FOCUS on Water

Virginia Water Resources Research Center • Virginia Tech

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Edward Born

Rockbridge's Illegal Dumps

Dennis Slifer (*above*), a former Virginia Tech graduate student and resident of Rockbridge County, stands amid the trash of an illegal dump in the Turkey Hill Section of the county.

"Dumps like these are a health threat," he says. "They have the potential to pollute ground and surface water, spread disease, cause forest fires and even traffic accidents."

Slifer's concern over illegal dumps began when he and some neighbors tried to get the county to clean up around a dumpster and move the dumpster to a more acceptable place. For Slifer's account of that three-year effort and how it led to the discovery of 73 illegal dumps in Rockbridge County, please turn the page.

'Promiscuous' dumps — so called because of their unrestricted and indiscriminate nature — are illegal, but laws banning them are seldom enforced.

by Dennis Slifer

RURAL areas in Virginia are plagued with unsightly and polluting roadside trash dumps. The Virginia Health Department refers to them as "promiscuous" dumps because of their unrestricted and indiscriminate nature. Although they are illegal in Virginia, laws banning them are seldom enforced. Furthermore, county governments vary in their approach to dealing with them. Many localities lack ordinances or resources to fight them. Some even lack the will.

My interest in the issue goes back to 1983 when a small group of neighbors tried to get the county to clean up an open dump that had grown up around a dumpster on State Route 661 and covered an area between 5,000 and 10,000 square feet.

This dump threatened a nearby trout stream, and it may have been polluting one resident's spring water and the well of another. It took two attorneys and three years of concentrated citizen involvement before the county cleaned up the tons of household trash that had accumulated at the site and moved the dumpsters to a more convenient and environmentally safer site. Besides the angry residents and their lawyers, players in this protracted drama included the State Health Department, the Department of Highways and Transportation, the Rockbridge County Board of Supervisors, the Rockbridge County administrator, and the county operations supervisor, who manages Rockbridge's dumpsters.

The experience was a hard lesson in social studies. It did, however, cause me to wonder about how many other open, illegal dumps there were in the county. That speculation convinced me to undertake a study to determine the number of illegal dumps, their potential for environmental harm, and policies and practices affecting them.

The Study Area

ROCKBRIDGE COUNTY is similar to many western Virginia counties in geology and landscape. It is one of 24 counties that form the Valley and Ridge Province, one of five distinct geological areas in the state. In this area, long parallel mountain ridges separate valleys which are usually underlain by limestone bedrock. The Shenandoah Valley runs through many of these counties, including Rockbridge.

