

Pennsylvania Department of Environmental Protection
Lead Ban Surveillance Project 2007



Bureau of Water Standards and Facility Regulation
Safe Drinking Water Program

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Introduction

Lead is an element occurring naturally in the environment. It can be introduced to the body through food and drink, as well as through inhalation or ingestion of non-food products containing lead. Lead is known to be toxic to humans, accumulating in the skeletal system, where it can remain for decades. Exposure to lead at levels as low as 0.015 mg/L in drinking water can lead to serious health problems such as developmental delays and attention deficits in children, and kidney problems and high blood pressure in adults. Additionally, prolonged exposure can cause brain, nervous system, and hearing damage along with headaches in children, as well as memory problems, pregnancy complications, reproductive problems, and muscle and joint pain in adults.

While lead does not usually occur naturally in water sources, it enters drinking water through corrosion of plumbing materials which the water passes through. Water becomes corrosive when it has a low pH, low mineral content, or high dissolved oxygen content. The Lead and Copper Rule of the Safe Drinking Water Regulations requires public water suppliers to install corrosion control treatment if the lead level is above 0.015 mg/L at more than 10% of the household taps that are sampled. The Pennsylvania Plumbing System Lead Ban and Notification Act prohibits the use of leaded solders in potable water plumbing. As a result of these regulations, lead exposure from drinking water has been significantly reduced over the last 15 years. The following report details the history of the Pennsylvania Lead Ban Act and intern surveillance project, and provides a summary of the work completed by the 2007 Lead Ban intern.

Background: Solder

Solder is a metallic compound used to seal or join metallic surfaces. There are two aspects by which solder is classified; core type and composition. The core is composed of rosin flux, acid flux or solid metal. Flux acts as a pretreatment to the metal being soldered, to help the solder stick and hold. Acid or solid core solders are usually preferred for plumbing purposes. The composition of solder is the percentage of metals contained in the solder. Some common solders, their composition, and uses can be found in Table 1.

Table 1: Common Solders and Their Uses.

| Composition | | | | Intended Uses |
|-------------|-------------|-----------------|---------------|---|
| % Tin (Sn) | % Lead (Pb) | % Antimony (Sb) | % Silver (Ag) | |
| 85 | 15 | | | Plumbing, general purpose |
| 50 | 50 | | | Plumbing, auto repair, stained glass, general purpose |
| 60 | 40 | | | Electrical repair, stained glass, general purpose |
| 40 | 60 | | | Plumbing, general purpose |
| 30 | 70 | | | Auto body and radiator repair |
| 95 | | 5 | | Lead free, plumbing |
| 95 | | | 5 | Lead free, plumbing |
| 5 | | | 95 | Lead free, plumbing |
| | | | 100 | Lead free, plumbing |
| ? | ? | ? | ? | Commercial grade, general purpose |

Background: The Plumbing System Lead Ban and Notification Act

The Pennsylvania Plumbing System Lead Ban and Notification Act, Act 1989-33 (Lead Ban Act) was enacted in an effort to strengthen the provisions of the PA Safe Drinking Water Act in order to remain consistent with the Federal Safe Drinking Water Act Amendments of 1986. The Lead Ban Act helps to safeguard our public drinking water systems from harmful levels of lead. Act 1989-33 was signed into law on July 6, 1989 and went into effect on January 6, 1991. One of the main purposes of this law is to “protect public health and safety by prohibiting the sale of certain materials commonly used in plumbing system construction, modification, and repair,” including leaded solders, pipes, pipe fittings, and fixtures.

Lead free solders and flux may contain no more than 0.2% lead, while pipes, pipe fitting and other fixtures may contain no more than 8.0% lead. The Act also prohibits the sale and use of 50/50 and 85/15 tin-lead acid or solid core solders as well as solders with unlabeled lead content, such as “commercial grade” solder. All other leaded solder is restricted to non-plumbing use only, and is permitted to be sold in non-plumbing sections of retail stores. Table 2 outlines the status of solder in Pennsylvania based on the Lead Ban Act.

Table 2: Solder Status Based on Composition and Core.

| Tin-Lead Composition | Core | Status |
|-----------------------------|-------------|---------------|
| ? Commercial grade | Solid | Banned |
| ? Commercial grade | Acid | Banned |
| 50/50 | Solid | Banned |
| 50/50 | Acid | Banned |
| 85/15 | Solid | Banned |
| 85/15 | Acid | Banned |
| ? Commercial grade | Rosin | Restricted |
| 50/50 | Rosin | Restricted |
| 85/15 | Rosin | Restricted |
| 60/40 | All | Restricted |
| 40/60 | All | Restricted |
| 30/70 | All | Restricted |
| 15/85 | All | Restricted |

The second important objective of Act 1989-33 is to “provide for notice of the potential for leaded contamination of drinking water consumed by users of public water systems.” The Department of Environmental Protection (DEP) has been granted the power and authority to administer and enforce Act 1989-33, which was written in compliance with the Lead Ban provision of the Federal Safe Drinking Water Act Amendments of 1986.

