

GAO

Report to the Chairman, Committee on
Environment and Public Works, U.S.
Senate

December 1991

WATER POLLUTION

Nonindustrial Wastewater Pollution Can Be Better Managed





**Resources, Community, and
Economic Development Division**

B-245695

December 5, 1991

The Honorable Quentin N. Burdick
Chairman, Committee on Environment
and Public Works
United States Senate

Dear Mr. Chairman:

In response to your request and subsequent discussions with your office, this report discusses the (1) range, sources, and seriousness of pollutants found in nonindustrial wastewater; (2) strategies and programs developed by local and state governments to better manage and control these pollutants; and (3) federal options that might encourage or require better management and control of nonindustrial wastewater pollution. This report contains recommendations to the Environmental Protection Agency (EPA) to better manage and control—and potentially reduce—nonindustrial wastewater pollution.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies of the report to appropriate congressional committees; the Administrator, EPA; and the Director, Office of Management and Budget. We will also make copies available to other interested parties on request.

This work was performed under the direction of Richard L. Hembra, Director, Environmental Protection Issues, who may be reached at (202) 275-6111. Other major contributors to this report are listed in appendix I.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Some of the 34 billion gallons of wastewater collected by the nation's sewers each day from homes, commercial establishments, and industry contain toxic substances that may threaten aquatic life and cause cancer and other human health problems. Because sewage treatment plants are not typically designed to treat toxic substances, many such substances simply pass untreated through the plants into receiving waters.

Concerned that existing programs target industrial sources of toxic pollution but largely ignore commercial and household sources, the Chairman, Senate Committee on Environment and Public Works, asked GAO to examine (1) the range, sources, and seriousness of pollutants found in nonindustrial wastewater; (2) the strategies and programs developed by local and state governments to better manage and control these pollutants; and (3) federal options that might encourage or require better management and control of these pollutants.

Background

The Environmental Protection Agency (EPA) implements many of its water quality programs through facility permits limiting pollutant levels. Its primary permit program is the National Pollutant Discharge Elimination System Program, in which limits are placed on pollutants that sewage treatment plants and industries can discharge directly into the nation's waters. Another program, the National Pretreatment Program, places limits on toxic discharges from certain industries to about 1,500 of the nation's major treatment plants in order to reduce the amount of these pollutants passing through the plants into receiving waters. Treatment plants themselves can also set more stringent discharge limits on these industries and may set local limits for other industrial and commercial discharges not otherwise subject to pretreatment requirements. Nevertheless, most commercial establishments and virtually all households discharge untreated wastes into sewers.

Results in Brief

Households and commercial establishments can discharge significant amounts of toxic and other harmful pollutants into sewers. Household pollutants include detergents, toilet bowl cleaners, drain openers, and motor oil; commercial sources include photo processors, dry cleaners, and car washes. Because the Clean Water Act emphasizes the control of industrial wastewater pollution, EPA has focused little attention on assessing or controlling nonindustrial sources of toxic pollutants discharged to sewage treatment plants. EPA officials agree, however, that the seriousness of the problem in certain locations argues for a more complete examination of the problem nationwide.

Some states and localities have established programs to keep nonindustrial pollutants from entering treatment plants. These include programs that (1) identify problem sources and prevent their discharge of toxic pollutants into sewer systems; (2) provide consumers with information on household products, their proper disposal, and alternatives to these products; and (3) ban substances linked to poor water quality. Other programs, such as product labeling programs, are not designed specifically to address water quality concerns but still lower the levels of pollutants found in nonindustrial wastewater.

EPA's efforts thus far have been limited primarily to providing guidance and information on methods to assess and prevent nonindustrial wastewater pollution to states, localities, and the public. Other options available to EPA include requiring treatment plants to gather data about their nonindustrial toxic pollution problems; establishing a clearinghouse on nonindustrial wastewater pollution; requiring treatment plants to implement "source control" programs such as used oil collection programs; instituting voluntary or mandatory product labeling programs; and in the most serious instances, banning substances that pose unreasonable risks to human health and the environment.

Principal Findings

Nonindustrial Wastewater Contains Numerous Toxic Pollutants

Industry continues to be the greatest source of toxic discharges into sewage treatment systems. Nevertheless, the Office of Technology Assessment estimates that household wastewater alone accounts for about 15 percent of the regulated toxic pollutants entering treatment plants. Furthermore, EPA estimates that as industrial discharges decrease, the proportion of both household and commercial pollutants sent to treatment plants will increase and ultimately account for almost two-thirds of the toxic metals discharged to treatment plants.

Most environmental studies thus far have focused primarily on industrial wastewater. But studies by treatment plants have already documented that nonindustrial wastewater can be a particularly significant source of toxic influent in certain areas. For example, a Seattle, Washington, treatment plant estimates that up to 26 percent of the arsenic entering the plant originates from household laundry detergents, dishwashing detergents, and bleach. A Palo Alto, California, treatment plant determined that up to 81 percent of the silver entering the plant

comes from nonindustrial sources. Other studies point to car washes, dry cleaners, and a wide variety of household products as contributors of lead, mercury, phosphorus, oil, and benzene to treatment plants.

Options to Better Manage Nonindustrial Wastewater

Some states and localities have established programs to better manage and control pollutants in nonindustrial wastewater. After Palo Alto's treatment plant concluded that nonindustrial influent threatened aquatic habitats in the South San Francisco Bay, the plant imposed limits on silver discharges from commercial photo processors, hospitals, and dental offices. According to a plant study, this program will potentially save the city tens of millions of dollars that would otherwise have to be spent on treatment to remove the silver.

Some states and localities have even banned the use of certain chemicals outright. For example, many states in the Great Lakes and Chesapeake Bay areas have banned the use of phosphates, saving treatment plants millions of dollars. Washington, D.C.'s phosphate ban, for example, saves the city about \$6.5 million annually. Other state programs have focused on pollutant reduction. In 1990 alone, over 800 household hazardous waste collection programs took place in 42 states. Furthermore, a number of localities have established used oil collection and recycling programs to reduce the 267 million gallons of oil improperly disposed of annually.

EPA efforts to better manage and control nonindustrial wastewater have thus far been limited primarily to providing information and guidance to states, localities, and the public. However, GAO believes that while the appropriate level of federal involvement will ultimately depend on the seriousness of nonindustrial pollution, certain steps are warranted now. Specifically, more needs to be known about the source and seriousness of problems at individual treatment plants and the steps being taken to address them. EPA officials acknowledge that one readily available option for conveying the information gathered would be to expand the Agency's existing pollution prevention clearinghouse to include this type of information. Once this information is gathered and analyzed, EPA can determine whether more direct regulatory actions are warranted to reduce nonindustrial wastewater pollution.

If necessary, EPA could also exercise its authority under the Toxic Substances Control Act to restrict or ban these substances. The act also allows EPA the less drastic option of requiring manufacturers to place

warning labels on products to inform consumers of risks, proper use, and disposal.

Finally, several options have merit as general pollution prevention tools that extend beyond wastewater quality to include other environmental objectives such as protecting air quality and groundwater. A primary example is the type of voluntary labeling program in place in several other countries. Under these programs, manufacturers agree to submit their products to panels comprising government, environmental, and industry officials who evaluate products' relative environmental risks. A product posing a low risk is awarded a seal that advertises its environmental merits. EPA is currently looking at the feasibility of using a labeling program in the United States.

Recommendations

GAO recommends that the Administrator, EPA, require major wastewater treatment plants to identify the most serious nonindustrial pollutants entering their facilities and the sources of these pollutants, and report on their efforts to control them. EPA should use this information to determine what, if any, further analyses are needed by these or other plants. Further, EPA should make this information available to other treatment plant officials so they can benefit from others' experiences, and potentially reduce the start-up time and costs of needed programs to better control these pollutants.

GAO also recommends that, on the basis of the information reported to the Agency, the Administrator determine whether further regulatory actions are needed to reduce nonindustrial wastewater pollution. Such actions could include (1) requiring treatment plants to implement source control programs (e.g., regulating additional industrial and commercial discharges and establishing programs to collect household hazardous wastes) and (2) exercising the Agency's authority under the Toxic Substances Control Act to restrict or ban substances, or require manufacturers to place warning labels on their products to alert consumers to the products' risks.

