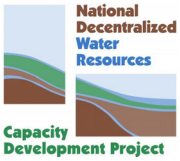

National Decentralized Water Resources
Capacity Development Project

A Status of Tools and Support for Community Decentralized Wastewater Solutions

Green Mountain Institute for Environmental Democracy

Montpelier, Vermont

May 2003

A Status of Tools and Support for Community Decentralized Wastewater Solutions

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DISCLAIMER

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EXECUTIVE SUMMARY

With support from the National Decentralized Water Resources Capacity Development Project (NDWRCDP), the Green Mountain Institute for Environmental Democracy (GMI) held two workshops to explore the status of current tools and services for communities seeking to address their wastewater needs. The attendees of these workshops were a mix of decentralized wastewater experts, service providers, government officials, and community members with a range of experience in addressing wastewater problems. The NDWRCDP was created and is supported by Congress (through the United States Environmental Protection Agency (US EPA)) primarily to address the barriers to full consideration and implementation of decentralized wastewater systems (Decentralized wastewater systems are defined as individual source and clusters of sources that treat and return wastewater to the environment in close proximity to the source) in the US. The barriers to decentralized wastewater systems have been identified as: lack of knowledge and public misperception, legislative and regulatory constraints, lack of management, liability and engineering fees, and financial barriers. This project with GMI was conceived primarily to address the first barrier, i.e., lack of knowledge and public misperception.

This report highlights presentations and discussions from these workshops and should promote further discussion regarding the types of continuing support that communities need to address their wastewater problems.

Findings

Community Motivation to Act

Community members need to focus attention on their wastewater problems. Wastewater is one of many community issues, and on its own it is rarely a priority and rarely a topic to which community members are willing to commit their time or financial resources. There is no simple solution to enhancing community awareness and willingness to act, and most of the recommendations included in this report are intended to increase the motivation and ability for a community to act.

State Agencies' Role in Initiating Action

In most cases, a community decides to act to address their wastewater issues based on requirements of state regulatory agencies that have determined that a community's failing wastewater infrastructure creates a public health or environmental hazard. However, few states are systematic in reviewing the status of wastewater management for each rural area and initiating action.

The Role of Service Provider

The decision-making process within a community to address their wastewater needs is almost always enhanced by the active participation of service providers with knowledge of and experience in decentralized technologies and in implementation of effective community processes. The current availability of service providers to communities is not uniform, nor, generally adequate to provide the necessary technical and process support.

Community Process Is Important But Hard To Promote

The effectiveness and long-term sustainability of community wastewater solutions benefits from well-planned community processes. Active participation in a comprehensive assessment of wastewater infrastructure, physical setting, environmental conditions, and regulatory attitudes is a first step that will lead to a better decision-making process and broader support for the eventual solution. But, just as with the issue of community motivation to address wastewater needs, committing to a community process requires a significant amount of time that is always in short supply. Numerous studies have shown that take the time to implement a strong community process usually reach a sustainable solution, while those small communities that do not often end up with severe and lasting community divisions, and often suffer from a crippling over-expenditure of funds that could be used for other desirable purposes.

The Role of Expert Knowledge In Topics Such As Assessment and Technology Selection

Communities need to employ experts in wastewater management to assist and guide the decision-making process. A less recognized, but equally important need is for community members to participate in the decision-making process. Different communities will have a different balance between the role of the expert and community members in carrying out functions such as assessments and the choice of specific wastewater technologies. It is critical for service providers and technical experts to consider the appropriate mix that is going to work in any specific community and tailor their services to accomplish the optimal type and level of support.

Managing decentralized wastewater solutions is as important as the technology chosen, but often more difficult to implement

The US EPA efforts to promote the need for appropriate levels of management of decentralized wastewater systems before, during and after their construction is laudable. All meeting participants acknowledged the value of effective management in ensuring that wastewater technologies meet required performance goals. However, communities do not as readily accept the long-term requirements that management of decentralized technologies demand and too-often feel their job is complete after the selection and construction of wastewater treatment facilities. To some degree, this is related to their belief that conventional central sewers and urban treatment technologies (centralized systems) are the most desirable solutions to their problems and a lack of appreciation of the costs of managing the centralized systems.

Status of Tools

A growing number of tools are available for communities to help them in making wastewater decisions, in the form of guidance documents and computerized (e.g., CD ROMs) guidance products. In general, most of the tools provide useful background knowledge, but few—if any by themselves—are sufficiently simple to provide the step-by-step guidance and detail to carry out the necessary activities for addressing specific community situations. Rather, these tools must be complemented by the assistance of trained service providers in order to assure their effective use in the community decision-making processes.

Recommendations

More Analytic Material

More information is needed that relates failing (usually onsite) wastewater treatment systems to environmental and economic damages. The term "failure" in this case includes hydraulic failures that cause the opportunity for direct human contact with inadequately treated wastewater and treatment performance failures that impact ground and surface waters in the surrounding area. There may also be value to provide increased focus on the description, performance, appearance, space requirements and operation and maintenance needs of proposed alternative technologies so that community members and regulators can better choose between them based upon their own needs. For example, the community may want increased water reuse and limited capital and operating costs, while the regulator may seek nutrient or pathogen reduction in local receiving waters. Tools that can help satisfy all of these needs will offer valuable assistance to the community decision-making process.

Clear Messages

A clear set of messages about the current status of wastewater management, the implications of failing systems and the capital and management costs for ensuring adequate treatment needs to be delivered through many channels. These consistent messages should build a stronger foundation for public support and political action to address small community wastewater problems. During the 1990s, a significant level of watershed-based reporting identified impaired streams and the sources of critical pollutants. In headwater streams, small communities are often the primary sources of pathogens and nutrients. In addition, a message regarding the relative economic and environmental value of decentralized solutions as compared to central (conventional) solutions is also important in order to overcome current perceptions of decentralized technologies as less effective in treating wastewater and of centralized systems as desirable, cost-effective alternative solutions.

A Means for Communication and Networking

As the number of communities that use effective community decision-making processes and decentralized technologies increase, a well advertised network of experienced consultants, regulators, and community members will help others overcome the challenges of initiating community processes for making more cost-effective wastewater decisions.

Coordinate Training

Several training opportunities now exist, and there is already a critical need for more trained regulators and consultants who are experienced in the trade-offs between decentralized and centralized solutions. This demand will increase in order to satisfy the needs of a growing number of communities that seek affordable and effective wastewater solutions. A coordinated effort to link training opportunities with target audiences will help expand the available pool of service providers and knowledgeable regulators.

Policy Recommendations

Several policy-related issues affect the choice of wastewater solutions. For example, growth management is an important consideration for many communities. The availability of wastewater infrastructure is a part of decision-making that may direct and control future growth in communities. Therefore, more information regarding how decentralized technologies can be beneficial for adhering to planned growth will overcome the current belief that decentralized technologies circumvent growth management plans. This myth relates to the fact that land-use plans that are currently in place are largely based on unscientific limits to development based on codified minimum on-site system requirements and soil maps. Future land-use plans should reflect community-generated desirable growth patterns based on realistic and defensible community goals.

Other approaches that are important to consider are the integration of wastewater management with storm water management and drinking water system management. Coordinated management of these vital community functions should create the most cost-effective and efficient approaches for each and empower creative solutions to all.

Another consideration that can enhance general support of decentralized technologies and other "soft path" approaches to environmental action is an encouragement of community-based environmental protection. Soft path approaches are those that minimize infrastructure requirements and changes to natural hydrologic patterns. Community-based approaches promote stakeholder involvement in designing, reviewing, improving, and defending local solutions.

Finally, there should be a clearly stated general policy of determining when and under what circumstances states require communities to address failing wastewater systems. Such a policy could, in itself, be central to increasing the attention that communities give to their wastewater needs, and therefore increase the number of places where managed decentralized technologies may be applied.

TABLE OF CONTENTS

LIST OF TABLES

1 INTRODUCTION

Conventional sewerage is a high-cost capital investment that has significant operating costs. In some places in the country, these systems are an unaffordable solution for managing wastewater and may lead to unintended consequences for growth management. In addition, there are thousands of areas of the country where the current reliance upon individual on-site septic systems without sufficient management leads to degradation of surface and ground water quality. Managed decentralized solutions[1] may provide an alternative that solves the problems caused by the latter without all the negative results of the former.

This project was supported by the National Decentralized Water Resources Capacity Development Project (NDWRCDP). The NDWRCDP was created and is supported by Congress (through the US EPA) primarily to address the barriers to full consideration and implementation of decentralized wastewater systems (defined as managed systems that treat individual sources and clusters of sources and return wastewater to the environment in close proximity to the source) in the US. Those barriers have been identified as: lack of knowledge and public misperception, legislative and regulatory constraints, lack of management, liability and engineering fees, and financial barriers. This project with GMI was conceived primarily to address the first barrier, i.e., lack of knowledge and public misperception.

During two workshops held in June and November of 2002, experts in the application of decentralized solutions met with representatives of community projects that have already or are in the process of deciding on wastewater solutions. The purpose of these workshops was to better understand the services and tools that are available to communities and how these tools and services can be improved.[2]

This report is the result of those workshops. The intent of the report is to identify where additional effort can strengthen the participation of communities in making wastewater decisions that apply managed decentralized solutions, when appropriate. There is an increasingly common sentiment that addressing wastewater needs in this country is a significant challenge and that the consideration of decentralized solutions is a necessary step to ensure that all communities have the best, most affordable options for maintaining water quality. However, there are several

[1] The definition of "decentralized wastewater systems" was never specifically addressed in the two workshops. The general agreement is that any managed wastewater system that addresses the needs of more than one household and does not rely exclusively on large-diameter pipes to a central facility with surface water discharge fits the definition. In addition, a neighborhood or other collection of on-site systems servicing single households but with the potential for management by a single entity is also included in this discussion.

[2] Workshop participants were faithful to the philosophy that decentralized solutions may not always be the most appropriate for all communities. The emphasis in discussions was to provide a community the basis on which to decide the wisest solutions, and to implement those decisions.

hurdles that presently make the implementation of decentralized solutions challenging, and in some cases, ineffective.

The two workshops focused on distinct aspects of decentralized wastewater system development. As the result of interviews that led to the first workshop, the meeting organizers put a particular emphasis on the issue of interactions between community representatives and technical experts such as wastewater engineers. The second workshop put an emphasis on the relationship between a community and state agencies that are required to regulate wastewater and often provide assistance, as well.

Both workshops were designed to recognize the role of service providers in assisting communities. These organizations include government-sponsored organizations such as the US Department of Agriculture's Rural Utility Service (USDA RUS), non-governmental organizations such as the Canaan Valley Institute, and Rural Community Assistance Program (RCAP). Service-providing organizations are important because they already have developed a trusting relationship with small communities through their activities of working with those communities to assist them in understanding their problems, facilitating community meetings, providing direct administrative assistance to help those communities obtain financing, and guiding them through funding applications and creation of administrative procedures. They provide assistance to communities, but they can also be mechanisms for disseminating common messages regarding the need to consider managed decentralized solutions, especially where regulatory and other existing institutions fail to make such information known to the communities.

The first part of this report is structured to run through each of the steps in the community process that leads to the choice and implementation of wastewater solutions. These steps constitute a "community process." From the observations noted, the remainder of the report identifies key findings that provide the basis for the last section of conclusions.

2 THE COMMUNITY WASTEWATER DECISION PROCESS

Awareness

The first step for a community addressing wastewater needs, usually in response to regulatory directives, is to gain an awareness of the issue of wastewater and the current status of its management in the community. This first step is critical, because in the absence of community awareness, there is no motivation for communities to participate in decisions to affect future wastewater problem abatement. Several attendees of our second workshop highlighted that "lack of awareness" is an important factor impeding progress in small communities that do not understand the implications of their present wastewater management practices.

There are two aspects of awareness that have differing implications on the progress toward problem solution within a community. One aspect is the recognition that failing existing onsite (usually conventional septic tank-soil absorption systems built in accordance with state codes and unmanaged in operation) systems exist in their community, and that the landscape (soil, hydrogeology, etc.) has limited capacity to accommodate additional growth that will depend on land dispersal of wastewater, especially when growth itself competes for the available land. Awareness of this aspect helps communities to define their problem. The second aspect is related to the economics of wastewater management, and both the need for community investment to address wastewater needs and the often greatly different level of infrastructure investment required for central sewers compared with on-site or small-diameter conveyances. Awareness of the relative costs of these alternatives can lead a community to incorporate decentralized systems in their planning process.

