

**SWANA RECYCLING  
TECHNICAL ASSISTANCE STUDY**

**FINAL REPORT**

**GUIDANCE FOR ESTABLISHING A PERMANENT  
ELECTRONICS RECYCLING PROGRAM  
AT THE WAYNE TOWNSHIP LANDFILL**

**Prepared for:**

**CLINTON COUNTY SOLID WASTE AUTHORITY  
CLINTON COUNTY, PENNSYLVANIA**



**Prepared by:**

**GANNETT FLEMING, INC.**



**HARRISBURG, PENNSYLVANIA**

**AUGUST 2004**

**SWANA RECYCLING  
TECHNICAL ASSISTANCE STUDY  
FINAL REPORT  
GUIDANCE FOR ESTABLISHING A PERMANENT  
ELECTRONICS RECYCLING PROGRAM  
AT THE WAYNE TOWNSHIP LANDFILL**

**Table Of Contents**

	<i>Page</i>
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 Scope.....	1
<b>2.0 BACKGROUND .....</b>	<b>1</b>
<b>3.0 SOLID WASTE SERVICES AND RECYCLING SERVICES.....</b>	<b>2</b>
3.1 Recycling Activities .....	2
3.1.1 Curbside Recyclables Collection Services.....	2
3.1.2 Drop-off Recycling Services.....	3
3.1.3 Wood Recycling.....	3
3.1.4 Household Hazardous Waste Collection Events.....	3
<b>4.0 ELECTRONICS RECYCLING .....</b>	<b>3</b>
4.1 Permanent Electronics Recycling Locations in Pennsylvania .....	3
4.1.1 LCSWMA Permanent HHW Facility .....	4
4.1.2 Loyalhanna Watershed Association Permanent Electronics Collection Facility....	6
4.2 UNICOR .....	8
4.3 Listing of Computer Recyclers and Reusers in Pennsylvania .....	9
<b>5.0 PROPOSED CCSWA PERMANENT ELECTRONICS DROP-OFF PROGRAM .....</b>	<b>11</b>
5.1 Acceptable Electronics.....	11
5.2 Estimated Quantity of Electronics for the Proposed CCSWA Program.....	11
5.3 Receiving and Processing Electronics at the CCSWA MRF .....	12
5.4 Packaging and Shipping Requirements .....	14
5.5 Cost For Implementing the CCSWA Permanent Electronics Program .....	16
<b>6.0 CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>16</b>

**FIGURES**

---

Figure 1: Clinton County Solid Waste Authority Material Recovery Facility – Conceptual Electronics Receiving/ Handling Areas

**APPENDICES**

---

- Appendix A: Electronics Recycling - Monthly Tracking Sheet
- Appendix B: LCSWMA Educational Materials/ Ads
- Appendix C: UNICOR Information Sheet

**SWANA RECYCLING  
TECHNICAL ASSISTANCE STUDY  
FINAL REPORT**  
**GUIDANCE FOR ESTABLISHING A PERMANENT  
ELECTRONICS RECYCLING PROGRAM  
AT THE WAYNE TOWNSHIP LANDFILL**

## **1.0 INTRODUCTION**

Through the partnership with the Solid Waste Authority of North America (SWANA), the Pennsylvania State Association of Township Supervisors, and the Pennsylvania Department of Environmental Protection (PADEP), the Clinton County Solid Waste Authority (CCSWA), Clinton County, PA was approved for a technical assistance project to be provided by Gannett Fleming, Inc. (GF).

The CCSWA is interested in operating a proposed permanent electronics recycling program at the existing materials recovery facility (MRF) located at the Wayne Township Landfill site, in Clinton County, Pennsylvania. As envisioned, the program would be open to residents during normal landfill operating hours and would rely on CCSWA personnel to administer and operate the program. Gannett Fleming has been selected to provide guidance in developing the permanent electronics recycling program. As reviewed with the CCSWA, GF will complete the following tasks for this project:

### **1.1 Scope**

- Task #1** Gannett Fleming staff will work with the CCSWA to gather pertinent background information required for the completion of this study. This will include information about the existing recycling and landfill operations, electronics markets, and recycled electronics handling/ packaging requirements.
- Task #2** Gannett Fleming will contact municipalities, counties and solid waste authorities and associations that are currently operating permanent electronics drop-off sites. The information gathered from these contacts will be used to provide guidance to the CCSWA for implementing the electronics program. This task may include one (1) meeting/ site visit to review the permanent electronics drop-off operation.
- Task #3** Task 3 will include the preparation of a brief comprehensive report containing findings and recommendations.

## **2.0 BACKGROUND**

Clinton County is located in a predominantly rural portion of the north central region of Pennsylvania. The County is home to about 38,000 residents based on 2000 US Census data. The CCSWA has implemented a relatively comprehensive program committed to reducing, reusing, recycling and managing solid wastes. Over the past six years, the CCSWA has emphasized improving recycling efforts in the County. The CCSWA operates a MRF to

consolidate and process recyclables. Additional information related to the CCSWA’s solid waste and recycling programs has been summarized from the CCSWA website ([www.waynetwplandfill.com](http://www.waynetwplandfill.com)) and is included in the sections below as supporting information to this project.

### **3.0 SOLID WASTE SERVICES AND RECYCLING SERVICES**

The CCSWA offers a variety of solid waste services to Clinton and surrounding counties. These services are summarized below:

- **Solid Waste Management**

The CCSWA is available to assist businesses and industries with their solid waste management decisions. This can range from the performance of waste audits or reviews to the completion of DEP required disposal forms.

- **Waste Hauling**

The CCSWA owns several 100 cubic yard walking floor trailers, which are available for hauling select waste such as, construction/demolition, foundry sand, contaminated soil, etc.

- **Wood Grinding**

The CCSWA owns a Morbark Model 1300 Tub Grinder and a Morbark trommel screen, which are used to process the wood material into high quality landscape mulch. These machines are available for rent to process wood waste throughout the north central region of Pennsylvania.

- **Recycling**

The CCSWA operates a countywide recycling program which utilizes both curbside and drop-off collection methods. CCSWA personnel are available to assist municipalities, businesses, and industries with recycling issues (i.e. collection, market coordination, education, etc.). Additional information related to recycling activities is presented in Section 3.1

- **Landfill and Recycling Facility Tours**

Tours of the Wayne Township Landfill and recycling facility are available upon request.