Background: Implementation of the Act

During the eighteen months between the signing and enactment of the Lead Ban Act, the Bureau of Water Supply and Wastewater Management (now the Bureau of Water Standards and Facility Regulation) developed the Pennsylvania Lead Ban Surveillance Program in order to eliminate the availability of leaded solders used for plumbing purposes. A public outreach campaign was designed to educate those audiences affected by the ban, including distributors, retailers, manufacturers, public water suppliers, plumbers and plumbing contractors. The campaign informed the public about the

environmental and health effects of lead in drinking water through media reports and the distribution of pamphlets, fliers, and newsletters.

Since 1991, the Bureau of Water Standards and Facility Regulation has hired a summer intern to implement the Lead Ban Surveillance Program. The main focus of the Surveillance Program is to conduct compliance checks on retail facilities where solder is commonly sold in order to ensure compliance with the Lead Ban Act. Initially, the program focused on the sale of solder at hardware stores only.

Background: Inclusion of Other Retail Stores

In 1999, the Department discovered that stained glass stores sell solder, and thus should be included in the Surveillance Program. In 2002, it was brought to the attention of the surveillance program that other retail establishments (i.e. auto parts stores) were selling banned and restricted solders. Additionally, in 2004, electronic stores were found to sell solder, and became included in the program. These stores carry solder for non-plumbing uses, such as in vehicle maintenance, electronic repair and the creation of stained glass decor. However, the Act states that no “person” may sell banned solder in the state, thus including any type of retail store. The presence of lead free and restricted solders is acceptable anywhere in these stores, as they do not have plumbing sections. However, the availability of banned solder is a violation of the Lead Ban Act. Section 4, “Prohibition of Sale of Plumbing Materials That Are Not Lead Free,” of the Act states:

“No person shall sell, exchange or offer for sale within the Commonwealth and pipe, pipe fitting, solder or flux commonly used in plumbing systems that is not lead free. Solders that are not lead free and that are commonly used in plumbing systems include, but are not limited to, solid core or acid core solders, such as 50/50 tin-lead solder and 85/15 tin-lead solder.”

At the time that the Act was written, 50/50 and 85/15 solid and acid core solders were commonly used in plumbing systems and were therefore banned for sale in Pennsylvania so no one could be able to unintentionally use it in a plumbing system. This is the basis for surveying the other stores.

Initial inspections of these ‘other’ stores - auto parts, stained glass and electronics stores were conducted in 2004 and 2005 to determine what solders are available (specifically whether banned solder is sold) and whether the program needed to be expanded to include these retail facilities as part of routine surveillance. Only a small percentage of these facilities have been surveyed. Of the stores inspected, several have been in violation of the Act, so these facilities are now included in stores to be inspected. In 2007, no distinction was made in the results section as to the difference between hardware and other retail stores. Surveys are conducted primarily at hardware stores, home centers, general department stores, plumbing supply stores, and auto parts stores. Also included are craft stores and electronics stores. Approximately 20% of retail stores in Pennsylvania that potentially sell solder are inspected each year, with the goal of visiting each store in Pennsylvania at least once every five years.

Internship Project

The primary purpose of the Lead Ban Internship project is to ensure compliance with the Lead Ban Act. Interns employed by the Bureau of Water Standards and Facility Regulation conduct surveillance activities in order to ensure compliance with the Ban of Sale provision of the Pennsylvania Plumbing System Lead Ban and Notification Act.

The internship project began in the summer of 1992 and continued in the summers of 1993, 1994 and 1995. Inspections were not conducted during 1996 and 1997, but were resumed in 1998 and continue to present day. From 1992 through 2001, a representative sample of stores in each county was inspected. However, as of 2002, surveillance is conducted completely in a limited number of counties each year. All stores in the selected counties are inspected. As stated earlier, approximately 20% of the retail facilities in the state are visited each year. If interns complete their assigned counties before the end of the summer, stores selling banned solder or found to be noncompliant at the time of their last inspection are re-inspected.

Interns are provided with a list of all stores previously known to sell solder in the assigned counties. Additionally, interns are responsible for searching for new stores using the Internet, phone books, and any other available resources. This list serves as a basis for inspections, with any stores encountered along the way being added to the list. During each survey, information is recorded on a survey sheet, of copy of which is included in Appendix A. The information gathered serves to determine the compliance status of the store. A store is either in compliance with or in violation of the Lead Ban Act. Noncompliance may include one of two violations. A store may be selling banned solder, or selling restricted solder in their plumbing section. It is also possible for a store to have both types of violations. If a store does not have either type of violation, meaning that all restricted solder is sold in a non-plumbing section and there is no banned solder for sale, they are considered to be in compliance with the Lead Ban Act.

If a store is found to be noncompliant, the intern speaks with a manager or other store employee. The Lead Ban Act is summarized, and the reason for the violation(s) is explained. Employees are asked to correct the problem by removing the banned solder, and/or moving the restricted solder to a non-plumbing section. Often, an information packet including a copy of the Act is left with store employees, regardless of their current compliance status, in order to remind them of the Act and its implications. A copy of this packet (minus the Act) is found in Appendix B. Retailers are reminded that discarding leaded solder in the trash is prohibited by the Department's Waste Management regulations, and are encouraged to return the solder to their supplier for store credit. If information about the manufacturer or supplier of the banned solder is available, it is recorded. Noncompliant retailers are also sent a Violation Notice within two weeks of the intern's visit, as a written record of the visit and reminding them of the appropriate corrective action(s).