In many of the cases considered during the two workshops and other experiences reflected by the attendees, the initial awareness of wastewater issues for a community has been almost always the result of regulatory pressures brought by state or local health authorities[3]. The threat of regulatory action has the effect of initiating community projects. When applied in a well-understood and consistent manner, these regulatory threats may stimulate even more local projects with consistently better results, because communities can be prepared and plan more efficiently as they approach a known action condition. However, there does not appear to be a systematic mechanism within each state to evaluate and act upon the status of wastewater management in small communities, particularly in rural areas without wastewater authorities. Absent regulatory action, homeowners and interested citizens can be the source of action, but only in a few cases have a group of homeowners recognized the need to address these issues, and

[3] In almost all states, environmental agencies play the role of regulating wastewater management, but regardless of the agencies involved and their missions, in most cases, it is the health aspects of mismanaged wastewater that lead to enforcement actions. The split authorities have been cited as a barrier to appropriate solutions (US EPA, 1997).

those were usually the result of contaminated wells identified by bacterial sampling where local health officials understood the potential public health risks of inaction.

At both workshops, we viewed a video from the Pennsylvania Department of Environmental Protection (DEP) that focused on the need to manage on-site septic systems. Such a tool may provide some greater awareness of individual septic system operations and maintenance, and attendees generally gave it solid marks. However, the delivery of such a tool deserves greater attention as it is not clear how homeowners would be exposed to its messages. Also, the specific Pennsylvania video is limited to the issue of septic tank maintenance and not the overall community need to address wastewater. During the first workshop, one set of comments suggested that video presentations such as DEP's could be a part of a series. This one could help with general awareness, but others should be employed to introduce information about different technologies as solutions and the mechanisms for management.

After a few residents build their awareness about wastewater needs, they need to build enough community support to continue with the pursuit and implementation of a solution. During the second workshop, we considered how best to encourage greater motivation. Among the possibilities are building a stronger understanding of the health and economic damages that result from failing systems. Another well-supported idea was to provide enough assistance so that a threatened community could understand that its situation is not unique, and that there are other similar communities that have already addressed similar problems or are in the process of doing so. Building a comfort level around the idea that a community's problems are not unique and that there are appropriate solutions was strongly supported. In arid regions of the country, the potential to reuse wastewater and thus put less pressure on limited water supplies can help bring community members to the table. None of the suggested solutions is universally applicable, and to no one's surprise, no magic bullet was identified. The need to consider more tools to build a community's motivation remained on a list of concerns that deserve greater attention.

After Awareness

In states with robust support systems, the first contact by the regulatory agency is followed up by technical assistance. In our second workshop, this sequence of events was described for both the states of Washington (a staff member of the Department of Ecology with a specific job to work with communities) and Oregon (a multi-agency effort: Community Solutions Teams and a Department of Environmental Quality (DEQ) function: Environmental Partnership of Communities or EPOC). However, in many other states, the primary technical and process assistance is not provided by the states, but by rural assistance agencies with government or foundation support. Examples of the support agencies include the Rural Community Assistance Program (RCAP), the Rural Utilities Service (RUS), which is a part of the Rural Development branch of USDA, the Canaan Valley Institute (CVI), which is active in the Mid-Atlantic highlands, and the Rensselaerville Institute (TRI), which focuses on self-help programs.

During the first workshop, a great deal of discussion focused on the role of technical consultants in a community project. In many cases, the consultant can control the final form of the solution based on the community perception of expertise. A service provider can also offer a certain level of experience and provide a broader perspective for the community to consider during its

decisions to choose wastewater technologies. One of the discussions during the second workshop was how these support agencies can form initial contacts with communities having a need. In some cases, rural assistance agencies have existing relations with communities and, when the issue of wastewater arises, they are often perceived as natural allies and are asked to bring in their expertise. In some other cases, one community is familiar with the experiences of a neighboring community and attempts to utilize the same support organization. In still other cases, the support agency becomes aware of the needs of a community and introduces themselves and their services. In the second workshop, several cases of direct regulatory agency assistance were discussed. The only true constant in all of these cases is the unique story for each community.

Community Process

The first workshop dedicated some discussion to the issue of establishing a basic project framework (defined herein as a series of steps, e.g., community profiling, visioning, evaluation of alternatives, etc., that a community must perform to constitute a successful community decision-making process) for use when a community begins to consider developing wastewater solutions. Graham Knowles of the National Environmental Services Center noted that a basic "Starters Kit" was not yet available, but may be a useful product for future development. In the absence of such a tool, communities seeking to solve local wastewater problems in a supportable, sustainable manner and the service providers who seek to assist them in doing so can use a few newly developed, but essentially untried, community process tools. Examples of these tools are included in Appendix A, and they generally include detailed steps for self-assessment (community profiling), building local citizen involvement, establishing decision-making frameworks, and cultivating the capacity to address the technical and financial challenges that will need to be addressed during a project.

There are at least two guides that lay out a very basic structure for developing decentralized wastewater solutions within communities. In both Minnesota's[4] and New Mexico's guide[5], a specific case is used to run the reader through a series of project steps. During the second workshop, we reviewed these two guides (and a draft guide from Oregon that focuses on technology choices) and considered their application in carrying out specific project steps. In each case, the guides serve as a good foundation, but are not sufficient for communities to tackle a project without trained assistance.

The National Onsite Demonstration Project (NODP) has completed CDs that provide some more detail to particular phases in a community wastewater project including self-assessment, technology choice, finance and visioning. These provide some good ideas, but unlike the state-published guides do not offer a framework within which each of the project steps can be implemented. Also, both the guides and CDs, as well as other guidance information, require additional support, possibly by those agencies that often work with communities such as RCAP and CVI, as mentioned above.

[4] Small Community Wastewater Solutions: A Guide to Making Treatment, Management and Financing Decisions, University of Minnesota, BU-07734-S, 2002.

[5] Centralized Management of Decentralized Wastewater Systems: A Reality-Based Guide, New Mexico Environment Department, Construction Programs Bureau, April, 2002

Assessment

During the first workshop, we focused on the assessment phase of a community process. During assessment, a community gathers information on its current wastewater management, soil conditions, water quality, available land for new systems, fiscal capacity and several issues related to the capacity of community to design and implement a managed wastewater solution. There is no standard sequence of steps for assessment, and the workshop developed a rough list of information needs that an assessment process should gather. See Table 2-1. To our knowledge, there is not yet a comprehensive up-to-date product that lists all the information that should be gathered through assessment, and no specific tool that provides a set of comprehensive activities for accomplishing the assessment task. The NODP CD on assessment supplies a survey tool that includes almost 100 questions, and these questions are a good starting point for considering assessment needs. However, the assessment process requires the integration of the assessment results into a community process and the CD does not provide that integration.

Table 2-1
Questions for Community and for Experts

Questions for Community	
• Soil characteristics	• Acceptance of technical options
• Numbers and locations of system failures	• Acceptance of management options
• Water quality data	• Political and legal capacity
• Who will put process in place?	• Who are necessary partners?
• Cost of current system repairs	• Ready for change?
• How does community want to develop?	• Repercussions of non-action
• Public health risks—fecal contamination, encephalitis	• Ready for conformation…or state of compliance
• What self-help capability (talent) exists in the community?	• Value of water resources?
Questions for Experts	
• Costs (short and long term)	• Will technology be accepted (regulatory environment)?
• Alternatives available	• Repercussions of non-action

Expert Knowledge

In addition to building general awareness and developing a baseline of information, communities need to address some technical questions regarding specific technologies, financing options, and the regulatory requirements for any new systems. There is a consensus among workshop participants that these steps benefit from the support of experienced practitioners. The first workshop placed an emphasis on the manner in which a community can select and work with engineering experts, specifically. The identification of experts with appropriate experience was noted as a primary challenge. Beyond the identification of an expert, the needs for communities in working with experts are standard process issues such as clearly stating the outcomes desired and providing a clear communication path so that the consultant can gather the information that he/she needs in order to consider viable technologies. There is also value to having an ombudsman that can serve as an intermediary between the consultant and the community. In some cases, the assistance agencies serve that role. During the first workshop several attendees noted that expertise in working with state regulators is an important factor for consideration. This was the reason for including more state officials in the second workshop.

In neither the first nor the second workshop were simple solutions to the challenge of working with experts identified. Rather, there was general support for stronger community processes including a strong assessment, and strong public involvement. Implied during the first workshop, and emphasized during the second workshop was the need for a community to identify and fully use one or more champions from its ranks who can oversee the process and coordinate the efforts of community members with regulators, consultants, and other experts.

Community Spark Plugs

During the second workshop, a representative of the Rensselaerville Institute elaborated on the need for what that organization and its Self-Help Program call a "spark plug" to ensure that a community maintains focus and progress in addressing its wastewater needs. In the language of community processes, this is expressed as a need for committed/dedicated leadership from a respected member of the community. While the value of spark plugs or leaders was generally acknowledged, the issue of finding and cultivating leadership was not explicitly addressed during either workshop but they are the focus for some organizations providing training and scholarship programs.[6] One path for developing leadership may be the expansion of a network of community members who have strong interests in solving wastewater needs. Providing individuals a chance to interact with others can build their confidence and knowledge about wastewater solutions, and these strengths can help in their potential leadership roles. However, these leaders should not express strong prejudice of specific solutions prior to the process, but build community dialogue with an open mind to ideas regarding alternative solutions.

[6] One national organization is the Community Leadership Association. See www.communityleadership.org

Choosing a Technology and a Solution

One of the specific steps in the development of a community solution is the consideration of technologies and the necessary management program by communities. This is a particularly interesting step, because it is the first opportunity to differentiate decentralized solutions from traditional central sewer solutions or site-by-site repairs of individual septic systems. This step may be a prelude to a facility plan by an engineer or may be a joint effort wherein the engineer assists the community representatives in their quest to become aware of viable technologies and required management programs that could be employed by the community to solve its problems. Many advocate doing this step before hiring an engineer, so that inexperienced engineers can be excluded from doing critical subsequent facility planning. Others advocate exposing the engineer to the same information as the community at the same time, so the former can do a better job of facility planning when it is called for. No set answer to this dilemma was provided. In a presentation during the first workshop, the community members who attended noted that a comprehensive representation of different technologies was interesting and that this was the first time most of them were exposed to such a product. As a result of that presentation, there were many questions on the relative benefits of each system type, although the answers were typically dependent on local conditions.

While it is true that the presentation of different technologies was interesting during the workshop setting, there were some questions during the second workshop about whether the discussion of different wastewater technologies is readily carried out in a community setting. Providing in-depth information on the different technologies is a focus for many individuals with significant experience in the implementation of decentralized solutions. However, community members without that experience have a different perspective, and the details of different systems may be beyond their interest or capability. This topic deserves greater attention, but it was noted that one of the hallmarks of present practice is that the choices between specific wastewater technologies are rarely made by community members. Rather, it is common for consulting engineers to introduce communities to technologies with which they have the most experience and training. Therefore, it is possible that a specifically tailored level of information on different technologies, their management needs, costs, and other characteristics of application is more important for community support providers, consulting engineers, and regulators, rather than community members. However, a more simplified version of such a presentation should be an effective tool in the community process. The option of simultaneous exposure of the community and the engineer was not discussed during the workshops but may be important to consider for service providers and future training exercises.

The mechanism to provide support information to community assistance providers was a topic discussed during the second workshop. The need for some expert support in developing an audience-specific level of information was reiterated. One general conclusion from these discussions is that the gap between present engineering education and the state of knowledge of managed decentralized wastewater systems suggests that there may be value to review the current training opportunities available for engineers. Providing more training opportunities through professional development educational credits is a possibility to expand the number of engineers exposed to decentralized solutions. In addition, the current development of curriculum for training programs can be updated to include the most recent knowledge of technologies and to include more case studies of the recent applications that have been successful. Providing

similar, audience-specific information to community assistance providers and regulators is also worth additional consideration.

Beyond the technical issues, there are some political (or personal) issues that drive technology decisions. It is important to build on the EPA message that managed decentralized solutions are equal in importance and value to central sewers. This message will not only help influence regulators to recognize the relative value of managed decentralized solutions, but homeowners who have second thoughts about decentralized systems will also begin to see that managed decentralized systems are not poor cousins to central sewers in addressing their wastewater needs. Low-income families have expressed concern about decentralized systems because decentralized systems have an image of a lower level of service than that provided by central sewer solutions.