### **3.1 Recycling Activities**

#### **3.1.1 Curbside Recyclables Collection Services**

The CCSWA offers bi-weekly curbside collection service to 13 municipalities within Clinton County. The CCSWA is under contract with the City of Lock Haven to provide curbside collection to all City residents. Curbside recyclables collection occurs bi-weekly and includes the following materials: aluminum and steel containers, clear/brown/green glass bottles and jars, newspaper, magazines, mixed paper and plastic bottles.

### 3.1.2 Drop-off Recycling Services

The CCSWA operates approximately 25 municipal recycling drop-off sites throughout the County. This service is provided at no charge to county residents. The materials generally collected at these sites include:

- aluminum containers
- steel containers
- clear glass bottles & jars
- green glass bottles & jars
- brown glass bottles & jars
- newspaper
- #1 & #2 plastic bottles
- corrugated cardboard

The MRF also accepts office paper, motor oil, and car batteries.

### 3.1.3 Wood Recycling

The CCSWA accepts brush and yard waste, pallets, and other miscellaneous clean wood material. The CCSWA uses a tub grinder to process the wood material into high quality landscape mulch. The tub grinder is available for rent to other local governments to grind wood waste in the surrounding north central region.

### 3.1.4 Household Hazardous Waste Collection Events

The CCSWA held Household Hazardous Waste (HHW) collection events in 2002 and 2003. These events were held at the Authority's Recycling Center. The CCSWA does not accept electronics during HHW collection events.

## 4.0 ELECTRONICS RECYCLING

Between the years 1997 and 2007, experts estimate that we will have 500 million obsolete computers in the United States and more than 63 million computers are expected to be retired in 2005 alone. Furthermore, with the expected transition from Cathode Ray Tubes (CRTs) to Liquid Crystal Display screens, which are expected to outsell CRT's for the first time this year in both computer monitors and televisions, the problem is expected to intensify. In addition to being voluminous, this equipment contains materials that we do not want in our natural environment, including lead, mercury, silver, chromium, zinc and cadmium<sup>1</sup>.

### 4.1 Permanent Electronics Recycling Locations in Pennsylvania

Currently, there are two established permanent electronics collections sites operating in Pennsylvania. One is located in Lancaster County and is operated by the Lancaster County Solid Waste Management Authority (LCSWMA). The second permanent electronics site is operated by the Loyalhanna Watershed Association located in Ligonier, Pennsylvania, in Westmoreland

---

<sup>1</sup> DiPasquale, Nicholas. "DEP Deputy Secretary Testifies Before House Committee About New Approaches For Electronics Recycling." Frequent Newsletter - Testimony, 16 March 2004, 20 Apr. 2004. <<http://www.dep.state.pa.us/dep/deputate/polycomm/newsletter/03-19-04/2538400.htm>>.

County. The Elk County Solid Waste Authority recently began operation of a third permanent site located in Ridgway, Pennsylvania. Information on the two established electronics sites is provided in the Sections below.

#### 4.1.1 LCSWMA Permanent HHW Facility

GF and the CCSWA visited the LCSWMA HHW facility on August 16, 2004 to observe the electronics operation and to ask questions about their program. Some important information noted during this site visit included:

- Be prepared to handle material that may be dropped off outside the facility by residents before or after hours or on days not scheduled for electronics collection
- The contracted vendor Envirocycle retrieves a loaded box trailer containing 22 gaylord boxes every one or two months from the Lancaster facility. The LCSWMA is satisfied with the service provided by Envirocycle.
- Lancaster’s population is 470,000 people, which is nearly 13 times that of Clinton County. Consequently, it should be recognized that an electronics program in rural Clinton County may generate a substantially smaller quantity of electronics and far fewer loads per year.
- Participation usually drops in winter months
- Tracking sheets are useful to document material origin/ participation (GF created a Monthly Tracking Sheet for electronics, which is included in **Appendix A**)
- Assessing a fee to residents for electronics is counterproductive since the material can easily be disposed of as residential refuse (already a cost to residents)

General information on the LCSWMA electronics/ HHW program is presented below.

Address           Lancaster County Solid Waste Management Authority  
1299 Harrisburg Pike  
Lancaster, PA 17604-4425

#### Program Description

Lancaster County is home to approximately 470,000 residents. Although there is a large population base in Lancaster, the LCSWMA estimates that the vast majority of participants for the electronics program originate within a 20-30 mile radius of the facility. The LCSWMA currently contracts with Envirocycle, Inc. of Hallstead, Pennsylvania to provide reclamation and disposition services for electronics. LCSWMA has operated a permanent HHW collection site since 1981. When the Authority added electronics collection to the program on July 1, 2001, the LCSWMA worked with Recycle America Alliance located in York, Pennsylvania to process electronics. This relationship continued for two years until Envirocycle was awarded the contract as a result of a competitive bid process.

Envirocycle takes one trailer load consisting of approximately 22 pallets of electronics every one to two months from the HHW facility. The computers and CPU’s are placed on skids and computer peripherals are placed in gaylords, also on skids. Envirocycle weighs each load and invoices the LCSWMA based on the contracted price per pound. On average, each completed trailer contains 15,000 lbs. of electronics.

The LCSWMA has a permanent HHW Facility that provides for the free drop-off the following items by Lancaster County residents:

- Computers\*
- Batteries
- Paint
- Fluorescent light bulbs
- Propane tanks

\*Acceptable computer peripherals include monitors, printers and keyboards.

Residents of Lancaster County can recycle computer equipment at the HHW facility for no charge. Small businesses can recycle up to 25 computers. The first 5 computers will be recycled for no charge. If more than five computers are recycled, there is a \$5 fee for each additional monitor and a \$5 fee for each CPU. After electronics are received by the HHW facility the CPU’s and monitors are shrink wrapped and placed on separated skids. Computer peripherals are placed in gaylords.

In 2002 the LCSWMA collected/ recycled the following quantities of electronics at their HHW facility:

<b>Computer Monitors</b>	35,340 lbs
<b>Computer CPU’s</b>	22,450 lbs.
<b>Computer Peripherals</b>	17,600 lbs.
<b>Total</b>	<b>75,390 lbs.</b>

In 2003 the LCSWMA facility processed 4,200 participants that dropped off approximately 90,000 lbs of electronics.

HHW Facility - Hours of Operation (2004)

<b>Monday through Friday</b>	<b>8:30 a.m. until 3:00 p.m.</b>
<b>2nd &amp; 4th Saturday of each month</b>	<b>8:00 a.m. until 12:00 p.m. noon</b>

The LCSWMA currently employs two full-time staff members to operate the HHW facility. One staff person can typically handle receiving and processing electronics, but the specific annual staff time required solely to handle electronics was not determined.