Data collected during each survey is stored in a computer database. The Lead Ban database is updated and maintained on a regular basis throughout the summer to ensure an accurate list of store contact information as well as to keep track of their inspection history. The database has undergone several revisions over the years, and is very valuable in making office time efficient and productive for the intern. The database also serves to create various reports which help show the statistics of the Lead Ban Surveillance project results over the years.

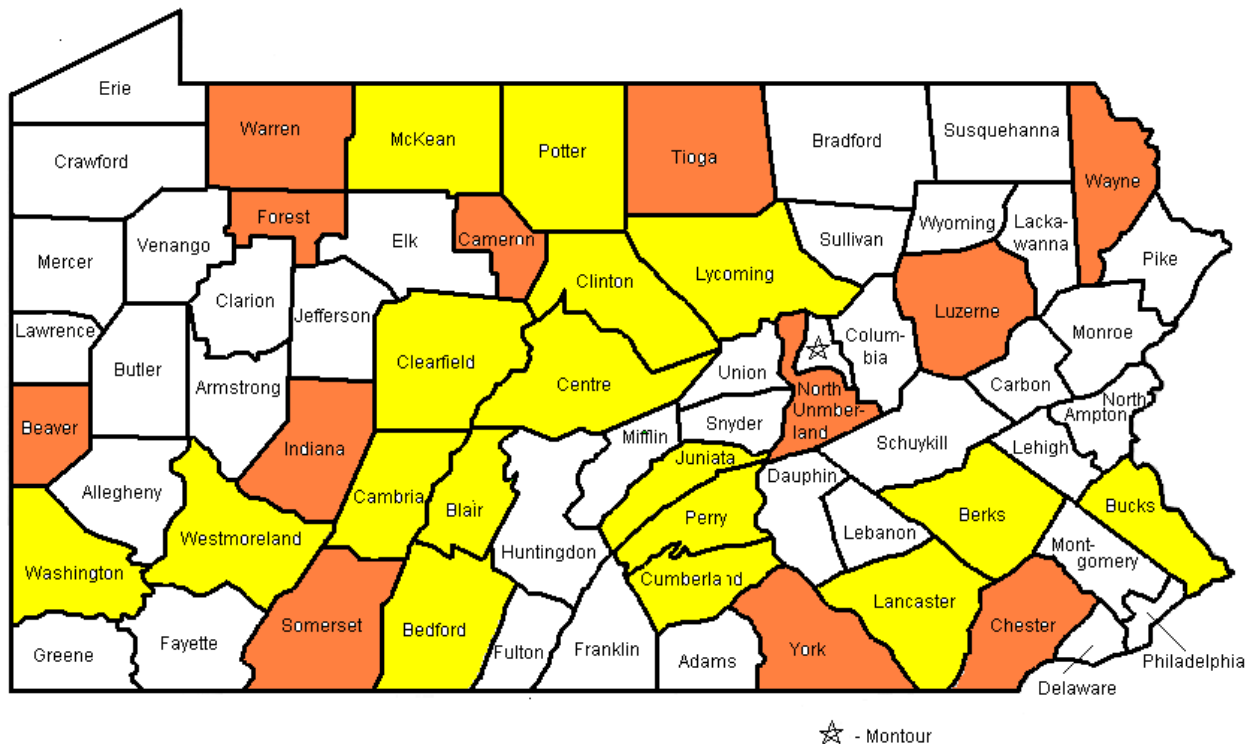
Results: 2007 Surveillance Activity

This summer a total of 294 stores potentially selling solder were inspected in 12 different counties. Of the 294 stores inspected, 232 sold solder. A majority of the 62 remaining stores went out of business, while some lumber yards and other stores were active but did not sell any solder. Of the stores carrying solder, 210 of the stores had lead free solder for sale, 120 of which sold only lead free solder. Twenty-seven (27) of the 232 stores (11.63%) selling solder were in violation of the Pennsylvania Lead Ban Act. Restricted solder was found in the plumbing section of 15 stores or 6.46% of the total stores selling solder. Banned solder was found in 16 stores or 6.89% of the total stores selling solder. Four stores had violations for selling both banned solder and leaded solder in the plumbing section. These stores were counted in both of the above totals. A summary of inspection results for 2007 is provided in Table 3.

Additionally, re-inspections were conducted at facilities in 17 other counties. Stores that were known to be selling banned solder at their last inspection were visited in these counties. The results of the re-inspections are listed in Table 4. Of the small sample of stores selling solder (28 stores), five stores or 17.8% were non-compliant. Of those five stores, four were selling banned solder, and one had restricted solder for sale in its plumbing section.