Agency Comments

GAO discussed the contents of the report with EPA officials, who generally agreed with the facts presented, and has included their comments where appropriate. However, as agreed, GAO did not obtain written comments on a draft of this report.

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Abbreviations

EPA Environmental Protection Agency
GAO General Accounting Office

Introduction

Each day, the nation's sewers collect about 34 billion gallons of wastewater from homes, commercial establishments, and industry and transport it to more than 15,000 sewage treatment plants nationwide. After treatment, the wastewater is discharged into rivers, lakes, and oceans. In addition to treated sewage, this wastewater may contain large quantities of toxic pollutants. Because treatment plants are generally not designed to treat these substances, many of the pollutants pass through the treatment plant into receiving waters.

The Environmental Protection Agency (EPA) implements many of its water quality programs through facility permits that limit pollutant levels. Under EPA's National Pollutant Discharge Elimination System Program, for example, limits are placed on the pollutants that sewage treatment plants and industries can discharge directly into the nation's waters. Under the National Pretreatment Program, limits are placed on pollutants certain industrial facilities discharge that indirectly enter the nation's waters through sewers that service about 1,500 municipal wastewater treatment facilities. Further, treatment plants may set discharge limits for other industries and commercial establishments otherwise not subject to national pretreatment requirements. However, despite the existence of the Pretreatment Program, many industrial facilities, most commercial establishments, and virtually all households discharge at least some untreated toxic wastes into sewers. These wastes may then find their way into the environment.

Problems Associated With Nonindustrial Wastewater

Nonindustrial wastewater contains toxic and other harmful pollutants that are associated with health and environmental problems; the pollutants can also adversely affect treatment plant operations and worker safety. For example, heavy metals such as lead and mercury are associated with brain and kidney damage. Table 1.1 shows the health effects associated with some of the other toxic pollutants found in nonindustrial wastewater.

Table 1.1: Health Effects Associated With Pollutants Found in Nonindustrial Wastewater

Pollutant	Associated health effects
Benzene	Central nervous system effects; nausea, dizziness, and vomiting; also increases the risk of leukemia.
1,2-Dichloroethane	Heart, liver, kidney, and central nervous and circulatory system effects; is also a possible cancer-causing agent.
Selenium	Lesions of the heart, kidneys, and spleen; heart, liver, kidney, gastrointestinal, and neurological effects.
Antimony	Nausea, vomiting, and abdominal cramps.
Pentachlorophenol	Liver, kidney, and central nervous and reproductive system effects.
Toluene	Speech, vision, and hearing problems; impaired memory; and kidney, lung, liver, and central nervous system effects.

According to state data reported to EPA, sewage treatment plants are the most extensive source of estuary pollution, affecting over half of the impaired estuary areas thus far assessed. These plants are also a significant source of river and lake pollution, affecting 16 percent of impaired river miles and 15 percent of impaired lake acres. For example, phosphates can impair water quality by stimulating excessive algae growth, which in turn can deplete oxygen levels in waters, ultimately killing fish. In addition, some of the pollutants found in nonindustrial wastewater can inhibit wastewater treatment processes, corrode sewer pipes, and cause illness among treatment plant workers. Flammable wastes, such as gasoline, are even known to have caused explosions in sewer systems after being dumped down storm drains by homeowners.

Limitations of Treating Toxic Pollutants

Wastewater treatment methods generally do not destroy toxic pollutants. Rather, pollutants discharged into sewers can be removed from the wastewater or transferred to other environmental media (air, water, land) by (1) leaking from the collection system, (2) evaporating into the atmosphere, (3) biodegrading, (4) partitioning to sludge, and (5) passing through treatment plants into receiving waterways.

Because many pollutants cannot be neutralized or destroyed by these treatment processes, they can continue to pose environmental risks. For example, heavy metals that are removed from wastewater often end up in the sewage sludge that is generated as a by-product of the treatment process. If the sludge contains high levels of toxic pollutants, it cannot be used as fertilizer or otherwise be beneficially used and must be incinerated or buried in landfills. These disposal methods, in turn, pose further risks to the air and groundwater.

Moreover, wastewater treatment facilities are expensive. For example, just to provide for documented sewage treatment needs, EPA estimates that more than \$80 billion will be needed over the next 20 years to refurbish deteriorating treatment plants and construct additional facilities to treat wastes from growing populations.

Pollution Prevention Legislation and Policies

To compensate for the limitations of traditional, end-of-pipe treatment technologies, the Congress enacted the Pollution Prevention Act of 1990. The act establishes a national policy for addressing pollution:

- Whenever feasible, pollution should be prevented or reduced at the source.
- Pollution that cannot be prevented should be recycled in an environmentally safe manner.
- Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner.
- Disposal or other release into the environment should be employed only as a last resort.

The act also sets forth a formal mandate for EPA to establish programs that promote pollution prevention. In response to the act, EPA drafted guidance to promote municipal water pollution prevention programs. According to this guidance, EPA's policy "represents a significant shift from current practices by stressing a preventive approach to water pollution abatement rather than one of remedial action." This new approach will include preventing pollution by wastewater treatment plants through (1) conserving resources to reduce water and energy use, (2) promoting source-reduction activities to reduce conventional and toxic pollution of plant influent, and (3) encouraging recycling, beneficial uses of sludge, and proper treatment of wastes. EPA plans to support states and localities by (1) providing educational materials, (2) providing technical assistance, (3) funding state training programs, and (4) providing a limited number of incentive grants for states to develop pilot programs.

Objectives, Scope, and Methodology

In a July 30, 1990, letter, the Chairman, Senate Committee on Environment and Public Works, expressed concern about potentially serious environmental impacts of nonindustrial pollutants entering sewage

treatment plants and the lack of progress so far in controlling them. The Chairman asked us to examine

- the range, sources, and seriousness of pollutants found in nonindustrial wastewater that enters sewage treatment facilities;
- local and state programs designed to control nonindustrial wastewater pollution; and
- federal options to better manage and control nonindustrial wastewater pollution.

To determine the range, sources, and seriousness of nonindustrial wastewater pollution, we identified and reviewed relevant studies from officials representing EPA, wastewater treatment associations, environmental organizations, and sewage treatment plants. After reviewing and analyzing these studies, we obtained the views and opinions of these officials on these nonindustrial wastewater pollution issues.

We identified local and state programs designed to control nonindustrial wastewater pollution by contacting officials from EPA, state, and local governments; wastewater and solid waste management associations; and environmental organizations. In addition, we reviewed nonindustrial pollution control programs at two treatment plants—in Palo Alto, California, and Seattle, Washington. These two programs were identified by several of the officials we contacted as particularly effective programs.

To identify federal options to better manage and control nonindustrial wastewater pollution, we obtained and reviewed applicable EPA studies and documents that outlined such options. We discussed the merits and shortcomings of these and other options with officials from EPA, states, and localities; industry and wastewater management associations; environmental organizations; and individual wastewater treatment plants.

We also reviewed EPA's Financial Integrity Act report for fiscal year 1990.¹ The report did not identify material weaknesses in EPA's water quality program specifically related to nonindustrial wastewater pollution.

¹The Federal Managers' Financial Integrity Act of 1982 requires federal agencies to report "material weaknesses" in their operating programs and plans for corrective actions to the Congress and the President.

We performed our audit work at EPA headquarters in Washington, D.C., and, to obtain a diverse geographical representation, in four EPA regional offices—Region I in Boston, Region V in Chicago, Region IX in San Francisco, and Region X in Seattle. We also contacted officials in Region III's Chesapeake Bay Liaison Office in Annapolis, Maryland, to obtain information on the effect of phosphate bans in the Chesapeake Bay area.

Our work was conducted from August 1990 through August 1991 in accordance with generally accepted government auditing standards. In addition to this report, in July 1991, we testified on the results of our work at hearings held by the Senate Subcommittee on Environmental Protection, Committee on Environment and Public Works.²

We discussed our audit findings with EPA officials. In general, they agreed with the facts presented, and we have incorporated their comments where appropriate. As agreed, we did not solicit written comments from EPA on a draft of this report.

