division
National Risk Management Research Laboratory
Cincinnati, OH 45268

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NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OH 45268

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CONTACT

James Bridges and N. Theresa Hoagland are the EPA contacts for this report. They are presently with the newly organized National Risk Management Research Laboratory's Sustainable Technology Division in Cincinnati, OH (formerly the Risk Reduction Engineering Laboratory). The National Risk Management Research Laboratory is headquartered in Cincinnati, OH, and is now responsible for research conducted by the Sustainable Technology Division in Cincinnati.

FOREWORD

The U.S. Environmental Protection Agency is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory is the Agency's center for investigation of technological and management approaches for reducing risks from threats to human health and the environment. The focus of the Laboratory's research program is on methods for the prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites and ground water; and prevention and control of indoor air pollution. The goal of this research effort is to catalyze development and implementation of innovative, cost-effective environmental technologies; develop scientific and engineering information needed by EPA to support regulatory and policy decisions; and provide technical support and information transfer to ensure effective implementation of environmental regulations and strategies.

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E. Timothy Oppelt, Director
National Risk Management Research Laboratory

ABSTRACT

The United States Postal Service (USPS), in cooperation with EPA's National Risk Management Research Laboratory (NRMRL), is engaged in an effort to integrate waste prevention and recycling activities into the waste management programs at Postal facilities. In this report, the findings of the Pollution Prevention Opportunity Assessment of the United States Postal Service, Materials Distribution Center, Central Repair Facility, and Label Printing Center located in Topeka, KS are described. This assessment was conducted during the week of March 6, 1995.

The report describes the mission of each of the functional areas of the facility including operations performed, processes and materials employed and the wastes and emissions generated. Recommendations are made concerning the procurement of office supplies, maintenance supplies and hazardous materials; management of hazardous materials; purchase of chemicals on EPA's 33/50 list; improvement of source separation and recycling of paper and paper products, metals and plastics; management of unwanted equipment; and other recommendations that can lead to the elimination, reduction, or improved management of the facility's solid and hazardous waste streams and emissions to air and water.

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SECTION 1.0

INTRODUCTION

The United States Environmental Protection Agency (EPA) is actively supporting the development of pollution prevention program plans for Federal facilities. Since 1988, the EPA has managed a technical support effort known as the Waste Reduction Evaluations at Federal Sites (WREAFS) Program. WREAFS was established to provide pollution prevention solutions to environmental issues through research, development and demonstration of pollution prevention techniques and technologies, and transferring lessons learned within the Federal community and related private sector support industries. WREAFS has conducted more than 37 separate RD&D efforts under funding from both EPA and nine other Federal departments and agencies via interagency agreements.

The United States Postal Service (USPS), in cooperation with EPA's National Risk Management Research Laboratory (NRMRL), is engaged in an effort to integrate waste prevention and recycling activities into the waste management programs at Postal facilities. The purpose of this project is to perform pollution prevention opportunity assessments (PPOAs) at several types of Postal Service facilities, to identify the pollution prevention opportunities for those facilities, to recommend implementation strategies and to develop facility guidance that can be incorporated into a revision of the USPS Waste Reduction Guide.

In this report, the findings of the PPOA conducted for the United States Postal Service at the facilities associated with the Materials Distribution Center located in Topeka, KS are described. The site assessment was conducted during the week of March 6, 1995.

The Assessment Team performed a multi-media pollution prevention assessment. Wastes of concern included air emissions from the printing operation; wastewater discharges; hazardous material acquisition, use and storage; hazardous waste storage and disposal; procurement; and solid waste management, including recycling. The report begins with a brief description of the facility. This is followed by descriptions of specific operations and the wastes and emissions generated. Both site-wide and operation-specific recommendations are made that may lead to the elimination, reduction, or improved management of the facility's waste streams. Mention of trade names, commercial products, or vendors does not constitute endorsement or recommendation for use.

1.1 SITE DESCRIPTION

The Materials Distribution Center (MDC) is located approximately ½ mile west of Route 75 in Topeka, KS, at the corner of Montara Boulevard and Route 75. The surrounding area is devoted to mixed industrial and agricultural uses. The site is bordered on the north by Forbes Industrial Park, on the south by farmland, on the east by Route 75 and Forbes Field, and on the west by a county golf course. The USPS operations occupy eight buildings on the site. Four buildings are owned by the USPS (Buildings 301 through 304); four are leased by the USPS from Forbes Industrial Park (Buildings 1 through 3 and 8).

Buildings 301-304 were built in 1953. Buildings 301 through 303 are one story warehouses comprising approximately 200,000 square feet each, divided into five 40,000 square foot areas. Building 304 is the pumphouse for the MDC's backup fire protection system. The pump is capable of moving water from the on-site water reservoir to the MDC buildings in case of fire. The USPS occupied these buildings in 1959; previously, the buildings were used by the Department of Defense for the storage of natural rubber.

The leased facilities, Buildings 1, 2, and 3, encompass an additional 440,000 square feet of warehouse space. Building 8, providing an additional 78,000 square feet, is leased by the USPS for a contractor-operated Central Repair Facility (CRF).

The USPS MDC operations include three organizational groups operating multiple sites within and around the MDC location. The resident organizational groups include the Materials Distribution Center, the Label Printing Center and the Central Repair Facility.

SECTION 2.0

MATERIALS DISTRIBUTION CENTER (MDC)

This section addresses the operations performed within the MDC and the wastes and emissions generated by those operations. The section also describes current waste management practices.

2.1 FACILITY DESCRIPTION

The mission of the MDC is the specification, acquisition, storage, distribution and maintenance of more than 16,000 parts, supplies, and pieces of equipment for the USPS automation and computer systems, nationwide. The MDC encompasses five distinct operations: Materials Distribution Center, Inventory Control, Inventory Support, Systems Integration, and the Topeka Purchasing Center. The offices, a variety of inventory management and systems integration functions, and repairables storage are located in Building 303. The MDC warehouses include Buildings 1, 2, 3, 301, and 302.

Each operation independently procures office supplies, computer and copier paper and toner cartridges. Laser printer toner cartridge recycling is available, but is managed by a separate agent in each operation. Maintenance (plumbing, heating) for all operations is supervised by the Plant Maintenance staff and billed to the MDC. Maintenance supplies and cleaning chemicals are included.

2.1.1 INVENTORY CONTROL

Inventory Control includes both Logistics Management and Tech Data (National Inventory Control) functions. Logistics Management is responsible for tracking equipment, supplies and parts, maintaining current supplies and predicting future needs. The 22 employees determine inventory needs for more than 15,000 stock repair parts, supplies and equipment for 400 USPS field offices. They also determine how much of a particular item will be kept on hand, and notify purchasing when warehouse stock is low. Tech Data works with a core of key vendors to determine the parts needed to support each machine for ten years.

Logistics Management also collects excess or discontinued property and manages its sale, either by auction or negotiated contract with a scrap dealer, based on the quantity and quality of the materials. USPS has no mechanism to notify this group when equipment phase-out or modification is planned. Equipment modifications can generate substantial amounts of material

requiring management or disposal. Receipt of defective equipment also creates significant material management costs.

2.1.2 Topeka Purchasing Center

The Topeka Purchasing Center has 20 employees including a manager, 14 purchasing agents and secretarial support. The Purchasing Center does not establish requirements; these are determined by Inventory Control. The procurement staff is responsible for identifying vendors and procuring the parts inventory for the USPS automation system, nationwide.

2.1.3 Inventory Support

Inventory Support consists of 30 employees in five separate operations that provide support to the National Inventory Control operations. Inventory Support is responsible for establishing purchasing and packaging requirements. Additional responsibilities are described below.

Provisioning

When procurement of new equipment is anticipated, the provisioning section performs background research to support the purchase. This may include gathering engineering data from the manufacturer and USPS Engineering Research and Development, creating models and testing failure rates. Provisioning staff determine the kind and number of parts that will be needed to support the equipment in the field, particularly the anticipated number of spare parts per site required for the first year of operation.

Catalogue and Technical Management

This group maintains the records of technical data, including all equipment drawings and specifications. They are responsible for the catalogue record database and support to the Assistance Center.

Topeka Material Assistance Center

The Material Assistance Center provides customer assistance to the field offices. These individuals locate parts, track orders, and assure a timely response to customer questions and concerns.

Acquisition Support

Acquisition Support provides product quality control and inspection services. The staff may inspect orders at the loading docks and visit manufacturing facilities to observe and evaluate products.

2.1.4 Systems Integration

Systems Integration provides computer information systems support to the facility. Systems Integration staff operate the Local Area Network (LAN), maintain personal computers, and provide user support. They perform minor repairs and stockpile old parts for sale as scrap. Although the complex has e-mail capabilities, the system is seldom used for facility-wide communications. There has been no effort to procure energy efficient computer equipment. Although the manager was familiar with EPA's Energy Star program, he felt it was inconvenient because of the time required for equipment warm-up. The Systems Integration section is testing and evaluating the Material Distribution Inventory Management System, a headquarters project. Fire protection in the computer room is provided by fourteen one quart glass bulbs of halon installed in the ceiling.

There is one lunch/break room with vending machines in Building 303. Each water fountain has a paper cup dispenser. The restrooms are furnished with paper towels and liquid soap dispensers.

2.2 MDC WASTE GENERATING OPERATIONS

Wastes generated by MDC operations include excess and obsolete equipment and supplies; corrugated cardboard; computer paper, white paper, mixed office paper, and magazines; laser toner cartridges; break room wastes including cans, bottles, wrappers, paper cups and food; pallets; shrink and stretch wrap; plastic and metal strapping; and paper and plastic dunnage.

Solid waste disposal for all operations is coordinated through a single contract with Topeka Waste, a subsidiary of Waste Management, Inc. The contract includes rental of five 40 cubic yard compactors. One compactor at Building 302 is pulled twice each month, compactors at both ends of Building 2 are each pulled once per month and the compactor at Building 8 is pulled weekly. The four waste compactors are pulled a total of 100 times per year. Charge per pull is \$618, for an estimated monthly solid waste collection and disposal bill of \$4,944.

In November, 1994, the container at Building 303 was designated as the accumulation point for recyclable corrugated cardboard. Topeka Waste Management charges \$305 to deliver the cardboard to Republic Paper. Republic Paper pays the MDC \$125 for the compactor load, for a net charge to the MDC of \$180 every other month. Facility-wide, estimated monthly solid waste management fees total \$5,034, for an annual waste management expense in excess of \$60,000. These charges are divided among the three organizational group finance numbers: the Material Distribution Center pays three fifths of the total, the Label Printing Center one fifth, and the Central Repair Facility the final one fifth.

The CRF compactor is pulled weekly and accounts for 52 percent of the total waste volume generated by the Topeka complex. It appears that the CRF is being charged for only 20 percent of the total solid waste disposal costs.

The MDC generates limited quantities of hazardous waste. In the past year, the MDC disposed of two drums of waste paint that were inadvertently shipped to the MDC. The MDC took responsibility for these drums and disposed of them as hazardous waste.

2.3 WAREHOUSE OPERATIONS

This section addresses the specific operations performed within the warehouses, the wastes generated by these operations, and current waste management practices.

Five individual buildings and a portion of the MDC office building (303) are devoted to warehouse operations. With the exception of Building 3, the warehouses are well insulated and maintained at a comfortable indoor temperature for the physical comfort of the workers and protection of the fire system. All of the warehouses are lighted with double rows of fluorescent lamps above the aisles.

Building 301 has 200,000 square feet of usable space divided into five 40,000 square foot areas. Four sections of Building 301, 160,000 square feet of warehouse space, are leased by the Defense Logistics Agency and used for storage of bales of natural rubber, each weighing 250 pounds. The rubber has been on-site since the late 1950's and may already have reached the end of its useful life. DLA has not indicated any interest in removing the rubber, although USPS personnel indicated that the Postal Service needs the warehouse space. The fifth section of Building 301 houses maintenance equipment and some maintenance activities, including the ongoing destruction of more than 160 brass plaques bearing the old Postal Service logo. These plaques, each weighing more than 100 pounds, were transported to the Topeka facility for consolidation. Once the logo has been obliterated, the brass will be sold at auction.

Building 302 provides 200,000 square feet of usable space divided into 40,000 square-foot areas. Building 302 houses the MDC receiving and shipping operations, as well as warehousing of more than 16,000 "consumable" parts and equipment that are purchased, consumed, disposed and replaced. Shipping and receiving activities procure thousands of cardboard boxes and jiffy bags annually. The MDC was unable to quantify either the number of these purchases or the cost to the USPS. Wastes generated from shipping and receiving include: corrugated cardboard; paper, metal and plastic strapping; polystyrene peanuts; plastic film; pallets; fluorescent light tubes and employee wastes.

Section A of Building 303 is the repairables section, housing 1,300 different kinds of equipment that can be or have been repaired for reuse in USPS operations. Some computer equipment from the Central Repair Facility awaiting shipping is stored here. The warehouses were clean and well organized; however, significant quantities of obsolete equipment were evident throughout the facility. For example, the Assessment Team observed more than 150 Apple IIE computers, dating from the 1970s, still in the original boxes.

The older warehouses, Buildings 1 and 2, provide a total of 400,000 square feet of warehouse space. Building 1 is dedicated to receipt, storage and shipping of 120 separate items, including capital equipment and supplies. These facilities are operated under the Rapid Emergency Deployment Inventory or REDI system. Orders are generated by Inventory Control and delivered daily, accompanied by appropriate shipping labels. After the items to fill an order are removed from their warehouse locations, they are taken to the loading dock, packaged, and shipped by Yellow Freight. All shipments are tracked using an electronic data interface through which the USPS can communicate directly with Yellow Freight, locate any shipment and determine its status within minutes. By eliminating paperwork and human error, this system has saved the USPS more than \$14 million in the past few years.

Building 2 is the supply warehouse for more than 3,500 paper products, including USPS forms and documents. The shipping operation reuses some cardboard boxes, but most are discarded into the compactor. For shipment of multiple packages to Bulk Mail Centers, the supply warehouse currently uses cardboard gaylord boxes. The gaylords, 4 feet square, were purchased to replace reusable over the road (OTR) containers. USPS staff defended this decision because they need at least 11, and sometimes as many as 30, gaylord-size containers per day and they cannot guarantee that OTRs will be available when needed. Staff stated that other USPS facilities hoard OTRs, especially during the Christmas holiday season. Also, the OTRs require more storage space, while gaylords store flat until used. It should be noted, however, that during the three day assessment more than 20 OTRs were sitting outside in the snow behind Building 302.

Obsolete forms and other paper discards are accumulated on pallets. When 15 to 18 pallets have accumulated, the contractor, P & S Services, is called to collect the paper for recycling. The P & S contract specifies that the paper must be recycled, not landfilled. The USPS is paid 0.001 cents per pound of paper.

Building 3 is used for storage of obsolete equipment, materials awaiting auction or disposal, and courtesy storage. For example, more than one hundred defective mail storage boxes are stacked in cardboard boxes. The USPS logo must be cut from both sides of each box before the metal can be sold as scrap. Building 3 is heated only minimally to maintain freeze protection; lights were left on, although the warehouse was not occupied.

The MDC generates limited quantities of hazardous waste. In the past year, the MDC disposed of two drums of waste paint that were inadvertently shipped to the MDC. The MDC took responsibility for these drums and disposed of them as hazardous waste.

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SECTION 3.0

MATERIALS DISTRIBUTION CENTER OPPORTUNITIES

This section describes pollution prevention opportunities specific to the operations of the Materials Distribution Center (MDC). Exhibit 3.1 summarizes the wastes generated by the MDC, current management practices and potential pollution prevention opportunities.

EXHIBIT 3.1 MDC WASTE GENERATION

Waste	Current Management	Opportunities
Obsolete, damaged or defective equipment	USPS logo removed/defaced; auctioned or sold as scrap	Reduce generation Improve economics of scrap sales
Corrugated cardboard	Some hauled to Republic Recycling by Topeka Waste Management for net cost of \$180 per compactor load	Reduce incoming boxes Improve diversion for recycling Improve economics of recycling
Computer print-out	Some collected for recycling by Hunter; some discarded as waste	Reduce generation Improve diversion for recycling
White paper	Some collected for recycling; most discarded as waste	Reduce generation, divert for recycling
Mixed paper	Some collected for recycling; some discarded as waste	Reduce generation, divert for recycling
Magazines	Discarded as waste	Reduce generation, divert for recycling
Toner cartridges	Refurbished and reused in multiple programs	Combine into single program
Pallets	Reused then discarded as waste	Reduce variety, establish recycling options
Plastic stretch wrap	Discarded as waste	Reduce generation, divert for recycling
Strapping	Discarded as waste	Divert for recycling
Dunnage	Discarded as waste	Reuse, divert for recycling

3.1 PAPER RECYCLING

Current Conditions

The Supply warehouse in Building 2 stores and ships paper products, e.g., Postal Service forms and catalogs, to USPS facilities throughout the United States. The warehouse contains 3,500 unique items. For various reasons, such as the new Postal Service logo, items become obsolete and must be removed from stock. Rather than disposing of the material in the dumpster, the warehouse supervisor established a recycling program with P & S Services. The program includes obsolete forms, publications, catalogs, and some cardboard.

The contract with P & S Services was awarded in September, 1992, and stipulates that the paper must be recycled, not landfilled. The USPS receives \$0.001 per pound (\$2.00 per ton) for scrap paper, including forms and miscellaneous paper grades. P & S Services also will collect scrap wood and wooden pallets at no cost. Revenues received from the paper recycling program are sent to the USPS payment center in San Mateo, CA.

Exhibit 3.2 lists the invoices that USPS has received from P & S Services. There is a discrepancy, since there are no invoices for 1994. The USPS Contract Representative is working to rectify this problem.

EXHIBIT 3.2 PAPER RECYCLING

Period	Amount	Payment
Oct-Dec 92	Oct - 68,000 lbs Nov - 75,000 lbs Dec - 225,000 lbs	\$368.00
Jan-March 93	173,000 lbs	\$172.97
July-Sept 93	15,000 lbs	\$15.00

P & S Services collects material on an on-call basis and must pick up the paper within 48 hours. For each pick-up, the Postal Service must have available a truckload of material, i.e., 18 pallet loads or skids. According to the warehouse supervisor, P & S services picked up 18 pallets per week (approximately 72 pallets per month or 864 pallets per year) in 1994. For 1995, the warehouse supervisor expects to generate 18 skids once every 2 weeks. A large amount of paper was generated in 1994 because the new Postal Service logo made many forms obsolete.

Pollution Prevention Opportunities

1. Reduce waste paper generation

The Postal Service should attempt to minimize the number of items that become obsolete to reduce their waste paper generation. The supply warehouse staff should conduct a study to determine the most common reasons why supply items become obsolete. Based on this study, USPS can make recommendations to the appropriate offices about print quantities and revising forms and catalogs in a manner that reduces the quantity of these items that must be discarded as obsolete. Items that change for aesthetic reasons should not automatically be discarded or recycled; rather, the existing stocks should be distributed and used during a transition phase before new forms are issued.