By separating the data gathered during routine inspections and re-inspections, comparison of the different compliance statuses is possible. Five of 28 stores (17.8%) that were previously selling banned solder were found to be in violation, while 27 of the 232 stores routinely inspected (11.63%) were found to be in violation. Of the 5 stores in violation after a re-inspection, 4 (14.3%) were selling banned solder, while 16 (6.89%) facilities were found selling banned solder during routine inspections. The percent of stores selling banned solder after a re-inspection appears to be higher than the percent found selling banned solder during a routine inspection. However, this could be due to the fact that fewer re-inspections were conducted during the summer or that stores found to be non-compliant may continue to sell banned solder even after being notified that they are violating the provisions of the Lead Ban Act. Therefore, regardless of the reason, additional enforcement measures may be necessary to bring these facilities into compliance.

Figure 1: Counties in which stores were inspected in 2007. *



**Orange Counties were completely inspected, while Yellow Counties were only re-inspected*

Figure 2: Counties where banned solder was sold in 2007.

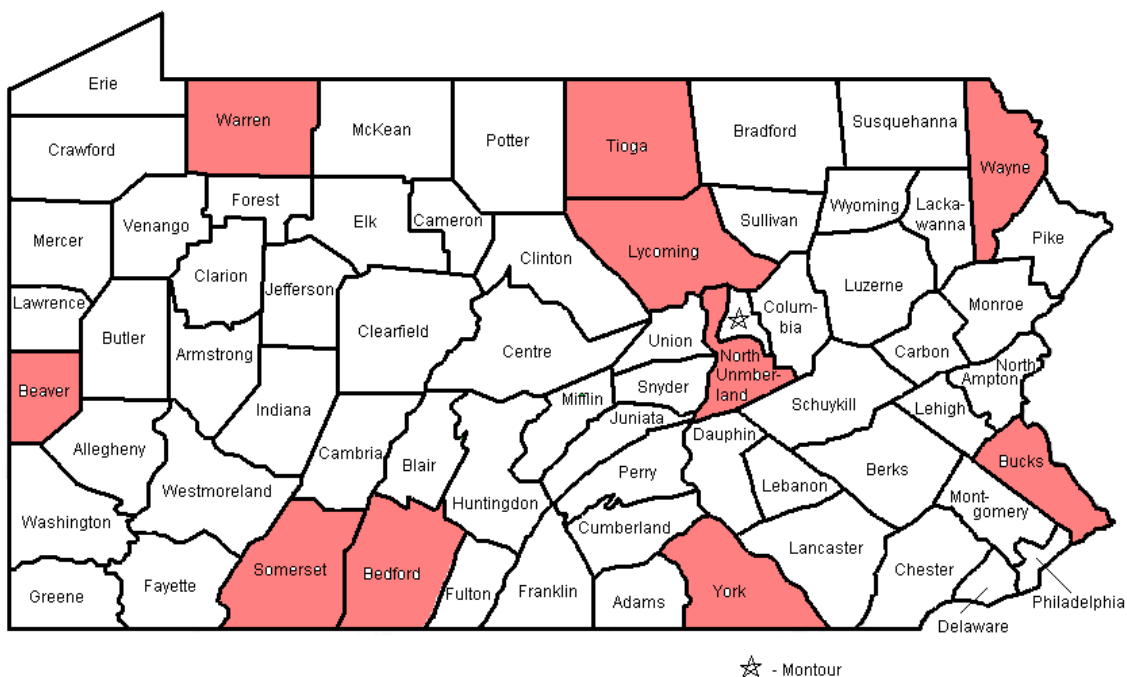


Table 3: Summary of 2007 Inspections

| County ID Number | County Name | Total Stores Inspected | Total Stores Selling Solder | Non-Compliant Stores | Stores Selling Banned Solder | Restricted Solder in Plumbing Section | Restricted Solder in Non-Plumbing | Lead Free Sold | Lead Free Only |
|-------------------------|----------------------------|-------------------------------|------------------------------------|-----------------------------|-------------------------------------|--|--|-----------------------|-----------------------|
| 67 | York | 52 | 37 | 5 | 3 | 2 | 18 | 29 | 19 |
| 56 | Somerset | 32 | 25 | 5 | 3 | 3 | 11 | 21 | 12 |
| 04 | Beaver | 23 | 21 | 2 | 2 | 0 | 9 | 19 | 12 |
| 32 | Indiana | 19 | 15 | 0 | 0 | 0 | 3 | 14 | 12 |
| 27 | Forest | 4 | 4 | 0 | 0 | 0 | 2 | 4 | 2 |
| 12 | Cameron | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62 | Warren | 14 | 13 | 1 | 1 | 0 | 5 | 12 | 8 |
| 59 | Tioga | 22 | 19 | 3 | 2 | 2 | 10 | 18 | 7 |
| 64 | Wayne | 14 | 13 | 2 | 2 | 2 | 6 | 11 | 5 |
| 15 | Chester | 45 | 38 | 2 | 0 | 2 | 17 | 36 | 19 |
| 40 | Luzerne | 47 | 30 | 4 | 0 | 4 | 7 | 29 | 19 |
| 49 | Northumberland | 21 | 17 | 3 | 3 | 0 | 11 | 17 | 5 |
| Total | | 294 | 232 | 27 | 16 | 15 | 99 | 210 | 120 |
| Percentage | (of stores selling solder) | --- | 78.9% | 11.6% | 6.9% | 6.5% | 42.7% | 90.5% | 51.7% |