Facility Planning

The general decision about what collection of technologies will best meet the needs of a community leads to the more specific description of system requirements included in a facilities plan. The design of a facilities plan was considered as a discussion topic for the first workshop. However, we were unable to structure a presentation or discussion that would provide the attendees enough detail to participate in a meaningful way within the time constraints of the workshop.

There may be some value to review some community case studies to determine if the process of facility plan development and its necessary reliance on engineering expertise is an opportunity to build greater community capacity. It may be possible that service providers can work with some interested community members to systematically review a draft facility plan for the purpose of ensuring that the needs of the community are met. In this way, the possibility for a community to pursue decentralized solutions may be enhanced.

System Installation

After a community approves the approach outlined in a facilities plan, the detailed engineering of the system is next followed by the installation of pipes and treatment facilities. While our workshops did not focus on this issue, the self-help programs described for Starbuck, Washington and the State of Texas provided interesting stories for how community members can be involved in installing systems and keeping out-of-pocket expenses low. The use of self-help programs is not a focus for many of the individuals with experience in implementing decentralized solutions. A further consideration of its potential to reduce costs and increase the value of decentralized solutions may be in order[7].

[7] The use of untrained citizens to install wastewater infrastructure is not a simple path to cost cutting. One of the reviewers of this report notes that a great deal of training and some hand holding is necessary to get local citizens to provide useful service in system installation. In that reviewer's opinion, the costs for supporting local citizens participation may exceed the benefits.

Management

An overarching consideration in the implementation of wastewater solutions is the issue of management. EPA has placed a great emphasis on the need for management in the implementation of wastewater strategies within communities. All of the workshop attendees with wastewater experience support the need for explicit consideration of management options in the implementation of wastewater solutions. However, while this need is apparent to experienced wastewater service providers, most communities place a greater emphasis on the selection and construction of wastewater technologies, rather than on the consideration of the management structures necessary to ensure adequate implementation of their wastewater investments. More consideration of how to reinforce the need for management in decentralized wastewater applications may be appropriate.

During the first workshop, several experienced professionals noted that it is necessary to build an attitude of conformance among community members. This is another way of considering the management needs for a community. Conformance is a principle where community members gradually decide to act to protect local resources from inappropriate wastewater practices as a part of a social norm. Conformance is in contrast to compliance because for compliance, the motivation for wastewater management is the regulatory regime, and not a sense of community. Conformance is most important in the management of decentralized solutions because government-enforced management of a large number of dispersed systems may not be as readily accepted by the residents as is the traditional management of large, centralized wastewater treatment systems.

3 EXISTING SERVICES

Before outlining the recommendations for future activity, this section reports on the current status of different service providing agencies. As noted earlier, service providers are critical to the success of a community in addressing its needs. It is the service providers that could be the delivery mechanism for tools that can help communities carry out their decision-making process. Unfortunately, there is not yet a network of service providers that would ensure any consistency in the delivery of service, but several are considering and some even planning to develop such programs. Such a network would provide a stronger mechanism for circulating tools and case studies and could serve as a feedback mechanism to EPA and the professional wastewater community regarding the status of decentralized technology implementation and management.

National Environmental Services Center

The National Environmental Services Center (NESC) has a wealth of information based on its coordination of the National On-site Demonstration Projects and specific efforts to develop tools such as the video tapes and CDs viewed during the workshops. The National Small Flows Clearinghouse is also part of the NESC, and offers a broad variety of products that can assist in a successful community decision-making process. However, NESC does not have the resources or organizational mission to provide the support necessary for the thousands of neighborhoods and municipalities that require assistance in considering their wastewater needs. Through discussions with several community participants, NESC is not presently a fully utilized resource, but it has the potential to either expand its functions to support a wider range of community projects or to provide its products and training to other community service providers, engineers, and regulators.

Training Centers

The expanding number of state-associated onsite wastewater training centers is an additional resource that could play a stronger role in meeting community needs. Their current curriculum focuses on working with the onsite wastewater industry practitioners, but there are opportunities for expanding their roles that are important to pursue. During the second workshop, a recommendation surfaced regarding the value of more continuing education opportunities for engineers that could be managed through the training center network. Ongoing training module development sponsored by the NDWRCDP and the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT) will create programs suitable for this purpose by the end of 2004.

US EPA

US EPA has a critical role at the national level. Its recently developed onsite treatment manual[8] is a strong foundation of performance information on onsite wastewater systems that can assist in creation of community support for soil-based alternatives. The US EPA Voluntary Guidelines for Management of Decentralized Wastewater Systems and an accompanying implementation Handbook is due to be released in 2003. These resources, with sufficiently trained community assistance or engineering consultant support, could fill a vital and necessary role for initially structuring community activities in concert with the state and local regulators. In addition to the general guidance products above, EPA is focusing additional efforts on the issue of management of decentralized wastewater systems, and is actively promoting targeted states to adopt codified management requirements for successfully implementing sustainable decentralized solutions.

State Regulatory Agencies

State regulatory agencies play a critically important role in supporting community efforts to manage their wastewater challenges. The two workshops highlighted the differences between the approaches that different states take. In many states, environmental and/or public health agencies do not or are not able to provide technical or community process assistance to their communities. In a few cases, such as New Mexico, Washington, and Oregon, state agency staff work directly in structuring community processes that may lead to the design, construction, and management of decentralized systems. In those states, the agencies play a role similar to other service providers. Service providers must have a mechanism to include state and local regulatory agencies in their community assistance projects. In all cases, state agencies must be part of the process, but in most it is more difficult than it is in the active states. The reason for state participation in local projects is that the regulators must approve any program developed by the community. The benefit for communities that have access to active state agency support is that the approval of the proposed solution by the regulatory process is generally more readily obtained. In cases where state agency support is not possible, there may be additional hurdles in receiving project permits. When state agencies are participating in the community process, there is a stronger relationship to the permit writers, and the communities have an inherent advocate for their solution.

Other Public and Private Sector Agencies

It is more difficult to characterize the range of services provided by other public sector agencies and the private sector. As noted earlier in this report, the Rural Utility Service (RUS) and US EPA are federal government organizations that work with small communities in solving wastewater problems. Service provider organizations, such as the Rural Community Assistance Program (RCAP) and Canaan Valley Institute, work closely with communities and those federal agencies to assist them with the processes established by the federal and state governments to implement those solutions. The coverage of communities by any one of these

[8] On-site Wastewater Treatment Systems Manual, United States Environmental Protection Agency, Draft EPA/625/R-00/008, February 2002.

community-assistance organizations is incomplete, when one looks at the number and geographical distribution of small communities needing such assistance.

Consultants

Treatment system manufacturers and consulting engineers can bring extensive experience to a community that is wrestling with its wastewater needs. Some of these organizations have provided community assistance services. Unfortunately, the number of qualified engineers in the decentralized wastewater systems field is small at this point in time, and the lack of community resources to fund the extensive efforts involved in organizing and implementing the community process makes such efforts a major drain on the engineer's need to make a profit to survive in business. Thus, few of the small number of qualified engineers are willing to undertake this role.

There is a need for the consultants who normally work with these communities in providing engineering services for their infrastructure needs to expand their ability to provide such services, but most are not trained in the decentralized options at this point in time. Another NDWRCDP/CIDWT project scheduled for completion in 2004 is to create modules on decentralized concepts and technologies that can be used in their entirety or partially inserted into engineering and science courses at the University level. Use of these modules will have short-term impacts on the near-term graduate professionals, but overall change in the engineering approach is a long-term consequence.

Manufacturers

Manufacturers have undertaken the role of assisting community processes in some instances because it gives them an advantage in promoting the use of their equipment in the final plan. Thus, they have a financial reward that is greater than that of the engineer in the choice of the decentralized solution. They may be more willing to undertake this support role in light of the potential rewards.

Potential

The potential exists to expand both public and private sources of support.

4 CONCLUSIONS AND RECOMMENDATIONS FOR THE NDWRCDP

The Status of Tools and Delivery

The issues of tools and delivery are linked. There is a wealth of new tools to provide information and structure for community processes, but no single tool or set of information is in common use. More important than the tools themselves is the need to cultivate a stronger delivery mechanism. Currently, only a small number of communities that would benefit from pursuing community-based solutions to wastewater management receive the assistance from service providers that includes the information necessary to introduce and facilitate a decision-making process for the design of optimal wastewater problem solutions. An expanded network of trained service providers may strengthen the application of existing tools. That training should include a working knowledge of the advantages and disadvantages of managed decentralized systems.

While service delivery deserves a primary focus, most community projects would benefit from both stronger decision making processes and a more comprehensive set of information about decentralized solutions. Specifically, a "starter's kit" that highlights some of the basic steps necessary in carrying out a project is not currently available. This "starter's kit" should provide, at a minimum, background on:

- The relationship of failing systems and water quality (and impacts on public health and economics)
- An understanding of the decentralized approach and more traditional centralized approaches
- A recognition of capital and operating costs in system selection
- The importance of community processes
- A description of the options for managing decentralized solutions
- A comprehensive set of case studies to illustrate how similar communities have solved similar problems

Tools that help outline the needs for assessment are available, but it is not clear the degree to which a community can develop the necessary information to assist in the facility planning that leads to creation of a management program, technology selection, and plan implementation. This may be a case where the most important factor for a community is building a relationship between the community, service providers, regulators, and engineering experts in order to ensure that the appropriate information is gathered and used to create a solution acceptable to all parties.

More detailed information about specific decentralized solutions could be in the form of a comprehensive set of case studies related to similar communities with similar problems that made technology and management choices. This information would not only educate, but also provide communities greater confidence in pursuing decentralized solutions that otherwise are popularly considered as novelties and unproven solutions by many engineers, regulators, and community citizens.

Strengthening Motivation to Address Wastewater Needs

Complementing development of better process tools and information on decentralized solutions, NDWRCDP should focus its attention on describing the real and perceived environmental and public health harm from failing wastewater systems. There is no organized set of information that focuses on the topics of risks from inappropriate wastewater management or the range of costs that should be expected in considering solutions. The results from the NDWRCDP and US EPA sponsored Rocky Mountain Institute study on community decision-making criteria may provide further insight as to the decision-making motivations of communities. Prior to that report (due in 2003), the discussions leading to the two workshops pointed to the importance of understanding costs and benefits from different technology choices. During Jim Kreissl's presentation on different technologies in the first workshop, the attendees strongly supported the development of supplemental information regarding specific pollutant reductions (e.g., phosphorus and nitrogen) and the range of costs that might be expected from specific technologies. NDWRCDP is embarking on a massive reliability and relative-risk study that may help address this need. It also is sponsoring a project with the Oak Ridge National Laboratory that will provide information on integrated risk assessment (due in 2003) that will offer insights into the risks and costs of a wide range of failure modes.

Developing and Delivering Clear Messages

While this project is not intended to strengthen political arguments for more effective wastewater management, workshop attendees left no doubt that a stronger political context will be beneficial for both developing community motivation for considering wastewater solutions generally, and for promoting the idea that decentralized solutions are practical and affordable options. Some of these messages include:

- Contamination of underground water supplies from failing septic systems is a serious public health problem
- The potential for local reuse of water is a normally unrecognized benefit for any alternative wastewater solution
- The importance of management (including the need for professional competence in overseeing the operation of all community systems)
- The potential for cost savings when compared to traditional centralized wastewater systems
- Decentralized systems are high-quality solutions (managed decentralized systems can be equal to or better than central sewers for wastewater treatment, better for hydrology, and have the potential to support growth-management objectives)

The presentation by Paul Chase suggested that failure rates for managed decentralized systems are low, thereby reducing the impacts on water quality. Such statistics may have value to promote a broader discussion around the value of managed decentralized solutions. Additional comments suggested there may be existing information that the failure rate for central sewer and resulting impacts could complement the discussion of successes for decentralized solutions.

A secondary value to strengthening the communication of decentralized wastewater principles and practices is that fine-tuning communication requires clear thinking regarding the relationship between the problems of inadequate wastewater management and progress in water (local watershed) quality. For those individuals who do have experience in applying decentralized solutions, taking some time to develop their message may help them improve their practices by renewing their focus on environmental and economic outcomes.