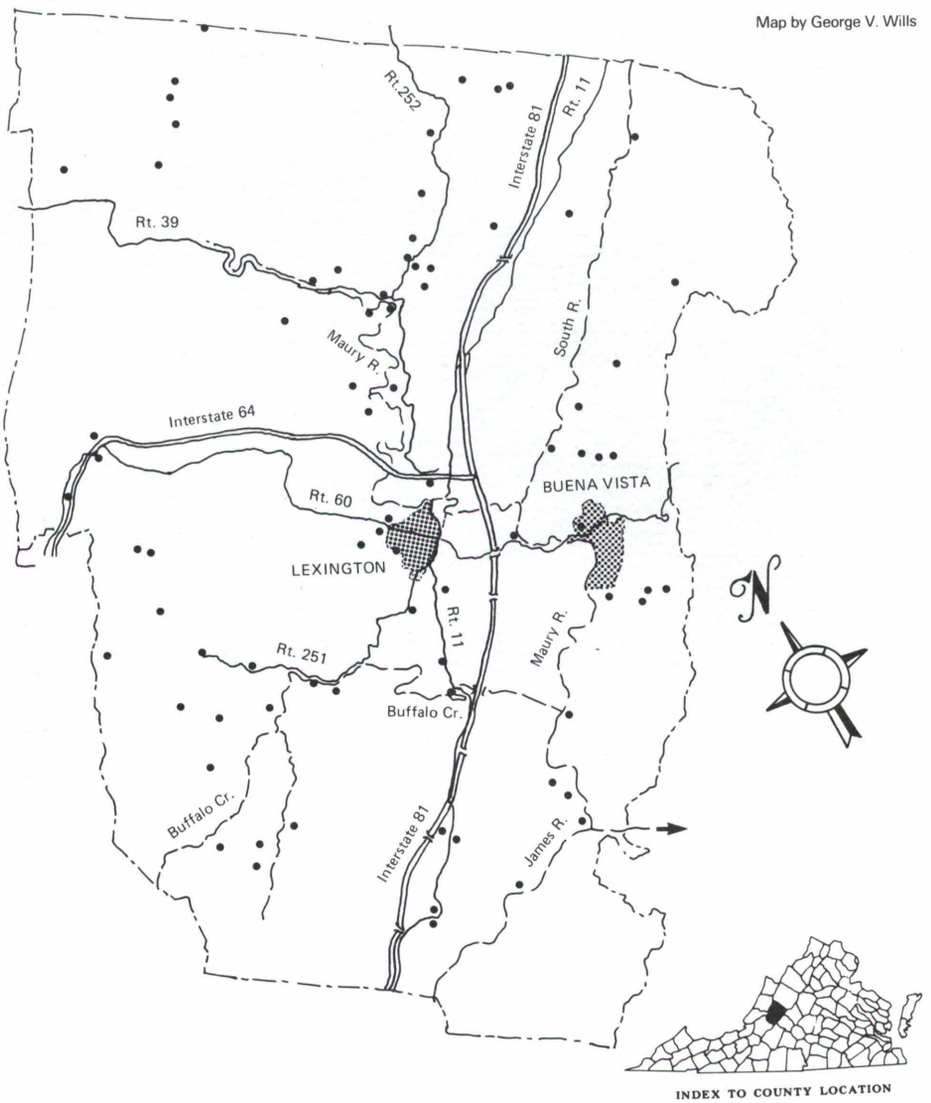
Rockbridge covers 604 square miles and consists of a broad central valley bordered on the east by the Blue Ridge Mountains and on the west by ridges of the Allegheny Mountains. Both the Jefferson and George Washington national forests extend into the area. Fertile limestone soils in the valley provide the county's best agricultural land. The Maury River and its tributaries define the drainage system for the county.

About 32,000 people live in the county. The number of residents has been relatively stable for some time, and only a modest increase is projected for the future.

Central waterworks supply about half the Rockbridge population while individual wells and springs supply the other half. Groundwater use exceeds 5 million gallons a day. Total water usage for the Rockbridge area is expected to increase 51 percent between 1980 and 2030, according to the Virginia Water Control Board's Draft Report for the Maury River Subarea.

Most of the groundwater withdrawals in the county are from the limestone aquifers of the valley areas. These aquifers provide the greatest amounts of groundwater but are also the most susceptible to contamination. Sinkholes are common throughout the areas underlain by limestone, and each is a possible direct channel to the groundwater system.

Map by George V. Wills



Location of illegal dumps in Rockbridge County

How Illegal Dumps Pollute Water

Contamination from dump sites can affect both surface and groundwater. In lakes, ponds, marshes, and low-volume streams, contamination has killed vegetation and fish and curtailed recreational use. Groundwater and surface water are interconnected and in some cases both may suffer from the contamination of a single dump site. Most dumps probably pose a much greater threat to groundwater than to surface water, however.

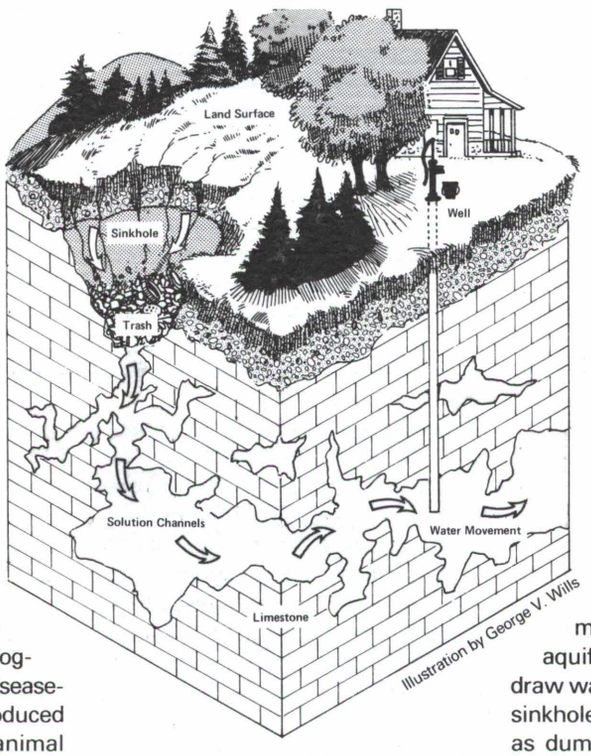
Open dumps are continuously exposed to the elements. Rain and snow infiltrate the contents and carry a solution of dissolved chemicals into the soil and groundwater. The decomposition and reactions of compounds in the dump can produce a lethal brew of dissolved contaminants known as leachate. Organic and inorganic chemicals, pathogens, heavy metals, and nitrates are typical elements of leachate. The type of wastes in the dump is the primary factor determining the composition and toxicity of the leachate.