Table 4: Summary of 2007 Re-inspections

| County ID Number | County Name | Total Stores Inspected | Total Stores Selling Solder | Non-Compliant Stores | Stores Selling Banned Solder | Restricted Solder in Plumbing Section | Restricted Solder in Non-Plumbing | Lead Free Sold | Lead Free Only |
|-------------------------|----------------------------|-------------------------------|------------------------------------|-----------------------------|-------------------------------------|--|--|-----------------------|-----------------------|
| 36 | Lancaster | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 0 |
| 41 | Lycoming | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 0 |
| 42 | McKean | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 53 | Potter | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 14 | Centre | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 17 | Clearfield | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 18 | Clinton | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 21 | Cumberland | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 09 | Bucks | 7 | 6 | 2 | 2 | 0 | 5 | 6 | 1 |
| 11 | Cambria | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 05 | Bedford | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 06 | Berks | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07 | Blair | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 65 | Westmoreland | 5 | 3 | 0 | 0 | 0 | 3 | 3 | 0 |
| 34 | Juniata | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 50 | Perry | 2 | 2 | 0 | 0 | 0 | 1 | 2 | 1 |
| 63 | Washington | 2 | 2 | 0 | 0 | 0 | 1 | 2 | 1 |
| Total | | 35 | 28 | 5 | 4 | 1 | 18 | 27 | 9 |
| Percentage | (of stores selling solder) | --- | 80.0% | 17.8% | 14.3% | 3.6% | 64.3% | 96.4% | 32.1% |

Table 5: Combined Results: Inspections and Re-inspections

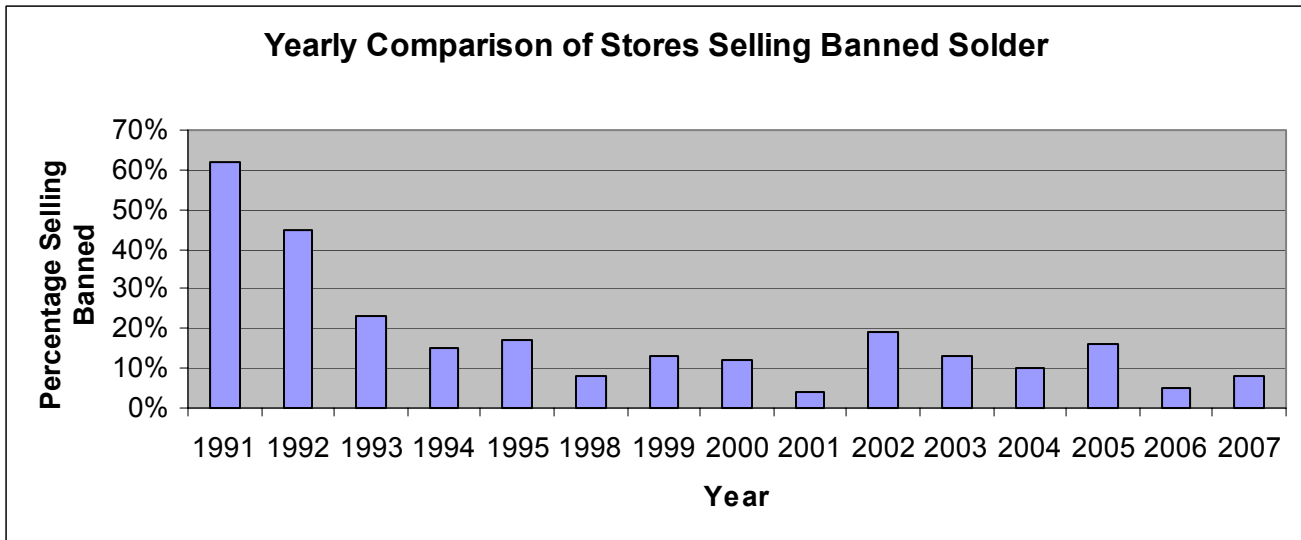
| | Stores Inspected | Stores Selling Solder | Non-Compliant Stores | Stores Selling Banned Solder | Restricted Solder in the Plumbing Section | Restricted Solder in Non-Plumbing | Lead Free Sold | Lead Free Only |
|------------|-------------------------|------------------------------|-----------------------------|-------------------------------------|--|--|-----------------------|-----------------------|
| Total | 329 | 260 | 32 | 20 | 16 | 117 | 237 | 129 |
| Percentage | | 79.0% | 12.3% | 7.7% | 6.1% | 45.0% | 91.1% | 49.6% |

Table 6: Comparison of stores selling banned solder 1991-2007

| | 1991 | 1992 | 1993 | 1994 | 1995* | 1998* | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|-------------------------------|-------------|-------------|-------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Stores Selling Solder | 94 | 480 | 141 | 153 | 130 | 99 | 168 | 186 | 187 | 245 | 260 | 194 | 114 | 181 | 260 |
| Percent Selling Banned Solder | 62% | 45% | 23% | 15% | 17% | 8% | 13% | 12% | 4% | 19% | 13% | 10% | 16% | 5% | 7.7% |

(*No data was collected 1996-1997).