2. Seek a more beneficial recycling contract

The supply warehouse should identify other paper recyclers in the area that will provide better service, including competitive pricing and better record keeping. The MDC should seek a long-term contract for paper recycling with a per ton payment indexed to the paper market. This would guarantee a higher price for the paper. See Section 8.8 for additional recommendations concerning improved paper recycling and a list of area recyclers.

3.2 SOURCE SEPARATION OF ADDITIONAL RECYCLABLES

Current Conditions

The offices in the Materials Distribution Center currently separate some computer printout for recycling. The computer printout is collected in 90-gallon wheeled containers. However, the Assessment Team saw significant quantities of white paper and mixed office paper in the waste containers. Aluminum cans and other food and beverage containers from the break room are also discarded into the solid waste stream.

Pollution Prevention Opportunities

1. Seek new markets

Given the current market value of all grades of office paper, the MDC should seek a market for additional paper grades and enter into a long-term paper recycling contract indexed to the paper market.

2. Employee involvement and training

Employees need information concerning the kinds of paper that can and should be recycled. Employees should be involved in the planning and implementation of the recycling program so that they will value participating in it.

3. Improve source separation of paper

The MDC should provide individual desktop/side collection containers for recyclable paper. These container should be clearly labeled and/or a distinct color to distinguish them from the waste containers. A collection container for paper recycling should be located next to each printer and copying machine. Employees should be encouraged to empty their desk collection boxes into centralized consolidation containers. The recyclable paper should be regarded as a valuable commodity, not a waste.

4. Source separate additional items

Recycling of aluminum cans and other food and beverage containers can be coordinated with Shawnee County collection of toner bottles from the LPC.

3.3 LIGHTING/ENERGY

Current Conditions

The Assessment Team observed that MDC staff routinely left lights and equipment turned on in restrooms, break room, offices and warehouses.

Pollution Prevention Opportunities

1. Motion sensitive lighting

Install motion sensitive lighting in breakrooms and other infrequently used areas.

2. Turn lights off

In warehouses, turn lights off in unused sections or maintain only low-level security lighting. Establish a policy of turning lights off when leaving an office.

2. Low energy lighting

See Section 8.14 for a discussion of federal energy policies and the EPA Green Lights Program. Even if the facility does not join the Green Lights program, it should strive to incorporate the goals of the program into its lighting plans.

3.4 PACKAGING SPECIFICATIONS

Current Conditions

Inventory Support staff are responsible for packaging specifications to ensure the integrity of procured parts and equipment. In some cases, these specifications may require more packaging than is necessary to protect the shipment. For example, packaging specifications for toner shipped to the LPC require that two bottles of toner be placed in a corrugated box. The boxes must be palletized with rigid cardboard corners, banded and shrinkwrapped. These multiple layers will not protect the bottles of toner from damage from forklift movement or shipping any better than a single corrugated box containing multiple bottles of toner. All of the required packaging becomes solid waste and the MDC must pay to dispose of the packaging they specified originally.

USPS Waste Reduction Guide (AS 552 February, 1992, p. 36) encourages postal managers to reduce packaging wastes entering the Postal Service waste stream. "Postal priorities for packaging are (1) no packaging, (2) minimal packaging, (3) refillable or reusable packaging, and (4) packaging that is recyclable and contains recycled materials. As a rule of thumb, ordered materials should consist of 90 percent product and 10 percent packaging."

Pollution Prevention Opportunities

1. Review packaging specifications

Review all packaging specifications for redundancy. Develop a policy that directs developers of specifications to perform critical review of potential solid waste impacts of packaging requirements. Reduce multiple layers of packaging whenever product integrity will not be threatened.

SECTION 4.0

LABEL PRINTING CENTER

This section addresses the specific operations performed within the Label Printing Center, the wastes and emissions generated by these operations, and current waste management practices.

4.1 FACILITY DESCRIPTION

The Label Printing Center (Building 303) produces variable data bag and tray labels for 40,000 customers, including USPS nationwide and a variety of bulk mailers. These labels must be both human and machine readable. Orders for the labels are submitted on a USPS form. Clerks enter the order information into the computer and file the order forms. The forms are retained for three years. Only computer printouts are collected for recycling. Office paper and quarterly purges of the files generate significant quantities of mixed office paper that is currently discarded.

A majority of the labels are produced on a Dennison Presidax 1440 Ion Deposition Computerized Label Printing System. Ion Deposition printing utilizes a toner to create the data image on an anodized dielectric cylinder. The image is then transferred to the paper between the dielectric cylinder and a pressure roller using 2,000 psi hydraulic pressure. Following application of the data image, the paper is cut to size and the label order is wrapped with a clear plastic, heat-welded banding tape. The LPC operates three lines. All three lines operate during Tour 2 (day) and two of the three operate during Tour 1 (evening). One line is shut down for maintenance during Tour 1 on a rotating basis. Line 1 produces the 1x3-1/3 inch tags and prints approximately 4 to 5 million tags per shift. This line produces collated sets of tags on alternating weeks. The collated sets are made up of approximately 10 million tags. Lines 2 and 3 produce 2x3-1/3 inch tags and each prints approximately 2.5 million tags per shift. These lines run collated sets every week that consist of approximately 10 million tags. These high-speed lines use a total of thirty-five 650 pound rolls of tag stock paper, 32 gallons of toner and 13,800 yards of banding tape per day.

Although the toner is poured from a one gallon/five pound bottle into the printer receptacle, the printer area is remarkably clean and well maintained. The toner receptacle is enclosed and an exhaust system draws any fugitive toner dust into a bag-house unit. The unit has been in operation for one year, and the sock filters are currently being changed for the first time. Facility personnel plan to dispose of the filters into the solid waste compactor. Floors around the

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equipment are cleaned regularly with a treated mop. The mop heads are returned to the supplier who cleans, retreats and returns them to the facility.

The Label Printing Center also has a small Pressure Sensitive Label section which creates small orders and custom labels for various Postal Service operations. This operation was moved from New Jersey to Topeka in August, 1994. It utilizes an AM Multigraphics 2500 VR master plate maker and two AM Multigraphics 2850 Offset Lithography presses. One two-person shift processes orders that are cut to size and packaged by hand. Approximately half of the printing is done on pressure sensitive stock and the other half on 110 and 120 lb. cardstock and 20 lb. bond paper in a variety of colors. The purchase and use of paper varies seasonally and by workload; however, facility personnel estimate that they will use 36,000 sheets of cardstock and 9,000 sheets of pressure sensitive paper per year.

Additional components of the LPC operations include: a raw material storage warehouse, containing rolls of paper and boxes of toner for the printing system, as well as boxes of a variety of colors and sizes of paper for the Pressure Sensitive section; a maintenance shop containing a seldom-used solvent parts washer; and several computer rooms where label orders are entered into the computers that drive the printing system. The cost of the paper is reduced because the USPS has the ability to warehouse a significant stock of paper rolls. The LPC also contains a break room for workers.

4.2 LPC WASTE GENERATING OPERATIONS

The Label Printing Center generates several hazardous wastes. These include gear oil, hydraulic oil, and cleaners, degreasers, and chemicals associated with the operation of the offset lithography presses: Blankrola solvent, Deglazing solvent, and Toner Remover. Exhibit 4.1 shows the products used by the Label Printing Center that contain ozone depleting substances (ODS) or chemicals on EPA's 33/50 list of chemicals targeted for reduction. See the appendices for further discussion of ozone depleting substances and EPA 33/50 Chemicals.

Solid wastes include corrugated cardboard, computer print-out, mixed office paper, printed label stock, banded and printed label stock, cardboard cores and wooden ends from rolls of paper, and HDPE plastic toner bottles. The toner bottles are collected by Shawnee County for recycling on a no cost/no revenue basis. About five percent of the labels printed are test runs or defective runs generating as much as 16,000 to 20,000 pounds of recyclable paper per month. The printed white and colored tag stock is collected in gaylord boxes and sold to Republic Paper. Republic Paper collects the tag stock and pays three cents per pound, providing monthly revenue of \$480 to \$600. Another 4,000 pounds of excess banded label stock is generated each month. The clear plastic bands are considered a contaminant and, because it is extremely labor intensive to remove the bands to recover the paper, Republic collects this material, but does not pay for it.

EXHIBIT 4.1 LIST OF LPC PRODUCTS WITH ODS OR 33/50 CHEMICALS

MSDS Number	Trade Name	ODS or 33/50 Chemical
12	SLI Designers Cream	20% xylene by weight
15	Belt dressing TM-3244	30% trichloroethane
17	Clenesco Polylube Spray Grease	17% trichloroethane
18	Curtis Industries Duratron Electric Parts cleaner	93% trichlorotrifluoroethane 4% trichlorofluoromethane
20	Radiator Specialty Company Electric Motor and Contact Cleaner	25 % perchloroethylene 73% trichloroethane
21	Chemtronics Flux-off NR	92% 1,1,2-trichloro-1,2,2-trifluoroethane
25	Chemtronics Konform	1-10% toluene 30-80% 1,1,2-trichloro-1,2,2-trifluoroethane
26	Home Oil Company Solvent	3% toluene
28	Illinois Bronze Paint Company Wrinkle Finish Spray	35-48% methylene chloride
30	Steven Industries Neoprene Contact Cement	8.2% methyl ethyl ketone
36	Dymon A-103 Contact Cleaner & Degreaser	75-90% 1,1,2-trichloro-1,2,2-trifluoroethane
39	Excelda MFG Co. Stainless Steel Polish-aerosol	98% trichloroethane
40	GC Electronics Contact Kleen	74% 1,1,2-trichloro-1,2,2-trifluoroethane
42	Dymon A-098 Mechanics Friend	perchloroethylene
43	Crown Teflon Lubricant	1-10% toluene 51-70% trichloroethane 1-10% 1,1,2-trichloro-1,2,2-trifluoroethane
44	GC Electronics Flux Remover-hi strength	74% methylene chloride 9.3% 1,1,2-trichloro-1,2,2-trifluoroethane
49	AM Multigraphic Blankrola Solvent	25% perchloroethylene
51	AM Multigraphic Copier Toner Remover	70-75% trichloroethane
53	AM Multigraphic Deglazing Solvent	96% trichloroethane

SECTION 5.0

LABEL PRINTING CENTER (LPC) POLLUTION PREVENTION OPPORTUNITIES

This section describes pollution prevention opportunities specific to the Label Printing Center (LPC). Exhibit 5.1 presents the waste generated by the LPC and potential pollution prevention opportunities.

EXHIBIT 5.1 LPC SOLID WASTE

Waste	Current Management	Opportunities
Corrugated cardboard	Hauled to Republic Recycling by Topeka Waste Management for net cost of \$180 per compactor load	Reduce incoming boxes Improve diversion for recycling Improve economics of recycling
Computer paper	Some collected for recycling by Hunter; some discarded as waste	Reduce generation Improve diversion for recycling
Mixed office paper	Discarded as waste	Reduce generation Divert for recycling
Test runs and defective printed label stock	Recycled	Reduce generation
Banded label stock	Recycled	Reduce generation
Cores and ends	Discarded as waste	Divert for reuse or recycling
HDPE bottles	Recycled	Reuse

5.1 LABELS

Current Conditions

The LPC prints and distributes more than twelve million labels each day. The label ordering operation and the label printing operation generate significant quantities of paper, plastic and chemicals. In addition, the labels themselves are discarded and replaced, repeatedly, throughout the mail distribution system.

Pollution Prevention Opportunities

The USPS should seek an alternative mechanism to label mail bags, boxes and reusable mail distribution equipment. For example, reusable labels may be used in closed loop distribution programs. A bar-code or magnetic strip with coded information could be utilized if human readability is not required.

5.2 PAPER

Current Conditions

The LPC currently is using virgin paper in its label printing operation. The LPC has a three-year contract that expires in May, 1996 with the Paper Company of America (PCA) to supply Ungummed Label Paper (tag) that meets U.S. Postal Specification #430307 dated August 8, 1992. This specification requires 100 lb. paper on 13.51 inch wide rolls with a roll diameter of 48 inches. The LPC uses approximately 35 rolls of paper per day. Therefore, the LPC uses approximately 22,750 pounds of paper per day. The LPC uses mostly white paper but also uses small amounts of colored paper. Paper is used on a first-in first-out basis. The paper is unloaded from the pallet in the warehouse staging area outside of the LPC. The outer wrapping, including brown paper, cardboard ends and wooden core plugs is disposed. The paper is then rolled into the LPC and allowed to acclimate for one week prior to use in the printers.

Pollution Prevention Opportunities

1. Specify Tag Paper with Recovered Content in New Procurements

The LPC should procure paper with recovered content after the current paper contract expires in May, 1996. The USPS Waste Reduction Guide (AS 552, February, 1992, p. 32) directs requiring offices to "review purchase specifications to eliminate prohibitions or limitations on use of recovered materials." In addition, specifications should be modified to encourage use of recycled products.

The LPC should strive to use paper with recovered content. The Assessment Team contacted the current paper contractor, Paper Corporation of America (PCA), who indicated that the current USPS contract price of \$0.39 per pound was favorable to the USPS, since the price of virgin paper has nearly doubled since this contract was signed. The PCA representative stated that the paper used by the LPC is available with greater than 20 percent recovered content and, on receipt of a firm request for paper with recovered content, they could provide a quote in two weeks for delivery in 30 days. This indicates that paper used by the LPC is readily available with recovered content. The PCA representative stated that the recovered-content paper would certainly meet the existing paper technical specifications and that the quality of the paper with recovered content was just as good as the virgin paper. The price of paper with recovered content is currently higher than virgin paper. The PCA representative stated that the current

price of this type of virgin paper was approximately \$0.62 per pound, while paper with recovered content was approximately \$0.65 per pound. This could represent an increase in paper costs of approximately \$150,000 per year based on the current contract delivery rate of 5,200,000 lbs. per year. USPS Headquarters is drafting a policy supporting a five percent price preference for products with recycled content. Facilities will be encouraged to purchase recycled-content products, even at a higher price, as long as that price is no more than five percent above the price of the product manufactured from virgin materials.

2. Recycle Core Plugs or Return for Reuse

The wooden core plugs on the paper rolls are used by the paper manufacturer to prevent the cardboard fiber cores from being crushed during paper rolling, movement and storage. These plugs, which come two per roll, are approximately 6 inches in diameter and 1 inch thick and weigh approximately 1.1 pounds each. The plugs are removed prior to paper use. In the past, some of these plugs have been donated to schools for use in crafts projects. However, they are typically disposed into the solid waste compactor. Use of approximately 35 rolls per day or 8,750 paper rolls per year, results in the disposal of approximately 17,500 core plugs weighing approximately 19,250 pounds. The volume of cores disposed is approximately 10.6 cubic yards. Based on the disposal fee for solid waste of \$618 per compactor load, core disposal costs approximately \$155.00 per year.

The paper supplier stated that the paper mill would accept return of the plug cores as long as they were not cracked or broken and the shipper paid for freight charges. The Postal Service should accumulate the cores for an appropriate period of time and ship them back to the mills for reuse. This may cost more than the disposal fee but should be considered as an option. Future contracts should specify that the supplier backhaul or absorb the cost of returning the plug cores.

3. List the Core Plugs on a Waste Exchange

A second alternative would be to list the core plugs on a waste exchange. Materials Exchanges were established to provide a means for industrial waste generators to recycle (or reuse) valuable resources. In general, waste exchanges try to "match-up" generators of waste with companies interested in recycling or reusing the discarded materials. The benefit from waste exchanges is that clients minimize waste disposal expenses, reduce the need for landfilling, and increase the value of wastes, by-products, surplus and off-spec resources. For further information, contact:

Kansas Materials Exchange
P.O. Box 152
Hutchinson, KS 67504-0152
(316) 662 0551

4. Recycle Fiberboard Cores

Approximately 8,750 fiberboard cores from the paper rolls are generated per year by the LPC. Currently, the cores are discarded as solid waste. The cardboard recycler will not accept the cores mixed with corrugated cardboard. LPC staff should work with local paper recyclers to identify a market for the fiberboard. See Exhibit 8.4 for a list of local paper recyclers.

5.3 LPC MAINTENANCE SHOP

Current Conditions

The LPC has its own machine/maintenance shop where parts for the label printers are cleaned and repaired. This shop has several repair benches and a solvent sink. The LPC uses approximately 20 products that contain either ozone depleting substances (ODS) or chemicals on EPA's 33/50 list. Exhibit 4.1 provides a list of materials used by the LPC that contain these constituents. The LPC has begun phasing out the use of products with 33/50 chemicals and LPC personnel state that adequate substitutes have not been found for nine materials.

Based on discussions with LPC personnel, the parts washer is used very rarely. The parts washer is a solvent based unit and the LPC personnel state that the solvent has not been changed in five years. The LPC personnel also indicated that they have approximately 25-30 gallons of fresh solvent (perchloroethylene) stored in a drum for use in the parts washer.

Pollution Prevention Opportunities

1. Eliminate solvent sink or replace with an aqueous washer

Eliminate the parts washer or replace with a non-petroleum based or an aqueous cleaning system. The LPC should evaluate the frequency of use of the parts cleaner and make a determination if the parts cleaner is necessary for the shop. If the LPC ever chooses or is required to replace this parts cleaner, it should select an aqueous cleaning system. An aqueous based parts cleaner currently is used at the CRF Repair Mechanical (RM) operation and personnel have reported more than satisfactory parts cleaning.

2. Replace Products containing ODS and EPA 33/50 Chemicals

The LPC provided MSDSs for all of the products used. The Assessment Team identified 20 materials that contained constituents of concern, either ozone depleting chemicals or other chemicals on EPA's 33/50 list. The LPC has taken steps to eliminate the use of or is depleting existing stocks, with the exception of nine products. The following products have not been eliminated because the LPC has not yet found an adequate substitute.

Dylek NF Aerosol

LPC personnel were concerned about using particular chemicals that were not listed on EPA's 33/50 list. Specifically, they were concerned about the use of 1,1-dichloro-1-fluoroethane. This is an ingredient in Dylek NF Aerosol which is used as a cleaner for the small holes in the ion deposition plate. 1,1-dichloro-1-fluoroethane is a hydrochlorofluorocarbon (HCFC) and is considered a Class II ODS).

The Department of Defense (DOD), and the Air Force specifically, have taken the lead in eliminating the purchase and use of ODS. DOD has restricted the purchase and use of all Class I ODS (e.g., CFCs, Halon) and allows the use of Class II ODS only as a last resort. Specifically, DOD states that Class II ODS may be used only after all environmentally preferable alternatives have been evaluated and rejected for technical or economic reasons. The Postal Service does not have a written policy concerning ODS, but USPS Headquarters has stated that facilities should follow the Air Force policy described above.

In addition, the toxicity of this material is in the same range as other organic chemicals on EPA's 33/50 list, targeted by EPA for reduction. Ideally, the LPC should specify a substitute cleaner that can perform the cleaning function and is more environmentally acceptable. On-site testing will still be necessary to assess the performance of any cleaner identified. Potential substitutes are listed in Exhibit 5.2.