Water is contaminated when elements, compounds, or pathogens are added to it and change its composition. Contamination can be from biological or chemical sources. Biological contamination results from disease-causing microorganisms introduced into water from human or animal wastes or dead animals. Chemical contamination involves a multitude of substances, some of which are largely indestructible and persistent in their polluting effects. The health effects of most hazardous chemicals are not yet known. Some of these hazardous materials are odorless and tasteless. These invisible contaminants could be especially insidious to human health.

A former head of the Virginia Water Control Board once estimated that 80 percent of Virginians rely on groundwater for at least part of their water needs, including 1.5 million residents who rely solely on wells or springs. According to EPA figures, 98 percent of rural Virginians rely on groundwater.

Groundwater movement is usually very slow, so it is not unusual for contamination from an open dump to show up years after wastes were dumped or the site was closed. The time lag between occurrence and detection is a problem because irreversible damage may occur before the contamination is discovered. Research by the U.S. Public Health Service reveals that waste disposal sites abandoned 20 years ago are still sources of contamination. It is for this reason that waste disposal sites are often referred to as environmental time bombs.

In areas underlain with limestone, sinkholes provide ready access for pollutants to reach groundwater.



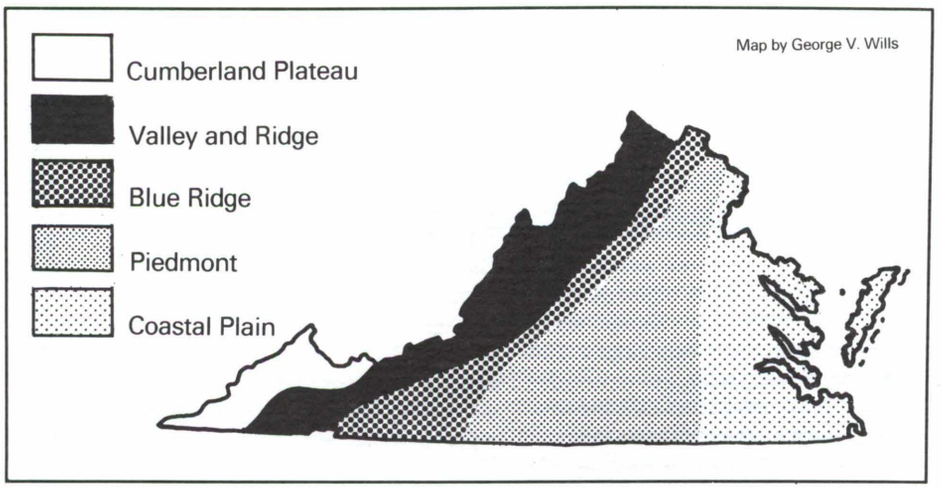
Distribution and movement of groundwater is controlled by the nature of the containing aquifer (a geologic formation that yields usable quantities of water). Filtering and natural processes in the soil and bedrock gradually help reduce some contaminants as they disperse from the source. However, groundwater in areas of limestone and dolomite bedrock is especially vulnerable to contamination. Thin soils, exposed bedrock ledges, caves, and sinkholes characterize these areas and allow rapid infiltration of underlying aquifers. Sinkholes act as natural funnels, concentrating runoff (or leachate) and introducing it into the groundwater. Limestone and dolomite are dissolved by slightly acidic groundwater, forming caves and solution channels. Groundwater in these carbonate rocks flows freely with no filtering effect and carry contaminants long distances in short periods of time.