Figure 3: Graph of Yearly Comparison of Stores Selling Banned Solder



Discussion: Why are stores in violation?

When stores are in violation of the Act, it can be due to a simple lack of awareness about the provisions of the Lead Ban Act. Many store employees are not even aware of the Act's existence. Often, when a restricted solder is found in the plumbing section, it is attributable to the fact that those stocking the shelves keep similar products together so that customers can find them easily. However, this leads to the risk of an uninformed consumer purchasing a leaded solder for use in plumbing, since the solder is found in the plumbing section. Once this risk is explained to store employees, the necessity of moving the restricted solder is usually understood.

However, in the case of banned solder being found in stores, it is less likely to be caused by a lack of awareness. Many reasons were given as to why banned solder was for sale in the non-compliant facilities. Some stores were so old that they had stock remaining from when 50/50 was acceptable, and simply were never visited by an intern to ensure that the 50/50 was removed. In other stores, the presence of 50/50 was blamed on suppliers, who were often out of state and potentially unaware of Pennsylvania's stricter laws. In some stores, including a few plumbing stores, employees stated that they were unaware of the law, but knew that 50/50 was preferred by many contractors as it is regarded as easier to work with. In at least one plumbing store, it was apparent that awareness of the law existed but was blatantly disregarded. Along with lead-free solder, there were several spools of 50/50 solder, with stickers reading "for roofing" applied by the retail location. Additional enforcement measures may be required for those few stores that blatantly disregard the provisions of the Act.

Additionally, stores that have not typically been included in the intern surveillance programs, such as auto part stores, never received the mailings detailing the law. Even if employees were aware of the specifications of the lead ban, they were not aware that the law applied to their stores.

While store employees gave various explanations for their store's noncompliance, a lack of awareness of the Lead Ban Act was prevalent in a surprising number of stores. Many owners and managers were completely unaware of the specifications of the Act, even if their store was in compliance. However, some store employees were very familiar with the Act, and as soon as they learned the intern was with the DEP, immediately knew the intern was there to check their solder. Some store employees were even surprised to learn that leaded solder is still available for sale. In 2007, the wide range of awareness and reactions to information about the Act was surprising.

Conclusions: Trends and Suggestions

The Lead Ban program has made a great impact on the availability of 50/50 and 85/15 tin-lead solders in Pennsylvania. As can be seen in Figure 3, the number of stores selling banned solder has dropped significantly since 1991. Since 1994, less than 20% of the stores inspected each year had banned solder for sale. This is a great contrast to the 62% of stores which sold banned solder in the program's initial year. There is no doubt that the Lead Ban program and the efforts of the Lead Ban interns have been effective.

Pennsylvania's Lead Ban Act was created in order to protect state residents from the harmful effects of lead in drinking water. This Act has initiated a great change in the sale of leaded solder for plumbing uses, and appears to be making progress. Pennsylvanians should be reminded of the Act when purchasing solder. In the course of this year's surveys, a few stores were noted which had placed bright signs warning against using leaded solder for plumbing. Other stores still had copies available of the Lead Ban Act packet the DEP sent out several years ago. Their efforts to inform consumers should be supported by the DEP. Retail locations that sell solder should not only be re-informed about the regulations that apply to their stores, but should be provided with material to distribute to concerned consumers, in order to make them aware of the Act.

There are a few trends that are not represented in the data, but are obvious when conducting surveys. One major trend is the replacement of small locally owned hardware stores with large chain stores. Many hardware stores have gone out of business when faced with the low prices and large stocks that stores such as Lowes and Home Depot can provide. These chain stores, along with chain department stores (Walmart and Kmart) have been observed to sell only lead-free solder.

This year's data also shows that a higher percentage of re-inspected stores are in violation, compared to routinely inspected stores. Again, this may be due to the fact that many regularly inspected stores are large chain stores that sell only lead-free solder. It is also possible that stores which were once selling banned solder are more likely to continue to be noncompliant, compared to stores which have a history of compliance. This seems to strengthen the argument for continued focus on reinspections, along with routine inspections of portions of the state. It may be beneficial to complete all of the reinspections needed at the beginning of the next year's activity, so that the list becomes manageable on a yearly basis. This way, each intern will only have to complete the reinspections of stores found to be in violation the previous year, and stores in violation will not continue to sell banned solder, or restricted solder in the plumbing section during the years between inspections.

This summer, 7.7% of the stores found to sell solder were providing banned solder for sale to the public. While there is improvement since the signing of the Act, there are still a significant number of stores selling banned solder. Banned solder is by no means unavailable for use in Pennsylvania. Of the 260 stores visited, 12.3% were in violation of the act. This figure is not as startling as the number of stores noncompliant at the onset of this program, however, after almost 17 years, it seems that the Lead Ban Act is still in need of enforcement.