An Additional Focus on Communication

Graham Knowles introduced the idea that decentralized wastewater is currently a topic only embraced by innovators and slowly being considered by early adopters in the sequence of innovation adoption. The communication of ideas and experiences will facilitate its movement into the mainstream of wastewater management implementation. Specifically, meeting attendees identified that increased efforts in communication should involve engineers and regulators with limited experience in decentralized solutions and promote the decentralized story at national and local levels.

One of the examples cited during the meeting for greater communication was the result of Jim Kreissl's presentation on decentralized solutions. It was noted that a similar presentation for regulators might be very valuable to increase their understanding of the technologies and their significant track record for implementation and success.

For the general public, media efforts such as the videotapes developed by Pennsylvania and NODP are good vehicles for information. NDWRCDP may want to consider whether a series of videos is worth an investment and the related question for mechanisms to distribute the videos in a way that accomplishes outreach to a sufficient portion of the public.

Another specific idea noted during the first workshop was the development of a web site that could include networking information. To some degree, each of the most familiar websites (NDWRCDP, US EPA, and NSFC) fulfill one or more of the examples provided. Examples of this networking information include:

- Links to other websites (especially noted were state National Onsite Wastewater Recycling Association (NOWRA) and National Environmental Health Association (NEHA) branches)
- Schedule of conferences and workshops available
- Lists of consultants and engineers with familiarity to decentralized solutions
- List of case studies of successful small community applications of decentralized wastewater solutions

A final conclusion related to the value of increased communication is the consensus from both of the workshop audiences that the opportunity to occasionally gather, compare notes and share experiences provides an important mechanism for strengthening the field of decentralized wastewater management. Since there is such a diverse range of important participants in community processes, the core decentralized technology advocates should maximize their attempts to reach out to other stakeholders who are impacted by such decisions. Cross-fertilization, such as that occurring in these workshops, will only strengthen each attendee's understanding of the challenges and potential successes in utilizing decentralized solutions.

Growth Management

Because there is a strong interest in growth management in many parts of the country, there is value for the NDWRCDP to consider sponsoring research linking the application of decentralized solutions with meeting local growth management objectives. The basis of this research is to seek better understanding of the potential of decentralized solutions to provide lower cost wastewater options and the increased flexibility of decentralized solutions to be designed to support any type of desired land-use applications. The ongoing analysis of existing case studies by the Rocky Mountain Institute for NDWRCDP and similar efforts by the US EPA and NODP are an excellent start in these efforts. The benefits of decentralized wastewater solutions can be used to complement a strong growth-management planning process. It may be important to show a relationship to Smart Growth policies by drawing an image of how well planned decentralized systems can help support smarter development patterns with a focus on water quality.

An issue deserving further research and discussion is how to differentiate central sewer solutions from decentralized solutions for the purpose of growth management. Some decentralized solutions will have the same impacts on potential growth as would a central sewer. However, a cluster system that relies on local subsurface treatment may better support community-generated limits on the potential for future growth. A second aspect of decentralized solutions that may support growth management goals is the use of lower-cost wastewater solutions in areas where local planning has identified the benefits of additional growth, but central sewers are too costly and the soils cannot support single-lot onsite systems. There is probably a lot of room for discussing how wastewater management can be integrated into growth management decisions. However, it was clear during the workshop that wastewater management choices, by themselves, will not supplant growth management planning in order to accomplish a community's goal for future growth.

Integration with Other Infrastructure Issues

Wastewater management is only one of the needs facing small communities. Other responsibilities include water supply, stormwater management, transportation infrastructure, and general land-use planning.

The opportunities for integration are:

- Assistance to communities working on stormwater management compliance through maximization of infiltration near the source in lieu of traditional mass translocation schemes

- Capacity planning to reduce water supply shortages may encourage decentralized approaches with local water reuse solutions for wastewater management, as well
- Public health decisions relating to recreation in some areas and drinking water quality in others

Valerie Nelson introduced a story that can serve as an example for how a non-integrated approach is ineffective and will end up costing more money. A North Carolina community extended its public sewer to a new neighborhood, in part to reduce the problems of a surface water supply that was contaminated with wastewater. As a result, the resulting growth in the newly sewered area caused an increase in stormwater runoff and the water quality of the surface water decreased.

Building Professional Capacity

During the final day of the second workshop, we reviewed the findings from the first two workshops. One of the conclusions reached was the need to consider professional training as a mechanism for strengthening community applications of managed decentralized solutions. This conclusion resulted from observations that the consulting engineer has traditionally provided decisions about decentralized wastewater technologies for a community. The entire concept of a community process and an informed community-client is aimed at making these decisions a partnership, especially knowing that most engineers lack familiarity with decentralized alternatives. Therefore, it was concluded that there must be some concerted effort to promote community process and to educate the engineers. The suggestion that many states require continuing education of engineers to maintain their licenses to practice was identified as potential means of re-educating the engineers within those states. Also, the onsite training centers were noted as a means of providing this form of continuing education. Recognizing that onsite technology is only one part of the decentralized technology concept, such a step was recognized as incomplete, but potentially useful, since new decentralized technology overview modules were being prepared that would be broader than the traditional onsite focus of the training centers. Exploring more connections with professional associations and regulators may also help build more training opportunities for engineers and regulators. One other suggestion that arose regarding training centers was to use existing training facilities to provide non-technical presentations aimed at community leaders, real estate brokers, developers, bankers, and other potentially impacted audiences as a means to improve center revenues and draw a variety of appropriate audiences.

Environmental Management Systems

A general policy that received some support from the workshops is the encouragement of environmental management systems for use by municipal governments. Environmental management systems are a topic of discussion within the private sector as well as municipal governments as a means to provide a focus on environmental endpoints as well as fiscal and regulatory endpoints. Several mechanisms exist to encourage environmental management systems used in municipal governments. Similar training on managed decentralized wastewater technology could become part of the curriculum that supports environmental management systems.

Wastewater Management Policy

Beyond developing a clear message about the relationship between wastewater management and water quality, NDWRCDP should promote consistent approaches for state agencies to identify wastewater problems. As noted during the second workshop, state agency action directed towards communities with failing wastewater systems is an important incentive to begin a community's attention to their wastewater needs. Unfortunately, there is significant political pressure that makes it difficult for state agencies to consistently identify wastewater problems. These political pressures are the result of economic costs from managing wastewater and the potential that the identification of failing systems translates to a significant need for infrastructure investments. Probably linked with any policy encouraging more consistent enforcement of wastewater regulations will be the need for a mechanism to support wastewater infrastructure investment. The possibility of increasing uses of the State Revolving Fund as a source of capital for decentralized wastewater investments needs to be considered more thoroughly. Also, there is a need for more practical guidance for communities to obtain funding to conduct community planning processes. Although the NESC offers a multitude of possible sources available on a national basis, the New Mexico guide provides specific sources that are most likely to be fruitful for local communities in that state. These types of regionally-specific guides, combined with some practical advice for application wordings that have proven to be successful (as provided in the NESC tool related to finance options), would be extremely valuable for small communities contemplating wastewater investments.

Decentralized Wastewater Management is an Example of Community-Based Environmental Protection

As described above under the topic of integration, decentralized management of wastewater is just one of many responsibilities for communities. The philosophy of community-based environmental protection has been supported by EPA and several state agencies for many years and recognizes the role of community members in taking responsibility for the solutions to local environmental problems. Support for the general policy of community-based environmental protection will strengthen decentralized wastewater decision-making indirectly by building a greater case for local decision making. In addition, managed decentralized wastewater solutions are a good example of "soft path" technologies that tend to be locally directed.

In the work that GMI has carried out for communities (consistent with the experience of other workshop participants such as the National Association of Counties (NACo) and the National Association of County and City Health Officials (NACCHO)), there is a recognition that strong community processes are important for accomplishing locally driven change, but implementing those processes may be more effort than community members are willing to expend. The result is that many community projects do not develop clear goals, do not fully utilize a community's strengths, and do not establish clear decision-making processes. Stronger encouragement of community processes and greater support for the role of local participation can build/reinforce the need for higher quality local projects. A key part of such encouragement should be a means of identifying and supporting key local representatives who can serve as leaders of those community processes. Although there are some recent reports available on identifying community stakeholders, such as EPA 842-B-01-003 "Community Culture and the Environment", only a few such as the "Self-Help Handbook" by Schautz and Conway offer some

criteria for identifying local "spark plugs" who can undertake and move the community process forward. Such guidance needs to be supplemented and made into a tool to assist in the implementation of community processes in a variety of local settings.

There are numerous guides available for conducting or facilitating community processes that have been referred to in this report from a variety of sources, including those from the US EPA, University of Minnesota, West Virginia University, and Cornell University. All can be very useful in undertaking and sustaining community processes and in handling the inevitable conflicts of community factions.

There is also a need to assist communities in the process of when to hire an engineer and how best to do that. At both workshops the issue of how to work with the engineer was prominent, but the issue of how to hire the best engineer for the job was not part of those discussions. Clearly, some assistance needs to be provided through community-assistance organizations and other sources to help in this critical step in the process. The whole idea of community-based decision-making is to assure that the community is both informed and involved in even the technical aspects of the process, to assure that those aspects stay within the expectations of that community.

5 ADDITIONAL RESOURCES

A Simpler, Cheaper Alternative to Sewer Systems: Centralized Management of Decentralized Wastewater Systems, A Reality-Based Guide
New Mexico Environment Department, April 2002
Richard_Rose@nmenv.state.nm.us

National Decentralized Water Resources Capacity Development Project
http://www.ndwrcdp.org/

National Onsite Wastewater Recycling Association
http://www.nowra.org/

National Small Flows Clearinghouse
http://www.nesc.wvu.edu/nsfc/nsfc_index.htm

Small Community Wastewater Solutions: A Guide to Making Treatment, Management and Financing Decisions
University of Minnesota Extension document BU-07734-S, 2002
www.extension.umn.edu

US EPA Fact Sheets/Decentralized Wastewater Issues
http://www.epa.gov/owm/mtb/mtbfact.htm
http://www.epa.gov/etv/index.html

US EPA Onsite Wastewater Treatment Systems Manual
Publication EPA/625/R-00/008 (February, 2002)
Available in PDF format:
http://www.epa.gov/ordntrnt/ORD/NRMRL/Pubs/625R00008/html/625R00008.htm

6 LIST OF ACRONYMS AND ABBREVIATIONS

CIDWT	Consortium of Institutes for Decentralized Wastewater Treatment
CVI	Canaan Valley Institute
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality
EPOC	Environmental Partnership of Communities
GMI	Green Mountain Institute for Environmental Democracy
NACCHO	National Association for County and City Health Officials
NACo	National Association of Counties
NDWRCDP	National Decentralized Water Resources Capacity Development Project
NEHA	National Environmental Health Association
NESC	National Environmental Services Center
NODP	National Onsite Demonstration Project
NOWRA	National Onsite Wastewater Recycling Association
RCAP	Rural Community Assistance Program
RUS	See USDA RUS
TRI	The Rensselaerville Institute
US EPA	United States Environmental Protection Agency
USDA RUS	United State Department of Agriculture Rural Utility Service

A COMMUNITY PROCESS TOOLS

Communities by Choice
Online community water resources
http://www.communitiesbychoice.org/resources.cfm?c=251&rs=1

Community Toolbox
University of Kansas—Community Toolbox
http://ctb.lsi.ukans.edu/

Environmental Planning for Small Communities
US EPA Publication EPA/625/R-94/009 (September, 1994)
Available in PDF format:
http://www.epa.gov/ORD/NRMRL/Pubs/1994/smallcom/625R94009.htm

Guide to Local Environmental Action Projects in Central and Eastern Europe
Institute for Sustainable Communities
www.iscvt.org

Rocky Mountain Institute
Infrastructure and System Planning
http://www.rmi.org/sitepages/pid275.php

Protocol for Assessing Community Excellence in Environmental Health
National Association for County and City Health Officials
http://www.naccho.org/GENERAL261.cfm

US Department of Housing and Urban Development
Office of Community Planning and Development
http://www.hud.gov/offices/cpd/

B PRESENTATIONS

Mid-Atlantic Workshop

- *Decentralized Wastewater Technologies*, Jim Kreissl, NDWRCDP
- *Planning for Effective Wastewater Management Decision-making*, Bruce Douglas, Stone Environmental*, Inc.*
- *Working with Engineers, Regulators & Financial Experts*, Pio Lombardo, Lombardo Associates, Inc.
  Management Options, Pio Lombardo, Lombardo Associates, Inc.
- *Model Program 5: Utility Ownership and Management*, Paul K. Chase, Chase Environmental Services, Inc.
- *Voluntary National Management Guidelines*, Stephen Hogye, US EPA

Pacific Northwest Workshop

- *Developing Community Solutions to Wastewater Needs*, Ken Jones, Green Mountain Institute for Environmental Democracy
- *Teller County Onsite Wastewater Management Project*, Randy Swepston, Teller County Environmental Health Services, CO
- *LaPine National Decentralized Wastewater Demonstration Project*, Barbara Rich, Project Coordinator
- *State Role in Supporting Community Solutions*: Washington State, J. Mark Soltman, WA Office of Wastewater Management
- *Environmental Management Systems Onsite*, Bob Rubin, US EPA

Please note that presentations are available in PDF format by clicking on the presentation title (in the online version of this report). They are not included in the printed version of this report.