Further, subsurface drainage paths in carbonate rocks flow independently of surface drainage, making it difficult to predict exact contamination effects. Contaminants can show up in surprising and unlikely places far from the source. In a Missouri study, published in 1982, of groundwater contamination from sinkhole dumps, dye tracers injected in a sinkhole emerged at major springs as far as 25 kilometers away, showing that bacteriological and chemical contamination of groundwater was resulting from sinkhole dumps.

Throughout the Valley and Ridge Province of Virginia the limestone valleys contain the most productive and widely used aquifers. Many wells and springs draw water from these aquifers. That sinkholes commonly have been used as dump sites represents a serious threat to groundwater quality in carbonate aquifers.

Along with contaminating water, open dumps often serve as breeding grounds for disease-carrying flies and rats. Dumps have caught fire — either a result of spontaneous combustion or arson — and have produced toxic fumes. Dumps along streams introduce broken glass and other hazardous materials to swimmers, anglers, and aquatic life. Pets and livestock have been poisoned by scavenging from dumps. Many are at roadside, and the presence of parked vehicles or debris in the road creates a hazard.

— D.S.



Virginia is composed of five geologic provinces, and each has distinctive groundwater characteristics. Nowhere is the potential for pollution of groundwater higher than in the Valley and Ridge province, where Rockbridge County is located.

Number and Description of Dumps

THIS study identified 73 illegal dump sites in the county. Forty-nine were roadside dumps, 24 were on private property, and 9 were on National Forest land. The dumps ranged in size from small piles of litter covering less than 100 square feet to large accumulations of trash covering 5,000 square feet or more. Thirty-two were adjacent to streams.

The dumps are typically in sinkholes, on steep wooded embankments, or in ravines and gullies. Roadside dumps are found along remote stretches of road wherever there is a wide place, or pull off, on the shoulder of the road and a steep bank or cliff over which to throw the trash.

The contents of these dumps indicate they are primarily used by private individuals. No evidence of illegal industrial dumping was found, and only five dumps contained commercial and institutional wastes.

A typical dump consists of a mixture of large items (old appliances, tires, auto parts, furniture, etc.) and the diverse household trash and garbage typical of America's modern throwaway society. The most commonly observed hazardous materials were motor oil cans and oil filters, paint cans, dead animals, herbicide and insecticide containers, household cleaning agents, solvents, and polishes.

Potential for Pollution

TO categorize the dumps identified in this study an objective ranking system was devised, based on size, geology, contents, topography, nearness to water, and estimated patterns of use. Three categories of dump sites were developed: dumps posing a serious threat of environmental contamination; dumps posing a moderate threat; and dumps posing only a small threat.

Of the dumps identified in this summary, 11 percent represent a serious threat to water quality; however, of those dumps identified as posing a moderate threat, 12 percent border on serious. That over half the dumps in this survey contain hazardous material underlines the magnitude of the contamination threat from open dumps. Because three-fourths of the dumps are in limestone areas and more than one-fourth of them are in sinkholes, the county is vulnerable to groundwater problems from open dumps. Though close to half the dumps are adjacent to streams, the threat to surface water isn't as great as the threat to groundwater.

Despite the availability of trash collection (dumpsters), the number and distribution of open dumps throughout Rockbridge County implies that promiscuous dumping is a common practice. The number of roadside dumps identified in this survey is approximately the same identified by the Health Department in 1967, which seems to indicate the problem is not decreasing. The amounts and types of hazardous materials, on the other hand, are increasing, along with the danger of water contamination.

Seven of the open dumps are at dumpster sites. Each is a location where significant amounts of trash are more or less continuously present on the ground in the vicinity of the dumpsters, in spite of the county's ordinance banning the littering or vandalism of a dumpster site.

During the course of the study, water samples were analyzed from sources near 21 dump sites, including the "cleaned up" site on route 661. A sample of runoff from the soil at the dump site during a rainfall in June 1986 showed the toxic metal lead in concentration at 0.1 milligrams per liter (mg/l), which is twice the maximum contaminant level established by state and federal agencies for drinking water. This implies that the soil is contaminated at the dump site even though the dump has been cleaned up. In addition, a sample of groundwater from the author's well (located one mile from the old dump site) also showed lead at 0.1 mg/l. Although this result does not establish a connection between the dump and this well, the possibility does exist.