APPENDICES



Pennsylvania Department of Environmental Protection
LEAD BAN SURVEY FORM

| | | | |
|---|-----------------------|------------------------|--|
| County ID# | County Name | Date | Last Survey Date (if known) |
| Store ID# | Store Name | Contact Person & Title | |
| Location Address | | | Phone |
| Mailing Address (if different from location) | | | Fax |
| Store Type | Chain? Yes No | Chain Name | Inspection Type |
| Solder Types Sold (circle all that apply) | | | Initial _____ Routine _____ Re-Insp. _____ |
| Banned Restricted Lead-Free None | | | |

| Status (B/R) | Manufacturer | UPC | % Sn/Pb | Core (A/R/S) | Label? (Y/N) | Diam (in.) | Wt. (oz.) | Qty. |
|--------------|--------------|-----|---------|--------------|--------------|------------|-----------|------|
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(additional space if needed on back of form)

Where is restricted solder located? (if applicable) _____

Notes: _____



Fact Sheet

Commonwealth of Pennsylvania • Department of Environmental Protection

PENNSYLVANIA LEAD BAN

In July 1989, Pennsylvania passed *The Plumbing System Lead Ban and Notification Act* (PA Lead Ban). The law became effective on January 6, 1991 and applies to plumbing construction or repairs done after that date.

Pennsylvania's law is similar to the 1986 amendments to the federal Safe Drinking Water Act (SDWA). The federal law requires the use of lead-free materials in construction or repair of any public water systems (PWS), any facility connected to a PWS, or any plumbing that provides water for human consumption. Lead-free is defined as any pipes or pipefittings that contain less than 8 percent lead, and any solders or flux that contain less than 0.2 percent lead. The law was further strengthened by the 1996 amendments to the federal SDWA. The amended law bans plumbing suppliers from selling after August 6, 1998 both leaded solder or flux and pipe, fittings, or fixtures that are not lead-free and do not meet acceptable lead leaching standards. Pipes, fittings, or fixtures that meet the lead leaching standards in ANSI/NSF Standard 61: *Drinking Water System Components – Health Effects* are deemed to be acceptable.

Why Ban Lead?

Although lead may be found in many places in our modern society, water is probably the easiest to control. Our drinking water can contain a significant amount of lead (up to 40 percent of a person's total lead exposure) as a result of corrosion of pipes, solder, and fixtures found in buildings or in the mains or service connection of a PWS. Solders are a major target under the PA Lead Ban since they are more likely to exceed allowable lead-content levels.

Pregnant women, their unborn children, young children (especially under the age of six), and middle-aged men and women are especially vulnerable to the health effects of lead. Exposure to lead above recommended levels may lead to delays in normal physical and mental development in babies and young children, slight defects in attention span, hearing and learning abilities in children, and may slightly increase blood pressure in some adults. Long-term exposure to lead above recommended levels may result in stroke, kidney disease, or cancer.

Summary of the PA Lead Ban

- PA's Lead Ban applies to all plumbing, not just plumbing used for drinking water.
- The Lead Ban forbids the sale as well as the use of leaded solder, flux, pipe, and pipefittings. These products were to have been removed from sale by January 6, 1991.
- Solders banned for sale in PA include 50/50 and 85/15 tin-lead acid and solid core solders, leaded solders labeled for plumbing use, or leaded solders not labeled as to content.
- Other leaded solders may be sold only if the package bears a prominent label stating that it is illegal to use the solder or flux in the installation or repair of any plumbing. Also, leaded solder is not allowed to be located in the plumbing section of the retail facility.
- The Lead Ban applies to all water users including private homes or facilities that obtain drinking water from private wells.
- A builder must certify that materials used in the construction of a new plumbing system, which is to be connected to a PWS are lead-free. A PWS must refuse connection to any

person who fails to provide that certification unless the local municipality has a plumbing code that prohibits the use of leaded materials.

Further Information:

Plumbers

You may only use lead-free materials in any construction or repair work you do in Pennsylvania. Specific materials that may not be sold or used include:

- Lead Pipes
- Copper or brass fixtures, pipe or fittings not meeting the lead-free definition and not meeting the lead leaching limits set in ANSI/NSF Standard 61 after 8/6/98.
- Solid and acid core solders or flux containing more than 0.2 % lead.
- Solders not labeled lead free or not labeled for lead content
- Lead-containing solders labeled for plumbing use.

The Lead Ban does not apply to:

- Bulk lead normally used to repair cast iron pipe joints.
- Bar lead solder normally used in construction and repair of sheet metal, such as ductwork, roofing, etc.
- Any other lead solder not used in the plumbing industry (except 50/50 or 85/15 tin-lead solder). Solders that have automotive, electronic, industrial or other applications not related to plumbing are not banned. These solders have specifications distinct from solders commonly used for plumbing applications.

Builders, Real Estate Agents, Property Owners, Municipal Officers, and Public Water Suppliers

After 1/6/91, before a newly constructed home or building may connect to a public water system (PWS), the individual requesting the connection must certify to the PWS that the materials used in the plumbing system are lead-

free or the local plumbing code must require that lead-free materials be used.

The PWS must refuse connection if proper certification is not provided and the municipality does not have a suitable plumbing code.

