Gloucester first to construct onsite project alternatives

by Nancy Gover
Small Flows Editor

Gloucester, Massachusetts, is an old fishing port located about 40 miles north of Boston. The community is perched on bedrock with exceptionally shallow soils. For years onsite systems in its northern end have presented wastewater treatment and disposal problems.

Over the years, North Gloucester’s failing septic systems have leaked effluent directly into the ocean. High levels of fecal coliform in the surrounding waters resulted in the closing of the area’s shellfishing beds in the late 1970s. The community is currently under a consent decree to comply with federal and state water quality standards by 1999.

There was an earlier attempt to extend sewer pipes to North Gloucester from a treatment plant located on the other side of town. However, this effort halted when the Federal Construction Grants Program was phased out in the late 1980s.

But the road to a solution may be close at hand. In 1993, Gloucester obtained a modification of its consent decree that would allow North Gloucester to experiment with alternatives other than central sewerage. This marked the first time that widespread use of alternatives was considered for further evaluation in Massachusetts.

In November 1994, North Gloucester became the first of seven communities nationwide to complete construction of onsite wastewater systems as part of the National Onsite Demonstration Project (NODP).

The NODP provides grants and other assistance for participating communities to help them identify, install, and monitor proven alternative systems in the hopes of finding those that best meet their needs, while remaining cost-effective.

According to Anish Jantrania, Ph.D., P.E., in-house consulting engineer for the city of Gloucester, this increases the number of viable options available to Gloucester’s homeowners and may lessen the need for sewers.

The National Small Flows Clearinghouse (NSFC) is coordinating the NODP project under a $1.5 million cooperative agreement with the U.S. Environmental Protection Agency (EPA).

ETI promotes use, development of innovative technologies

by Kevin Wilcox
NSFC Staff Writer

New, innovative wastewater treatment technologies could be finding their way into small communities around the country thanks to a new program from the U.S. Environmental Protection Agency (EPA).

The Environmental Technology Initiative (ETI) was announced in President Bill Clinton’s State of the Union address February 17, 1993. ETI seeks to speed the development of innovative environmental technologies through a funding program. These new technologies can then be marketed in the U.S. and in other parts of the world.

“ETI is rooted in the President’s commitment to the proposition that economic development and environmental protection go hand in hand,” said EPA Administrator Carol Browner.

“Its goal is to spur the development and use of innovative environmental technologies to protect the environment and enhance the competitiveness of the U.S. environmental technology industry,” Browner continued.

Exciting times for wastewater

The ETI program promises to bring the development of new wastewater treatment technologies, because several projects in the field have been funded.

According to Joyce Hudson, environmental engineer with EPA’s municipal technology branch and an ETI committee member, ETI represents the first time since the early 1980s that research and development in alternative wastewater treatment technologies has had a catalyst.

Under the Construction Grants Program, money was set aside to promote innovative and alternative wastewater treatment systems. As the Construction Grant Program was phased out in the late 1980s in favor of establishing the State Revolving Fund (SRF) loan program, the set aside funding was also phased out.

“Quite a few innovative and alternative technologies were funded under the Construction Grants Program,” Hudson said. “When the funding stopped, that momentum died. There was no catalyst for development of wastewater treatment technology.

“We’re excited by ETI,” Hudson added. “We received more than 1,700 proposals for all topics areas for 1995. We’re eager to see what will develop from these projects.”

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Gloucester first to construct onsite project alternatives

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after installation and will occur over the long haul. “The systems will cut operational fees by half,” explains Jantrania.

He emphasizes there are long-term environmental advantages to be considered also. At present, the treatment plant that serves 40 percent of Gloucester’s residents provides only primary treatment (settling out solids) before pumping the effluent through an outfall pipe directly into Massachusetts Bay.

Fecal coliforms are of particular concern in Gloucester as well as in other coastal areas. If high levels of fecal coliform appear in coastal waters, valuable shellfishing beds and public beaches are threatened.

A delicate situation
Gloucester’s experimental area is made up of the communities of Lanesville, Bay View, Riverview, and part of Annisquam. All are located along the Atlantic coast on Cape Ann in northeastern Massachusetts. The area to be served contains about 800 homes.

What makes Gloucester’s situation especially delicate is that it has not one, but several environmental concerns. Foremost among them, according to Ellen Katz, wastewater engineering coordinator, is shallow soils. She points out that while the law requires a four-foot separation distance from groundwater or bedrock, only about 25 percent of North Gloucester’s homes can meet that requirement.

North Gloucester also contains wetlands, ponds, areas of high groundwater, and a public water supply reservoir. In addition, some of the homes are served by private wells. All these conditions complicate matters because consideration must be given both to preservation of groundwater quality and prevention of coastal contamination.

Gloucester’s new demonstration systems replace failing septic systems on three residential sites. Basically they are variations on a standard septic system with innovative additions that address Gloucester’s unique environmental sensitivities.

Gloucester’s proximity to wetlands, the ocean, and other environmentally sensitive areas means that its onsite systems must reduce nitrate or pathogens, or both, says Katz.

She explains that in areas where groundwater is as shallow as Gloucester’s, the septic tank effluent must be treated to a very high quality before disposal to reduce the area required for a drainfield.

Another consideration was cost. Katz emphasizes that systems allowing shallow or above-ground installation were used where possible to keep costs down. This is especially important in an area that is rocky, because rock removal is so expensive, adds Katz.

The demonstration systems
The innovative systems selected for use in the Gloucester portion of the NODP were septic systems paired with a sand filter, a trickling filter, or a synthetic foam bio-filter. All replaced existing failed cesspools at the three residential sites.

Sand filters are appropriate for areas sensitive to nitrogen and for small lots, explains Jantrania. Effluent flows from the septic tank into a two-foot layer of sand (the sand filter) and then into shallow, “gravelless” disposal trenches for subsurface disposal.

The system employed at Gloucester is a high-rate intermittent sand filter, Jantrania explains, meaning that the surface area of the sand filter itself is very small (in this case, 10 feet by 10 feet) and effluent is pumped into it (dosed) every hour and a half at relatively high rates, about 3.5 gallons per day (gpd) per square foot. The high rate of dosing helps reduce the area required to install the system. The shallow, “gravelless” drainfield is also relatively compact and inexpensive to install, he explains.

The trickling filter system is a modification to an existing septic tank for removal of nitrogen. Like the sand filter, it is appropriate for areas near surface waters that are sensitive to nitrogen and have space limitations. It is combined with a shallow sand-lined trench for subsurface disposal. Trench dimensions are 65 feet by five feet with 10 inches of sand and six inches of gravel.

The pump in the septic tank recycles water through the trickling filter for biochemical oxygen demand (BOD) and nitrogen removal, and then back into the septic tank.

One of the advantages of the trickling filter, points out Jantrania, is that since the effluent is recirculated, it is treated for longer.

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is that it can be retrofitted to an existing septic tank. The filter fits into a riser above the septic tank inlet manhole.

The synthetic foam bio-filter works in much the same way as a sand filter, but it can be installed above ground inside a small, six-foot by six-foot “garden shed” structure, says Jantrania. This results in an additional savings in terms of both installation costs and space. The synthetic foam bio-filter is especially well-suited for use on small lots and in shallow soils or where the groundwater is high. The system uses a conventional gravity-fed trench for disposal.

Prior pilot study
Prior to participating in the NODP, Gloucester funded a pilot study to determine if onsite systems could treat septic tank effluent to a degree that would allow it to be discharged safely into Gloucester’s shallow soils, and to see if it could be done at an affordable cost.

The pilot study involved installing and monitoring two package treatment systems and two recirculating sand filters, one that discharged into a gravelless drainfield, and another that utilized a pressure-dosed leachfield. This study began in April 1994 and will end this spring.

The results of the pilot study were positive in several respects, Katz explains. The effluent quality was very good. All of the systems performed within acceptable legal limits.

The city also gained an understanding of the need for contractor training. However, Katz says that costs of this pilot study were much higher than expected.

Costs were high due to construction delays, the billing process utilized, and other factors related to the contractors’ unfamiliarity with the systems. “All four systems were bid as a package and required contractors to provide performance bonds, which discouraged smaller contractors from bidding,” she says. Katz points out that construction delays and other problems due to the contractor’s unfamiliarity with the systems are common because alternative systems are still a relative rarity throughout the U.S.

NODP construction success
Due to lessons learned during this pilot phase, the city has been careful to include in the NODP a training component for local contractors. Katz explains separate contractors were hired to install each of the three systems in order to develop a base of knowledge within Gloucester. Other contractors and regulators were invited to the sites during construction to help extend that knowledge base, she explains.

Gloucester’s experiences during the pilot phase also helped the city streamline the NODP construction process. As Katz says, the NODP system construction came in ahead of schedule and under budget. She attributes this success to Gloucester’s hands-on approach, Gloucester’s involvement extended to providing day-to-day management and technical assistance to contractors at the work sites. When compared to resources used for the pilot project, Gloucester’s direct approach resulted in a tremendous savings in both time and money. Katz explains that it pared construction time down to only six days per site, and costs were reduced from more than $45,000 to about $15,000 per site.

The city also realized a large savings by managing the construction sites rather than contracting the work to an outside firm. The cost of construction management was brought down from $15,000 per site during the pilot phase to less than $1,000 per site for the NODP, according to Katz.

Monitoring
Monitoring of the NODP systems began in January 1995 and will continue for 12 months. Samples will be taken from the three residential sites. The wastewater will be examined before and after it enters the systems.

Groundwater will be monitored by looking at samples taken from monitoring wells located uphill and downhill from each treatment system’s disposal field. Jantrania says that samples collected during monitoring will be analyzed for a number of chemical and biological components, including BOD, total suspended solids (TSS), ammonia, nitrate, and pathogens. The monitoring program will also include data about water use.

After data collection is complete, Jantrania says the next step will be to compile it. The resulting report will summarize each system’s operating conditions and performance data. It will also include information on the cost of

Construction workers prepare a foundation for the shed-like structure that will house the synthetic foam bio-filter.

Photo courtesy of Anish Jantrania, Ph.D., P.E.
**NODP communities demonstrate alternatives**

by Nancy Gover
Small Flows Editor

Editor’s Note: The National Onsite Demonstration Project (NODP), is providing grants and other assistance for seven communities to help them identify, install, and monitor alternative wastewater treatment systems. (See map for site locations.)