²Opportunities to Better Manage and Control Nonindustrial Wastewater Pollution (GAO/T-RCED-91-72, July 9, 1991).

Relative Significance of Nonindustrial Wastewater Pollution Is Expected to Increase

Despite the gains realized through EPA's Pretreatment Program, studies indicate that industrial facilities continue to be the most significant source of toxic pollutants discharged into sewer systems. Nonetheless, the studies also indicate that both household and commercial sources are major contributors of some toxic pollutants as well. For example, in 1987, the Office of Technology Assessment estimated that household wastewater alone accounts for about 15 percent of the toxic priority pollutants¹ that enter treatment plants. Furthermore, the contribution by nonindustrial sources to any individual treatment plant's toxic waste load can be considerably greater.

If EPA's Pretreatment Program continues to reduce industrial sources of toxic wastewater pollution, the relative contribution of nonindustrial pollutants will increase. According to EPA, after certain industries reduce the pollutants they discharge into sewer systems, commercial establishments and households will account for nearly two-thirds of the toxic metals discharged to treatment plants. Therefore, efforts to further reduce these pollutants will have to take nonindustrial sources into account.

Households and Commercial Establishments Discharge Significant Amounts of Toxic Substances Into the Nation's Sewers

Studies conducted by EPA and others over the last 12 years continue to show that nonindustrial wastewater contains significant amounts of toxic and other harmful pollutants. For example, in 1979, EPA conducted a study to determine the relative contribution of priority pollutants to sewage treatment plants from residential, commercial, and industrial sources. EPA conducted sampling at a variety of sites in four cities: Cincinnati, Ohio; St. Louis, Missouri; Atlanta, Georgia; and Hartford, Connecticut. Of 129 priority pollutants,² EPA analyses detected 56. On the basis of the sampled data, EPA developed a model of the relative contribution from industrial and nonindustrial sources.

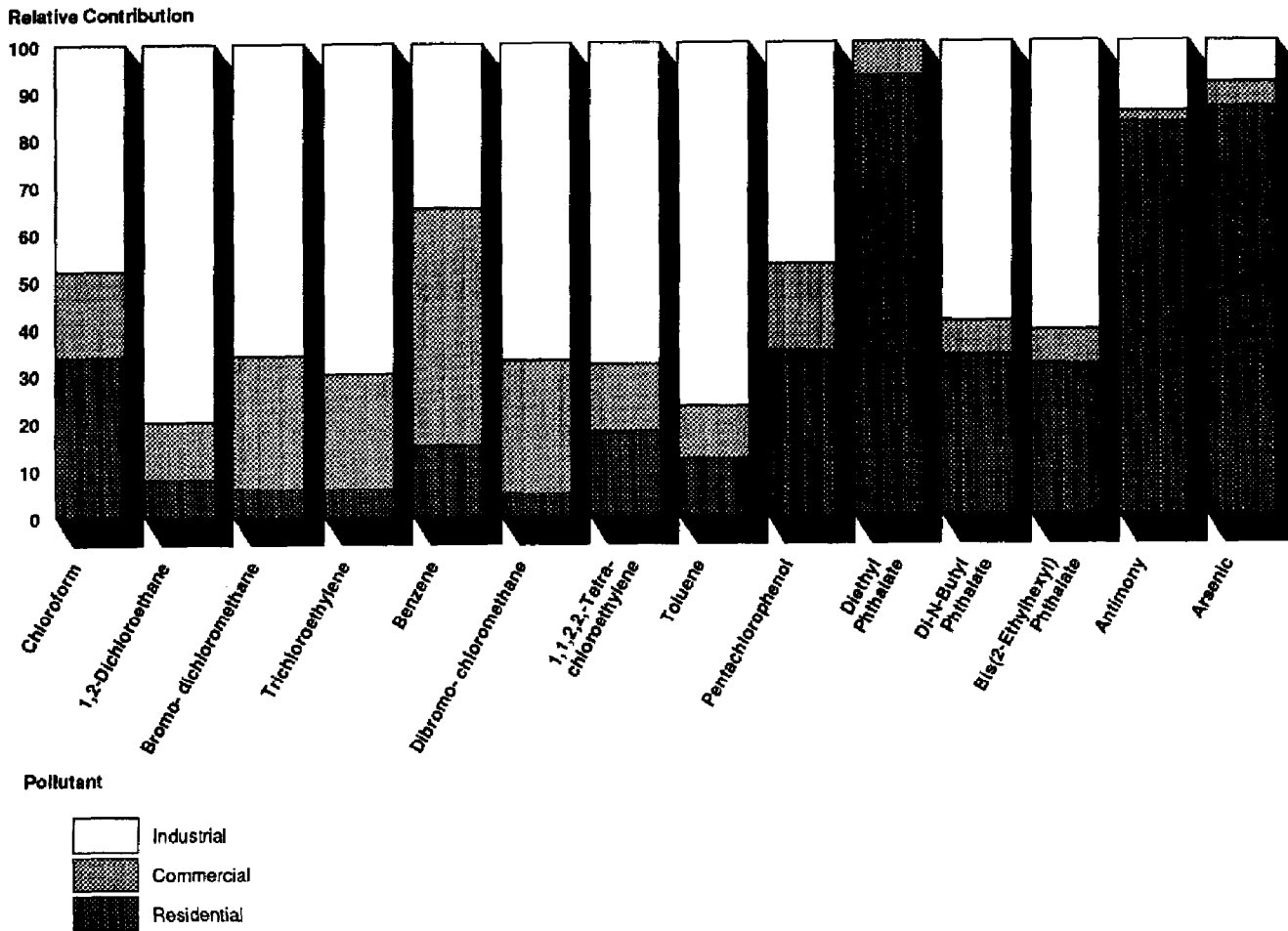
Although the study concluded that industrial facilities are the major source of most toxic pollutants entering sewage treatment plants, it also found that households and commercial establishments are significant sources of many pollutants and are often the major source. As shown in figure 2.1, for 28 of the pollutants detected in the samples, residential and commercial sources combined accounted for 20 percent or more of the pollutants entering the plants; for 15 of these pollutants, these sources accounted for the majority of the pollutants entering the plants.

¹The Clean Water Act requires EPA to regulate a list of specific toxic pollutants commonly referred to as priority pollutants.

²At the time this study was conducted, the priority pollutant list contained 129 pollutants; it currently contains 126 pollutants.

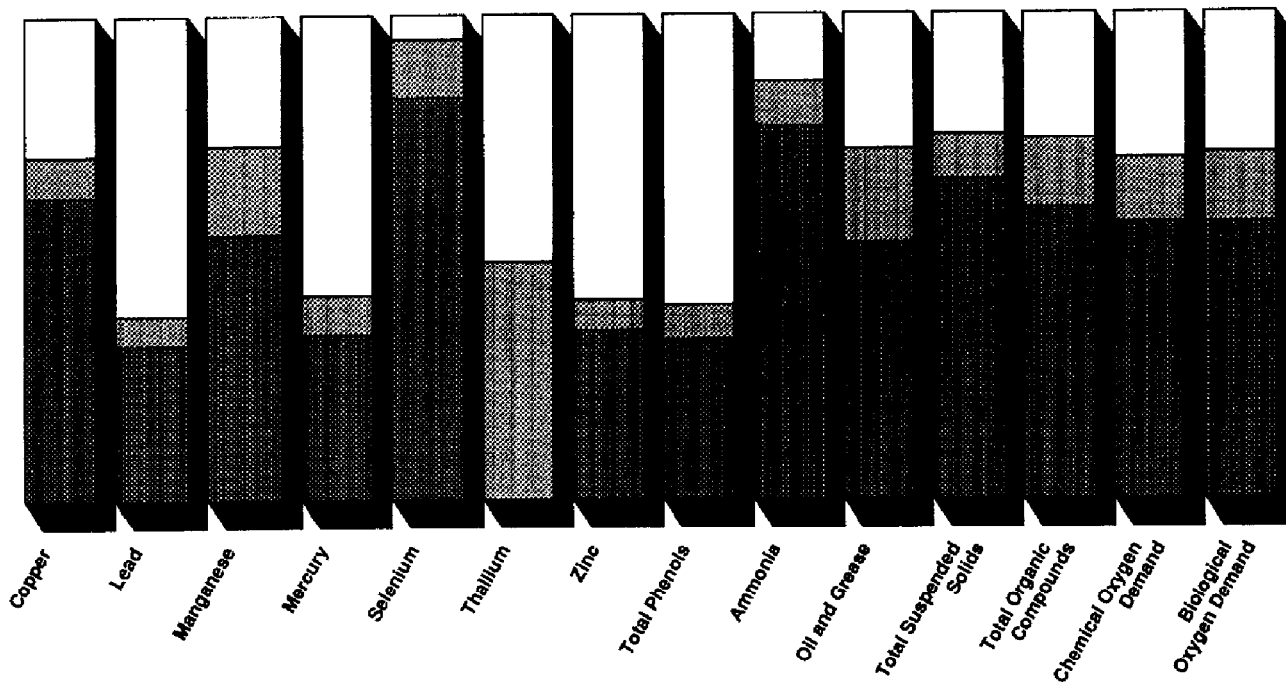
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Figure 2.1: Relative Pollutant Contribution to Hypothetical Sewage Treatment Plant (Flow: 60% Residential, 20% Commercial, 20% Industrial)



