

Old electronics piling up in Virginia, nation

Concern grows as e-waste proliferates and no one knows where it all goes

BY REX SPRINGSTON

Times-Dispatch Staff Writer

Virginians are creating piles of potentially dangerous waste.

The problem is old electronics, or e-waste — computers, cellphones and other gadgets that people toss because they've found something newer and shinier.

"It's not factory waste but post-consumer waste that's coming out of your hands, my hands or anybody's hands," said Jim Puckett, director of the Basel Action Network, a Seattle-based environmental group.

The old electronics are laced with pollutants, such as lead and cadmium, that have been linked to cancer, nervous-system damage and other problems.

No one is sure how much e-waste Virginians produce. No one tracks it closely, in Virginia or nationally. But everyone agrees it's a lot.

The Environmental Protection Agency says the U.S. discarded about 2.25 million tons of electronics in

See **WASTE**, Page A11

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Tp E-waste

- See a video about computer recycling and find out about the effects of electronic waste. Go to TimesDispatch.com, search: e-waste.

Proper disposal

- Certification programs ensure proper recycling of electronics. **Page A12.**

Where to go

- Consumers and businesses have options for recycling used electronics. **Page D1.**



ALEXA WELCH EDLUND/TIMES-DISPATCH

Peter Parthemos unloads monitors at Computer Recycling of Virginia near Tappahannock. Since 2006 it has recycled and refurbished about 47,000 formerly state-owned computers that were replaced by Northrop Grumman under that company's contract to provide technology services to the state.

VIRGINIA'S E-WASTE



LINDY KEAST RODMAN/TIMES-DISPATCH

Waste

From Page A1

2007, the most recent year for which even a rough estimate is available.

That's about 14½ pounds — roughly the weight of a couple of laptops — for every U.S. resident. It's also nearly a three-fold increase from the estimated 850,000 tons in 1997, according to the EPA.

"There's so much of it, and it's being generated at an increasing rate in the U.S. and worldwide," said Dan Gallo, an environmental protection specialist for the EPA.

And no one knows precisely where it all goes. Most of it ends up in landfills that are safe now, regulators say, but which critics say will leak someday.

A portion of the waste — the amount is in dispute — gets exported to such places as China and Africa, where workers in unsafe conditions extract valuable copper and other materials using open fires and acid.

Most aspects of e-waste are unregulated, federally and in Virginia. "We're not deeply involved in how computers are managed in Virginia, other than encouraging that they be recycled or donated so they can have continued life," said Steve Coe, recycling specialist with the state Department of Environmental Quality.



The state and federal governments oversee the disposal of cathode-ray tubes, or CRTs — the big, glassy parts in old computer monitors and TVs — which can contain up to 8 pounds of lead, a toxic metal.

But while some states ban resi-

Virginia localities can ban people from tossing lead-laden CRTs in the trash, but few localities — and none in the Richmond area — do that.

Of the electronics discarded in 2007, more than 80 percent went into landfills, the EPA says. Everyone agrees that's a waste of landfill space and valuable materials that can be recycled. The question is whether that dumping endangers the public.

The EPA says no, because modern landfills are equipped with plastic underground liners and systems designed to limit pollution.

"If properly managed, the disposal of electronics in landfills can be safe," Gallo said.

Others fear that even the most modern liners will leak someday, allowing e-waste-tainted "garbage juice" to pollute underground water, which can feed wells and streams.

"The heavy metals are there for the long, long term, and I don't think the liners are there for the long, long term," said Roger Die-drich, who deals with waste issues for the Virginia chapter of the Sierra Club.

Acidic liquids in landfills can dissolve hazardous metals in e-waste such as lead and copper, said John T. Novak, a Virginia Tech professor of civil and environmental engineering.

If the landfill leaks, those metals can contaminate groundwater, but operators of properly built landfills should prevent that by pumping out and treating the liquids, among other measures, Novak said.

Landfills contain lots of nasty things, including treated wood containing copper and arsenic. You can debate the wisdom of building big landfills, but there is nothing really unique about the threat of the e-waste in them. Nonhazardous



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A box of power supplies is ready for recycling at Computer Recycling of Virginia, a nonprofit near Tappahannock.

or recycled.

Much of the recycled waste is ultimately broken down into parts such as plastic and metals that can be used to make such products as parking-lot curbs and lead-acid batteries.

Although it sounds wonderful to recycle, critics say a lot of e-waste that is diverted toward recycling gets shipped to developing countries.