C REPORT FROM THE MID-ATLANTIC WORKSHOP

Background

The National Decentralized Water Resources Capacity Development Project (NDWRCDP) was established by authorization from the US Congress to support research and development to improve our understanding and strengthen the foundations of training and practice in the field of onsite/decentralized wastewater treatment. The Education and Training Subcommittee builds opportunities to strengthen the awareness and knowledge of decentralized wastewater technologies for community members, service providers, engineers and regulators. This workshop is the first of two to explore the current status of tools available for community members to help them implement decentralized solutions to their wastewater needs.

There were two objectives for this meeting. The primary objective was to provide feedback to national organizations that work with communities that are interested in implementing decentralized solutions to their wastewater needs. The second objective was to provide community members some assistance in their next steps towards decentralized wastewater solutions.

The attendance at this meeting was by invitation, only. The intent was to bring a mix of individuals representing community members, service providers and the creators of tools that are generally applicable in carrying out a project to implement decentralized solutions to their wastewater needs. At times, the differentiation between community members, service providers and tool makers is artificial, and the workshop sessions did not rely on the classification of individuals to record remarks. A list of the attendees to this workshop is included at the end of this Appendix.

As a product of the first workshop, this report highlights the findings and serves as the basis for developing the second workshop to be held in the Pacific Northwest in October. The findings are preliminary and, together with the findings from the second meeting help support final recommendations. The Summary report includes conclusions from the two workshops.

Agenda Summary

Several of the workshop attendees arrived at the conference facility the night before the formal kick-off and informal discussions took place that evening and during breakfast of the first day.

The workshop itself opened with some introductory comments from Ken Jones (Green Mountain Institute for Environmental Democracy) as facilitator for the event and he placed an emphasis on respect as a key to learning for adults. This opening theme not only served as a ground rule for participation but reflected the need to develop communication materials that build on the experiences of community members and regulators. Changing the direction of management from an either/or decision between on-site septic systems and central sewers to a hybrid solution including decentralized solutions will require a clear understanding of the experiences of others in the regulatory, contracting, and engineering worlds.

The community members introduced themselves and highlighted some of the factors that initiate their interest in pursuing decentralized systems. These factors include:

- Contaminated drinking water
- Restrictions on future growth without wastewater management
- Changes in a community from rural land use to more concentrated human development
- Insufficient funds to solve the problem with central sewer approaches

In addition to community members, the workshop included "service providers" that work with individual communities to help them with their wastewater needs. Each of the service providers noted the general lack of community resources and infrastructure in smaller, more rural communities on which they focus their services.

Following the community introductions, Graham Knowles (National Onsite Demonstration Project) presented a video that introduces the idea of decentralized wastewater as a solution for failing septic systems. He followed the videotape with a brief overview of decentralized wastewater solutions introducing an analogy between the black box that represents under-the-ground wastewater treatment and the black box that represents people's decision-making processes. While there is some science to guide the construction and operation of the wastewater box, there is more art to manage the decision making process.

Graham included a presentation on the functions of the National Small Flows Clearinghouse at the National Environmental Services Center at West Virginia University (for the rest of this report, this group is referred to as "Small Flows Clearinghouse"). Graham identified the need for a community's core commitment to act as one criterion that the Small Flows Clearinghouse uses in deciding locations for providing support. Graham also listed some skills that a community will need in order to move forward in implementing the stages of a decentralized solution. These include:

- Environmental and Socio-economic assessment
- Land use planning

- Wastewater management
- Public health
- On-site management

During this and later discussions, Graham listed some guidance tools for small community self-assessment and visioning that the Small Flows Clearinghouse has indicated to be near completion. The session concluded with a discussion of indicators that can help a community plan for its wastewater needs. These indicators include both indicators of public health and indicators of a community's carrying capacity.

Following lunch, Ken introduced the first discussion question:

- What kinds of information are helpful to ensure the development and implementation of wastewater solutions?

The responses are captured in the tables, below.

Table C-1 Questions for Community

- Soil
- Numbers and locations of system failures
- Water quality data
- Who will put process in place?
- Cost of current repairs
- How does community want to develop?
- Public health risks—fecal contamination, encephalitis
- What self-help (talent) exists in the community
- Acceptance of tech options
- Acceptance of management options
- Political capacity
- ID necessary partners
- Ready for change?
- Repercussions of non-action
- Ready for conformation…or state of compliance
- Value of water resource?
- Use of water resource?

Table C-2 Questions for Outside Experts

- Costs (short & long term)
- Alternatives available
- Will technology be accepted (regulatory environment)
- Repercussions of non-action

Following that brief discussion, the workshop moved on to a presentation from Jim Kreissl (NDWRCDP) about the different technologies that are available for managing wastewater. For many people in the room, this presentation represented the first time that information from a range of systems was presented in a single format. Jim concluded the presentation with some tables that show the comparison between systems. These tables sparked quite a bit of interest and

discussion with the general request that more factors be included in a presentation that compares technologies. Some of the suggested factors included:

- More detailed cost information
- Nitrogen/Phosphorus/Pathogen removal
- Compatibility for different size communities

The second day started with a discussion of the relationship between the community and consulting experts. Bruce Douglas (Stone Environmental) introduced three cases of community approaches to decentralized solutions and the roles of the professional consultants. One of the specific points brought out during this presentation was the challenge in gaining useful information from community members because of the fear that the information may be used as a tool for regulators to enforce change.

Pio Lombardo (Lombardo Associates, Inc.) followed up with his perspective from the engineering community and the different roles that consulting engineers need to play, suggesting that different experts are necessary to help with different phases of a community project.

The discussion session that followed these presentations began with a review of the list of information that is important for a community to gather in order to move forward in tackling their wastewater management needs. While the potential list of technical information is long, a core of data needs and sources rose to the top of the list:

- Parcel maps
- Topography maps
- Soils Survey maps
- Water quality data (surface and ground water, if available)

The primary questions that arose from the participants were related to knowing how much the community and its assistance providers can do and when to ask for consultant assistance.

The final content session focused on the management of decentralized solutions. A premise for this session was that the management of a system after the community has made its decision and the technology has been implemented is critical to the long-term success of that system. Steve Hogye (US EPA) introduced the session by offering the management framework under development by EPA. This framework includes five tiers of management. A community can choose any of the tiers dependent upon the degree of needs for that community.

Paul Chase (Chase Environmental Services) presented the results from a survey of thirteen utility owned systems and found a range of management functions carried out, but a consistent result in terms of reduced failure rate as compared to the systems that were replaced.

Following Paul's presentation, Pio Lombardo offered additional examples of management and promoted some basic themes for considering management options.

During lunch of the second day, the participants broke into five groups to discuss five topics of interest. These topics included:

- Better understanding the issue of responsibility, power, and authority
- Establishing performance standards
- Addressing growth management needs
- Addressing shrinking populations and lack of revenues
- Working with regulators

The end of the workshop was used to identify major themes from the workshop and next steps for both the community representatives and the national level tool makers that attended the meeting. The results from these sessions serve as the remainder of this report.

Workshop Findings

There are four categories of findings from the workshop.

- An evaluation of tools available for communities
- Direct support for communities
- The need for greater communication
- Decentralized wastewater management as an example of Community-Based Environmental Protection

Evaluation of Available Community Tools

One of the key objectives for this workshop was to identify how community members respond to the tools that are available for promoting solutions to wastewater needs This did not occur for several reasons:

1. **There is not a refined list of tools that are available for communities**. This is not to say that there is not a great deal of information that is available for communities. The "Wastewater Products Catalog" from the Small Flows Clearinghouse lists a great deal of information on decentralized wastewater management. This material will be supplemented by a list of products under development, as well. However, for the purposes of the workshop, there was not a tool presented that could be discussed explicitly regarding its application at the community level to achieve a particular community need.

2. **The issue of wastewater management may not yet be amenable to the progression through a series of tools**. The very first task of needs definition could benefit from extensive assessment and visioning tools of the type under development by the Small Flows Clearinghouse, although the application of such tools by the community and their assistance providers will be challenging. (see comments in the section on pages C-8 and C-9 under Decentralized Wastewater Management as an Example of Community-Based Environmental

Protection, Evaluation) After the needs assessment and visioning, the variability in communities makes the application of any specific tool difficult, with the possible exception of grants and loans application assistance.

3. **The application of a tool in a workshop setting is challenging**. The mix of attendees and workshop structure made it difficult for community members to try their hands at individual tools. It is very difficult for members of different communities to work on any single tool together because their local conditions are quite different. From GMI experience in the past, it is difficult to condense the experience in tool use to a very short time period and receive useful feedback.

One of the specific products that the National Small Flows Clearinghouse has been developing is a Starting Kit that could help communities recognize some of the first steps necessary for carrying out a decentralized approach. It may be useful for this product to be presented with the concepts of adult education clearly in place. Specifically, the Starting Kit needs to tap into existing local community experiences and opportunities in order to engage the necessary audiences.

The presentation by Jim Kreissl did lead to some significant discussion about potential improvements in the display of decentralized solutions. The comments themselves suggested categories for focusing on expanding the information and include more on costs, specificity of site requirements and efficiencies in removing certain contaminants. In addition to the specific comments, the level of interest in the presentation suggests that a systematic display of different technologies may be worth developing more completely.

Another example of a tool that elicited some significant discussion was the use of survey tools (presented by Bruce Douglas referring to the Warren, Vermont case) to get information from community members about their wastewater systems. Because gathering information from community members can be challenging, any cases where there are successful applications of survey tools may be useful for greater dissemination.

Direct Support for Communities

A second objective for this workshop was to provide assistance to individual communities. Comments from both community representatives and service providers noted that the meeting provided a great deal of information and the structure helped them think about approaches for dealing with their issues back home. It is important to note that all of the information provided during the workshop has been available in written form and much of it was available via the Internet for any audience. However, a workshop forum is a valuable mechanism to help community members and service providers incorporate the material into their own local situation.

GMI introduced this workshop with a discussion about the role of dialogue and respect in the process of accomplishing adult education. To the extent that each of the tools is intended to be an educational device, NDWRCDP may wish to revisit the current mechanisms for tool delivery to ensure that each tool provides enough opportunity for interaction within community projects. In general, presentations that directly reflect the experiences of community members provide the greatest amount of information to those community members. After Graham's presentation of

the introductory video, a key comment noted the emphasis on images of housing stock that suggested that the case studies described were for more affluent communities. For lower income communities, their overall ability to learn from the content of the video is compromised by the physical setting portrayed during the presentation. Even more important for adult learning, the design of sessions that allow for participation by community members is a more certain path for gaining results of better issue comprehension. Tools like the Community Readiness Indicator Instrument, under development by the Small Flows Clearinghouse, invite public participation and its implementation should provide important feedback on its utility.

To close out the meeting with the community members, we explored some of the next steps that each community was considering. Most of the responses were related to increasing the outreach for their efforts by expanding communication. Specifics include holding a public workshop, working with county commissioners, holding a public meeting, developing a public education strategy, and initiating work with permitting agencies.

The final response to next steps was roundly supported and not surprising. Developing more monetary resources is key for all of the participating communities to progress.

The Need for Greater Communication

Graham Knowles introduced the idea that decentralized wastewater is currently a topic only embraced by innovators and slowly being considered by early adopters in the sequence of innovation adoption. The communication of ideas and experiences will facilitate its movement into the mainstream of wastewater management implementation. Specifically, meeting attendees identified that increased efforts in communication should involve engineers and regulators with limited experience in decentralized solutions and promote the decentralized story at national and local levels.