Source: GAO illustration based on EPA data.

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Furthermore, a 1986 EPA study anticipated that when certain industries eventually reduce the pollutants they discharge into sewer systems, the relative contribution of some toxic pollutants by households and commercial establishments will increase. Contributions of certain toxic metals, for instance, are projected to increase from 8 percent of the total to 63 percent.

As figure 2.1 indicates, households account for the majority of 12 pollutants tested. Household sources of toxic and other harmful pollutants

include pesticides, drain cleaners, toilet bowl cleaners, degreasers, detergents, gasoline, and motor oil. EPA estimates that each year, do-it-yourself motor oil changes account for 135 million of the 267 million gallons of oil disposed of improperly. According to EPA, up to 4 million gallons of oil are dumped into sewers. Households also discharge significant amounts of phosphorous to treatment plants; according to EPA, phosphorus in detergents accounts for about one-third to one-half of phosphorous entering treatment plants.

In addition to households, a variety of commercial establishments contribute to wastewater pollution. In 1987, the Office of Technology Assessment estimated that about 15 percent of all priority pollutants entering treatment plants came from households. An additional 15 percent came from commercial establishments or industries not subject to national pretreatment requirements. In 1991, EPA published data collected from 21 municipalities to determine the types of pollutants discharged to treatment plants by various commercial establishments. The types of pollutants discharged commercially are shown in table 2.1.

Table 2.1: Examples of Pollutants Discharged by Selected Commercial Facilities

Type of facility	Pollutants discharged
Hospitals	Total dissolved solids, chemical oxygen demand, phosphate, surfactants, formaldehyde, phenol, fluoride, lead, iron, barium, copper, and zinc
Radiator shops	Chemical oxygen demand, zinc, lead, and copper
Car washes	Chemical oxygen demand, zinc, lead, and copper
Truck cleaners	Chemical oxygen demand, total dissolved solids, cyanide, phosphate, phenol, zinc, aluminum, chromium, lead, and copper
Photo processors	Silver
Dry cleaners	Total dissolved solids, chemical oxygen demand, phosphate, butyl cellosolve, N-butyl benzene sulfonamide, iron, zinc, and copper
Laundries	Chemical oxygen demand, ethyl toluene, n-propyl alcohol, isopropyl alcohol, toluene, m-xylene, p-xylene, ethylbenzene, bis (2-ethylhexyl) phthalate, iron, lead, zinc, copper, chromium, phosphate, and sulfide

Source: Supplemental Manual on the Development and Implementation of Local Discharge Limitations, EPA, May 1991.

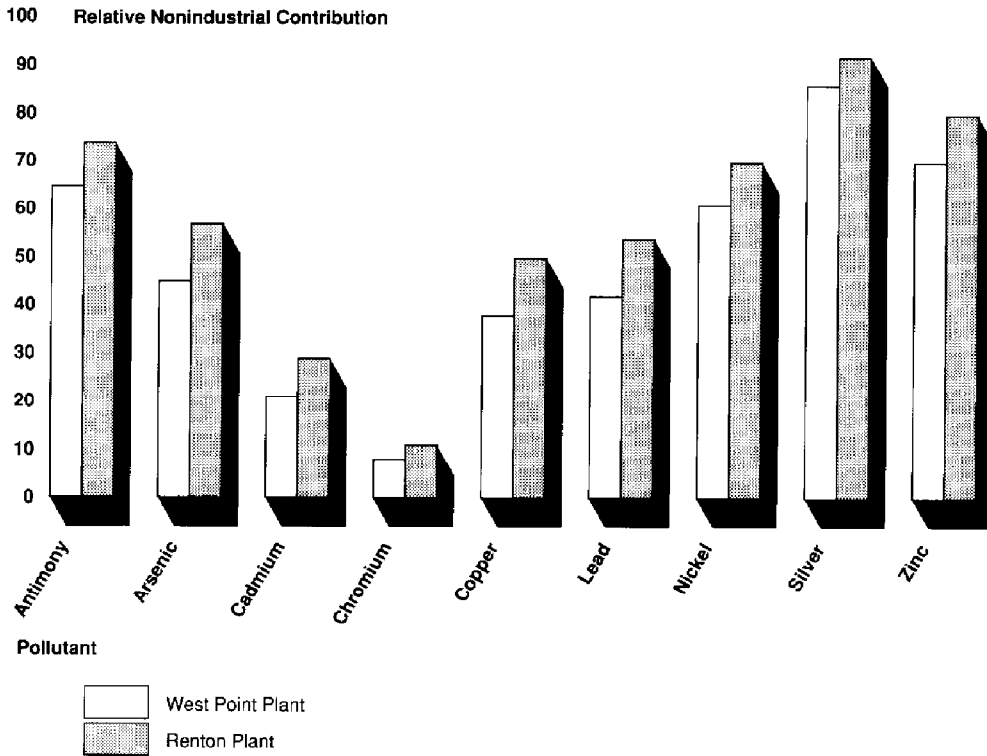
Studies conducted by individual treatment plants also revealed household and commercial pollutants discharged into sewers. For example, a Seattle, Washington, treatment plant study found that nonindustrial sources contributed up to 96 percent of certain toxic pollutants entering the plant. According to the study, these high levels occur, in part,