Private Wells

Although certification is not required for hook up to a private well, the PA Lead Ban applies to all plumbing applications. Homebuyers, homeowners, real estate agents, and contractors should be sure that only lead-free materials are used in all new plumbing construction and repairs.

Violation of the Lead Ban

If plumbing materials containing lead are used in Pennsylvania after January 6, 1991:

- The plumber may be required to replace the banned materials with lead-free materials at the plumber's own expense. In addition, a supply of an alternate, approved drinking water (bottled water) may be required until the plumbing is replaced.
- Monetary penalties may be assessed.
- Federal law forbids the US Department of Housing and Urban Development (HUD) and the Veteran's Administration (VA) from insuring or guaranteeing a mortgage or from furnishing assistance for a newly constructed residence if the new residence's potable water system is not lead-free.

For Additional Information:

Contact your local municipality if you suspect a local plumbing code violation.

If there isn't a local plumbing code or if you suspect a violation of the ban of sale, please contact:

PA Department of Environmental Protection
Bureau of Water Standards & Facility
Regulation
PO Box 8467
Harrisburg, PA 17105-8467
(717) 772-4018

Lead Solder: What Can I Sell?

DEP Fact Sheet For Wholesalers, Distributors And Retailers

The purpose of this fact sheet is to summarize how the Department of Environmental Protection (DEP) will implement and enforce the ban of sale of lead solders as required under Pennsylvania's (PA) Plumbing System Lead Ban and Notification Act. This law took effect on January 6, 1991 and prohibits both the sale and use of lead plumbing materials. Solders are a major target under the PA Lead Ban since they are more likely than other plumbing materials to exceed allowable lead-content levels.

Definition of Lead-Free under PA Lead Ban

- *Pipes and pipe fittings containing less than (<) 8.0 % lead*
- *Solders and flux containing less than (<) 0.2 % lead*

Solders Banned For Sale

These solders cannot be distributed or sold in wholesale or retail establishments in Pennsylvania.

- 50/50 and 85/15 solid core and acid core solders (as listed in the Act).
- Lead-containing solders labeled for plumbing use
- Solders not labeled lead-free or labeled as to content

Solders with Restricted Sale

- Lead-containing solders not banned for sale, including all rosin core solders, have sale restrictions. These solders are intended to be used for non-plumbing purposes.
- These solders cannot be sold or displayed in plumbing supply sections of general wholesale/retail stores or in the proximity of plumbing materials in any establishment.
- DEP suggests the plumbing wholesalers discontinue the sale of these solders because of the danger of their use for plumbing purposes, thus opening the wholesaler to liability under the Act.

See reverse side for the banned status of various solders.

Solder Identification Table

| Composition Weight % | | | | Intended Use | Ban Status |
|----------------------|-----------|---------------|-------------|--|------------|
| Tin (Sn) | Lead (Pb) | Antimony (Sb) | Silver (Ag) | | |
| 85 | 15 | -- | -- | Plumbing, general purpose | B |
| 50 | 50 | -- | -- | Plumbing, general purpose | B |
| 60 | 40 | -- | -- | General purpose, stained glass, electrical | R |
| 45 | 55 | -- | -- | General purpose | R |
| 40 | 60 | -- | -- | General purpose | R |
| 35 | 65 | -- | -- | Non-plumbing wiping | R |
| 35 | 63.2 | 1.8 | -- | General purpose | R |
| 40 | 58 | 2 | -- | General purpose | R |
| 30 | 70 | -- | -- | Auto body and radiators | R |
| 25 | 75 | -- | -- | Auto body and radiators | R |
| 20 | 80 | -- | -- | Auto body and radiators | R |
| 2 | 98 | -- | -- | Auto radiator cores | R |
| 63 | 37 | -- | -- | Electronic, circuit boards | R |
| 70 | 30 | -- | -- | Industrial-coating metals | R |
| 62 | 38 | -- | -- | Industrial-silver surfaces | R |
| 15 | 85 | -- | -- | Industrial-coating metals | R |
| 10 | 90 | -- | -- | Industrial-join/coat metals | R |
| 5 | 95 | -- | -- | Industrial-join/coat metals | R |
| -- | 97.5 | -- | 2.5 | Industrial-torch heating | R |
| -- | 94.5 | -- | 5.5 | Aircraft engines | R |
| 20 | 79 | 1 | -- | Machine soldering | R |
| 25 | 73.7 | 1.3 | -- | Machine soldering | R |
| 30 | 68.4 | 1.6 | -- | Machine soldering | R |
| 1 | 97.5 | -- | 1.5 | Food service equipment | R |
| 62 | 36 | -- | 2 | Silver coated surfaces | R |
| 96 | -- | -- | 4 | Lead free | L |
| 95 | -- | -- | 5 | Lead free | L |
| 94 | -- | -- | 6 | Lead free | L |
| 95 | -- | 5 | -- | Lead free | L |

B - Sale of acid and solid core solder completely banned.

R - Sale restricted. These solders cannot be sold or displayed in plumbing supply sections of general wholesale/retail stores or in proximity to plumbing materials in any establishment. The label cannot indicate plumbing as an intended use.

L - Lead Free.