EXHIBIT 5.2 POTENTIAL CLEANING AND DEGREASING SUBSTITUTES

Product/Company	Description	NSN and Price
Enviro Klean 1000 Allied Enterprises, Inc	Low VOC, non-CFC aerosol spray for degreasing various industrial parts and equipment	6850-01-061-5493 16 oz. \$4.00
Electrowash 2000 Chemtronics	General purpose electronic precision cleaner. No ODS, safe on plastics.	6850-01-393-9054 12.5 oz. \$9.50
Heavy Duty Degreaser CRC Industries	Heavy duty cleaning and degreasing. Removes grease, oil, dirt and other contaminants from parts and equipment	6850-01-380-3976 20 oz. \$5.63

Chemtronics Fluxoff NR

Chemtronics Fluxoff NR is used to remove excess solder flux from circuit boards following board repair. According to the MSDS, this material contains 92 percent 1,1,2-trichloro-1,2,2-trifluoroethane. This chemical is a Class I ODS and is targeted for elimination by Federal facilities.

The Repair Board (RB) shop of the CRF has used this material in the past. This shop has discontinued its use because of the presence of the 1,1,2-trichloro-1,2,2-trifluoroethane. The CRF has changed to a cleaning method that scrubs the boards with a solution of water and Mr. Clean followed by rinsing with water and drying with pressurized air. Technicians at the CRF stated that this method took more time and effort but that the quality of cleaning was acceptable. The LPC should consider this alternate cleaning method for its board cleaning. For additional less toxic electronics/flux cleaners see the Defense General Supply Center's Environmentally Preferred Products Guide or the examples noted in Exhibit 5.2 above.

Dymon A-103 Contact Cleaner and Degreaser

This contact cleaner and degreaser is used to clean electronic parts and contains 75 to 90 percent 1,1,2-trichloro-1,2,2-trifluoroethane. The LPC uses 144 - 16 oz. cans per year. There are several potential electronics cleaners/degreasers that do not contain ODS or chemicals on the EPA 33/50 list. Exhibit 5.3 identifies two potential substitutes.

EXHIBIT 5.3 ADDITIONAL CLEANING AND DEGREASING SUBSTITUTES

Product/Company	Description	NSN and price
Electronics Cleaner/Degreaser 2000 Chemtronics Inc.	Removes oils, grease, dirt and fluxes. High dielectric strength. Ultrasonic applications. Not compatible with some plastics.	6850-01-1038 18 oz aerosol \$14.15
Lectra Clean II CRC Industries	Electrical cleaning and degreasing. Removes grease, oil, dirt and other contaminants from motors, parts, and other equipment	6850-01-382-5783 12-20 oz cans \$67.50

Gunk Brake Cleaner

The LPC uses 24 - 10 ounce cans of Gunk per year to clean the brake drums on the high-speed printers. The MDC uses Curtisol Brake and Parts Cleaner (33882) for cleaning brake drums. The Curtisol product does not contain any constituents of concern.

5.4 PRESSURE SENSITIVE OPERATION

Current Conditions

The Pressure Sensitive printing operation uses the following chemicals of concern: AM Multigraphic Blankrola Solvent containing 25 percent perchloroethylene; AM Multigraphic Copier Toner Remover containing 70 to 75 percent trichloroethane which is placed on small wipe pads and used to clean the printer roller, mat or print drum; and AM Multigraphic

Deglazing Solvent containing 96 percent trichloroethane, used for rubber roller deglazing and deglazing the mats on the printer cylinder. These chemicals, when spent, constitute the majority of hazardous waste generated by the facility.

Pollution Prevention Opportunity

1. Replace Chemicals with Non-toxic Alternatives

In cooperation with the equipment manufacturer, AM Multigraphics, LPC staff have identified potential substitutes for these three materials. While some retraining of personnel may be necessary, introduction of substitute chemicals has the potential to eliminate most hazardous waste generation at the LPC.

2. Replace Petroleum-based Inks with Vegetable or Aqueous-based inks

Vegetable-based inks are alternative printing inks made with soybean or other vegetable derived oils in place of all or part of the petroleum-based oils used in most inks. Soy-based ink, or soy ink, was developed in 1979 as an alternative to petroleum-based inks to decrease industry's dependence on imported oil. Since that time, approximately one-third of the newspapers printed in the U.S. have begun to use soy inks. In addition, nearly one-fourth of the commercial printers in the U.S. now are using soy ink on a regular basis.

Vegetable inks are available in both black and a variety of colors. According to trade associations, colored soy ink is more widely used than black. Apparently, color vegetable based inks are more competitively priced and tend to perform better than black inks, in relation to its petroleum-based counterparts. However, soy ink manufacturers indicate that black soy ink is often the least expensive, with certain colors, such as green and purple, being the most expensive. Among manufacturers, obviously, prices vary.

Soy inks offer many pollution prevention advantages over petroleum based products because they:

- Reduce the content of petroleum oil in inks and consequently lessen solvent emissions. In heat-set printing, petroleum-based inks are dried, and volatile organic compounds (VOCs) are released into the atmosphere in the drying process. Soybean oil does not evaporate when the ink dries. Instead, the oil polymerizes as the ink hardens.
- Are easier to remove from paper pulp prior to recycling. This means there is less damage to pulp fibers, fewer harsh chemicals are required, and less bleaching is required, leading to more usable fiber and cleaner waste water in deinking and pulping mills.

- Reduce the amount of paper wasted in press start-up. Soy ink flows more smoothly than petroleum-based inks; as a result, the ink coverage is more thorough from the beginning of a print job.
- Provide a more intense color than petroleum-based inks because soy oil is clear, while petroleum is a dark, murky color. As a result, printers can use less ink to gain the same effect. Some printers report as much as 25 percent greater mileage from soy inks.
- Decrease spoilage and the need to dispose of spoiled inks. Properly formulated soy inks may exhibit better storage properties.

Some literature indicates that soy ink cleans off of presses more easily than petroleum-based inks, allowing the printer to use less harmful cleaners, such as soap and water, as opposed to the typical hydrocarbon solvents used to remove conventional inks from presses. However, no confirmation of this information could be gained from actual printers. Most indicated no difference in necessary cleaning procedures.

See the appendices for Federal requirements for use of vegetable-based inks and industry points of contact.

5.5 LPC HAZARDOUS WASTE GENERATION

Current Conditions

The LPC generates hazardous waste from the new offset printing process. This process generates three hazardous waste streams. These include: Blanket wash (Blankrola) which contains tetrachloroethylene (F002 when spent); Electrostatic solution containing potassium hexacyanoferrate (potentially D003); and liquid developer, containing isoparaffinic hydrocarbons (D001 if spent).

The LPC generates approximately one gallon per week of each of the above hazardous waste streams. These are stored temporarily near the printing process and transferred to the hazardous waste storage drums that are located in a lean-to shed adjacent to Building 303, where the hazardous waste is stored in two drums on a pallet.

In addition there were numerous off-spec and/or outdated products in storage awaiting disposal. The LPC staff is attempting to characterize and dispose of these materials in an appropriate manner.

Pollution Prevention Opportunities

1. Set up an adequate hazardous waste storage area or satellite accumulation area.

The LPC should set up an adequate hazardous waste storage area to reduce the potential for spills, worker exposure and mixture of incompatible chemicals. The report from the facility compliance audit performed in December, 1994 noted several compliance deficiencies for the hazardous waste storage area and provided several options to remedy the hazardous waste storage deficiencies. The Assessment Team concurs with each of the suggestions in the compliance audit report and believes that the MDC/LPC should set up a secure hazardous waste storage area or satellite accumulation site as soon as possible. The compliance report did not provide any research information on storage containers, and LPC personnel were interested in identifying potential storage devices: Exhibit 5.4 presents some examples of outdoor hazardous waste storage containers. See the appendices for further guidance on procurement of storage equipment.

EXHIBIT 5.4 EXAMPLES OF HAZARDOUS WASTE STORAGE STRUCTURES

Name and Address	Model	Price (May 1995)
P&D Systemtechnic 3026 River Park Drive Louisville, KY 40211 (502) 776-7776	2P2-G (Non-combustible) 2-drum capacity	\$1385.00
Safety Storage Inc. 2301 Bert Drive Hollister, CA 95023 (408) 637-5955	Safety Storage Locker, Model 2 (non-combustible) 2 drum capacity	\$910.00
HazStor Hazardous Material Storage 2454 E. Dempster St. Desplaines, IL 60016 (708) 294-1000	Model LK02 (Non-combustible) Model LF02 (Fire Rated) 2 drum capacity	\$2,350 \$3,650
Precision Quincy Corp. 1625 North Lake Shore Drive Woodstock, IL 60098 (815) 338-2960	Model HB 5 ST (Non-combustible) 3-5 drum capacity	\$3,000

5.6 LABEL PRINTING PROCESS MODIFICATIONS

Current Conditions

The Label Printing Center generates significant quantities of recyclable paper from its Dennison Presidax 1440 Ion Deposition Computerized Label Printing System. A majority of the paper, approximately 20,000 pounds per month, is clean label stock which is recycled by Republic Paper. Republic pays three cents per pound for this clean tag stock. An additional 4,000 pounds of label stock contaminated with plastic banding are generated each month. The

clear plastic bands are considered a contaminant and, because it is extremely labor intensive to remove the bands to recover the paper, Republic does not pay for this label stock.

Because of the design of the Dennison Printing Systems, it is not possible to perform quality control (QC) on the labels prior to banding; therefore, some defective and test runs are banded with the heat sensitive tape. LPC supervisors expressed a willingness to modify the printing system to perform QC prior to the heat sensitive banding; however, this would require an engineering redesign of the system.

In addition, LPC staff also are willing to consider alternatives to the heat sensitive banding to permit increased recycling of the label stock; however, there are several constraints on banding. For instance, the majority of the label must be visible and the banded label must be both machine and human readable.

Pollution Prevention Opportunities

1. Modify the label printing process

The state of Kansas operates a non-regulatory pollution prevention program at the Department of Environment's Office of Science and Support. The program provides assistance in the form of library searches, free on-site consultations, and workshops on issues such as solvent alternatives. Annual awards recognize innovative pollution prevention efforts. Contact Theresa Hodges, Director, at (913) 296-5572 for more information.

Technical assistance is available through the Pollution Prevention Institute at the Kansas State University Extension Service. The Pollution Prevention Institute provides free access to the services of chemical and materials engineers. For further information, contact Michele Feenstra (913) 532-6501.

The LPC should contact the Pollution Prevention Institute at Kansas State and the Pollution Prevention Office at the Kansas Department of Environment for assistance in reducing the waste from the Dennison Printing System. These organizations can assist in the following areas:

- Reduce the reject rate of the printing systems,
- Develop a substitute for the heat sensitive plastic banding, such as a cellulose band or paper wrapper with the label printed on the outside, and
- Redesign the printing system to allow quality control prior to banding.

2. Stop banding test runs

The LPC should stop banding the test label with the heat sensitive banding tape. The test bundles will always be waste and should not be banded. This will reduce the amount of contaminated label stock.

5.7 PLASTIC TONER BOTTLES

Current Conditions

On average, the LPC uses 32 bottles of ion deposition toner per day, or 700 bottles per month. Each bottle contains 5 pounds, or 3,000 ml of toner. The bottles were designed with a wide mouth so that they could be placed into the printers, but there were problems with this system. Currently, the toner is poured from the bottles into a collection bin in the printers. In the past, the printing facility tried to use the toner in bulk; however, transferring the toner from the bulk containers to the printers proved very messy.

The toner bottles are made of natural HDPE plastic and have screw on lids. Currently, LPC staff place the empty plastic bottles in a collection container. The toner bottles are picked up by Shawnee County for recycling on a no cost/no revenue basis.

Pollution Prevention Opportunities

1. Establish a reuse program

The LPC should attempt to establish a reuse program with the toner manufacturer or supplier. The Assessment Team contacted Delphax, the toner supplier, and Coates Reprographics, the toner manufacturer, to determine whether they would accept the used containers for refilling/reuse. Delphax does not accept the used containers for refilling or recycling; instead, they encourage their customers to recycle the containers locally. Coates also does not accept the used containers for refilling because of technical specifications on particulate matter in the container. According to Coates, refilling the containers would require cleaning the containers, and the combined cost of transporting and cleaning the containers would be higher than the company can afford. Coates encourages its customers to recycle the containers.

Although neither the toner manufacturer nor supplier currently accept used toner bottles for reuse, they may be willing to establish a trial closed-loop program in the future. Contact:

Mr. Steve Milewski
Delphax Systems
5 Campanelli Circle
Canton, MA 02021
(617) 828-9917 and

Mr. Anthony Nickalls
Coates Reprographics Inc.
Country Club Road, P.O. Box #180
Dallas, Pennsylvania 18612-0160
(717) 675-1131

2. Recycling

The LPC should contact other recyclers in the Topeka-Kansas City area to determine whether the LPC can receive revenue from the used HDPE toner bottles. The Assessment Team contacted Smurfit Recycling in Kansas City, KS to determine whether they would accept the toner bottles. Smurfit accepts baled HDPE containers, although they may be able to accept them unbaled in Gaylord containers. Before providing a price quotation, a Smurfit representative would need to assess the type and quantity of material. The contact at Smurfit is Mr. John Funke, Jr., Smurfit Recycling, 510 Division St., Kansas City, KS, 66103, (913) 236-8000, FAX: (913) 722-5600.

3. Procurement specifications

For future toner procurement contracts, the Postal Service should consider including language that requires the manufacturer or supplier to accept the toner bottles back for refilling and reuse.

SECTION 6.0

CENTRAL REPAIR FACILITY (CRF)

This section describes the operations of the Central Repair Facility, the solid and hazardous wastes generated and the current arrangements for the management of those wastes.

6.1 FACILITY DESCRIPTION

The Central Repair Facility utilizes 78,400 square feet in Building 8, which is owned by Forbes Industrial Park and leased to the USPS. Facility operations are performed by an on-site contractor. There are 150 contractor employees and a USPS Facility Manager on-site. Facility maintenance (plumbing, heating) is provided by the MDC Plant Maintenance staff. Solid waste is disposed into a 40 cubic yard compactor which is serviced under the Topeka Waste contract and charged back to the facility. The compactor is pulled weekly. CRF is responsible for procuring janitorial services and cleaning supplies, however, USPS pays for the custodial services.

The Central Repair Facility receives and repairs electronic equipment, including circuit boards, monitors, printers and motors from USPS facilities, nationwide. Equipment still under warranty is sent back to the manufacturer for repair and then returned to CRF for distribution to USPS facilities. To avoid spending more on repairs than an item is worth, the CRF operates according to a Master List, supplied by the USPS, that dictates the maximum amount of time and money that can be spent to repair a particular item.

If the CRF makes a preliminary determination that it is not cost effective to repair a piece of equipment or that the part is obsolete, the decision to dispose of the piece of equipment must be confirmed by the Materials Review Board. The Board determines the final disposition of the equipment which may be discarded, cannibalized and discarded, or returned to USPS for auction.

6.2 CRF WASTE GENERATING OPERATIONS

The following discussion describes the numerous wastes generated from the operation of the CRF.

6.2.1 Warehouse

The CRF Warehouse contains parts and equipment awaiting repair as well as a supply of containers for shipping repaired equipment. The warehouse is cleaned out twice each year,

generating two to three compactor loads per cleanup of discarded equipment and packaging. Some pieces are returned to the MDC for auction and some metals are diverted for recycling.

6.2.2 Receiving

In the Receiving Section, boxes of equipment are unpacked prior to assignment to an appropriate repair operation. A single employee unpacks the equipment and places the packaging into a metal OTR. When it is full, the OTR is rolled over to the solid waste compactor and emptied. As much as 90 percent of the packaging, including corrugated cardboard boxes, foam molds, paper, plastic film, tape, strapping and other dunnage is discarded. A CRF staff person indicated that there was no economic incentive to recycle.

6.2.3 Shipping

To protect repaired equipment during shipment, each part is encased in urethane foam. An employee sprays liquid "Instafoam" into a corrugated cardboard box. As the foam begins to rise, a pink plastic film sheet is placed on top of the foam. The repaired part is placed on top of the plastic sheet and pressed into the foam which forms a protective nest around it. Next, the part is covered with another plastic sheet and the box filled with foam. Closing the box forms the foam over the part. This operation is supposed to be performed inside a hood; instead, the fan in the hood is turned on and the work performed on a shelf in front of the hood. The Instafoam contains 4,4-diphenylmethane diisocyanate which is subject to the reporting requirements of the Emergency Planning and Community Right-to-Know Act (EPCRA). The CRF currently does not use sufficient quantities of this material to meet the reporting threshold.

The boxes with the foam mold are intended for reuse for shipping of similar kinds of equipment. In reality, most are discarded. The foam attaches to the wall of the corrugated box, contaminating the corrugated and rendering it unacceptable for recycling. Smaller boxes sized for specific parts and pieces of equipment are utilized in another area of the shipping operation. The shipping department uses approximately 30 different sizes and types of boxes and jiffybags. In the past year, the CRF used 22,925 new boxes and 23,313 new jiffy bags. Some boxes received were reused for shipping. Many parts are shipped to the MDC for restocking. Parts or machines that are high dollar items or of limited quantity are sent directly back to the end user.

6.2.4 Purchasing and Stock Room

The CRF stock room maintains inventory control by utilizing contractor-developed software to sustain an accessible record of the status of each item. Under the current contract with the USPS, the contractor is required to control the inventory and materials used in the CRF and maintain a stockroom to properly support CRF operations. Requirements include maintaining stockroom security at all times and limiting the number of employees authorized to make receipts to and issues from the stockroom. The contractor is required to maintain a current

inventory of all accountable items furnished by the USPS and to perform quarterly inventories of one quarter of the stockroom items, and annual inventory of all accountable property items.

Procurement and Inventory Control at the Central Repair Facility provides an example of a well organized and operated materials handling operation. All supplies and parts are ordered by a central purchasing department. Materials are managed from a Central Stock Room. The purchasing department does not specify paper products with recovered content, but some toilet tissue and towels contain recovered content. Otherwise, no products with recovered content are procured by the CRF. The following provides a more detailed description of the purchasing and material control system at the CRF.

Purchasing

The purchasing department at the CRF consists of two purchasing agents. One agent handles the stock inventory and the other purchases new or special items. The purchasing department is authorized to make purchases up to \$10,000. Purchases above \$10,000 require USPS approval. Only the USPS supervisor has a credit card for purchases. The purchasing agents use a purchasing and materials inventory system based on software developed by the contractor to manage its inventory. This system contains a database of information on all items purchased by the CRF, including description, National Stock Number (NSN), Original Equipment Manufacturer (OEM) number, quantity on-hand, price, vendor, and storage location. This system also tracks the usage of items as they are requisitioned from stock and automatically produces purchase orders based on usage rates and stock reorder point (usually half the yearly usage rate). This system allows the purchasing department to track monthly usage so material shortages do not occur and to observe trends to allow investigation of abnormal usage of materials. The system allows the procurement staff to provide rapid turnaround on requests concerning stock on hand as well as past material usage trends. They are able to access NSNs, product information and costs in a clear concise fashion. This system can also track waste disposition. For example, the purchasing staff was able to track the quantity of waste oil sent for recycling in the past year (26 55-gallon drums)..