Lead was detected at the same level of contamination in water from a pond owned by Clyde Falls and from four private wells located next to another illegal dump near Brownsburg. Although a natural source for lead in the groundwater of this limestone area cannot be ruled out, good reasons exist to suspect the source is the illegal dump. First, the dump is located at the head of a wet-weather spring, so that during wet weather a stream flows under the dump and then into Falls' pond, 350 yards away. Falls claims that the pond's water quality suffers because the dump is upstream from it. He has observed oil slicks on its surface. Second, there are many sources of lead (and numerous other possible contaminants) in this dump. Such sources include discarded vehicle batteries, many oil cans and used oil filters, paint cans, other chemical products, including about a dozen one-gallon pesticide and herbicide containers discovered in the dump in August 1986. They appeared to have been recently discarded.

Although this particular illegal dump is in a remote wooded area on private property, it is used by a number of households, according to Falls, apparently with the unspoken approval of the property owner, even though public trash containers are located within three miles of the site.

State Laws and Practices Affecting Illegal Dumps

ACCORDING to Sec 32-9.1 of the Virginia Code, open dumping of solid wastes, with the exception of certain inert solid waste, is illegal. Also illegal is littering, which is defined in Sect. 10-199 of the Virginia Code as "all waste material including but not limited to disposable packages or containers but not including the wastes of the primary processes of mining, logging, sawmilling, farming, or manufacturing." The

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Litter Control Act and other sections of the Virginia Code prohibit dumping trash on highways, rights-of-way or private property (Sec. 33.1-346), throwing trash or garbage into streams (Sec. 62.1-194), and dumping refuse, garbage, dead animals, etc. in caves or sinkholes (Sec. 10-150.14). The Litter Control Act also states that all law enforcement officers in the state shall enforce its provisions (Sec. 10-202).

State agencies concerned with the problem of open dumps include the Health Department, Water Control Board, Division of Litter Control, Waste Management Board, and Department of Highways and Transportation. The primary responsibility for dealing with them belongs to Health Department sanitarians who are assigned to each county. According to the department's solid waste program, they are to "investigate, initiate enforcement action and see that plans are carried out to secure compliance with Health Department regulations. . . ." If necessary, a sanitarian may contact the regional solid waste consultant for help.

An informal cooperative agreement between state and local government best describes the approach used by sanitarians in dealing with dump problems. Sanitarians are charged with developing an overall environmental program for their area. According to Kenton T. Chestnut, Jr., compliance director for the Virginia Health Department, the department tries to get localities involved in enforcement of antidump regulations through informal educational programs. According to Charles Wisecarver, Rockbridge County sanitarian, most sanitarians do not maintain an active program for controlling promiscuous dumps and usually respond only to dump problems brought to their attention by complaints from local residents.

The Department of Waste Management (formerly a division of the Health Department) also has some responsibility for controlling open dumps. Its efforts, says Technical Services Chief Barry Wright, are determined by priority and scale and are limited by having only five regional consultants to cover the entire state. As a result, this agency's investigations are confined to the largest and worst open dumps.

The Virginia Division of Litter Control maintains a number of programs aimed at controlling open dumps, since promiscuous dumps and litter, both illegal, are obviously related.

The Division of Litter Control supports recycling programs, information and education programs, and grants to localities for program development. Rockbridge County has received the maximum grant of $3,000 a year for the past several years. According to the county administrator, the money is used to sponsor poster contests in local schools and to support Scout groups at Goshen and youth programs at Natural Bridge Learning Center in return for maintenance of nearby dumpster sites by these groups. According to State Maintenance Engineer C. O. Leigh, cleaning up roadside litter and dumps cost the Department of Highways and Transportation nearly $2.85 million in 1985. Expenditures in Rockbridge County totaled $47,158 and involved 5,616 hours of work.

As part of its pollution response program, the Virginia Water Control Board investigates

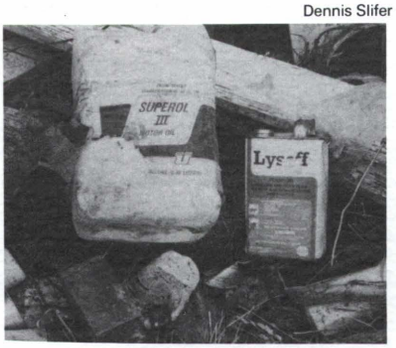
Number of Chemicals In Use: 61,000 and Growing

Householders and farmers use a vast number of chemical products and manufactured goods that can pollute groundwater. In 1983, the U.S. Environmental Protection Agency estimated there were more than 61,000 chemicals in the marketplace with several hundred being added each year. Household hazardous wastes can be organized into the following general categories:

- Automotive products (oil, antifreeze, transmission and brake fluids, batteries)
- Garden products (pesticides, herbicides, chemical fertilizers)
- Kitchen Cleaners (bleach, drain and oven cleaners, waxes, scouring powders)
- Aerosols (cleaners, deodorants, air fresheners)
- Home maintenance supplies (wood preservatives and stains, swimming pool chemicals, asphalt and roofing tar, asbestos, disinfectants, mothballs)

The volume of household waste continues to increase, along with the number of products with hazardous properties. In its Report to Congress on Waste Disposal Practices for 1977,

Dennis Slifer



Sampling of hazardous wastes in Turkey Hill Dump

EPA states that 135 million tons of residential and commercial waste are disposed of annually in the U.S. How much goes in illegal dumps is unknown, but, according to the Division of Litter Control, Virginians annually discard more than 300 million pounds of litter along state roadways costing the state nearly $2.85 million a year in litter control.

The contribution of hazardous materials to the waste disposal problem is significant. For instance, most of the 250 million pesticide containers and unknown quantities of unused pesticide are crudely buried, thrown away as trash in an open dump, or sent with the garbage to a landfill every year in the U.S. According to a 1977 EPA study on groundwater pollution problems in the Southeast, the average U.S. household yearly discards at least one pound of lead, cadmium, mercury, arsenic, or similar poisons from such common sources as paint, batteries, paper, and cleaning products As little as 3.5 ounces of these compounds dissolved in 125,000 gallons of water may be harmful or even deadly to humans.

Petroleum products, especially used motor oil, are a serious threat to drinking water drawn from contaminated groundwater. A gallon of oil can render undrinkable 2 million gallons of water. Do-it-yourself oil changers in Virginia improperly dispose of an estimated 4 million gallons of used oil every year. Just the oil left in supposedly empty containers is enough to create a problem at some dump sites. Contamination of a creek from the oil in discarded cans has been documented at a dump in Bedford County.

— D.S.

Rockbridge lacks an ordinance outlawing promiscuous dumps. There is an ordinance regulating dumpsters but no one to enforce it.

complaints about dumps where wastes are getting into surface water. Authority for this inspection and for enforcement action is taken from Title 62.1 of the Virginia Code. A citizen complaint about a Rockbridge County dumpster site in January 1986 led to a VWCB investigation. After cleaning up the site, the county was required by the VWCB to install a containment fence around its dumpster to prevent trash from being thrown over a bank and into a nearby stream.

County Policies and Practices Affecting Illegal Dumps

ROCKBRIDGE COUNTY does not have an ordinance or regulation specifying that open or promiscuous dumps are illegal. It also does not have a comprehensive solid waste ordinance. Instead, it relies on an ordinance pertaining to the use of the trash containers. The ordinance defines who may use the dumpsters, restricts what may be deposited in them, and makes vandalism and littering of dumpster sites illegal. The county does not employ any enforcement personnel to deal with dumpster sites or illegal dumping in general.

Maintenance of all dumpster sites is the responsibility of the county and includes clean-up of sites which become littered. The county supervisors are responsible for selecting locations for dumpsters, which are supposed to be conveniently accessible to all county residents. However, some residents are 10 to 15 miles from the nearest dumpster. Quite a few dumpsters are located close to streams, with the result that surface water contamination is a possibility if the site is abused. Many dumpster sites have no containment fence or else have inadequate and broken-down fencing. Consequently, loose trash can be distributed over a wide area by wind, water, and scavengers.

Rockbridge County experimented briefly with enforcement by using funds provided by the Division of Litter control to hire a part-time officer for a few months in 1984. This person was hired to prevent abuse of container sites, and cited several violators. The local court failed to cooperate, however, and according to County Administrator Donald G. Austin, it dismissed all cases. The Division of Litter Control points out that "an arrest for littering is futile because the court is reluctant to convict," implying that this problem is not unique to Rockbridge County.

The county operates a waste collection system and a sanitary landfill for disposal of residential, commercial, and industrial wastes generated in the area. This system was inaugurated in 1973 as a result of State Health Department regulations that forced closure of the numerous open dumps which were then legally in use throughout the county. State Health Department records indicate there were seven major open dumps operated by the county or municipalities and at least 59 promiscuous roadside dumps in the county at the time. Counties are required by state law to provide a landfill, but trash collection systems are not mandated.