The NODP’s recent progress in Gloucester, Massachusetts, is described on page 1. The six remaining NODP communities, their environmental sensitivities, and the demonstration systems they chose to address them are profiled below. Each community’s NODP plan also includes an educational component.

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**Anne Arundel County, Maryland**

The chief environmental consideration in this community is controlling and preventing pollution of the Chesapeake Bay and its shoreline. Improvement in wastewater treatment will be aimed at reducing the amount of nitrogen, phosphorus, and pathogens.

The National Onsite Demonstration Project (NODP) will evaluate all existing recirculating sand filters in the Anne Arundel County area, and publish a report containing results of the evaluation. It also will install and monitor a number of alternative wastewater treatment methods, including a recirculating sand filter, a peat filter, and a trickling filter designed for use with a septic tank. It will install and monitor a drip disposal system and a shallow pressure-dosed disposal system.

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**Benzie County, Michigan**

Chief among the concerns of this resort area are restrictions caused by numerous lakes, small lots, sandy soils, and seasonal fluctuations in population. The community also wishes to address the problem of phosphorus loading.

Benzie County will first assess the actual extent of its phosphorus loading. It also will install and monitor sand filters and drip irrigation systems, including several with an iron-bearing medium designed to remove phosphorus.

Educational programs will target regional sanitarians and system installers.

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**Dorchester County, Maryland**

Dorchester County is restricted by a high groundwater table, sandy soils, and saturated soils. The community is concerned with controlling nutrient and pathogen input, and with other factors that affect the Chesapeake Bay’s water quality.

The NODP will install and monitor a recirculating sand filter, a drip irrigation system, and constructed wetlands. Part of the project will be devoted to the monitoring of existing berm infiltration ponds and sand-lined trenches.

Related public education efforts will target county and local officials with similar wastewater concerns throughout Maryland’s eastern shore.

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**Monongalia County, West Virginia**

This community’s concerns are shallow and impermeable soils and regulatory considerations that currently limit extensive use of alternative onsite systems.

The project will involve the demonstration of several wastewater treatment methods at a county park. Proposed methods include a contour system, a low-pressure dosed system, a gravelless trench system, and drip soil absorption systems. They also may include waterless toilets, a recirculating sand filter, a constructed wetland, and home aeration units.

The educational component of the project will include exhibits and interpretative programs intended to educate park visitors, school children, professionals, and state regulatory officials.

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**Paradise, California**

Chief among the environmental concerns of this community is removal of nitrates and pathogens through soil absorption in order to meet stringent state standards for groundwater protection.

The NODP will use a variety of methods to help meet these standards, including sand filter pretreatment. It will also develop monitoring methods to determine the efficiency of treatment that occurs in subsurface absorption trenches of different dimensions and depths, and develop a subsurface trench design that maximizes removal of nitrogen and pathogens.

Paradise’s plan for public education involves obtaining the assistance of secondary school students and undergraduate engineering students who will help monitor and test the demonstration systems.

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**Waquoit Bay, Massachusetts**

Waquoit Bay’s chief concerns are removing nutrients and dealing with its highly permeable soils.

The NODP in Waquoit Bay will demonstrate several different filtration methods in combination with individual septic tanks, including recirculating sand filters, synthetic foam filters, trickling filters, and peat filters. It also will evaluate the efficacy of shallow absorption trenches.

Waquoit Bay’s educational programs will target local officials and design professionals.

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**Future issues of Small Flows** will report on NODP progress in these communities. For more information about the NODP, order the brochure described here or call the NSFC’s toll-free number 1-800-624-8301.

New brochure provides more information on NODP

What role does the National Small Flows Clearinghouse (NSFC) play in the National Onsite Demonstration Project (NODP)?

What is the project’s objective? How were the participating communities selected?

The answers to these questions and more are included in a new brochure available from the NSFC. It also contains information about the NSFC staff members who coordinate the project and the names of nationally-recognized wastewater experts who provide technical assistance.

You will read more about the NOPD in future articles in Small Flows. But if you want more information right away, call our toll-free number 1-800-624-8301 and order the free NODP brochure.
ETI promotes use, development of innovative technologies

Continued from page 1

The U.S. Congress appropriated $36 million for ETI in fiscal year 1994. The average ETI project was awarded $300,000 in fiscal year 1994, with projects ranging from $50,000 to $2 million. The awards for fiscal year 1995 are expected to be in the same range.

ETI was funded at $68 million for fiscal year 1995. President Clinton has requested more funding for fiscal year 1996, but with the changing political climate in Washington, things are still up in the air.

Three requests for proposals Project proposals have been accepted from federal, state, and tribal agencies for 1995 ETI projects. Later, proposals will be accepted from nonprofit organizations and small businesses. Proposals must be approved by an EPA committee and then by an expert panel.

“The panel looks to see if this type of project is technically feasible and if it’s already being done,” Hudson said. “We want to fund new projects.”

Once the projects pass the expert panel, they are returned to the committee, which then awards grants to the prioritized projects as funding allows. This grant money is then leveraged with other funds by the recipients.

The two remaining requests for proposals will be issued early in 1995. The first will go to nonprofit organizations. The second, probably in early spring, will go to small businesses. Both of these groups anticipate a $5 million set aside in the 1995 ETI program.

Six topic areas There are six topic areas, each with a specific objective, for 1995 ETI projects. They include:
- Policy Framework,
- Innovation Capacity,
- Environmental Technologies,
- Pollution Prevention Technologies,
- Domestic Diffusion, and
- International Diffusion.

Project criteria
There are both general and specific criteria that help decide which ETI projects will receive funding. The criteria are designed to assure that funded projects feature cooperation, clearly stated objectives, and results produced in a timely manner.

“It is imperative that ETI funds be spent with an eye on being able to track and measure success—that is, for each project to truly make a difference in the field of environmental technology,” the request for proposals states.

“The EPA, federal agencies, states, and tribes are in a unique position to support environmental technology innovation because our legislative authorities and environmental management responsibilities often drive the demand for environmental technologies, goods, and services,” Browner said in a letter to prospective ETI participants.

“Working together through this program, we can create a regulatory atmosphere that nurtures innovation, creates jobs, and protects the environment,” Browner continued.

For more information, or if you would like to apply for funding, contact the Environmental Technology Initiative at EPA’s Office of Policy, Planning, and Evaluation at (202) 260-2686.

“ETI is rooted in the President’s commitment to the proposition that economic development and environmental protection go hand in hand.”
Carol Browner
EPA Administrator

WANTED
MANUFACTURERS AND CONSULTANTS

Do you or your company provide services or produce equipment and/or supplies for small flows wastewater systems? If so, the National Small Flows Clearinghouse (NSFC) would like more information about your company for our Manufacturers and Consultants Database.

The Manufacturers and Consultants Database is a computer listing of companies that can be sorted according to specific criteria. It allows us to produce a list of products and services tailor-made to the precise needs of individual requests received over our toll-free national hotline.

Typical database entries include:
- engineers and other consultants who work with or specialize in planning, design, coordination or construction of small community or individual onsite wastewater treatment systems; and/or
- companies that produce the equipment and supplies (pumps, filters, septic tanks, etc.) used in the construction of small and onsite wastewater treatment systems.

The NSFC is also currently seeking information from companies or nurseries that supply aquatic plants for use in ponds, lagoons, and constructed wetlands. These include duckweed, bullrushes, hyacinths, and cattails.

If you would like your company to be included in the Manufacturers and Consultants Database, please give us a call at 1-800-624-8301 and ask for Todd Olson.

If you are looking for wastewater equipment and services such as those listed above, please call us and ask for a member of the technical services staff, who will search the database for you.

The search itself is absolutely free. We charge $.10 per page for a printout. A complete database listing, containing approximately 1500 entries is also available for $36.10. Just call our toll-free number and order item #WWPCCM16.

Carol Browner
EPA Administrator

“ETI is rooted in the President’s commitment to the proposition that economic development and environmental protection go hand in hand.”

For more information, or if you would like to apply for funding, contact the Environmental Technology Initiative at EPA’s Office of Policy, Planning, and Evaluation at (202) 260-2686.

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Ten steps assist in selecting, working with engineer

by George A. Chimiklis, Senior Environmental Specialist, and Jeff Tracey, Environmental Assistance Specialist, Rural Community Assistance Corporation (RCAC)

Editor’s Note: The following article by the Rural Community Assistance Corporation’s (RCAC) George Chimiklis and Jeff Tracey is reprinted from Volume 12, Number 3 of the Pacific Mountain Review, RCAC’s rural development journal. This ten-step approach to seeking and selecting an engineer was adapted from training provided by RCAC and other Rural Community Assistance Programs (RCAP).

Rural Community Assistance Corporation (RCAC) recently concluded a training session on the community facilities development process for local officials and community leaders in southern New Mexico. I asked those attending for their comments on our day-long training. From the back of the room, a man rose and identified himself as a consulting engineer.

“I listened closely to what you said on how to hire an engineer,” he began. “And I can say this—I sure wish you had been around to train some of the communities I’ve worked with. It would have made my job so much easier if the local boards had known what they wanted before they hired me.”

The situation this individual was referring to happens all too often in communities. A question comes up, and the first response is “Ask the consultant.” A consultant, however, can only design and propose solutions based on available information. It is the community that will have to live with, and pay for, whatever solution is ultimately selected.

If there ever was a time of “cheap money” and government grants, it is now over for most communities. Today, infrastructure projects (roads, water, wastewater systems, and more) are too expensive to leave solely to technical experts. Community leaders and their employees must insist that any consultant work closely with them to ensure the final project is a good match with the community’s resources, priorities, and ability to maintain them over the expected life of the facility.

Ten steps to successful consultant hiring

Communities that have hired consultants sometimes report bad experiences. The following recommendations are common sense approaches to help avoid those bad experiences in the future. There are two major components that guide the consultant hiring process: preliminary planning and the selection process. These two components are divided into 10 steps.

Preliminary planning

Step 1 — Defining the problem as a problem

Sometimes a mistake is made by defining problems in terms of a particular solution or technology. For example, in the mid-1980’s, Donald, Oregon had an outbreak of waterborne diseases due to sewage contamination of its water system. This led to a state health order requiring the town to replace its water system and install a new sewage treatment system.