Material Distribution

Distribution of items is carefully controlled in the CRF. Access to the stock room is limited to a small group of authorized employees. Only stockroom employees are allowed into the stock areas; others have access only to a parts pickup area. If an item is required by a technician, it is requested via computer. The contractor has developed a system by which the shop supervisor or other authorized party enters the request at a terminal in the shop. The request is processed in the stock room, removed from stock, placed in a bin for pickup and deducted from the computer inventory record. Each shop designates a "runner" who is authorized to enter the parts pickup area to retrieve the completed order. This system keeps a tight control over stock and keeps employees at their work stations, rather than searching for parts.

6.2.5 Repair Mechanical (RM) Shop

The RM shop performs a wide variety of mechanical repairs, including motors for letter sorting machines and other motor parts. The shop has 17 technicians. When a machine is brought in for repair, any oil is drained into a drain pan. The used oil is then placed into a used oil storage drum that contains a funnel and cap. There is no secondary containment system for the used oil drum. When the oil drum is full (approximately every three weeks), the drum is capped and moved with a fork lift to the back loading dock. After several drums are accumulated, an oil recycler is called to collect the oil. The recycler charges \$15.00 per drum. The technicians use disposable rags for cleanup.

The RM shop contains two aqueous parts washers in a diked area. Water from the parts washers is drained once per month into the sanitary sewer system. A filter system is being ordered for the parts washer to remove oil from the water prior to sending it to the drain. The disposal method for any filters generated has not yet been determined.

The shop also uses a heated oil system to heat bearings prior to use. No waste oil has been generated from this system to date. Other wastes generated from this shop include scrap metals and batteries which are recycled with the MDC metals recycling program.

6.2.6 Repair Boards (RB) Shop

The RB shop repairs numerous types of circuit boards. The shop has 53 technicians. The technicians typically clean the board to remove dust and dirt prior to beginning work. This is performed manually in the wash room by scrubbing the board with Mr. Clean (ammonia, soap, and water) and water or, in some cases, nail polish remover (acetone). The clean boards then are dried using compressed air. All washing chemicals are discharged into the sanitary sewer. The technicians then diagnose the problem and replace chips or other defective components by desoldering the piece and resoldering a replacement part. After repair, the board is washed again to remove excess flux and dirt. CRF personnel estimate that the desoldering operation generates approximately one pound of lead solder per day that is discarded as solid waste. Technicians use disposable rags for cleaning. Several products containing EPA 33/50 chemicals were noted in the shop.

6.2.7 Repair Peripherals (RP) Shop

The RP shop is very similar to the RB except that it has 22 technicians and repairs keyboards, monitors, printers and other peripherals. The RP shop utilizes Fluxsolv, a product containing 1,1,1-trichloroethane, to clean circuit boards.

6.2.8 Specification Development

The Specifications Development area is an office setting where the specifications for equipment testing and repair are developed. This office has no recycling, and no duplex copying capability. The specifications development area also has a computer room and document storage area which has a Halon fire suppression system.

SECTION 7.0

CENTRAL REPAIR FACILITY POLLUTION PREVENTION OPPORTUNITIES

This section presents the Pollution Prevention opportunities specific to the Central Repair Facility (CRF). Exhibit 7.1 provides a list of the CRF wastes, management practices and potential pollution prevention opportunities.

EXHIBIT 7.1 CRF WASTE GENERATION

Waste	Current Management	Opportunities
Cardboard	Discarded into solid waste	Replace with durables, Reuse Recycle
Foam	Discarded into solid waste	Replace with durables, Reuse
Plastic film	Discarded into solid waste	Reduce, Recycle
Tape	Discarded into solid waste	Eliminate
Strapping	Discarded into solid waste	Reduce, recycle
Metal	Collected for recycling Discarded into solid waste	Improve source separation for recycling
Batteries	Accumulated for recycling through MDC Discarded into solid waste	Source separate Recycle
Paper	Discarded into solid waste	Reduce paper use Recycle
Oil	Collected for recycling	Secondary containment for drums Cover storage area
Computer parts	Sold as scrap Discarded into solid waste	Sell to computer recycler
Solder	Discarded into solid waste	Less-toxic substitute

7.1 CRF PROCUREMENT AND INVENTORY CONTROL

Current Conditions

The CRF stock room maintains inventory control by utilizing contractor-developed software to sustain an accessible record of the status of each item (see Section 6.2.4 for a full description of the inventory control system).

Pollution Prevention Opportunities

1. Use the system to track hazardous materials.

The inventory control system should be modified to include a data field that indicates the presence of ODS, EPA 33/50 chemicals, and TRI chemicals and that can be used to track hazardous materials ordered and used in the CRF. This will allow the CRF to identify products containing hazardous materials and target them for reduction in use or for product substitution. Such a system may also assist in the quantification of hazardous materials used, for the purposes of TRI reporting.

7.2 USE OF EPA 33/50 CHEMICALS

Current Conditions

The CRF currently uses many materials containing chemicals on the EPA 33/50 list. Exhibit 7.2 presents the materials identified by CRF contractor personnel as containing EPA 33/50 chemicals. The CRF has phased out the use of some products that contain these chemicals and some employees have used personal initiative to remove others from the work place.

Pollution Prevention Opportunities

1. Change Purchasing Specifications

Change purchasing specifications to require substitute products that do not contain the target chemicals. Once current stock is exhausted, only substitutes should be purchased.

One Federal supply list of alternative products is the Defense General Supply Center (DGSC) List of Environmentally Preferred Products (October, 1994). For example, the DGSC lists Enviro Kleen, Formula 1000 manufactured by Allied Enterprises, Inc. as a possible replacement for 1,1,1 trichloroethane. This is a low VOC, non-CFC aerosol spray for degreasing various industrial parts and equipment. This product comes in a 16-ounce can for \$4.00; the National Stock Number (NSN) is 6850-01-061-5493. DGSC publishes bi-monthly Hazardous Technical Information Series Bulletins on new environmentally-preferable products, as well. To be placed on the DGSC mailing list, write to Defense General Supply

EXHIBIT 7.2 MATERIALS USED AT CRF CONTAINING EPA 33/50 CHEMICALS

Category/Product	Use	33/50 chemical
Adhesives		
E-Z Weld Multipurpose Solvent Cement	General purpose adhesive	methyl ethyl ketone
Scotch-Grip 1357 High Performance contact Adhesive	General purpose adhesive	methyl ethyl ketone
Liquid Nails 601	Wood to wood, wood to polyurethane	benzene
Service Cement	Foam to metal	toluene
Trubond Contact Cement	General purpose adhesive	toluene, methyl ethyl ketone
Office Supplies		
Correction Fluid Thinner	Thinning correction fluid	1,1,1-trichloroethane
Correction Fluid	Paper correction	1,1,1-trichloroethane
Solders		
LA-CO Fast 50/50	Solder	lead
Copper Alloy Solder	Solder	nickel
Flux cored Solder	Solder	lead
Metal Alloy Solder	Solder	lead
Flux Remover		
Fluxsolv	Remove excess solder flux	1,1,1-trichloroethane
Coatings/Paints		
Red GLPT Varnish	Used on windings and coils	xylene
Kleer Spray	Clear coat on bar code labels	toluene
Ultra Flat Black	Recoating metal surfaces	xylene
Locquic primer T	Primer	1,1,1-trichloroethane
Red Lead	Coating to check gear tooth contact	lead tetraoxide
Lubricants		
Spray Lube	Lubricant	1,1,1-trichloroethane
Tel-X Aerosol	Lubricant	1,1,1-trichloroethane

EXHIBIT 7.2 MATERIALS USED AT CRF CONTAINING EPA 33/50 CHEMICALS

Category/Product	Use	33/50 chemical
Cleaners		
GSA Stainless Steel Polish	Steel polish	1,1,1-trichloroethane
Meter Mist Country Garden	Air freshener	1,1,1-trichloroethane
Temperature Testing		
Tempilaq 200-219	Indicate temperature when heating metal for different applications	toluene
Tempilaq 400		1,1,1-trichloroethane, toluene
Tempilaq 375, 388		1,1,1-trichloroethane, toluene
Tempilaq 313, 319, 325, 331, 338, 344, 350, 363		1,1,1-trichloroethane, toluene
Tempilaq Red Label Thinner	Tempilaq thinner	1,1,1-trichloroethane
Other		
Imtech NCI Toner	Copier toner	toluene
Prevent Aerosol	Unknown use	1,1,1-trichloroethane

Center, DGSC-SHS/HTIS, 8000 Jefferson Davis Highway, Richmond, VA 23297-5670. There are several other sources of information on pollution prevention as well as on potential chemical substitutes. See the appendices for additional sources of pollution prevention information. See Section 8.15 for a discussion of Internet Resources.

The following describes some potential alternatives to products currently purchased that contain EPA 33/50 chemicals. Ideally, the CRF should specify substitutes that can perform the same function and are more environmentally acceptable. On-site testing will be necessary to assess the performance of these products.

Cleaners

The CRF currently uses a GSA stainless steel cleaner that contains 1,1,1-trichloroethane. GSA stocks a stainless steel cleaner that does not contain any EPA 33/50 chemicals. Caljen Gleem Stainless Steel Cleaner has a National Stock Number of 7930-01-360-8050.

Air Freshener

The CRF currently uses an air freshener that contains 1,1,1-trichloroethane. There are numerous off-the-shelf air fresheners that do not contain EPA 33/50 chemicals.

Correction Fluid

Aqueous based correction fluid is available from GSA. The NSN is 7510-01-020-2806. This will eliminate the use of both the correction fluid and correction fluid thinner containing 1,1,1-trichloroethane.

7.3 FLUX REMOVAL

Current Conditions

During the on-site assessment, the Team observed several methods of removing flux and cleaning printed circuit boards prior to and following repair. Among the shops in the CRF, there are different policies concerning the use of hazardous materials. In particular, the Repair Board (RB) shop and the Repair Peripheral (RP) shop have different policies on the use of Fluxsolv which contains 1,1,1-trichloroethane. The RB shop is not allowed to use Fluxsolv to clean the circuit boards because the shop supervisor is concerned about the health effects of 1,1,1-trichloroethane. Instead, RB shop staff must clean the boards with Mr. Clean detergent and water. RB staff find that this method works; however, it takes a little more effort.

In contrast, RP shop staff routinely use Fluxsolv to clean their circuit boards. When asked if Mr. Clean could be substituted for Fluxsolv, shop staff indicated that it would not work. It did not appear that the RP shop had made any attempt to identify less-toxic substitutes for Fluxsolv.

Pollution Prevention Opportunities

1. Make facility-wide hazardous materials policy changes

When a substitute is found for a product containing hazardous material, the CRF should make a policy change that applies to all the shops in the facility. This should apply immediately to the substitution of Mr. Clean for Fluxsolv as well as for future substitutes that may be found to work in place of hazardous substances.

7.4 LEAD SOLDER

Current Conditions

The Central Repair Facility uses lead-containing solder in its electronic repair activities to "connect" or form conductive electrical joints on circuit boards. In 1994, the CRF used 68 rolls of Kester solder, 351 rolls of solder wick lite, six rolls of flux .025 diameter reliacore 15 RMA wire solder alloy, and two rolls of flux P-3 reliacore 15 RMA wire solder alloy. The CRF has always used lead solder in its operations and has not conducted any research into alternatives. As one technician stated, "We use lead solder because that's what we have always used."

The desoldering operations at the CRF generate approximately one pound of lead solder waste per day. The lead-containing solder waste is disposed into the solid waste compactor as common practice. In Kansas, lead waste is governed by the Federal Resource Conservation and Recovery Act (RCRA). However, most RCRA regulations do not apply to small quantity generators, i.e. those generators who produce less than 100 kg/month of all types of hazardous waste. Although the CRF may be allowed to dispose of the lead solder waste in the trash, there are several environmental concerns associated with this waste management practice. Most importantly, heavy metals, such as lead, may leach from the landfill to contaminate local ground water supplies and cause human health concerns.

In addition to the environmental concerns associated with lead, lead soldering also requires the use of fluxes and cleaning solvents containing hazardous chemicals such as methyl ethyl ketone and toluene.

Pollution Prevention Opportunities

1. Lead Solder Substitutes

The CRF should identify an alternative, lead-free solder and substitute this product for the lead solder in its repair activities. There is a relatively large commercial market for lead-free solders, and a variety of vendors. However, there are no "drop-in" replacements for lead containing solders. That is, any lead-free replacement will have different performance characteristics than standard lead solders and may require technical changes in soldering techniques.

Prior to procuring and using lead-free solders, the CRF should insure that any replacement solder meets their requirements. Because of the wide range of performance requirements and the wide variety of lead-free solders available, it is not possible to recommend a one-for-one replacement. The actual selection of a specific solder should be performed by CRF staff. Exhibit 7.3 provides information about vendors of lead-free electronic solders.

For additional information on research and development efforts on lead-free solders, the CRF should contact the National Technology Transfer Center (NTTC). NTTC can provide information, at no cost, about ongoing research and development, as well as evaluations of lead free solders. Their address is:

The National Technology Transfer Center
316 Washington Avenue
Wheeling, WV 26003
Phone: (304) 243-2126
FAX: (304) 243-2539
Contact: Mr. Aaron M. Hasak, Technology Agent

EXHIBIT 7.3 VENDORS OF LEAD-FREE SOLDER

Vendor	Description (Information as of May 1995)
Englehard Corporation 235 Kilvert Street Warwick, RI 02886 1-800-225-2130	Englehard Corporation manufactures a variety of lead-free solders. In particular they manufacture a rosin core solder for electronic use called Silvabrite 100. The cost of this solder, which is a tin/copper/silver alloy, is \$9.43/lb, based on a 50 lb. order.
IEM/Fusion Incorporated 4658 East 355th St Willoughby OH 44094 (216) 953-4964 FAX: (216) 942 9083	IEM Fusion manufactures lead-free solders, including tin/silver solders. They stated that these solders perform as well as conventional lead solders.
Taracorp Industries 1200 16th St. Granite City IL, 62040 1-800-851-3300, ext 162 FAX: (618) 451 9310	Taracorp Industries manufactures a wide variety of lead-free solders for use in electronics. Prices range from \$3.80/lb for tin/antimony solder, to \$4.95/lb for tin/copper solder. The type of solder will depend upon the specific applications and requirements, such as melting temperature and strength.
Kester Solder Test Equipment 515 East Touhy Ave Des Plaines, IL 60018 (708) 699-5562 FAX: (708) 699 5548	Kester Solder Test Equipment manufactures lead free solder for electronic use. Before using this solder, the circuit boards must be tested to ensure that they can withstand the higher temperatures typically required for lead-free solders.
Arcade Electronics 5655 F General Washington Drive Alexandria VA 22312 (703) 941 1074 FAX: (703) 941 1325	Arcade Electronics has available a tin solder which can be used with a flux that does not require cleaning. It is available in 20 pound boxes at \$15.10 per pound.

Another resource available to the CRF is the Manufacturing Technology Information Analysis Center (MTIAC), part of the Defense Technical Information Center. This Center can provide information, at no cost, on lead-free solders for electronic use. Their address is:

Manufacturing Technology Information Analysis Center
ITT Research Institute
10 West 35th Street
Chicago, IL 60616-3799
Phone: 800-421-0586
FAX: (312) 567-4736

2. Lead solder waste recycling

Although the CRF may be legally permitted to dispose of their lead soldering waste in the trash, this practice should be discontinued because of the environmental, human health and

liability concerns associated with this type of lead disposal. Instead, the CRF should institute a lead soldering waste collection and recycling program. This program can be established easily and at little cost. Placing a centralized lead soldering waste drum in each shop to collect the lead waste from staff and placing individual lead soldering waste collection containers at each technician's work station will allow ease of lead accumulation.

There are several lead recycling operations in Kansas and Missouri that will accept lead soldering waste from the CRF. Lead recyclers include:

Schuylkill Metal Corporation
P.O. Box 156
Forest City, MO 64451
(816) 446-3321

Schuylkill Metal Corporation is a secondary smelter of lead located approximately 100 miles from Kansas City, MO. Their primary source of lead is from lead-acid batteries. However, they have the capacity to accept other forms of lead waste, including soldering waste. Soldering waste is not an especially valuable source of waste, but Schuylkill Metal Corporation will accept small quantities at no cost as a public service. Generators can deliver soldering waste directly to the plant or Schuylkill may be willing to pick up from the generator when there is a vehicle in the area.

The Doe Run Company
Highway KK
Boss, MO 65440
(314) 626-3476

The Doe Run Company is a large secondary lead smelter. They are located in the south central part of Missouri, approximately 250 miles from Kansas City. They accept a variety of soldering wastes; normally, they pick up material in full truck loads. The value of the material depends upon the type of waste. They will accept small quantities of lead waste delivered to their facility.

3. Materials Exchange

The CRF also may consider contacting the Kansas Materials Exchange to determine whether they will accept a listing for lead soldering waste. The exchange was established to provide a means for industrial waste generators to recycle (or reuse) valuable resources. In general, waste exchanges try to "match-up" generators of waste with companies interested in recycling or reusing the discarded materials. The benefit from waste exchanges is that clients minimize waste disposal expenses, reduce the need for landfilling, and increase the value of wastes, by-products, surplus and off-spec resources.

Kansas Materials Exchange
P.O. Box 152
Hutchinson, KS 67504-0152
(316) 662-0551

7.5 WASTE OIL COLLECTION

Current Conditions

The Repair Mechanical (RM) Shop in the CRF generates waste oil from its repair activities. There is a centralized collection drum in the shop to collect the used oil. The RM shop generates one drum of waste oil every two to three weeks. They generated 26 drums of oil in the past year. When the drum in the shop is full, it is capped and moved to the loading dock with a forklift. After several drums have accumulated, the CRF contacts Capitol City Oil who charges \$15.00 per drum to recycle the used oil.

None of the used oil drums has secondary containment to prevent spills and leaks from escaping into the environment. On the loading dock, there was evidence of oil spills and/or leaks and one empty drum was knocked over because of the wind. An oil sheen was observed on the dock during a period of rain.