## HHW/ Electronics Education

The LCSWMA recognizes that HHW and electronics participation rates are, in part, a reflection of how well the public is educated on the available services. The LCSWMA educates the public on the HHW program through a variety of media, but primarily relies on a quarterly newsletter distributed to all residents with curbside trash and recycling services. Approximately 45 percent of the County population receives curbside collection services (and the newsletter) for trash and recycling. Educational ads related to the LCSWMA HHW program are presented in **Appendix B**.

The demographic characteristics of Lancaster County are significant because operating a HHW or electronics program in a more rural setting (such as Clinton County) may impact the program structure, quantity of material, and educational approach when implementing a permanent electronics and/or HHW collection facility.

## Paying For the Program

The LCSWMA currently pays for the operation of its permanent HHW operation through the following sources:

- **Act 190, HHW grant funding** – reimburses municipalities for 50 percent of the developmental and operational costs associated with HHW collection programs, up to a total of \$100,000 per county per year.
- Other non-grant reimbursed costs are absorbed by the LCSWMA

### **4.1.2 Loyalhanna Watershed Association Permanent Electronics Collection Facility**

#### Address

Loyalhanna Watershed Association  
110 Andi Lane  
Ligonier, PA 15658

#### Program Description

The Loyalhanna Watershed Association (LWA) is located in Westmoreland County and began operating a permanent electronics recycling drop-off in March 2003. The LWA uses a garage space in the former Ligonier Township Supervisor's building as the drop-off location. This location is available to serve all Westmoreland residents, however the LWA indicates that approximately 90 percent of those participating in the program come from within a 20-30 mile radius of the facility. LWA has intentionally kept the collection program localized for budgetary purposes. Westmoreland County currently has about 370,000 residents. Only one other electronics collection program has been offered in the County. In December, 2001, PA CleanWays collected 50,000 pounds of electronics in the Greensburg area.



The LWA currently contracts with Envirocycle to provide reclamation and disposition services for electronics. Envirocycle takes one trailer load consisting of about 40 to 45 gaylord boxes and skids (skids are stacked on top of gaylords) of electronics every four or five months from the LWA facility. TV's and microwaves are placed on skids and monitors, CPU's computer peripherals are placed in gaylords. Envirocycle weighs each load and invoices the LWA based on the contracted price per pound. On average, each completed trailer at the LWA facility of contains 20,000 lbs of electronics. For the first 12 months of operation the LWA electronics program collected approximately 60,000 pounds of electronics and related materials. The LWA accepts the following electronic items:

- Answering machines
- Compact disc players
- Copiers
- Duplicators
- Electronic typewriters
- Fax machines
- Hard drives
- Laptops
- Mainframe computers
- Mobile phones
- Modems
- Microwave ovens
- Pagers
- Personal Computers\*
- Printers
- Printed circuit boards
- Radios
- Stereos
- Tape players
- Telephones
- Telephone equipment
- Televisions
- Testing equipment
- Transparency makers
- Uninterruptible power supplies
- VCR's

\*Computer accessories such as monitors, keyboards, and other peripherals are accepted.

Residents may drop-off electronics at the facility free of charge. The LWA does not accept electronics from commercial establishments unless a donation is provided in a sufficient amount to offset the contracted costs for processing the material.

#### LWA Hours of Operation (2004)

<b>Tuesdays</b>	<b>12:00 p.m. until 5:00 p.m.</b>
-----------------	-----------------------------------

Note: Appointments for drop-off may be coordinated with the LWA

On Tuesday, the LWA uses three staff persons for approximately 2-3 hours to handle the electronics received at the facility.

#### Electronics Education

The LWA uses quarterly news articles in the local circulations to inform the public on the available electronics collection program. The LWA does not use permanent signage at the site for advertisement, but has elected to place temporary signs out only on Tuesdays while the program is accepting electronics. This is done to help minimize electronics and other materials being dropped off while the program is not in operation.

## Paying For the Program

The LWA currently pays for the operation of its permanent electronics collection through the following sources:

- **Act 190, HHW grant funding** – reimburses municipalities for 50 percent of the developmental and operational costs associated with HHW collection programs, up to a total of \$100,000 per county per year.
  - The LWA submits a grant disbursement request after an invoice is received from Envirocycle for each load of electronics. The LWA submits for reimbursement of up to 50 percent of eligible costs for staff time, associated program costs, and the invoiced amount (based on the contracted unit price per pound of material) from Envirocycle.
- **Private Donations** – The LWA accepts donations from Pa CleanWays and private entities to help offset cost of operating the electronics program.

As reported by the LWA, completed loads of electronics are taken by Envirocycle every 2-3 months at a cost of approximately \$3,000 - \$3,500 per load. Supplies such as skids, gaylords, and stretch wrap are included in the cost of the contract with Envirocycle. Staff time is the primary program cost in addition to the annual Envirocycle contract amount.

## 4.2 UNICOR

The CCSWA identified UNICOR as the preferred electronics vendor at the beginning of this study. The information below has been taken from the UNICOR website (<http://www.unicor.gov/>) and is presented to describe UNICOR's approach and methods for recycling and processing electronics.

Federal Prison Industries (trade name UNICOR) was created in 1934 by an act of Congress. UNICOR's mission is to employ and train inmates incarcerated in the Federal Bureau of Prisons. UNICOR inmate employment is strictly voluntary. UNICOR is a work/vocational training program to enhance the education and work skills of inmates. UNICOR inmates must contribute 50% of their earned wages to child support, alimony, court fines, and victim restitution as ordered by a court of law. Inmates who participate in the UNICOR program are less likely to return to criminal behavior. UNICOR receives no appropriated funding to supplement its operations. UNICOR's first recycling facility in Marianna, Florida was activated in 1994.

UNICOR has a "no landfill" policy for electronic materials. UNICOR meets the requirements of the OSHA Act of 1970 and 20 CFR 1910. UNICOR recycling centers operate in accordance with all applicable federal, state and local environmental regulations and standards. All UNICOR recycling facilities employ a full time Safety Manager on site to inspect and ensure the safety of all workers, staff and inmates. UNICOR operations take a "re-use first" approach to recycling - believing utilization of assets for their original purpose is the highest and best form of recycling. UNICOR tests all materials received; non-functional items are demanufactured for their component parts and residual materials, which are sold to reprocessors. UNICOR requires

that all reproprocessors/vendors sign a document certifying that all non-working monitors/CRTs are repaired or recycled.