Had they defined their problem in terms of a solution, they might have stated, “Our town has a contamination problem. We need to find a way of addressing it.” Instead, they set out to replace an existing conventional system with another, similar one. The city hired an engineer to design a replacement, but the proposed system proved too expensive.

An RCAC engineer later reviewed the proposal and determined that the proposed system was inappropriate due to the area’s high groundwater table. He recommended installing septic tanks with shallow lines and using septic tank effluent pumps to move the wastewater to a lagoon containment area. The lower-cost alternative system was later approved and installed.

Expressing the problem as a problem opens the process to thinking of alternative ways to solve it.

Step 2 — Gather pertinent information

Often the best solution is a combination of several alternatives. Information on these alternatives is available from a variety of sources, including the regional Rural Community Assistance Programs (RCAPs), rural water circuit riders, the National Small Flows Clearinghouse (NSFC), and regional offices of the U.S. Environmental Protection Agency.

Step 3 — Brainstorm alternatives

Start by thinking of as many ways as possible to solve the problem. Use the following questions to help you think about solutions:

- What would be the best solution if money were no object?
- What would be the least expensive way to solve the problem?
- How many years will the solution last?
- Can we break the solution down into a series of affordable steps or is it better to do it all at once?
- If the solution is so technical that we don’t understand it, how will we be able to operate and maintain it?
- Can we do all or part of the work ourselves?

Also consider the following:

- How much would our customers, and our neighbors, be willing to pay for service?
- Can we afford to pay for the facility ourselves?
- If we need to borrow money, where can we borrow it?

It’s very important to have a sense of what you can afford and what you’re willing to pay for the facility before you hire an engineer. Like asking a stranger to buy a car for you, if you can’t give the engineer some idea of what you can afford, you may get a Cadillac solution when you can only afford a Chevrolet!

Once you’ve identified your problem, have some ideas about alternative solutions to consider, and a sense of what you can afford, you’re ready to start selecting a consulting engineer.

The selection process

Before beginning the search for an engineer, you may want to create a selection committee of three people who will guide the selection process. If you think you’ll be seeking financing through a federal or state agency, contact that agency before you begin the selection process to learn that agency’s requirements.

Step 4 — Write out exactly what you want the engineer to do

Generally, you’ll need an engineer to:

- prepare a preliminary engineering report examining various approaches to solving your problem;
- recommend the best solution—taking into account your stated financial limitations;
- prepare a cost estimate;
- possibly help you submit applications for financing;
- do final design and construction drawings, and provide construction inspection services once suitable financing is secured.

Step 5 — Make a list of possible engineering firms

Make a list of at least five engineering firms that might be able to meet your community’s needs. Contact your state regulatory agency or the Rural Utilities Service (RUS), formerly the RDA, office in your state and ask for names of firms that have experience with problems of communities your size. If you are aware of nearby communities that have resolved a similar problem, ask for the names of engineering firm(s) they have employed previously. This is especially important if you’re looking at some new or alternative technologies.

Step 6 — Contact all the firms on your list

Let them know you’re interested in contracting for engineering services and that you’d like to receive a proposal from them outlining their qualifications. Again, if you plan to use state or federal money, check with the funding agency to see if they have any special requirements relating to securing engineering services.

A standard request for proposal (RFP) should be developed that can be publicized and sent to engineering firms. Sample RFPs can be obtained from several sources. Minimum information should include:

- the size of community to be served, usually defined as number of households or customers;

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- the potential sources of funding;
- a deadline for proposals; and
- an address to send proposals to and whom to contact (phone) to answer questions.

You should identify the information required in each proposal, which should include:

- prior experience with this kind of project;
- references from each project, including name, address, contact person and phone numbers;
- a listing of the firm’s qualifications, by staff person;
- options open to the community for funding the project; and
- experience with alternative systems appropriate for communities of your size.

Finally, you should identify how the selection will be made:

- past experience with this kind of project;
- favorable recommendations of previous employers;
- experience in working with state and federal funding programs;
- capability to meet time schedules and project budget requirements;
- willingness to work with community leaders in developing a list of potential solutions; and/or
- willingness to contract using the (funding) agency’s standard contract and fee schedule.

Step 7 — Select five engineering firms submitting proposals

Have the selection committee members review the proposals independently against the selection criteria stated in your RFP and select the top firms for reference checks. This will be your shortlist and should not exceed five firms.

Step 8 — Check references of your committee’s top choices

Contact communities that are listed as references, and don’t be afraid to ask tough questions. Some examples are:

- Were you satisfied with the quality of work?
- Was the firm able to meet the deadlines and schedules agreed upon in your contract?
- Was the engineer willing and able to work closely with your community?
- Did the project stay within the budget, or were there unexpected costs?
- Did you have any problems that would keep you from hiring the firm again?
- Did the engineering firm or consultant have other projects that caused time delays on your project?

Step 9 — Set up interviews

Once you’ve prescreened the proposals and checked references, you may be able to further narrow your list; if so, aim for three firms. Set up face-to-face interviews with each remaining firm. Allow enough time for each interview, about one hour. Set limits for the engineer’s presentation so your committee has plenty of time to ask questions. Require that the engineer who will be assigned to your project participate in the interview.

Use the interview to talk with each firm about your problem and strategy for solving it. Let them know what the financial limits of your community are, and make sure they understand that you’re concerned with the long-term operating costs, not just the initial capital costs.

Prepare a list of questions in advance, and ask each firm the same questions. Some examples are:

- What experience does your firm have with a project like ours?
- Are you willing to look at innovative and/or alternative designs that are reliable?
- Are there specific itemized services you don’t provide?
- Are you familiar with various funding agencies?
- Has your firm assisted with applications?
- What has your experience been in working with funding agencies?
- What is the success rate of those applications?
- Is the firm willing to enter into a fixed-cost, “not-to-exceed” contract, or is it in accord with the funding agency’s fee schedule?
- Who, specifically, in your firm will be working directly with our board (or council)?

- What other projects are you currently working on that could take time away from our project?
- Is the engineer willing to attend public meetings and discuss the project with customers?

Each selection committee member should have a set of questions available for each interview, with space provided after each question. This way, selection committee members can jot notes of that firm’s response and be able to recall critical points if the interviews take place over several days. A simple (+), (0), (-) rating of the firm’s response to each question will also help during the selection process, with (+) indicating fully satisfied with answer; (0) indicating neutral response; and (-) indicating not fully satisfied with answer.

Step 10 — Make your final selection

After all interviews have been conducted, have your selection committee evaluate all of the information that has been gathered. Discuss the pros and cons of each firm, comparing information obtained during interviews along with the original proposal and reference checks. Your goal is to select the firm you believe will do the best job of solving your community’s problem. Do this by having members of the selection committee rank the firms privately, adding up the plus signs and circling the responses that were most convincing to them. Then discuss each firm with committee members, taking turns discussing their rating and key points. For example, one committee member may choose a firm because it was eager to support the project by attending public meetings to describe the project to the community. Another may question whether this firm has too many current projects to give your community the assistance it needs. These concerns should balance out after hearing all comments, and a consensus should emerge. If the committee deadlocks on two firms, two or three new questions can be developed as a tie-breaker with a follow-up interview.

As soon as possible, sit down and negotiate a contract and payment schedule with the selected firm. If you will be financing the project through state or federal sources, the financing agency can probably make this easy for you with a standard engineering contract and fee schedule you can use to complete this step.

If you’re not able to negotiate a satisfactory contract, notify your top selection in writing that you are breaking off negotiations, and begin negotiations with your second choice. Once you’ve reached a satisfactory agreement, notify all other firms that you have completed a contract with the firm you’ve selected.

At a minimum, contracts should set out a clear understanding of the engineering services to be provided, a timetable for completion of the engineering, and a price for services and a payment schedule stating when you’ll pay. The reasonableness of the engineer’s proposed fees can be checked with organizations like the Professional Engineers’ Council or your state RUS office. Tie your proposed payments to the completion of tasks, such as the completion and acceptance of a preliminary engineering report or state approval of final design. If borrowing RUS funds, ask the engineer to accept payment for the preliminary design report when the project is funded.

Regardless of a community’s size, there are a number of organizations available to help. With patience, and some research, community officials can get the assistance they need to plan and successfully develop community facilities.
NSFC offers guide to wastewater and water budgeting for utility managers

Running a community’s water and wastewater system is a full-time job, but utility managers are often given the additional responsibility of developing an annual budget for the utility’s operations.

A new booklet, A Utility Manager’s Guide to Water and Wastewater Budgeting, is now available from the National Small Flows Clearinghouse (NSFC). It is designed to help utility managers with little or no accounting experience plan and develop an annual budget. The booklet presents basic financial concepts and practical strategies for budgeting that are easy to understand and use. The lesson begins with a discussion of the importance of accurate budgeting for water and wastewater systems. The probable sources of revenues and expenses are listed, and strategies for estimating future costs are offered, including sample worksheets for tracking historical trends. Then, step-by-step instructions are given for projecting future revenues and expenses based on the information collected in the worksheets.

Other topics covered in the booklet include tips on how to market the budget to the community, how to make the most of public hearings, and how to measure the efficiency of the budget once it is approved. Additional sources offering help or information for the utility manager are listed throughout the booklet.

The guide was prepared by the U.S. Environmental Protection Agency and the University of Tennessee’s Municipal Technical Advisory Service. To order a copy, contact the NSFC toll-free at 1-800-624-8301, and order item #FMBLFN13. The booklet is free. Add $2 to cover shipping and handling.

New newsletter offers financial information

The National Drinking Water Clearinghouse (NDWC) has launched a new quarterly newsletter, Water Sense, to help small communities learn about different ways to finance their drinking water projects.

Aimed at local, state, and federal officials; planning commissions; assistance organizations; and others involved in small community environmental projects, Water Sense will include information about:

- funding sources;
- funding source criteria;
- resources that provide financing assistance;
- news on legislation;
- cost-saving strategies; and
- innovative financing mechanisms.

The first issue was published as a four-page insert in NDWC’s Fall 1994 issue of On Tap, which provides technical and regulatory information for small communities. Water Sense is being developed by Editor Laurie Klappauf and Staff Writer P.J. Cameon.

Readers are encouraged to offer story suggestions and share their knowledge and “real-life” experiences in water and wastewater financing.

If you would like to receive a free subscription and/or send comments to Water Sense, please write to Editor, Water Sense, NDWC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506, or call 1-800-624-8301.