Pollution Prevention Opportunities

1. Obtain secondary containment for used oil drums

To prevent spills or leaks that may escape into the environment, the CRF should purchase secondary containment for the used oil collection drums located inside and outside the building. In addition, the drums stored outside should be covered to protect them from the elements. Sources and cost estimates for secondary containment equipment are listed below in Exhibit 7.4

EXHIBIT 7.4 EXAMPLES OF CONTAINMENT EQUIPMENT

Product	Manufacturer	Description	Cost (May 1995)
Double Drum Waste Collection Center #57-858	Direct Safety Company 7815 South 46th Street Phoenix, AZ 85044 1-800-528-7405	Polyethylene drum storage system which stores two 55-gallon drums. Two lockable slide-on covers snap into place for watertight seal. Drums rest on removable grating.	\$699.00
Spill Control Pallets (available in two-drum and four-drum sizes) 2-drum #57-852 4-drum #11-683	Direct Safety Company 7815 South 46th Street Phoenix, AZ 85044 1-800-528-7405	Designed for use in weather-protected environment, these pallets provide secondary containment necessary to protect against leaking drums.	2-drum: \$281.00 4-drum: \$434.00
Spill Killer Containment Unit #57-130	Direct Safety Company 7815 South 46th Street Phoenix, AZ 85044 1-800-528-7405	This secondary containment holds one 55-gallon drum and is designed to be easily moved by a forklift.	\$148.75
Spill Skid Systems 3-drum SpillSkid with fiberglass grate and tarp #YS-23412 4-drum SpillSkid with fiberglass grate with tarp #YS-14896	Lab Safety Supply P.O. Box 1368 Janesville, WI 53547-1368 1-800-356-0783	Each holds a full 85 gallons of spill inside an HDPE wellspace. Sturdy, non-metallic construction. Transportable by forklift	3-drum with grate and tarp \$441.20 4-drum with grate and tarp \$572.00
SteelSkids and Spill Platform YS-18394	Lab Safety Supply P.O. Box 1368 Janesville, WI 53547-1368 1-800-356-0783	Factory-grade platforms of 7-gauge steel allow safe storage of up to nine 55-gallon drums. All units feature removable steel-bar grating, 3/4" drain plug and attached grounding bolt for flammable protection.	Nine drum platform \$1,444.00
Polyethylene Spill Sump Basin #74-095A	C&H Distributors 400 South 5th Street P.O. Box 04499 Milwaukee, WI 53204 1-800-558-9966	Made of HDPE; prevents environmental contamination by collecting leaks and spills.	\$45.00
Spill Container 2-drum base #74-226D 2-drum cover #74-234D 4-drum base #74-245D 4-drum cover #74-262D	C&H Distributors 400 South 5th Street P.O. Box 04499 Milwaukee, WI 53204 1-800-558-9966	Contains spills and leaks from 55-gallon steel drums. Drums are held securely by a molded-in locating ring	2-drum base \$207.00 2-drum cover \$207.00 4-drum base \$247.00 4-drum cover \$247.00

7.6 FOAM PACKAGING MATERIAL

Current Conditions

To ship computers and computer parts, the CRF uses "Instafoam," an expandable liquid foam, as packaging material in the cardboard boxes. CRF staff spray the Instafoam in a cardboard box, place a plastic sheet over the foam, allow the foam to expand, and then place the object in the box. A second plastic sheet is placed over the computer equipment, and the Instafoam is sprayed onto this plastic sheet to provide additional protection. Since the Instafoam is sprayed directly into the cardboard box, the box cannot be recycled, because it is very difficult to remove the foam from the box.

The Instafoam is supplied in a set of 120 gallon drums: Part A Instafoam is a polymeric diphenylmethane diisocyanate, and Part B Instafoam is a mixture of polyols, methane catalysts and silicone surfactant. The CRF used approximately 18 sets of the Instafoam in 1994 at a cost of \$82,620. In addition, the CRF used an estimated 23,000 boxes and 46,000 plastic sheets for shipping at a cost of more than \$30,000.

As mentioned earlier, the Instafoam contains 4,4 diphenylmethane diisocyanate which is subject to the reporting requirements of EPCRA; however, the CRF does not use enough of the material to make it reportable under these regulations. Currently, the Instafoam operation is conducted next to, rather than under, the fume hood. Although the hood is turned on when the Instafoam is sprayed, it is not able to capture all of the vapors because the operation occurs at too great a distance from hood.

Pollution Prevention Opportunities

1. Use reusable foam templates

Since the Instafoam contains hazardous materials, the CRF should find alternatives to this product. The CRF should pursue the use of reusable foam templates as packaging materials. In general, the equipment shipped from the CRF falls into four categories: 1) monitors, 2) keyboards, 3) computers and 4) circuit boards. Although the specific shapes may vary slightly, the overall form of the equipment in each category is similar. A template could be developed for each category and used as packaging material in place of the Instafoam. This recommendation should be addressed in conjunction with the recommendations concerning reusable packaging (see Section 8.4). A foam template will eliminate the use of a product that contains a TRI chemical and will allow the reuse/recycling of the packaging container.

There are several considerations for this pollution prevention opportunity. First, the CRF/USPS must establish a system to return the templates to the CRF for reuse. There will be labor costs associated with the research and design of this type of program. A second consideration is that the foam packaging will require more storage space. CRF will have to

identify storage space; however, there appears to be sufficient storage space available in other warehouses (e.g., Building 3).

2. Change Instafoam process

If the CRF continues to use the Instafoam process, then the process of filling the box should be modified. The filling of the boxes should be performed inside the ventilation hood to reduce worker exposure to hazardous chemicals. The current hood is not large enough to make its use easy for the workers; modification of the hood may be necessary.

Operators also should change the method of using the Instafoam. Staff should place a plastic sheet in each box prior to spraying the foam. This will prevent the foam from adhering to the box and allow separation of the foam from the box. The box can then be reused to package a different part or be recycled.

SECTION 8.0

FACILITY-WIDE OPPORTUNITIES

This section addresses pollution prevention opportunities that impact a variety of operations within the Topeka facilities. Exhibit 8.1 summarizes the opportunities identified during the PPOA.

EXHIBIT 8.1 FACILITY-WIDE OPPORTUNITIES

Waste or Operation	Pollution Prevention Opportunities
Environmental management	Appoint environmental coordinators to organize pollution prevention and recycling activities among the operations
Waste disposal	Allocate solid waste disposal costs based on generation Use compactor pressure gauge to determine when containers should be pulled
Corrugated cardboard	Perform cost/benefit analysis Introduce reusable distribution packaging Establish closed loop network for OTRs Improve source separation for recycling Establish a new recycling contract
Procurement	Utilize inventory control software Purchase products containing recycled content Eliminate purchase of products with EPA 33/50 chemicals
Paper	Reduce paper use Train employees in source separation Institute a multi-facility recycling program
Energy	Establish lights out policy Use motion sensitive lighting where appropriate Utilize Green Lights Program Procure Energy Star compliant computer equipment
Fluorescent lighting tubes	Establish a recycling program
Halon fire suppressants	Replace

8.1 ENVIRONMENTAL COORDINATOR

Current Conditions

The Topeka Materials Distribution Center does not have an environmental coordinator who is responsible for the environmental activities at the Topeka facilities. Instead, environmental activities are addressed on an as-needed basis by either the facility maintenance supervisor or various interested staff members. More importantly, no one is designated to monitor environmental compliance issues at the Topeka site. Ultimately, the highest ranking USPS employee on site is responsible for all environmental activities, including the CRF. Should a hazardous waste spill occur, this individual would be held responsible and liable for the clean-up.

In addition, there is no coordination between the organizations that have established environmental programs, such as recycling. For instance, the Label Printing Center has initiated a paper recycling program with Republic Paper, the Supply Warehouse in Building 2 has established a separate paper recycling program with P & S Services and the MDC offices are working with Hunter. No attempt has been made to coordinate these recycling programs.

Pollution Prevention Opportunities

1. Appoint Environmental Coordinators

The Materials Distribution Center should appoint at least two environmental coordinators for the Topeka facilities. One should be responsible for the environmental activities at the MDC and the other should be responsible for the Central Repair Facility. These individuals should monitor the environmental issues at the facilities and identify opportunities to either reduce or recycle the wastes generated. In addition, the two environmental coordinators should work together to develop environmental programs, such as affirmative procurement, that apply to all the facilities. These activities are not likely to require an extensive time commitment; interested staff could be encouraged to accept this additional responsibility.

8.2 ALLOCATION OF WASTE DISPOSAL FEES

Current Conditions

One compactor at Building 302 is pulled twice each month (24 pulls per year). Compactors at both ends of Building 2 are each pulled once per month (24 pulls total) and the compactor at Building 8 is pulled weekly (52 pulls per year). The four waste compactors are pulled a total of 100 times per year. According to the MDC solid waste contract administrator, the MDC is charged 3/5 of the total solid waste costs, the LPC 1/5 and the CRF 1/5.

Pollution Prevention Opportunity

1. Reallocate solid waste costs based on generation rate.

The current cost allocation system does not provide any incentive for an organization to reduce its solid waste disposal. Each organization's solid waste disposal charges are constant, regardless of the quantity of waste generated. The MDC should allocate solid waste disposal costs based on the number of compactor pulls that an organization requires. This will provide equitable sharing of costs and allow organizations to realize reduced operating costs based on reduced waste generation.

8.3 SOLID WASTE COMPACTORS

Current Conditions

The 40 cubic yard compactors for solid waste are pulled on a weekly or bi-weekly basis. The charge is \$618 per pull.

Pollution Prevention Opportunities

Use the pressure gauge on the compactor to determine whether the container is full. Pulling only when the container is full may reduce the number of pulls, and thus the total solid waste collection and disposal costs for the facilities.

8.4 REUSABLE DISTRIBUTION PACKAGING

Current Conditions

The MDC, LPC and CRF purchase thousands of single use corrugated boxes to ship printed labels, supplies and equipment to regional bulk mail facilities for distribution to other USPS facilities. For example, the MDC uses corrugated gaylord boxes to containerize boxed USPS forms and documents for shipment to regional Bulk Mail Centers (BMCs). Topeka MDC staff noted that they were unable to maintain a sufficient supply of BMC Over the Road containers (OTRs) to meet their shipping needs.

The USPS Waste Reduction Guide (AS 552, February, 1992, p. 36) states that USPS priorities for packaging are (1) no packaging, (2) minimal packaging, (3) refillable or reusable packaging, and (4) packaging that is recyclable and contains recycled materials. USPS policy states, "Returnable packaging--such as some shipping containers--can be returned to suppliers for reuse and redistribution. Refillable or reusable packaging may be refilled or reused by postal employees, manufacturers and consumers . . . Requirements-generating offices should investigate the potential for using these types of packaging. Packaging that can be refilled or reused for its original purpose is preferable . . ."

Neither the MDC nor the LPC was able to determine the number of boxes purchased annually. Exhibit 8.2 provides an overview of CRF purchases of boxes and other packaging.

Once the shipments from the MDC, LPC or CRF are received at their final destination, the boxes become waste. The USPS incurs additional costs for the labor to unpack and manage the boxes as well as the costs associated with their ultimate recycling or disposal.

The USPS has addressed the question of how to move mail between or among facilities and, at the same time, reduce the generation of waste and the cost and labor to manage that waste. The USPS maintains an inventory of more than 75 million pieces of reusable mail transport equipment (MTE) ranging from trays and hampers to rolling stock. Wire containers, BMC OTRs, and multi-purpose containers are considered desirable because the increased capacity of these containers reduces the number of trips, resulting in savings from reduced labor and transportation costs.

At present, each USPS facility must document its requirements for MTE. Local areas are encouraged to establish "closed loop" systems to ensure the availability of containers (*Container Methods Handbook* PO-502, pp. 116f). However, imbalances in container availability affect facility operations and MTE inventory control remains a complex problem. To improve inventory control, the USPS plans to establish a network of 31 Mail Transport Equipment Service Centers. The MTE SC will provide computerized inventory tracking and maintain repair records. Facilities will be able to call the MTE SC to find out where excess MTE should be sent as well as to order additional MTE.

Pollution Prevention Opportunities

1. Initiate cost/benefit analysis

The USPS should apply the same policy to the movement of USPS materials and supplies that they have applied to the movement of mail. USPS should initiate a study to determine the cost/benefit of replacing single use corrugated boxes in certain USPS shipping operations with distribution packaging that can be reused hundreds of times.

According to a 1994 report entitled Delivering the Goods: Benefits of Reusable Shipping Containers (INFORM, Inc.), reusable distribution packaging is most effective when utilized:

- for frequent deliveries,
- over short distances ,
- between a small number of parties, and
- using company-owned or "dedicated" vehicles

The MDC initiates daily shipments to regional Bulk Mail Centers using dedicated vehicles.

EXHIBIT 8.2 CRF PACKAGING PURCHASES

Item	Cost Per Item	Quantity Used	Total Cost
Folder/foam 20x12x3	\$1.72 ea	4,820	\$ 8,290.40
Folder/foam 7x7x3	.65 ea	3,483	2,263.95
Folder/foam 12x10x4	.88 ea	2,829	2,489.52
Folder/foam 10x8x3	.67 ea	11,422	7,652.74
Starpack 6x6x10	2.66 ea	206	547.96
Starpack 10x10x12	6.79 ea	373	2,532.67
DoubleWall (DW) box 9.5x5.75x4.75	.65 ea	3,148	2,046.20
DW box 8x4x4	.38	60	22.80
DW box 19.75x11.375x8.75	.76 ea	3,354	2,549.04
DW box 17.5x14x12	2.21 ea	2,401	5,306.21
TripleWall (TW) Box 28x28x20	23.41 ea	27	632.07
DW Box 22.5x11x9.5	3.15	135	425.25
DW Box 26x15x13	4.91	125	613.75
DW box corner stitch 22.75x21x16	2.18	1,579	3,442.22
DW box fold to fold 24x24x9.5	3.10	490	1,519.00
DW box 15.5x8.5x10.25	1.44	315	453.60
DW box 14.75x13.25x13.75	1.46	180	262.80
DW box 15.75 x 14.25x13.75	3.14	60	188.40
DW box 12x12x6	.59	3,375	1,991.25
DW box 25.5x20.5x18	3.81	1,680	6,400.80
DW box 21x15.75x13.125	2.38	1,251	2,977.38
DW box 14x14x8	1.02	2,465	2,514.30
TW box 30x15x12	5.61	30	168.30
DW box 24x16x12	2.60	475	1,235.00
DW box 24x12x6	2.32	765	1,774.80
DW box 38x29x24	5.20	8	41.60
Box for model 644	3.17	249	789.33
Corr. box 16x16x16	1.17	693	810.81
DW box 40.75x5.25x1.75	2.16	5	10.80
DW box 24x24x24	5.10	55	280.50
TOTAL		46,058	\$51,943.05

The five major obstacles to expanding reuse of distribution containers are: 1) capital expense, 2) tracking containers, 3) cost of returning containers to point of origin, 4) lack of storage space and 5) resistance to change. The REDI system (see Section 2.3) could serve as a model for an OTR tracking system. Containers can be hauled to the MDC using established routes. Storage space should not provide a major obstacle since the containers will move in and out of the facility on a daily basis.

2. Establish closed loop network for BMC OTRs

Specifically, the MDC should establish a closed loop distribution network with regional BMCs. This will allow the MDC and the BMC to keep track of the number of OTRs in transit and establish a system to haul OTRs to the MDC on a regular basis. Once this closed loop network is established, the MDC will be able to eliminate the use of the corrugated gaylord boxes, reducing purchasing, labor and disposal costs for both the MDC and the BMCs.

As mentioned above, the USPS provides instructions for designing and implementing "Closed Loops" in *Handbook PO-502, Container Methods*, Section 322.4, page 116.

8.5 PURCHASING AND INVENTORY CONTROL

Current Conditions

Despite numerous telephone discussions, the Materials Distribution Center staff did not provide any information on the kinds and quantities of packaging purchased for the warehouse operations. The staff did state that each section kept this information separately and there was no centralized information storage. The Central Repair Facility purchasing agents use a purchasing and materials inventory system based on software developed by the contractor. This system contains a database of information on all items purchased by the CRF, including description, NSN, OEM, quantity on-hand, price, vendor, and storage location. This system also tracks the usage of items as they are requisitioned from stock. The system allows the procurement staff to provide rapid turnaround on requests concerning stock on hand as well as past material usage trends.

Pollution Prevention Opportunities

1. Introduce inventory control software

Introduce the use of software that will enable the MDC to store purchasing and stock information in a database that includes fields for tracking monthly use, quantity on-hand, price, vendor, and storage location. This information can be used to track monthly usage so material shortages do not occur and to observe trends to allow investigation of abnormal usage of materials. This system also can track waste disposition and recycling.

8.6 AFFIRMATIVE PROCUREMENT

Current Conditions

The decentralized nature of the procurement system at the Topeka facility leads to inconsistent purchasing practices and procurement standards. For instance, the CRF has cleaning product dispenser units that measure exact amounts of product for use, while the MDC does not have such systems. Since these systems reduce the quantity of cleaning products purchased and used and save money, it is difficult to understand why they were not purchased for all operations at one time.

The USPS Waste Reduction Guide directs Requiring offices to "review purchase specifications to eliminate prohibitions or limitations on use of recovered materials." In addition, specifications should be modified to encourage use of recycled products.

Section 6002 of the Resource Conservation and Recovery Act (RCRA) directs Federal agencies to purchase "items composed of the highest percentage of recovered materials practicable." In 1995, EPA finalized the *Comprehensive Guideline for Procurement of Products Containing Recovered Materials* (60 FR 21370, May 1, 1995) providing requirements for procurement of seven categories of products including paper and paper products, vehicular products, construction products, transportation products, park and recreation products, landscaping products and non-paper office products. Items of particular interest to the USPS include printing and writing papers, re-refined oils engine coolant, trash bags, toner cartridges, binders and desktop accessories. The guidelines provide information about the recommended percentage of recovered material, product availability and performance, and specification language.

In Executive Order 12873, October 22, 1993, President Clinton directs agencies to develop and implement affirmative procurement programs for all EPA guideline items and ensure that these programs require that 100 percent of their purchases of products meet or exceed the EPA guideline standards. Although the USPS is not an Executive Branch Agency, it is Postal Service policy to adhere to Executive Orders whenever possible. Exhibit 8.3 presents products for which EPA has established minimum recovered content levels.

None of the Topeka operations is able to document successful implementation of EPA procurement guidelines for products manufactured with recovered content. In addition, the operations cannot demonstrate successful reduction or elimination of the seventeen products on EPA's 33/50 list. Purchasing officials are not sure whether procurement specifications have been updated to include recycled content in paper products. Current supplies of printing, duplicating and computer paper do not contain any recovered content.