All items must be completely recycled with none of the materials being landfilled. UNICOR requires that all reproprocessors/vendors sign a document certifying that they will not transfer, export or re-export, directly or indirectly to any party listed as prohibited from receiving products by the U.S. Government or prohibited by applicable law and that they are not on, or under control of any party on any such list.

UNICOR teams with many small businesses and recyclers to handle electronic waste in a cost effective, efficient and environmentally friendly manner. UNICOR accepts most electronic items for recycling. If an item cannot be reused or made functional, UNICOR breaks the equipment down into its component parts for sale for other uses. UNICOR's goal is to make sure all residual materials are recycled or resold. Addition information has been provided by UNICOR in an informational sheet included in **Appendix C**.

### **4.3 Listing of Computer Recyclers and Reusers in Pennsylvania**

The following list of computer recyclers and reusers has been taken from PADEP's website (<http://www.dep.state.pa.us>) and represents a fairly complete list of companies, organizations, and contacts that recycle and/or reuse computers and electronics:

#### **Envirocycle, Inc.**

Rte. 81, Exit 68 - PO Box 899  
Halstead PA 18822-0899  
Phone: 570-879-2862  
Contact: Greg Vorhees  
[www.enviroinc.com](http://www.enviroinc.com)

#### **UNICOR Recycling Factory**

1000 William Penn Road  
Lewisburg, PA 17837  
Phone: 570-522-7692  
Contact: Duane Lamper  
[dlamper@central.unicor.gov](mailto:dlamper@central.unicor.gov)

#### **Reclamere, Inc.**

905 Pennsylvania Avenue  
Tyrone, PA 16686  
Phone: 814-684-5505  
Fax: 814-684-6044  
Contact: Joseph P. Harford  
[www.reclamere.com](http://www.reclamere.com)

#### **The Computer Hardware Initiative Project**

Pennsylvania State University  
State College, PA  
[www.scholars.psu.edu/CHIP/](http://www.scholars.psu.edu/CHIP/)

#### **The Children's Project**

1920 West Marshall  
Norristown, PA 19403  
Phone: 610-337-4434  
Contact: Robert Toporek  
[www.project-2000-computers.com](http://www.project-2000-computers.com)

#### **Elemental, Inc.**

2371 Church Street  
Philadelphia, PA 19124  
Phone: 215-289-1475 - Fax: 215-289-4914  
Contact: Karen Petherbridge  
[eleminc@aol.com](mailto:eleminc@aol.com)  
web site: [www.eleminc.com](http://www.eleminc.com)

**Nonprofit Technology Resources**

1508 Brandywine St.  
Philadelphia, PA 19130  
Phone: 215-564-6686  
Contact: Stan Pokras  
[www.libertynet.org/ntr/](http://www.libertynet.org/ntr/)

**A-Plus Industries, Inc.**

415 N. 15th St., 2nd Floor  
Allentown, PA 18102  
Phone: 610-821-5550  
Contact: Glorinda Cook  
[gcook@aplusindustry.com](mailto:gcook@aplusindustry.com)

**Equipmed Services**

PO Box 735  
Bethlehem, PA 18016  
Phone: 610-691-4410, 800-527-2560  
Contact: Richard Schmidt  
[equipmed@fast.net](mailto:equipmed@fast.net)

**LAA Ltd.**

3327 West Queen Lane  
Philadelphia, PA 19129  
Phone: 215-848-1207  
Contact: Bob Sheppard  
[www.scrapmarketplace.com](http://www.scrapmarketplace.com)

**North Light Community Center**

175 Green Lane  
Philadelphia, PA 19127  
Phone: 215-483-4800  
Contacts: Irene Madrak, Ed DiMadia

**Russell A. Morello and Sons, Inc.**

18 Maple St.  
Conshohocken, PA 19428  
Phone: 610-828-1612  
Contact: Joe Morello

**Hi Tech Scrap**

214 North Lexington St. - Point Breeze  
Pittsburgh, PA 15208  
Phone: 412-731-5805  
Contact: Donald Roethlein

**Second Source**

1241 West Chester Pike  
West Chester, PA 19382  
610-692-9200  
[www.secondsourceonline.com/](http://www.secondsourceonline.com/)

**Ko Enterprises**

4204 E. Thompson St.  
Philadelphia, PA 19137  
Phone: 215-743-9140  
Contact: Chi Huang

**Advanced Environmental Recycling Co., L.L.C.  
Mercury Technologies International, L. P.  
(AERC/MTI)**

2591 Mitchell Avenue  
Allentown, PA 18103-6609  
Phone: 800-554-2372  
Contact: Judy Dolce  
[www.aercmti.com](http://www.aercmti.com)

**GreenSpan Computer Stewardship and  
Recycling Co.**

Recycling facility: 201 N. Braddock Ave  
(enter off of Thomas Blvd. at end of  
building)  
Point Breeze  
Pittsburgh, PA 15208  
Phone: (toll free) 1 866 904 7726  
Fax: (412) 767 5260  
[agreenspan1@earthlink.net](mailto:agreenspan1@earthlink.net)  
[www.agreenspan.org](http://www.agreenspan.org)

**ECS&R/ReCom**

3237 US Highway 19  
Cochran, PA 16314  
Phone: 814-425-7773  
Contact: Jeff Trotter

**Midway Fire Company No. 2**

17 E. Manor Ave  
Enola, Pa. 17025-2822  
Phone: 717-732-3977  
Fax: 717-901-6164  
Contact: David McClure, President  
[davidm@paonline.com](mailto:davidm@paonline.com)

## 5.0 PROPOSED CCSWA PERMANENT ELECTRONICS DROP-OFF PROGRAM

The CCSWA is interested in operating a proposed permanent electronics recycling program in order to provide Clinton County residents with an outlet to dispose/ recycle electronics in an environmentally responsible manner. As reviewed in Section 4.0, there are potential environmental hazards associated with landfilling or other inappropriate disposal methods of these items that further emphasize the benefits of recycling these materials.

### 5.1 Acceptable Electronics

As proposed, the CCSWA permanent electronics program would accept electronics at the existing materials recovery facility (MRF) located at the Wayne Township Landfill site. A final determination of the list of accepted electronic materials will be made when, and if, the CCSWA elects to implement the proposed program. As reviewed with the CCSWA, the following list of electronics is proposed to be accepted by the CCSWA permanent electronics program:

- Computer Systems\*
- PDAs
- Printers
- Scanners
- Cordless/Corded Phones
- Cell Phones
- Pagers
- Answering Machines
- Fax Machines
- Copiers
- Audio Visual Equipment
- Televisions
- VCRs
- CD Players
- DVD Players
- Radios
- Stereos
- Video Game Consoles
- Cameras
- Calculators
- Adding Machines

\*Computer accessories such as keyboards, mouse, and related peripherals are accepted. The CCSWA does not intend to accept HHW materials for collection with the permanent electronics program, and may add or delete items from the list if needed.