Guide focuses on funding for rural systems

Small communities are often frustrated when trying to secure funding assistance for water and wastewater facility projects, especially for those projects that require funding from more than one agency.

However, the Council of State Community Development Agencies (COSCDA) has published a guide intended to help rural communities to achieve their development goals by making it easier for them to combine agency resources.

The booklet, Financing Water and Waste Disposal Systems in Rural Areas: A Working Guide for State Coordination, is aimed at helping rural communities interested in applying for water and waste disposal grants. It covers grants that may be obtained through the U.S. Department of Housing and Urban Development’s State Community Development Block Grant (CDBG) program, loans and grants available through the U.S. Department of Agriculture’s Rural Utilities Service (RUS) Water and Waste Disposal (WWD) program, and loans through the U.S. Environmental Protection Agency’s State Revolving Fund (SRF) program.

Disposal Systems in Rural Areas: A Working Guide for State Coordination, is aimed at helping rural communities interested in applying for water and waste disposal grants. It covers grants that may be obtained through the U.S. Department of Housing and Urban Development’s State Community Development Block Grant (CDBG) program, loans and grants available through the U.S. Department of Agriculture’s Rural Utilities Service (RUS) Water and Waste Disposal (WWD) program, and loans through the U.S. Environmental Protection Agency’s State Revolving Fund (SRF) program.

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The probable sources of revenues and expenses are listed, and strategies for estimating future costs are offered, including sample worksheets for tracking historical trends. Then, step-by-step instructions are given for projecting future revenues and expenses based on the information collected in the worksheets.

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Financial management is EPA seminar topic

A one-day financial management training seminar, “Tools for Success,” will be held at six locations throughout the U.S. in March and April. Sponsored by the U.S. Environmental Protection Agency (EPA), the seminar is designed for utility managers, EPA and state compliance people, and regulators who make site visits.

Sponsored by the U.S. Environmental Protection Agency (EPA), the seminars focus on maintaining the dynamic balance between your utility’s financial well-being and its ability to operate effectively and maintain compliance.

It will present important principles of financial management and explain tools that you can use to evaluate your utility’s financial health.

Seminars will be held in the following cities on these dates:

- Nashville, Tennessee: March 20
- Indianapolis, Indiana: March 22
- Philadelphia, Pennsylvania: March 28
- Hartford, Connecticut: March 30
- Dallas, Texas: April 4
- Park City, Utah: April 6

Deadline for registration for all seminars is March 1.

For more information, or to register for any of the seminars, contact Jim Fagan at (703) 760-0451.
**West Virginia voters clear way for bond sewage fund**

*by Natalie Eddy*

NSFC Staff Writer

Communities in West Virginia now have an additional resource to help fund sewage treatment projects thanks to a $300 million bond referendum narrowly approved by state voters late last year.

The plan was approved by approximately 3,600 votes, or a 50.8 percent to 49.2 percent margin, in a special referendum in the November 1994 general election.

Details of how the bonds will be issued have not been legislated, but it is anticipated that six to eight general obligation bond issues aggregating $300 million will occur over the next five years.

The bond issues will be repaid by an annual dedicated portion of the state coal severance tax. The first $16 million of the coal tax has been earmarked for the bond repayment, effective July 1, 1995.

### Source of revenue

Ron Stone, executive assistant to the cabinet secretary of the West Virginia Department of Tax and Revenue, said the coal severance tax is the gross receipts associated with the production of natural resources, of which 90 percent are from coal.

Mark Muchow, director of research with the Tax and Revenue Department, said the state expects to collect $173 million in 1995.

Stone speculated that the severance tax was chosen as the bond repayment because “it is a dependable source of revenue for the state.” He added, “Historically, the money has been there. Coal is very abundant in West Virginia, and it is very unlikely that this revenue will be eliminated.”

Bernie Yonkosky, director of the West Virginia Water Development Authority, said he believes this approach to raising capital for needed water and wastewater projects in West Virginia is practical. He agreed that the legislature probably felt the coal money offered a secure source of revenue for the bond repayment.

Yonkosky, who also serves as a member of the state’s Infrastructure and Jobs Development Council (IJDC), said some money may be available as early as this summer to begin funding projects.

According to Yonkosky, the state Legislature is currently in session and is working on passing enabling legislation to specify how the bonds will be issued, and how much will be issued the first year.

Yonkosky said that according to the U.S. Environmental Protection Agency’s 1992 Needs Survey Report to Congress, West Virginia’s current and future wastewater needs are in excess of $2 billion.

“We’re in the early stages of receiving proposals for projects,” said Yonkosky. “It’s difficult to say what the current funding need will be over the next six months.”

He speculated that between $40 to $50 million worth of projects may receive funding from the first bond issue.

“It’s my understanding that they will be general obligation bonds issued on a competitive basis,” he added.

House Bill 5006 calls for 80 percent of the money to be dedicated for wastewater and water projects with the remaining 20 percent being set aside for “infrastructure” improvement projects.

The legislation states that the council may make grants in areas where “the level of rates for the users would otherwise be an unreasonable burden given the users’ likely ability to pay” or in areas where “the absence of a sufficient number of users prevents funding of the project except through grants.”

The federal revolving loan program, authorized under the Clean Water Act, requires states to match the federal contribution. In addition to providing starter funds for individual projects, monies from the program also may be used to provide grants to rural areas that cannot afford to match the state or federal funds.

### Council’s duties

The IJDC is required to develop uniform guidelines for state agencies to use in funding requests for projects. In July 1994, the state’s legislature passed House Bill 5006 that created the West Virginia Infrastructure Fund and the IJDC to oversee the money collected from the bond issues.

The guidelines are required to contain the following factors:

- the economic benefits of the project;
- the public health benefits of the project;
- the degree to which the project will bring the state into compliance with federal regulations regarding sewage systems; and
- the cost-effectiveness of the project.

### Process to obtain funding

The council has developed a preliminary application form to be used by all project sponsors making funding requests.

No project sponsor may apply for or receive a loan, grant, or other funding assistance, except by submitting a completed preliminary application and receiving approval by the council.

The council is required to approve or deny a project within 30 days of receipt of a completed preliminary application.

For more information about the program or to obtain a pre-application form, write to the West Virginia Water Development Authority, 1201 Dunbar Avenue, Dunbar, WV 25511, or call (304) 558-3612, or fax (304) 558-0299.

### “Coal is very abundant in West Virginia and it is very unlikely that this revenue will be eliminated.”

Ron Stone, executive assistant to the cabinet secretary of the West Virginia Department of Tax and Revenue

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**EFIN BBS offers on-line finance help**

Have you accessed the Environmental Financing Information Network (EFIN) yet? EFIN is a new computer bulletin board developed by the National Small Flows Clearinghouse (NSFC). It is designed to help you locate information about environmental finance.

Users can access a database containing publications about environmental finance, plus case studies that demonstrate successful use of funding methods. Two helpful documents, *Alternative Financing Mechanisms and Fee Systems*, are also available on-line.

If you need further information, EFIN’s Contact Directory guides you to individuals at the federal, state, and local levels who may be able to help.

It costs nothing to access and use EFIN. All you need is a computer with a modem and communications software. Dial 1-800-291-0349 and follow the simple log-on procedure. If you need assistance, call 1-800-624-3381 and ask for Brad Maust, system operator.
Low-interest loans are available to rural communities in seven southeastern states to help finance wastewater, water, or housing-related activities.

The Southeast Rural Development Loan Fund (SRDLF) offers interim funding to public service authorities, local governments (county or municipal) users associations, and nonprofit organizations in Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida.

Beth Taylor, loan fund manager for SRDLF, said funding allocations and projects served have varied since the organization’s beginning in 1986.

“We have currently experienced an increase in the number of loan requests per year,” said Taylor. Approximately 20 projects have been financed by the loan fund with many recipients returning repeatedly for additional funding.

The program offers funding from $1,000 to $150,000 at interest rates ranging from 3 to 7 percent.

Interest rates are based on a community’s ability to repay a loan, the number of low-income residents benefitting from the project, and the current market rate, according to Taylor.

Terms of the loans are flexible and can be tailored to fit the needs of a community. There are no penalties or fees for pre-paying a loan before its maturity date. Loan lengths may vary from one to ten years.

Guidelines call for projects to serve rural populations of 10,000 or less and eligibility is based on a 30 percent threshold of low-income residents.

The funds may be used for pre-development, system upgrades, and new development.

Past projects have included:
- sewer system and water line extensions;
- sewer system dechlorination;
- sewer, plumbing, and water system rehabilitations;
- installation of septic tank systems and wells;
- replacement of water meters; and
- storage tank restoration.

SRDLF is headquartered in Roanoke, Virginia, and is a program of the Virginia Water Project, Inc., the Southeast Rural Community Assistance Program, an affiliate of a national network of rural technical assistance centers. Until 1992, the program operated only in Virginia.

“Virginia, Georgia, and Maryland are our busiest states,” said Taylor. “We’re working with other funding sources to get activities initiated in other states. If we’re not able to find a project, we offer a referral service to help find other funding sources. We also assist in completing applications.”

The SRDLF was established with a $1 million loan from the Ford Foundation.

Recently, the program was approved for a $2 million loan from the Rural Development Administration (RDA). This makes the loan fund an Intermediary Relending Program (IRP) of the Farmers Home Administration.

Applications are taken year-round with completed loan applications being acted upon within 60 to 90 days.

For additional information, or to obtain an application, contact the loan fund at 1-703-345-1184, or write Southeast Rural Development Loan Fund, P.O. Box 2868, Roanoke, VA, 24001.

The first issue of a new publication from the National Drinking Water Clearinghouse (NDWC), Water Sense, contains information about other funding available through RUS’s Intermediary Relending Program. (See article on page 8 for information on how to obtain a subscription.)

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**Fund provides low-interest loans for wastewater/water**

by Natalie Eddy
NSFC Staff Writer

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**GAO report explains benefits, barriers of alternative systems**

by Kevin Wilcox
NSFC Staff Writer

Alternative wastewater treatment systems can be substantially less expensive than conventional systems, but there are barriers limiting the use of existing alternatives and the development of new technology, according to a new report by the U.S. General Accounting Office (GAO).