One of the examples cited during the meeting for greater communication was the result of Jim Kreissl's presentation on decentralized solutions. It was noted that a similar presentation for regulators might be very valuable to increase their understanding of the technologies and their significant track record for implementation and success.

A secondary value to strengthening the communication of decentralized wastewater principles and practices is that fine-tuning communication requires clear thinking regarding the relationship between the problems of inadequate wastewater management and progress in water quality. For those individuals who do have strong experience in applying decentralized solutions, taking some time to develop their message may help them improve their practices by renewing their focus on environmental and economic outcomes.

During the closing session of Day Two, there was significant discussion about the accessibility of information that may promote greater communication. One of the specifics noted was the development of a web site that could include networking information. Examples of this networking information include:

- Links to other websites (especially noted were state NOWRA and NEHA branches)
- Schedule of conferences and workshops available

- Lists of consultants and engineers

Decentralized Wastewater Management as an Example of Community-Based Environmental Protection

Decentralized management of wastewater is just one of many responsibilities for communities. The philosophy of community-based environmental protection has been supported by EPA and several state agencies for many years and recognizes the role of community members in taking responsibility for the solutions to local environmental problems.

In the work that GMI has carried out for communities (and we believe consistent with the work of NACo and NACCHO), there is a recognition that strong community processes are important for accomplishing locally driven change, but implementing those processes may be more effort than community members are willing to expend. The result is that many community projects do not develop clear goals, do not fully utilize a community's strengths and do not establish clear decision-making processes. As a result, they have difficulties in solving problems. The draft Community Readiness Indicator Instrument from the Small Flows Clearinghouse is a good example of a community process tool that should be applied in communities, but may be difficult to convince project organizers of its value. During this workshop, we could not gain much feedback from community members regarding the practical value of the assessment tools for them to complete their own work, since no specific tools were presented. For the follow-up workshop in the Pacific Northwest, there is a need to explore what kind of presentation and dialogue can help community members recognize the value of some of the process steps necessary to decide and implement decentralized wastewater solutions.

Evaluation

A written evaluation form provided workshop attendees with three questions. We received responses from thirteen participants including most of the community representatives.

Question 1: To the extent that you attended this workshop to gain knowledge/information, did the format help you accomplish that objective?

Question 2: In most cases, the four content sessions were intended to offer a mix of presentation and discussion. Was the length of the presentations too long, too short, or about right?

Question 3: The knowledge and experience that different participants brought to this workshop varied widely. Was there a need to spend more time bringing more participants "up to speed"?

The general response to question one was positive, most of the attendees found that the workshop provided them with a great deal of information and the structure of the presentation of content material helped them structure their own needs. Two cases cited a desire for more information on technical materials and for the connection to regulatory requirements.

This question was intended to focus on community members and service providers and showed that workshop agendas such as this one are generally good for promoting a better understanding

of the decentralized wastewater issue, but deserve more detail to apply to any specific community setting.

The general response to Question Two was positive. In two cases, the attendees requested more time, and in two cases, the attendees mentioned that the overall workshop was too long.

The general response to Question Three was that getting attendees up to speed was not a problem.

A request for additional comments led to several ideas about getting into issues in more detail and further developing the relationship to regulatory issues. In terms of the process, there were two requests to increase the opportunities for hands-on exercises.

In addition to the written evaluation, the close of the meeting provided an opportunity for participants to provide recommendations for improving the meeting. Several people took this opportunity to suggest broadening the participation to include regulators and engineers that have less experience with decentralized solutions.

A few individuals recognized that the notebook and materials were not used to adequately. One specific suggestion was to include discussion questions with each section of materials.

A final point for consideration is to change the language from “assessment” to a term with less political baggage.

Mid-Atlantic Workshop Agenda

June 26, 2002—Day One

10:00 am **Agenda Review, Ground rules and Introductions** *(Ken Jones)*
The focus for these introductions is to learn from the community representatives regarding their wastewater needs. Introductions from service providers and tool developers will be brief (more time for their introductions during their presentations.)

11:00 am **Introduction to Decentralized System Development** *(Graham Knowles)*
In this opening session, we will lay out a structure to help consider the use of tools and resources for developing decentralized solutions for your community wastewater needs.

11:30 am **Community Assessment Presentation** *(Graham Knowles)*
A presentation directed to the community representatives that focuses on the tools to accomplish community assessments, what those tools deliver, and what it requires to use them.

12:30 pm **Lunch**

1:30 pm **Community Assessment Response and Discussion** *(GMI)*
Each community team will respond regarding the degree to which the information provided in the morning session is:

- Already readily available and regularly practiced
- Not available and useful, and how it might be disseminated
- Not available, but not useful and how it might be improved

(In each community response session, we are not looking for common responses, but the natural variability that is expected from communities with different contexts.) The session will be ended with a brief review of the findings.

3:00 pm **Break**

3:15 pm **Presentation on Decentralized Technologies** *(Jim Kreissl)*
In this session, we will present the different kinds of technologies that are available for addressing a community's wastewater needs. The presentations will focus on the different kinds of community conditions that different kinds of technologies can be applicable.

4:00 pm **Response and Discussion** *(GMI)*
Similar to the 1:30 session, the community representatives will address how the information on decentralized technologies (not the technologies themselves) is useful for their own situations.

6:30 pm **Dinner**

June 27, 2002—Day Two

8:30 am **Agenda Review and Discussion of NDWRCDP Activities** *(GMI/NDWRCDP)*

9:00 am **Working with Experts—Engineers, Regulators, Finance—Presentation** *(Bruce Douglas, Pio Lombardo)*
A theme that consistently arises from communities is the challenge in working with engineers in getting plans and system design that meets the needs of a community, particularly when a community is looking for decentralized solutions. In this session, we will explore some of the ways that community members can work better with engineers and other professionals such as regulators and financial agents.

10:00 am **Break**

10:30 am **Working with Experts—Regulators, Engineers, Finance—Response and Discussion** *(GMI)*
We will use this time to have each community discuss its current status of project development and identify, as a group, some of the opportunities to strengthen their use of engineers and interactions with regulators and the financial community. The last part of this session will be the identification of activities that national organizations can take to address the needs of communities in issues of technical communication.

11:30 am **Management Capacity Experiences and Resources—Presentation** *(Paul Chase, Graham Knowles, Pio Lombardo)*
The construction of wastewater facilities will only solve wastewater needs if the systems are monitored, maintained, and inspected. In this session, we will introduce aspects of decentralized system management.

12:30 pm **Lunch Discussion about the policy aspects of Decentralized Systems Management**
One aspect of management which is difficult are the political issues associated with setting up management systems. State agencies, county commissions, local governments, and newly empowered wastewater utilities all need to work together. During lunch, we will talk about some of the experiences and approaches for managing the political landscape around decentralized wastewater.

1:30 pm **Management Capacity Experiences and Resources—Response and Discussion** *(GMI and panel)*
Similar to the feedback sessions yesterday, the communities will offer their feedback regarding the effectiveness of existing tools and resources that assist in developing management systems.

2:30 pm **Compilation of summary comments, next steps and general reactions** *(GMI)*
This meeting is intended to develop a series of next steps for the community participants as well as the representatives from national organizations and service providers. We will use this session to summarize those next steps.

3:00 pm **Adjournment for Community Participants—Debrief for other** *(GMI/NDWRCDP)*
This workshop is the first of two, the other taking place in the Pacific Northwest in October. For those individuals who are interested, we will review the findings from the meeting and highlight some of the findings to be communicated through the workshop report and further explored during the fall workshop.

4:00 pm **Meeting adjournment**

Mid-Atlantic Workshop Participant List

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D REPORT FROM THE PACIFIC NORTHWEST WORKSHOP

Background

The Decentralized Water Resources National Capacity Development Program (NDWRCDP) was established by authorization from the US Congress to support research and development to improve our understanding and strengthen the foundations of training and practice in the field of onsite/decentralized wastewater treatment. The Education and Training Subcommittee builds opportunities to strengthen the awareness and knowledge of decentralized wastewater technologies for community members, service providers, engineers, and regulators. This workshop is the second of two to explore the current status of tools available for community members to help them implement decentralized solutions to their wastewater needs.

As with the first workshop in June, there were multiple objectives for the November workshop. The primary objective was to provide feedback to national organizations that work with communities interested in implementing decentralized solutions to their wastewater needs. The second objective was to provide community members some assistance in their next steps towards decentralized wastewater solutions. Finally, this workshop provided opportunities to better understand the role of state agencies in supporting communities' wastewater solutions in addition to serving as the regulatory "police" ensuring adequate wastewater management.

The attendance at this meeting was by invitation, only. The first workshop included community members, community service providers, and technical experts. This second workshop included those same categories of participants as well as representatives from state agencies of Oregon and Washington. A list of the attendees to this workshop is included at the end of this Appendix.

This report highlights the findings from the workshop and complements the findings from the first workshop. Together, these two reports serve as a foundation for the final report, which includes recommendations and key conclusions regarding existing tools for communities pursuing decentralized wastewater solutions.

Agenda Summary

Several of the workshop attendees arrived at the conference facility the night before the formal kick-off and informal discussions took place that evening.

The workshop began with introductions from the participants. Most of the participants had experience with at least one community and in several cases many communities that have worked to design solutions for their wastewater needs.

Following the introductions, we reviewed a video tape produced by the state of Pennsylvania that focused on the need to manage individual on-site septic systems. A written evaluation form was completed as well as a short discussion regarding the relative value of this video tape as a communication tool for the public.

In order to kick off the discussions, Ken Jones presented two frameworks which outlined the phases of a community process. The first framework represents a general sequence of activities that a community must progress through to implement solutions:

- Build Awareness, Education, and Trust
- Develop capacity to solve the problem
- Build an attitude of conformance

The second framework includes specific activities that are necessary in implementing wastewater solutions:

- Assessment
- Establish wastewater goals
- Evaluate options
- Design solutions
- Implement and Manage

After this brief presentation, Ken introduced the participants to an exercise that was intended to review the applicability of different tools designed for assisting communities and addressing their wastewater needs. The state of Minnesota has produced a guide titled "*Small Community Wastewater Solutions: A Guide to Making Treatment, Management and Financing Decisions.*" The state of New Mexico has also produced a guide titled "*A Simpler, Cheaper Alternative to Sewer Systems: Centralized Management of Decentralized Wastewater Systems.*" The state of Oregon has a draft guide intended to address some of the technical choices for selecting among decentralized technologies. The National Environmental Service Center has recently produced four CDs that provide guidance to communities on aspects of a community process for implementing wastewater solutions. The CDs cover the topics of assessment, public involvement, technology choices, and finance.

In order to prepare for the exercises, the participants heard a presentation from Bob Rubin who has joint appointments at North Carolina State University and the US EPA. Bob introduced EPA's guidance material for decentralized wastewater management. Ken gave a brief introduction of the Minnesota, New Mexico, and NESC products. Jim Kreissl summarized the Oregon product.

The exercise began by breaking the group into four teams. Team one developed an outreach plan in order to engage community members in a project to address wastewater needs. Team two developed the general project work plan that listed a number of steps necessary for a community to address its wastewater needs. Team three considered what is necessary to make decisions among the wastewater technologies that are available for communities. Team four considered the management options for operating wastewater systems. The intent of the exercise was to provide a fairly realistic scenario for using the available tools. In addition to the tools, most of the participants brought their own experiences as well, which makes interpreting the results difficult.

The first step in the exercise was for each team to develop a list of the necessary steps to accomplish their charge. These steps were presented back to the full group and the full group responded to their lists highlighting the most challenging items. Those challenging items then became the topic for a second team meeting. In all cases, the teams were asked to use the available tools and consider how those tools help them with their assignments.

The final reporting session was focused on how each team used the available tools.

The first day closed with a presentation from Randy Swepston of Teller County, CO. Teller County is a rapidly growing area west of Colorado Springs. In addition to growth pressures, the terrain and soil types make wastewater management challenging. Randy's presentation focused on how the County has engaged the public in better understanding their wastewater needs and using a range of resources to complete wastewater assessment studies.

The second day began with a video presentation developed by the National Onsite Demonstration Project. This video reports on several communities around the nation which have implemented decentralized solutions. The intended audiences for this video are those professionals and interested communities that are considering decentralized solutions to meet their wastewater needs. As with the first video, participants filled out a written evaluation form and participated in a discussion.