EXHIBIT 8.3 PRODUCTS WITH MINIMUM RECOVERED CONTENT LEVELS

Category/Product	Percent Recovered Content
Paper	
High grade bleached printing and writing paper	20%
Mimeo and duplicator paper	20%
Computer paper	20%
Envelopes	20%
Tissue Products	
Toilet tissue	2-100%
Paper towels	40-100%
Paper napkins	30-100%
Facial tissue	10-100%
Unbleached packaging	
Corrugated boxes	25-50%
Vehicular Products	
Lubricating Oil (re-refined oil)	25%
Tires	retread tires
Construction Products	
Fiberglass (glass cullet)	20-25%
Cellulose loose-fill and spray-on (postconsumer paper)	75%
Structural fiberboards	80-100%
Laminated paperboards	100%
Cement and Concrete (coal fly ash)	0-40%
Cement and Concrete (ground granulated blast furnace slag)	25-50%
Polyester Carpet Face Fiber (PET resin)	25-100%
Patio blocks (rubber or rubber blends)	90-100%
Patio blocks (plastic or plastic blends)	90-100%
Floor tiles (rubber)	90-100%
Floor tiles (plastic)	90-100%
Transportation products	
Traffic cones (PVC, LDPE, Crumb Rubber)	50-100%
Traffic barricades (HDPE, LDPE, Pet Steel)	80-100%
Traffic barricades (Fiberglass)	100%
Park and Recreation Products	
Playground surfaces (rubber or plastic)	90-100%
Running tracks (rubber or plastic)	90-100%
Landscaping Products	
Paper-based hydraulic mulch (postconsumer recovered paper)	100%
Wood-based hydraulic mulch (recovered wood and/or paper)	100%
Non-paper Office Products	
Office recycling containers and waste receptacles (plastic)	20-100%
Office recycling containers and waste receptacles (steel)	25-100%
Plastic desktop accessories (polystyrene)	25-80%
Plastic-covered binders (plastic)	25-50%
Chipboard, paperboard, pressboard binders	80%
Plastic trash bags	10-100%

Pollution Prevention Opportunities

1. Purchase products with recycled content and train staff

The Topeka MDC, LPC and CRF should establish preference programs and adopt specifications for the purchase of products made with the percentages of recovered material specified in EPA Guidelines. Changes in the procurement system will create staff training opportunities. In addition, staff will need training on Federal affirmative procurement requirements.

8.7 REDUCE PAPER USE

Current Conditions

Personnel interviewed by the Assessment Team in offices and warehouse settings, while aware of the double-sided copying capabilities of some duplicating equipment, do not consistently use those options. The copying machine in the CRF does not have duplex capability. Staff is not aware of any efforts to encourage reduction in the quantity of paper used and disposed. While computer printouts can be placed in collection containers for recycling, the Assessment Team observed a significant amount of CPO in the waste containers. White and mixed office papers and magazines are not recycled.

Pollution Prevention Opportunities

Before initiating an enhanced recycling program, facility managers and staff should adopt and promote a variety of techniques to prevent or reduce the quantity of paper generated for disposal.

- Establish a duplex copying policy for all multi-page documents and provide staff training in the use of the double-sided function on copying equipment. As equipment is replaced, specify easy to use, rapid, duplex capability.
- Expand and encourage the use of electronic mail in office and warehouse settings rather using paper memos and distribution copies.
- Limit distribution lists. If paper copies are necessary, circulate one memo or report with a cover sheet indicating distribution.
- Identify opportunities to reuse paper and paper products. Corrugated cardboard boxes, jiffy bags, manila envelopes and other packaging materials are reusable for their original function; paper can be turned over and used as scratch paper or made into message pads.

- Encourage staff to proofread on screen and save information on disks rather than as paper file copies.

8.8 MAXIMIZE DIVERSION OF RECYCLABLE PAPER

Current Conditions

Paper recycling operations target only computer printouts (CPO) and corrugated cardboard. White office paper, mixed office paper, magazines and newsprint are not source separated for recycling.

Pollution Prevention Opportunities

The Topeka facilities generate a quantifiable supply of consistent quality used paper. Given the current market value of a variety of paper grades, the MDC and CRF should pursue a long-term contract with a paper recycler or manufacturer. Such a contract should provide containers, regular collection and a per-ton payment indexed to the paper market. The recyclers will pay a higher price for source separated paper and paper products. In addition, prices fluctuate considerably. Factors affecting prices include current market prices, whether the recycler picks up the material or it is delivered, volume, etc.

Each employee should receive basic training in what kinds of paper can be recycled and a container for source separation of recyclable paper. Exhibit 8.4 provides information on some local companies interested in discussing paper recycling opportunities.

8.9 IMPROVE SOURCE SEPARATION OF CORRUGATED CARDBOARD (OCC)

Current Conditions

Corrugated cardboard is generated primarily by shipments to the facility from MDC and LPC suppliers of parts and equipment, office products, paper, toner and other supplies. In the CRF, corrugated cardboard is generated by shipments from USPS facilities. See Section 8.4 for a discussion of waste reduction opportunities associated with reusable distribution packaging.

Since November, 1994, the 40 cubic yard compactor located behind Building 303 has been dedicated to cardboard recycling, as have approximately forty of the 1.5 cubic yard collection containers in the warehouses (Buildings 302, 1 and 2). Some of these smaller containers have been labeled "cardboard only". The compactor is pulled every other month by Topeka Waste. Topeka Waste charges \$305 per pull to transport the OCC to Republic Paper; Republic Paper pays the MDC \$125 for the 40 cubic yards of compacted OCC for a net cost to the MDC of \$180 per compactor load.

EXHIBIT 8.4 RECYCLERS OF PAPER AND PAPER PRODUCTS

Recycler	Material Accepted	Requirements	Material Price (May 1995)
Batliner Paper Stock Kansas City, MO (816) 483-3343	All types of paper and corrugated cardboard	Mixed paper separate from corrugated cardboard	Mixed paper: \$50/ton Loose corrugated cardboard: \$75/ton
Eco Recycling Topeka, KS (914) 233-7488	All paper including magazines and newsprint and corrugated cardboard	No source separation necessary	Donations only; no payment
Republic Recycling Topeka, KS (913) 235-2515	Most types of paper, but large quantities are required	Separated by: office and computer paper; mixed paper; corrugated cardboard; and newsprint.	Office and computer paper: \$150/ton; mixed paper: accepted but no payment; corrugated cardboard: \$100/ton; newsprint: \$20/ton.
Smurfit Recycling Kansas City, KS (913) 236-8000	All types of paper	Separated by: office and computer paper; mixed paper; corrugated cardboard; newsprint; and magazines.	Office and computer paper: \$280/ton; mixed paper: \$180/ton; baled corrugated cardboard: \$165/ton; newsprint: \$60/ton; and magazines: \$75/ton.
Till-Star Enterprises Topeka, KS (913) 354-7710	All types of paper	Prefers separated by: office and computer paper; mixed paper; corrugated cardboard; newsprint; and magazines, but would work with Postal Service.	Office and computer paper: \$40- \$80/ton; mixed paper: \$20-\$40/ton; baled corrugated cardboard: \$40- \$80/ton; newsprint: \$20/ton; magazines: \$5-\$10/ton.

In all three operations MDC, LPC and CRF, source separation of corrugated cardboard for recycling is haphazard at best. For example, in many of the 1.5 cubic yard containers within the MDC warehouses, wastes were not segregated. Corrugated cardboard was mixed with paper, plastic film, plastic and metal strapping, coffee cups, aluminum cans and other materials. Even some of the designated cardboard collection containers were contaminated with other materials. The LPC appeared to be the most efficient in diverting corrugated boxes, but they were discarding the round end cover sheets and kraft protective sheets from the paper rolls. The CRF was not separating cardboard for recycling in any of its operations, although at least 75 percent of the solid waste from the CRF is corrugated cardboard.

Based on the Assessment Team's observations of the five compactors and approximately forty 1.5 cubic yard waste collection containers in the warehouses, a conservative estimate of the quantity of corrugated cardboard, based on best professional judgement, is that corrugated cardboard comprises 90 percent of the material in the dedicated OCC compactor and 50-60 percent of the material discarded into the other four solid waste compactors. As discussed earlier, MDC disposal records indicate that Topeka Waste pulls the solid waste compactors a total of 100 times per year and charges \$618 per pull for a total annual disposal cost of \$61,800.

Compacted corrugated cardboard weighs between 300 and 500 pounds per cubic yard. Thus, a full 40 cubic yard compactor contains approximately 12,000 lbs or six tons of compacted cardboard. The USPS pays out \$180 per compactor load every other month for a total annual expenditure of \$1,080 compared with \$3,708 for disposal of the material.

Pollution Prevention Opportunities

1. Improve separation under existing collection arrangement

Establish a corrugated cardboard source separation policy, designate containers for cardboard only and train all employees to maintain separation of OCC for recycling. Continue current collection arrangement with Topeka Waste and Republic Paper.

The MDC stated that there were 100 pulls of the 40 cubic yard compactors per year. The Assessment Team observed that at least 50 percent of the solid waste in the compactors is corrugated cardboard. If this cardboard were source separated, 50 compactor pulls would be waste and 50 pulls would be segregated corrugated cardboard. Each solid waste pull costs \$618, so 50 pulls represents \$30,900 in waste transportation and disposal costs. If these 50 container loads were delivered to Republic Paper, instead of the landfill, the cost would be reduced to \$305 per pull and the total annual cost reduced to \$15,250. Thus, potential savings from avoided disposal costs for this option are \$15,650. In addition, Republic Paper pays \$125 per load of corrugated for potential annual revenues of \$6,250. Total potential savings for this option are \$21,900.

2. Improve separation and initiate a new contract

Establish a corrugated cardboard source separation policy, designate containers for cardboard only and train all employees to maintain separation of OCC for recycling. Establish a market with a local recycler willing to enter into a contract based on a fixed price plus a fixed percentage of current market price.

Again, the current annual cost of transportation and disposal of 50 compactor loads at \$618 per pull is \$30,900. Other local paper recyclers will pull source separated, loose corrugated cardboard at no charge and pay between \$75 and \$165 per ton for the value of the material. Fees for container rental and pulls are always negotiable; USPS should leverage the quantity and quality of the product to obtain containers and collection at no charge. Eliminating 50 pulls at \$618 per pull produces potential savings from avoided disposal of \$30,900. Assuming six tons per full 40 cubic yard compacted pull, the Topeka facilities generate 300 tons of recyclable corrugated cardboard per year. At the more conservative return of \$75 per ton, the total revenue would be \$22,500. In response to a blind telephone call, Republic Paper stated that they would pay \$100 per ton for clean, loose corrugated cardboard. At \$100 per ton, the USPS could generate revenues of \$30,000 per year. Revenues plus avoided disposal yields savings of \$53,400 to \$60,900 per year. Exhibit 8.5 compares the costs of the two OCC recycling options.

EXHIBIT 8.5 CORRUGATED CARDBOARD RECYCLING

Maximize corrugated cardboard recycling	Option 1: Continue current arrangement with Topeka Waste and Republic Paper	Option 2: Negotiate a contract with another paper recycler
Total additional pulls of 40 cubic yards compacted corrugated per year	50	50
Annual weight of corrugated	300 tons	300 tons
Annual collection costs	\$15,250 (\$305/pull)	0
Annual avoided disposal	\$15,650	\$30,900
Revenues from sale of corrugated	\$6,250 (\$125/pull)	\$22,500 - \$30,000 (\$75-100/ton)
TOTAL SAVINGS	\$21,900	\$53,400 - 60,900

8.10 REDUCE DISPOSAL OF PLASTIC FILM

Current Conditions

Plastic shrink and stretch wrap enters the waste stream from pallets and packages shipped to the warehouses and CRF. When these deliveries are unwrapped for distribution to warehouse storage or shipment to USPS facilities, the plastic film is disposed into the solid waste stream.

Pollution prevention opportunities

1. Collect the plastic stretch film for recycling

Plastic film recyclers will collect truckload quantities (approximately 20 tons) of clean, baled stretch wrap and pay approximately \$40 per ton for the material. Both Mobil Chemical and Smurfit Recycling provide stretch film recycling programs.

Mobil's stretch wrap recycling services are offered nationwide. The program includes collection and purchase options for the used stretch wrap. The stretch wrap must be free of contaminants and baled. In addition, Mobil requires truckload quantities for transportation services to be cost effective. A truckload would consist of an average of 30,000 to 40,000 pounds of stretch wrap.

Mobil has strict content specifications for the material the company purchases. Mobil specifications include baled stretch wrap containing at least 96 percent polyethylene stretch film and:

- Less than 3 percent HDPE, LDPE bags and shrink film
- No PVC or PVDC (Saran) films
- No moisture - dry bales only
- No trash, loose paper or corrugated inside bales
- No corrugated or poly slip sheets as headers/end caps on bales
- No strapping, twine or tape
- No wood or broken pallet pieces
- No polystyrene or polyurethane foam
- No oil or grease
- No hazardous material, medical wastes, nor containers used to package these products.

Bale specifications include:

- Dimensions of 24"x36"x42" minimum to 36"x48"x72" maximum
- Weight of 750 pounds minimum to 1,200 pounds maximum
- Bale integrity must be maintained through shipping, unloading and storage.

Mobil picks up the material and pays 2 cents per pound for the stretch wrap. The material is processed at Mobil's facility located in Jacksonville, IL. The recycled resin is then used by various divisions within the company to manufacture products, such as: new handwrap and institutional can liners; Hefty trash bags; Trex, a wood-polymer composite; and trash cans. For further information, contact: Mobil Chemical Company, Commercial Recycling Group-Reston I at (703) 742-6546

Smurfit Recycling has a plant in Kansas City, KS and purchases clean, baled stretch wrap in truckload quantities. Smurfit pays approximately \$20 to \$40 per ton for truckload quantities. Smurfit requires that the stretch wrap be free of contaminants, including paper.

The recycling industry requires high quality and large quantities of stretch wrap for material collection and processing to be cost effective. The Postal Service may have difficulty in accumulating truckload quantities of stretch wrap. As an alternative to the truckload quantity requirement, the Postal Service could implement a comprehensive materials recovery program to include stretch wrap, office paper, polystyrene, aluminum cans and corrugated cardboard. Smurfit could collect a truckload of all of the materials, rather than requiring truckloads of individual materials. For further information, contact: Smurfit Recycling at (618) 463-6389.

The Topeka operations would have to purchase a baler and store the bales of stretch wrap until a truckload quantity was accumulated. Approximate revenues from a truckload of clean, baled stretch wrap would be \$800. Stretch wrap represents approximately 10 percent of the waste stream or 192 compacted cubic yds. per year. At an estimated weight of 225 pounds per compacted cubic yard, the Topeka operations generate slightly more than 40,000 pounds or about one truckload of plastic film per year. Exhibit 8.6 provides a summary of the economics of plastic film recycling.

EXHIBIT 8.6 PLASTIC FILM RECYCLING

Activity	Costs	Revenues
Baling equipment purchase	\$8,500	
Annual operating and maintenance costs (includes labor)	\$5,000	
Avoided disposal		\$2,900
Sale of plastic film		800
TOTAL	\$13,500	\$3,700

While Exhibit 8.6 suggests that purchase of a baler for plastic film recycling is not cost effective, it should be noted that the same baler could be used to bale corrugated cardboard.

Baling could potentially increase the revenues from the sale of the cardboard since all recyclers pay a premium for baled corrugated.

Since other regional USPS facilities, including Bulk Mail Centers and Processing & Distribution Centers, also generate substantial quantities of plastic stretch film, the USPS could consider a consolidated operation. USPS could purchase one baler, locate it at a facility that has storage space, and consolidate plastic film recycling for a variety of regional facilities. The film could be transported in clearly labeled collection boxes as part of the regional transportation system.

8.11 IMPROVE DIVERSION OF METALS

Current Conditions

Some metals are diverted for recycling in the LPC and CRF. However, there is no clearly stated policy and directive concerning metals recycling. Employees are inconsistent in their metals recycling behaviors. In Building 1, for example, some metal strapping is collected for reuse. In the other warehouses, however, the Assessment Team observed large quantities of metal strapping in the waste collection containers.

Pollution Prevention Opportunities

1. Improve source separation

Establish a policy concerning which metals will be diverted for recycling. Provide training for employees and locate clearly labeled containers for source separation of recyclable metals. Exhibit 8.7 provides a list of local companies interested in working with USPS to establish a broader metals recycling program. Recyclers will pay more for source separated materials; however, prices vary considerably and are dependent on the commodities market.

EXHIBIT 8.7 METALS RECYCLERS

Recycler	Material Accepted	Requirements	Material Price (May 1995)
A&D Scrap Metal Recycling Topeka, KS (913) 232-1666	All metals	Separate by metal	Iron and tin: \$40/ton Aluminum: \$.46/lb
Bailey's Recycling Company Topeka, KS (913) 232-5152	All metals	Separate by metal	Iron: \$40-\$44/ton; Aluminum, up to 50 lbs: \$.50/lb; Aluminum, more than 50 lbs: \$.52/lb

Becker Brothers, Inc. Kansas City, MO (816) 471-3244	All metals, including aluminum cans.	Separate by metal	Prices vary with commodity prices and are dependent on quality
Till-Star Enterprises Topeka, KS (913) 354-7710	All metals	Separate by metal	Iron: \$20/ton Aluminum: \$.45-\$.50/lb

8.12 FLUORESCENT LIGHTING TUBES

Current Conditions

The offices, warehouses and work areas are lighted with hundreds of fluorescent tubes arranged in pairs spaced approximately four feet apart. Expired lamps are stored in unprotected piles in several warehouse locations, including the LPC. In one location, the Assessment Team found a partially filled bulb crusher -- a 55 gallon drum, sealed to prevent exposure to mercury, with a mechanism to crush the expired fluorescent tubes. The maintenance staff stated that they had not yet identified an environmentally sound disposal option for the fluorescent tubes.

USPS Memorandum for Managers, Operations Support, dated December 16, 1994, states that "Under no circumstances should these lamps be mechanically crushed or ground into smaller pieces. This method of disposal increases the exposure of hazardous materials to both employees and the environment. Lamps should be boxed prior to disposal."

Fluorescent lights are one of the most energy efficient lighting sources available. However, fluorescent lighting tubes contain mercury, which is used as an element to conduct the flow of the electric current. Historically, fluorescent lighting tubes were discarded into landfills. When the tubes broke, mercury was released to the environment. This potential hazard caused many states to classify fluorescent lighting tubes as hazardous waste and require that they be managed in accordance with applicable hazardous waste laws and regulations.

Recycling spent fluorescent lighting tubes offers an environmentally sound alternative to expensive hazardous waste disposal. Additionally, recycling may relieve the generator of future liability concerns associated with tube disposal. Several companies provide recycling services for spent fluorescent lighting tubes and some of these companies also accept ballasts, a component of the light fixture. Ballasts manufactured prior to 1980 contain polychlorinated biphenyls (PCBs), which also present disposal problems. However, ballasts produced after 1980 do not contain PCBs. According to Ron Newman of A-TEC Recycling, the useful life of ballasts is approximately 15 years. Since ballasts manufactured after 1980 do not contain PCBs, ballasts containing PCBs should not present significant disposal problems beyond the near term.

Some states allow ballasts that do not contain PCBs to be disposed of in sanitary landfills. However, according to Stephanie Small of DYNEX Environmental, Inc., non-PCB ballasts

contain diethylhexylphthalate (DEHP). Evidence indicates that DEHP is a human carcinogen. Due to either the PCBs or DEHP content, Ms. Small recommends that customers manage all ballasts as hazardous.

Pollution Prevention Opportunities

1. Establish a recycling program

Store expired bulbs in boxes in a safe area. USPS facilities should ship expired bulbs to an approved facility for recycling of glass, metals, and mercury. Expired ballasts should be shipped to an approved facility for appropriate disposal of hazardous constituents.