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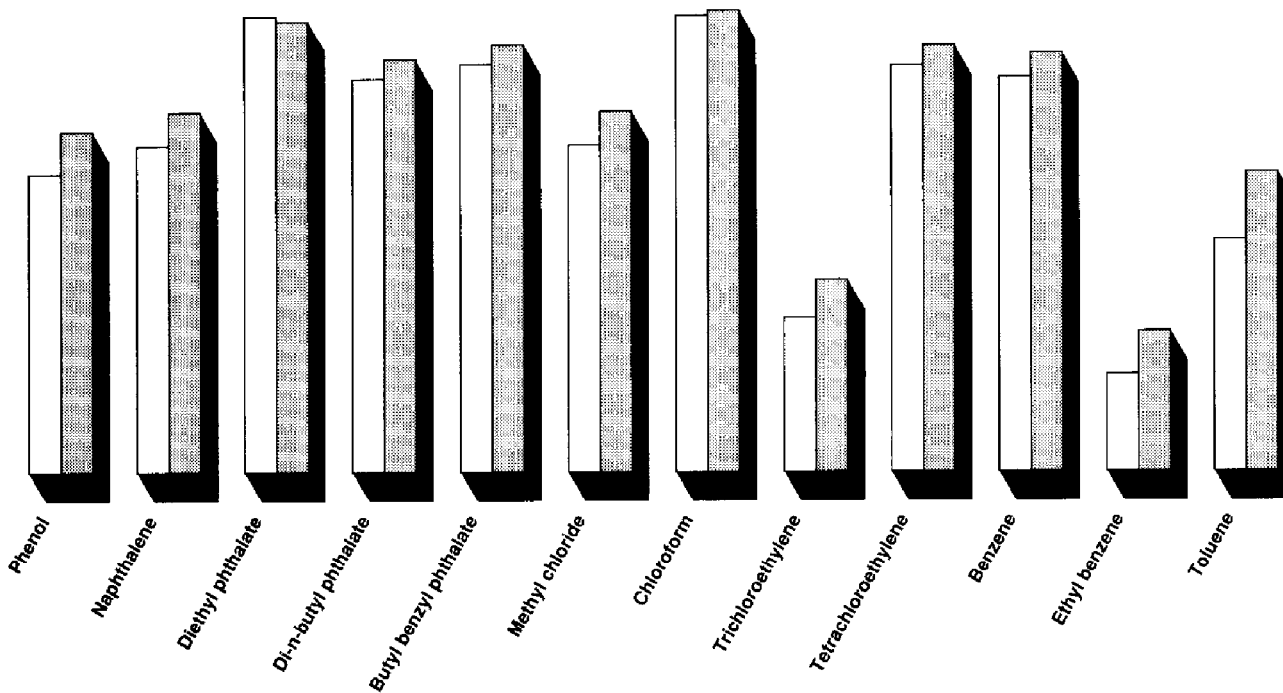
because the volume of wastewater from nonindustrial sources is approximately six times larger than the volume from industrial sources. Thus, although the concentrations of pollutants in nonindustrial wastewaters may be low, volume can be high. Figure 2.2 shows the estimated relative nonindustrial contribution of toxic pollutants at two Seattle plants.

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Figure 2.2: Relative Estimated Nonindustrial Pollutant Contribution (Percent of Total Volume) at Two Seattle Treatment Plants



Source: GAO illustration based on data from the Municipality of Metropolitan Seattle (Metro).



As shown in figure 2.2, in several cases nonindustrial sources were the major source of toxic pollutants entering the treatment plants. The table also shows that, even within a city, there can be some variation in the contribution of toxic pollutants by nonindustrial sources. For example, while nonindustrial sources contributed 48 percent of the toluene that entered the West Point plant, these sources accounted for 62 percent at the Renton plant. Similar variations occurred for other toxic pollutants.

Seattle treatment plant studies and analyses also determined that up to 64 percent of the arsenic that ended up in sewage sludge came from households. One study concluded that a significant amount of the arsenic—up to 40 percent of the residential load, or up to 26 percent of the total load—came from powdered laundry detergents, dishwashing detergents, and bleach. A study conducted by the Soap and Detergent Association (a trade organization representing the industry's interests) came up with similar findings. The study examined the level of toxic pollutants that household cleaning products contribute to wastewater

treatment plants. It focused on arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc. The study found that, with the exception of arsenic, the contribution of metallic pollutants to wastewater influent from household cleaning products was less than 1 percent. However, 13 percent of the arsenic reaching wastewater treatment plants came from these products.

A 1989 study conducted by a Palo Alto, California, treatment plant also concluded that wastewater from households and commercial establishments contains significant levels of toxic pollutants. For example, the study estimated that up to 26 percent of the zinc and up to 22 percent of the copper and cyanide that entered the plant came from households. Households could also be responsible for up to 15 percent of the lead, 12 percent of the cadmium, and 7 percent of the nickel entering the plant.

Of greater concern, however, was the amount of silver entering the Palo Alto plant. The plant discharges its wastewater directly into the South San Francisco Bay, a sensitive ecological system that, because of its unique hydrogeological conditions, receives little mixing from ocean tidal action. Consequently, pollutants are not easily dispersed and tend to accumulate. As a result, levels of silver in the tissues of clams living near Palo Alto's discharge point are higher than in other South Bay locations. The plant determined that household discharges accounted for up to 7 percent of the silver the plant received, while commercial establishments and industrial facilities not regulated under the plant's pretreatment program accounted for up to 43 percent. At these levels, according to a plant official, even if the industrial discharges of silver regulated by the plant were completely eliminated, the plant would not be able to meet anticipated, more stringent permit limits under the National Pollutant Discharge Elimination System Program.

Conclusions

While the nature and extent of problems can vary by location, studies conducted by EPA, treatment plants, and others indicate that nonindustrial wastewater contributes significant amounts of toxic and other harmful pollutants to sewage treatment plants. These pollutants can pose serious threats to the environment, public health and safety, and the operations of the treatment plants themselves. Although nonindustrial users of the plants discharge relatively low concentrations of these pollutants, the high cumulative volume of nonindustrial wastewater can make these contributions significant. In coming years, as EPA's Pretreatment Program further reduces toxic and other harmful pollution from industrial sources, the relative contribution to pollution from nonindustrial sources can be expected to increase.

Options Exist to Better Manage Nonindustrial Wastewater

Concerned about the effects of toxic wastewater on both water quality and on the sewage sludge generated by the wastewater treatment process, some states and localities have established programs to manage and control pollutants found in nonindustrial wastewater. These programs range from relatively modest steps, such as public education efforts, to more significant and costly actions, including product bans. States and localities have also established a wide variety of programs—such as household hazardous waste collection programs—that are not designed specifically or solely to address wastewater quality concerns, but that can nonetheless lower the level of pollutants found in nonindustrial wastewater.

Because the Clean Water Act emphasized the control of industrial wastewater pollution, EPA has focused most of its attention on industrial rather than nonindustrial sources of toxic pollutants discharged to sewage treatment plants. EPA efforts to better manage and control nonindustrial wastewater pollution have primarily been limited to providing information and guidance to consumers, states, and localities. Options available to EPA to better manage and control nonindustrial wastewater pollution range from voluntary, relatively low-cost programs that could be readily implemented in the near future, to mandatory and more costly options that should be considered only if further information indicates they are warranted.

State and Local Programs to Manage Nonindustrial Wastewater Pollution

While a complete inventory of state and local programs designed to manage and control nonindustrial wastewater does not exist, EPA, wastewater treatment, and environmental officials identified a number of programs designed to better control the problem. In addition, these officials told us that there are a number of programs that are not designed specifically to address water quality concerns but that lower the levels of pollutants found in nonindustrial wastewater.

Two programs designed specifically to address nonindustrial wastewater were cited by several of the officials as being particularly comprehensive. The impetus for, and experiences of, these two programs are discussed below.

Palo Alto's Toxic Reduction Program

The city of Palo Alto, California, discharges its treated effluent into the South San Francisco Bay. In 1989, California designated the South San Francisco Bay as a "toxic hotspot" under provisions of section 304(l) of the Clean Water Act. This section requires states to develop lists of

heavily polluted surface waters that are not expected to meet established water quality standards, even after required controls are in place for facilities discharging into the waters. States were also required to identify point sources of toxic pollution and develop strategies to control their toxic discharges. Palo Alto's wastewater treatment plant was identified as such a point source.

As a condition of being allowed to discharge its treated effluent into the Bay, Palo Alto's National Pollutant Discharge Elimination System permit required the treatment plant to reduce the toxicity of its discharges. To meet this requirement, the plant (1) determined whether all significant and controllable sources of pollutants had been identified and were regulated under its pretreatment program, (2) identified feasible waste minimization measures that would reduce or eliminate sources of the toxic substances in its influent, and (3) investigated additional treatment technologies to apply at the sewage treatment plant.

Additionally, the plant conducted a survey of several cities that had adopted local limits to reduce heavy metals loads or had implemented industrial, commercial, and domestic source reduction programs. On the basis of the survey results, Palo Alto concluded that it should (1) continue and expand local limits for nonindustrial facilities, such as commercial laundries and dry cleaners; (2) develop a toxic pollution source reduction program with cities and agencies throughout the Bay Area; and (3) sponsor workshops, develop and distribute information to the public on source reduction techniques, and encourage the development and use of less toxic products and processes.