### 5.2 Estimated Quantity of Electronics for the Proposed CCSWA Program

As reviewed in this report, there are only two existing permanent electronics drop-off facilities in Pennsylvania, one located in Lancaster County and one in Westmoreland County. Therefore, there is little historical information available for estimating/ projecting electronics material generation for a proposed permanent electronics drop-off facility. In addition, demographics, number of material types collected, education outreach and participation, and even weather and other factors may impact the annual quantity collected and the participation rate for an electronics drop-off program. Participation may also be influenced by the level of public information efforts.

With these qualifiers in mind, **Table 1** (below) presents the pounds per capita generation of the Lancaster and Westmoreland County permanent electronics drop-off facilities. For comparison, this per capita generation rate was applied to Clinton County’s population to estimate the quantity of electronics anticipated for the proposed CCSWA electronics program. The per capita generation information and estimate provided is not intended to be statistically significant and is provided for comparison and reference purposes only. It is important to note that each existing permanent electronics facility indicated that the majority of participants were located within a 20-30 mile radius of their facility.

As shown in the table, the estimated range of CCSWA electronics (6,000 - 7,000 pounds) is based on a per capita generation rate of .0160 – 0.190. This rate is derived from the annual collection data (year 2000 population / annual collection totals in pounds) from the two existing permanent electronic sites shown in the table. CCSWA planning and operation activities could consider an estimated annual generation number/ range of 8,000 – 20,000 pounds for the proposed program. The initial year of the program may yield higher quantities than subsequent years.

**Table 1: Electronics – Per Capita Generation and Clinton County Estimated Annual Quantity**

Electronics Facilities	County	Population (Approx.)	Annual Quantity Collected (Pounds)	Pounds Per Capita of Electronics
Lancaster County Solid Waste Management Authority	Lancaster	470,000	75,000 - 90,000 <sup>(1)</sup>	0.159 – 0.191
Loyalhanna Watershed Association	Westmoreland	370,000	60,000 <sup>(2)</sup>	0.162
<b>CLINTON COUNTY - ESTIMATED QUANTITY</b>				
Clinton County Solid Waste Authority	Clinton	37,000	6,000 – 7,000 <sup>(3)</sup>	0.160 – 0.190

(1) The LCSWMA facility collected approximately 75,000 lbs. of electronics in 2002 and 90,000 lbs. in 2003.

(2) The LWA facility collected approximately 60,000 lbs. over a 12-month period beginning in March 2003.

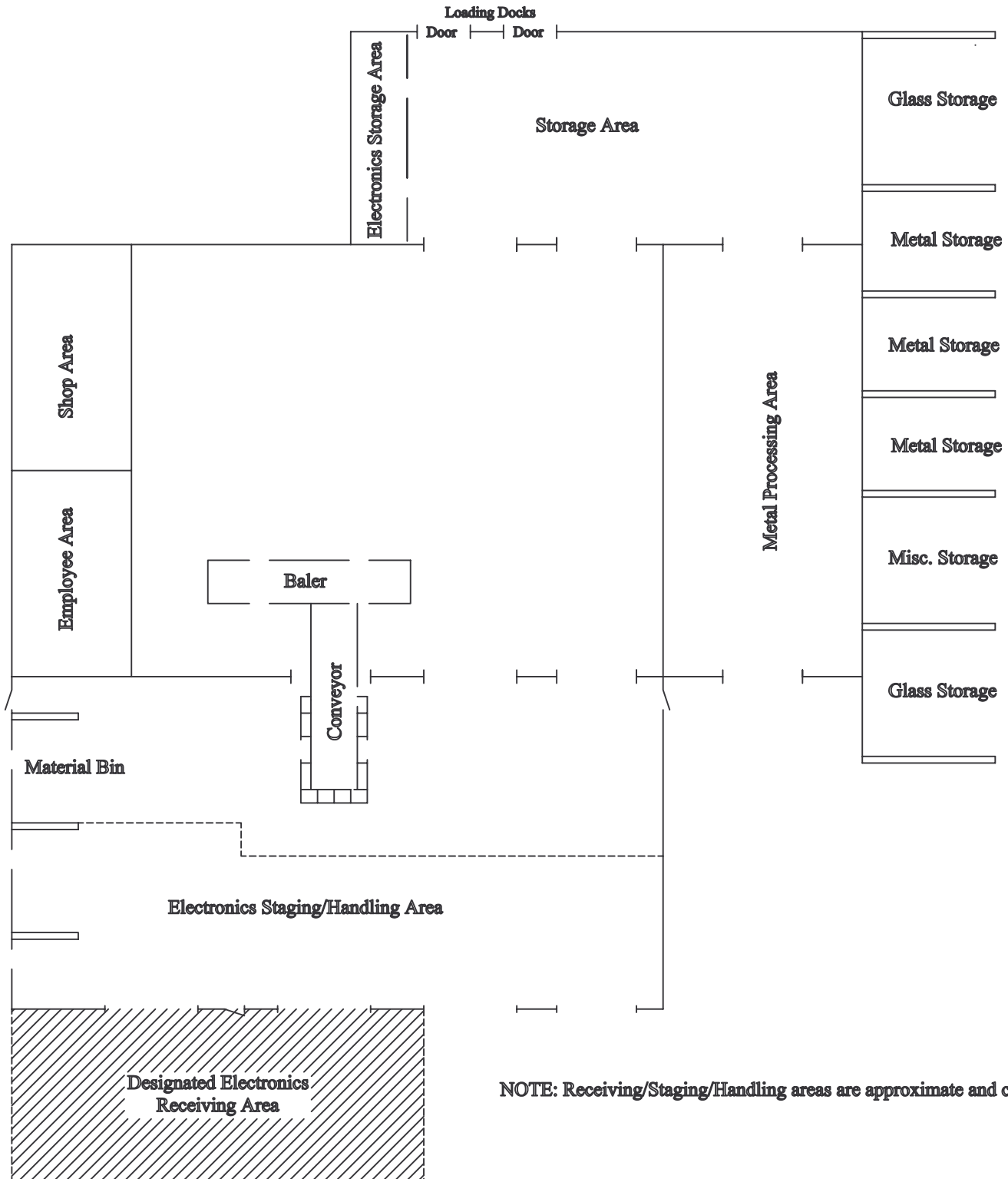
### 5.3 Receiving and Processing Electronics at the CCSWA MRF

As conceptualized, residents with electronics could enter the site along the MRF access road from Pine Mountain Road. Residents would be directed by signs to the designated electronics drop-off area located at the southern side of the MRF in front of four overhead bay doors (refer to **Figure 1**). CCSWA staff would assist the resident as needed to unload the materials directly into gaylord and/or onto pallets. As discussed with the CCSWA and as observed at the Lancaster County HHW facility, it is preferred that electronics get placed in gaylord containers. UNICOR recommends monitors and CPU’s be placed on separate skids and shrink wrapped, but have agreed to accept these items in gaylords from the CCSWA’s recycling facility.