The sanitary landfill is centrally located near Buena Vista, is operated in compliance with state regulations, and is open more than 40 hours a week. No user fee is charged to residents, but commercial and industrial users must pay.

The collection system consists of containers (dumpster boxes) distributed throughout the county and three loading trucks for transporting the wastes to the landfill. Currently, the county has 160 dumpsters on 63 sites. Residents deposit in them about 145 tons of trash a week. These dumpsters were not meant to accommodate certain wastes, such as appliances, tires, wire, car parts, furniture, and rubble. To address this need, the county began placing a few large containers in strategic locations in late 1985. These larger dumpsters presumably offer an alternative to promiscuous dumps.

Implications and Suggestions

THE findings of this study reveal that open dumps are widespread and numerous in Rockbridge County. The presence of hazardous wastes in these dumps combined with the predominant occurrence of dumps in limestone areas implies a substantial risk of groundwater contamination from open dumps in Rockbridge and counties with a similar geology.

Mechanisms exist for dealing with the problems of promiscuous dumping but their implementation and effectiveness vary among localities. In Rockbridge, the number of dump sites apparently has remained at about the same level over the last 20 years, despite the creation of a landfill and a collection system. This suggests that county and state controls have been ineffective in eliminating dumps. Experience of residents in dealing with the county over dump issues implies that local authorities have been reluctant to address these concerns.

Several trends emphasize the importance of dealing with the open dump problem:

1. The volume of domestic and commercial wastes continues to increase.
2. The number of hazardous chemical products and manufactured goods also increases yearly.

Center Offers Groundwater Program

Do you or a group you belong to want to learn more about groundwater and how to protect it in your area? With grants from the Virginia Environmental Endowment and the Region III (Philadelphia) Office of the U.S. Environmental Protection Agency, the Water Center has produced educational materials for young people and adults, and several of its staff members will make presentations to citizen groups anywhere in the state at no charge.

Publications by the Center include *A Groundwater Primer for Virginians,* a book for adults; *Sandcastle Moats and Petunia Bed Holes: A Book about Groundwater,* for middle school students (with an accompanying teacher's guide); *Facts about Virginia's Groundwater,* a colorful brochure; *Virginia's Hidden Resource,* a 12-minute slide-tape show; *Groundwater: Sculptor of Caves,* a 5-minute slide-tape show; and an interactive computer game, *What Would You Do?* It asks the user to find the source of well water contamination and requires the user to use problem-solving techniques. Children and adults have found the game fun and informative.

For more information on the Center's groundwater programs and educational materials, write to Diana L. Weigmann, Virginia Water Resources Research Center, Virginia Tech, 617 N. Main St., Blacksburg, VA 24060-3397.

— Edward Born

3. Disposal sites, current or abandoned, may continue to pollute groundwater for many years.
4. Demand for water, especially groundwater, continues to rise.
5. Counties in the Valley and Ridge Province are especially at risk not only because of the vunerability of their groundwater but also because steep hilly terrain makes dumping trash into roadside ravines or sinkholes tempting and convenient.

A successful antidump campaign must attack the problem from many directions. Coordinating the various state, local, and private interests is complex but necessary if the open dump problem is to be eliminated. A program to control dumping should consist of three phases: (1) identification and inventory of sites, (2) clean-up, and (3) prevention of recurrent dumping after clean-up. In most cases existing laws and agencies ought to be sufficient for carrying out such a program, but evidence suggests that these mechanisms are often not translated into effective on-the-ground remedies. The best catalyst for creating positive change is an informed, concerned, and assertive citizenry. A combination of community groups and local government produces a good alternative mechanism for increasing awareness and accountability, as well as for getting things done.

Identifying and cleaning up open dumps requires a great deal of physical effort. Prevention and enforcement, however, are more complex issues involving questions of law, politics, education, economics, psychology, and culture. The answer would seem to lie in the imposition of more restrictive regulations and controls, as well as a heavy emphasis on public education and environmental awareness.