The report, Water Pollution: Information on the Use of Alternative Wastewater Treatment Systems, was requested by the chairman of the House of Representatives subcommittee on investigations and oversight, committee on public works and transportation.

In preparing the report, the GAO contacted federal and state environmental protection agencies, as well as small communities that use alternative systems. The National Small Flows Clearinghouse (NSFC) also provided information to the GAO.

Although small community wastewater treatment needs account for 12 percent of the overall national need, small communities often have less access to wastewater funding, according to the report.

“The cost savings associated with alternative systems may allow communities that cannot afford conventional facilities to effectively meet their wastewater treatment needs,” the report states.

The report identifies various alternative wastewater treatment systems, including several onsite systems and different types of cluster and centralized facilities. Technologies include constructed wetlands, overland flow, slow-rate land application, and lagoons.

“Natural systems generally require larger amounts of land than mechanical systems but are simpler and usually much less costly to operate,” the report continues. “Natural systems can cost less to construct and their facilities can require fewer and less-skilled staff to operate, consume less energy, and produce less sludge than conventional facilities.”

The GAO also looked at alternative wastewater collection systems, including small-diameter effluent sewers, pressure sewers, and vacuum sewers.

“The savings associated with alternative collection systems for appropriate small communities generally range from 25 percent to as high as 90 percent of the cost of conventional gravity sewers,” the report states.

The GAO identified a number of barriers that impede the use of alternative systems, including:
- a lack of knowledge about the alternatives’ applicability, performance, and cost;
- financial disincentives within the private sector to design and/or construct facilities employing alternative systems; and
- restrictive state and local codes and regulations.

According to the report, engineers whose fees are calculated as a percentage of net construction costs face a financial incentive not to design an alternative system, which is less expensive, and therefore generates a smaller fee.

The GAO found that through demonstration projects under the new Environmental Technology Initiative (ETI) (See story on page 1), the U.S. Environmental Protection Agency (EPA) will seek to help bridge these barriers. ETI projects also can help in the development of new technologies to further reduce the cost of wastewater treatment, the report states.

If you’d like a copy of the GAO’s report, Water Pollution: Information on the Use of Alternative Wastewater Treatment Systems, call the NSFC at 1-800-624-8301 and request item #WWBLGN55.

The report costs $2. Add $2 for shipping and handling.
Dear Editor:

Regarding the interest of discharging chloride salt brine into a septic system—if folks would use potassium chloride as a regenerator instead of sodium the question would be moot. Enclosed please find a brief article on potassium chloride, and why it’s such a positive solution.

There is a ton of information and studies available on this; all anyone has to do is ask for it.

The National Small Flows Clearinghouse, established by the U.S. Environmental Protection Agency under the Federal Clean Water Act (CWA) in 1977 and located at West Virginia University, gathers and distributes information about small community wastewater systems. Small Flows is published quarterly in January, April, July, and October.

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Let's Talk to the Editor

California community uses alternative regenerator

Dear Editor:

We are a small town in California and have been providing it to our customers for more than six months with very positive results.

Sincerely,
Benjamin Boer
Water Conservation Officer
Cambria Community Services District
Cambria, California

In response to his letter, Small Flows asked Benjamin Boer about his community’s decision to promote potassium chloride instead of sodium chloride as a water softening regenerator. He says that potassium chloride’s higher cost (sometimes as much as twice the cost of sodium chloride) is more than outweighed by its benefits for the small community of Cambria (population 6,000).

Part of Boer’s job as the district’s water conservation officer is to market reclaimed wastewater from its wastewater treatment plant, some of which may be provided to local farmers. He says sodium chloride remaining in the treated wastewater may affect the district’s waste discharge requirements and its suitability for agricultural use. Reclaimed water containing potassium, on the other hand, actually promotes growth.

Boer enclosed a copy of “Potassium Chloride: Alternative Regenerator for Softening Water”. The paper was reprinted from Better Crops with Plant Food, Fall 1993 publication of the Potash and Phosphate Institute. Copies are available for $1 each (reference Volume 77, Number 4, page 24). To order, call the institute at 1-913-776-0273, or fax: 1-913-776-8347.

Sodium impact on septic drainage soils

Dear Editor:

The harmful effect of sodium on soil clays is well documented in agricultural texts. Research in the late 1940s to mid-1950s, undertaken to find causes of septic system failures, pointed out potential damage to soils from sodium carried in septic tank effluent. Researcher and soil scientist T.W. Bendixen of the Federal Security Agency’s Cincinnati Environmental Health Center outlined his concerns in a 1952 speech titled “Clogging Characteristics of Domestic Effluent.”

Bendixen observed, “It is generally considered that waters containing 50 percent or more as sodium of the total cations (sodium, calcium, magnesium and potassium) are potentially harmful to the water absorption characteristics of soil. Even in sandy soils,” he continued, “waters of 85 percent or higher are likely to make soils impermeable after prolonged use. There are some indications that potassium may have similar effects.”

In 1973, Wastewater Treatment Systems for Rural Communities, published by the Commission on Rural Water, stated that “high concentrations of sodium ions exchange with calcium and magnesium ions in the clay matrix. The exchanging ions alter the forces that hold the clay together and cause it to lose its structure—the clay becomes tighter and seals.”

In arid climates, high evapotranspiration and sodium laden irrigation water combine to cause impermeable clay development under or within the root zone of crops like cotton. To help offset this problem, gypsum, in many forms, may be added to irrigation waters.

Researcher S.R. Weibel added ground gypsum to septic tank effluent and reported beneficial results from his 1952 tests in “Studies on Household Sewage Disposal Systems.”

In their 1984 report to the Water Quality Research Council, “Potential Effects of Water Softener Use on Septic Tank Absorption in On-Site Waste Water Systems,” University of Wisconsin-Madison researchers E.J. Tyler, R.B. Corey, and M.U. Olou recommended that “studies be initiated to determine the effects of solutions containing conductivities of natural soil columns...and actual salt concentrations in various zones of septic tanks with and without addition of water softener wastes.”

In 1991, Robert A. Patterson, soil scientist, Department of Resource Engineering, University of New England, New South Wales, presented a speech in which he stated, “The problems associated with disposal of septic tank and aerated wastewater treatment system effluent will continue so long as there is no education of the homeowners, poor standard trench dimension with respect to soil type, and lack of understanding by local authorities of the specific effects of sodium upon that soil.”

In his summary, Patterson said, “The need for better understanding of sodium effects upon soils used for the disposal of wastewaters cannot be too highly stressed. Whether the effluent is disposed of through subsurface absorption or through the surface, the effects of sodium salts on hydraulic conductivity are pronounced.”

Labels on commonly used laundry powders and cleaning, beauty, and cooking products reveal high levels of sodium as principle ingredients. Patterson determined that 38 percent of the sodium budget comes from laundry powders, which list up to 40 percent of content as sodium sulfate.

More than 40 years ago, Fred Horne, a specialist in physical and chemical correction of septic system soils, addressed sodium issues. With support from Chevron’s agricultural division to research the potential of various amendments, leading soil and wastewater experts were commissioned to conduct blind field tests on the impact of sodium. This research also studied corrective measures on mature, in-use, septic disposal systems. It was concluded that an agricultural soil amendment, calcium polysulfide, in combination with dispersing agents, refloucculated sodium bonded soils and restored drainage to failing and clogged drainfield systems.

Today, 26 million homes rely on soils to permanently dispose of wastewater.

Problem solving relies on good information. Without the research of dedicated scientists, we cannot build solutions for today’s problems. The challenge now is in finding ways to reach these 26 million homeowners so that they may benefit from what has been learned.

Cordially,
Mary H. Gayman
Drayner, Inc.
Kingsburg, CA 93631

For more information, you may contact Gayman at (209) 897-3323, or fax (209) 897-0814.
The U.S. Environmental Protection Agency (EPA), Region 5 is offering several new, free environmental software programs for the general public that run on IBM-compatible computers.

Alfred Krause, EPA Region 5 outreach coordinator, said a total of 34 software programs are being offered in the areas of wastewater treatment, drinking water, water conservation, agriculture, farmstead risk assessment, wetlands, water education, solid waste, environmental assessment, health, and regulations. Five of the programs also are available in Spanish.

Karen Reshkin, EPA software development specialist, said, “We’re very pleased with the response we’ve received about the program and with the variety of subjects we have been able to offer.”

She added that the program grew to its present size from originally being offered only in Region 5 extension offices. “We did the first couple of programs, and they were requested by a much wider audience than anticipated. The requests grew, and we added more titles,” she said.

Reshkin said EPA plans to expand the program to include additional topics. Krause added that the acquisition of a high-speed disk copier means the orders now can be filled with greater speed.

All of the software programs must be used with a hard drive and a high-density disk drive. Some programs require more than one diskette for processing.

Krause said an ideal system for running all the programs is a 486 PC with a VGA monitor and a mouse. He added, however, that many of the programs will run on older or less powerful equipment.

Two of the more recent wastewater-related programs include:

- **Principles and Design of Onsite Waste Disposal with Septic Systems.** This instructional program contains 80 color graphic screens and some animation to teach the basics of onsite treatment such as septic tanks, drainfields, mounds, and water conservation. Main menus include principles of treatment, design and siting, soil basics, and water conservation. (Target audience: Everyone from onsite system installers or their customers to middle school students and older.) [Program requires one diskette, either size.]

- **Municipal Pollution Prevention Diagnostic Planner (CMAR 2.0).** Based on the Wisconsin Department of Natural Resources’ Compliance Maintenance Annual Report, this hyper-text-based program serves as an early warning system for wastewater treatment plant operators. The user supplies information on influent loadings, discharge monitoring data, pretreatment, financial status, failures and upsets, and other aspects of plant operation and maintenance. Point values are assigned to potential problem areas and the resulting report is saved to a printable file. (Target audience: Wastewater treatment operators.) [One 3-1/2 inch diskette or two 5-1/4 inch diskettes are required.]

Other available wastewater-related software programs in the same series include:

- **RWASTE II: Residential Waste Treatment Evaluation.** RWASTE works from a layout, soil, and groundwater information provided by the user to select a wastewater treatment technology (septic tank, mound, at-grade, and holding tank) and provides a preliminary system design. It calculates the amount of grade and backfill necessary, and selects a pump, if necessary. RWASTE is improved from earlier versions and includes interactive help, a color interface, and a simplified installation program. (Target audience: onsite system installers, sanitarians, farmers, homeowners, state and local regulatory staff, engineers, and engineering students.) [Program requires one diskette, either size.]