**FIGURE 1**

# Clinton County Solid Waste Authority Material Recovery Facility

## Proposed Permanent Electronics Program Conceptual Receiving & Handling Areas



NOTE: Receiving/Staging/Handling areas are approximate and conceptual only.

Miscellaneous electronics and remaining computer peripherals would also be placed directly into gaylord boxes. In some instances (e.g. when handling more than one customer at a time) it may be beneficial to use a cart to place and move electronics. A photograph of the cart used at the LCSWMA HHW facility is shown (right) for reference.



After loading, the full gaylords/ skids of CPU's and monitors could be temporarily stored in the existing storage area inside the MRF or loaded directly onto a box trailer. Once a load was completed (approximately 22 skids of non-double stacked pallets), the CCSWA may schedule a delivery to UNICOR or a contracted recycling vendor. UNICOR is located in Lewisburg, Pennsylvania and is approximately 50 miles from the CCSWA facility. Based on review of the LCSWMA operation and LWA operation, it is estimated that the CCSWA could expect to send 1-3 box trailers to UNICOR per year. Factors such as public education and participation, demographics (including the population within 20-30 miles of the drop-off point), loading methods, and trailer size may impact the frequency of deliveries.

### Operating Schedule

Based on information gathered during this project from other permanent electronic operations, along with considerations of impacts to the CCSWA Landfill operations, it may be beneficial to limit the number of days when electronics will be received at the MRF. Limiting electronics collection at the MRF to one or two days per week (during normal operating hours) may help to minimize the operational impact at the MRF. Staff will be needed to assist residents unloading at the designated drop-off area. Staff will also need to stack, shrink wrap, and store the electronics.

### **5.4 Packaging and Shipping Requirements**

In general, shipping and handling requirements will be specified by the company or vendor that will be receiving and processing the electronics. The packaging requirements for UNICOR's electronics program have been provided below as an example. Based on review of other electronics vendors, UNICOR's requirements of packaging electronic items are very similar to other electronics vendors. The packaging requirements and information presented below is located UNICOR's website (<http://www.unicor.gov/>).

It is noted that discussions were held with UNICOR about shipping requirements, and UNICOR was agreeable to the CCSWA's proposed use of gaylord boxes for electronics as an alternate for shrink wrapped pallets.

### **Packaging:**

Material must be packaged by the generator for pickup. The material must be placed on pallets, either in Gaylord boxes or shrink wrapped directly to the pallet. By packing the items tightly on the pallet or tightly within a Gaylord, breakage and shifting is diminished. By using



pallets, the material can be loaded and unloaded using a forklift. The use of a forklift and a loading dock is therefore required. If an item is bigger than a pallet or Gaylord (such as cabinets or main frames or any other large electronic item), the item must be placed in the trailer in such a way so that it can be loaded and unloaded easily.

**Monitors:**

Monitors should be skidded 4 rows high with cardboard between rows. The monitors should be placed face down on the cardboard to protect the screens. Shrink wrap each layer several times. Pull the shrink wrap tightly to ensure the product does not come apart in shipment.



**CPUs:**

CPU's should be skidded up "head" high, stacked and tightly shrink wrapped.



**Printers:**

Printers should be skidded and shrink wrapped if they are able to be stacked in a safe manner. Otherwise, place printers neatly in a Gaylord container or boxes. The Gaylord box must be placed on a pallet.



## 5.5 Cost For Implementing the CCSWA Permanent Electronics Program

It was not part of this project scope of work to provide cost information or evaluate costs related to the implementation and operation of the CCSWA's proposed permanent electronics drop-off program. However, some related cost information is presented in this section based on findings from background research conducted during this study.

At the beginning of this project, the CCSWA had the understanding that electronics collected at landfill locations and delivered to the UNICOR facility for processing were accepted at no cost to the landfill (or any landfill). However, UNICOR indicated in a phone conversation with GF that they were forced to start charging for this service to cover the costs for recycling and processing of the materials. UNICOR has indicated it would assess a charge of \$.05 per pound for electronics delivered to their door by the CCSWA. As an example, if the \$.05 per pound rate (which does not include transportation costs) is applied to the 75,000 lbs of electronics collected by the LCSWMA's electronics program in 2002, the annual cost (paid to UNICOR for recovered electronics) is approximately \$3,750. Recognizing that Lancaster County's population is nearly 13 times that of Clinton County (and that the expected quantity of electronic material recovered by the CCSWA will be far less than in Lancaster), the annual cost paid out to UNICOR or another electronics vendor for material collected by the CCSWA will be a relatively nominal cost (especially when considering the available state funding sources).

UNICOR indicated it was not their desire to charge a unit cost per pound to landfills, but had experienced several problems with landfills that decreased the value of the electronics received. These problems in turn increased UNICOR's costs. The increased cost to UNICOR resulted from some landfills picking out the valuable electronics for sale and sending UNICOR only the leftover, less-valuable electronics. Some landfills generated revenue for electronics by charging residents a fee for accepting electronics, while UNICOR was offering a free service to the landfill. Further, some landfills accepted electronics from large businesses, and it was not the intent of UNICOR to act as a free disposal service for large businesses.

Cost information was gathered from several municipalities that previously bid for electronic collection services. Based on the information reviewed, Envirocycle, Inc. had been the lowest cost responsible bidder (provided lowest cost per pound) for several recent competitive bids for electronics recycling services.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

The CCSWA has the necessary infrastructure in place to operate a permanent electronics drop-off program at the MRF located at the Wayne Township Landfill site (refer to Section 5.2 of this report). From review of other permanent electronics programs, it appears that it is economically feasible for the CCSWA to implement this program. Additionally, there is grant funding available to help fund eligible portions of this program, which has been confirmed in discussions with PADEP. The actual cost of the program would be determined by actual residential participation (amount of material collected), related educational efforts, actual staff time required, grant reimbursements, and any other associated costs.