Palo Alto initially focused on reducing silver discharges because levels detected in its influent were significantly above expected permit limits and because of concerns about silver's effect on clam reproduction in the South San Francisco Bay. Although the plant's treatment processes had been removing about 85 percent of the silver entering the plant, Palo Alto will be required to meet new discharge limits expected to be placed on its permit under the National Pollutant Discharge Elimination System Program in December 1991. To do so, Palo Alto will need to install additional treatment equipment or reduce levels of silver entering the plant, before treatment, by 75 percent. According to a Palo Alto study on installing additional treatment equipment, the costs of construction, increased energy requirements, and the disposal of 2.5 million gallons per day of toxic by-products (generated by treatment) would add at least \$20 million per year to the plant's current annual operating

costs—tripling current sewage use rates. Source reduction, plant officials concluded, was clearly the preferable option.

After determining how much silver could be discharged into the city's sewer while still meeting future permit limits, Palo Alto lowered pretreatment discharge limits for industrial facilities in September 1990. At the same time, the plant also imposed local limits on small volume photographic materials processors that for the most part had not been regulated in the past. The city also adopted a silver reduction ordinance that regulated all dischargers of silver to the sewer, from the smallest dentist offices to the largest photoprocessing facilities. Previously unregulated dischargers have until September 1991 to comply with the new requirements.

The ordinance allows silver dischargers to either (1) treat spent solutions on site to remove nearly all of the silver before discharging into the sewer or (2) deliver spent solutions to a silver reclaimer. The sewer ordinance carries enforcement provisions under which the treatment plant can impose fines of up to \$6,000 per day for noncompliance. The treatment plant's goal, however, is to encourage compliance with the ordinance by helping the regulated community. The plant has held several workshops to explain the ordinance and its importance to the affected community. According to treatment plant officials, small business compliance with the ordinance will be the key to the program's success.

In addition to its efforts to reduce silver contributions (loadings) in the sewers from industrial and commercial facilities, the plant is also targeting domestic silver sources. The plant has developed educational pamphlets that encourage home hobbyists to take spent solutions to household hazardous waste collection sites rather than dispose of them in a sink. In January 1991, the plant began distributing these pamphlets to photochemical sales outlets within and outside of its service area and has asked these retailers to distribute this information to customers. Although the plant's environmental compliance division manager is uncertain to what extent silver loadings into the plant's influent will decrease, the official told us that sharp reductions are expected by the spring of 1992.

Seattle's Product Risk Assessment Program

In the 1980s, Seattle officials determined that the city's nonindustrial wastewater contained high levels of arsenic and other pollutants that were contaminating its sewage sludge. In 1989, the city's wastewater agency, Metro, established a program (as part of a more comprehensive

statewide program to manage hazardous waste) to identify and reduce sources of hazardous chemicals in the wastewater treatment system and local waters. As part of this effort, Metro entered into a contract the same year with the Washington Toxics Coalition (a nonprofit environmental group) to evaluate environmental and health risks associated with various consumer products and to inform the public about these risks. Metro and coalition officials believe that once consumers are informed, they will choose products with relatively lower associated environmental risks.

To implement this program, the coalition (1) developed criteria for rating consumer products according to their relative hazard or degree of safety to people and the environment, (2) gathered data on a wide range of consumer products and rated these products using the criteria it had developed, (3) created an automated data base to store product evaluations, and (4) conducted efficacy tests and ratings on “home recipes” for household products that are promoted as safer alternatives to name brand products.

In developing the rating criteria, the coalition established a committee composed of local environmental, health, solid waste, and wastewater treatment officials. The rating system they developed was based on four broad categories: (1) near-term toxicity, (2) long-term toxicity, (3) flammability/reactivity, and (4) environmental hazards. Each of these categories was then further subdivided to address specific concerns. For example, near-term toxicity was broken out into subcategories of route of exposure (e.g., eyes, mouth, skin).

The products are evaluated under each subcategory and assigned a color—green, yellow, red, or black; a green designation represents the least risk to the environment and human health, while black represents the most risk. The color gray is used when not enough information is available to determine a rating. A product’s rating in each of the four categories is based on the least favorable rating it receives in any of the subcategories. This approach was taken because coalition officials believe that a serious hazard in any of the subcategories should be reflected in the final ratings and should not be minimized by averaging with other, less significant hazards.

The coalition has thus far rated 250 products, including laundry detergents; household cleaners, such as scouring powders and oven cleaners; drain openers; art and hobby markers; pesticides; and lighter fluids. The ratings for these products were contained in two reports issued to Metro

in 1990 and 1991. Metro and the coalition have provided fact sheets to local merchants on the preliminary ratings and have asked the retailers to distribute these fact sheets to consumers.

According to a Metro official, in an effort to evaluate the effectiveness of its consumer education campaign, Metro has obtained agreement from several local cooperative stores to share their sales data with the agency. Metro hopes to evaluate the effectiveness of its efforts by observing changes in consumer consumption of products for which it has developed recommended alternatives. Since the program is only in its initial stages, however, the official was unable to provide us with information on the success of Metro's program. In the future, Metro hopes to measure reductions in the levels of arsenic in its wastewater and sludge, thereby making sludge cleaner and easier to manage.

State and Local Product Bans

Some states and localities have banned the use of certain chemicals after determining that they pose significant risks to the environment. For example, many states in the Great Lakes and Chesapeake Bay areas have banned the use of phosphates (a source of phosphorous) in laundry detergents because of their adverse effect on water quality and aquatic life. In doing so, some treatment plants have saved millions of dollars by eliminating the need to treat this pollutant. According to EPA, Washington, D.C.'s phosphate ban saves the city an estimated \$6.5 million annually in operation and maintenance costs—representing 10 percent of the treatment plant's operating budget.

Other products adversely affecting water quality have also been banned. For example, because of concerns about potential groundwater contamination, Connecticut banned the retail sale of sewer and septic cleaners containing any of the compounds listed on EPA's priority pollutant list. According to state officials, one product marketed in the state contained enough benzene in 1 gallon to seriously pollute a million gallons of water.

Broader State and Local Programs With Impacts on Wastewater Pollution

In addition to programs designed specifically to protect water quality, states and localities have established a wide variety of programs aimed more broadly at reducing the levels of toxic pollutants in the environment. While not designed solely to address water quality problems, these programs can indirectly reduce the level of toxic substances that might otherwise find their way into sewer systems. These programs include the following.

California's Proposition 65

Proposition 65, officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986, became law as the result of a citizen petition that placed it on California's general election ballot; voters passed it by a nearly two-to-one margin. According to a draft report prepared for EPA,¹ Proposition 65 has led to prominent labeling of products such as alcohol and tobacco and has caused widespread debate over the labeling requirements for a variety of other products.

According to the report, proposition 65 requires the governor to list chemicals known to the state to cause cancer or other toxic effects. Twelve months after a chemical is listed, businesses must not knowingly expose any individual to a significant risk level of the chemical without first providing a "clear and reasonable warning." This warning is to be provided not only to consumers but also to workers who are exposed to the chemical on the job. Twenty months after the chemical is listed, businesses must not knowingly discharge the chemical in significant amounts into the drinking water supply.

The report states that the law is enforced as follows: Sixty days after notifying public authorities of a potential violation, any individual or group may sue the violator. The burden of proof is on the accused violator to show that it is obeying the law, rather than on the accuser to show otherwise. The individual or group bringing the suit may eventually receive a percentage of the penalty fines imposed on the violator. Both this "bounty hunter" incentive and the reversed burden of proof represent a marked change from traditional regulation of toxic or carcinogenic substances.

According to the report, in the first major enforcement action under the proposition, the state attorney general filed suit against tobacco companies, grocery stores, and others for failure to provide warnings in conjunction with the sale of cigars and pipe tobacco. In a settlement reached in October 1988, the tobacco companies agreed to label their products' packages in a manner similar to federal cigarette labels.