- **Alternatives for Unsewered Communities.** This program is an extensive guide to the facilities planning process for small communities. Topics covered include needs documentation, development of alternative solutions, and selection of the best response, as well as treatment management and implementation. A section on sludge also is included. (Target audience: Local officials and cooperative extension services.) [Three 3-1/2 inch diskettes or two 5-1/4 inch diskettes.]

Other water-related education programs include:

- **Groundwater Education System.** This program educates users about the nature of groundwater and the principles of groundwater protection. All important concepts are reinforced with definitions or colorful interactive graphics. It includes a newspaper clipping file and a follow-up quiz. (Target audience: General public.) [Program requires one diskette, either size.]

- **Surface Water Education System.** This program includes a general overview of the importance and quantity of surface water, a detailed look at this resource for Indiana, and a discussion of how surface water can become contaminated. Hypertext,a number of photos, and graphics illustrate an extensive discussion of agricultural best management practices to protect surface water resources. (Target audience: General public.) [Program requires two diskettes, either size.]

- **UIC Class V Injection Wells.** EPA’s Underground Injection Control (UIC) program is explained in this hypertext-based software package, with a focus on Class V injection wells. These wells inject wastewater directly into or above underground sources of drinking water. It is important to understand why they exist, why they may pose a danger to the environment, and how they may be operated and maintained safely. (Target audience: General public.) [Program requires one diskette, either size.]

To receive the free programs, send the appropriate number of blank high-density diskettes and the names of the programs requested to Reshkin, U.S. EPA, Region 5, 77 W. Jackson, Mailcode S-14J, Chicago, IL 60604-3590 or for more information, call (312) 353-6353.

Duplicates of the software may be purchased from either of two sources. In the past, Purdue University has offered the complete set of programs on CD-ROM. However, as of this issue, they were sold out, and a reissue was being planned. Price of the reissue, which includes shipping and handling fees, is uncertain.

For information about the Purdue program, call (317) 494-1173 or write to The Farm Building Plan Service, Purdue University, 1146 AGEN Building, West Lafayette, Indiana, 47907-1146.

Public Brand Software offers the programs to the public for $5 per disk, plus a $5 shipping and handling charge per order.

For more information about Public Brand Software or to order, call 1-800-426-3475 or write to Public Brand Software, 25 First St., Cambridge, MA 02141.
Program targets restaurants with onsite systems

by Natalie Eddy
NSFC Staff Writer

An education program in Mason County, Washington, called Business in the Blue, is keeping local restaurants in the pink.

Washington State University Cooperative Extension in Mason County, has initiated the program for owners of food service establishments to help improve their onsite sewage treatment and disposal systems and improve the area’s watersways.

The program is designed to help restaurant owners and managers better understand their septic systems and the special problems associated with the food service industry.

“Business in the Blue officials visit each replying establishment to inspect the facility’s kitchen practices and sewage-system management. Each visit includes:

- inspection of plumbing system for leaks and general maintenance;
- evaluation of water conservation practices;
- visual inspection of the drainfield;
- observation of cooking and dishwashing staff;
- menu review to determine how much oil is used;
- review of cleaning compounds in use and the strengths used;
- review of support contractor practices (septic pumpers, cleaners, and vent system maintenance);
- an interview with the owner or manager to review the facility/system history, problems encountered, current maintenance and cleaning practices, level of system knowledge, and staff turnover; and
- a consultation with the manager or owner to determine whether to train the entire staff or just the manager.

In addition, a majority of the area relies on wells for drinking water, adding to the importance of correcting these onsite systems.

Program history

The Business in the Blue program was started in January 1994, the result of a special grant from the Washington State University Water Quality Management Team.

Robert Simmons, an upland water quality agent at the extension office, came up with the concept for the program.

Since the program’s inception, 29 facilities out of a potential 100 have undergone specialized onsite training through workshops sponsored by the Mason County Cooperative Extension.

Eligible facilities include restaurants, campgrounds, grocery stores, convenience stores, and institutional facilities, such as schools and food banks.

To initiate the program, Burleigh sent surveys to food service establishments. Owners or managers of 26 establishments replied.

The results of this preliminary survey show that area commercial establishments are experiencing unique problems with their onsite systems, and that current training manuals written for homeowners are not addressing their specific needs, according to Burleigh.

Following the initial questionnaire, Business in the Blue officials visit each replying establishment to inspect the facility’s kitchen practices and sewage-system management. Each visit includes:

- inspection of plumbing system for leaks and general maintenance;
- evaluation of water conservation practices;
- visual inspection of the drainfield;
- observation of cooking and dishwashing staff;
- menu review to determine how much oil is used;
- review of cleaning compounds in use and the strengths used;
- review of support contractor practices (septic pumpers, cleaners, and vent system maintenance);
- an interview with the owner or manager to review the facility/system history, problems encountered, current maintenance and cleaning practices, level of system knowledge, and staff turnover; and
- a consultation with the manager or owner to determine whether to train the entire staff or just the manager.

Program leaders have prepared a special management guide to provide additional assistance. The information utilizes existing publications with input from state health department officials and knowledgeable installation and design contractors.

Training workshops offer hands-on experience. Burleigh said workshop formats range from one-on-one discussions to formal lectures with groups of five or more.

Some main issues discussed in each workshop include:

- a description of how the onsite system works and what maintenance is required;
- the importance of frequent inspections and pumping based on the rate of solids buildup;
- the unique risks associated with food service establishments, such as higher flow rates, higher strength, higher temperature, and additional disinfectants; and
- specific examples of proper and harmful practices at each facility with alternative suggestions to correct any problems.

Burleigh said that the stickers and program participation have almost become a status symbol, adding that it indicates the restaurants are environmentally aware.

The Business in the Blue program has been advertised heavily in the area, appearing in local radio, newspapers, newsletters, and display booths at the county fair and other public festivals.

In addition to drawing attention to Business in the Blue participants, continuous on page 15
Are legal remedies available for malfunctioning systems?

by Kent Seitzinger
NSFC Legal Advice Columnist

One of the most frequently encountered legal problems in wastewater treatment and disposal is the plight of the homeowner with a malfunctioning septic tank system.

There seem to be two common, yet diametrically opposed, misperceptions concerning this situation. The first is that there is no legal remedy available; the second is that there must be a legal remedy available.

Whether a legal remedy is available to the homeowner with a malfunctioning septic tank system depends upon a variety of factors. In fact, the issue is not a legal one, but rather a technical one: Why did the system malfunction?

Reasons for septic tank system failure fall into a few broad categories. The following categories are over generalized, but will demonstrate the common issues.

“Nobody’s fault”
The first category of malfunctioning systems I call the “nobody’s fault” group. These include old, worn-out systems that may have been installed properly at the time, but because of today’s more sophisticated understanding are now considered inadequate. These failures include situations where virtually everything is done correctly but the systems seem to fail anyway. While such failures are uncommon, they are not unheard of and probably result from our incomplete understanding of how septic tank systems function.

Homeowner abuse
The second category involves those systems that fail because they have not been properly maintained. These include situations where septic tanks or leachfields have been compromised (e.g., placing a driveway over the leachfield), the septic tank was not pumped when needed, or the system was overloaded hydraulically and/or organically.

Inadequate regulation
The third category of failures involves situations where a particular regulatory agency has an inadequate regulatory scheme. For example, most sophisticated regulators are aware that clayey or mottled soil almost always represents a limiting factor that must be considered when determining whether or not a site is suitable for a particular system. Some agencies, however, do not recognize such a limitation. Consequently, one could fully comply with all site evaluation standards, system design criteria, and installation requirements and still have a premature, if not immediate, malfunction.

Negligence
The final category includes those malfunctions that occur because someone has not done his or her job adequately. These malfunctions are usually a result of inadequate site evaluation. The system may not have been designed properly, it may not have been installed properly, and/or it may not have been properly or adequately inspected during construction.

Remedies
Generally, “nobody’s fault” failures will not have a legal remedy. The one possible exception is when there is some type of special protection such as a homeowner warranty that provides coverage for septic tank systems or a similar warranty provided by the installer. In some cases, state law may impose a warranty.

Failures involving systems that have not been properly maintained almost always have no legal remedy available since the system owner is at fault.

Failures caused by inadequate or improper governmental regulation are the most difficult to assess. Most states have governmental tort claims acts that prescribe the limits of governmental liability for such matters. In many, if not most, states, there are immunities that protect both the regulatory agencies and their employees. On a few occasions, however, a knowledgeable lawyer with creative legal skills may be able to fashion a remedy.

The negligence category is where most liability issues potentially exist. A detailed discussion of possible legal remedies for such situations will be explored more fully in the next issue of Small Flows.

Will normal use of household cleaners and disinfectants upset my septic tank?

Several manufacturers of septic tank additives claim improper functioning of residential septic tank systems is caused by adding household cleaners to the septic system. They claim that bacterial additives are needed to resupply the bacterial population required for anaerobic digestion in the septic tank.

However, the bacteria responsible for the digestion in the septic tank are commonly found in the domestic wastewater entering the tank as well as in the soil of the drainfield. As long as the septic tank is being used and maintained properly, the incoming wastewater from the residence will supply the septic tank with enough bacteria to properly carry out digestion.

Research conducted over the past several years has concluded that with normal use, household cleaning products do not adversely affect septic tank operation. Normal use of household cleaning products is considered to be the amount recommended by the manufacturer.

With normal use, household cleaners and disinfectants perform well in destroying bacteria in the home, but do not harm the bacterial action required for a septic tank to operate properly. This is due to dilution of the cleaning products once they enter the tank and the absorptive capacity of the organic material in it.

A study conducted at the University of Arkansas at Little Rock determined the amount of household chemicals required to destroy the bacterial population in an individual domestic septic tank. Domestic cleaners, disinfectants, and drain openers were selected to represent commonly used cleaning products.

Results of this study showed that an excessive amount of any of the cleaners or disinfectants applied in a slug loading (all at once) was required to destroy the bacteria in the septic tank. However, after normal septic system usage, the bacterial population recovered to its original concentration within hours. In other words, under extreme stress and shock loading conditions, the bacteria can be destroyed in the septic tank. Rejuvenation does occur, however, within hours following normal system usage.