After the video, we heard a presentation from Carol Wildman. Carol headed up a project in a small town, Starbucks, Washington that replaced many failing on-site systems with a cluster system using soil dispersion of effluent. One aspect of the Starbucks story is the use of self-help in order to minimize the costs. This presentation was followed by a presentation from Eric Ellman who supports self-help programs in the state of Texas.

After the community presentations, the group prepared for the afternoon by considering the occasional conflict between growth management and decentralized wastewater solutions during lunch. During the Maryland workshop earlier in 2002, the issue of growth management was important in the design of the agenda and the identification of participants. Maryland is a state with a specific growth management policy that restricts public investment in areas outside of defined growth areas. Oregon, a focus for the second workshop, is a state that also has growth

management policies that make it difficult for public investment outside of urban growth boundaries. However, in Oregon, the Department of Environmental Quality wanted to pursue ideas for addressing wastewater problems in rural areas outside of urban growth boundaries. In order to address the issue during the second workshop, we scheduled a specific session to consider the challenges in implementing decentralized solutions while also maintaining growth management policies.

After lunch, community participants offered a short list of the major challenges that face them in addressing wastewater needs. These challenges provided a basis for discussion with state agency representatives that offered short presentations regarding the sorts of services that they provide. Mark Soltman provided the presentation from the State of Washington Department of Health while several individuals offered a presentation of their services from the Departments of Environmental Quality and Land Use and Development from the State of Oregon.

To provide additional information from Oregon, Barbara Rich told the story of the development of an advisory board for the La Pine National Demonstration Project. This Advisory Board has developed recommendations for how the on-site systems in La Pine should be managed and financed.

There was a spirited discussion regarding the presentation from the Department of Land Conservation and Development. The basis of this discussion was an attempt to find a way for areas outside designated urban growth boundaries to more effectively pursue managed decentralized cluster system approaches for wastewater management. Currently, those areas are restricted from constructing infrastructure for multiple households without completing a waiver process with the state.

The second day of the workshop finished with a review of some of the challenges that face communities in addressing wastewater needs.

The third day of the workshop was for a smaller number of participants that play a role in developing support for communities across the country. Jim Kreissl represented NDWRCDP, Bob Rubin included an EPA perspective as well as experience from one of the Regional Training Centers. Hal Ball represented a leading manufacturer of decentralized wastewater treatment equipment that has implemented wastewater technologies in hundreds of locations around the country. Eric Ellman represented the Rensselaerville Institute for Self-Help and works with low-income communities in South Texas. He is interested in expanding decentralized solutions to further reduce costs. Nate England and Joe Sahlfeld work with Rural Development from USDA and provide engineering and financial support for small communities in Oregon.

Results of the Exercise

The detailed results from the exercises can be found near the end of this Appendix. In general, the four tasks carried out by the four teams provided a useful context for workshop participants to articulate some of the challenges in carrying out a community process. Several groups noted that the specific tools provided for the exercise offered some background information, but personal experience probably provided more of the substance of their deliberations. This observation is particularly true for the teams that focused on steering committee structure and public involvement.

Regarding the exercise generally, evaluation forms noted that most participants felt the exercise was most effective when specific information requests guided the deliberations. The first half of the exercise was more general in nature and participants found carrying out that portion more challenging. It may be difficult to translate the findings from this workshop to the application of similar exercises in workshops with attendance from a single community. It is more challenging for representatives from different communities to work on exercise that requires the consideration of a single location.

Learning From Other Communities

During this workshop, we heard presentations from three separate locations.

Teller County, Colorado—Randy Swepston's presentation explained the beginnings of a county-led process to characterize wastewater management and the link to ground water quality. Gaining public involvement in the process was not only necessary to provide a comprehensive picture of local on-site systems, but also provides a basis for building greater buy-in for future steps in wastewater management. A PDF version of the presentation is available.

Starbuck, Washington—Carol Wildman's story about the construction and management of a central collection system using soil dispersion for the effluent was a tremendous example of community engagement. While the decision making that led to the technology selection was not a focus of the presentation (and may not have been a focus of the community deliberation since one specific company was assisting their efforts), the installation of pipes and treatment systems using community labor required an organized and systematic decision making process that could serve as a model for other small communities. The follow up discussions led by Eric Ellman, as a staff member of The Rensselaerville Institute, promotes self-help for cost saving purposes, reinforced some of the principles of community process. These include:

- Leadership
- Systematic progress integrated with continuing planning
- Building community conformance (as opposed to relying on compliance to regulation)

La Pine, Oregon—Barbara Rich's presentation focused on the process for community decision making in the management of decentralized systems in Deschutes County, a National Onsite Demonstration Project. In the absence of a step-by-step manual for cultivating a community decision process, the La Pine project coordinators used standard planning processes to structure

the steps that have led to a management strategy that is currently in the process of implementation. The results of the planning process are not fully realized that this point, although there is some evidence that community acceptance of future regulations has a greater prospect for success because of the broad participation in the planning process.

In summary, these three stories are widely divergent in their emphases, their mechanisms used to make decisions, and their outcomes. Rather than attempt to draw conclusions from their similarities, it is probably more important to note the unique situations that exist. In working with other communities, a strong theme supports the notion that each community has individual situations requiring custom approaches.

This should not mask the value in cataloging experiences in the form of case studies. One of the observations made during both workshops is the need to promote an idea that no single community is alone in trying to tackle their wastewater needs. Case studies can provide a general support mechanism by providing background information that offers support to communities that are newly facing their wastewater problems. While not a focus in either workshop, the process of technology selection may benefit from a rich suite of examples that can provide examples for the support of individual technologies.

Results From the Community Challenges Discussion

In closing out the second day of the workshop, the attendees were asked to answer the questions:

> "What are the critical issues that resulted from this two day workshop? What Big Issues face communities in addressing their wastewater needs and their pursuit of decentralized technologies?"

1. Attendees got the message "Management Systems are critical to successful implementation of decentralized systems." This is related to the discussion that several service providers have learned that putting a system in the ground is not sufficient to ensure a long term solution of a community's wastewater needs. EPA is probably on-track by pushing the need for management and proposing its five example levels for carrying out that management.

2. Decentralized systems are equivalent to Central Sewers for solving wastewater problems. For some attendees that are comfortable with decentralized solutions, it came as a bit of a surprise that some low income communities consider decentralized systems (including on-site systems) as inferior to big-pipe central sewers. The basis for this perception is that on-site systems have been the cheap alternative to wastewater management and the large investment necessary to install a central sewer is a symbolic commitment to provide low-income residents a service equivalent to upper-income sewered communities. Examples of higher-income neighborhoods pursuing decentralized solutions will slowly correct the perception.

3. We need to look at regulatory processes. As with the first workshop, there is some recognition that community efforts can be inhibited by a reluctance of state agency (or county health officials) to accept decentralized solutions.

4. Do we have skilled people to operate complex systems? The interest in assuring management of decentralized technologies needs to be supported by training community members that would oversee the management. In some cases, community members may not be adequately trained to carry out the management functions. Third-party assistance complemented by remote sensing may provide communities the management support that is necessary. Simply establishing management guidelines is usually not sufficient to ensure that decentralized systems are inspected and maintained.

5. Expand the number of qualified consultants. During the first workshop, a significant part of the discussion focused on the relationship between communities and engineering consultants. While not a specific topic during this workshop, several participants note that communities cannot design and implement decentralized solutions in the absence of support from engineers that are familiar with the technologies.

6. Engineers must demonstrate competence in the field of decentralized technologies. Related to the issue of expanding the number of qualified consultants is the need to evaluate the experience of engineers so that communities can be assured of the competence of the designers and contractors responsible for implementing decentralized technologies. To build a larger number of qualified consultants and to build the capacity of engineers to manage systems, the workshop discussed the use of existing training opportunities.

7. We need to build the Community and state capacity to evaluate different technologies. This workshop utilized some limited tools that described the performance of decentralized technologies. However, the actual operation of different systems under differing soil and climate conditions provides a great variability in the actual effectiveness of any technology. Additional research and information support is necessary for more widespread applications of decentralized technologies operating under variable conditions.

8. We need a strategy to work with legislators. Several states are reluctant to pursue decentralized technologies. Similarly, several states are reluctant to enforce existing wastewater regulations. In both cases, state legislators may be the focus of information and training so that they better understand both the risks of failing wastewater management and the opportunities of decentralized technologies.

9. We need to develop and promote the message that managed decentralized technologies are OK (provide services "equal to central sewers"). The idea that decentralized technologies are somehow inferior to central sewers was initially raised in the workshop based on the reactions of low-income residents. However, regulators, engineers, and other members of the public also hold the perception that decentralized solutions are a throwback to historic failing on-site septic systems. More recent managed implementation of decentralized technologies under a wide range of conditions provides evidence that the systems can be effective in addressing wastewater needs.

10. Residuals management is an important part of wastewater management. In a growing number of places around the country, communities are facing a challenge of managing the residuals from wastewater treatment .[9] Land application of those residuals (often called "biosolids")

[9] One estimate is that 40% of a wastewater treatment plant operating costs are associated with biosolids (residuals) management.

faces resistance. Just as with recent implementation of decentralized wastewater technologies, new regulations in biosolids management have largely eliminated the problems from previously unmanaged experiences. But the perceptions of residuals as a waste product that needs to be isolated is still prevalent.

Further questions:

> "How do we motivate people to address wastewater? Do we have the tools to build this motivation? Can we describe how wastewater affects the commons?"

11. Wastewater management is a BIG issue (partly described by the US EPA's Needs Surveys for expenditures required for infrastructure and management) and deserves focus. Several times during the workshop, participants identified the daunting task of providing financial resources to support the infrastructure needs of wastewater systems. It may be the case that a more active campaign to communicate the needs for wastewater management is required to elevate this issue to the status necessary for building the financial capacity to address the problem.

12. We need to let people know that there is information about management systems and complex wastewater systems. One-half of the story is to raise awareness regarding the need to manage wastewater problems in the country. The other half the story is to make people aware that successful implementation of both wastewater technologies and management systems have been accomplished.

Conclusions

An Evaluation of Available Community Tools

Unlike the first workshop, in this meeting we were able to evaluate a small number of tools that could be used by communities addressing their wastewater needs. However, it is not fair to use this workshop as a real-life example of tools application. During this meeting, there were representatives from several communities present and not a single community with a single set of issues to address. Even with this limitation, it was clear that the tools offer only a starting point for discussion and could not be used as a recipe for communities to progress through the necessary steps of a community process.

Both videos received positive comments but it was also noted that identifying the correct audience for each was important. The guidebooks from New Mexico and Minnesota provided a foundation and a case study for applying steps in a community process, but they were not sufficient to develop the details of a work plan for any community. The CDs from the NODP received mixed reviews. In part, the products are not well polished and their application on computers still needs some bugs to be worked out. The content of the visioning CD was well-received, however the content of the assessment CD required more background information and would have benefited from some context in the overall process, e.g., next steps after the assessment exercise is complete. The finance CD could not be evaluated because of problems loading the CD onto a computer.

During the first workshop, participants noted that there is no comprehensive material to assist communities to start a process for identifying decentralized solutions. The tools evaluated during the second workshop probably do not satisfy that need. There are some tasks that fit the building awareness phase of a community project that need to occur before actual assessments or before the consideration of committee structures.

In summary regarding tools, it may be safe to conclude that the absence of tools is not the critical weakness preventing a community from effectively supporting communities' efforts for evaluating wastewater management solutions.

The Value of Dialogue

GMI has hosted dozens of workshops in the past five years. Without fail, the most positive responses from participants are related to the opportunity to interact with other participants. In some cases, the opportunities are most important for interactions with experts. But in many other cases, interactions with other community members who are or have been in similar phases of their local projects are equally important. This observation holds true for experts as well. Discussions of appropriate policies and professional challenges benefit from occasional idea exchange that can take place during workshop settings.

Growth Management

We heard presentations from state agencies responsible for implementing growth management policies as well as agencies responsible for ensuring adequate wastewater management. The main challenge in considering decentralized solutions is the possibility that cluster systems or other community approaches to wastewater may encourage new housing developments in areas that are not designated for growth under the state growth-management criteria. On the other hand, there is a recognition that appropriately designed wastewater solutions could complement growth-management strategies. While this observation meets general acceptance, the details for implementing such coordinated wastewater and growth-management policies were not forthcoming.