Localities should be the front line in the battle against open dumps. A comprehensive solid waste ordinance constitutes the primary weapon. If it is lacking there can be no fight. It follows that there can be no enforcement against promiscuous dumping if there is no local law against it. Further, localities should be confident of the cooperation of the courts in prosecuting dump-related cases brought to them as a result of enforcement activities. Sentencing violators would go far in influencing people's waste disposal habits. Counties should also design and operate collection systems for maximum convenience to residents. Type and size of containers, ease of access and use, truck schedules, container locations, landfill locations, and hours of operation are important factors affecting open dumping. In most cases adjacent counties would benefit by having similar collection systems, thus eliminating illegal dumping across county lines.

State law is more thorough in addressing the open dump problem than are local statutes. The Health Department bears the burden of dealing with this, primarily though its local sanitarians. Greater interaction with localities and more accountability within the health department would increase the sanitarians' effectiveness in eliminating open dumps. The five regional consultants of the Department of Waste Management provide technical assistance to sanitarians and localities in dealing with open dumps, but could be more effective if the large size of their regions was reduced by adding more staff.

The Division of Litter Control offers grants to localities; in many cases it is the only money spent by the localities on dump problems. The division's Operation Waste Watch, an educational program for public schools, represents a key element in a lasting solution to the open dump problem. However, recycling and educational programs stressing the environmental aspects of waste disposal would be effective if they were mandated and supported by the state at effective levels of funding.

The Department of Highways and Transportation could help by adopting a formal program to eliminate roadside dumps by constructing barriers wherever possible. Road maintenance personnel could report roadside dump sites as part of their normal duties. The department uses prisoner labor from the Department of Corrections for litter control along highways. Why not use them for cleaning up roadside dumps as well?

The recent trend in collective action between community groups and government is a positive sign that there may be a solution to the dump problem. One example is the organization of household hazardous waste collection days by some communities. At periodic intervals central collection sites are established and the assembled wastes are transported to an approved hazardous waste facility for recycling or disposal. Such actions require advanced planning and organizing and involve a cooperative effort by the community, local government, regulatory agencies, transporter, and facility operators. Fairfax County became the first Virginia locality to hold a household hazardous waste clean-up day in October 1985.

Community action and citizen awareness seem to be the key ingredients in finding successful solutions to the problems confronting our society from waste disposal. The ultimate responsibility for protecting Virginia's water resources lies with each individual citizen in the Commonwealth. Our land use and waste disposal practices must reflect recognition of that responsibility.

A STEHP in the Right Direction

During the 10 weeks of this study, author Dennis Slifer was supported by a Virginia Student Environmental Health Project (STEHP) internship. STEHP is evidence of a continuing interest in the environment by college students. Initiated in 1986 and patterned after a program started at Vanderbilt University, STEHP is based at Virginia Tech, but internships are open to any college student willing to work on a project in Virginia. It is funded by the Virginia Environmental Endowment and the Public Welfare Foundation.

STEHP sends student interns to communities asking for help with local environmental problems. Technical expertise is coordinated with community groups, local government, and regulatory agencies to help develop solutions to problems and to foster citizen awareness.

George Shaler, a former intern and 1987 STEHP director, says the group plans to develop five or six projects for this summer's program. The goal is to place two interns on each project.

STEHP is designed to assist groups with limiited resources in researching environmental problems requiring immediate assistance. Community groups provide room and board for their interns. In turn, the program provides technical assistance, laboratory testing, support of community organizations, and referral to other sources of help for environmental programs. Interns come from a variety of educational backgrounds, including environmental studies, engineering, law, medicine, and liberal arts. Its faculty advisers include two of Tech's most distinguished environmental experts, David Conn, director of the Center for Environmental Design and Planning, and Clifford W. Randall, director of the Environmental Science and Engineering Program.

— E.B.

Virginia Water Resources Research Center
Virginia Polytechnic Institute and State University
617 North Main Street
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PEDLAR GAP AREA, ROUTE 607, NEAR BUENA VISTA

Photos by Dennis Slifer

IRISH CREEK, ROUTE 603, GEORGE WASHINGTON NATIONAL FOREST

ROUTE 606, WEST OF RAPHINE

The Problem Isn't Only Rockbridge's

"Anyone who thinks the problem of illegal dumps and the threat they pose to groundwater is a problem found only in Rockbridge County is wrong," says author Dennis Slifer. "I believe I could have made an investigation in any county in the Valley and Ridge Province and found about the same results. Illegal dumps are a problem anywhere but especially in hilly or mountainous areas with limestone as the underlying rock."