Exhibit 8.8 provides information on the specific services offered by companies that provide fluorescent tube recycling services, the cost of the services and the geographic area serviced by each company. See the appendices for further information on fluorescent tube and ballast management.

EXHIBIT 8.8 FLUORESCENT LIGHTING TUBE RECYCLERS

Company/Address/Contact	Services Offered	Cost of Services (April, 1995)	Geographic Area Served
A-Tec P.O. Box 7391 Des Moines, IA 50309 (800) 551-4912	1. Lamp recycling: Customer to pack lamps in original box and store in safe place. 2. Pick-up service. 3. Ballasts accepted and shipped to FulCircle Ballast Recyclers.	4-ft lamp Over 4-ft/per foot High intensity discharge lamp (HID) \$2.29	IL, MO, Iowa, NE, KS, WI, MN
DYNEX Environmental, Inc. 4751 Mustang Circle St. Paul, MN 55112 (612) 784-4040	1. Lamp recycling: Customer to pack lamps in original box. 2. Provides reusable boxes to customer for rental. 3. Pick-up service. 4. PCB and non-PCB Ballast disposal (3 methods)	4-ft lamp (min. of 100) Over 4 ft (min. of 100) \$.39 \$.66 Ballast Disposal Method 1: Landfill (1 drum minimum) \$1.19/lb at \$795/drum Method 2: Decap (1 drum minimum) \$1.49/lb at \$1,100/drum Method 3: Incinerate (1 drum minimum) \$2.59/lb at \$2,000/drum	Nationwide
Lighting Resources, Inc. 386 South Gordon Street Pomona, CA 91766 (800) 572-9253	1. Lamp recycling: Customer to pack lamps and prepare bill of lading. 2. Pick-up service 3. Ballast recycling	Per lamp Per HID \$.07 to .10 \$.75 to \$2.75 Ballasts \$.75/lb at \$700 to \$750/drum	Nationwide
Mercury Technologies International 1940 Westwood Blvd., No. 218 Los Angeles, CA 90025 (310) 475-4684	1. Lamp recycling 2. Pick-up service	Per linear ft/lamp Per HID \$.07 to .10 \$3.00	Nationwide

EXHIBIT 8.8 FLUORESCENT LIGHTING TUBE RECYCLERS

Company/Address/Contact	Services Offered	Cost of Services (April, 1995)	Geographic Area Served
Recyclights 2010 East Hennepin Avenue Minneapolis, MN 55413-2799 (800) 831-2852 or (612) 378-9568	1. Lamp recycling 2. Pick-up service	4-ft lamp over 4 ft/lamp \$.40 to .60 Per HID \$.60 to .83 \$2.50 to \$5.00	Nationwide
Mercury Refining Company 1218 Central Avenue Albany, NY 12205 (518) 459-0820	1. Lamp recycling 2. Pick-up service	Per linear ft/lamp Crushed lamps per 55 gallon drum \$.08 HID/gal. \$ 650 with 1.5" diameter HID/gal. \$ 15 with less than 1.5" \$ 20	Nationwide
Bethlehem Apparatus Company, Inc. 890 Front Street P.O. Box Y Hellerton, PA 18055 (610) 838-7034	1. Lamp recycling: customer to ship whole tubes in original box or crushed lamps in 55 gallon drums.	4-ft lamp whole (1-3000) \$3.00 (3000-6000) \$2.25 (over 6000) \$1.50 8-ft lamp whole (1-3000) \$4.50 (3000-6000) \$3.50 (over 6000) \$2.25 1 to 5 Drums \$1,235/each 6 to 10 Drums \$ 930/each over 10 Drums \$ 650/each	Nationwide
USA Lights Environmental Inc. 2007 Country Road C-2 Roseville, MN 55113 (612) 628-9370	1. Lamp recycling: Customer to pack lamps in original boxes, secure box with tape, and record number of lamps on the box. 2. Pick-up service. 3. Pollution Liability Insurance coverage	4-ft lamp \$.44 8-ft lamp \$.62 Per HID \$2.29	Nationwide

8.13 HALON FIRE SUPPRESSANT SYSTEMS

Current Conditions

The MDC computer room is protected by 14 one quart glass bulbs of Halon in the ceiling. In addition, there are 21 nine pound portable halon extinguishers in the warehouses. The CRF utilizes a 360 pound Halon 1301 system in Building 8. Halon fire suppression systems at the MDC and CRF provide a high level of fire protection, with minimal secondary damage and minimal disruption to resumption of operations in the event of a fire. The level of protection provided by these systems is more than adequate to protect the assets at risk.

Although halon has excellent fire extinguishing properties, halons deplete stratospheric ozone, a substance critical in protecting the earth from the harmful effects of ultraviolet radiation. The international community acted to reduce the use of halons with the Montreal Protocol On Substances That Deplete the Ozone Layer, which set January 1, 1994 as the phaseout date for production and import of halons. The phaseout of production has made the identification of current uses of halons and acceptable alternatives to halons extremely important. Halons are used in many applications for fire protection including onboard aircraft, military vehicles, electronics equipment systems, electrical plant areas, control rooms, archival storage areas, cultural heritage areas, flammable hazards storage areas, and offshore oil and gas installations.

The halon systems are in place in computer rooms and storage areas for computer equipment. The computer equipment protected by the halon systems is used in supply functions for the USPS. The Postal Service must address both short- and long-term issues associated with providing adequate fire protection for these functions. In the short term, the Postal Service must cease any discharge testing of equipment, regularly inspect and maintain its existing halon 1301 systems, and implement the fire protection measures outlined below. Long term supplies of halons are uncertain. Although significant expenditures may be required, the USPS should prepare for potential future shortages by identifying its long term fire protection needs at the MDC and CRF and implementing a fire protection strategy that anticipates the removal of the existing halon systems. In the long term, the Postal Service must identify a suitable substitute for the halon systems in place and, after installing the new systems, properly transfer any remaining halon 1301 to the Defense Logistics Agency for banking.

Pollution Prevention Opportunities

1. Cease Discharge Testing

Until the USPS identifies a suitable replacement for the halon 1301 systems in place in the building, the MDC and CRF should not conduct discharge testing of the current systems. This unnecessary release of halon into the atmosphere represents a significant loss of stored halon. In lieu of periodic discharge tests, the halon systems should be inspected by a qualified fire equipment inspector.

2. Perform Regular Preventive Maintenance

Another significant loss of halon in fixed systems is through leaks in valves and discharge lines. The MDC and CRF should conduct regular preventive maintenance to insure that all halon systems in place are intact and free of leaks.

3. Implement Fire Protection Measures

In developing an alternative to halon 1301 fire suppression systems, USPS must examine other fire protection measures such as: fire protective enclosures; smoke control systems; manual fire fighting equipment; provision of high ignition resistance, low flammability cable and wire insulation, furnishings and interior finish; and "smoke resistant" electronics components. The MDC can reduce its total fire risk by such methods as: performing preventive maintenance on computer equipment, building redundant facilities, backing up records and other media, and preparing adequate post-fire reclamation procedures and contingencies. By taking these considerations into effect, USPS will ensure an acceptable level of fire protection, even though it may be replacing halons with a less effective chemical substitute. Specific fire safety features for electronics systems recommended by the Montreal Protocol 1991 Halon Technical Options Committee are presented in Exhibit 8.9.

EXHIBIT 8.9 FIRE PROTECTION MEASURES

- Redundancy
- Use ignition resistant wire, cable, and electronic components
- Minimize ignition source severity from external sources
- Measures to slow rate of fire development
- Measures to lower rates of smoke production
- Components hardened to the effects of heat and smoke
- Low smoke corrosivity
- Isolation of HVAC system
- Fire resistive compartment boundaries
- Detection and alarm systems
- Full-time manning
- Training of staff
- Availability of manual fire suppression equipment
- Fire department response time

According to a report prepared by the United Kingdom Department of the Environment, fires rarely start in electronic equipment rooms. Instead, fires are more likely to start in adjacent storage or work areas and then spread. USPS should design a fire protection strategy to take into account fires that may spread into computer equipment and storage rooms, as well as fires that start in the rooms themselves.

Elements of an effective fire protection strategy are presented below in the order of environmental preference.

Reduce risk of losses - maintain back-ups of data in a remote location, limit the size of the facility as much as possible, and ensure that adequate contingency arrangements are in effect.

Early detection - couple early detection systems with a rapid and guaranteed response by the fire department and an automatic sprinkler system.

Halon discharge override - install a manual override switch which stops the discharge of halon in the event of an accidental triggering of the halon 1301 system.

Cabinet protection - limit halon discharges to equipment cabinets themselves or provide in-cabinet detection systems coupled with automatic isolation of the power supply and sprinkler systems.

4. Replace Halon 1301

Once USPS has developed an acceptable replacement strategy, it should replace the existing halon system with a suitable alternative. The USPS should task the fire system maintenance contractor to evacuate the current halon system and collect the halon 1301 for recycling. The collected halon must be turned over to the Defense Logistics Agency (DLA) in accordance with appropriate DLA procedures. The following alternatives would provide adequate fire protection in the MDC and CRF.

Carbon dioxide systems - carbon dioxide systems are an alternative when total flooding is absolutely necessary. Disadvantages of carbon dioxide systems are the potential hazard to personnel and the possibility of secondary damage from thermal shock.

Automatic sprinkler systems - water or foam sprinkler systems are available which either spray, sprinkle, or mist. The disadvantage of relying solely on water sprinklers is the risk of water damage to computer equipment.

High expansion foam systems - high expansion foam systems provide contact cooling and do not require an air-tight enclosure. On the other hand, foam is electrically conductive, does not rapidly fill a volume, and may result in corrosion of equipment.

Dry chemical systems - although effective in extinguishing electrical fires, dry chemical systems often leave harmful residues on computer equipment and render them inoperable. The use of a dry chemical system should be contingent upon frequent backups of important data and redundancy of computer assets.

8.14 LIGHTING AND ENERGY

Current Conditions

Based on information provided by the MDC staff, the USPS facility in Topeka pays more than \$348,000 for electricity per year. This expense breaks down as follows: Buildings 1, 2, and 3 - \$35,495; Building 8 - \$62,660; and Building 303 - \$250,662.

The Federal government is a major consumer of energy, using more than two percent of all energy consumed in the United States. The Energy Policy Act of 1992 and Executive Order 12902 require Federal agencies to reduce energy use. The Energy Policy Act requires Federal agencies to reduce energy consumption per gross square foot 20 percent by the year 2000 and Executive Order 12902 requires Federal agencies to reduce energy consumption 30 percent by the year 2005. Both reductions are from a 1985 baseline. In addition, Federal agencies must conduct comprehensive energy audits and install cost-effective energy conservation measures; agencies are encouraged to audit 10 percent of their facilities each year, using "no-cost" audits where practicable. These requirements are summarized in Exhibit 8.10.

EXHIBIT 8.10 FEDERAL ENERGY POLICIES

Energy Policy Act of 1992	Executive Order 12902
Reduce energy consumption per gross square foot 10 percent by 1995 (1985 baseline)	Reduce energy consumption per gross square foot 30 percent by 2005 (1985 baseline)
Reduce energy consumption per gross square foot 20 percent by 2000 (1985 baseline)	Reduce energy consumption per gross square foot 20 percent in industrial facilities by 2005 (1990 baseline)
Conduct comprehensive facility audits and install cost-effective energy conservation measures	Conduct surveys and comprehensive audits
In Federally owned buildings, install all energy and water conservation measures that have payback periods of less than 10 years	Implement recommendations for energy efficiency, water conservation and renewable energy that have payback periods of less than 10 years

Pollution Prevention Opportunities

1. Install energy efficient lighting

In many Federal buildings, approximately 25 percent of the energy consumed is for lighting; replacement of inefficient lighting systems results in substantial energy and cost savings. EPA operates Green Lights, a voluntary, non-regulatory program promoting pollution prevention through the installation of energy efficient lighting. Federal partners agree to upgrade lighting to maximize energy savings wherever it is profitable. The Green Lights program

benefits participants by lowering electricity bills, improving lighting quality, and increasing worker productivity. Energy efficiency also reduces the quantity of pollutants released in the generation of electricity. For example, EPA estimates that if Green Lights were fully implemented, where profitable, in the United States, it would save over 65 million kilowatts of electricity annually, reducing the national electric bill by \$16 billion per year. The program would also result in reductions of carbon dioxide, sulfur dioxide, and nitrogen oxides equivalent to 12 percent of U.S. utility emissions, curbing acid rain and smog and helping to slow the greenhouse effect.

According to the *New York Times* of Wednesday, February 22, 1995, "One of the first Federal agencies to try this green technology was the Postal Service, which installed \$300,000 worth of energy-efficient lighting in its Reno office in the early 1980s. Postal officials say that office has saved \$52,000 a year in electricity bills in the years since, more than covering the initial costs. Moreover, a study of the Reno office in the late 1980s found that the better lighting helped make the mail sorters there the most productive in the Western United States. The officials said that the better lights helped reduce the errors the workers were making, allowing them to achieve a productivity gain that the Postal Service calculated to be worth \$400,000 to \$500,000 a year."

2. Become a Federal Partner in the Green Lights Program

Green Lights provides free technical assistance to participants through written materials, information hotlines, and thorough survey and analysis software products that allow Green Lights participants to analyze their options for installing energy-efficient lighting. The system helps participants survey the lighting systems in their facilities, assess their retrofit options, select the option that maximizes energy and pollution savings while simultaneously rating or improving lighting quality and meeting the Green Lights profitability criteria, and produces reports suitable for use by facility managers, financial staff, and senior management. See the appendices for further information on the Federal Energy Management Program and Green Lights.

3. Establish a "Lights Out" policy

Establish a policy of turning off lights and equipment when leaving an area. Where machine design permits, turn photocopiers to low power when not in use. Installation of motion sensors that automatically turn off the lights is another alternative. Each kilowatt hour saved prevents the formation of air pollutants, including 0.68 kg of carbon dioxide, 5.8 g of sulfur dioxide and 2.5 g of nitrogen oxides.

4. Procure computers that meet Energy Star requirements

Future computer equipment purchases should specify equipment that is energy efficient. Executive Order 12845 requires Federal agencies to purchase computer equipment that meets EPA Energy Star requirements for energy efficiency. The EPA Energy Star Program is a

voluntary partnership with the computer industry to promote energy-efficient personal computers, monitors and printers. Participating companies have committed to develop computer equipment that powers down when not in use. The "sleep" feature cuts energy use by 50 to 75 percent. Energy Star also includes a category for controlling devices, external retrofit products that reduce the energy consumption of existing computer equipment by automatically turning them off when not in use. The Federal Supply Service offers a product called the Intelligent Energy Saver, a PC add-on device that controls electrical power to the PC and its peripherals. The complete PC system can be powered on and off at user-defined dates and times. See the appendices for further information on Energy Star.

8.15 POLLUTION PREVENTION INFORMATION ON THE INTERNET

Current Conditions

During the site visit, USPS staff indicated that they would like information on accessing pollution prevention information through the Internet.

Pollution Prevention Opportunities

There are several sources of pollution prevention information on the internet. Perhaps, the best source is Enviro\$en\$e. This internet-based information source is funded by the Environmental Protection Agency and the Strategic Environmental Research and Development Program. Enviro\$en\$e allows those implementing pollution prevention programs or developing research and development projects to benefit from the experience, progress, and knowledge of their peers. Enviro\$en\$e includes a pollution prevention forum for all levels of government, researchers, industry, and public interest groups. Enviro\$en\$e has been developed to host an expert architecture known as the Solvent Umbrella. The Solvent Umbrella will allow users to access solvent alternative information through a single, easy-to-use command structure. Enviro\$en\$e is also modem accessible via Bulletin Board System (BBS). Through Netscape, Enviro\$en\$e address is:

<http://wastenot.inel.gov/envirosense>.

The EPA also has a World Wide Web Server (WWW) which is being run as a prototype system to provide Public Access to EPA information. The EPA provides the comprehensive Access EPA document describing environmental information, as well as a number of other pointers to Information Locators that can be obtained from the EPA and related organizations. In addition to this document the EPA's Public Information Center is available to provide assistance in accessing environmental information. An experimental EPA People Locator is also available. Through Netscape, EPA's WWW server can be accessed through <http://www.epa.gov>.

The EPA WWW server provides information on EPA Agency information and environmental data, including:

- Press Releases, Calendar, Announcements, Speeches,
- EPA Offices and Regions,
- Consumer Information,
- EPA Initiatives, Policy and Strategy Documents,
- Rules, Regulations and Legislation,
- EPA Standards,
- Science, Research and Technology,
- Information about Grants, Contracts (RFPs), and Job Vacancies,
- Newsletters and Journals, and
- Software and Databases,

Another source of environmental information is the Air Force Center for Environmental Excellence (AFCEE), Pollution Prevention Directorate located at Brooks AFB in Texas. AFCEE produces PRO-ACT fact sheets on various pollution prevention topics, ranging from corrugated cardboard pallets to a summary of environmental executive orders. Through Netscape, the PRO-ACT fact sheets can be accessed through:

http://chppm-meis.apgea.army.mil/pro-act/index_txt.html.

SECTION 9.0

CONCLUSIONS AND RECOMMENDATIONS

This Pollution Prevention Opportunity Assessment report documents the processes performed, wastes generated and current waste management practices at the USPS Materials Distribution Center, Label Printing Center and Central Repair Facility in Topeka, KS. During the assessment process, the Assessment Team identified opportunities to reduce both the quantity and toxicity of the wastes generated by this facility and recommended techniques for implementation of those pollution prevention options. The opportunities described in the previous sections constitute the recommendations of the Assessment Team. Exhibits 2.1, 5.1, 7.1 and 8.1 present a summary of the major facility-specific and facility-wide recommendations.

Dissemination of this report will encourage application of the pollution prevention opportunities in USPS materials distribution, printing and computer repair facilities nationwide as well as other Federal facilities with similar operations.

APPENDICES

EPA 33/50 PROGRAM

The 33/50 Program, one of EPA's Partners for the Environment Program, began in the late 1980s as a voluntary program to reduce toxic emissions of seventeen high priority chemicals reported on the Toxic Release Inventory (TRI). These high priority chemicals, chosen because of their relative toxicities, volumes of use, and potential for reduction through pollution prevention include:

- ▶ Benzene
- ▶ Cadmium and compounds
- ▶ Carbon tetrachloride
- ▶ Chloroform
- ▶ Cyanide compounds
- ▶ Dichloromethane
- ▶ Lead and compounds
- ▶ Mercury and compounds
- ▶ Methyl ethyl ketone (MEK)
- ▶ Methyl isobutyl ketone (MIBK)
- ▶ Nickel and compounds
- ▶ Tetrachloroethylene
- ▶ Toluene
- ▶ 1,1,1-trichloroethane
- ▶ Trichloroethylene
- ▶ Xylenes

The 33/50 Program gets its name from the original goals of the program to reduce the 17 priority chemicals by 33% by 1992 and by 50% by 1995. The U.S. EPA celebrated the early achievement of the 50% reduction goal in September 1996 when the 1994 Toxic Release Inventory data became available for public release. Between 1988 and 1994, 33/50 Program participants reduced environmental releases and off-site transfers of the 17 target chemicals by 757 million pounds. Companies and organizations participate in the 33/50 Program by submitting a letter to EPA stating their intention to participate and outlining their reduction targets and strategies. More than 1,300 parent companies operating about 6,000 facilities in the U.S. have participated in the 33/50 Program.