The report states that critics charge that the law will result in a proliferation of labels. Thousands of products contain some amount of the listed chemicals. However, the authors of the law claim that its goal is not to see widespread warning labels on products but to encourage manufacturers to make their products safer and, therefore, avoid labels. For

¹Environmental Labeling in the United States, Background Research, Issues, and Recommendations, Draft Report, Applied Decision Analyses, Inc., Dec. 5, 1989.

example, a typewriter correction fluid that contained a toxic substance was removed from the market by its manufacturer and replaced with a reconstituted version without this substance. For many products and industries, however, extensive litigation activities have delayed implementation of the law; and, according to the draft report on environmental labeling, some observers state that it is still too early to assess the law's full impact.

Household Hazardous Waste Collection and Recycling Programs

State and local household hazardous waste collection programs are another example of efforts to reduce the level of pollutants entering the environment. These programs are designed to lower the amount of household hazardous wastes—such as paints, solvents, and pesticides—that would otherwise be disposed of in landfills or dumped into sewers. The programs can range from toll free “hotlines” and other education efforts to inform the public how to safely dispose of these products to special curbside collection days or permanent collection sites. The programs have become increasingly popular over the past several years. According to Dana Duxbury and Associates, an EPA contractor, over 800 household hazardous waste collection programs took place in 42 states in 1990.

The Seattle area has been involved in the management of household hazardous wastes since the early 1980s. Its household hazardous waste management program includes a number of local government agencies, private companies, and community groups. The Seattle-King County Department of Public Health, for example, operates a central telephone line to answer all questions on household hazardous waste. City buses post advertising signs to raise awareness about household hazardous waste and promote its proper handling, as do radio public service announcements. In addition, solid waste, water, sewer, and drainage utilities insert educational fliers into their billings.

Because participation in Seattle's collection events exceeded program expectations, the city is establishing permanent, year-round collection sites and mobile units that collect household hazardous waste for 2-week periods at numerous temporary sites throughout the area. Between November 1989 and October 1990, Seattle's permanent site collected about 50 tons of hazardous waste from 2,600 customers and the mobile collection unit collected over 500 tons from 17,000 customers. Additionally, several localities have established used oil collection and recycling programs.

Although these programs are frequently designed to reduce the levels of toxic pollutants entering the municipal solid waste stream, many experts and officials we talked with believed that household hazardous waste collection programs also reduce the amount of pollutants that enter sewage treatment plants. Accordingly, some sewage treatment facilities have sponsored these programs. For example, Palo Alto's treatment plant informs residents of the city's program by placing inserts in utility bills and by holding the collection program at the plant.

According to EPA's report entitled Collecting Household Hazardous Wastes at Wastewater Treatment Plants: Case Studies (EPA, 1990), wastewater treatment plants are ideal facilities for household hazardous waste collection because they are often equipped to handle emergency spills. In addition, holding collection programs at the plants creates opportunities for public education about household hazardous waste and wastewater treatment.

Federal Options Exist to Better Manage Nonindustrial Wastewater

Because the Clean Water Act emphasized control of industrial sources of wastewater pollution, EPA has focused most of its attention on industrial rather than nonindustrial pollutants discharged to sewage treatment plants. EPA's efforts to better manage and control nonindustrial wastewater have primarily been limited to providing information and guidance to consumers, states, and localities. For example, EPA has published a pamphlet for wastewater treatment plants that encourages them to establish household hazardous waste collection programs. Additionally, EPA's guidance to treatment plants on the development of local limits suggests using sampling programs to characterize the extent of toxic pollutants discharged by commercial and domestic sources.

Although the Clean Water Act does not explicitly require EPA to develop nonindustrial influent control programs and strategies, we identified several such options through our discussions with EPA, state, treatment plant, and environmental officials. Options available to EPA range from voluntary, relatively low-cost programs that could be readily implemented in the near future to mandatory and more costly actions that should be taken only if warranted by new information documenting a serious problem. The relative merits of these options are discussed below.

Requiring Treatment Plants to Analyze Wastewater From Nonindustrial Sources

Although the best available information indicates that wastewater from nonindustrial sources may contain significant amounts of toxic and other harmful pollutants, little is known about the source and seriousness of these pollutants, particularly on a plant-by-plant basis. Most studies have thus far focused on industrial rather than on nonindustrial wastewater. Furthermore, the few studies that have examined nonindustrial wastewater suggest that the nature, source, and seriousness of problems can vary by location. For example, while Palo Alto discovered that silver from commercial establishments was adversely affecting water quality in the South San Francisco Bay, Seattle discovered that arsenic from laundry detergents was contaminating its sludge. The Seattle studies also demonstrated that pollution levels can even vary between treatment plants serving different parts of the same city.

EPA, state, and environmental officials acknowledge that more needs to be known about the range, source, and seriousness of problems associated with nonindustrial wastewater. According to the executive director of the Association of Metropolitan Sewerage Agencies, many treatment plants are now conducting various analyses of their influent and effluent. These analyses range from relatively inexpensive testing and monitoring of specific pollutants to more costly, comprehensive analyses of a broad range of pollutants and their sources. Although many plants already conduct some form of analysis, the director acknowledged that treatment plants will need to know more about an increasing number of sources of toxic pollutants in light of the new water quality standards, effluent limits, and sewage sludge standards required by the 1987 amendments to the Clean Water Act. These changes require states to adopt numeric criteria as part of their water quality standards for priority toxic pollutants. States must also meet concentration limits for these pollutants in sludge and develop acceptable sludge management practices.

Since available information indicates that nonindustrial wastewater can pose problems that can vary by location, EPA could initially require the nation's 1,500 major treatment plants² to conduct preliminary analyses of their nonindustrial influent. These data, in turn, could provide EPA with needed information to decide (1) what further analyses, if any, should be conducted by these plants; (2) if other, smaller plants should also conduct analyses; and (3) what further actions may be warranted to better control nonindustrial wastewater pollution.

²According to a 1986 EPA estimate, these 1,500 plants account for about three-fourths of both the total flow through treatment plants and the sewage sludge generated nationwide.

Establishing a Clearinghouse on Nonindustrial Wastewater Pollution

Although problems and the programs designed to address them vary by location, treatment plants could benefit from other plants' knowledge and experiences. For example, while high levels of silver presented a major problem for Palo Alto and elevated levels of arsenic were the primary concern in Seattle, the two cities' nonindustrial wastewater contained a number of toxic pollutants in common. Treatment plant officials told us that plants needing to assess and control nonindustrial wastewater pollution could benefit from the experiences of others—and potentially reduce program start-up time and costs—if they could readily obtain information on programs designed by others with similar problems.

EPA has already established a clearinghouse to promote pollution prevention. Among other things, this clearinghouse contains a repository of texts, fact sheets, and case studies on pollution prevention efforts. Users can access the clearinghouse's automated data base to conduct literature searches, order documents, and exchange information with or contact other clearinghouse users. EPA officials acknowledge that this clearinghouse could readily be expanded to include information on treatment plant studies of nonindustrial wastewater and programs designed to better control this influent.

Requiring Treatment Plants to Implement Source Control Programs

If EPA required treatment plants to identify the sources and magnitude of problems associated with their nonindustrial wastewater, the information could be used to identify what, and where, additional controls are needed. For example, if a study conducted by a treatment plant indicates that pollution levels are significant enough to pose compliance problems with its discharge permit, EPA could require the treatment plant to implement programs to reduce these levels. In fact, according to a regional EPA wastewater permit official, such water quality concerns may lead the EPA regional office to require some wastewater treatment plants to institute public education programs to alert the public about the environmental hazards of dumping used motor oil, paint, and other potentially harmful chemicals down sewer drains. Other programs could include those already instituted by some plants, such as establishing collection programs for household hazardous waste and used oil, or setting additional or more stringent local limits on dischargers of toxic wastes.

Although some treatment plants already impose local limits on commercial establishments, we noted in our 1989 report on the Pretreatment

Program³ that local limits may not always have been adopted when needed. Furthermore, as we noted in our July 1991 report,⁴ states have been slow in adopting numeric discharge limits for the Clean Water Act's priority pollutants. Without such permit limits, plants have had little incentive to impose local limits. An official from a wastewater treatment association told us that plants typically impose local limits only when they are violating or risk violating permit limits or are having difficulty getting others to take their sludge. In addition, although states may eventually develop permit limits for the priority pollutants, some state officials believe that nonpriority pollutants are causing serious water quality problems as well. Even in the absence of numeric permit limits, EPA recommends—in its July 1991 report entitled National Pre-treatment Program—promoting pollution prevention measures. These measures include developing sound local limits and domestic hazardous waste collection programs to reduce the discharge of toxic and other harmful pollutants from nonindustrial sources.