"Eighty percent of what you hand over to a recycler in this country is going to end up offshore," said Puckett, the Seattle environmentalist.

The exports can be legal, particularly if they don't involve cathode-ray tubes. But, critics say, some exports endanger overseas workers and mislead Americans who in good faith take their old computers and other items to recycling sites — sometimes paying for the privilege.

The EPA's Gallo said he does not know what portion of the exports is

ported electronics, Gallo said.

Robert Houghton, president of Redemtech, an Ohio-based company that repairs and recycles old electronics, said, "I think it's absolutely truthful to say that there are no completely reliable statistics" on where e-waste goes.

Some say Congress will eventually have to stop the improper handling of e-waste.

"We stopped companies from throwing stuff in rivers a long time ago," Houghton said. "This really isn't very different."

The state DEQ's Coe said he believes recycling companies in Virginia are operating properly — partly because they are truly "getting green" and partly because they fear getting bad publicity.

"There's a business risk if they don't do the right thing," Coe said.



At AERC Recycling Solutions, computers are dismantled and the parts sorted for recycling. Other electronic equipment is refurbished and sold. AERC, a Pennsylvania-based company, runs two warehouse-like plants near Ashland.

Chemicals and your body

Many computers, televisions and other electronics end up in landfills. Those items contain toxic chemicals, which critics say could leak out of the landfills someday and pollute underground water. People dismantling electronics in unsafe conditions also could be exposed. Here's a look at some of the chemicals and their health effects:

Arsenic: Can cause lung cancer, nerve damage and some skin diseases if exposure is long term.

Barium: Can lead to brain swelling, muscle weakness, increased blood pressure and damage to heart, liver and spleen.

Cadmium: Long-term exposure can lead to kidney damage and damage to bone structure; short-term exposure can cause weakness, fever, headache, chills, sweating and muscle pain.

Chromium IV: Can lead to a strong allergic reaction and damage to DNA cells.

Dioxins and furans: Can cause

metal. But while some states ban residents from dumping CRTs and other electronics in landfills, Virginia does not.

Among Virginia's neighbors, North Carolina and West Virginia will start banning the dumping of computer equipment and TVs next year. Maryland has no ban or plans for one.

Virginia allows individuals to dump old electronics with their household garbage, which ends up in a landfill.

...but there is nothing really unique about the threat of the e-waste in them, Novak said.

"A landfill is almost like a biological experiment," said Scott Mouw, North Carolina's recycling director.

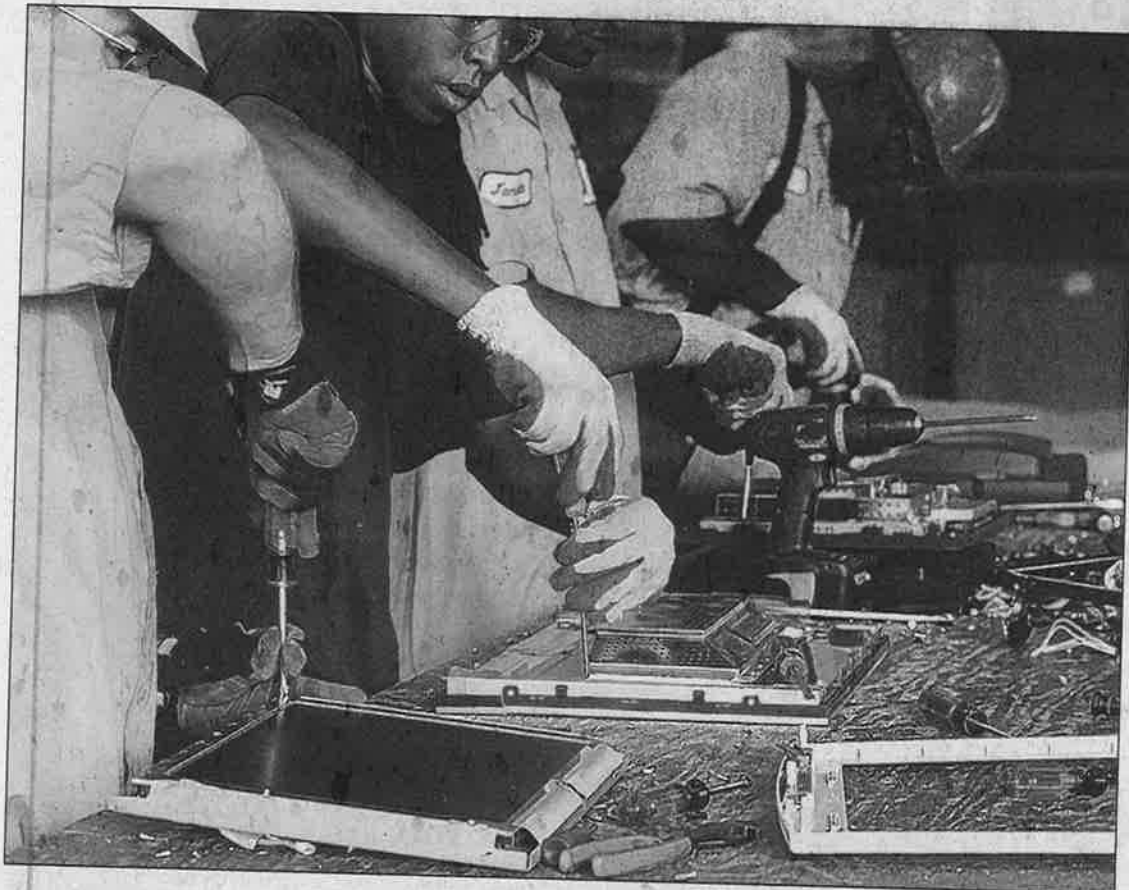
"To me, it's common sense" to recycle or reuse electronics, he said, and not put them where they might cause problems.