The study showed that even minute amounts of drain openers can kill the bacterial population in the septic tank. Therefore, the recommendation was made not to use large amounts of drain cleaners.

Recommended doses not to be exceeded for a 1,000 gallon septic tank were 1.3 gallons of bleach, 2.5 gallons of cleansers or disinfectants, and 0.65 ounces of drain openers. Higher doses were found to affect the septic tank bacterial populations.

If you are concerned about the effects of the cleaning products on your septic system, there are alternatives available. Penn State University has developed a fact sheet that lists several basic cleaning ingredients along with steps to follow that may be used for normal household cleaning jobs. For example, white vinegar can be used as a cleaner, deodorizer, or grease cutter. Lemon can be used also as a cleaner, deodorizer, or stain remover. A mixture of one-fourth cup baking soda, one-half cup vinegar, and one gallon of boiling water will clear most household drain blockages.

For additional information on the use of septic tank additives or the effects of household cleaning agents on septic tanks, call the National Small Flows Clearinghouse (NSFC) at 1-800-624-8301 and request the ADDITIVE packet. This packet contains a selection of articles on additives and cleaning products along with the report of the above-mentioned Arkansas study.

For general information on the proper care and feeding of a septic system, call and request the STINFOFL packet. This packet contains a selection of brochures concentrating on the care and maintenance of septic systems along with the Penn State fact sheet mentioned in this article. Both packets are free.
### Winter 1995 Calendar of Events

**April**

- **Event**: Idaho Environmental Health Associations Annual Educational Conference  
  - **Date**: March 15-17  
  - **Place**: Boise, ID  
  - **Phone**: (208) 327-7499

- **Event**: Water Quality Association’s 21st Annual Convention  
  - **Date**: March 14-19  
  - **Place**: Nashville, TN  
  - **Phone**: (708) 505-0161 Ext. 240, Nancy Raymond

- **Event**: Nolte and Associates, Inc.’s Seminar: Natural Systems for Waste Management and Treatment  
  - **Date**: March 22  
  - **Place**: Windham, NH  
  - **Phone**: (603) 228-1231

- **Event**: Nolte and Associates, Inc.’s Seminar: Natural Systems for Waste Management and Treatment  
  - **Date**: March 23-24  
  - **Place**: Portland, OR  
  - **Phone**: (916) 641-1500 Natural Systems Seminar Coordinator

- **Event**: Rural Community Assistance Corporation and Neighborhood Reinvestment Corporation’s Third Annual Pacific Northwest Regional Training Institute  
  - **Date**: March 27-28  
  - **Place**: Portland, OR  
  - **Phone**: (916) 641-1500 Natural Systems Seminar Coordinator

### May

- **Event**: American Institute of Hydrology’s 1995 Annual Meeting: Water Resources at Risk  
  - **Date**: May 14-18  
  - **Place**: Denver, CO  
  - **Phone**: (612) 379-1030, Dr. Diana L. Weigmann

- **Event**: Marine Estuary Shallow Water Science & Management Conference  
  - **Date**: April 3-7  
  - **Place**: Atlantic City, NJ  
  - **Phone**: (215) 597-3642

- **Event**: Missouri Milk, Food, and Environmental Health Association’s Annual Conference  
  - **Date**: April 5-7  
  - **Place**: Columbia, MO  
  - **Phone**: (816) 327-4653

### Program targets restaurants with onsite systems

Continued from page 13

Program officials initiated the advertising campaign to build recognition, attract new clients, and raise the public’s awareness about the importance of properly operating and maintaining onsite systems.

**Program accomplishments**

Although the program is still ongoing, Burleigh said that as of December 1994, 44 septic systems, located at the 29 participating establishments have benefitted from the program. He added that 33 of these systems are located on property that adjoins surface waters.

Follow-up visits to the facilities have shown that owners and managers are using proper concentrations of solvents and cleaners, and at least two establishments have stopped dumping vent cleaning solvents and residue down the drain.

In addition, Burleigh said there seems to be a better overall understanding of how onsite systems work and the need for proper tank pumping.

The program also seems to have reached the general public. Burleigh said numerous telephone inquiries and extension office visits have shown that the public generally is more aware of onsite system maintenance.

In addition, several hundred educational bulletins explaining the onsite system maintenance needs have been picked up by residents at various public displays.

Burleigh believes the program may serve as a prototype and can be easily duplicated for use elsewhere, especially in similar areas concentrated with food service establishments and onsite systems.

For more information about Business in the Blue, contact Burleigh at the Washington State University Cooperative Extension, N. 11840 Highway 101, Shelton, WA 98584, or call (206) 427-9670, extension 396.
Health departments provide data on onsite systems

by Natalie Eddy
NSFC Staff Writer

Information from a new National Small Flows Clearinghouse (NSFC) database on the status of small community onsite wastewater treatment systems will be available this spring.

In an effort to better understand the situation faced by small communities and to reach out to those in need of assistance, the NSFC began to contact local health departments last May. To date, NSFC has received information from approximately 25 percent of the nearly 3,000 community health departments contacted.

Tricia Angoli, a NSFC technical assistance specialist in charge of the data collection, said she is pleased with the information that has been collected so far. “The response has been overwhelming. As far as we know, this is the first time anybody has attempted to do something like this.”

Many of the local health departments that provided information for the database put a lot of time and effort into their reports to NSFC. “In addition, many of them provided research papers, reports, regulations, and other material for the our files,” said Angoli.

The NSFC initiated the data collection in an effort to assemble the most up-to-date information about the status of small community onsite wastewater treatment systems. It will also allow NSFC to pass along information and technical assistance tailored to meet the specific needs of homeowners, health departments, and environmental professionals in those areas.

Onsite issues
The database documents the number and types of onsite systems permitted at the local level and provides information about how localities deal with related issues, such as permitting, inspections, and maintenance.

It includes information about the number of new onsite systems permitted in a specific jurisdiction in 1993, what types of systems were permitted, and how many systems failed.

She said the information NSFC collects for the database will serve as a valuable resource for providing information and assistance to others who are facing the same challenges.

Of the jurisdictions for which NSFC has data, an average of 110 onsite systems were reported to have failed per jurisdiction in 1993. Of those that failed, an average of 98 were repaired or replaced in the past year.

Of those health departments reporting, an average of 30 percent of the homes in a given jurisdiction use onsite systems to treat and dispose of their wastewater.

Information from the reporting health departments shows the average cost for installing or constructing a new system ranged from $2,763 to $7,743. That included the cost of installing any type of onsite system, from a conventional septic system to an innovative/alternative system, such as a mound system, sand filter, or aerobic system.

Nearly 75 percent of the reporting health departments said they had turned down permits for onsite systems.

Most popular systems
The information gathered to date seems to indicate the most popular type of onsite system permitted is the conventional septic tank/soil absorption system with the second most popular type being the mound system.

Seventy-two percent of the reporting jurisdictions do not charge more for a permit if an alternative system is used. In addition, 83 percent of the those reporting keep records of repairs or alterations to onsite systems, and 64 percent of those charge for permits on repairs. The typical cost of a repair permit was $77.

Most of the reporting health departments said their areas had experienced an increase in population in 1993 and that the increase had affected the number of onsite systems.

More data collection
Work on the database will continue with NSFC technical assistance staff contacting health departments that have not provided information.

The original list of health departments was provided by the National Association of County Health Officials.

Angoli estimates that approximately 75 percent of all local health departments have been contacted. She added that the NSFC is in the process of compiling a list of the other 25 percent.

“We’ve already started getting updated local health department contacts from the states,” said Brock McCracken, NSFC research assistant, who is assisting Angoli with the data collection. He pointed out that, for some of the health departments they have contacted, this introduction to NSFC services may be an important first step in a long-term working relationship.

For more information or if you would like to provide information about onsite systems within your jurisdiction for the database, contact Angoli or McCracken at 1-800-624-8301.

EPA Regions

Data Collected to Date, by EPA Region

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<tr>
<th>EPA Region</th>
<th>Health Departments Contacted</th>
<th>Health Departments Reporting</th>
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The information collected so far shows that the number of onsite systems permitted in the reporting jurisdictions in 1993 range from zero to 4,000, with the average number being 319. Typical charges for an onsite system permit in those jurisdictions range from $95 to $260.

“This new collection of information will determine the true status of onsite systems by going directly to the people who permit and install them,” said Angoli.

She explains the data collection is also a way for NSFC to initiate a reciprocal working relationship with the local health departments. “We will also now be better able to refer callers seeking information to the appropriate contacts at the local level,” Angoli pointed out.

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NSFC wraps up another productive, successful year

Ibolya Gazdag, the NSFC’s exchange professional from Hungary, completed her three-month tour of duty at the NSFC in November. (See article in Fall 1994 issue of Small Flows.) While with the NSFC, she collected information about the U.S. Environmental Protection Agency’s (EPA) new sludge and septage regulations (40 Code of Federal Regulations, Part 503). She has returned to her post as head of the water supply and sewerage section of the Hungarian Ministry of Water Management.

Spraying the word
Several NSFC staff members have been on the road recently to promote the NSFC, speak at conferences, and gather information.

Technical assistance specialists Anderson and Susarla, as well as Gazdag, attended the First Annual Mid-Atlantic Conference on Environmental Finance in College Park, Maryland, in September where they exhibited NSFC materials and gathered financial information.

Anderson also attended the Wisconsin County Code Administrators’ Fall Conference in October. He gave a presentation explaining the services offered by the NSFC and an overview of alternative wastewater treatment and disposal technologies.

As everyone counted down the days in 1994, the National Small Flows Clearinghouse (NSFC) counted up its accomplishments for the year. By all measures, it was a busy and successful year.

We answered thousands of calls on our toll-free hotline: provided products to customers across the country; welcomed multitudes of new users to our computer bulletin board system; gathered information from hundreds of local health departments; participated in many national, state, and regional conferences; increased the readership of our newsletters; and debuted a new professional journal. (See the box on this page for more 1994 statistics.)

In addition, we’ve recently welcomed several new staff members and traveled across the country to attend conferences and promote our services.

Staff Changes
Vernon Deal joined the Environmental Services and Training Division (ESTD) in October as resource center supervisor. He is working to consolidate, organize, and acquire informational materials that will comprise the ESTD’s new resource center.