From information gathered from the two operational permanent electronics drop-off programs in Pennsylvania, it is not expected that the CCSWA program would collect near the quantity of electronics as the permanent electronics drop-offs located in Lancaster and Westmoreland (both having significantly larger populations). As a conservative estimated range, the CCSWA program (if implemented) may collect 8,000 – 20,000 lbs per year depending on a variety of factors identified in this report. (refer to Section 5.2). Based on this quantity estimate (range), the CCSWA would need to transport a box trailer (assuming 48’ – 52’ in length; with single-stacked skids) one or two times a year to UNICOR facility or a contracted electronics vendor facility.

Based on GF’s study findings the CCSWA essentially has two options in securing electronics recycling and processing services for materials collected by the proposed program:

- 1) Complete UNICOR’s (a.k.a Federal Bureau of Prisons) Customer Registration Form (Attachment B) and execute a Memorandum of Understanding (MOU) with UNICOR; a recycling facility operated by voluntary prison labor that will accept electronics delivered to their facility in Lewisburg, Pennsylvania at a cost of \$0.05 per pound.
- 2) Issue a competitive bid to secure a contracted electronics vendor to provide the required electronics services. Some electronics vendors will provide a box trailer, transportation of completed loads to their facility, and supplies (e.g. gaylords, skids, shrink wrap, etc.), all within the cost per pound provided in a bid response/ contracted price per pound. The cost information reviewed during this study for contracted electronics collection services ranged from \$.18 - \$.24 per pound for monitors, \$0 - \$.20 per pound for CPU’s, and \$15 – \$.20 per pound for computer peripherals. Sharp, Panasonic, Sony, and JVC items ranged from \$0.05 – \$0.10 per pound.

The CCSWA will have to determine if using UNICOR or a contracted electronics vendor is the better option. The cost per pound of material should not be the driving factor in this decision, because it amounts to a relatively nominal annual cost as estimated for Clinton County. For example, if you conservatively estimated that the CCSWA program collected 20,000 lbs of electronics in a 12 month period, this would total \$1,000 @ \$.05 for UNICOR or \$4,000 @ \$.20 for a contracted electronics vendor (a contracted vendor may supply all necessary materials, a box trailer, and transportation in their cost per pound). Therefore, the primary decision faced by the CCSWA is whether or not to procure a recycling trailer, procure other necessary equipment for the program and provide a driver for transporting the material, or to have a contracted electronics vendor provide these item and services as part of the contract agreement.

### **Education**

- If the CCSWA moves forward with implementing an electronics program, it is recommended that the CCSWA advertise the proposed permanent electronics program in advance of the program coming on line. This could be done through educational newsletters, brochures, and other sources of media that are available.

- If implemented, it is recommended the CCSWA provide ongoing education and information distribution related to electronics and consider education as a cost to be included as a budget item (state grant assistance may help partially fund this program).

### **Permanent Electronics Program – Operation**

- If the electronics program is implemented, it is recommended that clearly labeled signs be placed at the facility entrance and near a designated electronics area that indicate hours for electronics receiving, direct residents to the unload area, and provide related information as needed.
- It is recommended that the CCSWA limit the number of days the MRF accepts electronics to one or two days per week to minimize the operational impact at the MRF/ landfill. Although the impact (number of residents arriving at the facility per week) will be fairly small, there will be some time required to assist residents unloading electronics at the designated drop-off area. Limiting the number of days electronics arrive at the facility should also make it easier for the CCSWA to plan for receiving, processing and storing the electronics.

The CCSWA should remain flexible and adjust the collection schedule as needed to maximize efficiency and minimize impact to other landfill operations. The CCSWA may also allow residents to make arrangements for drop-off. Based on review of the LWA, Westmoreland County electronics program, it does not appear that limiting the number drop-off days will negatively impact the total participation/ collection throughout a given year.

### **Funding**

If the CCSWA elects to move forward with a permanent electronics drop-off program, the CCSWA should pursue grant funding and consider using the additional methods of funding presented below:

- **Act 190, Chapter 2, Household Hazardous Waste Collection Grant** – Reimbursement to registered sponsors of collection programs for household hazardous waste, electronics, and tires (not tire pile cleanups). Available for up to 50% of eligible costs. Eligible costs typically include collection, transportation, management of the wastes, & education.
- **Act 190 of 1996 (Section 901, Act 101)** - Passed on November 25, 1996, Act 190 (The Small Business and Household Pollution Prevention Act; originally H.B.1929) provides up to 80 percent reimbursement (to counties only) to develop and implement pollution prevention education programs for households and small businesses, even if conducted in the absence of a collection program.
- **Private Donations** – Private donations from organizations such as PA CleanWays and other private entities may be used to help offset cost of operating the electronics program.
- **Host Municipality Fee** - One option for municipalities hosting municipal waste landfills or resource recovery facilities is to fund programs with the host municipality fee, a fee required by Act 101. Regulation specifies a minimum fee of \$1 per ton of waste received, but provides latitude to negotiate with the facility for a higher fee to help pay for its programs.

**APPENDIX A**

Electronics Recycling - Monthly Tracking Sheet



Date \_\_\_\_ - 200\_\_

**Electronics Recycling  
Monthly Tracking Sheet**

<b>Municipality</b>	<b>Participants</b>	<b>Monthly Total</b>
Allison township		
Avis borough		
Bald Eagle township		
Beech Creek borough		
Beech Creek township		
Castanea township		
Chapman township		
Colbrook township		
Crawford township		
Dunnstable township		
East Keating township		
Flemington borough		
Gallagher township		
Greene township		
Grugan township		
Lamar township		
Leidy township		
Lock Haven city		
Logan township		
Loganton borough		
Mill Hall borough		
Noyes township		
Pine Creek township		
Porter township		
Renovo borough		
South Renovo borough		
Wayne township		
West Keating township		
Woodward township		
Notes:		

**APPENDIX B**

P E N N S Y L V A N I A

# Consumer Electronics Recycling

## Recycle Your Old Computer Equipment

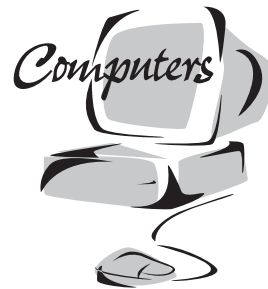
At the Lancaster County Solid Waste Management Authority's  
Household Hazardous Waste Facility  
1299 Harrisburg Pike, Lancaster, PA 17604

Monday & Tuesday	12:30 p.m. - 3:30 p.m.
Wednesday, Thursday, Friday	8:30 a.m. - 12:00 noon
2nd & 4th Saturday of each month	7:30 a.m. - 10:30 a.m.