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While most of the high-tech castoffs go into landfills, the rest are either repaired and put back into use,

...the EPA's Gallo said he does not know what portion of the exports is handled improperly, but, "We think it's not as large as what's being portrayed" in the media.

The Government Accountability Office said in a scathing 2008 report that the EPA did little to stop recyclers from sending e-waste overseas. Used electronics other than CRTs flow "virtually unrestricted" to developing countries, the report said.

The EPA is planning a study to better determine the fate of ex-



LINDY KEAST RODMAN/TIMES-DISPATCH

Computer e-waste coordinators (left to right) Jerry Ferguson, Brandon Harris, Jemelle Thornton and Frederick Terry dismantle computers at AERC Recycling Solutions near Ashland.

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Virginia's e-waste in 2009 included 20,370 computers and other electronics owned by state agencies, state officials said. AERC Recycling Solutions, a Pennsylvania-based company, dealt with the electronics at a cost of \$217,587. AERC's services included recycling computer parts and erasing data from computer hard drives. AERC runs two warehouse-like plants near Ashland.

In addition, Computer Recycling of Virginia, a nonprofit near Tappahannock, recycled and refurbished since 2006 about 47,000 formerly state-owned computers that were replaced by Northrop Grumman under that company's contract to provide technology services to the state. The payment to Computer Recycling totaled \$230,515, Northrop Grumman said.

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The potential danger of e-waste has been known for years, but there is a growing concern over its proliferation and the lack of transparency about its ultimate resting place.

"I don't know [where Virginia's e-waste goes] and I don't exactly know how to find out," said Sierra's Diedrich.

Could part of the issue be semantic?

Using the term "e-waste" for valuable used electronics adds to the problem, said Eric Harris, associate counsel for the Institute of Scrap Recycling Industries, a trade group.

"If we keep on calling it a waste," Harris said, "we're encouraging the type of behavior that is associated with waste."

Things would be better, Harris said, if we called the stuff "scrap."

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...to a strong allergic reaction and damage to DNA cells.

Dioxins and furans: Can cause hormonal disruptions, damage to a fetus, reproductive harm and lead to an impaired immune system.

Lead: Can cause brain, nerve and kidney damage, blood disorders and can also lead to developmental damage to a fetus.

Mercury: Ingesting or inhaling can damage kidneys and the central nervous system.

Selenium: In high concentrations can lead to selenosis, which causes hair loss, brittle nails and neurological impairment.

SOURCE: Silicon Valley Toxics Coalition

McDonnell's view

Virginia is not among the states that bar residents from dumping electronics in landfills. The McDonnell administration said the rules of disposal are something that could be revisited in the future, however.

"It's currently illegal to dump e-waste with one exception," said Stacey Johnson, a spokeswoman for the governor. "If the originator is a household, there is nothing to prevent them from putting it in the local trash system."

"Any kind of ban on that would be nearly impossible to enforce," she said. "That's why we have focused on having manufacturers develop a mandatory system to take back computer components at any time for recycling."

— Olympia Meola