This more comprehensive and organized resource center will allow the NSFC and its sister programs (the National Drinking Water Clearinghouse and the National Environmental Training Center for Small Communities) to better serve their customers.

Also in the interest of improving customer service, Murty Susarla and Clement Solomon recently became temporary full-time technical assistance specialists, bringing to five the total number of full-time staff members who answer your hotline calls. (g Anderson, Tricia Angoli, and Jennifer Hause are also full-time technical assistance specialists.)

Additionally, Hause recently completed training to become a West Virginia Class I-S certified wastewater treatment operator for ponds and package plants. She says her training and certification already have been helpful in providing technical assistance.

The NSFC’s publications staff has been quite busy with the recent publication of the new Small Flows Journal. (See box on page 18 for more information on how to subscribe.) So far the journal has been very well-received by our readers, and we’re already working on the next issue.

To that end, Cathleen Falvey has been hired to serve as the editor of the Small Flows Journal. In addition, she will coordinate future issues of PIPELINE. Kevin Wilcox, former PIPELINE editor, has returned to graduate school.

Additional transitions in the publications staff include Nancy Gover taking over the primary editorial responsibilities for this and future issues of Small Flows. She comes to this position after four years as a Small Flows staff writer. Jill Ross, former editor of Small Flows, is now responsible for overseeing all of the publications produced by the ESTD as publications supervisor.

Attending the Water Environment Federation’s 67th Annual Conference and Exposition in Chicago in October were Angoli, Hause, Solomon, Gover, Gazdag, and Todd Olson, an NSFC engineering research assistant. The NSFC delegation staffed an exhibit booth and visited other exhibitors to collect information for the Manufacturers and Consultants Database. This database allows NSFC customers to order a customized computer search of companies and consultants with specific wastewater-related products, knowledge, and expertise. (For more information on the Manufacturers and Consultants Database, see the box on page 5.)

NSFC Outreach Coordinator, Patricia Miller, Ph.D., attended the Ohio Environmental Health Association Conference in Sandusky in September. She gave a presentation on alternative onsite systems to a group of sanitarians and environmental health administrators.

Miller also attended the 1994 Kampgrounds of America (KOA) International Convention in Monterey, California, in November. There she presented two mini-courses: “Onsite and Small Wastewater Systems” and “Drinking Water Wells for Campgrounds” to 250 campground operators from around the U.S.

Continued on page 18
NSFC wraps up another productive, successful year

Continued from page 17

Miller, Anderson, Jeanne Allen, NSFC customer service representative, and David Pask, National Onsite Demonstration Project technical coordinator, attended the American Society of Agricultural Engineers’ (ASAE) Seventh International Symposium on Individual and Small Community Sewage Systems in Atlanta, Georgia, in December.

Miller, Pask, and Mori, ESTD manager, also attended the National Onsite Wastewater Recycling Association’s (NOWRA) Annual Meeting in Atlanta in December. Mori attended meetings of the NOWRA board of directors, of which he is a member. Pask gave a presentation on “National Perspectives on Onsite System Management.” Miller attended the Education Committee meeting.

Miller and Pask also participated in the Consortium for Decentralized Wastewater Treatment Systems meeting held in conjunction with the ASAE and NOWRA meetings.

January found Miller traveling to Michigan where she exhibited NSFC materials at the Michigan Onsite Wastewater Disposal Conference, the oldest state onsite conference in the country.

While in Michigan, she also participated in the National Sanitation Foundation’s Standards Committee meeting that is finalizing Standard 40, which covers standards and testing for aerobic treatment units.

In late January, Miller met with members of the Ohio and West Virginia YMCA Citizens Conservation Corps in Tucker County, West Virginia, to formalize project ideas for the group. Members of state and federal environmental agencies attended.

Angoli described the NSFC and the NODP, presented the results of the NSFC’s new database containing information about onsite systems (see article on page 16), and exhibited NSFC materials at the Sixth Annual On-Site Sewage Treatment and Disposal Conference in Auburn, Alabama, in January.

Brad Maust, system operator, encourages readers and users to voice their opinions. “I welcome everyone’s comment. The input we get from users helps us make a decision about what conferences will best serve the public,” Maust said. “We’re interested in having topical issues and using the BBS as a tool to gather and disseminate information.”

In addition to these possible conferences, the NSFC is considering adding a discussion group for high school teachers and students. “I have noticed an increasing number of high school teachers and students logging onto the system to learn more about various water topics,” Maust said.

“We would like to put together a special conference for the teachers and students and offer the assistance of our technical staff or various colleagues in the small wastewater treatment field,” he explained.

For more information about WTIE–BBS, or to voice your opinion about the conferences, call Maust at 1-800-624-8301. You also may leave a message on WTIE–BBS for Maust. To access the system, dial 1-800-544-1936 or 1-304-293-5969.
Below is a list of all articles published in Small Flows during 1994. If you would like to receive back issues of the newsletter or photocopies of individual articles, just check the appropriate boxes, fill in the order information below, and return this form to us. Back issues of Small Flows and photocopies of individual articles are free. Please include $2.00 for shipping and handling.

The National Small Flows Clearinghouse Publications Index, which lists all articles published in Small Flows and PIPELINE, is also available at no charge.

WINTER 1994 - COLD CLIMATE ISSUE
- Mr. and Mrs. Fish spawn learning and laughter
- Laterally thinking in groundwater flow: introducing contour disposal fields
- Watershed management of lakes saves money and protects the environment
- Washington bans use of onsite system additives
- Communities sought for additive evaluation
- Two Virginia counties regulate septic tank systems
- Help is close to home at environmental training centers
- EPA cracks down on operators submitting false reports
- EPA brochure details waterborne disease research
- CSU offers correspondence courses for operators
- EPA issues environmental rules guide for small governments
- Survey estimates wastewater treatment needs
- Work continues on Clean Water Act reauthorization
- Onsite demonstration project moving ahead
- Cross-cultural watershed monitoring is GREEN focus
- EPA Region 3 recognizes environmental education
- Litigation: Is it the answer?
- Three EPA publications offer help with sludge rule
- NATaT offers information
- Proceedings published by TX onsite wastewater council
- NSFC’s outreach effort is a busy two-way street
- Septic tank regulations book, contact list available from NSFC
- NDWC creates health effects conference on DWIE-BBS

SPRING 1994
- New EPA Water Administrator says small communities will win big under CWA, SDWA reauthorization proposals
- City, towns eye partnership to protect NY watersheds
- Drip soil absorption is newest disposal alternative
- Calculating area for a drip soil absorption disposal field
- Norwood is site of Georgia’s first municipal drip system
- Watershed management controversy: big city vs. small towns
- Small Town Task Force committee meets for the first time
- Needs survey, sludge conference now available
- Administration’s position on CWA reauthorization released
- CWA bills progress in House, Senate
- Census figures show that onsite systems are here to stay
- Maryland program helps treatment facilities save money and energy
- Suggestions to help reduce electric costs for wastewater treatment plants
- California approves residential graywater reuse standards
- Plumbing standards take effect, DOE drafts rules for products
- Desert House demonstrates water and energy savings
- Projects demonstrate, evaluate wastewater alternatives
- WTIE-BBS adds NODP conference
- Organizations provide valuable environmental information
- New WAVE may be the future for major hotel chains
- Sewer system case contains valuable lessons for small communities
- Proposals sought for innovative ideas in water and sewage treatment
- Water conservation handbook available
- NSFC bulletin board links professionals around the country

SUMMER 1994
- Alaskan villages earmarked for $15 million matching funds for wastewater/water upgrades
- Save the River grassroots campaign a success in New York
- Experts divided on discharging water softerner residuals into septic tanks
- EPA report provides consensus on SF constructed wetlands
- Sanitation conditions in Alaska compared to Third World countries
- RCAC offers Native American training program
- Watershed management resources available
- $5.9 million designated for Indian Set-Aside program
- NAWQA evaluates water quality in nation’s watersheds
- USGS educational poster series available
- UNESCO educational posters tackle environmental problems
- All eyes on House as CWA slows after spring push
- EPA computer bulletin board offers sludge conference
- EPA offers publications on sewage sludge
- EPA issues new industrial documents
- Pollution prevention program promotes clean water
- Water Quality Information Center offers variety of services
- Alternative system conference videotapes available
- Guidebook focuses on groundwater education strategies
- New onsite wastewater treatment book available
- Groundwater toll-free hotline available in Michigan
- Consultants should protect themselves from lawsuits
- NSFC county survey documents nation’s onsite systems

FALL 1994
- Students learn watershed management with hands on experience
- EPA’s new CSO policy tackles tough environmental issues
- Demonstrations showcase alternative systems
- Hungarian engineer visits NSFC
- WEF offers CSO publications
- NSFC offers CSO brochure
- EPA publishes new septage, sludge guides
- EPA offers new environmental publications
- NDWC offers groundwater teleconference video
- NETCSC training resources catalog available
- Does a consultant need a written contract?
- WATS Q & A
- Letters to the editor
- NSFC updates Facilities Database service
- CWA reauthorization is unlikely this year
- Task Force to present recommendations to Browner
- Task Force identifies small town differences
- Task Force offers principles to help small towns
- NSFC offers EFIN access through new computer bulletin board

Name __________________________________________
Title __________________________________________
Affiliation ______________________________________
Address _________________________________________
City _______________________ State _____ Zip _________
Name __________________________________________
Telephone ____________________________ FAX _________
Please help us clean up our act!

We are currently working to clean up our Small Flows mailing list and we need your help. If you are receiving multiple copies of our newsletters or need to have your address updated, please call us at 1-800-624-8301. Thanks for helping us to better serve you.

Train-the-trainer session to be offered

A course designed to help local officials improve wastewater, solid waste, and drinking water management in small communities is being offered by the National Environmental Training Center for Small Communities (NETCSC) on March 8, in San Diego, California.

Called the Basics of Environmental Systems Management (BESM) for Local Officials, the course covers the fundamentals of selecting, siting, financing, constructing, operating, and maintaining environmental systems. It is intended for trainers who will deliver the course to local officials.

The course is cosponsored by the National Association of Counties (NACo), the National Association of Towns and Townships (NATaT), and the Rural Community Assistance Program (RCAP). It is being held in conjunction with the RCAP national convention. For more information, contact Sandy Miller at 1-800-624-8301 extension 536.

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For more information about the services provided by the National Small Flows Clearinghouse, please call 1–800–624–8301.