**Lancaster County Residents**  
can recycle their computer for NO CHARGE. This includes associated items,  
such as monitors, printers and keyboards.

**Small Business**  
can recycle up to 25 computers. The first 5 will be recycled for NO CHARGE; after that there  
is a \$5 fee for each monitor and a \$5 fee for each CPU.

Come drop off for recycling your unwanted or used  
Computers and Accessories



Trashing your outdated hardware just doesn't compute.

Computers and accessories, televisions and other electronic equipment contain materials such as lead, mercury, cadmium and chromium. These materials need to be handled properly, so they are not released into the environment.

For more information about the facility, or what to bring, please  
visit [www.lcswma.org](http://www.lcswma.org) or call (717) 397-9968.

For more information on eCycling and for lists of other events across the state, visit  
the PA PowerPort at [www.state.pa.us](http://www.state.pa.us), PA Keyword: "Electronic Discards."



**Mark Schweiker**, Governor  
**David E. Hess**, Secretary





# Protect the Environment: Recycle Your Computer

A Service for Lancaster County Residents and Businesses



**We accept your computer scrap:**

- Monitors
- Computers (main CPU)
- Peripherals: mouse, keyboards, printers, scanners, etc.

## **Recycle America – Dixon Recyclers**

A service of Waste Management  
702 South Prince Street, Lancaster, PA 17603  
(717) 396-9999

### **Pricing**

Residents and businesses are welcome.

The following charges apply:

Monitors: 35 cents per pound

Computers (main CPU): 2 cents per pound

Peripherals: 13 cents per pound

*Note: These prices represent delivered items with minimal handling requirements.*

### **Hours**

Saturday: 8:00 AM – 11:30 AM

### **Businesses**

- Pick-up service can be arranged for acceptable quantities of computer scrap. Transportation and handling costs of this service are not reflected in prices above.
- No limit on the number of units to be picked up or delivered.

## **Lancaster County Solid Waste Authority**

1299 Harrisburg Pike, Lancaster, PA 17604  
(717) 397-9968

### **Pricing**

Lancaster County Residents: **FREE!**

Lancaster County Businesses: Up to five computers accepted **FREE!** After that, the charge is \$10 per monitor; \$5 per computer.

### **Hours**

Monday through Friday: 8:30 AM – 3:30 PM  
2nd and 4th Saturday of each month:  
7:30 AM – 10:30 AM

### **Hours After Labor Day**

Monday and Tuesday: 12:30 AM – 3:30 PM  
Wednesday, Thursday, Friday: 8:30 AM – noon  
2nd and 4th Saturday of each month:  
7:30 AM – 10:30 AM

Bring your computer(s) to the Household Hazardous Waste facility at 1299 Harrisburg Pike. For more information, visit our web site at [www.lcswma.org](http://www.lcswma.org) or call (717) 397-9968.



**LANCASTER COUNTY  
SOLID WASTE MANAGEMENT  
AUTHORITY**

**APPENDIX C**

# Reuse Your Resources



**UNICOR**



## Recycle

UNICOR can find a use for your unwanted electronic equipment.



## Recover

We can arrange to pick up your donation.



## Redistribute

No part goes to waste. If we cannot recycle it we will break it down into useful components.



## Resell

Our recycled electronic components are resold at competitive prices.



## Reuse

Reuse of all recycled material benefits the customer, the recycling vendor and the earth.

### Benefitting Others, Helping the Environment ... and You!

Everyone benefits when government agencies and private sector companies use the UNICOR recycling program. UNICOR's inmate labor force is trained to provide a service that is an asset to both public and private sectors, in protecting our environment. As a self-sustaining federal government corporation, all income earned by UNICOR is reinvested in the company's operations.

We provide competitively priced electronic recycling services that meet all federal, state and local codes. If an item cannot be reused we demanufacture it into components that will be recycled. We make sure every part and component gets reused or recycled.

Upon request, UNICOR can provide complete documentation of the recycling process used on your electronic equipment.



In 1999, UNICOR's Electronic Recycling Program won the White House Task Force "Closing the Circle Award" for recycling non-hazardous waste.

### Discovering Potential...

Since UNICOR accepts various electronic items for recycling, we offer a wide variety of items for sale after we de-manufacture the electronic equipment.

Put old, broken or surplus computer or electronic equipment to good use—let UNICOR recycle it. We can arrange to pick up significant quantities. Your donation may even qualify for a tax deduction. We accept donations from public organizations, private companies and government agencies. Please contact UNICOR at 202 305-3768 or 202 305-3884. Visit our website at [www.unicor.gov](http://www.unicor.gov) to find out more about how to take advantage of this opportunity.

Note: Item availability changes due to variety of items collected.



### Question:

How does recycling benefit you?

### Answer:

Federal Government agencies, as well as private companies are encouraged to be part of the environmental solution by reducing their trash sent to landfills, therefore saving money and potential environmental liabilities.

Electronics

Recycling

Services

**Question:** What type of material can be recycled?

**Answer:** UNICOR accepts most electronic items for recycling. If an item cannot be reused or refurbished, we break it down into parts that are sold for other uses. Our goal is to make sure every part is recycled or resold.

**Question:** Who can donate and who do I contact?

**Answer:** We accept donations from public agencies and private entities. Please contact UNICOR's Recycling Representative at 202-305-3732 or [Inovicky@central.unicor.gov](mailto:Inovicky@central.unicor.gov).

**Question:** Is the process documented?

**Answer:** Yes, UNICOR can provide cradle to grave documentation on recycled products if required.

**Question:** Why recycle computers?

**Answer:** Computers contain many potentially hazardous materials (lead, mercury, cadmium, etc.) Landfilling your computer poses a threat to the environment, along with health concerns.

**Question:** Who can buy refurbished parts and where can I see an inventory?

**Answer:** Public organizations, private companies and government agencies can purchase recycled products. Call UNICOR at 202-305-3732 for a list of available products, or contact UNICOR at [Inovicky@central.unicor.gov](mailto:Inovicky@central.unicor.gov).

**Question:** How much does UNICOR's recycling program cost the public?

**Answer:** As a self-sustaining government-owned corporation, UNICOR uses no congressional appropriations for their operating funds. Therefore the sale of recycled components and refurbished products fully fund this environmentally sound program.