Evaluation

A written evaluation form provided workshop attendees with three questions. We received responses from eleven of the workshop participants.

The first question asked attendees to identify any aspects of wastewater management and learned during the workshop. As expected, the responses to this question were varied. In some cases individuals learned from the experiences of individual communities, and in other cases the learning noted is related to the roles of differing state and federal agencies in supporting wastewater management.

The second question asked the attendees to list the actions they would take when they returned to their home as the result of the workshop. Some attendees identified specific steps to help move a

particular project forward. Several of the attendees noted additional contacts to make from different agencies participating in the workshop.

The third question asked for particular issues that were not adequately addressed in the workshop. Many attendees expressed their satisfaction with topics covered, but some issues raised were: property rights, the variation in different regions and community types, and more information on the benefits of wastewater reuse.

The final question asked participants to list some of the items that they would like to have follow-up on. The general theme in the responses was to provide follow-up information from the results of the meeting. The second response to this request was for a collection of examples from demonstration sites and other pilot communities.

Pacific Northwest Workshop Agenda

Day One—Tools for Communities

Thursday, November 21, 2002

Objective—Evaluate tools available for communities pursuing wastewater solutions.

Audience—There are three general audiences. The first and largest are representatives from local communities that are currently working on their wastewater needs and will include municipal officials and "movers and shakers". The second audience is representatives from communities around the country that have progressed through different stages of wastewater solution development. The third audience is the presenters of the tools and the NDWRCDP representatives interested in the reactions to these tools.

9:00–9:45 am **Introductions**
Introducing the workshop background and participants

9:45–10:00 **Framework for considering wastewater solution development**
There are two ways to consider the decision and implementation process for wastewater solutions. The first is a progression of tasks to arrive at a solution

- Assessment
- Establish wastewater management goals
- Evaluate options
- Decide general direction for solution
- Design solutions
- Implement and manage

In addition, there are phases for the community to progress through

- Build awareness/education/trust
- Develop capacity to address the problem/develop community action team
- Build a conformance attitude for ensuring the long term success of the solution

In this session, we will introduce these frameworks for consideration

10:00–10:30 **Tool presentation—videos**
NESC and the State of Pennsylvania have developed videos to introduce people to the options of wastewater management. We will present one of the videos for review at this time and a second on Day Two. We will provide a written evaluation tool to gauge the audience reaction to these two presentations.

10:30–10:45 **Break**

11:00–noon **Tool presentation—Guidebooks, CDs and technology review**
There are two (or three) published guides for giving communities a start at developing a wastewater project. In addition, the National Small Flows Clearinghouse at the National Environmental Service Center has developed a CD for the same purpose. We will start with a brief presentation on their general content and offer some specific ideas for how the information can be used at the community level. We will then continue with some brief comments from reviewers regarding the relative value of each tool and what it will take to make it more useful for community audiences. The session will close with instructions for the after-lunch break out.

Noon–1:00 pm **Lunch**

1:00–1:45 **Using the tools**
We will break into small groups to tackle individual steps in project development.

1:45–2:20 **Report back**
Each team will report the results from its project development assignment and we will review how the tools helped carry out the exercise. The report back session will also identify some follow-up assignments for the teams to tackle.

2:20–3:00 **Teams reconvene**
With some more focused questions, the teams will try to use the tools to build a more refined set of project steps.

3:00–3:15 **Break**

3:15–4:00 **Exercise summary and tool evaluation**
As the result of the exercise and discussion, we will identify some key themes regarding the tools that will help consider possible approaches for future tool development In addition, we will use this time to highlight some next steps for participating communities.

4:00–4:30 **Progress in Teller County, Colorado** *Randy Swepston, Teller County*
In December of 2001, five pilot communities gathered in Denver to kick off their efforts in arriving at decentralized solutions. We will have a representative from one of the communities provide us with an update n the progress that community is making towards decentralized solutions and how the training helped them carry out some activities.

4:30–5:00 **Day One conclusions**
A facilitated discussion to arrive at key points in the status of current tools for communities.

Day Two

Friday, November 22, 2002

Objective—We will continue the discussion of experiences in communities but add the role of regulatory agencies and the context of wastewater solutions related to other local infrastructure issues. We will not pretend to resolve the specific needs of communities, but rather to identify those needs and the mechanisms that states have to address them.

Audience—In addition to the Day One audience, we will have representatives from state and county regulatory and development agencies present to review the status of decentralized wastewater solutions as applied or planned in their jurisdictions.

8:30–9:00 am	**Day Two introductions, agenda review, and presentation of the second video**
9:00–9:45	**A case study from Washington** *Carol Wildman, Starbuck, WA* Starbuck, Washington has implemented a decentralized solution to its wastewater needs. We will hear from a community member that helped move this project along. In Starbuck, in addition to deciding upon wastewater technologies, the town used a self-help process for accomplishing the installation. While this approach saved the town almost one million dollars, it also required additional effort in engaging the town's citizens.
9:45–10:30	**The use of self-help to reduce project costs** *Eric Ellman, TRI South* The Rensselaerville Institute has promoted a process that was used in Starbuck to reduce implementation costs. During this session we will focus on the STEP process and get an update on its implementation in Texas and provide an opportunity to better understand its application.
10:30–10:45	**Break**
10:45–11:30	**Progress at La Pine, Oregon** *Barbara Rich, LaPine Coordinator* There is a national demonstration program in place in La Pine that is intended to investigate the potential for decentralized management of wastewater with a focus on protecting ground water quality. As with other communities, the project in La Pine has required an education and outreach campaign. This presentation will highlight the aspects of its outreach and provide a brief summary of results that may be applied in other towns, as well.
11:30 am–noon	**Current community challenges—Round One** During this session, we will discuss the current policy challenges in Oregon and other states highlighting the difficulty of implementing a decentralized technology outside of urban growth boundaries. The objective of this session is to identify the kinds of information and messages that can promote progress in using decentralized technologies where they are appropriate.
Noon–1:00 pm	**Lunch** Informal discussions discussing experiences with growth management and wastewater management.

1:00–1:30 **Report back**
A short discussion regarding the results from the lunch discussions

1:30–2:30 **Current community challenges—Round Two**
During this session, we will invite participating communities to highlight some of their experiences in partnering with regulatory agencies to address wastewater challenges. Participants from state agencies will have an opportunity to respond with perspectives on how current programs and policies may help communities address their wastewater needs.

2:30–3:30 **State role in supporting community solutions**
State environmental and health agencies play two important roles in working with communities to address wastewater needs. The state is typically responsible for enforcing health and environmental regulations that may lead to requirements for wastewater system repairs and management. In addition, the state agencies may play a role in working with the states to supply financial and technical resources. During this session, we will hear from several state agency representatives regarding the mechanisms that are in place and the tools that are used for assisting communities.

3:30–3:45 **Break**

3:45-4:15 **Revisiting community needs**
The first day identified some specific needs that communities need in order to move forward. As the result of the state presentations, we can re-visit some of those needs and the issues raised by communities in today's 1:45 session to consider what kinds of tools and mechanisms could be considered for addressing a community's needs.

4:15–5:00 **Conclusions from Day Two**
A facilitated discussion to arrive at key points from today's discussions regarding the context of decentralized systems for communities with multiple infrastructure pressures, challenging regulatory requirements and a shortage of revenue.

Day Three

Saturday, November 23, 2002

Objective—To summarize the findings from this meeting and the June meeting in Maryland and identify some next steps for further tool development. In addition to specific tool development, the next steps may include some steps for the service delivery organizations to consider for service coordination.

Audience—This part of the workshop will have a smaller set of participants representing the national level organizations that support the application of decentralized technologies.

8:30–9:30 am	**Summary of findings to date** GMI will present a list of findings from this and the Maryland workshop. The participants will help edit this list and develop some language so that each topic is clearly understood. From this list, there will be two general sessions: • The status of individual tools • The status of delivery mechanisms
9:30–10:45	**Status of individual tools**
10:45–11:00	**Break**
11:00–12:15 pm	**Status of delivery mechanisms**
12:15–1:30	**Lunch and informal discussion**
1:30–2:00	**Next steps**

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November 21–23, 2002

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Results From Day One Exercises

Work Plan Team

- Identified people to the phone-committees, organizations, structure
- Identify land uses, incomes
- Educational meetings
- Define present conditions
- timetable with mileposts
- Engineering challenges
- Sanitary surveys let people know-establish problem statement
- Needs assessment
- Public meetings with board members
- Funding sources for planning phase
- Hire consultant if funds available

Challenges to Focus On for Session Two

- How to deal with the situation when someone throws a wrench in the works
- How do we maintain motivation

Management Team

Operation and Maintenance

- Effect on resource sensitivity
- What legislation do we have
- What enforcement hammer-civil, criminal
- Community acceptance
- No national standards for O&M program

Planning and Inventorying

- GIS to communicate regarding the Commons

Performance Standards

- Revocable permits

Residuals Management

Maintaining the Details

Challenges for the Second Session

- Who are the managers?
- How to involve the public?
- How to get community buy-in?
- What is the status of statutory authority?
- Is there an alternative?

Technology Choice Team

(Based on the criteria from Oregon economic and community development guide.)

Six highly ranked criteria to evaluate community options—added safety as a criteria:

- Defining the problem for the purpose of the exercise-
- Conclusion: needs cluster to solve it
- Capital costs
- O&M costs
- Effluent quality
- Reuse potential
- Community impact (promote growth)
- Safety

Excluded Oregon Criteria on:

- Scalability
- Cross media impacts

Challenges for Second Session

- What information are you going to use?
- Whose information is it?

- What legislation do you have to support this?
- Who is making these decisions?

Public Involvement Team

How to maximize community involvement

Categories

- Who is public
- How raise awareness

Are they suspicious of the manager?

- Where do they gather?
- Ask: what is the problem?

Craft a Vision

How do we deal with problem people? (Politicians)

- Invite them to identify the solution

Identify Stakeholders

- Do you want experts engaged in discussion?
- How do you accommodate the audience? (See CD)
- Kinds of public—creating a crisis to engage interest
- Subtle manipulation of human concerns (shaming)
- Let people know the costs (environmental and economics)

Communication Challenges

- Problems and needs
- Choose the proper venue for events
- Avoid places that suggest bias
- Newsletter
- Be clear about potential biases
- Two-way communication

Challenges for Second Session

- Who will the public trust to describe the relative safety of a particular technology?
- How you maintain a long-term public involvement strategy?
- Public involvement as a tool to build the community

Evaluating Video Presentations

Pennsylvania DEP Video

The majority of comments regarding the Pennsylvania DEP informational video were positive. Most people felt that the video struck a good balance between simplicity and complexity, with several comments that a more technically-minded version (or separate video) aimed at contractors and engineers would complement the information. Comments on the ability of the video to represent "my" community varied. Some thought the video represented their areas well, others felt it was too "white collar", and would not directly connect with lower income, rural areas. Most felt that the video was truthful, with the exception of the statement "free of impurities", which several people objected to.

Numerous ideas were generated for audiences and opportunities to share the video. Audiences additional to the evaluation suggestions of school children, realtors, builders, homeowners, and municipal officials, included newly elected officials, public works officials, mortgage lenders, health department personnel, landscapers, and engineers. Opportunities to share the video included community work groups, fairs, home and garden shows, public libraries, public service announcements on TV and radio, and specifically worked into microbiology and environmental units in schools. Other comments suggested that more focus be placed on the activity of the soil as part of the system; the larger community aspects of caring for a personal system; more information on tank additives; less focus pumping/removal and more on owner involvement and prevention. A homeowner's checklist to accompany the video was proposed.

National Environmental Services Center (NESC) Video

Overall, the comments regarding the NESC video were complimentary. The video balanced simplicity and complexity, had good pacing, seemed truthful and professionally produced without being "too slick". Participants commented that the video seemed relevant to small rural communities and communicated the messages well that "other communities are doing this", "help is out there", and "management is key." Several people added that a diversity of homes/homeowners would be nice, with less emphasis on recreational communities.

Additional audiences and opportunities suggested included council planning meetings and board of public affairs meetings, public hearings, and stakeholders in communities facing these problems. After seeing the video, participants suggested that more detail on operational costs would be helpful, following up with communities after system startup, and returning to the "practical" aspects of the information at the end of the video. Several individuals commented

that the video had a more commercial feel in its second half, and requested that other relevant service organizations in addition to NESC be noted.

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