For more information about the participation in the EPA 33/50 Program, contact EPA's TSCA Assistance Hotline at (202) 554-1404. Or contact the 33/50 Program staff directly at:

33/50 Program (Mail Code 7408)
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
401 M Street
Washington DC 20460
Phone: 202-260-7538
POC: Ms. Chris Tirpak
Email: tirpak.chris@epamail.epa.gov

Information on the 33/50 Program is also available on-line through the EnviroSenSe web site:
<http://es.inel.gov/partners/3350/3350.html>

OZONE DEPLETING SUBSTANCES

The ozone layer in the stratosphere protects life on earth from exposure to dangerous levels of ultraviolet light. When CFCs and other ozone-degrading chemicals are released into the atmosphere, they will eventually rise to the stratosphere where they destroy the protective ozone layer. This destruction is occurring at a more rapid rate than ozone can be created through natural processes. Destruction of the ozone layer leads to higher levels of ultraviolet radiation reaching Earth's surface. This can lead to higher incidences of skin cancer, cataracts, and weakened immune systems. It is also expected to reduce both crop yields and ocean productivity.

The U.S., in cooperation with over 140 other countries, is phasing out the production of ozone-depleting substances. In 1985, the Vienna Convention was adopted to formalize international cooperation in stratospheric ozone protection. Additional efforts resulted in the signing of the Montreal Protocol in 1987. In the United States, Title VI of the Clean Air Amendments of 1990 address the phase out of ozone-depleting substances.

There are two classes of ozone depleting substances. Class I substances, as defined in section 602 of the Clean Air Act, include any chemical with an ozone-depleting potential of 0.2 or greater (based on CFC-11 having a ozone depleting potential of 1.0). Class I substances (CFCs, carbon tetrachloride, and methyl chloroform) were phased out of production by the end of 1995 and halons were phased out by the end of 1993. Class II substances, hydrochlorofluorocarbons (HCFCs), will be phased out of production and use by the year 2030. Accelerated phase outs of the most damaging Class II substances include HCFC-141b (by January 1, 2003), and CFC-142b and HCFC-22 (by January 1, 2010).

To address the availability of approved alternatives to ozone-depleting substances, the EPA's Office of Stratospheric Protection was mandated to establish the Significant New Alternatives Policy (SNAP) Program. The purpose of the SNAP Program is to identify alternatives to ozone-depleting substances and to publish lists of acceptable and unacceptable substitutes.

Executive Order 12843, *Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances*, signed in 1993, requires Federal agencies to comply with Title VI of the Clean Air Act Amendments dealing with stratospheric ozone protection, to maximize the use of safe alternatives to ozone-depleting substances, and to revise procurement practices to eliminate the requirement for ozone-depleting substances.

The U.S. EPA Office of Stratospheric Protection operates the Stratospheric Ozone Hotline at (800) 296-1996. It can be accessed between 10am and 4pm EST. They can field any technical or policy related questions on elimination of ozone depleting substances at U.S. Postal Service facilities.

The best source of technical, policy, and substitute chemical information can be obtained through the U.S. EPA's Stratospheric Ozone World Wide Web Home Page:

<http://www.epa.gov/ozone/index.html>. This web site contains information on the science of ozone depletion, substitutes for ozone depleting substances, international policy, and links to other sources of information. It can be used as a "jumping off" point for a wide variety of information related to ozone depletion available on the World Wide Web.

The mailing address for the Office of Stratospheric Protection is:

Office of Stratospheric Protection
U.S. Environmental Protection Agency
Mail Code 6205J
401 M St., SW
Washington, DC 20460

EnviroSenSe also has access to several material substitution databases. Their World Wide Web address is: <http://es.inel.gov>. Select "Solvent Substitution Data Systems" for links to several material substitution databases including those that specialize in solvents with ozone depleting ingredients.

EPA GREEN LIGHTS PROGRAM & THE FEDERAL ENERGY MANAGEMENT PROGRAM (FEMP)

The Green Lights Program is a voluntary pollution prevention program that encourages the use of energy-efficient lighting. It is one of the several ENERGY STAR® Programs sponsored by the U.S. EPA's Atmospheric Pollution Prevention Division. The purpose of the Green Lights Program is to encourage organizations to install energy-efficient lighting to prevent the creation of air pollution including greenhouse gases, acid rain emissions, air toxics, and tropospheric ozone, as well as prevent the generation of solid waste and minimize other environmental impacts of electricity generation.

Federal regulations and directives require Federal agencies to reduce energy use. Section 543 of the National Energy Conservation Policy Act, as amended by the Energy Policy Act of 1992, requires each agency to achieve a 10 percent reduction in energy consumption in its Federal buildings by FY 1995, when measured against a FY 1985 baseline on a Btu per gross-square-foot basis and a 20 percent reduction in Btu per gross-square-foot by FY 2000. In 1994, the President signed Executive Order 12902, *Energy Efficiency and Water Conservation at Federal Facilities*, which requires Federal agencies to reduce energy consumption by 30 percent by the year 2005, based on the agency's 1985 energy use.

In response to these mandated requirements, the U.S. Department of Energy's Federal Energy Management Program was established to assist Federal agencies to reduce energy costs by advancing energy efficiency, water conservation, and the use of solar and other renewable energy. FEMP accomplishes its mission by creating partnerships, leveraging resources, transferring technology, and providing training and support. For information on the Federal Energy Management Program contact the FEMP Help Desk at (800) DOE-EREC or the FEMP Office at (202) 586-5772.

The Department of Energy's Federal Energy Management Program has teamed up with the EPA's Green Lights Program to assist Federal agencies to achieve the mandated energy reductions. A kick-off is planned in March 1997. The U.S. Postal Service was one of the first to sign up as a pilot agency for this new collaborative effort. For more information, contact Rob White, National Marketing Director for Green Lights and ENERGY STAR® Buildings, at (202) 233-9242.

EPA provides a range of Participant Support Programs to help Green Lights members obtain information on energy-efficient lighting technology, financing options, software analysis tools, and public recognition opportunities. For more information about the Green Lights Program, contact:

Manager, Atmospheric Pollution Prevention Division
U.S. EPA
401 M Street SW (6202J)
Washington DC 20460

Tel: (202) 233-9190
Toll Free: (888) STAR-YES
Fax: (202) 233-9569
Fax-back system: (202) 233-9659.

The Green Lights World Wide Web Home Page is at:
<http://www.epa.gov/greenlights.html>. This web site includes general information about the Green Lights program, manuals and publications, software tools, and other technical information.

The Federal Energy Management Program Home Page is at:
<http://www.eren.doe.gov/femp/>. This web site provides news, technical assistance, project financing information, and procurement information to assist Federal agencies achieve the mandated energy use reductions.

U.S. Postal Service participates as a member of the Federal Interagency Energy Management Task Force. Contact Mr. Bernie Denno, Environmental Programs Analyst, at (202) 268-6014 for specific information on U.S. Postal Service involvement in FEMP and Green Lights Programs.

EPA ENERGY STAR® PROGRAM

The ENERGY STAR® Program is a voluntary pollution prevention program aimed at reducing energy consumption to help to combat smog, acid rain, and climate change through decreased emissions from electricity generation. It includes programs aimed at homes, residential HVAC, office products, buildings, and lighting. Programs of interest to the U.S. Postal Service include:

- ▶ Office Products. The EPA ENERGY STAR® Office Equipment program is a partnership with the office equipment industry to promote energy-efficient personal computers, monitors, printers, fax machines, and copiers. In 1993, an Executive Order 12845 was issued requiring all U.S. Federal agencies to purchase ENERGY STAR® computers, monitors and printers.
- ▶ Buildings. EPA's ENERGY STAR® Buildings program is a voluntary energy-efficiency program for U.S. commercial buildings. Partners can expect to reduce total building energy consumption by 30% on average.

For more information about the ENERGY STAR® Program, contact:

ENERGY STAR® Programs
U.S. EPA Atmospheric Pollution Prevention Division
401 M Street SW (6202J)
Washington DC 20460
POC: Ms. Jeanne Birskin, Chief, ENERGY STAR® Programs
Tel: (202) 233-9190
Toll Free: (888) STAR-YES
Fax: (202) 233-9569
Fax-back system: (202) 233-9659.

The ENERGY STAR® World Wide Web Home Page is at:

ENERGY STAR® Home Page
<http://www.epa.gov/energystar.html>
This web page contains news and information on all of the ENERGY STAR® initiatives.

The Atmospheric Pollution Prevention Division also prepares a newsletter, *The Update*, which communicates events, highlights, and news affecting Green Lights and ENERGY STAR® program participants. It is available on-line through the ENERGY STAR® Home Page.

FLUORESCENT TUBE AND BALLAST RECYCLING

Fluorescent tubes and lighting ballasts contain hazardous constituents that can make their handling and disposal problematic. Fluorescent tubes contain mercury which may be subject to hazardous waste regulations if deemed hazardous by the Toxicity Characteristic Leaching Procedure (TCLP) (40 CFR 261). Individual states may have other specific regulatory requirements governing the disposal of fluorescent tubes. However, in most cases, fluorescent tubes can be legally handled and disposed as municipal solid waste, creating a potential liability to the waste generator.

Fluorescent lamp ballasts manufactured before 1979 will contain polychlorinated biphenyls (PCBs), while those manufactured after 1979 should contain a label stating "NO PCBs." If there is no label, you should assume that the ballast contains PCBs. PCB-containing ballasts that are intact and are not leaking can be disposed in a municipal solid waste landfill in properly packed and sealed 55-gallon drums (40 CFR 761). Again, municipal disposal of PCB-contaminated waste poses potential liabilities to the generator.

To minimize environmental impacts, fluorescent tubes can be recycled. The mercury containing material is extracted and the glass and metal parts recovered for reuse or recycling. Before disposing of fluorescent tubes or lighting ballasts, you should contact your state or local regulatory agency for specific handling and disposal requirements. They may also have information on fluorescent tube recycling in your state or area. Consult your local telephone directory for phone numbers.

For information on Federal requirements, contact the following:

Resource Conservation Recovery Act (RCRA/Superfund/Right-to-Know Hotline

Phone: (800) 424-9346 or (703) 412-9810 in the Washington DC area.

Request documents such as *EPA Fact Sheet: Options for Disposal of Lights that Contain Mercury and Lighting Waste Disposal*, a general document published by the EPA's Green Lights Program on best management practices that includes recycling. Memoranda also are available through the fax-on-demand system. Dial (202) 651-2060 from the fax phone receiver, press 1 to order documents, press 11906 and 11907 (press 1 to confirm ordering each document), press # to finish ordering, then press start on your fax machine.

Toxic Substances Control Act (TSCA) Assistance Information Hotline

Phone: (202) 554-1404 Request regulatory guidance on the management and disposal of ballasts that contain PCBs.

Several fact sheets are available over the World Wide Web that contain background information as well as lists of fluorescent tube and lighting ballast recyclers:

U.S. Air Force Center for Environmental Excellence, PRO-ACT

<http://www.afcee.brooks.af.mil/pro-act/main/proact4.htm>

Select "Fact Sheets" from Home Page menu. Information in the PRO-ACT web site is public domain. However, telephone inquiries and requests for research or information are only available to Air Force users.

EnviroSenSe

<http://es.inel.gov/techinfo/facts/lamps-fs.html>

Fact sheet on disposal of spent fluorescent light tubes, developed by the Department of Public Works, City of Los Angeles. Contains a list of additional resources.

HAZARDOUS MATERIAL STORAGE STRUCTURES

Hazardous materials must be stored safely to prevent environmental releases through spills, adverse health impacts, fire or explosion hazards, or adverse chemical reactions with incompatible materials. Hazardous material storage is regulated at the Federal level by OSHA (29 CFR 1910). OSHA regulations can be accessed on-line through the OSHA Home Page (<http://www.osha.gov>); select Standards from the Home Page, OSHA Regulations (29 CFR), then Part 1910. Hard copies of the regulations are available through the Government Printing Office Order Desk, (202) 512-1800.

Hazardous materials also may be regulated on the state level as well as by local agencies (county/city fire departments) who may require flammable/combustible materials to meet certain storage requirements. Usually, these local ordinances will follow the National Fire Protection Association (NFPA), Fire Protection Guide on Hazardous Materials (Pamphlets 325A, 325M, 49, 491F and 704M). Contact your local fire department or the NFPA, (800) 344-3555, for specific requirements and copies of pamphlets.

Before purchasing or building a hazardous material storage structure, you need to understand the quantities and types of hazardous materials that you will need to store. You need to obtain the MSDS to understand flammability and incompatibility issues so you can select the appropriate storage structures. Decide how much material you must have on-hand in storage at any given time and select the appropriate size storage structure. Keep in mind, if you implement a hazardous material tracking program, you may need less storage area than past practices indicate.

An important issue in selecting a hazardous material storage structure is whether materials need to be segregated due to their chemical compatibilities. Hazardous materials must not be commingled with other materials which could produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mist, fumes or gases, or flammable fumes or gases. Incompatible materials that cause heat generation or violent reaction include mixing an base with an acid. For example, an alkaline cleaner or caustic liquid mixed with battery acid or other corrosive acids would cause a violent reaction. Information on incompatibilities should be identified on the MSDS. If there are any questions regarding material compatibilities, contact your local environmental, industrial hygiene, safety or fire department representative.

Hazardous material storage structures are available in a variety of sizes that meet varying requirements at costs ranging from several hundred dollars to tens of thousands of dollars. Some structures, such as flammable storage cabinets, may be stored indoors or outdoors. Other structures are the size of small buildings, and have several compartments for separating incompatible materials, and are generally stored outdoors. For vendor information on a range of hazardous material storage structures, contact your local procurement office. Additional information can be obtained from guides such as the Thomas Register of American Manufacturers (available through the local library) and through environmental and fire protection trade magazines (check your local environmental, safety, or fire protection office).

SUPPLIERS OF VEGETABLE OIL INKS

Vegetable oil inks offer several advantages over petroleum oil-based inks. Vegetable oil inks are made from renewable agricultural resources and decrease use of non-renewable energy sources. They have fewer volatile components, also known as volatile organic compounds or VOCs, that produce air pollution. Overall, vegetable oil-based inks have fewer impacts to the environment.

The Vegetable Ink Printing Act of 1994 was enacted to increase the use of vegetable oil-based inks used for printing Federal government documents. It states that Federal agencies may not procure lithographic printing ink, if it contains less than the following percentages of vegetable oil:

- ▶ In the case of news ink, 40 percent.
- ▶ In the case of sheet-fed ink, 20 percent.
- ▶ In the case of forms ink, 20 percent.
- ▶ In the case of heat-set ink, 10 percent.

The National Association of Printers and Lithographers has some general information on the use of vegetable-based inks for their Association Members. Contact Customer Service at (201) 343-0700 for more information.

The National Association of Printing Ink Manufactures (NAPIM) can provide a list of several vegetable oil-based ink manufactures in a given region. Contact Richard Incontro, NAPIM, 777 Terrace Ave., Hasbrouck Heights, NJ 07604, Phone (201) 288-9453, URL: <http://www.napim.com/> and specify your metropolitan or regional area.

The National Soy Ink Information Center has a strong identity as the information clearinghouse and resource for soy ink manufacturers and users. The center was established in 1993 by the Iowa Soybean Association (ISA). The center is fully funded by U.S. soybean producers. The center manages the SoySeal program, fulfilling requests for SoySeal user agreements and monitoring use of the SoySeal trademark. It also maintains relationships with soy ink manufacturers, printers and buyers; advises on research needed for product development; responds to trade media inquiries; leads soy ink and environmental seminars; and responds to telephone inquiries. Contact Jo Patterson or Wilson Cunningham at the National Soy Ink Information Center, 1025 Ashworth Road, No. 310, West Des Moines, IA 50265-3542, Phone: (800) 747-4275, Fax: (515) 223-4331, E-mail: soyink@soyink.com, URL: <http://www.soyink.com/>.

The two leading trade magazines in the ink industry, *American Ink Maker Magazine* and *Ink World*, publish buyers guides that list vegetable-oil and other low-VOC inks. These trade magazines should be available through your local printing organization.

General information on pollution prevention in the printing industry is available through Enviro\$en\$e (<http://es.inel.gov>). Select Enviro\$en\$e Industry Content Guides from the Home Page, then select Commercial Printing and Graphic Arts. Links to many documents, including those that address switching to vegetable or water-based inks can be found in the Frequently Asked Questions (FAQs). Additional links to case studies, fact sheets, and technical information are available through Core Documents.

POLLUTION PREVENTION INFORMATION SOURCES

Pollution prevention information sources are widespread. There are Federal-, state-, regional, and even local sources of pollution prevention information. At the Federal level, the U.S. EPA Office of Pollution Prevention and Toxics (OPPT) distributes a variety of pollution prevention information and oversees several pollution prevention initiatives. They publish the *Pollution Prevention News*, available in hard copy or through the U.S. EPA Pollution Prevention Home Page (see below for URL). OPPT also operates the Pollution Prevention Information Clearinghouse (PPIC). It is a free, non-regulatory service which provides telephone reference and referral, document distribution for selected EPA documents, and a special collection available for interlibrary loan. Publications available from PPIC are listed on the U.S. EPA Pollution Prevention Home Page (see below for URL).

Pollution Prevention Information Clearinghouse (PPIC)

Phone: 202-260-1023 (8:30 AM to 4:00 PM EST)

Fax: 202-260-4659

E-Mail: ppic@epamail.epa.gov

Mail: Pollution Prevention Information Clearinghouse
Environmental Protection Agency, MC 7409
401 M Street, SW
Washington, D.C. 20460

EPA Contact: Beth Anderson 202-260-2602

When calling PPIC for the first time, request a listing of all available documents. A more useful document for the first-time user is the *Pollution Prevention Directory* (EPA/742/B-94/005) which identifies Federal, state, regional, and commercially-available pollution prevention resources.

Some of the more popular World Wide Web starting points for Federal, state, and regional pollution prevention information include the following:

U.S. EPA Pollution Prevention Home Page

<http://www.epa.gov/opptintr/p2home/>

This web site provides general information on pollution prevention, pollution prevention initiatives, and links to other pollution prevention-related web sites.

Enviro\$en\$e

<http://es.inel.gov/>

Enviro\$en\$e is a "one-stop" repository for pollution prevention, compliance assurance, and enforcement information and data bases. Included are pollution prevention case studies, technologies, points of contact, environmental statutes, executive orders, regulations, and compliance and enforcement policies and guidelines. Enviro\$en\$e has numerous links to other Federal, regional, state, industry and academic pollution prevention resources. Enviro\$en\$e is an excellent "jumping off" point for additional pollution prevention information available on-line.