Banning Products and Chemicals

Initial and subsequent analyses of nonindustrial influent can help identify those substances that pose unreasonable environmental or health risks nationwide. When this situation exists, EPA could use its authority under the Toxic Substances Control Act to restrict or ban these substances. If EPA determines that a given substance poses unreasonable risks to human health or the environment, the act gives the Agency the authority to, among other things, (1) mandate that a substance be manufactured only in limited concentrations or (2) ban the manufacture and distribution of a substance altogether.

However, as we noted in our July 1990 report,⁵ EPA's past efforts to use this authority have been limited. In making a finding of unreasonable risk, EPA must consider the overall health risk to the public, the benefits of the activities/substance in question, and the economic cost of regulation. These considerations are subject to analyses and interpretation and can result in substantial delays and difficulties in using the act. Further, EPA officials said that a major problem in using the act is that it contains no deadlines for completing regulatory actions, and that the act requires

³Water Pollution: Improved Monitoring and Enforcement Needed for Toxic Pollutants Entering Sewers (GAO/RCED-89-101, Apr. 25, 1989).

⁴Water Pollution: Stronger Efforts Needed by EPA to Control Toxic Water Pollution (GAO/RCED-91-154, July 19, 1991).

⁵Toxic Substances: Effectiveness of Unreasonable Risk Standards Unclear (GAO/RCED-90-189, July 20, 1990).

EPA to exhaust other regulatory avenues with other federal agencies and programs before issuing rules under the act.

Instituting Voluntary or Mandatory Product Labeling Programs

Another option made available to EPA under the Toxic Substances Control Act would be to require manufacturers to place warning labels on consumer products. In addition to banning substances altogether, EPA has the authority to take less severe actions. For example, EPA can require manufacturers to label their products to alert consumers about a product's risks and inform them how to properly use and dispose of the product. Given this variety of risk-reduction measures, EPA believes that it has flexibility in making its unreasonable risk finding. Since relatively little impact would be imposed on society by requiring manufacturers to label substances with warnings and instructions, such a requirement would therefore be easier to justify under the act than would an outright ban. However, EPA officials told us that other pollution prevention measures are preferable. Instead of requiring manufacturers to label their products with warnings, for example, the Agency would prefer to encourage industries to voluntarily reduce the amount of toxic substances used in manufacturing processes and found in consumer products.

EPA has recently become more active in labeling issues outside the scope of the act. For example, in a joint effort with the Federal Trade Commission and the Office of Consumer Affairs, EPA is exploring the possibility of establishing national uniform guidelines or standards for the use of environmental terms in advertising. Although the Federal Trade Commission already has general guidelines requiring product claims to be truthful and substantiated, it has no guidelines for environmental claims and no expertise in dealing with such matters. As a first step, these agencies are developing guidelines for product claims of "recyclable," "recycled content," and "biodegradable." As currently planned, the federal environmental advertising guidelines would be voluntary. At the same time, however, such guidelines could assist the Federal Trade Commission in enforcing its mandate to ensure that manufacturers' claims are accurate and substantiated, according to an EPA official.

Finally, one other labeling option has merit as a general pollution prevention tool extending beyond wastewater quality to include other environmental objectives such as protecting air quality and groundwater. EPA has begun examining the possibility of instituting a voluntary, nationwide environmental labeling program. These so-called "green label" programs have been implemented in Germany, Japan, and

Canada. Under these programs, manufacturers agree to submit their products to panels generally composed of government, environmental, and industry officials who evaluate products' relative environmental risks. Under Germany's program, for example, products evaluated as posing low risks are awarded a seal (in this case, a "Blue Angel") that the manufacturers display on the product to advertise its environmental merits. The rationale behind these programs is that with environmental consciousness and concern growing, consumers will choose products with a seal over those without one. Most of these programs are funded by fees that the manufacturers pay to use the label.

Although EPA recognizes these programs' potential in reducing environmental risks, the Agency and manufacturers have raised concerns about the difficulty of determining which products pose greater or lesser environmental risks. For example, a number of factors need to be taken into account, such as how much pollution is created by the energy used to extract, process, and transport raw materials. Another factor would be how to weigh the different environmental impacts relative to each other in (1) different categories (less energy usage but more solid waste production), (2) different streams (less air pollution but more water pollution), and (3) different components in the same stream (fewer heavy metals but more toxic organics in the wastewater stream). In light of these problems, EPA is developing a methodology for analyzing products' environmental impact throughout their life cycle and plans to share the results of this methodology with manufacturers, public interest groups, and academics. If EPA's efforts yield a feasible methodology that adequately addresses EPA's and industry's concerns, a major barrier to instituting a "green label" program in the United States would be removed.

Conclusions

Although the appropriate level of federal involvement depends largely on the seriousness of nonindustrial wastewater problems, some additional federal efforts are warranted and could be implemented now. As a starting point, more needs to be known about the source and seriousness of these problems and the steps being taken to address them. We believe EPA should require treatment plants to gather and report this type of information. EPA can then make this information available to other treatment plant officials so they can benefit from others' experiences and potentially reduce start-up time and costs of needed programs. EPA officials acknowledge that one readily available option would be to expand the agency's existing pollution prevention clearinghouse to include this type of information.

Once this information is gathered and analyzed, EPA will be positioned to determine whether more direct and costly regulatory actions are warranted to reduce nonindustrial wastewater pollution. One option would be to require treatment plants experiencing problems to implement source control programs. Source control programs can include public education activities to alert the public about the environmental hazards of dumping used motor oil, paint, and other potentially harmful chemicals down sewer drains. Other source control programs could include the types of efforts some plants have already instituted, such as establishing collection programs for household hazardous waste and used oil, or imposing local limits on dischargers that would require them to remove pollutants from their wastewater.

If the information gathered confirms that certain substances are posing unreasonable environmental or health risks nationwide, EPA could also exercise its authority under the Toxic Substances Control Act to restrict or ban these substances. This act also allows EPA the less drastic option of requiring manufacturers to place warning labels on their products to alert consumers of product risks and inform them of proper product use and disposal.

Finally, several options have merit as general pollution prevention tools that extend beyond wastewater quality to include other environmental objectives such as protecting air quality and groundwater. A prime example is the type of voluntary labeling program in place in several other countries. EPA is currently looking into the feasibility of using this type of program in the United States.

Recommendations

We recommend that the Administrator, EPA, require major wastewater treatment plants to identify the most serious nonindustrial pollutants entering their facilities and the sources of these pollutants, and report on their efforts to control them. EPA should use this information to determine what, if any, further analyses are needed by these and/or other plants. Further, EPA should make this information available to treatment plant officials so they can benefit from others' experiences and potentially reduce the start-up time and costs of needed programs to better control these pollutants.

We also recommend that, on the basis of the information reported to the Agency, the Administrator determine whether further regulatory actions are needed to reduce nonindustrial wastewater pollution. Such actions could include (1) requiring treatment plants to implement source

control programs (e.g., regulating additional industrial and commercial discharges and establishing programs to collect household hazardous wastes) and (2) exercising the Agency's authority under the Toxic Substances Control Act to restrict or ban substances, or require manufacturers to place warning labels on their products to alert consumers of the products' risks.

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Related GAO Products

Water Pollution: Stronger Efforts Needed by EPA to Control Toxic Water Pollution (GAO/RCED-91-154, July 19, 1991).

Opportunities to Better Manage and Control Nonindustrial Wastewater Pollution (GAO/T-RCED-91-72, July 9, 1991).

Toxic Substances: Effectiveness of Unreasonable Risk Standards Unclear (GAO/RCED-90-189, July 10, 1990).

Water Pollution: Improved Monitoring and Enforcement Needed for Toxic Pollutants Entering Sewers (GAO/RCED-89-101, Apr. 25, 1989).

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